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Trade and Welfare Effects of New Trade Policy Instruments

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Geoeconomic concepts are gaining importance in EU trade policy. In this context new trade policy instruments are designed to protect the internal market against unfair trade practices, coercive actions as well as to ensure sustainable supply chains and the protection of human rights. The study extensively overviews seven policy instruments: Anti-Coercion Instrument (ACI), Enforcement Regulation (ER), International Procurement Instrument (IPI), Carbon Border Adjustment Mechanism (CBAM), Corporate Sustainability Due Diligence (CSDD), Level Playing Field Provisions in the EU-UK Trade and Cooperation Agreement (LPF), and EU Regulation on Deforestation-Free Products (EUDR). Using gravity models and a quantitative general equilibrium trade model, the impact of the selected trade policy instruments on trade and welfare of the EU as well as Austria is estimated based on different scenarios.

Keywords: Geoeconomic concepts, EU trade policy, internal market, unfair trade practices, coercive actions, sustainable supply chains, human rights, trade policy instruments, Anti-Coercion Instrument, International Procurement Instrument, Carbon Border Adjustment Mechanism, Foreign Subsidy Instrument, Corporate Sustainability Due Diligence, Level Playing Field Provisions, EU-UK Trade and Cooperation Agreement, Enforcement Regulation, Deforestation Initiative, gravity models, quantitative general equilibrium trade model, impact, trade, welfare, scenarios.
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Geoeconomic concepts are gaining importance in EU trade policy. In this context new trade policy instruments are designed to protect the internal market against unfair trade practices, coercive actions as well as to ensure sustainable supply chains and the protection of human rights. The study extensively overviews seven policy instruments: Anti-Coercion Instrument (ACI), Enforcement Regulation (ER), International Procurement Instrument (IPI), Carbon Border Adjustment Mechanism (CBAM), Corporate Sustainability Due Diligence (CSDD), Level Playing Field Provisions in the EU-UK Trade and Cooperation Agreement (LPF), and EU Regulation on Deforestation-Free Products (EUDR). Using gravity models and a quantitative general equilibrium trade model, the impact of the selected trade policy instruments on trade and welfare of the EU as well as Austria is estimated based on different scenarios.

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Executive Summary (English)

This study provides a comprehensive overview of newly introduced and proposed trade policy instruments by the EU. Most importantly, the analysis includes a model-based quantitative assessment of the expected long run macroeconomic effects of these trade policy measures, based on specific scenarios which are simulated with the KITE general equilibrium global economy and trade model. This analysis may inform policy decisions and contribute to a deeper understanding of the implications of the evolving EU trade policy in the current geopolitical context.

The new instruments mark a significant shift in the EU's trade policy strategy, bringing the "geopolitics of trade" into focus by broadening trade policy objectives to include foreign policy, environmental, humanitarian and security concerns. Many of the instruments provide the EU with defensive and retaliatory tools to counter unfair trade practices and coercion by its trading partners. These include the Anti-Coercion Instrument (ACI) and the updated Enforcement Regulation (ER). Others equip the EU with offensive tools to strengthen the EU's enforcement capacity in trade policy in order to promote sustainability goals as well as compliance with EU rules and standards and to establish "level playing fields". These include the International Procurement Instrument (IPI), the level playing field provisions in the EU-UK Trade and Cooperation Agreement (LPF), the Directive on Corporate Sustainability Due Diligence (CSDD), and environmentally relevant instruments like the Deforestation Regulation (EUDR) and the Carbon Border Adjustment Mechanism (CBAM). All seven instruments are analysed thoroughly in this study.

Summarising key points by emphasising **shared characteristics and general policy conclusions**, we can highlight the following:

- Countries most likely to be affected by the instruments include the EU Member States, the USA, China, Russia, the United Kingdom, Turkey and partly also Brazil and Indonesia.
- In general, the welfare effects of the instruments are modest. However, at the more detailed sector level, some of the instruments imply substantial trade diversion effects, foremost in the sectors directly targeted by the specific instrument. This leads to an uneven distribution of costs across EU Member States and sectors. Under most of these new trade policy instruments, EU countermeasures can impact both imports and exports of goods or services, but the ultimate objective is always to restrict or limit access to the EU Single Market. This includes export restrictions to deter foreign buyers as well as import restrictions and tariffs to discourage foreign sellers.
- The stronger the EU Single Market, the more effective and credible are threats to limit market access to third countries. Therefore, the attractiveness of the EU is to play a key role in the effectiveness of the instruments.
- A particular challenge is the coordinated application of the various instruments to prevent inconsistencies and to balance conflicting goals. Trade-offs between different instruments must be recognised and a clear strategy to prioritise goals must be defined. Clarification is necessary regarding competences between the EU and Member States. As an accompanying measure, speeding up decision-making in the EU Council for foreign and security policy is vital. Mechanisms to compensate unevenly distributed costs of countermeasures

between Member States could facilitate and support decision-making processes in EU's overall trade policy strategy.

- Legal concerns and inconsistencies with WTO rules should be prevented so as not to undermine the EU's stated aims of open trade and the importance of multilateralism.
- Cooperation, diplomatic dialogue and transparency as well as information sharing in the application of countermeasures with the conflicting parties are vital components in effectively resolving potential trade disputes and containing risks of retaliation.
- International cooperation and partnerships prove to be particularly effective in applying the instruments, enhancing sustainability and environmental goals or the compliance with EU rules and standards, and establishing a "level playing field".
- Last not least, regular monitoring and periodic review of the newly introduced instruments are essential for evidence-based policy adjustments.

At the more detailed level of individual trade policy instruments, the **defensive policy instruments (ACI and updated ER and in some parts the IPI)** reviewed are specifically associated with the danger of protectionism, of retaliation and of escalation of trade conflicts. This poses great demands on the design of the instruments and the credibility of countermeasures. Ideally, the mere threat of countermeasures should be sufficient, to de-escalate trade conflicts. The key prerequisite for this, as mentioned before, is the attractiveness of the EU Single Market. Other key aspects are the proportionality, transparency and predictability of countermeasures, multistage procedures, efficient mechanisms for identifying rule violations and for assessing the proportionality of countermeasures as well as the coordinated application of the trade policy instruments to ensure consistency. However, trade policy measures also entail economic costs for the country applying them. The simulations based on the KITE model reveal small economic repercussions for the EU and Austria in the scenarios where bilateral trade conflicts with China and Russia and the sectors most frequently targeted by trade restrictions are selected. The size of the economic costs depends on the specific type of measure taken and the sectors chosen. This requires evidence-based "trade policy intelligence" and model-based analysis in the application of countermeasures.

An analysis of the level playing field **(LPF) provisions** of the **EU-United Kingdom Trade and Cooperation Agreement (TCA)**, focusing particularly on the welfare and trade effects of subsidies and state aid, underscores the importance of compliance with these provisions to ensure fair competition. By establishing a level playing field, parties involved can ensure the mutually beneficial nature of their trade relations while effectively addressing evolving economic and environmental challenges. This also extends to competition among EU Member States. While subsidies and state aid are often employed strategically, any use of these measures should be subject to a thorough evaluation, carefully weighing the benefits of increased production and competitiveness against the associated economic costs and distortions, both domestically and internationally. Furthermore, trade agreements such as the TCA provide an opportunity to establish a level playing field within a framework that provides legal certainty, transparent dispute settlement mechanisms, and mechanisms to facilitate future convergence in standards. This also limits the risk of retaliation against LPF provisions. Moreover, careful monitoring and periodic reviews are important tools for making policy adjustments based on evidence and data.

The **proposal for a Directive on Corporate Sustainability Due Diligence (CSDD)** of 2022 promotes responsible global value chain practices, but also raises concerns about the EU's competitiveness and geopolitical influence. This is underscored by the model-based results. Successful implementation of the Directive has positive impacts on trade and welfare for all countries involved, encourages sustainability and facilitates the integration of "high-risk" countries into global markets. On the other hand, unsuccessful implementation of the CSDD results in significant welfare losses, leading to a substantial decline in international trade, particularly affecting high-impact sectors such as clothing, textiles, and leather. This failure also prompts trade diversion to less efficient production within the EU and negatively impacts the EU's international competitiveness. The withdrawal from markets where human rights and environmental violations are likely to occur is concerning given the EU's dependence on critical raw materials from these areas, and potentially jeopardises sustainability goals and competitiveness. At the same time, it is important to recognise, that unsuccessful implementation of the CSDD also has adverse effects on developing countries, especially those reliant on exports related to textiles, apparel, agriculture, mining, and metals to the EU. This highlights the need for proactive EU policy measures to manage the transition to sustainability in these countries, including partnerships, development assistance, and initiatives like the Global Gateway. Efficient CSDD implementation further requires the promotion of due diligence guidelines, standardisation of reporting practices, certification systems, and risk management criteria, as well as active involvement of civil society. International cooperation with like-minded partners such as the USA can reduce the risk of retaliation and foster harmonisation of global sustainability standards. Finally, successful implementation of the CSDD hinges on the strength of trade ties and the importance of the EU Single Market for the most affected countries.

The **EU Regulation on Deforestation-Free Products (EUDR)** and the **Carbon Border Adjustment Mechanism (CBAM)** are both regulations designed to meet the EU's ambitious climate and environmental goals. The model-based analysis of the EUDR highlights the potential for welfare costs of the EU if partner countries fail to comply with the EUDR rules in a scenario where deforestation-free products from major trading partners are banned from entering the EU Single Market. These costs arise due to a shift of deforestation-free goods towards more costly production within the EU. This could lead to welfare losses for the EU and Austria. However, as only specific products are targeted, these losses are small and amount to about 0.05% for the EU and 0.03% for Austria. The full economic impact of the EUDR will depend on an effective implementation of the EUDR in cooperation with key partners, mainly in developing countries. Internationally coordinated efforts to combat deforestation, as well as assistance to operators in least developed countries in meeting stringent due diligence requirements and facilitating the administrative process, could help to enhance the potential of the EUDR to limit global forest loss and forest degradation.

Regarding the CBAM, the model-based simulations suggest that it is an effective tool for reducing emissions at the EU level, thereby mitigating carbon leakage. The (long-term) macroeconomic impacts are likely to be small. Comparing a scenario of unilateral implementation of the CBAM and potential retaliation by partner countries with a scenario of climate cooperation within a Climate Club of G7 countries, welfare losses for the EU and Austria are reduced from 0.28% and 0.21% respectively to 0.15% for both the EU and Austria. Furthermore, the more the EU can play a pioneering role and accelerate global decarbonisation the higher the success

in fighting global emissions. A Climate Club as simulated in the study would reduce global emissions by 14.8%, equivalent to 5.46 bn tonnes of less carbon emissions annually. Expressing the emission reduction in terms of benefits of avoided damage, known as social costs of carbon, and assuming a recent cost estimate of 180 $/tonne yields welfare benefits from cost internalisation of around $ 983 bn. This represents a multiple of the welfare loss of the EU ($ -22.7 bn) and the USA ($ -108.7 bn) together incurred in the case of a Climate Club. This highlights the favourable cost-benefit-ratio of a Climate Club.

From an economic policy perspective, these results reiterate the need for multilateral cooperation, as well as cooperation and dialogue with trading partners to limit the risks of retaliation. Temporary transfer payments to sectors and households particularly affected by rising CO_2 prices could support a successful implementation of the CBAM within the EU.

Executive Summary (Deutsch)

Diese Studie bietet einen umfassenden Überblick über neu eingeführte und vorgeschlagene handelspolitische Instrumente der EU. Herzstück der Analyse ist eine modellgestützte quantitative Bewertung der zu erwartenden langfristigen makroökonomischen Auswirkungen dieser handelspolitischen Maßnahmen auf Grundlage spezifischer Szenarien und Simulationen mit dem KITE-Modell, einem allgemeinen Gleichgewichtsmodell der Weltwirtschaft und des internationalen Handels. Diese können ein wichtiger Wegweiser für Entscheidungen in der Handelspolitik sein und zu einem besseren Verständnis der Auswirkungen der sich entwickelnden EU-Handelspolitik im aktuellen geopolitischen Kontext beitragen.

Die neuen Instrumente markieren einen bedeutenden Wandel in der handelspolitischen Strategie der EU und rücken die "Geopolitik des internationalen Handels" in den Mittelpunkt, da sie die handelspolitischen Ziele auf außenpolitische, ökologische, humanitäre und sicherheitspolitische Belange ausweiten. Viele der Instrumente geben der EU Verteidigungs- und Vergeltungsinstrumente in die Hand, um gegen unfaire Handelspraktiken und Nötigung durch ihre Handelspartner vorzugehen. Dazu gehören das Anti-Coercion-Instrument (ACI) und die aktualisierte Enforcement-Verordnung (ER). Andere rüsten die EU mit offensiven Instrumenten aus, um die Durchsetzungsfähigkeit der EU in der Handelspolitik zu erhöhen oder um Nachhaltigkeitsziele sowie die Einhaltung von EU-Vorschriften und EU-Standards zu propagieren und "gleiche Wettbewerbsbedingungen" zu schaffen. Dazu gehören das Instrument für das internationale Beschaffungswesen (IPI), die Bestimmungen über gleiche Wettbewerbsbedingungen im Handels- und Kooperationsabkommen zwischen der EU und dem Vereinigten Königreich (LPF), die Richtlinie über die Sorgfaltspflicht von Unternehmen im Bereich der Nachhaltigkeit (CSDD) sowie umweltrelevante Instrumente wie die Entwaldungsverordnung (EUDR) und der CO_2-Grenzausgleichsmechanismus (CBAM). Alle sieben Instrumente werden in der vorliegenden Studie eingehend analysiert.

Die wichtigsten **gemeinsamen Merkmale und allgemeine politischen Schlussfolgerungen** können folgend zusammengefasst werden:

- Zu den Ländern, die am ehesten von den Instrumenten betroffen sein dürften, gehören die EU, die USA, China, Russland, das Vereinigte Königreich, die Türkei sowie zum Teil auch Brasilien und Indonesien.
- Im Allgemeinen sind die Wohlfahrtseffekte der Instrumente moderat, wenngleich einige Instrumente erhebliche Handelsumlenkungseffekte hervorrufen, vor allem in jenen Sektoren, auf die das jeweilige Instrument direkt abzielt. Dies führt zu einer ungleichen Verteilung der Kosten auf die Mitgliedstaaten der EU und die Sektoren.
- Handelspolitische Gegenmaßnahmen, die in den jeweiligen Instrumenten vorgesehen sind, betreffen sowohl den Import als auch den Export von Waren oder Dienstleistungen, doch besteht das eigentliche Ziel immer darin, den Zugang zum EU-Binnenmarkt zu beschränken oder zu begrenzen. Dazu gehören Ausfuhrbeschränkungen, um ausländische Käufer abzuschrecken, sowie Einfuhrbeschränkungen oder Zölle, um ausländische Verkäufer zu entmutigen.

- Je stärker und größer der gemeinsam EU-Markt ist, desto wirksamer und glaubwürdiger sind Drohungen den Marktzugang für Drittländer zu beschränken. Daher spielt die Attraktivität des EU-Binnenmarktes eine Schlüsselrolle für die Wirksamkeit der Instrumente.
- Eine besondere Herausforderung ist die koordinierte Anwendung der verschiedenen Instrumente, um Inkonsistenzen zu vermeiden und Zielkonflikte auszugleichen. Zielkonflikte zwischen verschiedenen Instrumenten müssen identifiziert und eine klare Strategie zur Priorisierung der Ziele festgelegt werden. Dazu gehört auch eine genaue Klärung der Zuständigkeiten zwischen der EU und den Mitgliedstaaten. Als flankierende Maßnahme ist eine Beschleunigung der Entscheidungsfindung im EU-Rat für Außen- und Sicherheitspolitik unerlässlich. Mechanismen zum Ausgleich ungleich verteilter Kosten für Gegenmaßnahmen zwischen den Mitgliedstaaten könnten die Entscheidungsprozesse in der handelspolitischen Gesamtstrategie der EU erleichtern und unterstützen.
- Rechtliche Bedenken und Unvereinbarkeiten mit den WTO-Regeln sollten vermieden werden, um die erklärten Ziele der EU – Offenheit im Handel und die Bedeutung des Multilateralismus – nicht zu untergraben.
- Zusammenarbeit, diplomatischer Dialog und Transparenz sowie Informationsaustausch bei der Anwendung von Gegenmaßnahmen mit den Konfliktparteien sind entscheidende Komponenten für die wirksame Beilegung potenzieller Handelsstreitigkeiten.
- Internationale Zusammenarbeit und Partnerschaften erweisen sich als besonders wirksam bei der Anwendung von Instrumenten zur Verbesserung der Nachhaltigkeit und der Einhaltung von Umweltzielen oder von EU-Vorschriften und EU-Standards und zur Schaffung gleicher Wettbewerbsbedingungen.
- Nicht zuletzt sind ein regelmäßiges Monitoring und eine periodische Überprüfung der neu eingeführten Instrumente für eine evidenzbasierte Anpassung dieser unerlässlich.

Auf der detaillierteren Ebene der einzelnen handelspolitischen Instrumente sind insbesondere die untersuchten **defensiven Instrumente (ACI, ER und teilweise auch das IPI)** mit der Gefahr von Protektionismus, Vergeltungsmaßnahmen und einer Eskalation von Handelskonflikten verbunden. Dies stellt große Herausforderungen an die Ausgestaltung der Instrumente und die Glaubwürdigkeit von Gegenmaßnahmen. Im Idealfall sollte die bloße Androhung von Gegenmaßnahmen ausreichen, um Handelskonflikte zu de-eskalieren. Die wichtigste Voraussetzung dafür ist, wie bereits erwähnt, die Attraktivität des EU-Binnenmarktes. Weitere wichtige Aspekte sind die Verhältnismäßigkeit, Transparenz und Vorhersehbarkeit von Gegenmaßnahmen, mehrstufige Verfahren, effiziente Mechanismen zur Feststellung von Regelverstößen und zur Beurteilung der Verhältnismäßigkeit von Gegenmaßnahmen sowie eine koordinierte Anwendung der handelspolitischen Instrumente. Handelspolitische Maßnahmen sind jedoch auch mit wirtschaftlichen Kosten für das Land verbunden, das das jeweilige Instrument anwendet. Die Simulationen auf Basis des KITE-Modells zeigen in den Szenarien, in denen bilaterale Handelskonflikte mit China und Russland sowie Sektoren, die am häufigsten Ziel von Handelsbeschränkungen sind, ausgewählt wurden, geringe wirtschaftliche Auswirkungen für die EU und Österreich. Diese Fallbeispiele zeigen aber auch, dass die Höhe der wirtschaftlichen Kosten von der Art der getroffenen Maßnahmen und den ausgewählten Sektoren abhängt. Dies erfordert evidenzbasierte "handelspolitische Intelligenz" und eine modellbasierte Analyse bei der Auswahl und der Anwendung von Gegenmaßnahmen.

Die Analyse der **Bestimmungen** des **Handels- und Kooperationsabkommens (TCA) zwischen der EU und dem Vereinigten Königreich** über gleiche Wettbewerbsbedingungen (Level Playing Field – **LPF)**, die sich insbesondere auf die Auswirkungen von Subventionen und staatlichen Beihilfen auf die Wohlfahrt und den Handel konzentriert, unterstreicht die Bedeutung der Einhaltung dieser Bestimmungen für die Gewährleistung eines fairen Wettbewerbs. Die Schaffung gleicher Wettbewerbsbedingungen ermöglicht es den beteiligten Parteien, die gegenseitigen Vorteile der Handelsbeziehungen zu wahren und gleichzeitig gemeinsam wirtschaftliche und ökologische Herausforderungen wirksam anzugehen. Dies gilt auch für den Wettbewerb zwischen den EU-Mitgliedstaaten. Während Subventionen und staatliche Beihilfen häufig strategisch eingesetzt werden, sollte jeder Einsatz dieser Maßnahmen einer gründlichen Bewertung unterzogen werden, bei der die Vorteile einer Steigerung der Produktion und der Wettbewerbsfähigkeit sorgfältig mit den damit verbundenen wirtschaftlichen Kosten und Verzerrungen sowohl im Inland als auch im internationalen Handel abgewogen werden. Darüber hinaus bieten Handelsabkommen wie das TCA die Möglichkeit, gleiche Wettbewerbsbedingungen innerhalb eines Rahmens zu schaffen, der Rechtssicherheit, transparente Streitbeilegungsmechanismen und Mechanismen zur Erleichterung einer künftigen Konvergenz von Standards und Normen bietet. Dadurch ist auch das Risiko von Vergeltungsmaßnahmen gegen die LPF-Bestimmungen begrenzt. Darüber hinaus sind eine sorgfältige Überwachung und regelmäßige Überprüfungen wichtige Instrumente, um Anpassungen in den LPF-Bestimmungen evidenzbasiert vorzunehmen.

Der **Vorschlag für eine Richtlinie über die Sorgfaltspflicht von Unternehmen im Bereich der Nachhaltigkeit (CSDD)** aus dem Jahr 2022 fördert verantwortungsvolle Praktiken in globalen Wertschöpfungsketten, gibt aber auch Anlass zur Sorge im Hinblick auf die Wettbewerbsfähigkeit und den geopolitischen Einfluss der EU. Dies wird durch die modellbasierten Ergebnisse unterstrichen. Während sich eine erfolgreiche Umsetzung der Richtlinie positiv auf den Handel und die Wohlfahrt aller beteiligten Länder auswirkt, die Nachhaltigkeit fördert und die Integration von Hochrisikoländern in die globalen Märkte erleichtert, führt eine erfolglose Umsetzung der CSDD zu erheblichen Wohlfahrtsverlusten und zu einem starken Rückgang des internationalen Handels, wovon insbesondere Hochrisikosektoren wie Bekleidung, Textilien und Leder betroffen sind. Dieses Scheitern führt auch zu einer Umlenkung des Handels auf eine (ineffizientere) Produktion innerhalb der EU und wirkt sich negativ auf die internationale Wettbewerbsfähigkeit der EU aus. Der mögliche Rückzug aus Märkten, in denen Menschenrechts- und Umweltverstöße wahrscheinlich sind, ist besorgniserregend, da die EU von wichtigen Rohstoffvorkommen in diesen Gebieten abhängig ist und dies potenziell auch die Nachhaltigkeitsziele und die Wettbewerbsfähigkeit gefährdet. Gleichzeitig ist es wichtig zu erkennen, dass eine erfolglose Umsetzung der CSDD auch negative Auswirkungen auf die Entwicklungsländer hat, insbesondere auf diejenigen, die von Exporten in die EU in den Bereichen Textilien, Bekleidung, Landwirtschaft, Bergbau und Metalle abhängig sind. Dies unterstreicht die Notwendigkeit proaktiver politischer Maßnahmen der EU zur Bewältigung einer nachhaltigen Transformation in diesen Ländern, einschließlich Partnerschaften, Entwicklungshilfe und Initiativen wie dem "Global Gateway". Eine effiziente Umsetzung der CSDD erfordert darüber hinaus die Förderung von Leitlinien für die Sorgfaltspflicht, die Standardisierung von Berichterstattungspraktiken, Zertifizierungssystemen und Risikomanagementkriterien sowie die aktive Einbeziehung der Zivilgesellschaft. Die internationale Zusammenarbeit mit gleichgesinnten Partnern wie den USA kann das Risiko

von Vergeltungsmaßnahmen verringern und die Harmonisierung der globalen Nachhaltigkeitsstandards fördern. Schließlich hängt die erfolgreiche Umsetzung der CSDD von der Stärke der Handelsbeziehungen und der Bedeutung des EU-Binnenmarktes für die am stärksten betroffenen Länder ab.

Die **EU-Verordnung über entwaldungsfreie Produkte (EUDR)** und der CO_2-Grenzausgleichsmechanismus **(CBAM)** sind beides Verordnungen, mit denen die ehrgeizigen Klima- und Umweltziele der EU erreicht werden sollen. Die modellbasierte Analyse der EUDR zeigt das Potenzial für erhebliche Wohlfahrtskosten für die EU in einem Eskalationsszenario (Verhängung eines vollständigen Importverbots für die betroffenen Produkte), wenn die Partnerländer die EUDR-Regeln nicht einhalten. Diese Kosten entstehen, wenn sich die Produktion der betroffenen Waren auf eine kostspieligere Herstellung innerhalb der EU verlagert. In diesem Zusammenhang könnte die EU Wohlfahrtsverluste erleiden. Da nur bestimmte Produkte betroffen sind, bleiben diese gering und belaufen sich auf etwa 0,05% für die EU und 0,03% für Österreich Die volle wirtschaftliche Wirkung der EUDR wird daher von einer effektiven Umsetzung der EUDR in Zusammenarbeit mit den wichtigsten Partnern, vor allem in den Entwicklungsländern, abhängen. Sowohl international koordinierte Bemühungen zur Bekämpfung der Entwaldung als auch die Unterstützung von Unternehmen in den am wenigsten entwickelten Ländern bei der Einhaltung der strengen Sorgfaltspflichten könnten dabei helfen und das Potenzial der EUDR für positive Umweltauswirkungen erhöhen.

Die modellbasierten Simulationen deuten darauf hin, dass CBAM ein effizientes Instrument zur Verringerung der Emissionen auf EU-Ebene ist und damit die Verlagerung von CO_2-Emissionen eindämmt. Die (langfristigen) makroökonomischen Auswirkungen werden als gering eingeschätzt. Vergleicht man das Szenario einer unilateralen Umsetzung des CBAM und möglicher Vergeltungsmaßnahmen der Partnerländer mit dem Szenario einer Klimakooperation im Rahmen eines Klimaclubs der G7-Länder, so sinken die Wohlfahrtsverluste sowohl für die EU wie auch für Österreich von 0,28% bzw. 0,21% auf 0,15%. Je mehr die EU darüber hinaus eine Vorreiterrolle einnehmen und die globale Dekarbonisierung beschleunigen kann, desto größer ist der Erfolg bei der Bekämpfung der globalen Emissionen. Ein Klimaklub, wie er in der Studie simuliert wird, würde die globalen Emissionen um 14,8% reduzieren, dies entspricht einer jährlichen Verringerung der CO_2-Emissionen von 5,46 Mrd. Tonnen. Bewertet man diese Emissionsreduktion als Vorteil aus vermiedenen Schäden, sogenannte soziale Kosten von Kohlendioxid, und verwendet man als rezente Kostenschätzung einen Wert von 180 $/Tonne, ergibt sich ein Wohlfahrtsgewinn aus der Kosteninternalisierung von rund 983 Mrd. $. Dies entspricht einem Vielfachen des gemeinsamen Wohlfahrtsverlustes der EU (-22,7 Mrd. $) und der USA (-108,7 Mrd. $) im Klimaklub-Szenario und verdeutlicht das vorteilhafte Kosten-Nutzen-Verhältnis eines solchen.

Auf politischer Ebene unterstreichen diese Ergebnisse erneut die Notwendigkeit einer multilateralen Zusammenarbeit sowie einer Kooperation und eines Dialogs mit den Handelspartnern, um das Risiko von Vergeltungsmaßnahmen einzudämmen. Temporäre Transferzahlungen für besonders stark von steigenden CO_2-Preisen betroffene Sektoren und Haushalte könnten eine erfolgreiche Umsetzung des CBAM in Europa unterstützen.

1. Motivation and structure of the report

In a world of increasing geopolitical tensions and the diminishing significance of global institutions, where international law is becoming less secure, the European Union (EU) must be able to credibly respond to non-rule-based, uncooperative behaviour from its trading partners. In response, the EU has completed a review of its existing trade policy in February 2021, published by the European Commission, which introduces the concept of "open strategic autonomy" and recommends an "open, sustainable, and determined trade policy." Trade policy thus becomes a new conceptual framework for a more geostrategic action by the EU.

In this context, the EU has developed and implemented a series of instruments to protect the European Single Market from unfair trade practices. Among the most important new trade policy instruments that the EU has introduced are the Anti-Coercion Instrument (ACI) to protect against economic coercion, the Enforcement Regulation (ER), the International Procurement Instrument (IPI), level playing field provisions in the EU-UK Trade and Cooperation Agreement (LPF), the Due Diligence Act for Supply Chains (DD), and the Carbon Border Adjustment Mechanism (CBAM) as well as the Deforestation Initiative (DI) as instruments with environmental relevance. These instruments are intended to facilitate the enforcement of the EU's own interests and values, including sustainability goals, human rights objectives, social standards, etc., and also to mitigate threats and opportunistic behaviour from trading partners. However, the new orientation of trade policy carries the risk of protectionism and escalation, as well as a stronger inward focus of the EU with potentially negative consequences for welfare. This requires careful consideration of the use of trade policy instruments and alternatives. Foreign trade is of great importance for the EU and the Austrian economy, as free access to international markets for exports and imports is crucial for economic and employment growth.

The study provides an overview of the various initiatives and new trade policy instruments introduced by the EU and examines their historical backgrounds and developments. Using gravity models and the KITE model, a quantitative trade model, the study estimates the impacts of selected trade policy instruments and scenarios on trade and welfare for the EU and Austria at the sector level. The study focuses on answering the following guiding questions:

- What role do the new trade instruments of the EU play in the context of global developments?
- What aims are pursued with these measures, and in which of these policy objectives, such as climate policy, does the EU take a pioneering role due to inadequate or lacking multilateral instruments?
- What are the quantitative impacts of the new trade measures at the European level and for Austria?
- What long-term structural effects can be expected for the international trade relations of the EU?
- What trade policy measures are available to the EU, and what are their different impacts?
- How likely are retaliatory reactions by trading partners and what impacts are to be expected?

- For selected instruments: What advantageous effects would result from successful achievement of the goals (e.g., increased market access in third countries) for the EU and Austria? How do these relate to the costs of using defensive measures?

From an economic policy perspective, the study contributes to the discussion on EU trade policy instruments and the strategic positioning of the EU. Thus, the proposed study will provide evidence-based insights into the impacts of the new instruments on the EU and Austria, which can inform policy decisions and contribute to a deeper understanding of the implications of the evolving EU trade policy in the current geopolitical context.

The chapters of the report are structured according to these guiding research questions. Chapter 2 begins with a brief overview of changing trade policy strategies in the context of global developments, leading up to recent trade policy shifts aimed at enhancing the EU's geopolitical role, enforcement capacity, critical supply security and fair competition. It reviews the role of new trade policy measures and highlights some principles that should lead their design and implementation to avoid new trade barriers and escalation spirals in trade conflicts. Chapter 3 describes the main methodology and empirical strategy to quantify the likely trade and welfare impacts of the selected new trade policy measures and informs about the underlying gravity model as well as the quantitative trade model "KITE" to be used. Chapter 4 provides a detailed overview of the new trade instruments. It presents the motivation, context and background for the introduction of each of the new trade instruments, summarises the main implementation steps and discusses their scope, content, application areas as well as key procedural aspects. It also provides an initial assessment of each instrument. Each of the sub-chapters concludes with a description of the scenarios to be simulated in the quantitative analysis of the study and with the presentation of the main results. Chapter 5 summarises and concludes. The datasets included will be referred to in the respective chapters, followed by a short description, while more details on the data and the construction of the most important databases are presented in Appendix A.

2. Shifts in EU trade policy and the role of new policy instruments

The EU trade policy strategy and objectives have constantly evolved and adapted in response to the changing economic environment and challenges. Over the last 20 years, the **"Global Europe" strategy of 2006** (European Commission, 2006) marked the first big changes. It expanded the narrow policy focus on promoting exports and imports to the broader objective of trade policy contributing to welfare maximisation[1]). It also led to a shift towards bilateral agreements, while the EU continued to acknowledge the key role of the WTO and the multilateral system. At the same time, the scope and depth of bilateral trade agreements increased to accommodate the changing international trade landscape. Modern free trade agreements (FTAs) not only regulate trade in goods and tariff concessions, but also cover trade in services, cross-border direct investments, e-commerce, and movement of people, as well as address issues such as regulatory differences, technical barriers, intellectual property rights, public procurement, investment protection, competition policy, labour norms, and environmental protection. This response also reflects the increasing presence of non-trade-related objectives (NTOs) in trade policy.

The proliferation of free trade agreements and their evolving nature have resulted in intense public debates and concerns about the rights of nation-states to regulate, provide public services, and achieve desired policy objectives such as consumer safety and environmental protection. This has also led to increased engagement of NGOs and civil society, which were not directly involved in trade policy prior to the new generation of agreements (Young and Peterson, 2006). The discussion and resistance against comprehensive and far-reaching trade agreements reached their peak with the rejection of the planned Transatlantic Trade and Investment Partnership (TTIP). With the financial crisis of 2008/09, concerns about imbalances through international trade also gained prominence. Many of these issues were addressed in the EU's **"Trade for all" strategy of 2015** as "lessons learned". The strategy emphasised the need for effective communication, democratic engagement to improve the acceptance of negotiated free trade agreements, and the increased role of the European Parliament and evidence-based trade policy (European Commission, 2015).

In recent years, the definition of trade policy objectives has further expanded due to geopolitical frictions, the decreasing importance of the WTO, and the increasing challenges related to ecological and digital transformations. The risk that foreign governments may cut off the EU from important imports or threaten to do so is central to the current discussion on strategic dependencies and "weaponised" critical supplies. While the COVID-19 pandemic exposed the fragility of supply chains, Russia's invasion of Ukraine underscored the risk of over-dependence of Member States of the EU. There has also been increasing risk that foreign governments exert "coercion" by repeatedly prescribed certain actions under the threat of economic consequences. Against this background, the EU completed a **review of its trade policy in February 2021** (European Commission, 2021A). It adopts the concept of "open strategic autonomy" and recommends an "open, sustainable, and assertive trade policy." With it, the geopolitics of trade are brought into focus extending trade policy objectives to foreign policy and security

[1]) Redistributing the gains from trade remained a goal of social policy.

concerns. The EU already responded to the new strategic guidelines with a series of initiatives and actions.

The EU's new strategy and more assertive power politics are reflected in the use of economic sanctions to punish human rights violations, prevent wars, and combat terrorism (see Kirilakha et al., 2021; Kamin et al., 2021; Felbermayr et al., 2022). The willingness to employ sanctions when necessary has most recently been evidenced by the EU's response to the Russian invasion of Ukraine. Furthermore, the EU's free trade agreements illustrate an expansion of objectives beyond traditional trade policy, with the inclusion of environmental and social policy issues.

Additionally, the newly introduced and proposed trade policy measures covered in this report are intended to equip the EU with defensive and retaliatory tools to fend off opportunistic behaviour and pressures of trading partners, as well as with offensive tools to increase the EU's enforcement capability in trade policy to propagate sustainability goals as well as adherence to EU rules and standards and to establish "level playing fields".

While the traditional approaches based on WTO rules may no longer be sufficient to address strategic dependencies and to mitigate the risks of opportunistic behaviour in trade relations, the new instruments mark a significant policy shift carrying the risk of increased protectionism, escalation of trade conflicts, and retaliation to the harm of European trade and welfare. This mostly relates to defensive measures, but the risks of retaliation, trade restrictions and escalation are also inherent to offensive measures such as the IPI, the DD or the DI and the CBAM. The empirically observable increasing number of sanctions is problematic insofar as it shows that many implicit or explicit threats have not been successful, and that a higher number of conflicts escalate (Kirilakha et al., 2021; Felbermayr et al., 2022).

Therefore, it is essential for the EU to carefully design and implement these new instruments in a way that minimises these risks. Economic game theory highlights the role of repeated interaction and cooperation among countries, along with adherence to rules and credible sanction threads. The WTO, but also bilateral trade agreements provide a framework for these mechanisms. With respect to the new trade policy instruments effective implementation relies on credible sanctions and efficient mechanisms for identifying rule violations.

In addition to the credibility of threats, the following principles are particularly important with regard to the new instruments in general and the strategic use of retaliation in particular (Felbermayr et al., 2022):

- deterrence as the primary objective, with the use of retaliatory measures as a last resort;
- gradual implementation of procedures, with consultation with the third country always being the first step;
- prudent use, i.e., only in cases of objective and serious violations of international law;
- proportionality of the retaliatory measures;
- transparency and predictability of the EU's counter-reactions, with basic rules potentially established at the multilateral level;
- international coordination, exchange, and cooperation with like-minded countries.

In addition to creating the legal conditions for threatening and taking retaliatory measures, the aim is also to speed up the decision-making process in EU external trade policy matters. As trade defence measures also have an impact on the EU's own economy, mechanisms to compensate for the uneven distribution of the costs of these measures among Member States, companies and/or sectors could support this objective.

3. Methodology and data

To quantify the effects of the trade policy instruments examined in this study, we employ a two-step approach for most of the instruments. In the first step a sector level structural gravity model for bilateral trade flows is estimated to capture the partial equilibrium trade effects of selected trade barriers, preferential trade arrangements and other control variables.

To determine the overall – general equilibrium – economic effects on trade and welfare, by taking into account international value chains, trade diversion and income effects, the estimated elasticities derived from the gravity model are applied in a quantitative trade model. The empirical analysis in this study applies the KITE ("Kiel Institute Trade Policy Evaluation") model and simulates various scenarios for each trade policy instrument.

The scenarios in turn are informed by detailed empirical evidence for each of the trade policy instruments analysed. To this end, the following guiding questions are central:

- What kind of trade measures can be employed under each respective instrument?
- Which bilateral relations are most likely to be affected by each instrument?
- Which trade measures are most frequently used by the EU and by its trading partners?
- Which of these measures are most frequently used in specific bilateral relationships and at the sector level? What are the most likely reactions of partners to EU defensive measures?

A more detailed description of the gravity model and the general empirical specification as well as the KITE model is provided in the following chapters. The general specification of the structural gravity model is adapted to fit the estimation for each of the trade policy instruments examined, and the respective applications are discussed in the relevant subchapters of chapter 4.

3.1 Structural gravity model and estimation strategy to identify trade effects of new policy instruments

The structural gravity model specified is based on Anderson and van Wincoop (2003) and Yotov et al. (2016) and, suppressing the industry/product index k for the moment is given by:

$$X_{ijt} = t_{ijt}^{1-\sigma} \kappa_{it} \Pi_{it}^{\sigma-1} P_{jt}^{\sigma-1} \theta_{jt} e^{\mu_{ij}} \eta_{ijt} \coloneqq e^{z'_{ijt}\alpha + \beta_{it(\alpha,\mu)} + \gamma_{jt(\alpha,\mu)} + \mu_{ij}} \eta_{ijt}. \qquad (3.1)$$

X_{ijt} measures the level of (nominal) bilateral exports from country i to partner country j in year t. Trade frictions are denoted by $t_{ijt}^{1-\sigma}$ with $\sigma > 1$ as the price elasticity of demand (elasticity of substitution) and are modelled as $t_{ijt}^{1-\sigma} = e^{z'_{ijt}\alpha}$ with z'_{ijt} representing a vector of time-varying bilateral trade barriers (such as tariffs, non-tariff barriers or preferential trade agreements entering into force or enlarged during the time period considered) and α their respective vector of parameter values.

The terms κit and θjt capture the size of countries and refer to the world output share of country i and the world expenditure share of country j, respectively. The terms, $\Pi_{it}^{\sigma-1}$ and $P_{jt}^{\sigma-1}$ reflect the outward and inward multilateral resistance terms and enter the model as exporter and importer time fixed effects with $e^{\beta_{it}} = \kappa_{it}\ \Pi_{it}^{\sigma-1}$ and $e^{\gamma_{jt}} = \theta_{jt}\ P_{jt}^{\sigma-1}$. Multilateral resistance terms capture relative trade costs of a country pair compared to all other countries. If two trading partners are neighbours, but remote from the rest of the world, the relative trade costs for this country pair will be relatively small and trade will be relatively high between these economies[2]). Finally, μ_{ij} are bilateral fixed effects capturing time-invariant bilateral trade frictions (e.g. language barriers, bilateral distance). These country pair fixed effects also mitigate endogeneity concerns with respect to bilateral trade policies (Yotov et al., 2016). The error term is captured by η_{ijt}.

The gravity model given in Equation (3.1) will be estimated with data pooled across industries or products. In this case the multilateral resistance terms are captured by exporter-industry-time and importer-industry-time fixed effects and time-invariant bilateral trade costs will be captured by exporter-importer-industry fixed effects.

To correctly identify the impact of trade policy measures employed under each of the respective new instruments reviewed, the general specification of the gravity model in Equation (3.1) is modified and adjusted to identify the respective trade policy instrument under investigation.

Most importantly, the empirical gravity models estimated in this study distinguish between international and domestic trade flows (i.e., domestic production). This distinction allows for changes in cross-border trade to be estimated relative to the development of nearly frictionless trade within country borders. Furthermore, non-discriminatory measures which affect all trading partners equally, but do not have an impact on domestic flows can be identified by exploiting the variation between international and domestic trade flows. Examples of such measures are manifold with respect to non-tariff trade barriers such as technical barriers to trade related to product standards or subsidies to domestic firms as well as export subsidies, but also most-favoured nation tariffs are an example.

Based on the structural model given in Equation (3.1) we derive the empirical model for estimation which is given in Equation (3.2). It interacts border dummies (B_{ij}, taking the value 1 for cross-border trade flows and 0 otherwise) with trade policy measures to ensure that the trade policy impacts are limited to cross-border trade flows only. This approach has been suggested by e.g., Yotov (2012), Bergstrand et al. (2015) and Heid et al. (2021) and has been applied in most of the empirical gravity model literature since. Based on this as well as the "best practices" and recommendations from the literature (summarised most comprehensively in Yotov et al. 2016) the following generic empirical specification will guide the formulation of the estimated gravity models presented in detail in the respective subchapters of chapter 4.

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[2]) Note, that the parameters of multilateral fixed effects depend on the vector of time-varying trade barriers z'_{ijt} with the corresponding vector of parameters as well as on time-invariant bilateral trade frictions μ_{ij} and on the economic size of the respective importers and exporters.

$$X_{ijkt} = \exp\left(\sum_{l=1}^{n} \alpha_{1,l} B_{ij} t_l + \sum_{l=1}^{n} \alpha_{2,l} B_{ij} \log(dist_{ij}) t_l + \alpha_3 B_{ij} BTB_{ijkt-1} + \beta_{ikt} + \gamma_{jkt} + \mu_{ijk}\right) + \eta_{ijkt} \quad (3.2)$$

The last terms in Equation (3.2), β_{ikt} and γ_{jkt} are the industry-specific inward and outward multilateral resistance terms which enter the model as industry/product-exporter and industry/product-importer time fixed effects and μ_{ijk} refers to industry/product-specific bilateral fixed effects capturing time-invariant bilateral trade frictions. These are directly taken from Equation (3.1) and reflect the structural components of the model. Again, the error term is captured by η_{ijkt}.

The variables t_l represent time dummies that take on a value of 1 whenever year $t = l$. Interacted with the border dummy in the first term of Equation (3.2), $B_{ij}t_l$ measures the general globalisation trend that is not captured by any of the free trade agreements or any other control variables in the model. The specified model also accounts for the changing impact of the geographical distance of trading partners, $dist_{ij}$. More distant partners are likely to have higher trade costs. However, interacted with the time dummies t_l, the estimated parameters reveal the change in trade costs over time. Globalisation trends and technological progress – especially the digital revolution – are very likely to have reduced the costs of distance.

The BTB_{ijkt-1} term represents the vector of time-varying bilateral trade barriers such as common membership of preferential trade agreements or any bilateral tariff or non-tariff barrier. The trade barrier term is lagged by one year as has been proposed by Bergstrand et al. (2015) to account for delayed adjustment of trade flows, and to account for problems of endogeneity which arise in situations when trade policy measures are imposed in reaction to high increases in imports. The BTB-term represents the most important covariate to be estimated to identify the role of the new trade policy instruments reviewed in this study. Depending on the trade policy instrument reviewed, the BTB-term is adjusted to identify the respective impact of the new trade policy tool.

3.2 The KITE model

We simulate the impact of the EU's trade policy instruments on the global trade network with the KITE model (Kiel Institute Trade Policy Evaluation Model), a computable general equilibrium model of the global economy and international trade (Felbermayr et al., 2023). The model explicitly considers intra- and international input-output linkages that reflect the cross-border nature of production today. This feature of the global economy is particularly important in the context of the EU's trade policy instruments, as changes in standards and non-tariff measures likely affect final goods trade and intermediate goods, i.e., inputs into the production processes of other products. An initial effect would propagate to other parts of an economy through domestic input-output linkages and to other countries through global supply chains. Thus, the KITE model captures this important facet of today's global economy.

The model has originally been developed by Caliendo and Parro (2015). They built a multisector version of the Ricardian trade model of Eaton and Kortum (2002), where countries produce and sell according to their relative comparative advantage. The model extends this framework by allowing for extensive intra- and international input-output linkages where goods

and services may enter as both final and intermediate goods. Trade policy is conducted through the tightening or easing of trade barriers in form of tariffs, export taxes, and non-tariff measures.

The KITE model can thus be used to quantify long-term direct and indirect trade effects (e.g., trade diversion and third-market effects) for European economies, particularly production effects at a sectoral level, next to price level, general welfare, and carbon emissions effects. Since long-term trade effects are simulated, the model estimates permanent level shifts in price levels and real income. Changes in welfare are measured as changes in real income. Real income is GDP plus tariff revenues divided by the change in the countries' price index. Production is calculated from the expenditure of all countries – including the own expenditure – for one sector from one country. The production value includes the value of intermediate products. All products can be both consumed and used as intermediate products in the production of other products. Fossil fuels can therefore be modelled simultaneously as internationally traded products and as production inputs whose combustion causes carbon emissions. Therefore, in the model we can track and tax not only the use of fossil fuels but also the embedded emissions in internationally traded products. The simulation is run for 65 sectors and 141 countries, covering more than 90% of global economic activity.

The increase in bilateral trade costs due to trade policy changes lead to several adaptation mechanisms in the model. (1) National prices and production of countries that apply higher trade costs change. Consumers and firms will either shift their consumption or intermediate input use to other goods from other sectors[3]) or they must bear higher prices. Therefore, consumers will lose purchasing power or firms will lose international competitiveness. (2) Changes in national prices and production lead to changes in the comparative advantage of a country and their terms-of-trade. That will lead to trade diversion, away from the previous trading partner that faces higher trade costs now. (3) An increase in bilateral trade costs leads to trade depression. More of the domestic demand will be produced domestically, which causes a decline in trade.

For the calibration of the model, we use commonly used data. The global input-output database GTAP 10 (Aguiar et al., 2019) provides detailed information on intranational sectoral linkages and global value chains for the benchmark year 2014. In addition, standard databases such as the UN Comtrade for trade data and the WITS and MacMaps databases for customs data are used to define the baseline scenario in our model. Finally, certain parameters that enter the model but are not directly observed are taken from the related literature. These include the so-called "trade elasticity" which measures the sensitivity of sectoral trade flows to changes in trade costs in those sectors, e.g., due to tariffs or non-tariff barriers. We obtain these required parameters from Fontagné et al. (2022), who use state-of-the-art statistical techniques for their estimation.

The model is solved in changes. After a trade policy shock, the level of a variable in the model, e.g., prices or income, is permanently shifted from the benchmark equilibrium. The model calculates the change from the benchmark equilibrium, which is the same across scenarios.

[3]) That depends on the substitutability of goods from different sectors in the production.

3.3 Most relevant datasets for estimation

Estimations of the gravity model are based on the International Trade and Production Database for Estimation (ITPD-E) and the Global Trade Alert (GTA) database on trade policy measures. The ITPD-E contains consistent data on international and domestic trade flows at the industry level. It is constructed using reported administrative data and intentionally does not include information estimated by statistical techniques, which makes the ITPD-E well suited for estimation of economic models, such as the gravity model of trade (Borchert et al., 2021, 2022). In order to be consistent with the GTA data, correspondence tables were constructed and used to convert ITPD-E industry classifications to the three-digit product level of the Central Product Classification (CPC). The ITPD-E integrates the dynamic gravity dataset (DGD) of the US International Trade Commission (Gurevich and Herman, 2018), which provides measures for distance, borders as well as preferential trade agreements, an integral component of the BTB-term. More details on the ITPD-E data used in this study can be found in Appendix A.

In addition, information on non-trade objectives in preferential trade agreements (Lechner, 2022) based on the Design of Trade Agreements (DESTA) dataset (Dür et al., 2014) is used to complement the information on preferential trade agreements in the ITPD-E. Non-trade objectives are provisions on human rights, social and environmental standards in trade agreements. Some PTAs also explicitly mention the role of firms in adhering to human rights, labour and social standards and environmental protection. Provisions in preferential trade agreements on responsible business conduct applied by firms are used in our analysis to approximate due diligence requirements. Appendix A provides details on the non-trade objectives database.

The GTA database is one of the most comprehensive databases on national trade policies adopted since 2009 for 153 countries. The detailed information of the GTA on trade policy instruments is used to analyse the Anti-Coercion Instrument, the Enforcement Regulation, the International Procurement Instrument and the Level Playing Field in the EU-UK Trade and Cooperation Agreement. GTA data provides information on the targeted sectors, the trading partners most likely to be affected as well as the date of implementation of trade restrictions. It covers tariff measures, trade defence measures (i.e. anti-dumping, anti-subsidy, safeguard and anti-circumvention policies) and a wide range of non-tariff measures (NTMs), ranging from import and export controls to financial constraints, intellectual property rights (IPR) protection or public procurement restrictions to state aid and subsidies or capital controls. Thus, the trade policy measures reported in the data cover all relevant types of trade measures that could be of relevance with respect to the new trade policy instruments analysed in this report. A further advantage of the GTA dataset is that it clearly distinguishes between discriminatory and non-discriminatory non-tariff measures (NTMs), a distinction that is not usually made in other datasets (such as e.g. TRAINS). In this study, we focus on policies affecting trade in goods. Appendix A gives a detailed overview of the trade policy dataset used in this study and the necessary adaptions to the original GTA dataset.

4. New trade policy instruments

4.1 The Anti-Coercion Instrument (ACI)

The Anti-Coercion Instrument (ACI) addresses the growing concern of coercive actions by third countries, which have been used to influence EU policy decisions. Its overarching goal is to safeguard the EU's interests and reinforce its open strategic autonomy. Table 4.1 provides examples of recent coercive actions and measures targeting the EU, with China and the USA being the most prominent cases.

Table 4.1: Trade coercion against the EU governments – selected examples

Implementing country	Year	Affected country/ countries	Triggering action	Coercive trade measure
China	2019	Sweden	Swedish culture minister awards the Tucholsky Writer's Prize to Gui Minhai (China-critical publisher).	Trade/business delegations cancelled. Postponement of trade talks by the China-Sweden Joint Committee on Economic, Industrial and Technical Cooperation.
China	2019	Czech Republic	Prague terminates sister city agreement with Beijing due to a clause to respect the one-China policy with respect to Taiwan.	Tourism restrictions – cancellation of several incoming musical group tours from the Czech Republic.
China	2021	Lithuania	"Taiwan" representative office opened in Vilnius.	Suspension of Lithuanian rail freight. – De-facto stop of trade as Lithuania is cut-off from customs clearing system. – Secondary sanction thread to restrict market access for EU firms trading with Lithuanian firms.
China	2020	Netherlands	Name change for the country's diplomatic mission in Taiwan.	Threat to suspend exports of crucial medical supplies to the Netherlands during the COVID-19 pandemic.
China	2020	Germany	Draft legislation to exclude Huawei from building the country's 5G infrastructure.	Threat of car tariffs on Germany.
China	2021	EU companies	EU in cooperation with the USA and the United Kingdom target four Chinese local officials with human rights sanctions.	Popular boycotts and disappearance from e-commerce apps.
USA	2019	EU	EU bypass of US sanctions on Iran.	EU export restrictions to the US
USA	2019	France	Taxes on digital services.	Threat of tariffs on French exports of cosmetics and handbags to the USA.
USA	2021	Austria, Italy, Spain, France	Investigations into digital services tax.	Import tariffs.
USA	2020	EU	Sanctions on North Stream 2 and TurkStream gas pipelines.	Secondary, extraterritorial sanctions on EU entities/persons with involvements in North Stream 2 or TurkStream pipelines
Russia	2015	Netherlands	Moscow-backed separatists made responsible for shooting down Malaysian Airline flight with Russian made missile.	Import ban on flowers from the Netherlands.
Russia	2014	Poland	EU sanctions over the war in Ukraine.	Import ban on fruits and vegetables from Poland.

Source: WIFO presentation, compiled from European Commission (2021B), Merics (2022), EPRS (2022B).

A compelling example of the ACI's relevance is the dispute between China and Lithuania in 2021. In response to Lithuania's decision to allow the establishment of a representative office for Taiwan, China not only imposed trade restrictions on Lithuania, but also threatened to restrict exports to China for European exporters unless they refrained from using intermediate goods from Lithuania. Similarly, the USA have threatened trade sanctions against European countries to dissuade them from implementing its planned digital tax. Other instances include US laws imposing sanctions against Iran or threats of sanctions related to North Stream 2.

4.1.1 The historical context and implementation steps so far

In the light of growing concerns about economic coercion, the European Commission presented the proposal for the ACI in December 2021 (European Commission, 2021C). This instrument builds on two existing regulations: the "Blocking Regulation" (EU Council, 1996) and an amendment to the "Trade Enforcement Regulation" (ER) for the enforcement of international trade rules in 2021 (European Parliament and Council, 2021). The "Blocking Regulation" prohibits EU companies from complying with requirements or prohibitions based on foreign laws. The amendment to the "Enforcement Regulation" grants the EU the authority to suspend and withdraw concessions in international trade agreements without prior WTO decision by enacting countermeasures. These measures were introduced by the EU in response to the deadlock in the Appellate Body of the WTO's dispute settlement mechanism since December 2019 (see chapter 4.2.2).

Figure 4.1: A timeline of implementation of the Anti-Coercion Instrument (ACI)

Note: Dates as of October 24, 2023.
Source: EPRS (2022A) and Legislative Observatory of the European Parliament (https://oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?lang=en&reference=2021/0406(COD).

Figure 4.1 presents the most important legislative procedural steps taken since the adoption of the Commission's proposal. Trilogue negotiations between the European Parliament, the EU Council and the European Commission have been completed, and a first agreement was reached on March 28, 2023. The ACI was adopted by the Council at the end of October and the legal act now awaits signature, which is expected by November 22, 2023.

4.1.2 The Anti-Coercion Instrument in detail

The ACI is designed primarily as a deterrent, creating the conditions for the EU to threaten reciprocal sanctions more credibly and effectively than before. It aims to de-escalate tensions through dialogue, with countermeasures as a last resort. The proposed procedure respects the principle of proportionality (reflecting the damage caused by the coercive act) and is structured as a multi-stage process, in which the European Commission first seeks to resolve the problems through diplomatic channels before resorting to countermeasures. Based on this consultation, the European Commission may propose (or not) countermeasures and submit them to a vote, in which the Member States vote by qualified majority (QMV).

The Commission defines coercion as actions by third countries that disrupt trade or investment and interfere with the legitimate sovereign decisions of the EU or its Member States. The range of possible countermeasures and actions to address coercion is broad and covers a wide range of trade policy measures such as the suspension of tariff concessions, imposition of tariffs, import/export licenses, quantitative restrictions on exports or imports, as well as limitations to services trade or the access to the EU public procurement market, and trade-related aspects of intellectual property rights. Other non-conventional measures – such as financial restrictions – may also be applied[4]).

The implementation and use of the instrument will face challenges of which the following may be noted as especially relevant (Erixon et al., 2022; Felbermayr et al., 2022).

- *Broad and vague definition of triggering events*, i.e. the circumstances under which the European Commission can or must take action. The European Commission will examine triggering events on a case-by-case basis. The advantage of a broad definition of "coercive measures" is the flexibility of the conditions for the application of the instrument. The disadvantage, however, is that this opens the door to subjectivity in the application of the instrument and that differences of opinion among the EU stakeholders are very likely. In any case, qualitative decisions are needed, based on the best possible evidence. Quantitative thresholds for the application of the instrument are hardly imaginable.
- *Unclear definition of the countermeasures to be applied and assessment of proportionality*: The ACI allows for a variety of countermeasures and requires proportionality of the measures taken. The form of the reaction and the methodology for determining proportionality are not always clear. A proportionality assessment must describe the likely effects of the numerous options, quantify them and define equivalent responses based on transparent methodologies. This is important because this instrument is located outside the WTO and therefore there is no independent supervision by an international organisation.
- *Decision-making processes:* The legal basis of the ACI is the common commercial policy. As such, it falls within the competence of the EU and the principle of subsidiarity does not apply. However, as the ACI involves geopolitical issues that extend into foreign and security policy, questions arise as to the legality and competence of the EU. In this respect, the distribution of competences within the EU needs to be clarified, especially when it comes to issues where the scope of purely economic coercion is less central. As an accompanying

4) A list of possible countermeasures is given in the Annex I of the proposal (European Commission, 2021B).

measure, it would be important to speed up decision-making processes in the EU Council on foreign and security policy issues. One possibility would be to relax the unanimity requirement for selected issues. In any case, it is important to coordinate any trade policy measure under this instrument with other policy areas to increase its effectiveness.

- *Coordination with other instruments:* Another open question is how the new instrument should interact with other EU instruments, such as the International Procurement Instrument.
- *International coordination and consultation:* International coordination and consultation with like-minded partners in the OECD or the WTO are also important due to the increased pressure on the country that is introducing or threatening to introduce a coercive measure. Transparency and predictability of procedures are important to avoid escalation. Multilateral agreements on corresponding basic rules could be concluded at the multilateral level. Unilateral EU action under the ACI could also be challenged as discriminatory under WTO rules but is ultimately geared towards preventing economic coercion on the EU and Member States as contradicting international law.

4.1.3 Detailed descriptive data analysis on potential impacts by sector and partner countries and results from the literature

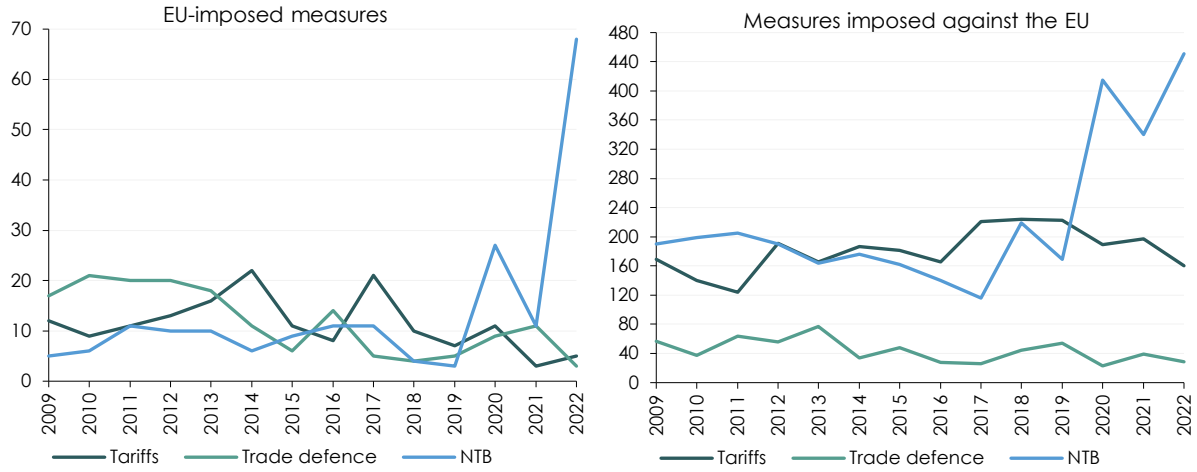
Although the ACI can cover total trade in goods and services, investment and procurement, the measures implemented are expected to focus on specific sectors and types of trade measures. In fact, past examples of coercive acts against the EU have often targeted symbolic industries, such as German cars or French cosmetics (Merics, 2022). For the EU response, in turn, the ACI prescribes a like-for-like response, while at the same time the EU will prioritise economic sectors and products for which substitute foreign suppliers are readily available to minimize the harm to domestic industries. Therefore, the EU will need to strategically select products for ACI countermeasures that will have an impact, while also being cautious not to overreach in its response. Overall, a delicate balance will need to be struck to ensure an effective and proportionate approach to countering economic coercion.

Since the ACI offers the flexibility to determine which sectors to address and which countermeasures to apply an analysis of existing trade measures imposed by the EU as well as measures imposed on the EU can provide valuable insights. The data analysis is based on the GTA database and will uncover the sectors most likely to be affected by protectionist measures in EU bilateral relations and the trade measures typically employed by the EU to achieve its policy objectives. The trade policy measures reported in the data cover all types of possible ACI countermeasures as far as trade in goods and services is concerned. A detailed description of the GTA data is given in Appendix A. Table A4 provides an overview of all intervention types and the groupings of interventions into distinct classes of trade measures used in the analysis of the GTA data in this study.

A closer examination of the trade-harming measures imposed by the EU on its trading partners reveals a significant increase in activity since 2019. This trend is particularly noticeable for non-tariff measures (NTMs), with a significant spike in 2020 and a further sharp increase in 2022. This recent surge of protectionist measures can be attributed to the impact of the COVID-19 pandemic in 2020 and the extensive sanctions imposed in response to the Russian invasion of the Ukraine in 2022. Furthermore, the EU's exposure to NTMs from its trading partners has gained

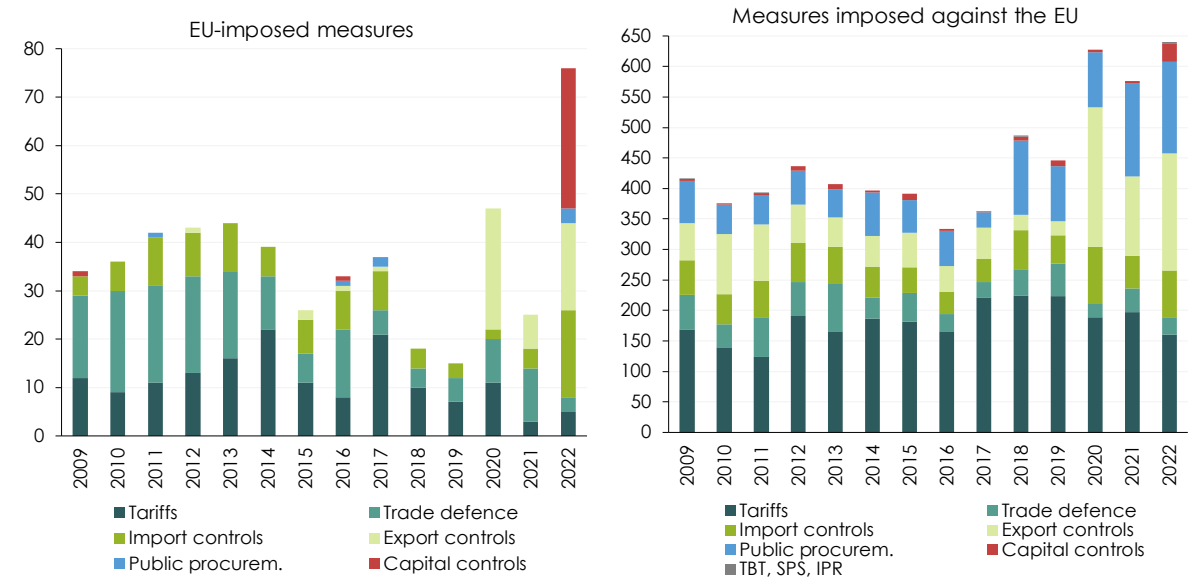
considerable momentum since 2017, indicating a growing trend in such measures in general (see the right-hand panel in Figure 4.2).

Figure 4.2: Emergence of protectionist measures 2009 – 2022



Source: Global Trade Alert Database, WIFO calculations.

Figure 4.3: Emergence of protectionist policies by type of trade measures



Source: Global Trade Alert Database, WIFO calculations.

A more detailed analysis of EU trade measures shows a notable shift towards export controls, and in the most recent year, 2022, towards capital controls. This intensified use of export controls is also evident in the mix of trade measures imposed on the EU. However, the most striking difference of the non-EU trade policy mix is the significantly larger share and rise of public procurement measures compared to those applied by the EU. In contrast, the use of trade

defence measures and import controls against the EU appears to be considerably less pronounced.

Upon closer examination, we also observe differences in the types of interventions employed across various trade policy measures when comparing EU-induced and non-EU measures (Figure 4.4). Particularly, anti-dumping duties feature prominently in both the EU measures and those set against the EU, while safeguard duties more often affect EU Member States. In terms of import controls, import quotas feature predominantly among EU measures, whereas import bans and licensing requirements are more prevalent among the measures implemented by EU partners. When it comes to export controls, export bans and licensing requirements are widely used by both the EU and its partners, while export taxes are the dominant protectionist measure affecting the EU.

In the area of public procurement, the EU has implemented only a small number of measures against its partners. The Global Trade Alert (GTA) lists only seven cases of public procurement interventions by the EU between 2009 and 2022. In contrast, over a thousand instances of public procurement interventions affecting the EU have been recorded over the same period. Protectionist localisation issues, such as regulations mandating the use of local labour, operations, or sourcing, outweigh preference margins and access restrictions in public procurement, which play a minor role.

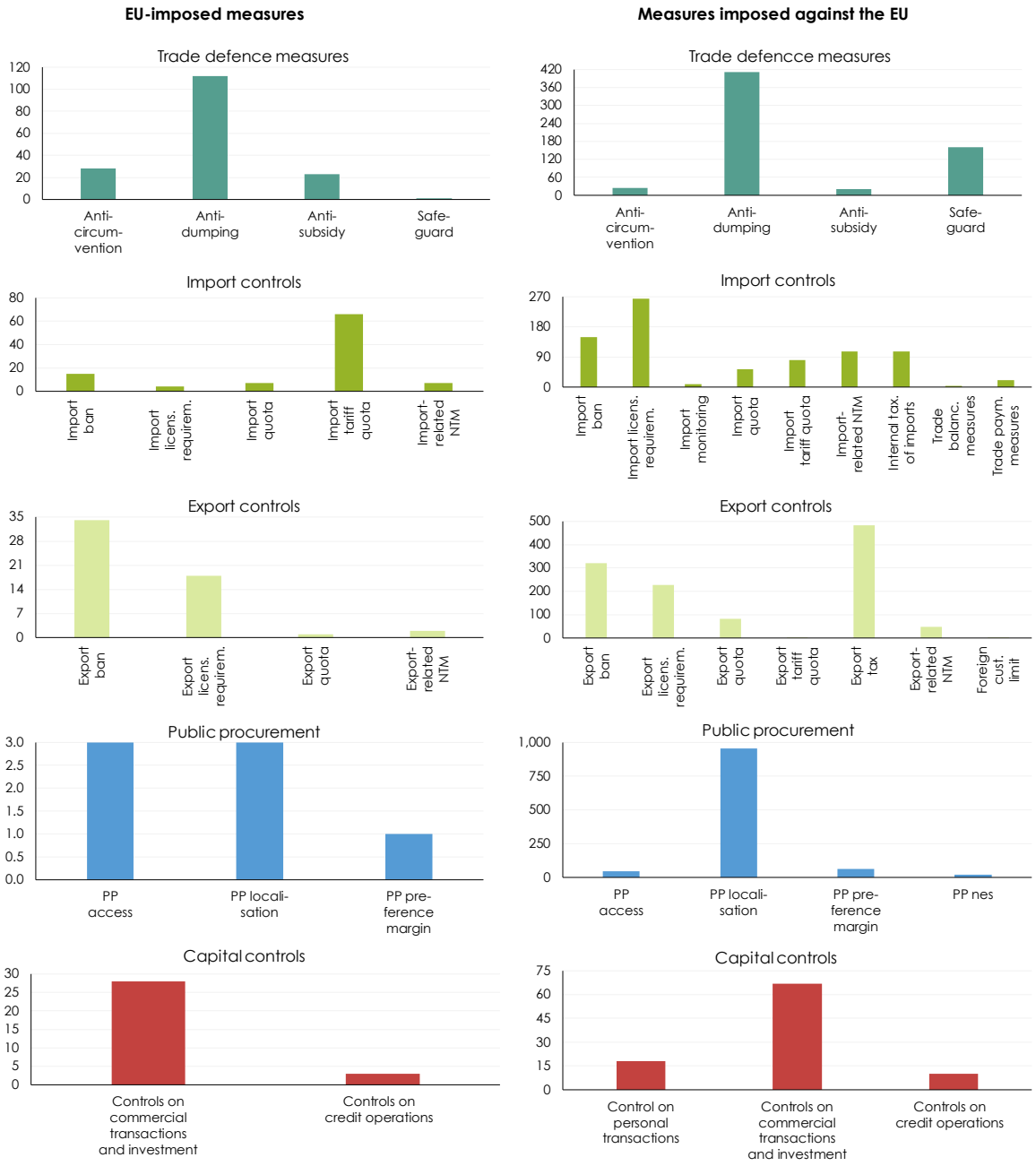
Capital controls, which pertain to commercial transactions and investment, are most often imposed by both sides.[5]) Finally, protectionist sanitary and phytosanitary standards (SPS), technical barriers to trade (TBT) and limitations on intellectual property rights (IPR) – not shown in Figure 4.4 – are very rare and not implemented at all by the EU against its partners[6]).

Looking at the countries most affected by EU trade policy measures, China, the USA, Russia, and India emerge as the top-ranked countries across all categories of trade barrier types (Figure 4.5, left-hand panel). Brazil and Turkey are also in the top group, particularly in terms of tariffs and import controls imposed by the EU. Notably, China stands out in terms of trade defence measures imposed by the EU, while EU export controls are most often targeted at Russia and Turkey. EU capital controls are most relevant in the context of sanctions imposed on Russia, particularly those imposed in 2022 in response to the Russian attack on the Ukraine.

[5]) Foreign direct investment is excluded from the analysis in this study.

[6]) It is worth noting that this finding derives from the fact the GTA database carefully evaluates the protectionist character of such measures and many of the SPS or TBT are not considered as protectionist interventions and thus are not covered by the data.

Figure 4.4: Types of interventions employed in trade policy measures implemented by the EU and those imposed against the EU, 2009 – 2022

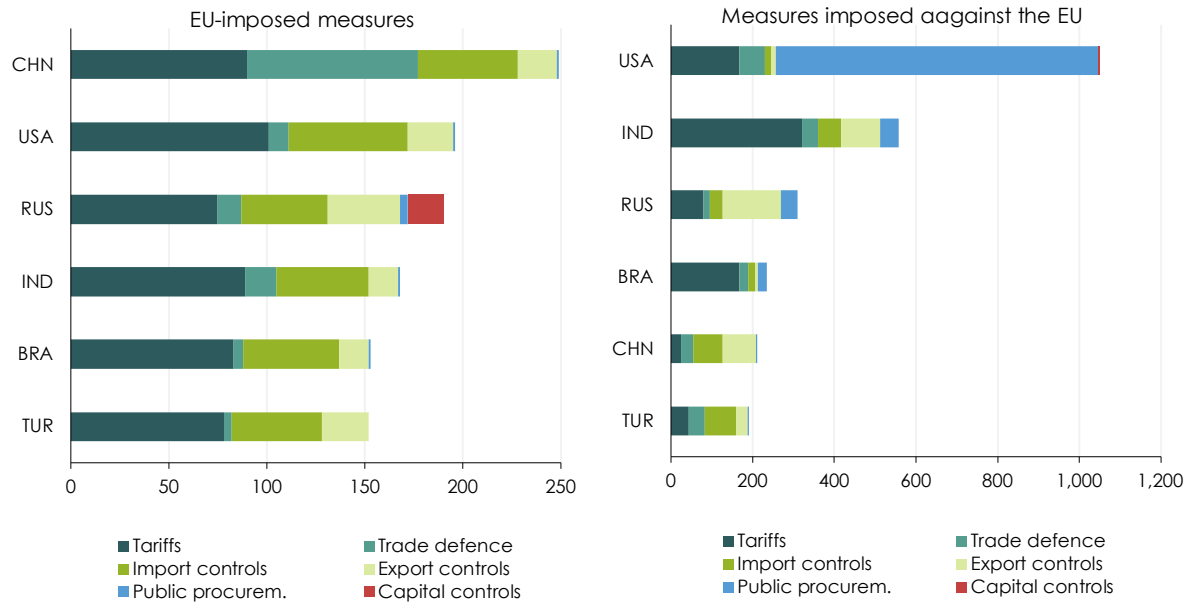


Source: Global Trade Alert Database, WIFO calculations.

When analysing trade measures implemented against the EU, a similar list of countries appears at the higher end of the ranking (Figure 4.5, right-hand panel). However, there are some interesting differences in terms of the types of trade policy interventions used. The USA are depicted as the most active player, particularly in terms of public procurement measures and trade defence measures. India ranks second, relying heavily on tariffs to deal with trade issues with the

EU. China, on the other hand, is not among the top countries in terms of trade barriers related to ACI-relevant measures, but it is certainly among the countries most likely to impose coercive actions against EU Member States. China commonly employs export controls as the preferred trade policy measure against the EU, as does Russia.

Figure 4.5: Ranking of countries based on the frequency of protectionist measures implemented by the EU or imposed against the EU, 2009 – 2022



Source: Global Trade Alert Database, WIFO calculations.

4.1.4 Quantifying the likely impact of the ACI – scenarios and empirical specification

To quantify the effect of the ACI, we follow the methodology outlined in chapter 3. As a first step, we estimate a structural gravity model of bilateral trade flows. The results of the gravity model provide us with elasticities of trade with respect to the most likely countermeasures of the EU in applying the ACI and are fed into the KITE trade model, which allows the simulation of different scenarios and the determination of general equilibrium trade and welfare effects. The estimation is based on ITPD-E trade data and GTA data on trade policy measures as referred to in chapter 3 and described in detail in Appendix A. As already stated earlier, the study focuses on trade in goods, excluding all services. In addition, all products related to mining, oil and gas had to be excluded from the regression analysis as the results for these product groups were completely unreliable, which might be related to the high volatility of the (nominal) trade flows considered.

Based on the empirical structural gravity model outlined in chapter 3.1, the following model variant of Equation (3.2) in chapter 3 is estimated:

$$X_{ijkt} = \exp\left(\sum_{l=1}^{n} \alpha_{1,l} B_{ij} t_l + \sum_{l=1}^{n} \alpha_{2,l} B_{ij} \; log(dist_{ij}) \, t_l + \alpha_3 B_{ij} \, \mathrm{PTA}_{ijkt-1} + \alpha_4 B_{ij} \, \mathrm{TARIFF}_{ijkt-1} + \alpha_5 B_{ij} \, \mathrm{DEFENCE}_{ijkt-1} + \alpha_6 B_{ij} \, \mathrm{IMPTB}_{ijkt-1} + \alpha_7 B_{ij} \, \mathrm{EXPTB}_{ijkt-1} + \alpha_8 B_{ij} \, \mathrm{PP}_{ijkt-1} + \alpha_9 B_{ij} \, \mathrm{OTHERTB}_{ijkt-1} + \beta_{ikt} + \gamma_{jkt} + \mu_{ijk}\right) + \eta_{ijkt} \quad (4.1)$$

All variables are defined as in chapter 3.1. The BTB_{ijkt-1} term of the general gravity equation, measuring "bilateral" trade policy measures in product group k at time t-1 is split into covariates that control for the effect of Preferential Trade Agreements (PTA_{ijkt-1}), tariffs (TARIFF_{ijkt-1}), trade defence measures ($\mathrm{DEFENCE}_{ijkt-1}$) as well as import controls (IMPTB_{ijkt-1}), export controls (EXPTB_{ijkt-1}), public procurement policies (PP_{ijkt-1}) and a group of other non-tariff barriers ($\mathrm{OTHERTB}_{ijkt-1}$)[7])[8]). All trade policy measures, as well as the variable identifying the effect of the PTAs enter the model with a time lag of one year. There are several reasons for this. First, it is reasonable to assume delayed adjustment of trade flows in reaction to newly implemented trade policy measures. Accounting for lagged effects of trade policies, has been proposed in the literature by Bergstrand et al. (2015) and examples of its application include Oberhofer and Pfaffermayr (2021). Second, the trade policy measures considered in this study are very often a reaction to high increases in imports. This can lead to problems of endogeneity when measuring the contemporaneous impacts of such policies. In addition, with annual trade data, we cannot control for the exact date of implementation of each policy during the year of observation[9]).

Estimation results for the key variables of interest are reported in Table 4.2. The estimated coefficients are negative and statistically highly significant for all types of bilateral trade barriers. Export controls have the strongest negative impact on bilateral exports, reducing bilateral trade by 7.6% in response to the introduction of the export barrier[10]). Import controls reduce bilateral trade by 6.4%, while tariffs or trade defence measures decrease trade by 3.8% and 5% respectively.

Public procurement barriers (PP) and the group of other trade barriers (OTHERTB) are non-discriminatory measures that affect all trading partners equally according to GTA data and could not be properly identified due to missing domestic trade flows for some countries and product

[7]) Please refer to Table A4 in Appendix A for an overview of intervention types subsumed under each type of trade policy measures.

[8]) To test the impact of trade policy measures most likely affected under the ACI, bilateral measures represent the most important covariates to be estimated to identify the role of the ACI. Most trade conflicts triggering the ACI are bilateral and not multilateral in nature and thus discriminate across trading partners.

[9]) In a robustness check we estimate the model with contemporaneous trade policy variables and arrive at similar results.

[10]) The percentage change is derived from the estimated coefficients by the following formula: $(e^{\alpha i}-1)*100$.

types in the data sample based on the ITPD-E[11])[12]). However, the estimated parameters of the bilateral trade policy measures are precisely estimated and provide a good basis for the simulation analysis and the resulting parameter values are directly implemented in the KITE model.

Table 4.2: Gravity model estimation results – defensive instruments

	(1) PPMLHDFE
Preferential Trade Agreements (PTA)	0.095***
	-(0.014)
Tariffs	-0.039***
	-(0.008)
Trade defence measures	-0.051***
	-(0.008)
Import controls	-0.066***
	-(0.018)
Export controls	-0.079***
	-(0.017)
Observations	17,428,668

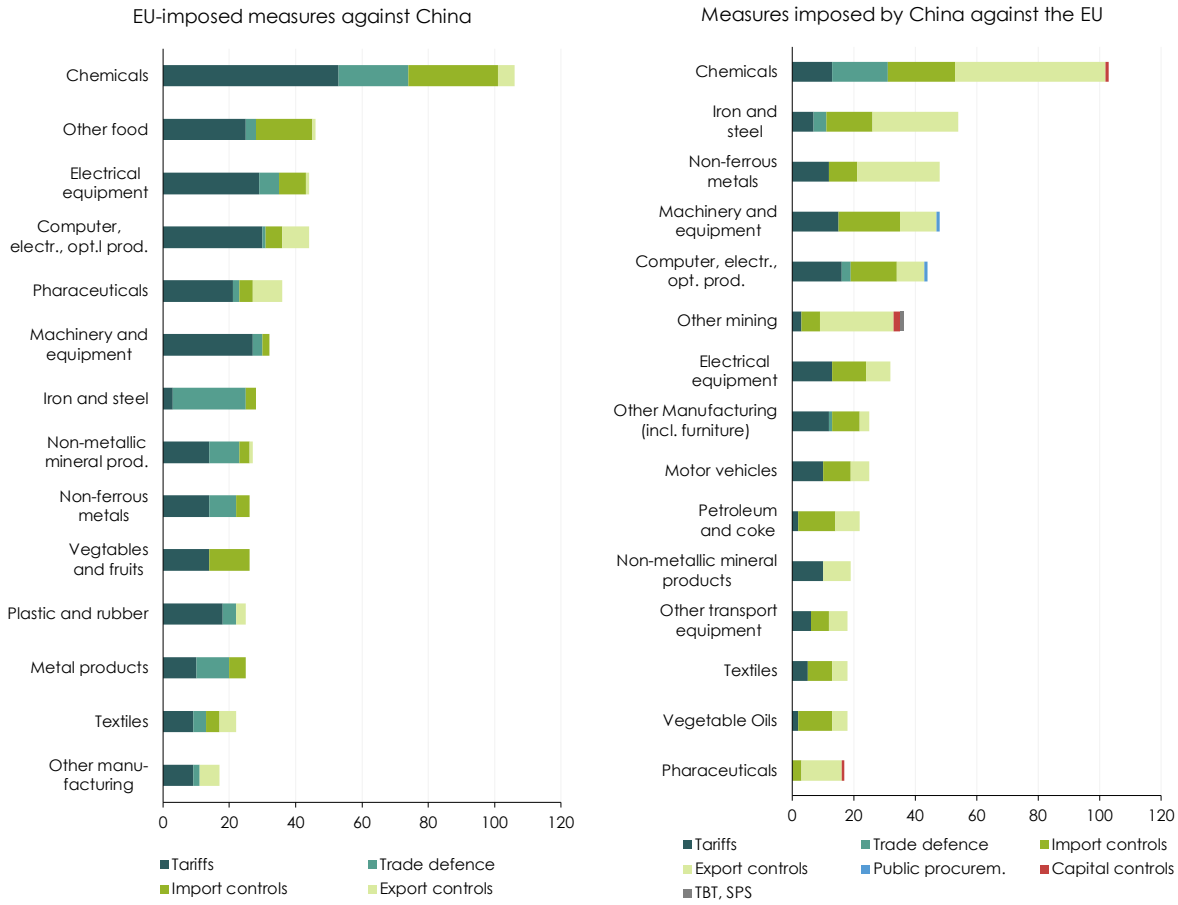
Note: The gravity models are estimated using the "ppmlhdfe" package of the STATA econometrics software (Correia et al., 2020). Robust standard errors clustered by country pairs and products in parentheses. *, ** and *** indicate statistical significance at the 10%-, 5%- and 1%-level, respectively. All control variables and fixed effects are included according to Equation (4.2).
Source: WIFO calculations.

The choice of scenarios to be simulated with the KITE model are in turn informed by empirical evidence and reference to recent coercive actions summarised in Table 4.3. China has made extensive use of coercive threats and actions in its economic policy, as highlighted by the European Commission's ACI impact assessment (European Commission, 2021B), the European Parliamentary Research Service (EPRS, 2022B), and the Mercator Institute for China Studies (Merics, 2022). Since 2018, China has escalated its use of such tactics, with the triggers for coercion expanding beyond traditional issues of sovereignty and national security to encompass China's international image and the treatment of Chinese firms abroad. Companies often face "popular boycotts" as a response to their actions, while trade restrictions are frequently employed to target foreign governments and exert broader economic pressure. Given this context, it is likely that the Anti-Coercion Instrument (ACI) will be employed against China. Therefore, the chosen scenarios use China as an example to evaluate the potential impact of the ACI.

[11]) In principle multilateral (non-discriminatory) measures that affect all trading partners equally but have no effect on domestic flows can be identified by exploiting the variation between international and domestic trade flows. However, missing data on domestic trade flows for some countries and product types in the data sample based on the ITPD-E made this identification strategy impossible. This problem is outweighed by the advantage of the ITPD-E's highly disaggregated data, which is the only way to preserve enough variation in the GTA trade barrier data in. All other databases (TiVA, WIOD) that also include domestic trade are too highly aggregated for these purposes. Estimation with a sample of data reduced to trade flows that only includes countries and industries with non-missing domestic trade results in too high a loss of data, reducing the sample by more than half.

[12]) Estimates including non-discriminatory multilateral trade barriers yield insignificant or unplausible results for these types of trade policies, while they produce the same results for the bilateral terms in Equation (4.1).

Figure 4.6: Most common protectionist measures enacted by the EU or imposed upon the EU in bilateral relations with China by industry, 2009 – 2022



Source: Global Trade Alert Database, WIFO calculations.

Figure 4.6 provides detailed information on the sectors and types of trade measures that have been applied in bilateral relations between China and the EU. These results serve as a guide for the analysis conducted in the proposed scenarios summarised in Table 4.3.

Table 4.3: Scenarios – Anti-Coercion Instrument

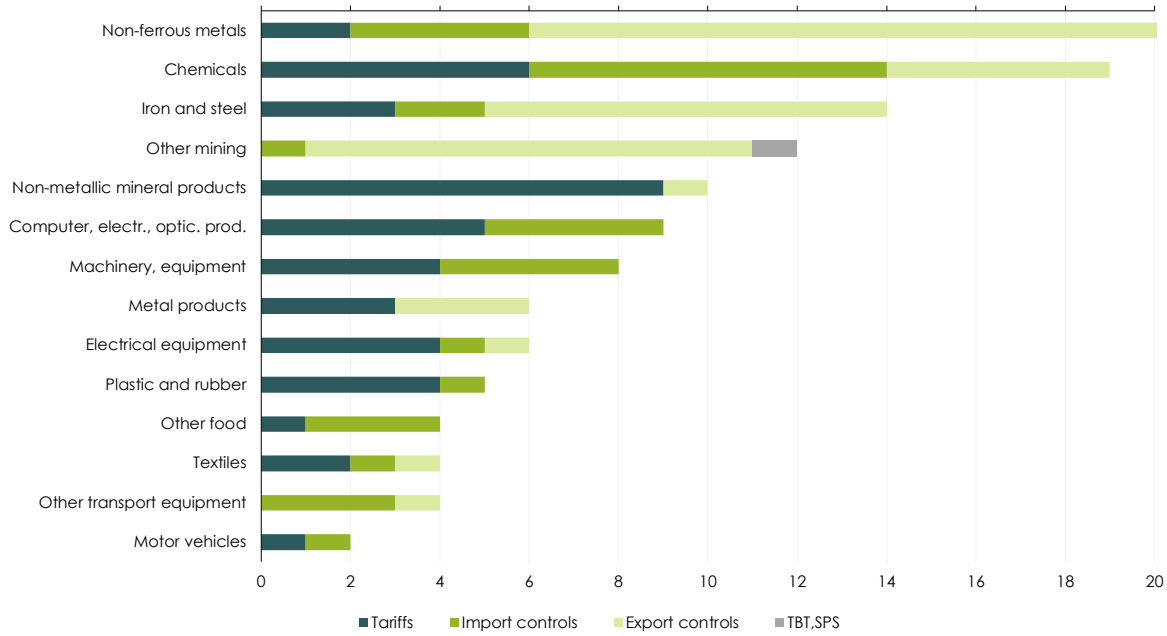
Scenario		Acting country	Affected country	Sector affected	Trade measure applied	Amount of trade affected - KITE Mio. $
1	Coercive act	China	Germany	Motor vehicles, oth. transp. equipm.	Import controls	49,145.2
2	EU countermeasures	EU	China	Chemicals Electrical equipment	Tariffs Tariffs	49,280.3
3	Retaliation	China	EU	Iron and Steel Machinery and equipment	Export controls Import controls	52,032.4

Source: WIFO presentation.

In the first scenario, we assume that China exerts coercive pressure on Germany for a particular reason and imposes import controls on the German motor vehicles and other transportation equipment sector. This choice is based on the fact, that symbolic industries are often targeted

in coercive actions, and Germany serves as a relevant example to study potential impact on Austria. Moreover, based on GTA data, import controls are among the most common types of trade barriers imposed by China on Germany in the car sector (Figure 4.7).

Figure 4.7: Most common protectionist measures imposed on Germany in bilateral relations with China by industry, 2009 – 2022



Source: Global Trade Alert Database, WIFO calculations.

The **second scenario** captures the impact of EU countermeasures most likely to be activated under the ACI. The assumed EU response under the ACI is an implementation of tariffs in the chemicals and the electrical equipment sectors, which is again motivated by past EU policies towards China (Figure 4.6). Table 4.3 also reveals that the amount of trade related to the EU countermeasures in scenario 2 is of similar size to the trade flows involved by the coercive act of China on Germany. At least in this respect, scenario 2 reflects the proportionality of the EU countermeasures. As noted earlier, a proportionality assessment should rather rely on the likely effects of the chosen trade policy actions.

The **third scenario ("retaliation") assumes that the dispute escalates**. China retaliates against the EU by extending protectionist measures to cover all EU Member States and two of the most frequently targeted sectors in the past. Referring to the most common barriers reported in (Figure 4.6, right-hand panel) the EU would most likely face Chinese export controls in the iron and steel sector, as well as import controls in the machinery and equipment industry.

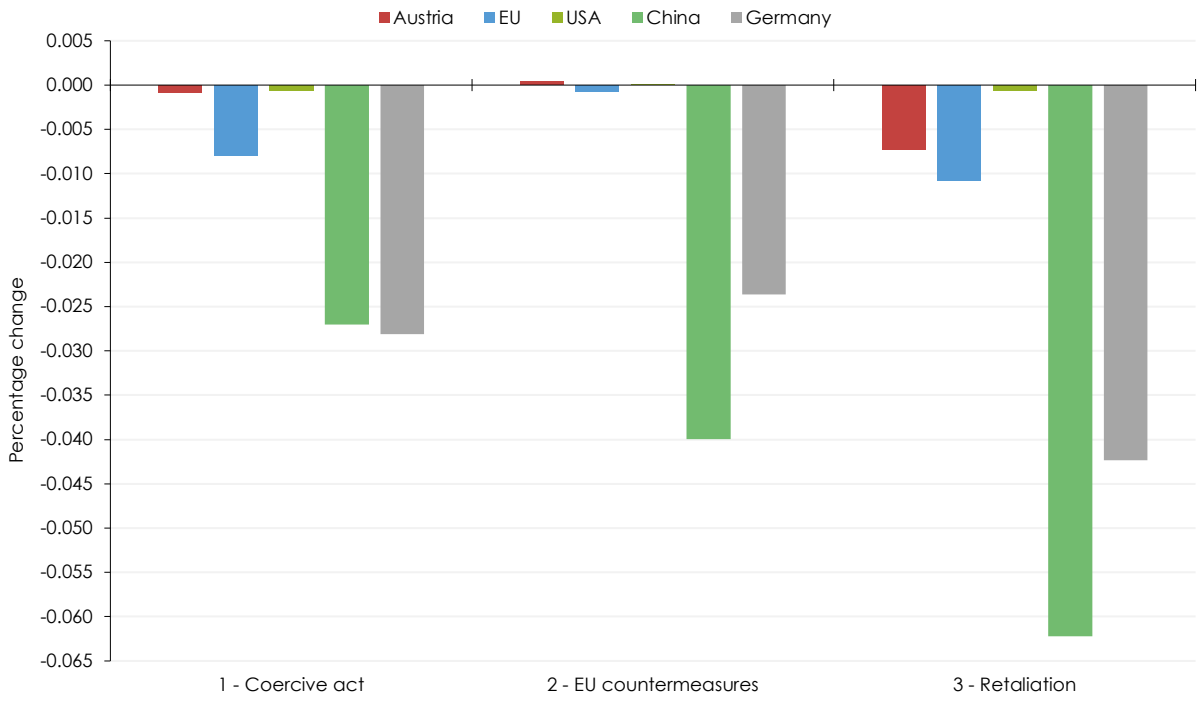
4.1.5 Welfare and trade effects of the ACI

The discussion of results starts with the presentation of welfare effects. Welfare effects reflect changes in real incomes and hence implicit changes in prices and the terms-of-trade and,

unlike changes in real output, take account of revenues from tariffs[13]). Besides welfare, effects on total trade, bilateral trade patterns as well as changes in trade at the sector level are analysed and discussed for each of the scenarios outlined in detail in chapter 4.1.4. The changes presented for each scenario reflect deviations from the baseline defined in the KITE model (see chapter 3.2) and each consecutive scenario includes the previous and current stages of the trade conflict. As long-term trade changes are simulated, the model estimates permanent level shifts in price levels and real income from the benchmark equilibrium (see chapter 3.2).

Figure 4.8 summarises the welfare changes of different scenarios for Austria, the EU, the USA, China and Germany. When analysing the effects, it is important to remember that the ACI was introduced to prevent coercive measures as well as possible retaliation. Any resulting trade and welfare effects therefore also reflect the extent of the losses that could potentially be prevented by the instrument.

Figure 4.8: Welfare effects for Austria, the EU and selected countries – scenarios for the ACI in comparison



Note: Welfare is measured by the change in real GDP.
Source: WIFO calculations based on the KITE model.

The results for **scenario 1 ("Coercive act")** summarise the impact of Chinese import controls on the German car and other transport equipment industry. The welfare effects are negative, not only for Germany, but also for the EU and Austria, as well as for China and the USA. As expected, the dispute has the most negative impact on the two rivals. However, as the trade

[13]) See chapter 3.2 for a more detailed description of the KITE model and the main channels of impact.

measures in this first scenario are limited to two industries and one affected EU country, the resulting welfare effects remain moderate, ranging from almost zero for Austria or the USA to about -0.03% for Germany and China[14]). Nevertheless, the simulation of scenario 1 already conveys an important message: The implementing country will not be spared the negative consequences of its own restrictive trade policy. In fact, in the example of trade measures chosen for scenario 1, the country imposing the restrictive trade measures (China) is itself affected almost as much as the immediate disputant in the trade conflict (Germany). Moreover, the negative impact on the directly involved parties spill over to other countries through trade and production linkages and global supply chains.

In **scenario 2 ("EU countermeasures"),** it is assumed that all de-escalation efforts through dialogs have failed, and the EU imposes tariffs on imports of chemicals and electrical equipment from China. As described earlier, the experiment follows the ACI guidelines on the proportionality of EU countermeasures. In doing so, it adopts the common practice of defining this proportionality in terms of the amount of trade volumes affected in each case (see chapter 4.1.4 for details). As we compare welfare effects to the coercive act in scenario 1, China is clearly worse off, while the negative impacts from the coercive act against Germany for the EU would be reduced (Figure 4.8). The impact on Austria is still small but becomes slightly positive. Overall, the selected countermeasures would almost offset the EU's losses from the first scenario, while China would suffer additional losses of roughly the same magnitude as the EU's losses from China's coercive act. As a result of the two stages of the trade dispute, China would be significantly worse off than the EU.

Since deterrence is the primary objective of the ACI and countermeasures should only be used as a last resort, the selection of countermeasures based on their welfare and trade impact is the most important basis for an effective and credible deterrent for the EU to resolve trade disputes diplomatically. As such, the countermeasures chosen would have the potential to pose a credible threat to China.

The changes in welfare implied by EU countermeasures in scenario 2 also show that the welfare effects associated with the imposition of tariffs are likely to be different from those associated with non-tariff barriers. This is because the implementing country receives tariff revenue and, depending on the market power and size of the imposing country and substitution elasticities, the tariff increase could be partly borne by foreign producers in the form of price reductions to avoid major losses in competitiveness. In this way, the welfare effects could in some cases be positive for the implementing country, as is the case for the EU in this second simulated scenario.

The final **scenario 3 ("Retaliation")** captures the welfare effects of a further escalation of the trade dispute, with China imposing additional export restrictions on its sales of iron and steel to the EU and import restrictions on EU machinery and equipment products. Overall, the effects are in line with expectations. Both actors, the EU and China, lose significantly compared to the baseline, but also compared to the other two previous stages of the dispute. Austrian welfare also declines, but the losses for Germany are much larger than those for Austria. Again, the impact on China as the implementing country is more significant than that on the EU. China's

[14]) Measured in absolute changes, real GDP in Austria would decrease by $ 3.7 mn, EU real income would shrink by $ 1.2 bn.

cumulative loss from all three phases of the trade dispute is 0.06%, while the EU's loss is 0.01%[15]). The dispute also has some additional, albeit small, negative welfare effects on the USA.

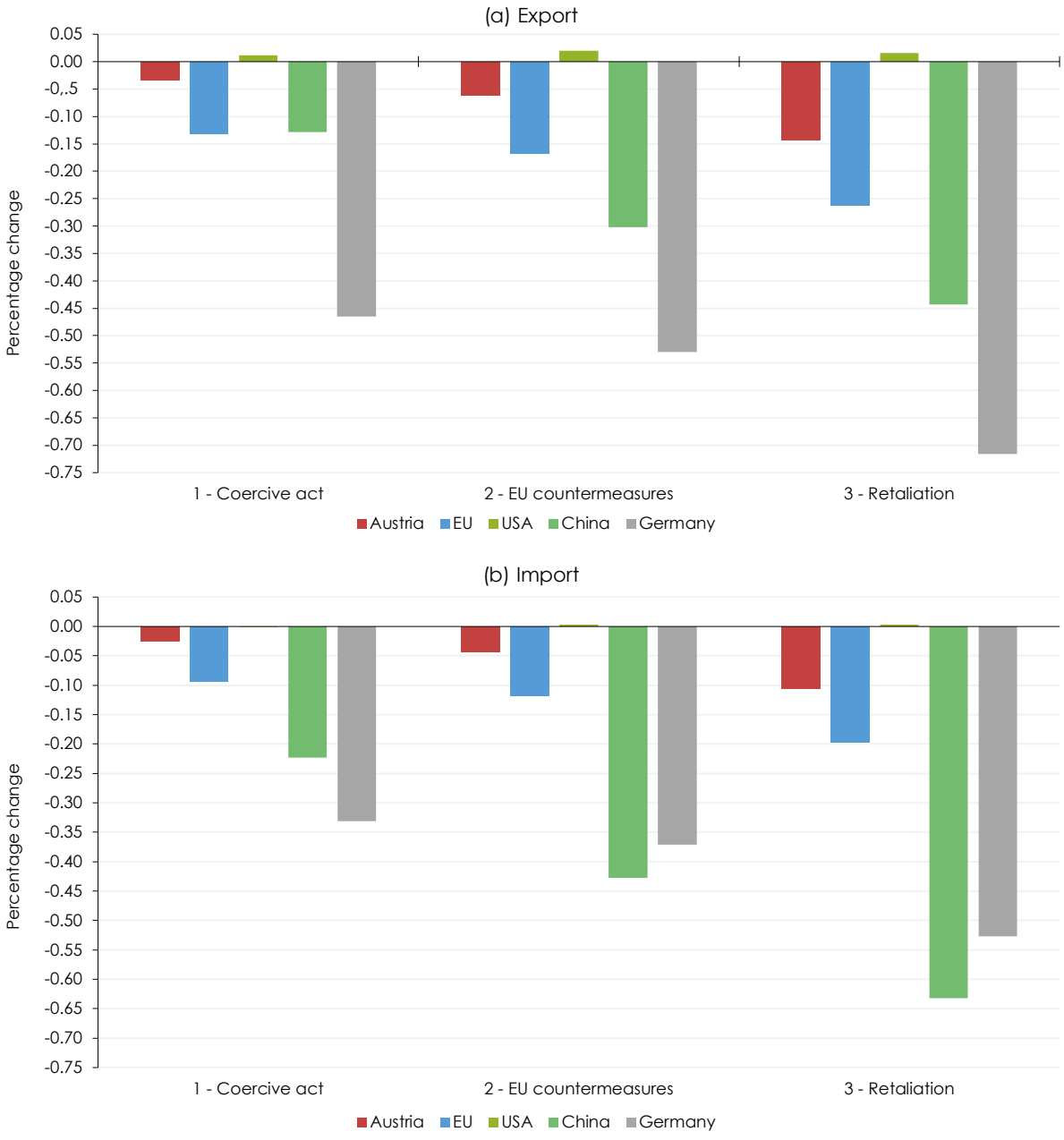
Figure 4.9 illustrates the total trade effects of the various ACI scenarios simulated. Overall, the changes remain small, but some changes in trade patterns emerge. As China imposes import restrictions on the German motor vehicles and other transport industries **(scenario 1 "Coercive act")** the trade of the two rivals is most negatively affected. Germany is to lose most trade shares. As the measures target German car exports, the effect on Germany's exports is higher than on its imports, and vice versa for China. Total German exports decrease by 0.47%, total imports shrink by 0.33%. This also negatively affects EU total trade. The impact on Austria's total exports as well as imports is negative as well, but small compared to the EU average. Chinese exports shrink by nearly the same rate as EU exports, while Chinese imports fall by more than total EU imports.

Further losses due to the EU countermeasures simulated in **scenario 2 ("EU countermeasures")** are limited for the EU, Germany and Austria. Mirroring the impact on welfare discussed above, the most obvious changes compared to scenario 1 occur for China which loses export market shares at the cost of Europe and reduces total imports as well. Finally, a further escalation of the trade dispute as China retaliates **(scenario 3 "Retaliation")**, exacerbates the trade losses of both rivalling parties. Germany's, and this time also Austria's, external trade is more affected by China's retaliation in the third scenario than in the previous ones, reflecting the importance of the sectors involved in both countries' total foreign trade.

Figure 4.10 provides further insights into the underlying shifts in the EU's and Austria's bilateral trade patterns with major trading partners as we move through the different stages of the simulated trade disputes. Chinese import restrictions on German cars and other transport equipment in **scenario 1 ("Coercive act")** lead to a loss of 2.5% in EU exports (dark colour) to China, while EU imports (light colour) from China shrink by 0.24%. As a result, total extra-EU trade also shrinks, while slight trade diversion effects can be observed in total EU exports to the USA. While the impact on total intra-EU trade is minimal, the pattern of EU trade with Germany changes, with EU countries exporting less to Germany but importing more from it.

[15]) This corresponds to an absolute change in real income of $ -30.9 mn for Austria and $ -1.6 bn for the EU.

Figure 4.9: Total trade effects for Austria, the EU and selected countries – scenarios for the ACI in comparison

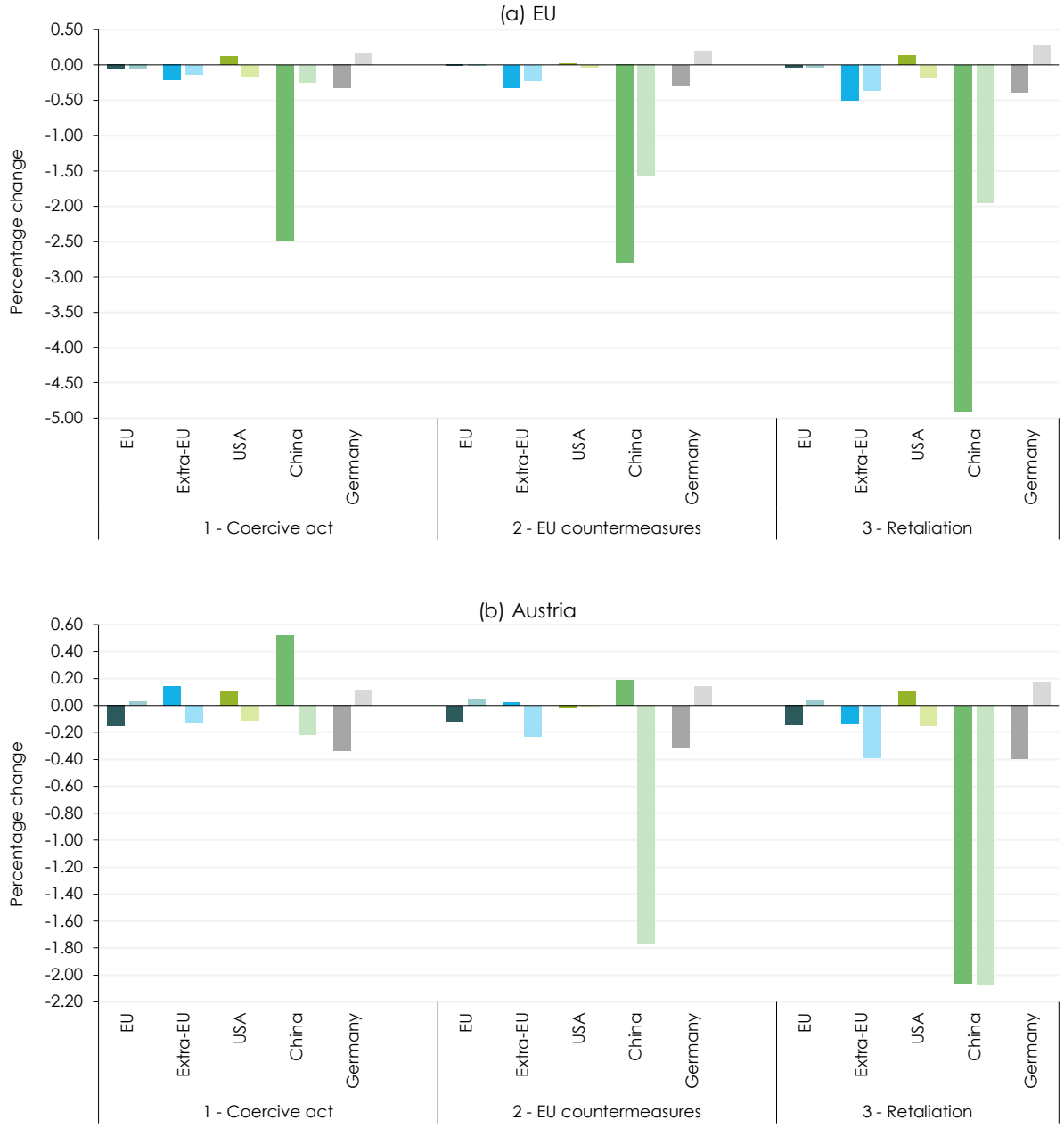


Source: WIFO calculations based on the KITE model.

The trade effects of China's coercive measures against the German car industry are smaller for Austria than for total EU trade, but more interestingly, the effects on Austria's bilateral trade patterns are also different from the EU effects. Austria's total exports to China benefit, as do exports to the USA and other extra-EU countries, while they are diverted away from Germany and other EU countries. Conversely, Austrian imports from Germany increase, while they shrink with respect to all other partners listed in the Figure 4.10. The latter result is partly due to

substitution effects from German motor vehicles and transport equipment to Austrian-produced cars and parts thereof, but it is also indicative of trade diversion within Europe to circumvent Chinese import restrictions on German cars.

Figure 4.10: Bilateral trade effects for the EU and Austria with selected partner countries – scenarios for the ACI in comparison



Note: Exports displayed in dark colours and imports in light colours.
Source: WIFO calculations based on the KITE model.

The **EU countermeasures** under the ACI in **scenario 2** have the largest additional impact on EU bilateral trade with China, with the highest changes in EU imports from China, leading to an overall decrease of 1.6%. Intra-EU trade is hardly affected by the tariffs on imports of chemicals and electrical equipment from China simulated in scenario 2. The shifts in Austria's bilateral trade – while still small – are somewhat more pronounced than in the EU's overall bilateral trade patterns, suggesting a strong role for these imports in Austrian manufacturing. Austrian imports from China fall by 1.8%, while the positive trade effect on bilateral exports to China is significantly decimated in the second scenario.

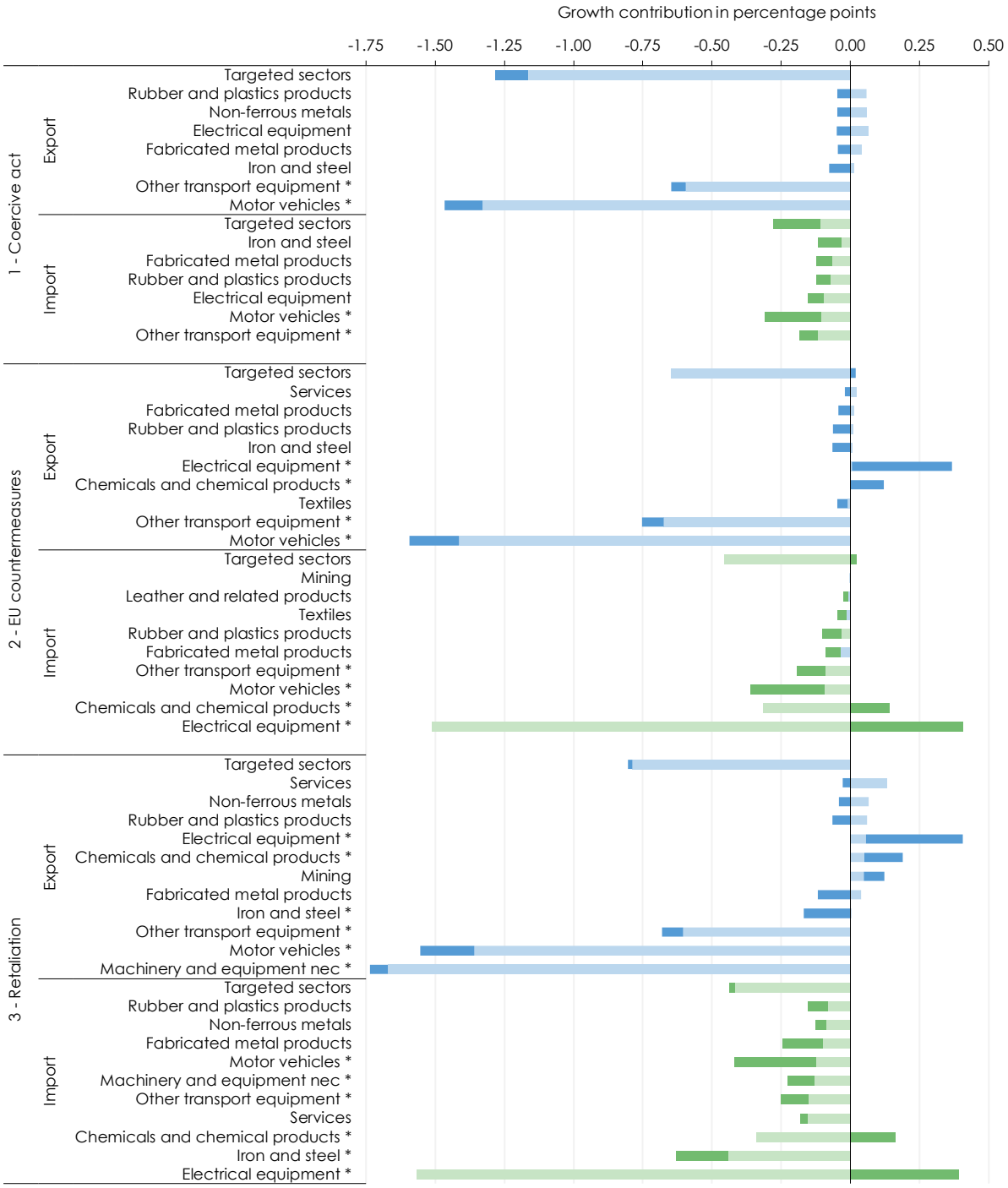
Finally, **retaliation** by China intensifies the loss of both rivalling parties, the EU and China in **scenario 3**. The simulated bilateral trade patterns of the EU reveal further trade diversion effects from China. EU exports to China fall by 4.9%. Some diversion of exports takes place towards the USA, while effect on intra-EU trade remains negligible. On the import side, most additional losses again accrue to bilateral trade with China. This signals that there is some further diversion of EU imports from the retaliating country by the EU to other sources.

For Austria, in contrast to the first two scenarios, the escalation of the trade conflict between the EU and China leads to the same general picture of results. The highest additional negative effects are observed for exports and imports to China. Bringing the trade dispute to the escalation stage in scenario 3 would diminish exports to and imports from China by 2.1%. In line with the EU pattern, Austria's bilateral exports to the USA increase.

Figure 4.11 provides more detail on the trade effects at the sectoral level. The effects are very small, too small to describe in detail, but they can be used to identify some general patterns in the impact of trade policy. The detailed results are presented in the Tables in Appendix B. The big picture from these details is summarised in Figure 4.11, which shows the growth contributions of EU exports and imports within the EU (dark colours) and to the extra-EU region (light colours) for the sectors most affected by the trade policy measures in each of the scenarios. Figure 4.12 reveals the sectoral effects for Austrian trade. The results show that all targeted sectors (marked with "*") are among the most negatively affected sectors, either in terms of exports or imports, depending on which flow is affected by the simulated trade policy measure[16]). Apart from the targeted sectors themselves, the sectors most affected are those most closely linked to the targeted sectors through vertical supply linkages. In **scenario 1**, which simulates Chinese import restrictions on the German automotive industry, these sectors include iron and steel, fabricated metal products, electrical equipment, non-ferrous metals, and rubber and plastic products. In **scenario 2**, which simulates the imposition of EU tariffs on chemical products and electrical equipment we see the strongest impact on the automobile industry, again reflecting the importance of this industry's supply relationship with China's electrical equipment industry.

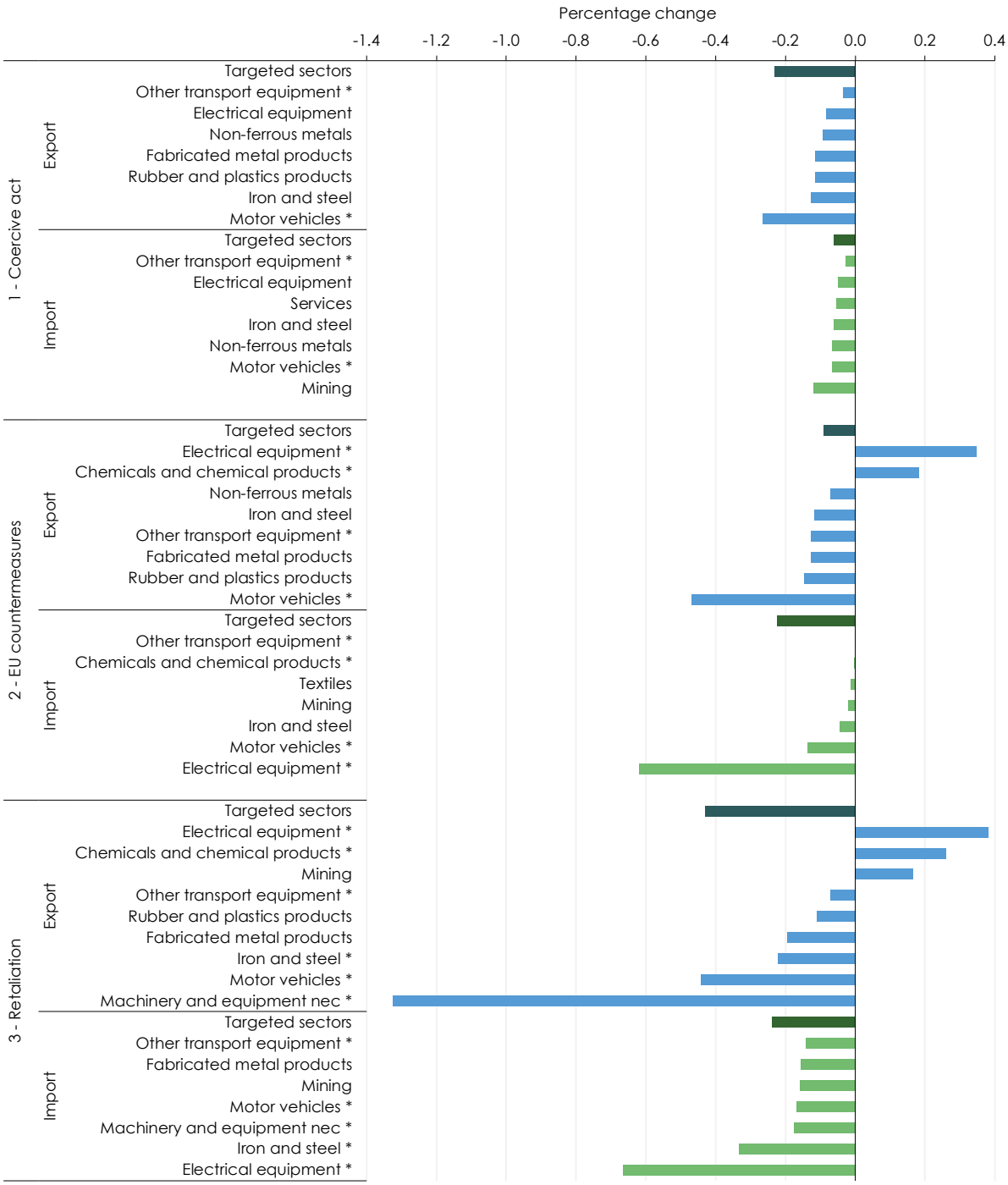
[16]) These effects may seem small; however, this total effect on trade conceals effects at the bilateral level, some of which can be very significant. As an example, German-China trade of targeted products from the car and other transport industries in scenario 1 are reduced by 22%, EU total exports of targeted products to China shrink by 14% in this experiment.

Figure 4.11: Sectoral trade effects for the intra-EU and extra-EU trade in targeted and most affected sectors – scenarios for the ACI in comparison



Note: Intra-EU displayed in dark colours and extra-EU in light colours.
Source: WIFO calculations based on the KITE model.

Figure 4.12: Sectoral trade effects for Austria in targeted and most affected sectors – scenarios for the ACI in comparison



Source: WIFO calculations based on the KITE model.

As we move towards the escalation scenario **(scenario 3)** and the final stage of the trade dispute, we find that exports of the machinery and equipment industry as well as the motor

vehicles and other transport equipment, and imports of electrical equipment industry and iron and steel industry will be most affected. Finally, the effect of trade diversion from extra-EU trade to more intra-EU trade is stronger in some of the targeted industries than in others. In the ACI experiments simulated in this study, trade diversion effects are most pronounced in electrical equipment and chemicals, leading to increased intra-EU trade in both industries (scenario 2 and scenario 3).

The analysis of sectoral trade effects leads to similar results for Austrian trade (Figure 4.12) and the general picture derived from the analysis of EU trade flows at the sectoral level also holds for Austria, but some interesting differences in the magnitude of the effects emerge. First, the effects for the motor vehicles industry and for other transport equipment are smaller than for the EU average. This is partly due to the fact that in the first scenario, Austrian trade in motor vehicles and other transport equipment on the Chinese market benefits from substitution effects away from German motor vehicles. On the other hand, the effects for important supplier industries (metals, rubber and plastics, electrical equipment) are larger than the EU average, reflecting strong production linkages with Germany.

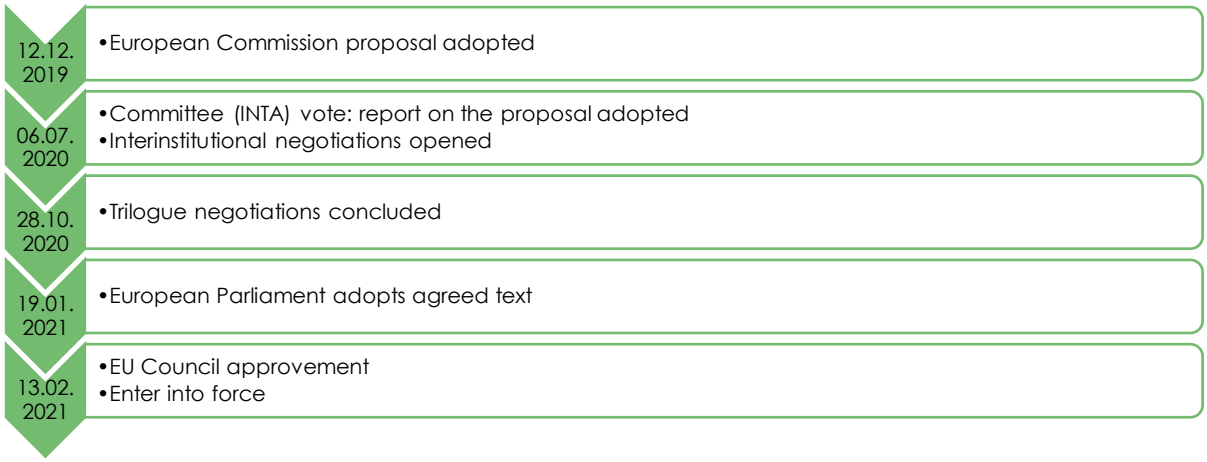
4.2 The updated Enforcement Regulation (ER) for trade disputes

The revised EU Enforcement Regulation (ER) empowers the EU to suspend or withdraw concessions or other commitments if trading partners violate international trade regulations and block dispute settlement procedures included in multilateral, regional and bilateral trade agreements, thus preventing the EU from obtaining final binding rulings in its favour. These changes to the ER were prompted by the blockage of the WTO dispute settlement procedure by the USA. As part of this update, the EU also gains the right to extend the scope of countermeasures, from tariffs, quantitative restrictions and public procurement measures to services and harmonised areas of intellectual property rights. It should be seen in close connection with the Anti-Coercion Instrument (ACI), which builds on the ER (see chapter 4.1). In general, the ER provides for a wide range of countermeasures that can affect all sectors of a country. However, the unilateral approach of the EU under the ER carries an increased risk of retaliation by the affected trading partners.

4.2.1 The historical context and implementation steps so far

In December 2019, the WTO Appellate Body stopped to function due to expired terms of judges, caused by the US blocking the nomination of new judges. This has paralysed the WTO dispute settlement system and created challenges for the enforcement of trade rules. This was coupled with an increased entanglement of trade conflicts with political power struggles and heightened concerns about the risks to EU interests. The EU has taken a three-folded approach to address this issue, including submitting WTO reform proposals, advocating a contingency solution called the Multiparty Interim Appeal Arbitration Arrangement (MPIA), and proposing amendments to the 2014 Enforcement Regulation[17]).

Figure 4.13: A timeline of implementation of amendments to the Enforcement Regulation (ER)



Note: Dates as of October 24, 2023.
Source: EPRS (2021), WIFO presentation.

[17]) This refers to regulation (EU) No 654/2014.

The MPIA was approved by the EU Council in 2020 and has since been ratified by 26 countries out of 164 WTO members. It offers an alternative route to dispute resolution under Article 25 of the WTO Dispute Settlement Understanding (DSU) for the time the WTO Appellate Body remains non-operational. However, as not all WTO members are part, there is a risk that an appeal by a losing party in a WTO dispute runs danger to remain unresolved and unenforceable to the detriment of the winning WTO member.

This further motivated the European Commission to propose amendments to the "Enforcement Regulation" (EU) No 625/2014. The respective proposal was published on December 12, 2019. It reflected the EU's commitment to multilateralism and binding independent adjudication and aimed to prevent the paralysis of the Appellate Body from incentivising EU trading partners to undermine the international rules-based trading system. The proposed amendments were also motivated by the Commission's aim to more effectively implement and enforce international trade agreements (EPRS, 2021). The amended ER entered into force February 13, 2021 (see Figure 4.13 for a more detailed timeline of implementation of the revised ER).

4.2.2 The Enforcement Regulation in detail

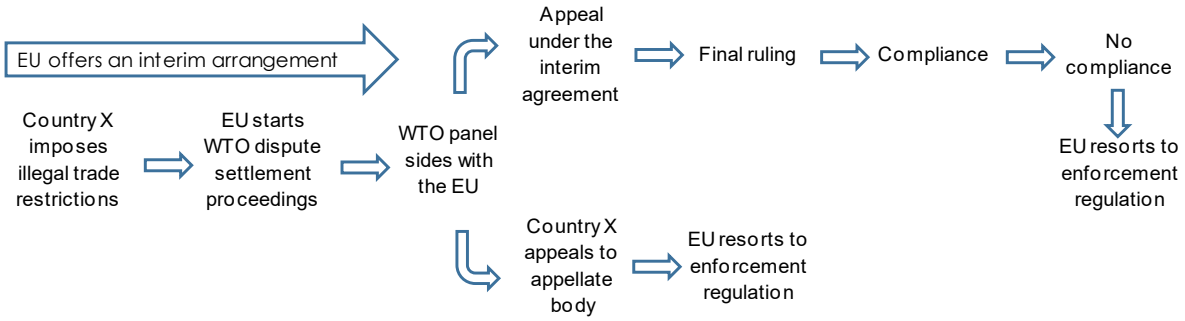
In its core, the proposed changes to the ER empower the EU to take action when another country blocks dispute settlements. Thus, if a country refuses to follow a ruling from a panel, the European Commission can adopt countermeasures or suspend concessions, even if the WTO' Appellate Body is unable to act [18]. These changes would also apply to similar situations in other international trade agreements where dispute settlement mechanisms are not working properly.

The adapted ER covers trade provisions on goods but has also been extended to cover trade policy measures that restrict trade in services or intellectual property rights (IPR). Similarly to the ACI reviewed in chapter 4.1 the ER offers a wide range of countermeasures that the EU could adopt, including non-tariff measures (NTM) of all kinds, such as import controls, export controls as well as restrictions on public procurement.

The procedural route for cases brought to the WTO dispute settlement mechanism is summarised in Figure 4.14. Upon the imposition of an illegal trade restriction by a country x, the EU files a request for consultation at the WTO and dispute settlement procedures are started In the event that the panel ruling is favourable to the EU, there are two possible routes for an appeal. If the appellant is also a member of the MPIA and agrees to arbitration procedures under Article 25 of the DSU, the appeal is filed under the interim arrangement and a final ruling is determined on the "MPIA route". If country x does not comply with this ruling, the EU can still resort to the ER to implement countermeasures. Alternatively, if country x appeals to the still dysfunctional WTO Appellate Body, the updated ER empowers the EU to impose countermeasures on country x.

[18] Disputes at the WTO dispute settlement mechanism are initiated by a formal request for consultations. During these consultations the complaining WTO member invites the member whose measures are being challenged to discuss the matter at issue. The complainant may then request the establishment of a panel to review the complaint if the consultations fail to resolve the dispute. The panel then makes its decision and any party to the complaint can appeal if it disagrees with the panel's decision.

Figure 4.14: Pathway for the EU Enforcement Regulation and WTO appeals



Source: EPRS (2021), Erixon et al. (2022).

Under the ER, the EU Commission is to suggest which countermeasures should be taken and which sectors should be targeted after information gathering or consultation with EU industry on a countermeasure with least negative impact for the EU, or it may only propose that no countermeasures should be taken at all where it finds no action is necessary to safeguard the Union's interests. ER presupposes situations in which only after the target country has been consulted and no solution is in sight, will the countermeasures be implemented by the EU upon, similar to ACI, a comitology vote in "no opinion, no action" examination procedure among the Member States on a proposal by EU Commission for a EU commercial policy measure. Similar to the ACI (see chapter 4.1), EU countermeasures should be applied on a "like-for-like" basis, i.e. they should not exceed the injury caused. As with the ACI, the methodology for determining proportionality is not always clear.

While the procedural route for ER enactment is clearly outlined and understood with respect to disputes under the WTO ruling, its application in disputes within bilateral or regional agreements is still less clear cut (Erixon et al., 2022).

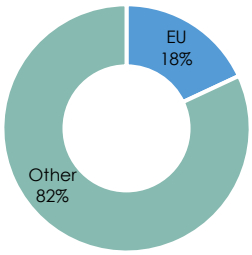
While the ER gives the EU greater power to enforce international rulings, particularly in cases where the other party is blocking dispute resolution, the EU's unilateral approach under the ER increases the risk of retaliation by affected trading partners. With its focus on contentious cases, any countermeasures imposed by the EU prior to resolution are likely to add fuel to the fire and make retaliation very likely. In addition, unilateral EU action under the updated ER could be challenged as discriminatory under WTO rules.

4.2.3 Detailed descriptive data analysis on potential impacts by sector and partner countries and results from the literature

Like the ACI, albeit as the ACI's historical predecessor only to a lesser extent the updated ER offers flexibility in the choice of countermeasures and the sectors to be targeted. Both the ACI and the ER provide for information gathering, consulting with the EU industry prior to imposing a countermeasure, and selecting a countermeasure that would ideally limit the backlash or damage to the EU industry caused by the EU countermeasure. As the ER is closely linked to the WTO dispute settlement mechanism, and indeed applies to blocked cases, an analysis of EU involvement in WTO disputes and transfers of disputes to the Appellate Body is very revealing.

It shows which countries and sectors are most frequently involved. We use data from the WTO dispute settlement gateway [19]). In most parts of the descriptive analysis the focus is put on the time period 2009 to 2022 to be compatible with the GTA dataset (compare chapter 4.1.3).

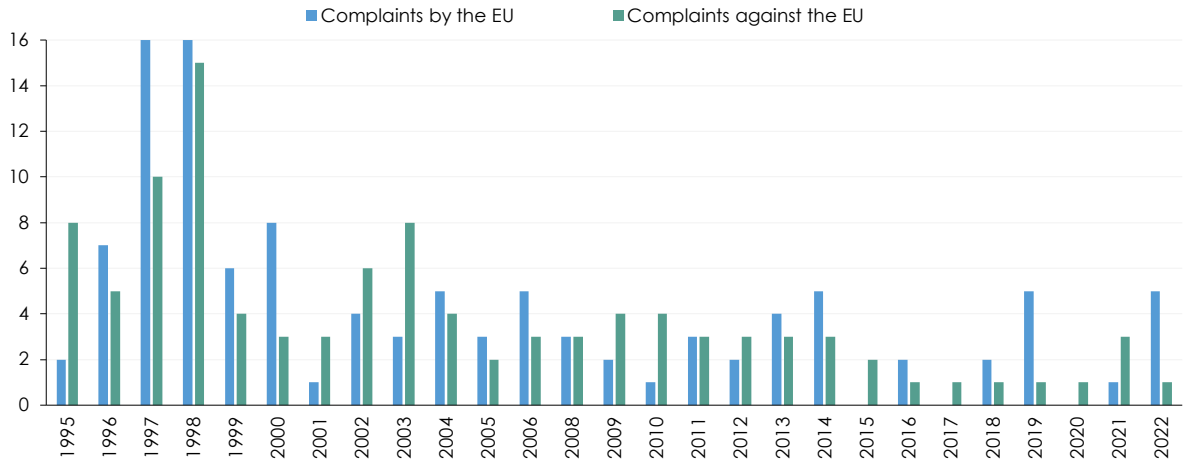
Figure 4.15: Share of the EU in total requests for consultation at the WTO, 1995 – 2022



Source: WTO (https://www.wto.org/english/tratop_e/dispu_e/dispu_e.htm), WIFO calculations.

From its inception in 1995 to 2022, the WTO Dispute Settlement Body received a total of 615 requests for consultations. The EU accounted for 111, or 18% of these (Figure 4.15). The highest number of complaints was in 1997 and 1998. Since then, there has been a slowdown and the number of consultations requested by the EU has averaged around 3 per year over the last ten years (Figure 4.16).

Figure 4.16: Requests for consultation at the WTO by the EU and by EU partners per year

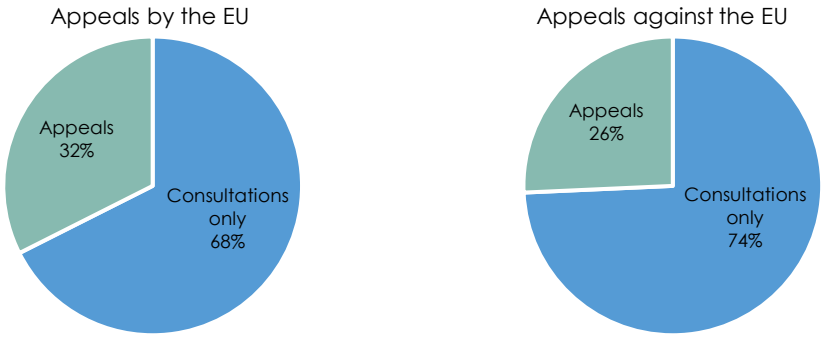


Source: WTO (https://www.wto.org/english/tratop_e/dispu_e/dispu_e.htm), WIFO calculations.

The same pattern emerges for complaints by trading partners against the EU. These have averaged around 2 per year over the last ten years. Only a fraction (32%) of EU complaints were referred to the Appellate Body. For complaints made against the EU, the proportion of cases appealed is even lower, at 26% (Figure 4.17).

[19]) https://www.wto.org/english/tratop_e/dispu_e/dispu_e.htm.

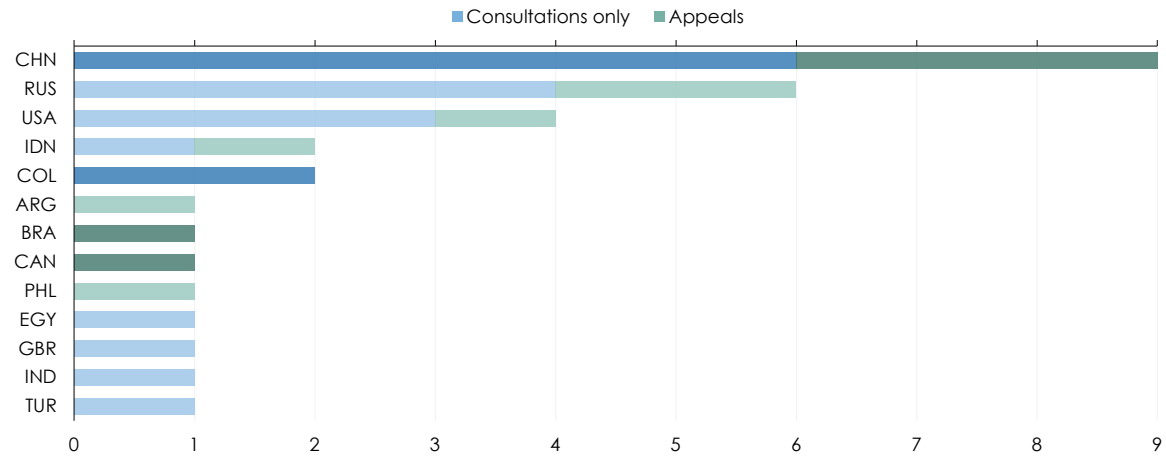
Figure 4.17: Share of disputes with recourse to the Appellate Body, 1995 – 2022



Source: WTO (https://www.wto.org/english/tratop_e/dispu_e/dispu_e.htm), WIFO calculations.

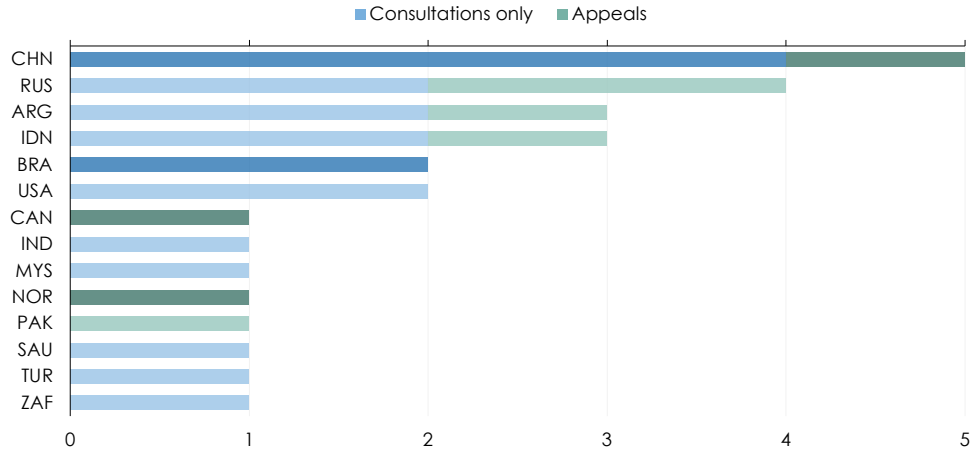
Most of the EU disputes since 1995 have been directed towards the USA, China, India and Argentina. However, only China and the USA have been among the most recent targets of EU complaints, with Russia and Indonesia also frequently appearing among the targets from 2009 - 2022 as shown in Figure 4.18. China leads the ranking in terms of appeals at the WTO Appellate Body over the latter period. In addition, China and Russia have also been among the most active recent initiators of investigations against the EU, followed by Argentina and Indonesia (Figure 4.19). Among these top ranked countries, only China is a member of the MPIA, and neither the USA nor Indonesia, Argentina or Russia have signed the arrangement.

Figure 4.18: EU initiated requests for consultation and appeals at the WTO by country affected, 2009 – 2022



Note: MPIA countries shown in dark colours.
Source: WTO (https://www.wto.org/english/tratop_e/dispu_e/dispu_e.htm), WIFO calculations.

Figure 4.19: Requests for consultation and appeals at the WTO against the EU by top ranked complaining partner country, 2009 – 2022



Note: MPIA countries shown in dark colours.
Source: WTO (https://www.wto.org/english/tratop_e/dispu_e/dispu_e.htm), WIFO calculations.

Table 4.4 summarises current disputes in which the parties involved have either already indicated their intent to resolve any appeal through the MPIA or have the option to do so because they are both parties to the MPIA[20]). The MPIA has been active since 2020 with 10 disputes having taken the MPIA route. The EU has been a complainant in only two of these cases. Both, the case of EU-Columbia (anti-dumping duties on French fries from Belgium, France, and the Netherlands) as well as the EU-Turkey case (measures concerning the production, imports and marketing of pharmaceutical products) have been concluded. It is noteworthy, that although Turkey is not an MPIA participant, the dispute between the EU and Turkey was resolved through an appeal-arbitration agreement under DSU Article 25, which respects the principles of the MPIA.

Table 4.4: Current disputes following the alternative MPIA-route

Complainant	Respondent	Dispute short title	Product/sector affected
Finalised MPIA arbitrations			
EU	Turkey	Turkey — -Pharmaceutical Products (EU)	Pharmaceuticals
EU	Colombia	Colombia — Frozen Fries	Frozen Fries
MPIA notifications			
Brazil	Canada	Canada — Commercial Aircraft	Commercial Aircraft
Canada	China	China — Canola Seed (Canada)	Canola Seed
Australia	China	China — AD/CVD on Barley (Australia)	Barley
Japan	China	China — AD on Stainless Steel (Japan)	Stainless Steel
Mexico	Costa Rica	Costa Rica — Avocados (Mexico)	Avocados
Australia	Canada	Canada — Wine (Australia)	Wine
Australia	China	China — AD/CVD on Wine (Australia)	Wine
China	Australia	Australia — AD/CVD on Certain Products (China)	Certain Products

Source: WTO (https://www.wto.org/english/tratop_e/dispu_e/dispu_e.htm), WIFO presentation.

[20]) These disputes refer to Article 25 of the Dispute Settlement Understanding.

Table 4.5: Number of requests for consultations and of appeals by the EU and selected countries and sectors most likely affected, 2009 – 2022

Complaints by the EU

Partner country	Year	Consulta-tions	Appeals	Sector	Sector according to KITE model
China		9	**3**		
	2009			**Raw materials**	**Chemicals (33)** **Non-ferrous metals (38)** **Other mining (18)**
	2010			Iron and steel fasteners	Iron & steel (37)
	2011			X-Ray equipment	Other manufacturing (45) Comp., electr., opt. prod. (40)
	2012			**Rare earths**	**Chemicals (33)** **Other mining (18)**
	2013			**High-perf. stainl. steel seaml. tub.**	**Iron & steel (37)**
	2016			Raw materials	Other mining (18) Non-ferrous metals (38) Chemicals (33)
	2018			Transfer of technology	IPR, trademarks, copyr. (1000)
	2022			Goods and services	Goods and services (3000)
	2022			Intellectual property rights	IPR, trademarks, copyr. (1000)
Russia		6	**2**		
	2013			Motor vehicles	Motor vehicles (43)
	2014			**Pigs**	**Other animal products (10)** **Cattle (9)**
	2014			**Commercial vehicles**	**Motor vehicles (43)** **Other transport equipment (44)**
	2014			Certain agricultural, manufacturing prod.	Machinery, equipment nec (42) Motor vehicles (43) Paper and paper products (31) Vegetable oils (21) Electrical equipment (41)
	2021			Domestic, foreign prod., serv.s	Goods (incl. cars) and services incl. motor vehicles
	2022			Wood	Forestry (13) Wood (30)
USA		4	**1**		
	2011			Stainless steel sheet and strip	Iron & steel (37)
	2014			**Civil aircraft**	**Other transport equipment (44)**
	2018			Steel and aluminium products	Iron & steel (37)
	2019			Ripe olives	Oil seeds (5)
Indonesia		2	**1**		
	2014			Clove cigarettes	Beverages & tobacco (26)
	2019			**Raw materials**	**Other mining (18)** **Chemicals (33)** **Non-ferrous metals (38)**

Table 4.5/continued
Complaints against the EU

Partner country	Year	Consulta-tions	Appeals	Sector	Sector according to KITE model
China		5	**1**		
	2009			**Fasteners**	**Iron & steel (37)**
	2010			Footwear	Leather (29)
					Plastic and rubber (35)
					Lumber (30)
					Other manufacturing (45)
	2012			Renewable energy	Computer, electr., opt. prod. (40)
					Iron & steel (37)
					Chemicals (33)
					Metal products (39)
					Electrical equipment (41)
					Other manufacturing (45)
					Petroleum & coke (32)
					Machinery and equipment n.e.c. (42)
					Non-ferrous metals (38)
					Non-metallic mineral products (36)
	2015			Poultry meat	Other meat (20)
	2016			Price comparison methodologies	Goods (2000)
Russia		4	**2**		
	2013			All imports	Goods and services (3000)
	2014			**Energy sector**	**Crude oil (16)**
					Other mining (18)
					Natural gas (17)
	2015			**Cost adjustment methodologies**	**Goods (2000)**
	2017			Cold-rolled steel	Iron & steel (37)
USA		2	0		
	2009			Poultry meat	Meat (20)
	2018			Certain products	Certain products
Indonesia		3	**1**		
	2012			**Fatty alcohols**	**Chemicals (33)**
	2014			Biodiesel	Chemicals (33)
	2019			Palm oil	Vegetable oils (21)
				Biofuel	Chemicals (33)

Note: Appeals displayed in bold characters.
Source: WTO (https://www.wto.org/english/tratop_e/dispu_e/dispu_e.htm), WIFO presentation.

Finally, Table 4.5 provides relevant details on the number of disputes and appeals as well as the respective sectors involved in the four countries. Disputes initiated by the EU against China most often concern raw materials and rare earths, while China's latest complaints against the EU involve all sectors related to renewable energy or poultry meat. EU complaints against Russia in 2013 and 2014 were mostly geared towards the car sector in 2013 and 2014. More recent disputes have targeted wood as well as goods and services in general. Russia has requested consultations with the EU regarding measures taken on crude oil, natural gas, and other mining products, as well as on iron and steel products. The EU has engaged in two disputes with the USA since 2009 concerning protectionist measures in the iron and steel sector, while disputes regarding civil aircraft have been ongoing since 2004. Finally, the EU's most recent cases with Indonesia have targeted raw materials, while Indonesia's complaints against the EU have

centred on the chemical sector, targeting fatty alcohols, biodiesel, and palm oil crop-based biofuels.

4.2.4 Quantifying the likely impact of the ER – scenarios and empirical specification

The ACI and the ER follow similar principles. To quantify the likely impact of the ER, we apply the same procedure and models used to analyse the impact of the ACI in the previous chapter. The results of the empirical gravity model specified in Equation (4.2) and reported in Table 4.2 will again inform the simulations of different scenarios using the KITE model (see chapter 4.1.4).

The choice of ER scenarios is guided by the descriptive analysis of EU WTO disputes as well as the more general results on trade barriers based on the GTA database in chapter 4.2.3. According to the suggestion of the Austrian Ministry of Labour and Economy (BMAW) that commissioned this study, the likely impact of the ER is exemplified by different scenarios involving bilateral relations with Russia. In this respect, it is important to note that the aim of this study is to highlight possible impacts of new trade policy instruments and that the methodologies applied are inappropriate for estimating the effects of reciprocal sanctions implemented in response to Russia's invasion of the Ukraine. At the same time and as explained in chapter 4.1.4, all products related to the minerals, gas and oil sectors had to be excluded from the regression analysis due to very unstable and unreliable results.

Table 4.6 presents the selected ER scenarios. In **Scenario 1** it is assumed that Russia imposes tariffs on imports of the EU motor vehicle and other transport sector. This selection of affected sectors is mainly based on the WTO disputes data. As reflected in Table 4.5 motor vehicles and other transport equipment have most often been targeted in WTO trade disputes between the EU and Russia. In addition, products from the car industry also rank prominently among the sectors most often affected by Russian trade measures against the EU according to GTA data as shown in Figure 4.20. Figure 4.20 also reveals that public procurement measures are the most popular trade barrier imposed by Russia in these sectors. Unfortunately, the effect of public procurement measures could not be identified with the data at hand. Apart from PP measures, tariffs are the most frequently implemented barrier.

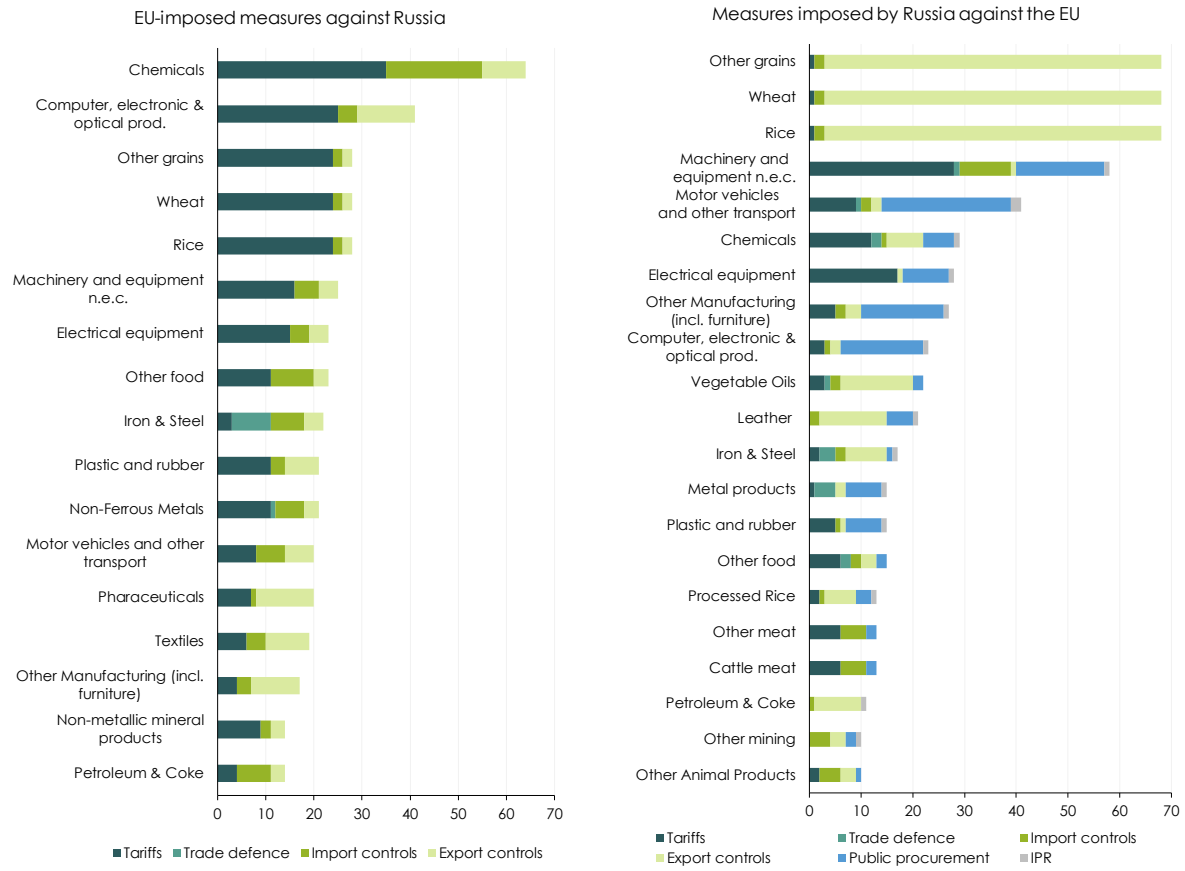
Table 4.6: Scenarios – Enforcement Regulation

Scenario		Acting country	Affected country	Sector affected	Trade measure applied	Amount of trade affected - KITE Mio. $
1	Protectionist Act	Russia	EU	Motor vehicles, oth. transp. equipm.	Tariffs	24,408.3
2	EU countermeasures	EU	Russia	Chemicals Computer, electronic, optical prod. Machinery and equipment Electrical equipment Iron & steel Non-ferrous metals	Tariffs Tariffs Tariffs Tariffs Tariffs Tariffs	24,375.6
3	Retaliation	Russia	EU	Agricultural, forestry, wood products Food products Machinery and equipment	Export controls Tariffs Tariffs	36,591.6

Source: WIFO presentation.

In **scenario 2 ("EU countermeasures")**,the EU imposes countermeasures under the rulings of the updated ER by imposing tariffs on Russian imports of the chemicals sector, the computer, electronic and optical products industry as well as the machinery, electrical equipment, iron and steel and the non-ferrous metals industries. Again, this choice is informed by past EU trade policies against Russia, as revealed in Figure 4.20 which is based on GTA data. EU countermeasures in this scenario – in a like-for-like manner – remain limited and proportional to the Russian protectionist measures as indicated by the values of bilateral trade in these sectors in Table 4.6.

Figure 4.20: Most common protectionist measures enacted by the EU or imposed on the EU in bilateral relations with Russia, 2009 – 2022



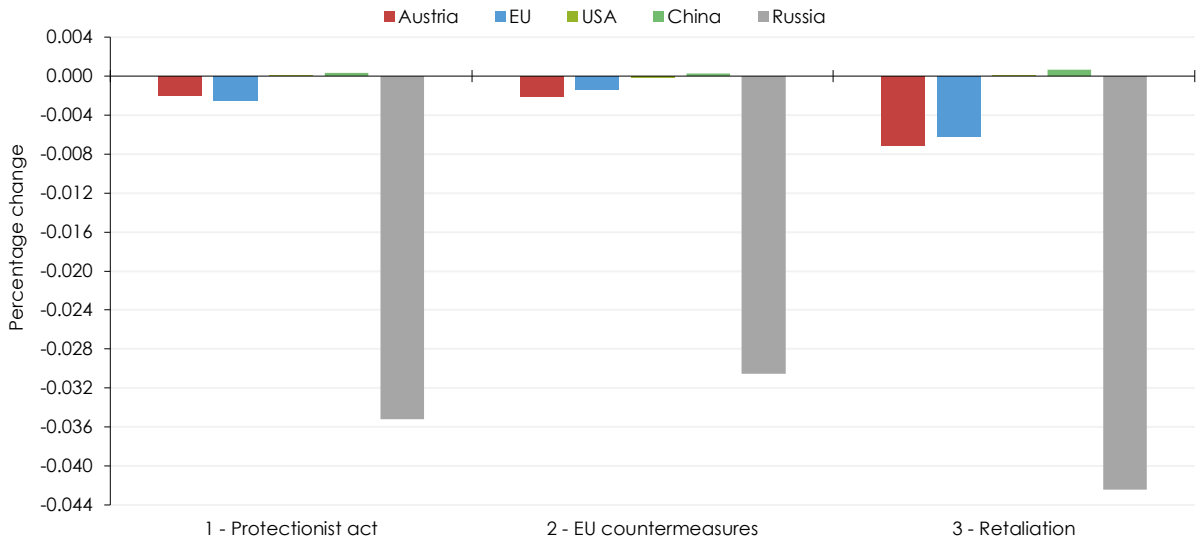
Source: Global Trade Alert Database, WIFO calculations.

Finally, **scenario 3** (**"Retaliation")** assumes an escalation of the disputes as Russia retaliates against the EU by expanding its protectionist measures to agricultural and wood products as well as food products and products of the machinery and equipment sector. Based on past trade policies, the scenario further assumes that export controls are imposed on all agricultural and wood products, while tariffs are enforced on EU imports of Russian food and machinery (Figure 4.20, right panel).

4.2.5 Welfare and trade effects of the ER

The simulation results for welfare, which represent real income changes, are shown in Figure 4.21 for three different scenarios defined and described in detail in chapter 4.2.1. The changes presented for each scenario reflect deviations from the baseline defined in the KITE model (see chapter 3.2) and each consecutive scenario includes the previous and current stage in the trade conflict[21]). Furthermore, the simulation results show pure effects of the trade dispute under consideration in the different ER scenarios but do not include impacts of reciprocal sanctions implemented in response to Russia's invasion of the Ukraine in 2022 (compare chapter 4.2.4.

Figure 4.21: Welfare effects for Austria, the EU and selected countries – scenarios for the ER in comparison



Note: Welfare is measured by the change in real GDP.
Source: WIFO calculations based on the KITE model.

In **scenario 1 ("Protectionist act by Russia")** Russian tariffs on EU imports of motor vehicles and other transport equipment have a negative impact on Russian welfare of 0.035%, while the negative effects on the EU and Austria are negligible (-0.002% and -0.003%, respectively[22]). China benefits slightly, while there is no effect on US welfare. This is a further example of how restrictive trade policy measures often backfire on the implementing country. In scenario 1, Russia inflicts more harm on itself than on the targeted countries. This is the result of efficiency losses associated with the restrictive trade policy (imported goods are more expensive or replacement by less efficient domestic production) that outweigh possible gains from additional custom revenues or positive production and trade balance effects. At the same time Russian market power in the targeted sectors is too small to be able to influence import prices by its

[21]) See chapter 3.2 for a more detailed description of the KITE model and the main channels of impact.

[22]) This corresponds to a reduction in real income of $ 8.4 mn for Austria and $ 385.8 mn for the EU.

trade policy and must therefore bear the entire price increases induced by its tariffs itself, leading to a fall in real income and a loss in competitiveness.

The results for **scenario 2 ("ER enforcement")** summarise the impact of EU countermeasures under the rulings of the updated ER. It is assumed that the EU imposes tariffs on imports of Russian chemicals, iron and steel, non-ferrous metals as well as computers and electronic products, electrical equipment, machinery and equipment. As described in chapter 4.1.4 of the ACI experiments, the enforcement follows a like-for-like approach and proportionality of the EU countermeasures in the amount of trade affected (before the imposition of restrictive trade policies) is assumed. The simulations in scenario 2 capture the effects on welfare and trade from the first stage of the trade dispute ("protective act by Russia") and this second stage ("ER enforcement").

The comparison of results to scenario 1 shows that EU countermeasures in the form of import tariffs on Russian products of the six selected sectors would not lead to much additional harm to Austria while the negative impacts on the EU from Russia's protective trade policy in scenario 1 would be reduced but not fully compensated (Figure 4.21). The welfare effects in China and the USA remain negligible. Russia still suffers from the highest welfare loss, but contrary to the intention of EU countermeasures, the welfare loss is reduced as compared to scenario 1.

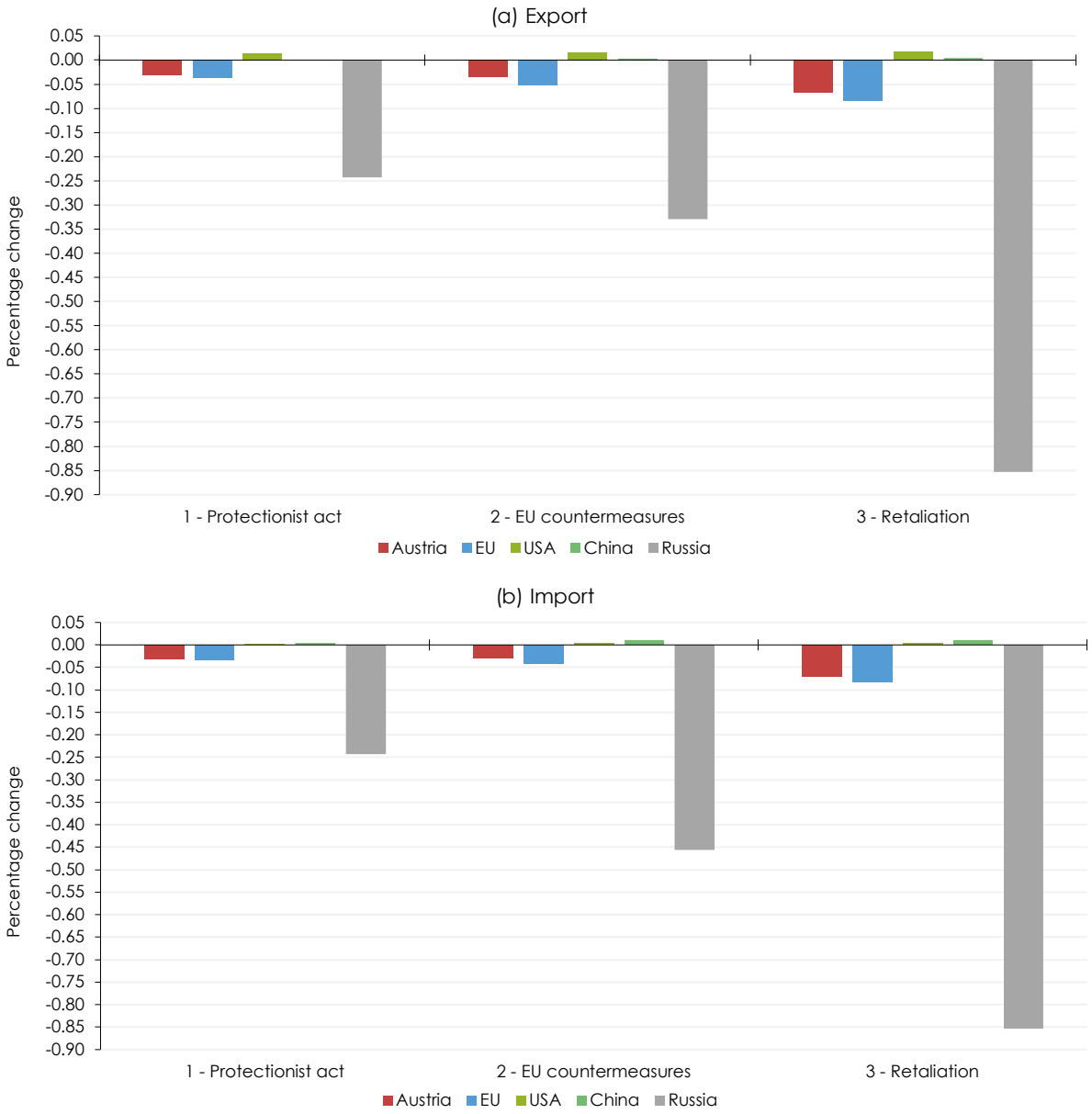
While the implied additional changes are small, the latter result is counterintuitive at first sight, but reflects the complex interplay of extensive national and international input-output linkages, price changes and trade diversion effects. Specifically, scenario 2 describes a situation in which EU tariffs are mainly imposed on intermediate goods for European production. As a result, downstream products from Europe become more expensive and the EU becomes less competitive, while Russian downstream products become more competitive. In addition, the general price level in the EU rises due to additional tariffs on Russian imports (lowering real income). In Russia, not only the relative prices of the downstream products fall, but also the prices of the originally targeted products as the tariff-induced price increases in the EU market are not fully passed on to European consumers and prices adjust accordingly. As the general price level in Russia falls, real income (and welfare) in Russia improves, and Russia gains international market shares relative to the EU for downstream products.

This tells us that it is challenging to establish reciprocal sanctions that are credible and effective threads and are simultaneously "proportionate" to the triggering protective measures of any partner country. Although the EU retaliation is about the same trade volume as in scenario 1, the outcome is not as expected and may even be reversed if restrictive trade policies are applied to intermediate goods. Scenario 2 illustrates the importance of accurately quantifying and determining proportional responses by analysing various countermeasure options through a model-based examination that considers all production linkages and trade diversion effects. Simply basing ER countermeasures on the volume of trade, as is commonly done, does not go far enough.

Scenario 3 ("Russian retaliation") simulates an escalation of the trade dispute between the EU and Russia through the implementation of retaliatory measures by Russia against the EU, targeting the machinery and equipment industry as well as agricultural, forestry, wood and food products. The results reveal additional damage to the welfare of the EU and Austria, but also a

deterioration in the welfare of Russia itself[23]). The effect on US welfare is negligible, while China's welfare change remains very small and positive.

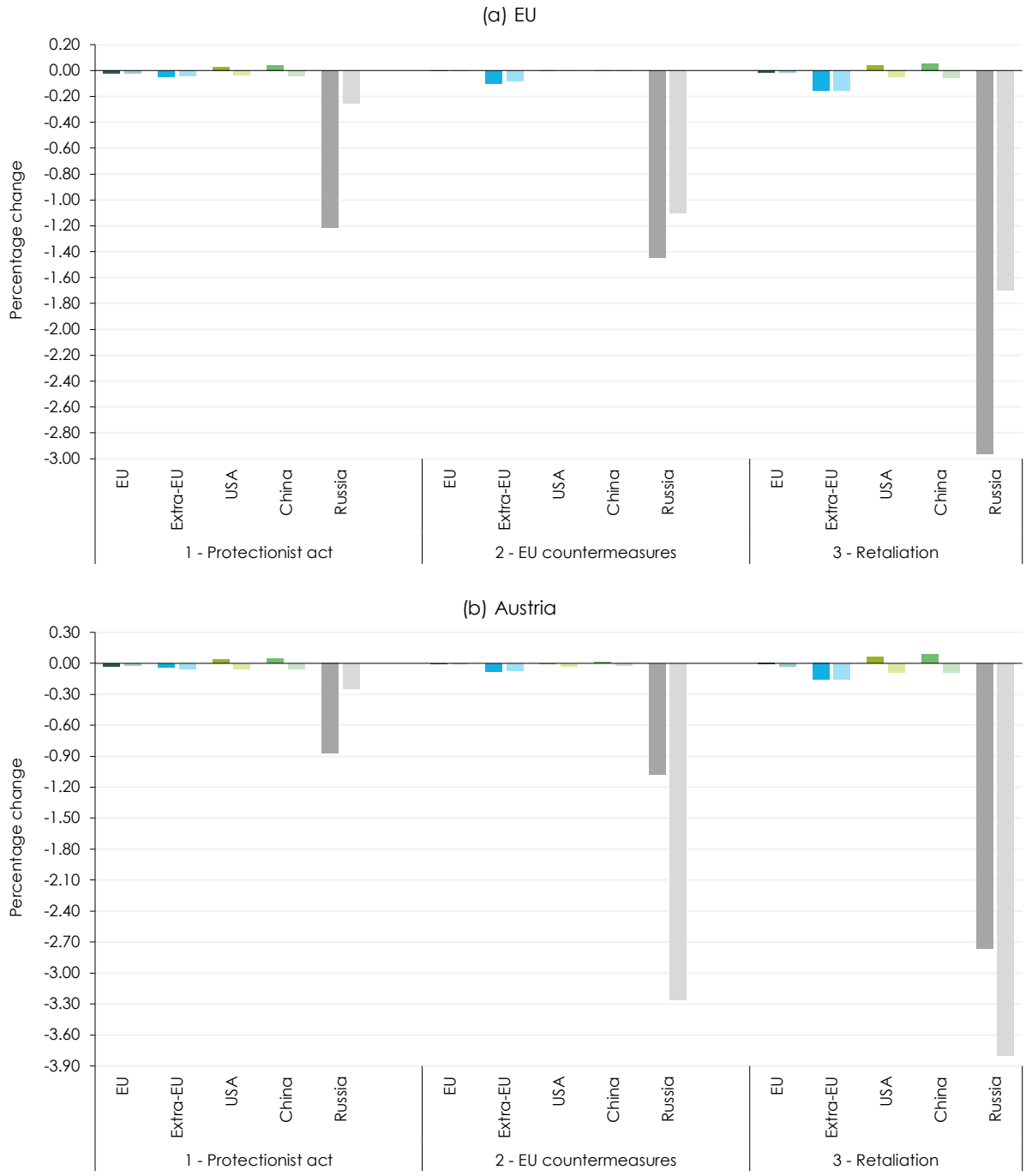
Figure 4.22: Total trade effects for Austria, the EU and selected countries – scenarios for the ER in comparison



Source: WIFO calculations based on the KITE model.

[23]) The reduction in welfare (real income) for Austria of 0.007% translates into an absolute change of real income of $ 30.3 mn. The decrease in EU real income of 0.006% amounts to an absolute change of $ 951.8 mn.

Figure 4.23: Bilateral trade effects for the EU and Austria with selected partner countries – scenarios for the ER in comparison



Note: Exports displayed in dark colours and imports in light colours.
Source: WIFO calculations based on the KITE model.

Effects on total exports and imports associated with Russia's trade restrictions implemented in **scenario 1** remain very modest (Figure 4.22). Both the EU and Austria see losses in total exports and imports of about 0.03% and 0.04%, respectively, while Russia is again to lose most[24]). The effect on US and Chinese trade is slightly positive, but practically negligible. Except for Russia, trade restrictions simulated in **scenario 2** also lead to minor additional shifts in the patterns of total trade. Russian total exports fall by 0.33%, imports by 0.46%. Retaliation by Russia, as simulated in **scenario 3,** again mostly hits trade of Russia. The trade effects remain very small for total EU exports with a decrease in exports of 0.08%.

Figure 4.23 summarises the simulated effects on EU and Austrian bilateral trade patterns with their main trading partners. In all scenarios the highest impacts are to be observed in EU and Austrian trade with Russia, while bilateral trade with the USA, China, other extra-EU countries as well as intra-EU trade is hardly affected at all.

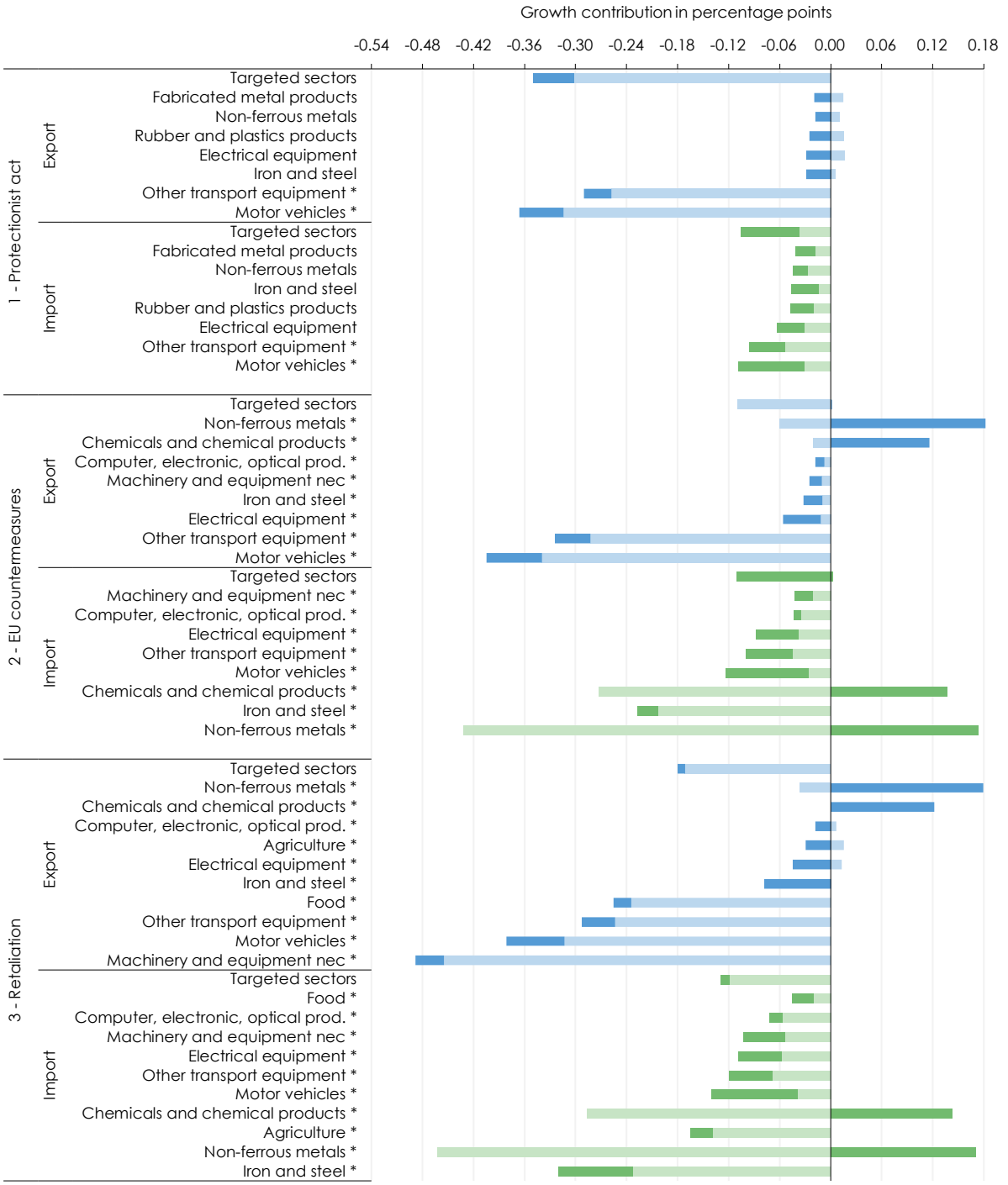
The EU trade effects at the sector level are presented in Figure 4.24. It shows the contributions to growth from intra-EU trade (dark colours) and extra-EU trade (light colours) for the targeted sectors (marked by "*") and the most affected sectors. More detailed information for all sectors can be found in the tables provided in Appendix B. The trade effects at this detailed level are very small for all sectors not directly targeted, but in general, sectors with closer production links to the targeted sectors are most affected in all simulated scenarios. We find EU total exports of the targeted sectors of **scenario 1** (motor vehicles and other transport equipment) to fall by 0.35%, and imports to decrease by 0.11% as a reaction to Russia's tariffs. Austrian exports of motor vehicles and transport equipment are down by 0.37% and imports shrink by 0.11%. Other transport equipment (-1.3%), a sector with a rather small share in total trade, records the largest decline in Austrian exports. The other sectors most affected in EU as well as Austria's trade are tied to these industries through vertical linkages and include iron and steel, electrical equipment, rubber and plastic products, non-ferrous as well as metal products.

In **scenario 2**, the group of all six targeted sectors is once again the most affected.

Finally, in the escalation scenario (**scenario 3**), which includes all previous stages of the trade dispute, we find that EU total exports of machinery and equipment, motor vehicles, other transport equipment and food would suffer the most. On the other hand, EU imports of iron and steel, non-ferrous metals, agricultural products and chemicals would decline significantly. The non-ferrous metals and the chemicals sectors stand out in terms of trade diversion from extra-EU trade to more intra-EU trade.

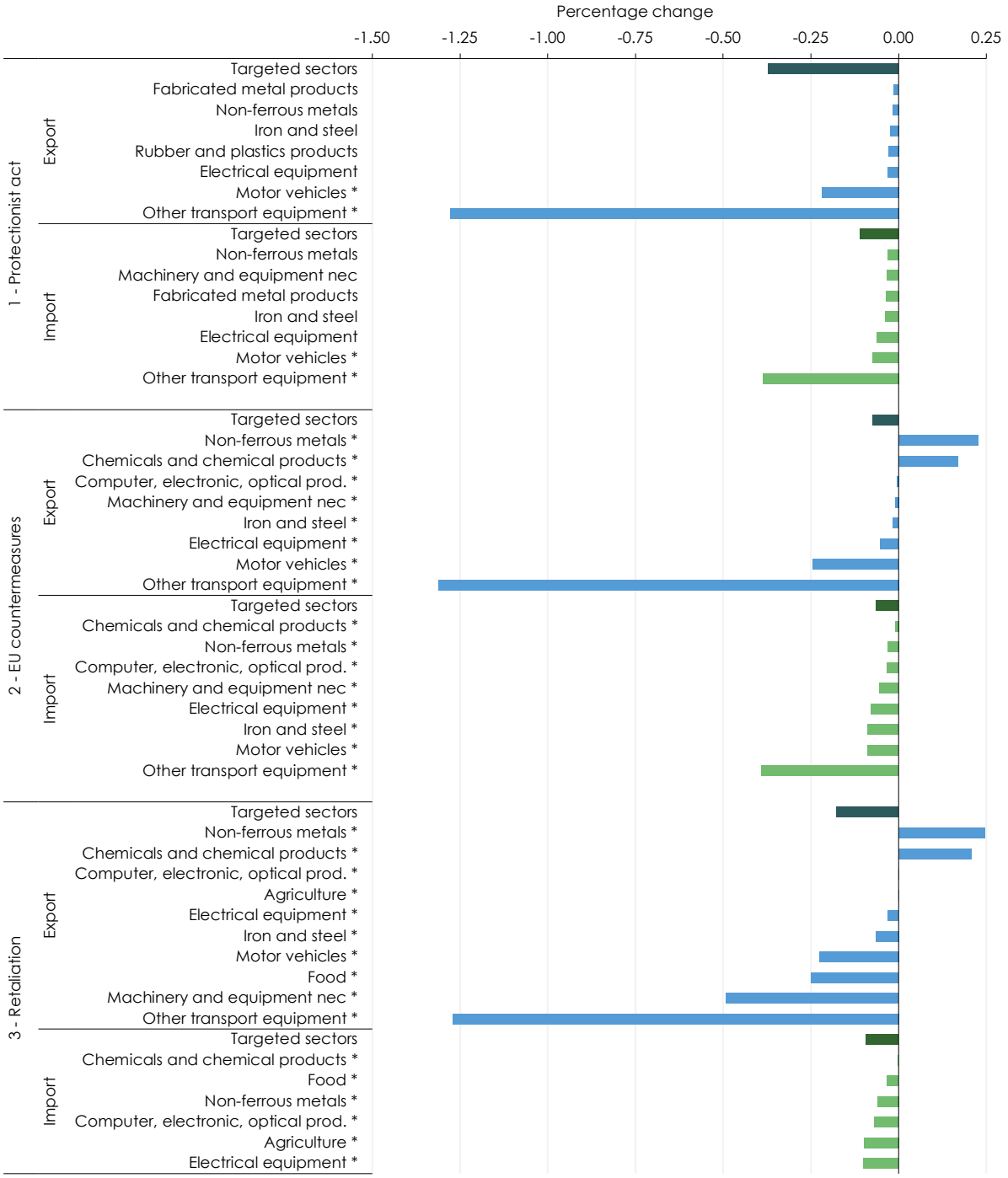
[24]) This hides some higher effects at the bilateral and sector level. EU exports of motor vehicles and other transport equipment as the targeted sectors of the trade policy measures in scenario 1 to Russia, fall by 11.2%. Austrian bilateral exports of these products shrink by 11.6%.

Figure 4.24: Sectoral trade effects for the EU in targeted and most affected sectors – scenarios for the ER in comparison



Note: Intra-EU displayed in dark colours and extra-EU in light colours.
Source: WIFO calculations based on the KITE model.

Figure 4.25: Sectoral trade effects for Austria in targeted and most affected sectors – scenarios for the ER in comparison



Source: WIFO calculations based on the KITE model.

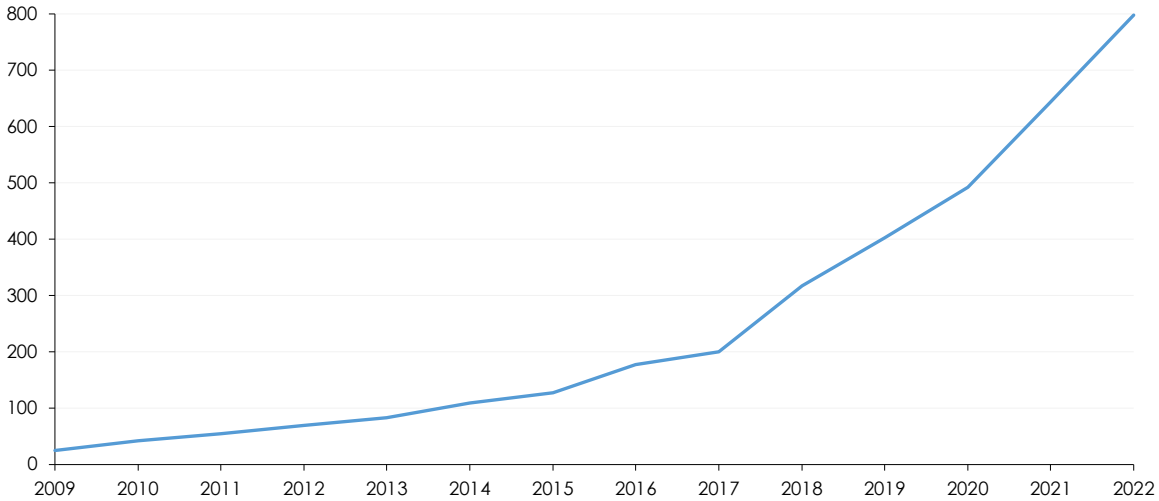
4.3 The International Procurement Instrument (IPI)

The International Procurement Instrument (IPI) serves as a mechanism for the EU to promote access to international procurement markets for EU companies while simultaneously limiting or excluding access to the EU market for companies, goods and services from countries that impose discriminatory measures against EU companies. Thus, instead of serving as a defensive measure, the IPI is designed as an offensive tool to ensure that EU companies have the same degree of market access in public procurement markets as the EU grants to other countries.

4.3.1 The historical context and implementation steps so far

According to OECD data, public procurement typically accounts for about 10% to 20% of GDP on average across countries [25]). This opens substantial trading opportunities, but countries have been very reluctant to open public procurement markets to international competition. Indeed, data from the GTA database (see chapter 4.1.3) indicates a significant increase in protectionist measures in public procurement over time (Figure 4.26).

Figure 4.26: Cumulative number of protectionist public procurement measures, 2009 – 2022



Source: Global Trade Alert Database, WIFO calculations.

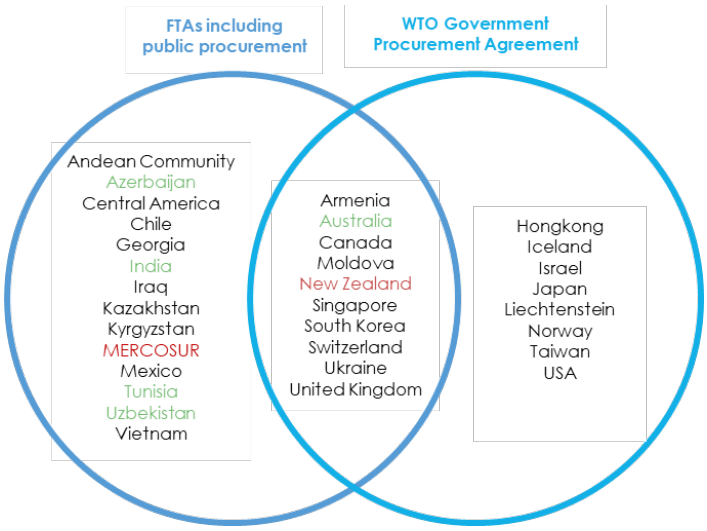
The EU has been advocating for increased openness in international public procurement markets and for reciprocal access for EU businesses both, through its participation in the Government Procurement Agreement (GPA) within the WTO, and bilaterally via free trade agreements (FTAs) including provisions on government procurement.

However, the IPI was born out of the moderate progress and success of both multilateral and bilateral efforts. The GPA has been signed by only 20 WTO members, including the EU, Canada, the United Kingdom, and the USA, but not China, India, Brazil or Russia. The EU has also been moderately successful in its bilateral free trade agreements. While the new and modern EU

[25]) https://www.oecd-ilibrary.org/sites/18dc0c2d-en/index.html?itemId=/content/component/18dc0c2d-en#sect-79.

trade agreements contain provisions on public procurement and aim to liberalise markets beyond the GPA, they are still characterised by many exceptions and limitations of scope. Out of the many EU free trade agreements, merely 24 include a chapter on public procurement (Dür et al., 2014 with a data update from 2022, Erixon et al., 2022). During EU-China negotiations on the Comprehensive Agreement on Investment (CAI), China specifically opposed the inclusion of public procurement[26]). Figure 4.27 provides an overview of the signatory countries to the GPA and countries with EU FTAs including provisions on public procurement. The most ambitious government procurement chapters among EU FTAs are to be found in the EU-UK Trade and Cooperation Agreement as well as in the EU-Japan FTA both going beyond the GPA and including more sectors (EPRS, 2022C)

Figure 4.27: Non-EU members of WTO-GPA and countries with FTAs including provisions on public procurement



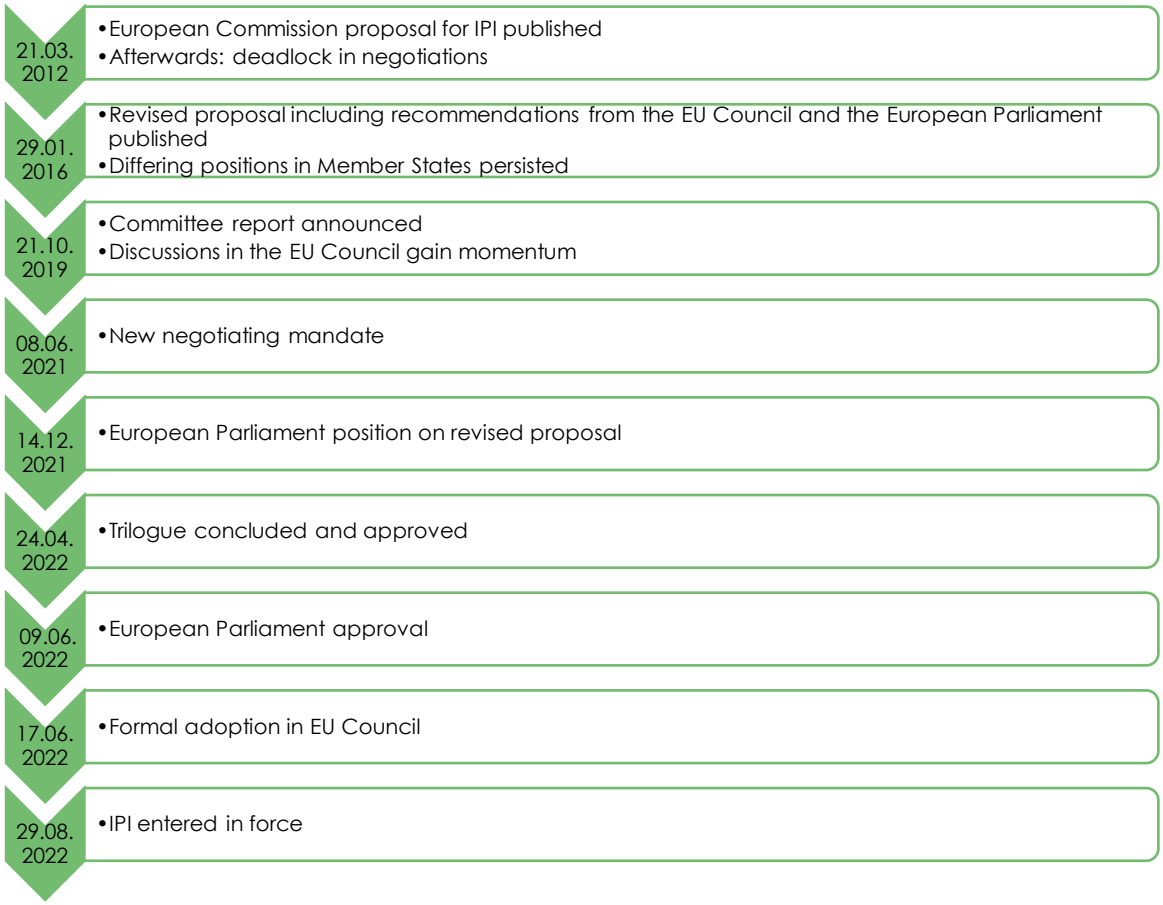
Note: Green – FTA under negotiation; red – FTA not in force.
Source: Erixon et al. (2022), WIFO presentation.

Efforts to implement the IPI look back at a ten-year history (Figure 4.28), beginning with an initial European Commission proposal in 2012. After numerous adaptations, and a standstill in discussions and legislative deadlock until around 2019, the instrument was adopted by the Council on June 17, 2022, and entered into force on August 29, 2022 (European Parliament and Council, 2022). During the process of IPI implementation many reservations were voiced by Member States. In addition to contentious issues regarding the exact procedure, discussions mainly focused on the potential cost-increasing effects resulting from reduced competition, which would be borne by public budgets, as well as possible retaliatory measures by affected countries. Many EU companies, including those in Austria, receive important public procurement

[26]) The agreement aimed to improve market access and competition conditions for European companies but is currently on hold due to current differences. See Felbermayr et al. (2022) for a detailed discussion.

contracts abroad and there is fear that retaliatory measures could ultimately result in additional obstacles rather than improved market access.

Figure 4.28: A timeline of implementation of the International Procurement Instrument (IPI)



Note: Dates as of October 24, 2023.
Source: EPRS (2022C), EP Legal Observatory (April 19, 2023, https://oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?reference=2012/0060(COD)&l=en), WIFO presentation.

The negotiations on the IPI gained momentum in 2019 and 2020 over concerns about European industry competitiveness and as part of the EU's attempt to tackle the increasingly challenging trading environment. The IPI was then viewed as a necessary and legitimate tool to promote EU business interests globally and an integral part of the EU's updated new industrial policy and review of its trade policy which adopted the concept of "open strategic autonomy" and recommended an "open, sustainable, and assertive trade policy" (European Commission, 2020; European Commission, 2021B).

4.3.2 The IPI in detail

The main objective of the IPI is to establish reciprocity. In this sense, the IPI is intended to give the EU additional leverage in negotiations with third countries for market access. The main features of the IPI can be summarised as follows:

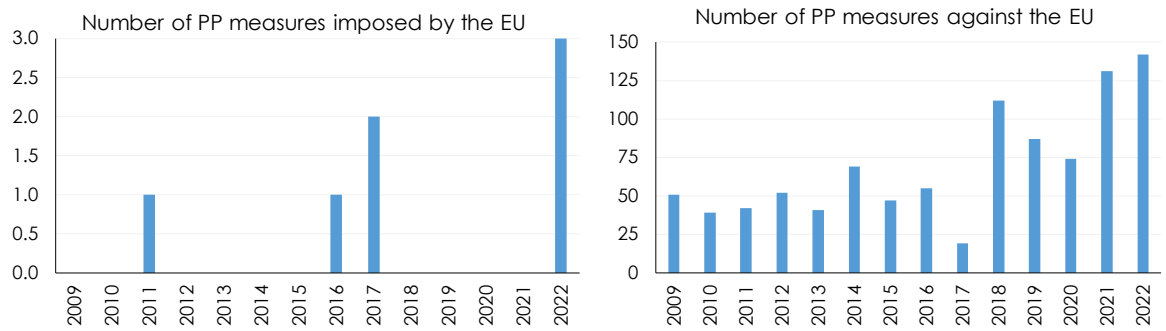
- *Scope:* The IPI will primarily apply to third countries that are not parties to the WTO GPA or do not have a FTA with the EU containing a public procurement chapter. This applies, for example, to China, India, or Brazil. However, GPA signatories, or countries with corresponding FTAs whose commitments in the areas of procurement do not correspond to those of the EU can also fall within the scope of the IPI.

  The threshold values for the procurement contracts above which the IPI applies have been set at a minimum of € 15 mn for infrastructure projects and € 5 mn for the procurement of goods and services. Exceptions are enforced with respect to bidders from the least developed countries (LDCs), which are covered by the Generalized System of Preferences (GSP+) or the "anything but arms" rule if more than 50% of the total value of the bid comes from that country. Further exceptions allowing contracting authorities not to use the IPI measures apply if (i) all bidders originate from the country on which the IPI measures are imposed or if (ii) there are overriding reasons of public interest, such as public health or the protection of the environment. In addition, the price adjustment measure would not be applicable in relation to European small and medium-sized enterprises (SMEs).
- *Procedure:* The European Commission is responsible for the process, which is designed to be multi-stage. If, in the first stage, the European Commission finds that there is an obstacle in the public procurement in a third country that corresponds to the application of the IPI, it will enter into negotiations with the affected third country to encourage it to open up its market. The deadline for investigation and consultation with the third country has been set at nine months, with the possibility of a five-month extension. If no agreement is reached, access for bidders from the third country to the EU market will be limited. The restriction will be in the form of either an adjustment of the evaluation of the bid in the award procedure (up to 50% adjustment of the overall score of the bid in case of the application of the MEAT - Most Economically Advantageous Tender principle - or up to 100% of the price in case of the application of the lowest price principle) or the general exclusion of bids from economic operators from the IPI targeted country. In any case the proportionality principle applies so that limitations in the access to EU procurement markets, should be proportionate to the third country barrier to governmental procurement.
- *Compliance with labour and environmental standards:* On the initiative of the EU Parliament, social, ecological, and labour law requirements must be taken into account in the evaluation of all procurement procedures covered by the IPI. Therefore, bidders must comply with EU rules in these areas. This is a novelty in international trade law. Previously, trade policy measures were based on the characteristics of the products ("hazardous goods"), not on the production processes ("goods produced under poor conditions abroad").

4.3.3 Detailed descriptive data analysis on potential impacts by sector and partner countries

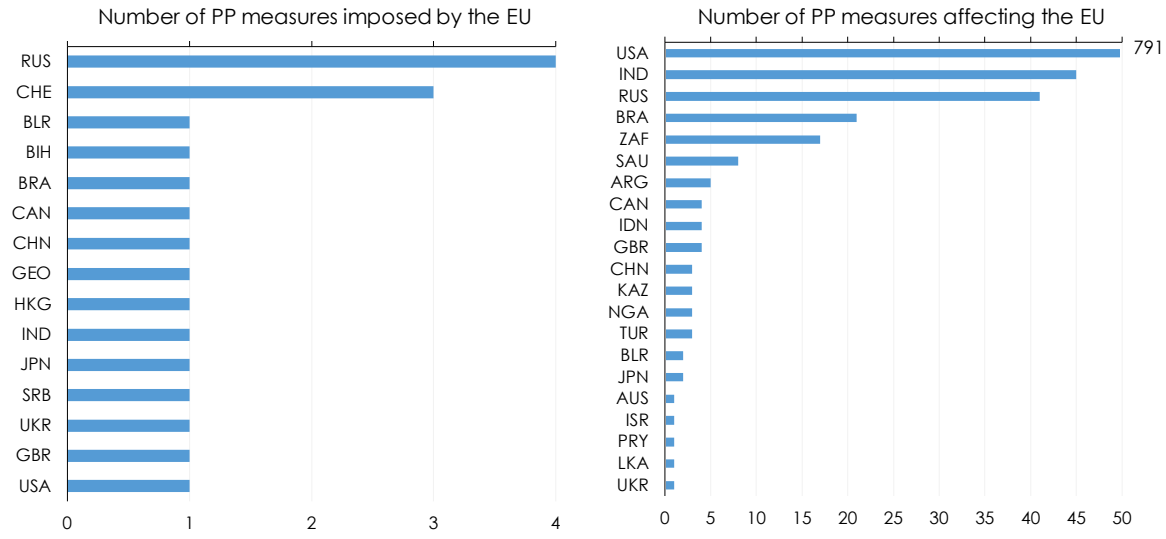
The main objective of the IPI is to achieve reciprocity in public procurement market access. In Figure 4.26 we see a tremendous increase in protectionist measures related to public procurement (PP) based on data from the GTA database. Figure 4.29 compares the number of discriminatory PP measures imposed by the EU with the number of PP measures restricting market access of EU firms to third markets over the period 2009 to 2022. So far, PP measures have not been an important trade policy tool for the EU. The GTA data lists only seven cases throughout the entire period. This contrast sharply with the EU's access to public procurement markets in extra-EU countries. In fact, over the same period, trading partners have taken more than 1,000 PP measures against the EU.

Figure 4.29: Protectionist public procurement measures per year imposed by the EU and against the EU, 2009 – 2022



Source: Global Trade Alert Database, WIFO calculations.

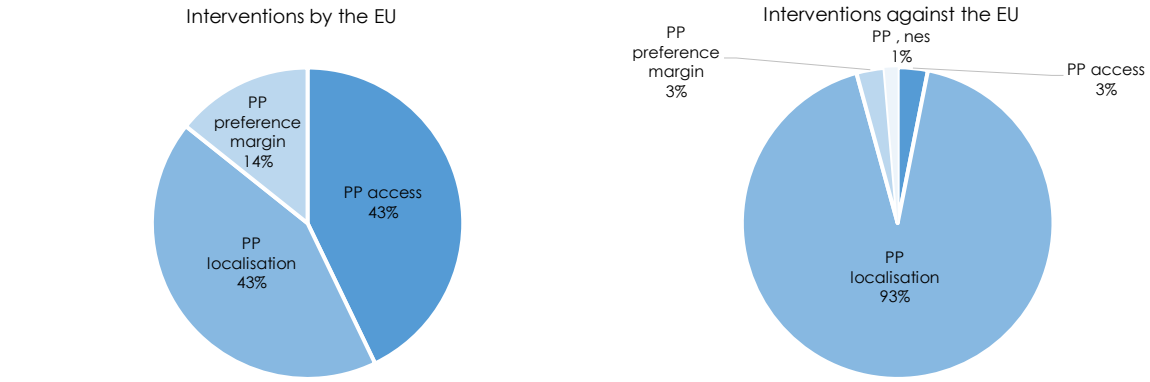
Figure 4.30: Number of protectionist public procurement measures imposed by the EU and against the EU by partner country, 2009 – 2022



Source: Global Trade Alert Database, WIFO calculations.

The USA account for over 80% of the restrictive measures in the public procurement market affecting EU Member States. India and Russia follow at a considerable distance. Russia and Switzerland, in turn, are most often affected by restrictions imposed by the EU (Figure 4.30).

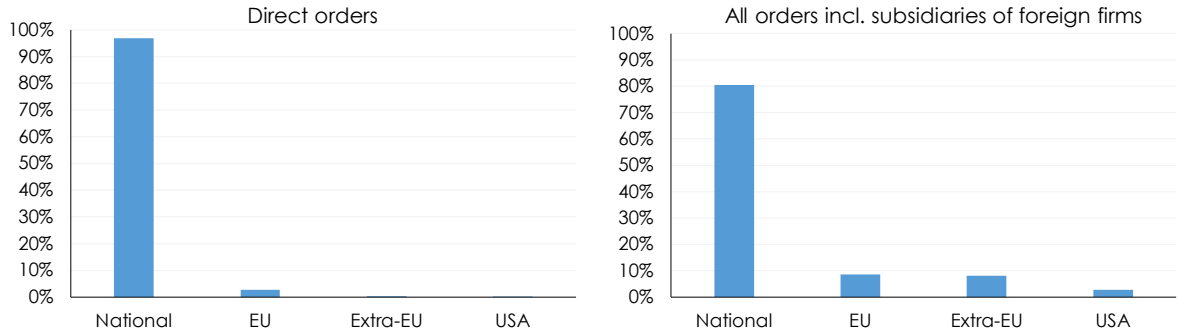
Figure 4.31: EU and external types of interventions in public procurement, 2009 – 2022



Source: Global Trade Alert Database, WIFO calculations.

In addition, there are notable differences in the type of PP measures imposed by EU and non-EU countries, as illustrated in Figure 4.31. The relatively small number of EU PP measures is evenly split between localisation measures and access restrictions, each accounting for 43%. The remaining interventions took the form of preference margins. Conversely, localisation measures were the most prevalent form of PP intervention against the EU. This is somewhat biased by the strong focus of US PP measures on local sourcing requirements, but the share of localisation measures would still reach about 70% if the USA were excluded.

Figure 4.32: EU public procurement awards over € 5 mn by country, 2006 – 2022



Source: TED, Amadeus, WIFO calculations.

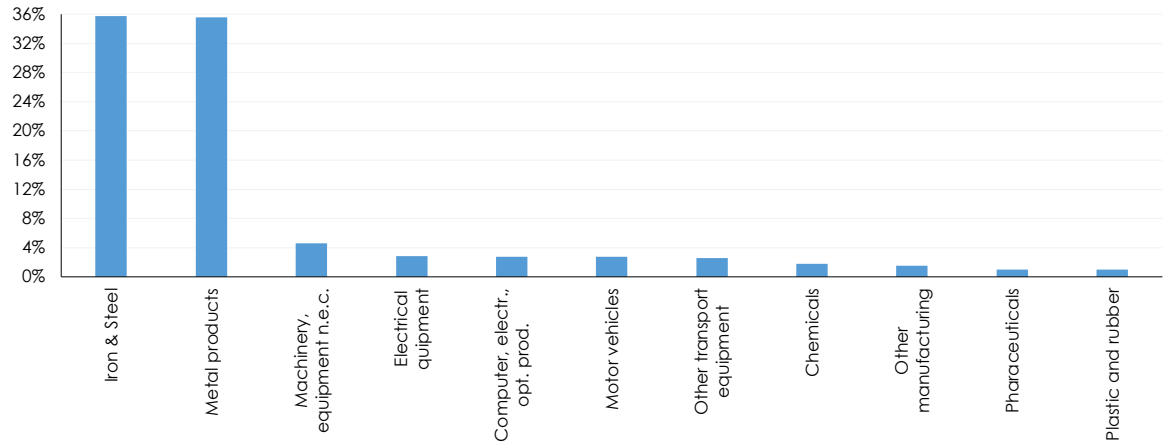
According to this assessment, the EU has relatively open public procurement markets. This is also evident in the more generous level of international commitments provided under the GPA. While some € 352 bn worth of EU public procurement is open to bidders from member countries of the GPA, other countries such as the USA or Japan offered € 178 bn and € 27 bn, respectively

(EPRS, 2022C)[27]). Moreover, during the Trump administration, the USA threatened to withdraw entirely from the GPA.

Although the PP is de jure relatively open to foreign bidders, the share of contracts awarded to foreign companies remains small, even in terms of cross-border orders within the EU Single Market. This is particularly true for larger procurement contracts above the IPI threshold of € 5 mn. According to data from the EU Tenders Electronic Daily (TED) database, a share of 96.9% of contracts is awarded to firms from within the same country, leaving a meagre 2.7% of goods and services to be procured from other EU countries and 0.5% from foreign firms in the extra-EU (Figure 4.32). Data from the TED reveals direct cross-border awards only. Using data from WIFO, which merges direct awards derived from the TED with data on company ownership from the Amadeus database, allows to take account of indirect awards won by subsidiaries of third countries. The results are presented in the right-hand panel of Figure 4.32. The share of national awards shrinks to 80.6% but remains high. The EU sources 8.6% from other EU Member States. The USA is the most important extra-EU market in EU public procurement accounting for a share of 2.7%, and other non-EU markets account for 8% of the total. China still plays a minor role (0.1%) in terms of the total EU PP market[28]). The high share of national procurement raises questions about the de facto openness of EU PP markets[29]).

Figure 4.33: Protectionist measures in public procurement contracts affecting EU Member States by sector, 2009 – 2022

Top ranked sectors



Source: Global Trade Alert Database, WIFO calculations.

In order to derive information on the sectors most often involved in public procurement, the analysis is based on two data sources. Figure 4.33 is based on GTA data and reveals the top-15 sectors with the highest shares of protectionist PP measures imposed on the EU by partner

[27]) Data from COM(2012) 124 final (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52012PC0124).

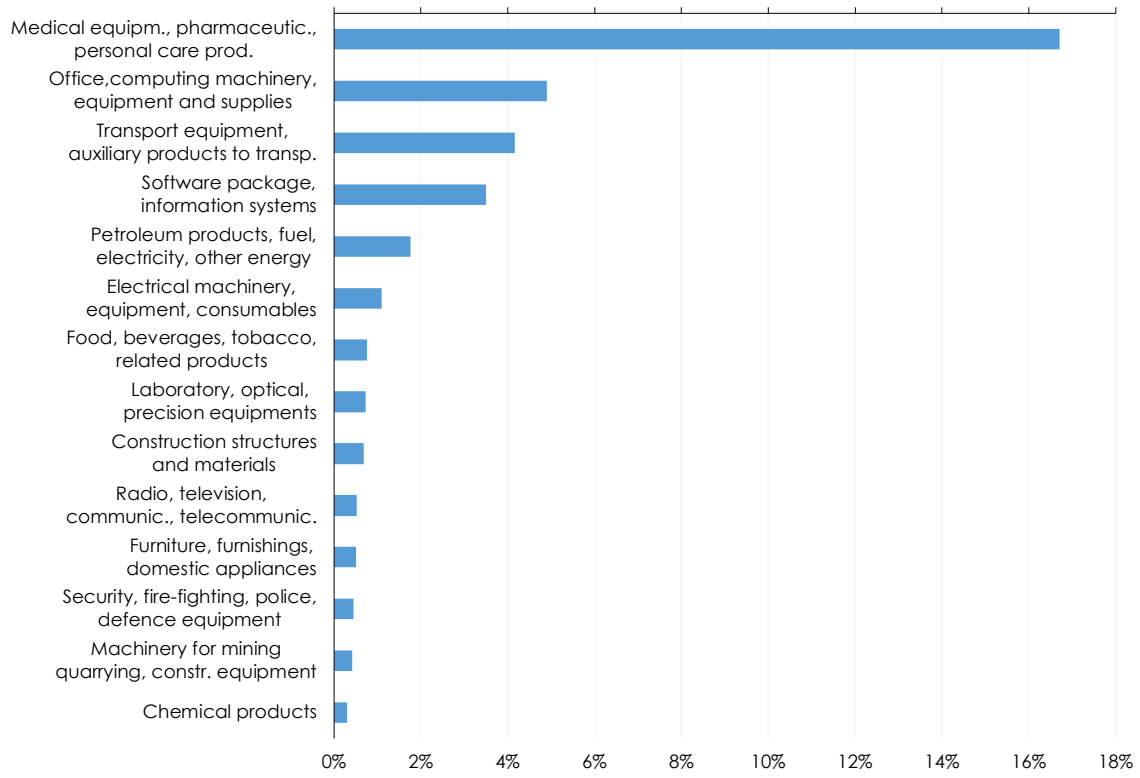
[28]) Note, however, that from the perspective of EU Member States Chinese involvement in public procurement may still be large.

[29]) See also Dawar (2017).

countries in. Iron and steel as well as metal products are most often affected. This results to a large extend from US local-sourcing requirements in the years 2021 and 2022. Other sectors most often affected are machinery and equipment, electrical equipment, computer, electronic and optical products, motor vehicles and transport equipment. Figure 4.34 is based on the EU TED data and reflects the (manufacturing) sectors most often included in public procurement contracts awarded to non-EU firms and exceeding the € 5 mn benchmark set by the IPI over the period 2009 to 2022. Unfortunately, the sector classification differs from all other data sources. Medical equipment and pharmaceuticals[30]) is the sector with the highest share. Other important sectors with a higher share of non-EU participation are office and computing machinery, transport equipment, software and information systems and energy.

Figure 4.34: Public procurement contracts over € 5 mn awarded to non-EU firms by sector, 2009 – 2022

Top ranked sectors



Note: The sectors refer to CVP codes.
Source: TED, Amadeus, WIFO calculations.

[30]) Data from 2009 to 2019 show the same ranking by sectors and the same outstanding position of medical goods. Therefore, the strong position of medical goods in EU public procurement to non-EU firms is not due to the COVID-19 crisis.

4.3.4 Quantifying the likely impact of the IPI – scenarios and empirical specification

As explained in chapter 4.1.4, the gravity model employed failed to identify trade elasticities associated with public procurement measures. This shortfall can be attributed to both data limitations and the non-discriminatory nature of most public procurement (PP) measures.

Data constraints primarily revolve around the poor quality of data on domestic trade flows in the ITPD-E trade dataset used, which is central for identifying the impact of non-discriminatory trade measures. These measures affect all trading partners equally but do not influence domestic trade, making their identification contingent on exploiting variances between international and domestic trade flows. Furthermore, trade flows related to government procurement represent only a tiny fraction of the overall bilateral trade flows within a sector. Unfortunately, no data directly representing PP-related trade flows are available[31]). Estimations including only the sectors most affected by PP measures, as identified in chapter 4.3.3, also did not yield meaningful results. For these reasons, the welfare and trade effects of the IPI could not be assessed.

[31]) The drawback posed by this issue is offset by the benefit of the ITPD-E's highly detailed data, which is essential for maintaining a sufficient level of variation in the trade barrier data obtained from the GTA. In contrast, all other databases like TiVA and WIOD, which also encompass domestic trade, have data that is overly aggregated for our specific needs. Attempting to estimate with a reduced dataset that includes only those trade flows involving countries and industries with available domestic trade information results in significant data loss, diminishing the sample size by more than half.

4.4 Level Playing Field in the EU-United Kingdom Trade and Cooperation Agreement (LPF)

The EU is one of the most open economies in the world, and its Member States are among the beneficiaries of globalisation. The EU attracts a high level of investment from its trading partners in third countries. However, foreign trade practices that distort the level playing field for EU companies are increasingly challenging this openness. The EU advocates for open international markets and has committed to granting market access to the European Single Market for specific goods and services to foreign companies. European companies often encounter difficulties in accessing non-EU markets due to protectionist or discriminatory measures maintained or introduced by some trading partners. EU companies may be adversely affected by subsidies granted to non-EU companies by their home governments since they are not yet subject to EU state aid control. As a response, the EU is taking several measures to ensure a level global playing field and increase market opportunities for European companies worldwide.

The Level Playing Field (LPF) provisions in the EU-United Kingdom Trade and Cooperation Agreement (TCA) 2021[32]) seek to safeguard open and fair competition between the EU and the United Kingdom in a manner conducive to sustainable development. The TCA is an extensive and ambitious economic partnership agreement between the EU and the United Kingdom, which includes the absence of tariffs and quotas for trade in all goods, comprehensive market access commitments, rules on investments, and a high level of openness for government procurement. The provisions of the LPF are designed to avoid distorting existing and emerging trade and investments in a sustainable manner. It includes principles on competition policy, subsidies, state-owned enterprises, taxation, labour and social standards, environment and climate, and other trade and sustainable development issues. The LPF provisions consist of a set of common rules and standards aimed at preserving the mutual benefits of the Single Market and the Customs Union while also respecting the sovereignty of both parties. These LPF provisions shall prevent the United Kingdom from using its regulatory freedom post-Brexit to lower standards while also enjoying market access to the EU granted by the TCA. The LPF provisions cover social, labour, environment standards and climate change, which are related to trade and sustainable development chapters in other recent EU trade agreements. The LPF provision in the TCA are, however, more ambitious in terms of non-trade objectives as well as competition policies.

4.4.1 The historical context and implementation steps so far

The TCA has been in force since January 2021. In contrast to other trade agreements, the TCA was established in a reverse process intended to terminate a previously open and liberal trade relationship, rather than creating a new open and liberal trade relationship that removes barriers to trade.

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[32]) Trade and Cooperation Agreement between the European Union and the European Atomic Energy Community, of the one part, and the United Kingdom of Great Britain and Northern Ireland, of the other part (signed December 24, 2020), O.J. (L) 149 (2021), https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2021.149.01.0010.01.ENG.

The LPF provisions were among the last provisions agreed upon in the TCA, which was finalised on December 24, 2020. The LPF chapter on subsidies and state aid was among the most conflict prone negotiation points during the negotiations from February 2020 till December 2020. Subsidies by EU Member States have always been subject to the strict EU state aid rules to avoid distortions of competition within the Single Market. State aid granted by non-EU governments to companies in the EU appears to have an increasingly negative impact on competition in the Single Market but do not fall under EU state aid control[33]). The inclusion of these regulations has the ability to limit the potential for deviations from EU regulations for the United Kingdom.

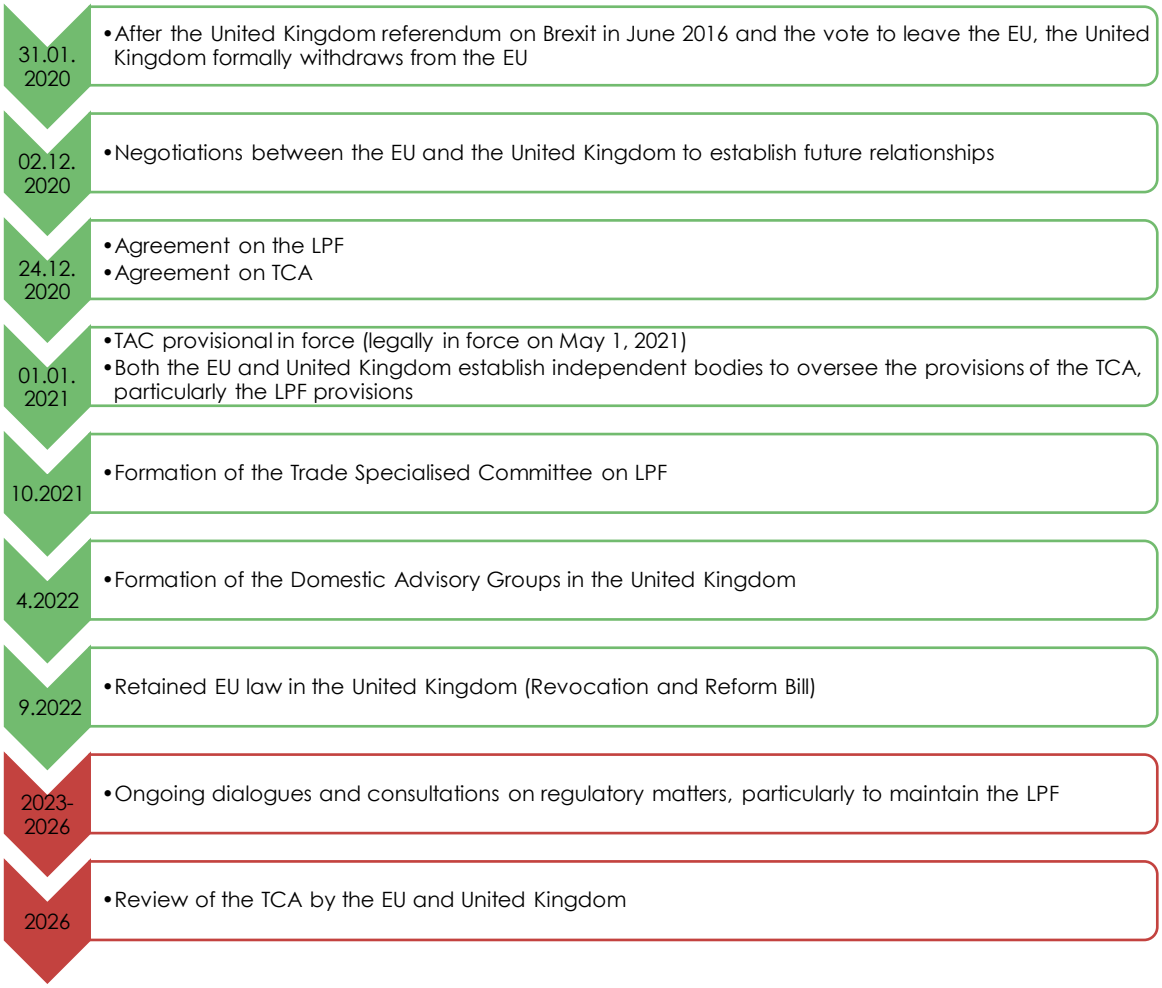
Both the EU and the United Kingdom have taken steps to establish the necessary institutions and procedures to enforce the LPF provisions and ensure their implementation. These measures include the establishment of independent bodies to oversee state aid and subsidies, as well as continuous dialogues and consultations on regulatory matters. To safeguard high standards, values and to protect consumer and employee rights, the LPF, and TCA more broadly, have imposed a specific monitoring role for civil society. Both the EU and United Kingdom governments are obligated to consult with Domestic Advisory Groups, comprising civil society representatives, on matters covered by the LPF and its implementation. These groups are tasked with consulting the Trade Specialised Committee on Level Playing Field on issues of compliance and violations of LPF commitments.

Additionally, the TCA includes a commitment for periodic evaluation and improvement of the implementation of the LPF. In 2026 the TCA provides for such a review, in particular the LPF provisions.

The commitments in the LPF might be compromised by the United Kingdom Government's Revocation and Reform Bill, which was published in September 2022. The bill aims to repeal or assimilate retained EU law in the United Kingdom and remove any EU law from the United Kingdom's K legal system by the end of 2023. This potentially leads to the erosion of employment and environmental standards derived from EU law in the United Kingdom. Labour market standards are especially under threat, as the United Kingdom has proposed regulations in summer and fall 2022 that limit trade union's rights and the rights of workers to strike (Ortino, 2022; Crawford, 2022). These new proposed regulations violate the employment standards committed to in the LPF contained in the TCA, as well as the international labour conventions on freedom of association and collective bargaining. In October 2022, following their first annual dialogue on the implementation of the TCA, the EU and United Kingdom Domestic Advisory Groups released a joint declaration urging the United Kingdom's government to adhere to the LPF commitments and to maintain high standards of workers' rights and decent jobs.

[33]) There is a growing number of cases where foreign subsidies appear to have facilitated the takeover of EU companies or distorted the investment decisions, market activity or pricing policies of their recipients, or distorted tendering in public procurement to the detriment of non-subsidised companies.

Figure 4.35: A timeline of implementation of the Level Playing Field in the EU-United Kingdom Trade and Cooperation Agreement (LPF)



Note: Dates as of October 24, 2023.
Source: WIFO presentation.

Moreover, the TCA has established a customs border between Northern Ireland and the rest of the United Kingdom, as Northern Ireland remains de facto in the Single Market. As a result, goods from other parts of the United Kingdom are subject to EU tariffs and Sanitary and Phytosanitary (SPS) controls when entering Northern Ireland. The LPF provisions within the TCA strive to ensure that the rights of citizens in Northern Ireland are not compromised in comparison to those in the Republic of Ireland. Nevertheless, the retained EU law act may undermine the United Kingdom's commitments in the Northern Ireland Protocol. The ongoing debate surrounding the Northern Ireland Protocol is an indication that further modifications to the bilateral relationship may be necessary in the future.

The LPF provisions in the EU-United Kingdom TCA represent a significant step by the EU in incorporating non-trade objectives into its trade agreements. The EU leans to a more active use of such LPF provisions to promote labour and environmental standards and safeguard fair competition. Although all new EU trade agreements include chapters on trade and sustainable

development[34]), the EU-United Kingdom TCA is the only one that includes provisions on trade remedies or sanctions in case of breaches of core violations of commitments on these provisions. Other countries, like the USA and Canada often include provisions in their free trade agreements allowing for sanctions or reduced benefits if a party breaches agreements on labour or environmental provisions. Despite this, only a handful of cases have been formally subject to dispute settlement (Velut et al., 2022).

In future and ongoing negotiations, the EU plans to include the use of trade sanctions for breaches of core violations in the trade and sustainability chapters (European Commission, 2022). However, conditioning trade access on compliance with environmental or labour standards and human rights can be trade-enhancing or trade-restricting, depending on the extent to which it leads to greater trade liberalisation or restricts access to the benefits of the EU market[35]).

4.4.2 The LPF in detail

The LPF provisions are designed to prevent distortions of trade and investment, today and in the future, in a sustainable manner. Title XI of the TCA on the LPF includes chapters on competition policy, subsidies, state-owned enterprises, taxation, labour and social standards, the environment and climate, and other trade and sustainable development instruments. Table 4.7 presents the respective provisions in detail.

Implementation and non-compliance with LPF provisions

In the EU-United Kingdom TCA, the Domestic Advisory Groups' involvement and the dispute settlement mechanism contribute to the transparency and efficacy of the LPF provisions. These provisions include mechanisms to address potential imbalances in trade and investment resulting from significant divergence in standards and regulations in the future. If, in the future, the level of standards and regulations diverges significantly and has a significant negative impact on trade and investment, the LPF provisions grant both sides the right to redress the imbalance in trade and investments by imposing tariffs or duties. The emphasis of the rebalancing mechanism is to address potential divergence due to one party not keeping pace with its own regulations, thus leading to a trade and investment advantage. This rebalancing mechanism aims to ensure, that the United Kingdom aligns with the EU in terms of environmental and labour standards, among other things (Lydgate et al., 2021). Additionally, a dispute settlement mechanism is provided to resolve any disputes between the EU and the United Kingdom, enhancing

34) Although recent EU free trade agreements, e.g. with Japan, Singapore, Vietnam, South Korea or Canada include commitments to comply with environmental and labour agreements, these sustainability commitments are not subject to enforceable dispute settlement. For example, in 2021, the EU complained that South Korea violated the labour standards agreed in the trade agreement and initiated an expert panel to report on this dispute and provided assistance in removing the breach. However, ultimately there are no sanctions for non-compliance in the trade agreements so far.

35) If the goal is to use conditionality to protect parts of the EU market from foreign competition, rather than to ensure a level playing field for domestic producers, then the EU's efforts are likely to be in vain, to the detriment of both its trade and sustainability agendas. Therefore, it is essential that the EU balances its goals of promoting trade liberalisation and ensuring a level playing field with its commitments to labour, environmental, and human rights standards.

the possibility of legal protection for social and environmental measures even in the presence of differences between the two parties.

If there is evidence that a subsidy severely negatively impacts trade and investment between the two parties, the harmed party may impose proportionate remedial measures, such as tariffs or duties, to address the negative impact. If the remedial measures are disproportionate, the dispute settlement procedure in the TCA can be invoked.

Any violation of labour and social standards as well as environmental and climate standards may lead to remedial measures in the form of temporary countermeasures taken only after consultation. If consultations fail, a panel of experts named by the Trade and Specialised Committee will review the case.

Table 4.7: The LPF provisions in detail

Chapter	Detail
Competition (Chapter 2)	The provision on competition policy is similar to provisions in other EU trade agreements with advanced countries, e.g. with Japan. One key commitment in the competition chapter is the prevention of collusion and anti-competitive practices.
Subsidies (Chapter 3)	The provisions relating to state regulation and public subsidies aim to ensure that subsidies granted by either party do not distort trade and investments between the United Kingdom and the EU. The LPF defines subsidies as financial assistance in form of direct funds, loans or guarantees, grants, foregone revenues, and the provision or purchases of goods and services that could provide an economic advantage to an economic actor. State aid provided to compensate for damages caused by exceptional non-economic events such as the COVID-19 pandemic, temporary assistance to emergencies, and subsidies to consumers are exempt from the LPF. Although many of the principles and definitions in the subsidies provisions are similar to those in the EU state aid system, the LPF provisions are weaker than the EU state aid system. Unlike the EU state aid regime, there is no ex-ante notification process for new subsidies in the United Kingdom. However, transparency and publication of any subsidy are required, as is the provision of any relevant information from either side. Enforcement of the subsidy control requires each side to maintain an independent authority that rules over subsidy cases according to domestic law. Either side can seek information and consultations related to the subsidy in question.
State-owned enterprises (Chapter 4)	State-owned enterprises shall operate under similar conditions as private companies in terms of transparency and competition, following OECD guidance and WTO provisions.
Taxation (Chapter 5)	The EU and the United Kingdom have to comply with international standards on tax transparency and exchange of information, such as the OECD's Base Erosion and Profit Shifting Initiative. This shall prevent tax evasion, tax avoidance and aggressive tax planning.
Labour and social standards (Chapter 6)	The EU and the United Kingdom have committed to adhere a high level of labour and social standards. Both parties have to enforce and monitor the International Labour Organization's fundamental principles and rights at work, such as the right to collective bargain, decent work, a safe and healthy work environment. Any changes in labour and social standards should not lower the respective standards or provide an unfair competitive advantage to either party (non-regression).
Environment and climate (Chapter 7)	Both parties have agreed to maintain their overall commitment to a high level of environmental standards and climate protection (non-regression). The EU and the United Kingdom committed to enforce and monitor measures to, among others, reduce emissions, conserve nature and biodiversity, manage waste, manage antibiotics in the food production and protect against harmful chemicals.

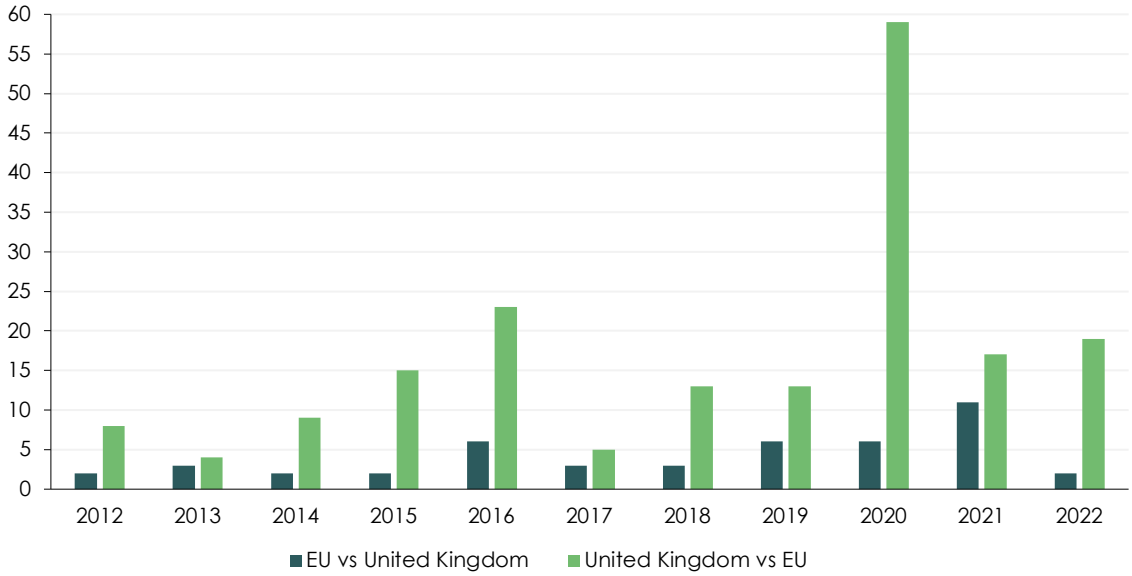
Source: EU-United Kingdom TCA, WIFO presentation.

4.4.3 Detailed descriptive data analysis on potential impacts by sector and partner countries and results from the literature

Empirical studies analyse predominantly the macroeconomic effects of the TCA in general. They find that the United Kingdom is likely to bear the highest macroeconomic losses in the medium term, while the EU will remain largely unaffected. The greatest effects will occur in the

EU's bilateral trade with the United Kingdom. According to calculations by Arriola et al. (2020) based on the OECD's equilibrium model, the United Kingdom's real GDP is likely to fall by around 3.5% due to the new trade regime after Brexit. Springford (2022) compares the development of the United Kingdom's real GDP with a "United Kingdom double" – constructed from a group of countries with very similar economic performance in terms of GDP, investment, trade in services and trade in goods before Brexit – and concludes that the United Kingdom's GDP in the last quarter of 2021 was 5.2% lower than in the "United Kingdom double without Brexit". Trade in goods and services with the EU is likely to have been negatively affected by around 7.8% on the import side and 6.1% on the export side, according to Arriola et al. (2020). Springford's (2022) "double-double modelling" comes to a loss of bilateral goods exports of the United Kingdom to the EU of around 14% but an increase in services trade of around 8%.

Figure 4.36: Newly implemented harmful subsidies and state aid cases by year



Source: Global Trade Alert Database, WIFO calculations.

Assessing the individual provisions of the LPF is difficult since not many regulatory changes have occurred since the TCA, including the LPF, entered into force. Many rules and standards in the United Kingdom match the standards and rules set by the EU, given the United Kingdom's previous membership in the EU.

Using the comprehensive information from the GTA database (see chapter 3.2 for details of the GTA database), we have a detailed look at state aid and subsidies, which was one of the most contentious aspects in the negotiation of the LPF in the TCA. Subsidies and state aid are typically among the most frequently implemented non-tariff trade barriers. State aid and subsidies as measured by the GTA include bailout, foreign market financial assistance, financial grant, in-kind grant, interest payment subsidy, production subsidy, state loan, tax or social insurance relief, and state aid not otherwise specified (see Table A4 in the Appendix). In this study, we focus only on subsidies and state aid that may not comply with the specification

outlined by the LPF chapter on subsidies (see chapter 4.4.2). Specifically, we focus only on interventions that certainly discriminate against the foreign commercial interests of the respective partner and are not emergency relief, such as those designed to combat the COVID-19 pandemic or immediate reactions to the Russian war in Ukraine[36]). Figure 4.36 depicts the evolution of subsidies and state aid of the United Kingdom harming at least one EU country and the evolution of EU subsidies and state aid that harms the United Kingdom. Even when the United Kingdom was still an EU member, we observe non-tariff measures in the form of state aid and subsidies between the parties harming each other. While the United Kingdom uses predominantly state loans and financial grants, the measures implemented by EU countries harming the United Kingdom are mainly loan guarantees and financial grants. Although LPF provisions on subsidies are consistent with many of the EU state aid principles, they are weaker than the EU state aid rules. The greater freedom to grant state aid and subsidies can be seen by the strong increase in the number of subsidies implemented since 2021.

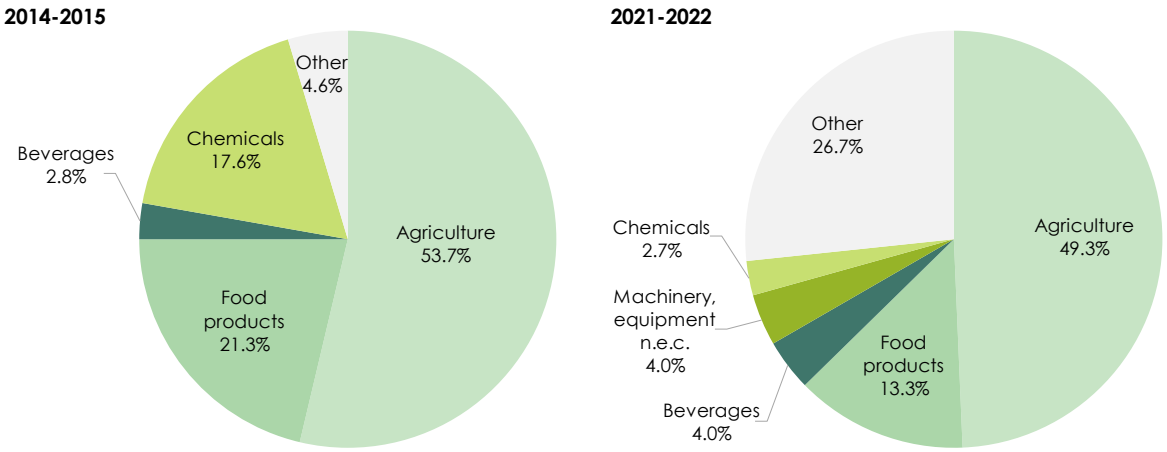
Governments often employ subsidies to support their industrial strategies, which typically identify sectors in need of investment and support to reach their full potential. Figure 4.37 shows the sectors to which the respective subsidies and state aid apply in the EU and United Kingdom, which harm the respective other party, pre- and post-Brexit in comparison. Prior to the Brexit referendum, the United Kingdom was still required to comply fully with EU regulations, and with the LPF provision in place.

While the majority of EU state aid and subsidies harming the United Kingdom is assisting EU agriculture and food production, the United Kingdom, pre-Brexit, did not target specific sectors but rather distributed its state aid and subsidies across many sectors. However, most part of the United Kingdom's state aid and subsidies in 2021 and 2022 is now more aligned with the current industrial strategy of the United Kingdom, focusing on the automotive and transport industry, computer and electrical equipment, as well as chemicals. As a result, the grants are partly targeted towards highly integrated sectors between the EU and United Kingdom, such as the manufacturing of machinery, automotive, minerals, and raw materials. It is important to note that the United Kingdom is no longer part of the EU Registration, Evaluation, Authorization and Restriction of Chemical Regulation (REACH) system, which records the production, use, and impact of chemicals and their substances. As a result, the United Kingdom needs to establish its own standard system in the chemical industry. The shift in state aid and subsidies across sectors by the United Kingdom is aligned with observable shifts in trade in these sectors, as can be seen in Table 4.8.

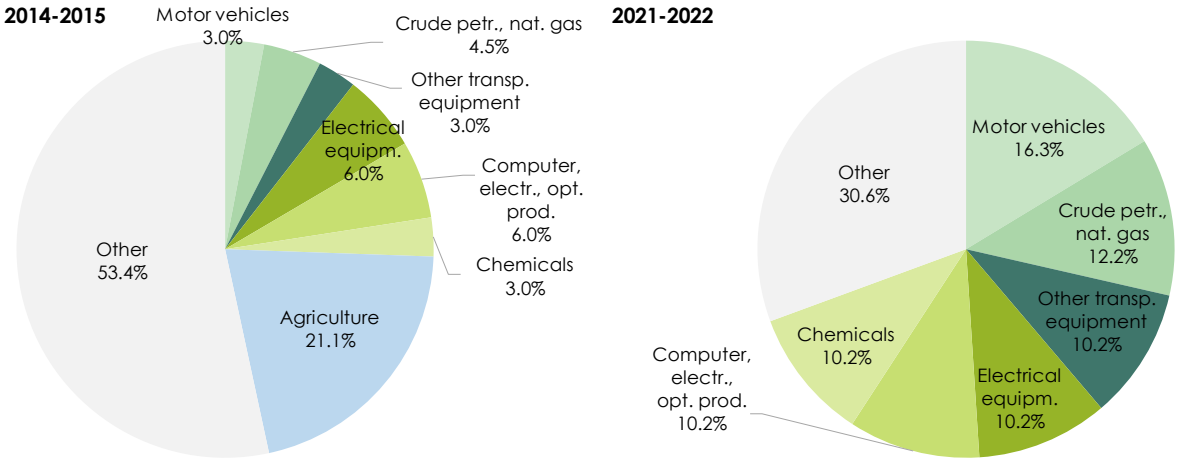
[36]) The evaluation of the discrimination of foreign commercial interest of trading partners is contained in the GTA database. To exclude subsidies and state aid that are primarily targeted to better cope with emergency economic situations, we use regular expressions to exclude subsidies and state aid related to COVID-19 ("covid", "cov19", "lock down", etc.) and the Russian war in Ukraine ("russia", "energy prices", etc.).

Figure 4.37: Sectoral distribution of subsidies and state aid of the EU and the United Kingdom harming each other – pre-Brexit and post-Brexit in comparison

EU vs United Kingdom



United Kingdom vs EU



Source: Global Trade Alert Database, WIFO calculations.

Compared to 2014/2015, the United Kingdom share in extra-EU trade has declined in total by around 4 percentage points. Sectors like the automotive industry, that is currently subsidised in the United Kingdom, experienced a strong decline in EU exports from 2014/2015 to 2021/2022, as shown in Table 4.8. With the help of subsidies, the United Kingdom aims to assist its automotive industry to master the transition from the traditional combustion engines to renewable energies and the mobility of the future.

Table 4.8: Foreign trade relations between the EU and the United Kingdom

	∅ 2014/15	∅ 2021/22	2021/22	∅ 2014/15	∅ 2021/22	∅ 2014/15	∅ 2021/22	2021/22
	bn €		%-change against 2014/15	Percentage shares in total exports/imports		Percentage shares in extra-EU exports/imports		%-point change against 2014/15
Imports of the United Kingdom								
Agriculture	6.2	7.9	26.9	2.0	2.6	20.6	17.7	-2.9
Crude petroleum, natural gas	0.8	0.3	-58.7	0.3	0.1	26.8	12.5	-14.2
Food products	25.9	30.0	15.8	8.5	9.8	28.4	20.4	-8.0
Beverages	4.9	6.2	26.3	1.6	2.0	18.4	13.0	-5.4
Chemicals	23.2	28.7	23.6	7.7	9.4	15.3	10.4	-4.9
Computer, electr., opt. prod.	27.6	23.0	-16.6	9.1	7.5	19.5	15.1	-4.4
Electrical equipment	11.6	13.4	16.0	3.8	4.4	12.5	10.6	-1.9
Machinery, equipment nec	23.0	27.1	17.6	7.6	8.8	9.3	8.3	-1.0
Motor vehicles	56.5	41.8	-26.0	18.6	13.6	24.2	25.7	1.5
Other transport equipment	8.0	11.3	41.1	2.6	3.7	8.0	10.9	3.0
Total	303.6	306.2	0.9	100.0	100.0	16.5	13.3	-3.2
Exports of the United Kingdom								
Agriculture	1.8	1.4	-20.8	1.0	0.8	4.3	3.4	-0.9
Crude petroleum, natural gas	13.2	27.9	111.5	7.2	15.2	5.2	2.3	-2.9
Food products	10.0	8.9	-10.9	5.5	4.9	14.1	11.3	-2.8
Beverages	2.8	3.0	7.4	1.5	1.7	43.7	37.7	-6.0
Chemicals	19.8	21.1	6.5	10.8	11.5	18.0	9.7	-8.3
Computer, electr., opt. prod.	15.3	8.3	-45.9	8.4	4.5	7.3	5.2	-2.2
Electrical equipment	5.7	4.8	-15.7	3.1	2.6	8.1	4.3	-3.9
Machinery, equipment nec	12.9	13.5	4.7	7.0	7.4	13.2	8.9	-4.4
Motor vehicles	20.0	14.1	-29.7	10.9	7.7	26.8	20.4	-6.4
Other transport equipment	7.1	9.6	34.5	3.9	5.3	11.8	7.9	-3.8
Total	183.3	182.7	-0.3	100.0	100.0	11.2	7.0	-4.2

Source: Eurostat.

4.4.4 Quantifying the likely impact of the LPF – scenarios and empirical specification

Since the United Kingdom was part of the EU, many rules and standards match the standards and rules set by the EU. Thus, there is a low probability of a dramatic divergence between the two regions. The analysis of the impact of the LPF focuses on state aid and subsidies, one of the most likely areas of divergence between EU and United Kingdom regulations. Other areas for potential divergence are enforceable labour standards and carbon pricing rules (for a discussion of the impact of carbon pricing and labour standards see chapter 0 and chapter 4.5). The analysis on the evolution of subsidies and state aid in the EU and the United Kingdom in chapter 4.4.3 forms the basis for the LPF scenarios to be simulated.

To quantify the impact of subsidies and state aid as part of the LPF we proceed in two steps. In a first step, we estimate the trade effect of subsidies and state aid that harm the respective trading partner. Using the structural gravity model, as outlined in chapter 3.1, we can identify the impact of state aid as non-trade barrier on cross-border trade. The estimated trade effect will then be employed in the KITE model to simulate the effects in three different scenarios: a scenario of the LPF in its current status quo and scenarios involving no divergence and a strong divergence from the LPF.

Based on the empirical specification outlined in chapter 3.1, we estimate the following equation:

$$X_{ijkt} = \exp\left(\sum_{l=1}^{n} \alpha_{1,l} B_{ij} t_l + \sum_{l=1}^{n} \alpha_{2,l} B_{ij} log(dist_{ij}) t_l + \alpha_3 B_{ij} \text{PTA}_{ijkt-1} + \alpha_4 B_{ij} \text{LPF\_in}_{ijkt-1} + \alpha_5 B_{ij} \text{LPF\_out}_{ijkt-1} + \beta_{ikt} + \gamma_{jkt} + \mu_{ijk}\right) + \eta_{ijkt} \quad (4.2)$$

All variables are as defined in chapter 3.1. The bilateral trade measure, i.e. the BTB_{ijkt-1} term in Equation (3.2) in chapter 3.1, is split into three covariates in Equation (4.2). First, we include an indicator for preferential trade agreements (PTA_{ijkt-1}) in force. Further, to identify the impact of the LPF, we consider subsidies and state aid, which have the potential to harm trading partner countries and are no emergency relief. In order to simulate the impact of subsidies and state aid in the KITE model, subsidies and state aid, which are granted by one country and are unilateral in nature, need to be transformed to a bilateral trade measure. Since most subsidies and state aid measures discriminate across trading partners, the affected jurisdictions as measured by the GTA database are a natural way of identifying the harmed trading partners. Furthermore, the identification of the harmed trading partner of granted subsidies and state aid allows us to differentiate between inward directed subsidies and state aid, designed to protect the domestic market and harm imports, and outward directed subsidies and state aid, that are often designed to increase exports. Thus, as a second and third covariate in Equation (4.2), we consider the impact of inward directed state aid for each affected product k implemented by country i likely discriminating country j at time t-1 (LPF_in_{ijkt-1}) and the impact of outward directed state aid for each affected product k implemented by country i likely discriminating country j at time t-1 (LPF_out_{ijkt-1}).

Table 4.9: Gravity model estimation results - LPF

	(1) PPMLHDFE
Preferential Trade Agreements (PTAs)	0.1006*** (0.0145)
Inward directed subsidies and state aid	-0.0019*** (0.0003)
Outward directed subsidies and state aid	0.0020** (0.0009)
Constant	8.2025***

Note: The gravity models are estimated using the "ppmlhdfe" package of the STATA econometrics software (Correia et al., 2020). Robust standard errors clustered by country-product pairs in parentheses. *, ** and *** indicate statistical significance at the 10%-, 5%- and 1%-level, respectively. Control variables include according to Equation (3.2) distance-border effects, a time trend, exporter-product fixed effects, importer-product fixed effects as well as exporter-importer-product fixed effects.
Source: WIFO calculations.

To identify the impact of subsidies and state aid, we consider the number of the subsidies and state aid measures implemented. We include only types of subsidies and state aid into our analysis that are used by either the United Kingdom or the EU, i.e. we include bailouts, foreign market financial assistance, financial grants, in-kind grants, interest payment subsidies, production subsidies, state loans, tax or social insurance reliefs, trade finance, and state aid not

otherwise specified. The trade policy measures considered in Equation (4.2), i.e. PTA and the LPF_in and LPF_out, enter the model with a lag of one year to capture lagged effects of trade flow in reaction to newly implemented policy measures.

Estimation results for the key variables are reported in Table 4.9. The control variables are as expected. A PTA has a positive significant impact on bilateral trade. Turning to our variables of interest, the estimates show that an additional outward directed subsidy and state aid increases bilateral trade by 0.002%, while an additional inward directed subsidy and state aid decreases bilateral trade by 0.002%.

The overall impact of state aid and subsidies is the joint effect of the estimated impact of the inward and outward directed subsidy and state aid. Thus, the composition of inward and outward directed subsidies and state aid determines the overall impact on bilateral trade. Table 4.10 presents the estimated overall average effect of subsidies and state aid on bilateral trade for the United Kingdom, the EU and Austria. Given the number of measures of inward and outward directed subsidy and state aid measures applied in 2021/2022, the overall impact of subsidies and state aid on bilateral trade is on average positive for the United Kingdom, while the overall impact of subsidies and state aid is on average negative for the EU Member States, which apply mainly inward directed measures. The pre-Brexit average effects of subsidies and state aid (+0.0008% for the United Kingdom and -0.0001% for the EU) This hints at a slight divergence in the LPF between the two partners since 2014/2015.

Table 4.10: Average overall effect of subsidies and state aid post- and pre-Brexit for the United Kingdom, Austria and the EU

	2021/22			2014/15		
	%-change	Average number of		%-change	Average number of	
		inward measures	outward measures		inward measures	outward measures
United Kingdom	0.0020	0.5890	1.5783	0.0008	0.1001	0.5010
Austria	-0.0035	1.9090	0.0240	-0.0001	0.0719	0.0007
EU	-0.0024	1.5023	0.2123	-0.0001	0.0543	0.0055

Note: The average total impact of the overall effect of subsidies and state aid on bilateral trade flows is calculated across all industries and across all trading partners for the United Kingdom, Austria and the EU.
Source: WIFO calculations.

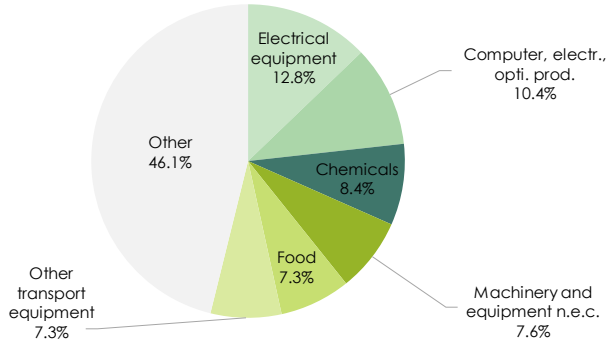
To shed more light on the economic impact of the LPF and the granted subsidies and state aid measures, the estimates from the structural gravity model are employed in the KITE model. Three different scenarios are simulated and inform on the risks of divergence from the LPF provisions between the EU and the United Kingdom. Since the KITE model is based on trade relationships and economic structures, including input and output relations, from 2014, the impact of the LPF with respect to changes in subsidies and state aid can be identified, isolated from Brexit-induced behavioural changes connected to uncertainty, as well as changes in trade patterns

The baseline scenario depicts the **status quo of the implementation of the LPF**. It assumes that both parties comply with the provisions in the LPF and benefit from the TCA. We measure the status quo of the trade relationships between the EU and the United Kingdom with the subsidies and state aid in place since the TCA is in force, i.e. we use the number of inward and outward

subsidies and state aid measures that were in place in 2021 and 2022 for both the EU and the United Kingdom in each sector (see chapter 4.4.3). We do not take into account any other subsidies and state aid measures in place in any other country.

In addition, we consider a success scenario that describes a situation of **no divergence** in regulations and standards between the EU and the United Kingdom. Thus, we consider the EU's and the United Kingdom's level of inward and outward subsidies and state aid prior to the Brexit referendum for each sector from 2014 to 2015 as outlined in chapter 4.4.3.

Figure 4.38: Sectoral distribution of subsidies and state aid of the USA in 2021/2022 discriminating against other countries



Source: Global Trade Alert Database, WIFO calculations.

Finally, an escalation scenario assumes strong **divergence** between EU's and United Kingdom's standards and regulations. We model a potential divergence in EU's and United Kingdom's regulations in state aid and subsidies leading to a distortion to bilateral trade flows. Such a divergence could e.g. occur if the United Kingdom's government decides to implement similar policies to address the current energy crises as the US government. The Inflation Reduction Act, that was signed by the US government in August 2022, offers around $ 370 bn of funding for climate efforts for a wide range of sectors over the next ten years. The Act aims to enhance the US economic competitiveness, innovation, and industrial productivity, particularly in renewable energy. The majority of the funds will be granted in form of tax incentives (for consumers and corporations), grants, and loans (The White House, 2022). For the escalation scenario, we assume that as a non-member of the EU, the United Kingdom invokes similar measures to cope with the current energy and inflation crises. Thus, we assume that the United Kingdom implements subsidies and state aid in sectors in which the USA grant subsidies and state aid to the harm of EU countries. A total of 297 newly implemented subsidies and state aid measures discriminating against other countries, are recorded for the USA in the years 2021 and 2022. Figure 4.38 shows that these US funds are widely dispersed among various manufacturing industries. This resembles the sectoral distribution of the United Kingdom's state aid and subsidies imposed in 2021 and 2022, but on a much larger scale.

4.4.5 Welfare and trade effects of the LPF

This chapter provides a comprehensive analysis of the welfare and trade consequences arising from compliance and non-compliance to the LPF provisions within the EU-UK TCA across three distinct scenarios simulated with the KITE model: (1) the **status quo** implementation of subsidies and state aid; (2) the scenario of **no divergence** between the United Kingdom and the EU in LPF compliance; and (3) a scenario marked by **significant divergence** in subsidies and state aid between the two parties, as measured by LPF principles. First, we discuss the welfare effects and then we look at the trade effects of the three scenarios.

The welfare effects of the LPF are defined by changes in real income resulting from the three different scenarios relative to the model baseline. Figure 4.39 shows the percentage changes in welfare for the EU, Austria, the USA, China, the United Kingdom and Ireland for the three different scenarios. Our estimates for the **status quo scenario** indicate that the LPF, as implemented in 2021/2022 after the TCA was in place, has a relatively modest effect on welfare. In general, while subsidies and state aid might increase the competitiveness of selected domestic sectors, the cost of the subsidies and state aid might outweigh the benefits. The level of subsidies and state aid for the United Kingdom and the EU implies a negative welfare effect for the EU (-0.0018%[37])), but also for the United Kingdom (-0.0014%[38])). The largest welfare loss of 0.0076% can be observed for Ireland. Ireland's economy is tightly interlinked with the economy of the United Kingdom, even after the United Kingdom left the EU. Thus, in terms of welfare, even a small regulatory divergence between the EU and the United Kingdom can harm closely linked trading partners. Austria is one of the few countries that experiences an increases in its welfare with regard to LPF implementation as of 2021/2022. Austria's gain in welfare by 0.0006%[39]) in the status quo scenario can be attributed to an increase in domestic production, particularly in the oil and gas sector. In Austria, the implemented inward directed subsidies and state aid by the United Kingdom and the EU Member States in 2021 and 2022 managed to increase domestic production by 0.3%, which offset parts of the negative distortions in trade.

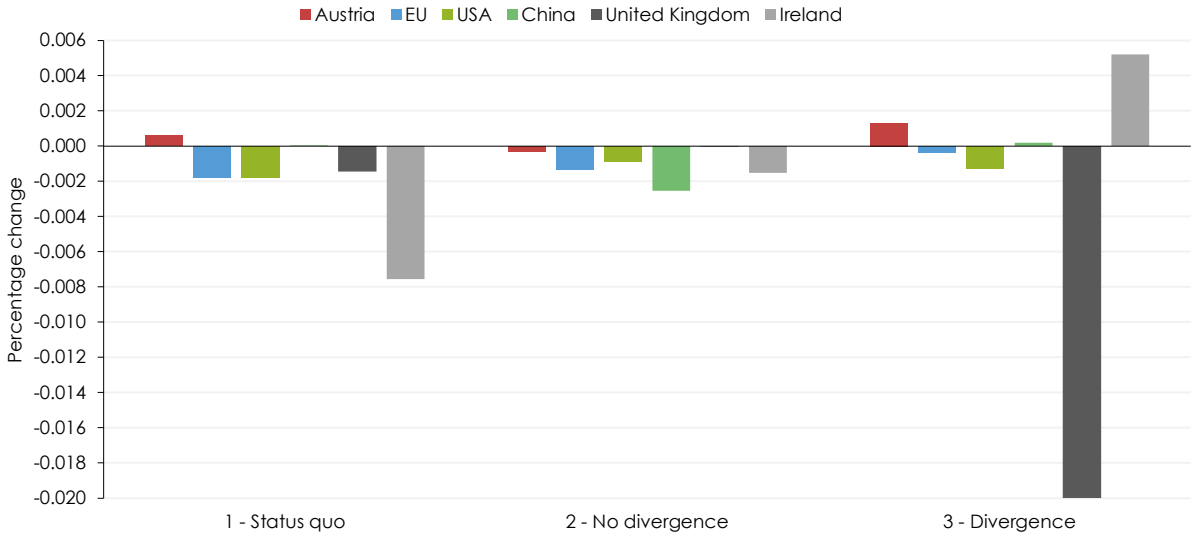
Simulations of the **no divergence scenario** suggest that the strict pre-Brexit subsidies and state aid regulations of the EU provide a fair level playing field for competition for the EU Members. When the United Kingdom was still a member of the EU, the provided subsidies and state aid had a negligible impact on the welfare of both the EU countries and the United Kingdom.

[37]) Measured in absolute terms, real GDP is estimated to decline by $ 267.9 mn in the EU.

[38]) The absolute real GDP of the United Kingdom is estimated to decline by $ 45.3 mn.

[39]) This corresponds to a change in absolute real GDP by $ 2.6 mn for Austria.

Figure 4.39: Welfare effects for Austria, the EU and selected countries – scenarios for the LPF in comparison



Note: Welfare is measured by the change in real GDP.
Source: WIFO calculations based on the KITE model.

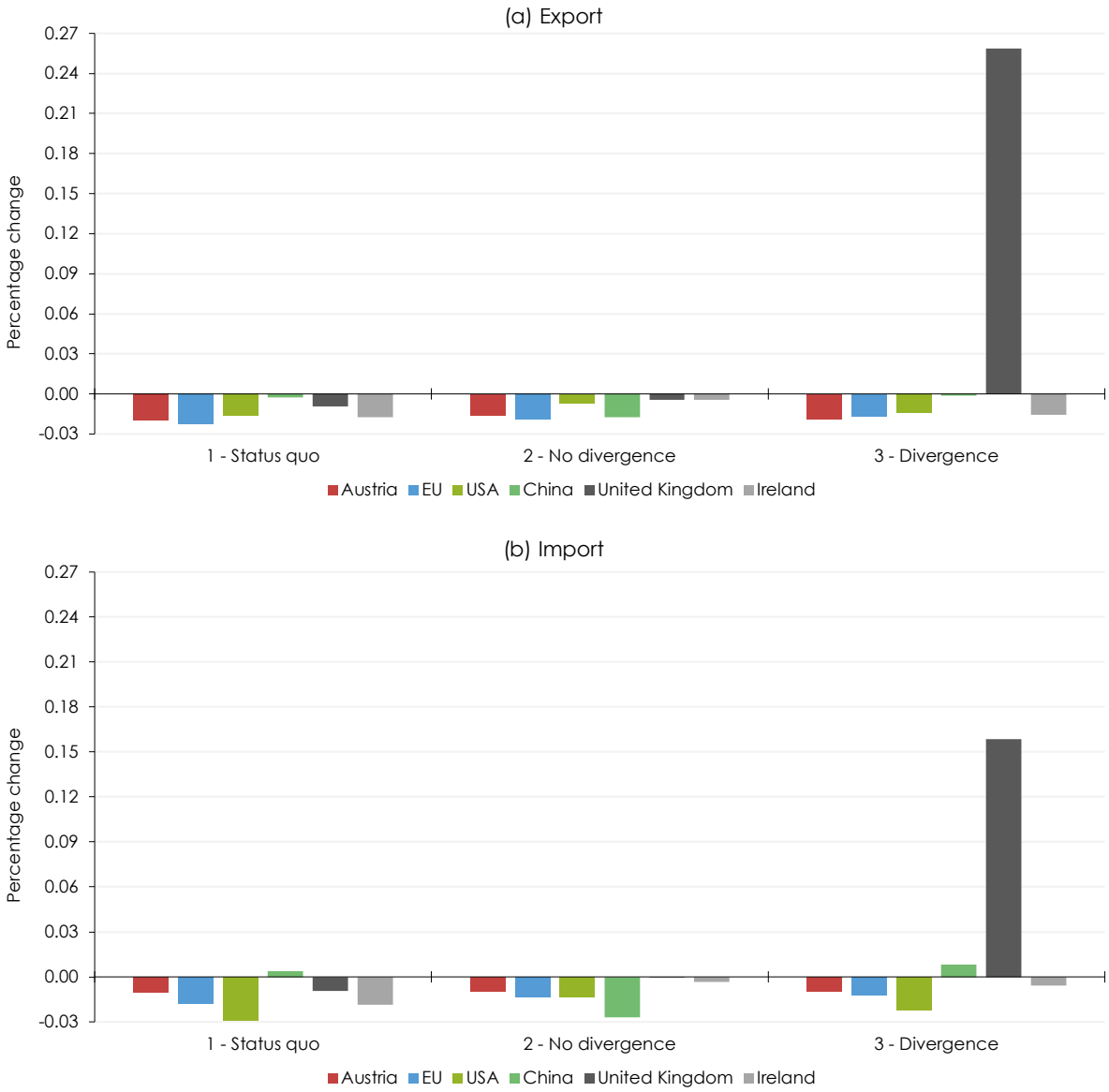
Compared to the status quo scenario, we observe that welfare loss in the no divergence scenario is 0.0004 percentage points smaller for the EU, 0.0014 percentage points smaller for the United Kingdom and 0.0061 percentage points smaller for Ireland[40]). Overall, welfare effects are relatively modest for the countries implementing subsidies and state aid. Furthermore, due to the sectoral shift of the implemented measures, a welfare-diminishing effect for China in the no divergence scenario of 0.0025 percentage points can be observed as compared to the status quo scenario. This is driven by a slightly tighter competition between the EU and the United Kingdom in the status quo scenario after the United Kingdom left the EU.

In the case of a strong deviation of the United Kingdom from the status quo and the LPF provisions in the TCA, the simulations of the **divergence scenario** suggest that such a deviation is particularly costly for the United Kingdom. Implementing numerous subsidies and state aid measures focusing on economically strong sectors will on the one hand increase the United Kingdom's production in heavily subsidised sectors like the manufacturing of machinery and equipment or other transport equipment, thereby enhance the United Kingdom's international competitiveness. However, on the other hand, the welfare benefit from increased production in some sectors for the United Kingdom is offset by the burden of the costs associated with the subsidies and state aid granted and the domestic and international sectoral economic distortions caused by their implementation. Accounting for budget effects, the welfare of the United Kingdom decreases by 0.02%, which corresponds to an absolute loss in real GDP by $ 631.9 mn. Other countries benefit from the trade diversion effect with a slightly higher welfare compared to the status quo or no divergence scenario. Austria's welfare increases by 0.002 percentage

[40]) Measured in absolute changes, real GDP in Austria declines by $ 1.2 mn, in the EU by $ 203.6 mn and in the United Kingdom by $ 0.5 mn.

points, the EU welfare by 0.001 percentage points[41]) and Ireland's welfare by 0.007 percentage points compared to the no divergence scenario.

Figure 4.40: Total trade effects for Austria, the EU and selected countries – scenarios for the LPF in comparison



Source: WIFO calculations based on the KITE model.

Looking at the total trade impact reveals the changes in the international competitiveness for each of our three scenarios in more detail. Figure 4.40 displays the percentage changes in total

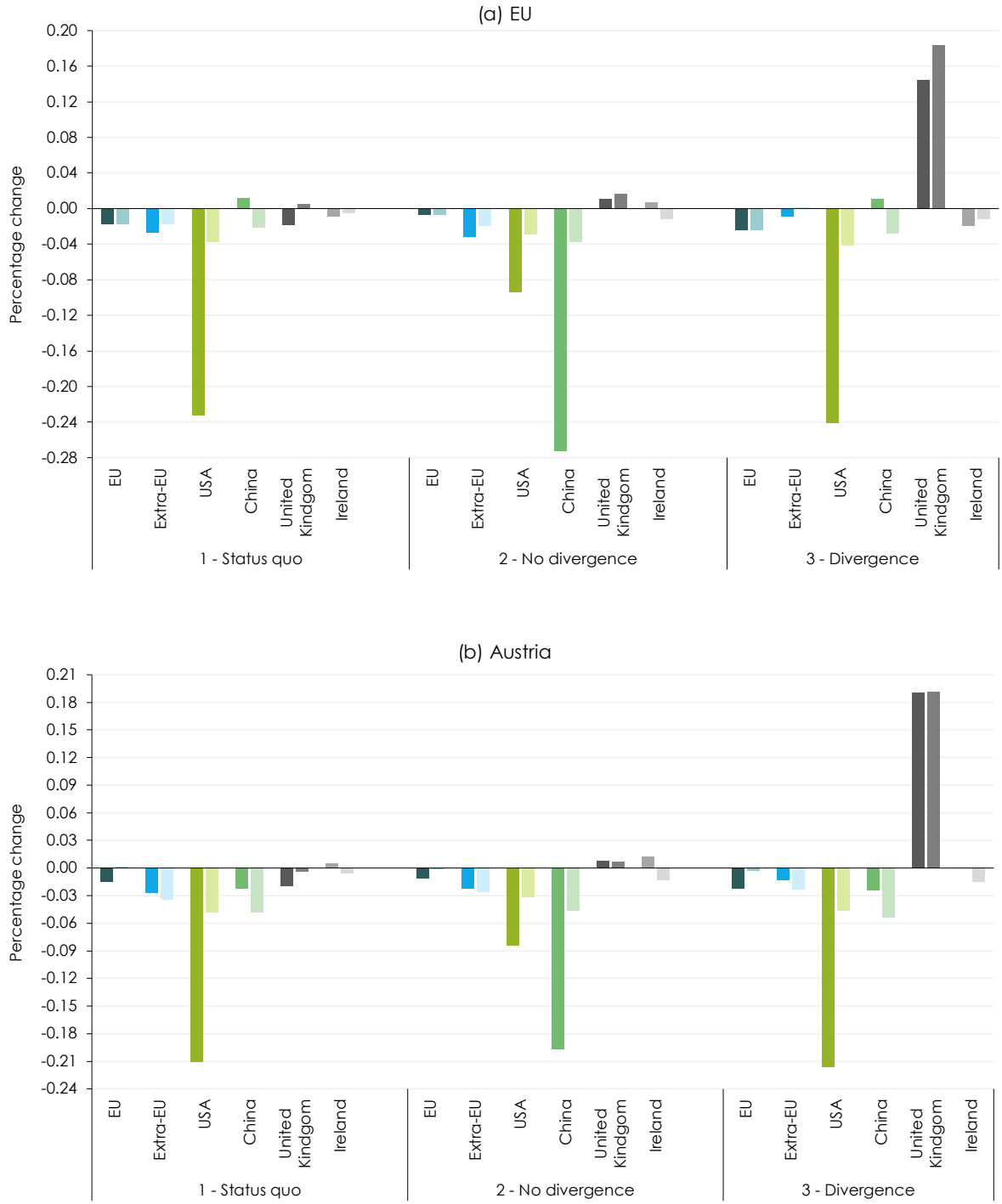
[41]) This corresponds to an absolute increase in real income of $ 6.8 mn for Austria and $ 150.8 mn for the EU compared to the no divergence scenario.

exports and imports for Austria, the EU, the USA, China, the United Kingdom and Ireland. Across all scenarios, we observe, that the impact on exports is stronger than the impact on imports for the EU Member States and the United Kingdom. In the scenario with **no divergence** in the level of subsidies and state aid between the United Kingdom and the EU, the effects on exports and imports are negligible small. Total trade of both the United Kingdom and the EU experience relatively small losses in exports and imports. Also, in the **status quo scenario** only a modest effect on trade can be observed. EU exports decline by around 0.02% while the United Kingdom's exports shrink by 0.01%. Thus, if subsidies and state aid measures conform to the LPF as agreed in the TCA, no significant harm in trade, nor notable shifts in competitiveness, caused by the imposed subsides and state aid between the United Kingdom and the EU can be observed. However, in case of a strong **divergence** from the status quo, i.e. in case the United Kingdom drastically increases its subsidies and state aid measures, the United Kingdom increases its total exports by 0.26% and its imports by 0.16%. While this improves the competitive position of the United Kingdom relative to the EU, EU trade also slightly benefits from increased production (and demand) in the United Kingdom following the substantial increase in subsidies and state aid.

This trade diversion effect becomes more apparent, when looking at bilateral trade changes. Figure 4.41 shows the percentage changes in bilateral exports (in dark colours) and bilateral imports (in light colours) induced by changes in the LPF for the EU across different scenarios. By looking at the **status quo** and the **no diversion scenarios**, we see that most trade divergence effects of the subsidies and state aid measures are observed for extra-EU trade, while trade among EU Member States and the United Kingdom are hardly affected in comparison. Thereby, bilateral trade of the EU with the USA is particularly harmed by measures imposed by the EU and the United Kingdom in 2021 and 2022, while trade with China is mainly harmed by subsidies and state aid measures imposed by the EU in 2014 and 2015. The changes in bilateral trade patterns for Austria, also shown in Figure 4.41, are similar to those of the EU in all scenarios.

Turning to the third scenario, a scenario of severe **divergence** between the United Kingdom and the EU due to a massive increase of subsidies and state aid in the United Kingdom, it can be observed that subsidies and state aid not only increase domestic production and distort domestic production towards the sectors that receive subsidies and state aid, but also increase demand from abroad. Figure 4.42 shows the difference in percentage points of bilateral exports (in dark colours) and bilateral imports (in light colours) for the United Kingdom in the divergence scenario compared to the status quo scenario. The exports of the United Kingdom increase substantially with the EU and Austria compared to the status quo scenario (by 0.18 percentage points and 0.20 percentage points, respectively). This increase in the United Kingdom's exports is particularly driven by the high number of outward directed subsidies and state aid. The United Kingdom increases its imports to the EU by 0.16 percentage points, to Austria by 0.21 percentage points and to Ireland by 0.11 percentage points as compared to the status quo scenario. The massive increase in subsidies and state aid in the United Kingdom leads to a rise in its exports not just to EU countries, but especially to non-EU countries, like the USA (+0.46 percentage points) and China (+0.36 percentage points compared to the status quo).

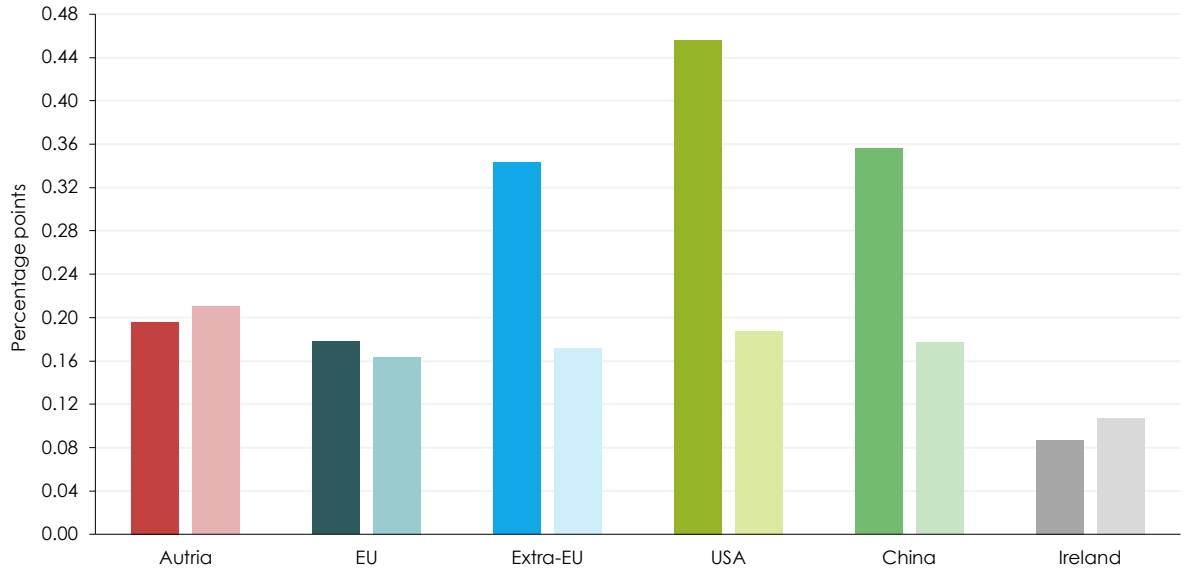
Figure 4.41: Bilateral trade effects for the EU and Austria with selected partner countries – scenarios for the LPF in comparison



Note: Exports displayed in dark colours and imports in light colours.
Source: WIFO calculations based on the KITE model.

These changes in bilateral trade patterns for the United Kingdom also affect the international competitiveness of the EU. Compared to the status quo, in the divergence scenario, the EU exports and imports to the USA, China and other extra-EU countries decrease slightly (Figure 4.41).

Figure 4.42: Bilateral trade effects for the United Kingdom with selected partner countries – the divergence scenario in comparison to the status quo scenario



Note: Exports displayed in dark colours and imports in light colours.
Source: WIFO calculations based on the KITE model.

Examining the trade flows by sector, it becomes apparent that subsidies and state aid might distort the economic sectors in the countries imposing subsidies and state aid. Sectors mostly targeted by the inward imposed subsidies and state aid are among those mostly affected by a decline in imports. Figure 4.43 shows the sectoral trade diversion in extra-EU trade. For the EU, which grants subsidies and state aid mainly to the agricultural sector in **all our scenarios** (see chapter 4.4.3 for details on the sectoral composition of the imposed subsidies and state aid), a decline of imports of agricultural products and products of sectors related to the agricultural value chain, e.g. milk, dairy products and processed rice, can be observed. In sectors, in which the United Kingdom implements subsidies and state aid that might harm the EU, e.g. motor vehicles, chemicals and electrical equipment, a slight decrease in exports by the EU can be observed, while the exports of the United Kingdom in these sectors increase. The largest distortions in sectoral trade for the EU can be observed in the divergence scenario, although the effects remain relatively small. A full list of sectoral effects across all three scenarios for the EU and the United Kingdom can be found in the Tables in Appendix B.

Figure 4.43: Sectoral trade effects for the extra-EU trade in most negatively affected sectors – scenarios for the LPF in comparison

Source: WIFO calculations based on the KITE model.

4.5 Corporate Sustainability Due Diligence (CSDD)

The EU proposal for a Directive on Corporate Sustainability Due Diligence (CSDD) and for a Corporate Sustainability Reporting Directive aims to promote sustainable and responsible business conduct throughout global value chains, with companies playing a key role in building a sustainable economy and society. The proposed Directive is part of the EU's broader commitment to sustainable development and the United Nations Sustainable Development Goals.

The objective of the proposed Directive is to improve corporate governance practices to mitigate adverse human rights and environmental impacts, increase corporate accountability, improve access to remedy for those affected by these adverse impacts, and avoid fragmentation of due diligence requirements across the EU Single Market. Businesses operating in the EU abide by high ethical standards and promote sustainability throughout their operations, thereby contributing to the achievement of the EU's broader sustainability objectives.

4.5.1 The historical context and implementation steps so far

On February 23, 2022, the European Commission adopted the proposal for a Directive on Corporate Sustainability Due Diligence Directive (COM(2022) 71). The EU has a history of employing due diligence and sustainability aspects as a policy lever[42]). This proposed Directive follows on several legislative acts and proposals concerning due diligence in companies' supply chains, with a view to improve the sustainability aspects of these supply chains (among them are the Conflict Minerals Regulation (EU 2017/821), the proposal for a regulation on prohibiting products made with forced labour on EU (COM(2022) 453), Regulation on Deforestation-Free Products (COM(2021) 706), and the EU Corporate Sustainability Reporting Directive (EU 2022/2464). The proposed Directive on Corporate Sustainability Due Diligence is set to complement the existing Non-Financial Reporting Directive (2014) by extending the scope of companies that are subject to mandatory audits and by reinforcing a standardised information reporting. Furthermore, the proposed Directive complies with the EU Directive on Preventing and Compacting Human Trafficking and Protecting its Victims (2011/36/EU).

In December 2022, the EU Council adopted its position on the CSDD Directive, amending the scope of the European Commission's proposal and recommending a less stringent approach to enforcement measures by proposing a three-year phase-in period and a less punitive approach to due diligence enforcement measures[43]). In June 2023, the EU Parliament adopted its formal position[44]), triggering the start of legislative negotiations in the EU trilogue. The EU Parliament favours expanding the scope of the Directive. The scope of the CSDD, its applicability in the financial sector, the conditions for civil liability, and the duties of directors are probable negotiation issues in the EU Trilogue, owing to the differing stances of the EU Parliament and Council regarding the European Commission's initial proposal. Once the proposed CSDD Directive is approved, EU Member States will have two years to transpose the Directive into

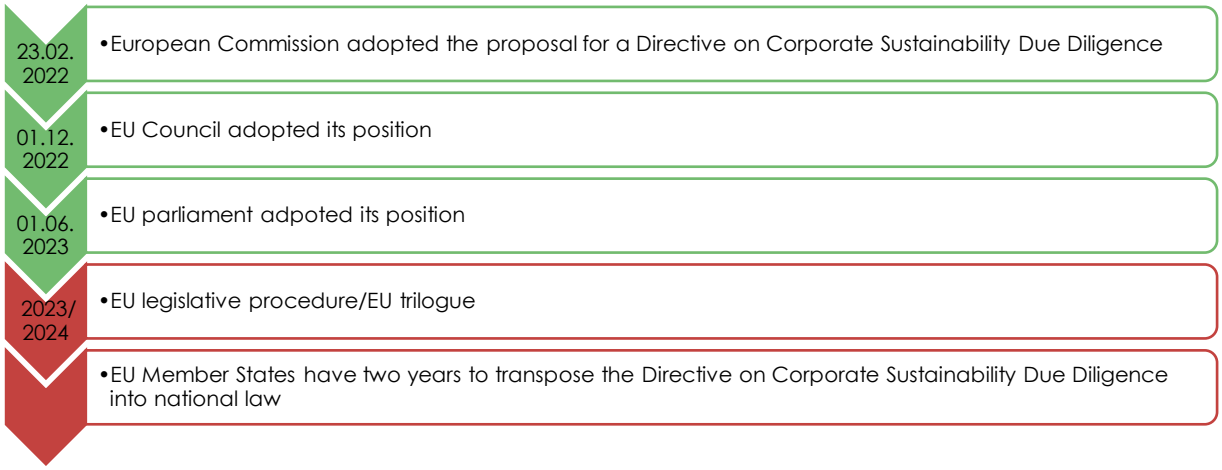
42) For a detailed historical review on international regulations and initiatives on responsible business conduct in the EU see Meyer and Reinstaller (2022).

43) See https://data.consilium.europa.eu/doc/document/ST-15024-2022-REV-1/en/pdf (last accessed April 18, 2023).

44) https://www.europarl.europa.eu/doceo/document/TA-9-2023-0209_EN.html (last accessed September 26, 2023).

national law. To facilitate the implementation and enforcement of the regulation for companies and states, the EU plans to publish guidelines for Member States and companies[45]).

Figure 4.44: A timeline of implementation of the Corporate Sustainability Due Diligence (CSDD)



Note: Dates as of October 24, 2023.
Source: WIFO presentation.

The CSDD Directive constitutes a significant advancement in accomplishing wider policy objectives by expanding the use of due diligence. Along with the trade and sustainability chapters, the proposed Directive aims to facilitate the implementation of EU standards and values beyond the EU borders by enforcing accountability on EU companies and their supply chains. Unlike other measures such as the proposal for a regulation on forced labour, the proposed CSDD Directive promotes responsible and sustainable business practices, both within and outside the EU. Furthermore, with the inclusion of all relevant established business relationships, an extraterritorial application and the possibility of civil law suits, the EU goes beyond the due diligence laws adopted in some EU Member States and non-EU countries in recent years.

4.5.2 The Corporate Sustainability Due Diligence in detail

The proposal of the Corporate Sustainability Due Diligence Directive (2022/0051 (COD)) applies to all large companies operating in the EU, i.e. companies with more than 500 employees and an annual worldwide net turnover of more than € 150 mn[46]).The CSDD Directive also extends to companies operating in high-impact sectors, with a net turnover of more than € 40 mn and

[45]) This is stated in the EUCSDD proposal.

[46]) According to the suggestion by the EU Council, EU companies with more than 1,000 employees and a net turnover of € 300 mn worldwide and non-EU companies with a net turnover of € 300 mn generated in the EU shall fall into the scope of the CSDD Directive in a three year phase-in period. In contrast, the EU Parliament advocates a threshold of 250 employees for EU-based companies exceeding € 40 mn worldwide and a threshold of EU-based ultimate parent companies of a group with more than 500 employees and a net worldwide turnover of more than € 150 mn. See https://data.consilium.europa.eu/doc/document/ST-15024-2022-REV-1/en/pdf (last accessed April 18, 2023) and https://www.europarl.europa.eu/doceo/document/TA-9-2023-0209_EN.html (last accessed September 26, 2023).

more than 250 employees. Table 4.11 lists the high-impact sectors as defined by the EU CSDD Directive. The definition of high-impact sectors has been limited to sectors that pose a high risk of adverse impacts for the EU and for which guidance from the OECD exists.

Table 4.11: High-impact sectors as defined by the EU CSDD

CPA code	CPA name
01	Products of agriculture, hunting and related services
02	Products of forestry, logging and related services
03	Fish and other fishing products; aquaculture products; support services to fishing
05	Coal and lignite
06	Crude petroleum and natural gas
07	Metal ores
08	Other mining and quarrying products
10	Food products
11	Beverages
13	Textiles
14	Wearing apparel
15	Leather and related products
16	Wood and of products of wood and cork, except furniture; articles of straw and plaiting materials
23	Other non-metallic mineral products
24	Basic metals
25	Fabricated metal products, except machinery and equipment

Source: EC 2022/0051(COD), WIFO presentation.

In addition, non-EU-based companies generating more than € 150 mn in net sales in the EU, or with more than € 40 mn in net turnover in the EU and with over half of their global net sales originating from activities in high-impact sectors, are also subject to the Directive's requirements[47]). To comply with supply chain due diligence, non-EU companies must appoint an EU resident representative to liaise with EU regulators. Although small and medium-sized enterprises (SMEs) are not directly included in the scope of the Directive, they will be indirectly impacted as suppliers and contractors to firms that are affected by the CSDD proposal. The Directive's scope includes "established business relationships" throughout the supply chain, beyond just direct supplier relationships. Combined with the extraterritorial scope of the EU Directive, multinational corporations based in the USA, United Kingdom, and Asia with a high turnover in the EU may experience a significant impact.

The CSDD Directive follows the six-step process outlined in the OECD Due Diligence Guidance for Responsible Business Conduct:

1. It is the duty of the director to integrate due diligence into policies and management systems, extending not only to the individual company but also its subsidiaries and supply chains.
2. Companies should identify actual or potential adverse human rights and environmental impacts, relying on both quantitative and qualitative information. This shall be done in regular intervals for assessing impacts and prior to new activities, major decisions,

[47]) The amendments by the EU Parliament also include non-EU ultimate owners of groups with more than 500 employees and a worldwide net turnover exceeding € 150 mn of which at least € 40 mn are generated in the EU. See https://www.europarl.europa.eu/doceo/document/TA-9-2023-0209_EN.html (last accessed September 26, 2023).

changes in operation, and at least annually throughout the life of the activity or business relationship.

3. If potential adverse human rights or environmental impacts are identified, companies should take appropriate measures to prevent and mitigate these impacts. Where it is not possible to prevent, terminate, or minimize adverse impacts, companies should prioritize actions and take reasonable measures to mitigate these risks. Companies should also ensure that contractual assurances obtained from business partners are accompanied by appropriate measures to verify compliance, and if such assurances cannot be obtained, companies may choose to terminate the contract.
4. Member States are responsible for supervising compliance with the new rules and are authorised to impose effective, proportionate, and dissuasive fines for non-compliance. Penalties should be proportionate to the seriousness of the infringement and take into account the size and resources of the company.
5. Companies should consult and communicate with potentially affected groups, including workers and other relevant stakeholders, to gather information on actual or potential adverse impacts.
6. National administrative authorities are empowered to halt infringements and pursue remedial actions to bring such infringements to an end. Additionally, victims will have the opportunity to take legal action for damages that could have been avoided with appropriate due diligence measures.

Thus, EU Member States will have a role in supporting companies in complying with the regulation by providing guidance and will also be required to establish effective and dissuasive penalties for non-compliance, such as fines or other administrative measures. Overall, the role of the EU Member States in the proposed CSDD is crucial for ensuring that companies operating within the EU prioritize sustainability and human rights considerations in their operations and supply chains. Through effective enforcement and support, Member States can help creating a level playing field for businesses and promote a more sustainable and responsible economy.

4.5.3 Detailed descriptive data analysis on potential impacts by sector and partner countries and results from the literature

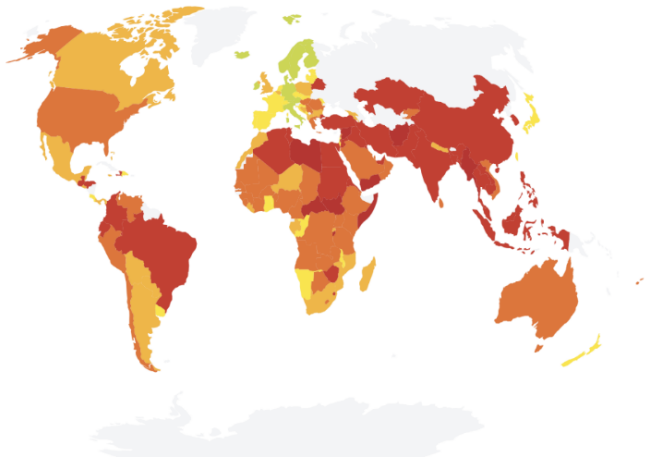
Many exporting companies are already implementing corporate responsibility practices (see e.g. Meyer and Reinstaller, 2022). The increasing engagement of companies in international business has also led to a greater need for reporting on corporate responsibility and supply chain due diligence to meet the demands of suppliers, buyers, investors, and customers. However, the adoption and implementation of due diligence, complying with the proposed EU CSDD Directive, are fraught with barriers and challenges, particularly for small and medium-sized enterprises. Implementation and monitoring costs depend on the level of tiers of the supply chain, sector, and location of trading partners. The CSDD Directive is estimated to increase costs for firms associated with each supplier relationship. Reporting obligations and necessary staff training are estimated to account for about one-third of the additional annual due diligence compliance costs for SMEs along supply chains (Torres-Cortés et al., 2020).

Research related to the corporate social responsibility practices has shown that firms can benefit from complying with due diligence. Despite the associated implementation and monitoring

costs, integrating social and environmental considerations into their business strategies, can help companies to improve their reputation, attract and retain talent, and to gain a competitive advantage in the market (see among others Vishwanathan et al., 2020; Tsang et al., 2020; Flammer, 2015). Moreover, responsible entrepreneurship can lead to cost savings through more efficient resource use and lower environmental impact, as well as better risk assessment (Ferrel et al., 2016).

The lack of due diligence along supply chains is a particular concern in many non-EU trading partners. Cases of violations of decent work can be found in various countries and regions globally, with the highest violation of human rights in Asia and the Pacific region and the Arab states. Figure 4.45 maps the extend of worldwide violations against human rights, labour standards and environmental protection according to the Global Rights Index of the International Trade Union Confederation. A particular motivation behind the CSDD Directive as well as the forced labour regulation are human rights and decent work violation in China, where most violations are reported in the Xinjiang Uyghur Autonomous Region involving Uyghurs and other ethnic minorities (Lehr and Bechrakis, 2019).

Figure 4.45: Map of human rights violation in 2022

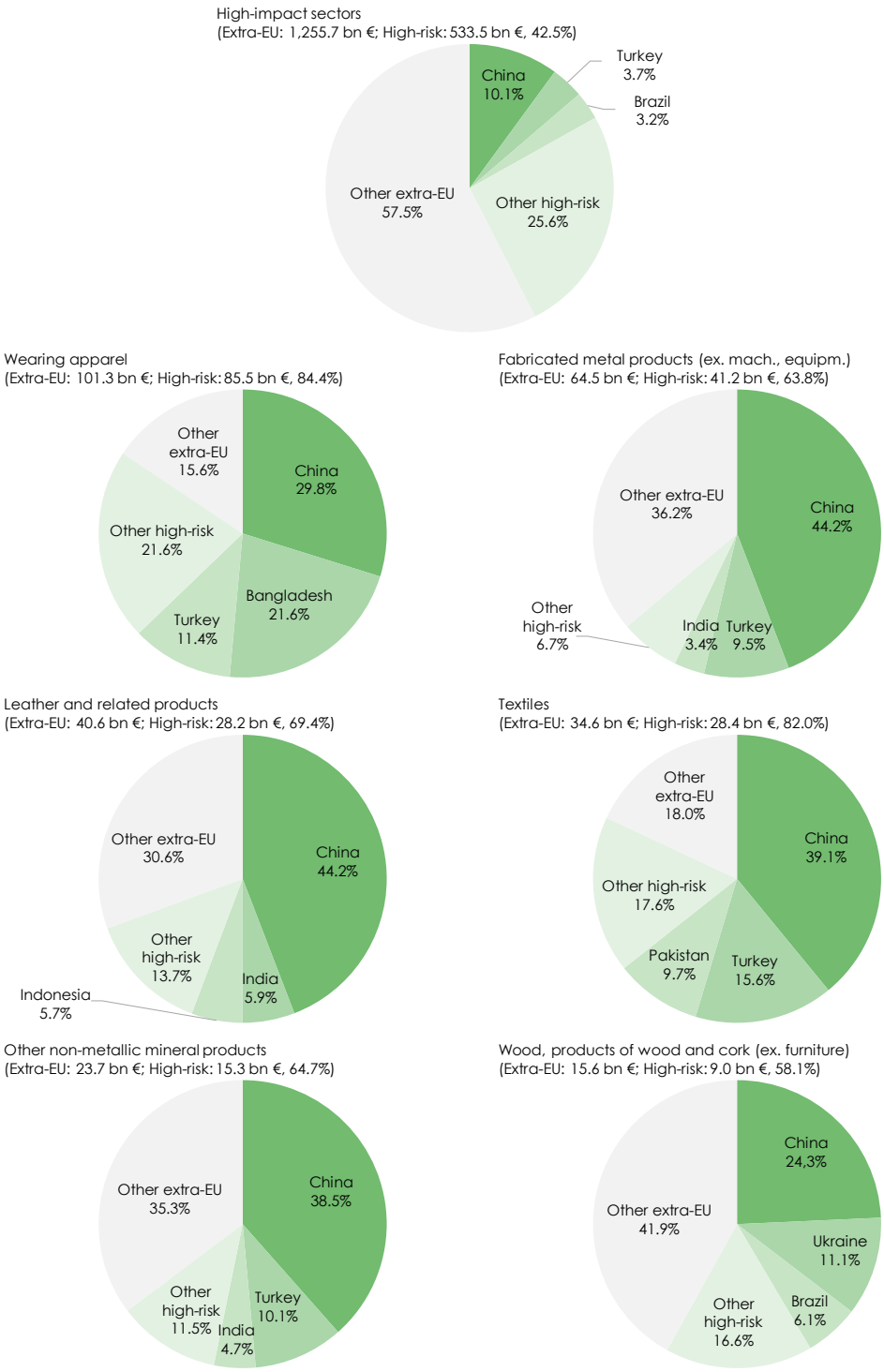


Note: Scale ranges from green – sporadic violations of rights to dark red – no guarantee of rights due to breakdown of the rule of law.
Source: https://www.globalrightsindex.org/en/2022/countries.

The EU is a significant supplier and buyer for many countries with a high risk of human rights violation, breaches of labour standards and environmental protection. In 2022, the EU imported 42.5% of goods in high-impact sectors, as defined by the Due Diligence Directive, from high-risk countries[48]). According to Figure 4.46, more than 10% of these are from China.

[48]) We define high-risk countries based on the countries with no guarantee of rights according to the Global Rights index and countries that are determined as conflict-affected and high-risk areas as defined by Conflict Minerals Regulations (EU 2017/821). Table A5 in the Appendix provides a detailed list of high-risk countries.

Figure 4.46: High-impact sectors with a share of more than 50% of extra-EU trade in 2022



Source: EC 2022/0051(COD), ITUC (https://www.globalrightsindex.org/de/2022/countries/afg-2), EU (https://www.cahraslist.net/cahras), Eurostat, WIFO calculations.

A closer look at the high-impact sectors (see Table 4.11) reveals that the wearing apparel and textile sectors are particularly prone to violations of due diligence. Figure 4.46 shows the import share from high-risk countries in high-impact sectors (excluding the EU Single Market). The EU imports 84.4% of wearing apparel and 82.0% of textiles from high-risk countries, with China, Bangladesh, Turkey, and Pakistan being the most important trading partners accounting for nearly two-thirds of total Extra-EU imports in the textile and apparel goods. Besides the high dependence on these countries in textile and apparel imports, related leather and leather products also exhibit a high dominance of products imported from China (44%). Moreover, wood and products made out of wood and cork, other non-metallic mineral products and fabricated metal products are among the six sectors of the 16 high-impact sectors that source predominantly from high-risk countries. Turkey, India and China account for more than 50% of total Extra-EU imports in the fabricated metal and the other non-metallic mineral products sector. Figure B2 in the Appendix shows the import share of extra-EU trade for the other high-impact sectors.

4.5.4 Quantifying the likely impact of the CSDD– scenarios and empirical specification

To quantify the potential impact of the due diligence requirements of the CSDD, an approximation is needed since the CSDD is not yet in force. The impact of NTOs in trade agreements can serve as positive signal for potential compliance with due diligence issues. Therefore, NTOs provide a useful approximation of the effect of compliance with responsible business conduct by the additional impact of these provisions on trade frictions. Like responsible business conduct, the CSDD Directive needs to be implemented by individual firms.

Figure 4.47: Non-trade objectives in EU trade agreements

Source: Lechner (2022), WIFO presentation.

Figure 4.47 provides an overview of the efforts to include due diligence issues in non-trade objectives and highlights agreements that explicitly mention the role of companies in adhering to human rights, economic and social standards, as well as environmental protection. In 2020, the EU had 29 trade agreements in place containing (non-enforceable) clauses on responsible business conduct. Particularly, the trade agreements of the new generation contain provisions on human rights, economic and social rights and environmental protection.

To access the impact of responsible business conduct of firms on cross-border trade, we estimate the impact of NTO provisions in trade agreements specifically stressing the role of firms for responsible business conduct in trade agreements using a structural gravity framework. In this way, we disentangle the effect of responsible business conduct (RBC) provisions in preferential trade agreements (PTA) from the general PTA effect. Based on the empirical specification of the structural gravity model outlined in chapter 3.1, we estimate the following equation:

$$
\begin{aligned}
X_{ijkt} = \exp\Bigg(& \sum_{l=1}^{n} \alpha_{1,l} B_{ij} t_l + \sum_{l=1}^{n} \alpha_{2,l} B_{ij} \, log\big(dist_{ij}\big) t_l + \alpha_3 B_{ij} PTA^{LR}_{ijkt-1} + \alpha_4 B_{ij} PTA^{HR}_{ijkt-1} \\
& + \alpha_5 B_{ij} PTA^{LR}_{ijkt-1} RBC_{ijt-1} + \alpha_6 B_{ij} PTA^{HR}_{ijkt-1} RBC_{ijt-1} + \alpha_7 B_{ij} PTA_{depth_{ijkt-1}} \\
& + \alpha_8 B_{ij} EU_{ijt-1} + \beta_{ikt} + \gamma_{jkt} + \mu_{ijk} \Bigg) \\
& + \eta_{ijkt} \qquad (4.3)
\end{aligned}
$$

Equation (4.3) adapts the basic specification of Equation (3.2) of chapter 3.1 to include PTA as well as RBC variables. RBC as applied by firms enters as an indicator variable equal to 1 if PTAs explicitly contain provisions related to a firm's responsibility to protect human, economic, labour, or social rights and the environment, often indicated by mentioning corporate social responsibility or a firm's responsibility for sustainable and ethnical business conduct. It is interacted with an indicator variable for PTAs currently in force. Since different costs for complying with the due diligence requirements and responsible business conduct can be expected for firms in the EU and firms in high-risk countries, we differentiate between PTAs with countries more likely to comply with due diligence, i.e. countries with a low-risk of violations of principles of responsible business conduct (PTA^{LR}) and for countries for which it might be more costly to comply with corporate due diligence, i.e. countries with a high-risk (PTA^{HR})[49]. Since there are not many high-risk countries in the GTAP dataset with PTAs, PTAs with or among middle- and low-income countries are classified as PTAs with high-risk countries. PTA^{LR} includes agreements among advanced economies that are not among high-risk countries[50]). To disentangle the effect of responsible business conduct from the general effect of a deep PTA, we include an additional variable for the depth of a preferential trade agreement. The deeper an agreement, the more likely it includes provisions on RBC as well. We also control separately for EU

[49]) Table A5 in the Appendix provides a detailed list of high-risk countries.

[50]) High-risk countries among high-income countries are Bahrain, Hongkong and South Korea.

membership, since the EU itself constitutes a particularly deep PTA. All other variables are as explained in chapter 3.1.

To properly identify the effect of RBC provisions, bilateral sectoral trade data from 1992 onwards from the ITPD-E is combined with the dataset on non-trade objectives and information on the depth of PTAs from DESTA including all 265 countries in the estimation. See chapter 3.3. for more information on these datasets.

Table 4.12 presents the results of our estimation of Equation (4.3). First, the deeper PTAs are, the more beneficial they are. For example, EU membership, a particularly deep agreement, increased bilateral trade by around 32%. Looking at countries with low-risk of violations of principles of responsible business conduct, we observe that PTAs with RBC provisions increase trade by 5.6%[51]), while shallow agreements between advanced economies do not increase bilateral trade between the partner countries. Turning to high-risk economies, our estimates indicate that in general signing a PTA is beneficial for developing economies, it increases trade by around 14.1%. However, if the provisions – like the RBC provisions – are too deep and costly to satisfy, the inclusion of RBC provisions impose additional trade frictions and might hinder trade with developing economies. Thus, RBC provisions, i.e. high due diligence requirements on human, economic and social rights and environmental protection, increase trade for low-risk countries and decrease bilateral trade for high-risk countries.

Table 4.12: Gravity model estimation results - CSDD

	(1) PPMLHDFE
EU	0.2779***
	(0.0183)
Depth of PTA	0.0119***
	(0.0034)
PTA (low-risk)	-0.0561**
	(0.0226)
PTA (low-risk) * RBC	0.1105***
	(0.0121)
PTA (high-risk)	0.1312***
	(0.0241)
PTA (high-risk) * RBC	-0.1498***
	(0.0290)
Constant	9.0891***
	(0.0366)
Observations	27,580,524

Note: The gravity models are estimated using the "ppmlhdfe" package of the STATA econometrics software (Correia et al., 2020). Robust standard errors clustered by country pairs and products in parentheses. *, ** and *** indicate statistical significance at the 10%-, 5%- and 1%-level, respectively. All control variables and fixed effects are included according to Equation (4.2).
Source: WIFO calculations.

[51]) The effect is estimated as the difference between the impact of signing a PTA among low-risk countries (PTR – low risk) and the benefit of signing a PTA (low risk) with RBC provisions, i. e. it is calculated by (exp(-0.0561+0.1105)-1)*100.

These estimated trade frictions for high-risk and low-risk economies resulting from the inclusion of RBC provisions in PTAs are used to simulate the impact of the CSDD. We simulate three distinct CSDD scenarios with the KITE model, a computational general equilibrium model (see chapter 3.2). The first scenario outlines the effect of the implementation of the CSDD, the second scenario simulates an escalation of the CSDD and the third scenario illustrates the impact of a success as other countries comply with the CSDD.

In the **implementation scenario**, we assume compliance with the CSDD as given by the effect of the RBC provisions included in many recent EU trade agreements. Thus, based on our estimates of the impact of responsible business conduct from the structural gravity model, we assume high implementation costs of the CSDD particularly for high-risk countries, while benefits outweigh the costs for low-risk countries. Thus, in the implementation scenario, we model an increase in trade friction between the EU and high-risk countries. Based on the gravity estimates discussed above, we therefore impose a reduction in imports of the EU from high-risk countries by 13.9%. In the simulation, trade frictions of other countries are not altered directly, but are affected due to input-output linkages.

In comparison to the implementation scenario, we consider an **escalation scenario**, which assumes that firms restrict their trade in sectors that are exposed to a high risk of violations of human, social or environmental standards. The risk of fines and lawsuits could make companies under scope of the CSDD Directive more risk-averse, leading them to withdraw from countries where potential human rights are violated, and labour and environmental standards are not respected. In this scenario, we assume that a high-risk exposure in conflict prone countries or high risk of violations of human rights leads to a stop of trade in high-impact sectors with these countries. Specifically, we assume that firms withdraw from importing high-impact products from high-risk countries. This has the effect of a ban on imports of high-impact products from high-risk countries to enter the EU Single Market. This implies that the EU, e.g., does not source textiles anymore from China.

The **success scenario** depicts successful implementation of the CSDD in which the due diligence regulation will also be adopted by other countries, i.e. the EU is successful in nudging foreign firms to comply with EU standards. For many high-risk countries, the EU is an important trading partner, i.e. many firms in high-impact sectors and in high-risk countries are an essential part of supply chains of firms active in the EU Single Market. Firms must abide to high EU standards, regardless of national standards in third countries, which renders lower standards particularly in high-risk countries irrelevant. Thus, it is difficult for high-risk countries to circumvent due diligence issues. This implies that the EU strategy of a shift of the burden from countries being responsible for complying with environmental, labour and human rights, to firms in the foreign country combined with the extraterritorial application of human rights and environmental provisions for firms selling their products on the EU Single Market help to mitigate and prevent adverse impacts on human rights, labour standards and environmental impact. To measure this effect, we assume that all trading partners, including the high-risk countries, comply with the requirements of the CSDD. In this success scenario, we apply the estimated benefit of the implementation of responsible business conduct on trade, derived by the gravity model, i.e. we apply the trade enhancing benefit of the inclusion of RBC in trade agreements for low-risk countries to all import partners of the EU. Thus, in this way, the compliance with high-risk

countries to human rights, labour standards and environment protection is an integral part of the scenario, and we are able to show potential extra-territorial effects of the application of an EU Directive in third countries. Note, however, that such a scenario is only likely in case the EU assists high-risk countries and major partners trading with products in high-impact sectors to be able to comply with the requirements of the CSDD.

4.5.5 Welfare and trade effects of the CSDD

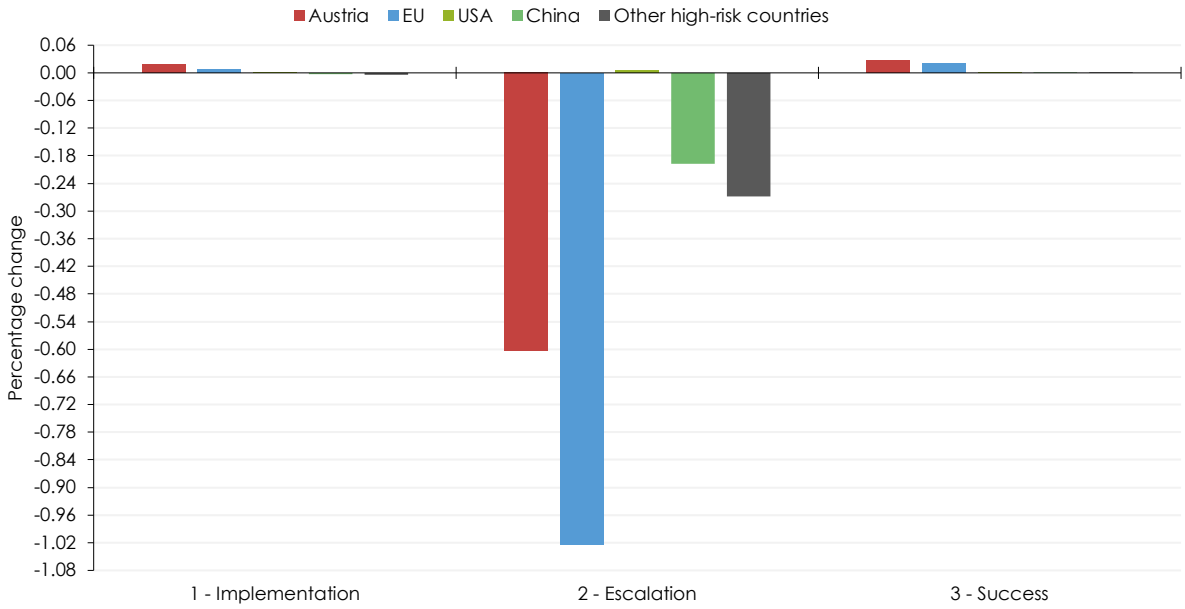
The welfare and trade effects of the three distinct scenarios of the CSDD Directive's implementation, escalation and success are presented in the following. Note that the simulated effects may underestimate the CSDD effects on both welfare and trade, because NTO provisions in PTAs are not enforceable and do not fully capture behavioural changes and cost associated with the implementation of the CSDD. Nevertheless, the findings shed light on the complex dynamics and trade-offs associated with the CSDD Directive's potential impact on welfare and trade across regions and income groups. First, welfare effects are discussed. This is followed by a detailed discussion of trade and trade diversion effects of the CSDD. Welfare changes are measured in terms of changes in real income. Figure 4.48 presents the percentage change in real income for the three CSDD scenarios for Austria, the EU, the USA, China and other high-risk countries (see the list of high-risk countries in Table A5 in the Appendix). The **implementation scenario** reveals relatively modest welfare effects, with the highest gains observed in high-income countries. The EU experiences a modest increase in welfare by 0.009%, while Austria surpasses the EU average with an increase of 0.017%[52]). The modest welfare effects across countries range from a 0.03% increase in Ireland, a low-risk country, to a 0.05% decrease in Kazakhstan, a high-risk country. Due to the trade frictions caused by the due diligence obligations, welfare generally declines for high-risk countries. The more the high-risk countries depend on exports to the EU, the higher the potential welfare losses. For China, a minor loss of 0.003% can be observed, while other high-risk countries, on average, experience a 0.005% decrease. Thus, the implementation of the CSDD could hinder the development of high-risk countries, which are often least developed countries.

The **escalation scenario**, in which imports of high-impact sectors from high-risk countries are hindered from entering the EU Single Market since they do not comply with the CSDD requirements, portrays larger and more substantial welfare losses. Particularly firms in EU countries are hurt by not being able to source high-impact inputs from high-risk countries. Due to higher import prices from alternative sources, and higher production costs, the real production and real income in the EU declines on average by 1.0%, with Austria (-0.6%) slightly below the EU average[53]). EU Member States that are particularly well integrated through value chain linkages with high-risk countries, such as Malta (-3.0%), Belgium (-2.26%), and Lithuania (-1.93%) experience much higher welfare losses. In turn, the degree of integration in global value chains between EU Member States and high-risk countries determines the magnitude of welfare loss.

[52]) Measured in absolute changes, real GDP in Austria would increase by $ 74.4 mn and in the EU by $ 1.4 bn.

[53]) In absolute terms, the real income of the EU declines by $ 155.9 bn and Austria's real GDP declines by $ 2.6 bn.

Figure 4.48: Welfare effects for Austria, the EU and selected countries – scenarios for the CSDD in comparison



Note: Welfare is measured by the change in real GDP. Oher high-risk countries see Table A5 in the Appendix without China.
Source: WIFO calculations based on the KITE model.a

Further, high-risk countries, such as Kazakhstan (-2.31%) and Cambodia (-2.52%), witness significant welfare losses, whereas developing countries not belonging to high-risk countries, like Botswana (+0.69%), Madagascar (+0.39%), and Sri Lanka (+0.36%), benefit from increased demand from their economies and are able to boost their production and international linkages, leading to a welfare increase. Thus, if firms operating in the EU Single Market withdraw from countries where human rights violations are likely, and labour and environmental standards are not respected, global welfare declines substantially.

In contrast, the **success scenario** demonstrates an aggregated global welfare increase of 1.1% in total. Thus, if major EU trading partners comply with the due diligence regulations without costly investments and additional trade friction, the EU and its trading partners experience welfare increases. The EU (+0.02%)[54]) experiences a larger increase compared to the mere implementation of the CSDD as measured in scenario 1. Austria benefits with an increase in welfare of 0.027%[55]). EU Member States closely linked to high-risk countries see the largest welfare gains. For the USA and other high-income countries, the impact is negligible. In this scenario, China and other high-risk countries intensify their trade relations with the EU, which also results in small welfare gains for these countries.

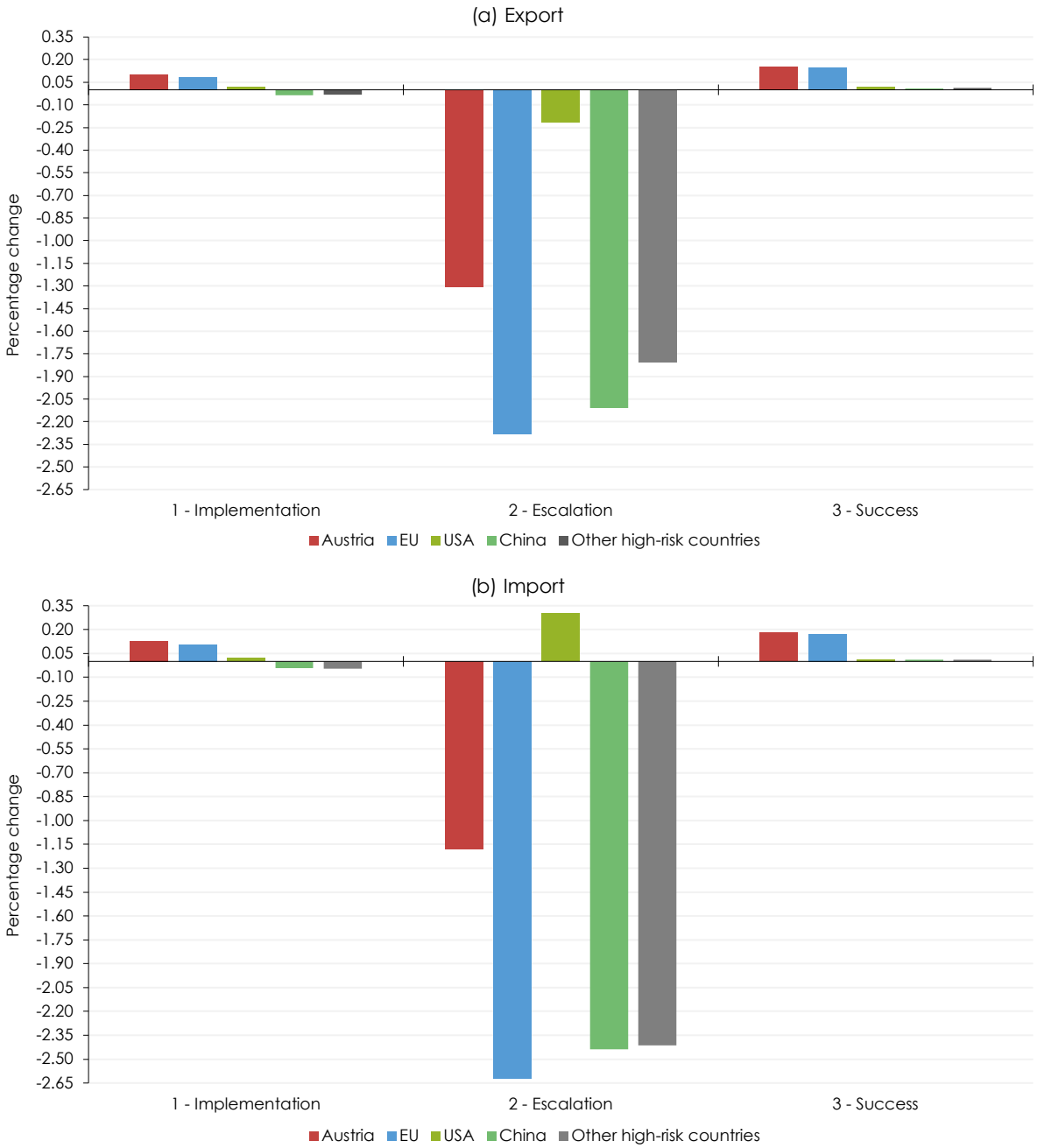
Analysing the effects of the CSDD scenarios on international trade provides a nuanced picture of how the CSDD Directive could influence global economic dynamics and shifts in international competitiveness. Figure 4.49 shows the percentage change in total exports (panel a)

[54]) This corresponds to an absolute gain in real income of the EU by $ 3.0 bn.

[55]) Measured in absolute real income changes, this corresponds to an increase in Austria's real GDP of $ 114.2 mn.

and total imports (panel b) for the three scenarios for Austria, the EU, the USA, China and other high-risk countries.

Figure 4.49: Total trade effects for Austria, the EU and selected countries – scenarios for the CSDD in comparison



Note: Oher high-risk countries see Table A5 in the Appendix without China.
Source: WIFO calculations based on the KITE model.

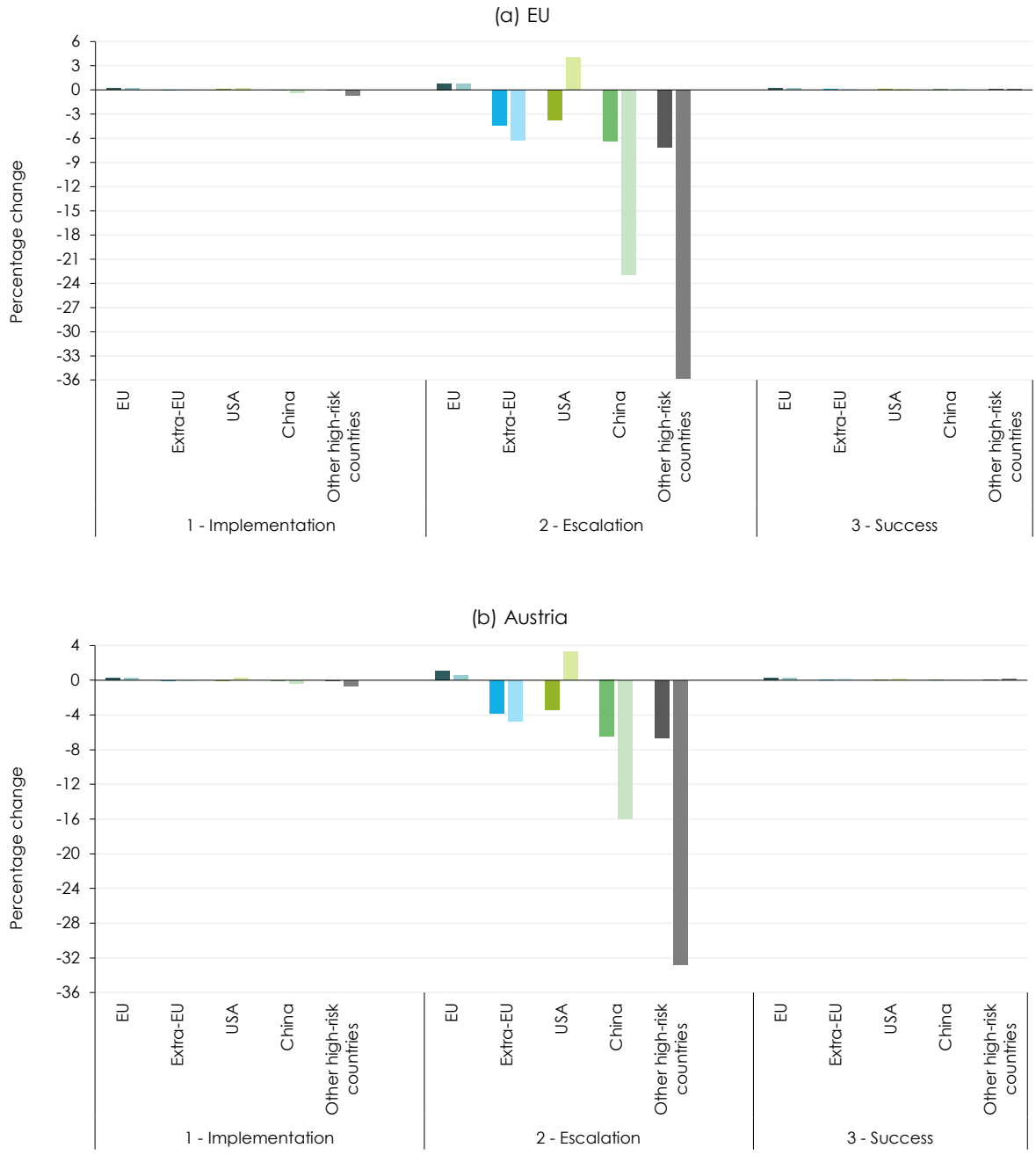
The **implementation scenario** reveals that low-risk countries, including the EU, the USA, but also some developing countries, appear to benefit from the increased demand for products complying with due diligence requirements, as their total exports and imports increase. This is a result of a shift in EU trade away from high-risk countries and suggests that low-risk countries may seem to gain a competitive advantage in the global market due to their adherence to sustainability and human rights. For the EU, it is noteworthy that imports increase slightly more than exports which is driven by an increase in intra-EU trade. Austria experiences a 0.10% increase in exports, while the EU sees a more substantial rise of 0.86% in total exports. Also, the USA observe a modest increase in both imports and exports. On the other hand, high-risk countries that face larger trade frictions, experience a decrease of 0.03% in both total exports and imports, with China experiencing a slightly more significant decline in both flows (-0.04%). This suggests that while the CSDD Directive enhances trade for compliant countries, it imposes challenges for high-risk economies, hinting at a trade diversion effect away from those countries. This has a potential adverse impact on their integration into international markets, and in turn on their development and growth prospects.

If suppliers of high-impact sectors in high-risk countries are not able to comply with the due diligence requirements and EU firms withdraw from these markets, the dynamics of global trade will change drastically. The **escalation scenario** paints a bleak picture, with more substantial declines in both imports and exports for the EU Member States and high-risk countries. The magnitude of the decline is strongest for the EU, with a loss in total exports of 2.3% and total imports of 2.6%. China and other high-risk countries also lose substantially, however to a slightly smaller extent than the EU. Austria, not as closely interlinked to high-risk countries as other EU Member States, loses less in terms of total trade than the EU average. These effects can be attributed to a drastic increase in trade frictions due to increased costs of complying with the due diligence requirements, leading to reduced international trade activity between high-risk countries and EU Member States. This underlines the adverse trade effects of the CSDD Directive when not implemented effectively.

The third scenario, the **success scenario**, provides a more positive outlook, with a modest increase in exports and imports for the EU, including Austria, and high-risk countries caused by the CSDD in the long run. Notably, exports from high-risk countries into the EU experience a boost, indicating that the CSDD Directive may facilitate better integration of these nations into international markets. This finding might suggest that the Directive could play a constructive role in promoting development in high-risk countries by fostering sustainable trade relationships, although the impact is relatively small.

Examining changes in bilateral trade provides deeper insights into the trade diversion effects induced by the distinct CSDD scenarios. Figure 4.50 shows the percentage change in bilateral exports (in dark colours) and bilateral imports (in light colours) for the EU (panel a) and Austria (panel b) for selected trading partners.

Figure 4.50: Bilateral trade effects for the EU and Austria with selected partner countries – scenarios for the CSDD in comparison



Note: Exports displayed in dark colours and imports in light colours. Oher high-risk countries see Table A5 in the Appendix without China.
Source: WIFO calculations based on the KITE model.

Already the **implementation scenario** shows modest effects on bilateral trade dynamics. The EU experience a decline in their trade with high-risk countries, both in terms of imports (-0.74%)

and exports (-0.07%). This underscores the trade diverting effects in EU trade away from high-risk countries as noted above. Note that the estimated effects represent rather a minimum trade diversion effect as NTOs in PTAs are, unlike the CSDD requirements, not enforceable and might not fully account for behavioural changes and costs associated with the due diligence requirements. Intra-EU trade sees an increase of 0.2%, while extra-EU trade declines. EU Member States strengthen trade ties with other EU countries, to ensure compliance with the CSDD standards and to mitigate risks associated with trade with high-risk nations. Moreover, there is also a notable shift in extra-EU imports away from high-risk countries toward nations with lower risk profiles, such as the USA. This shift in trade patterns suggests that the CSDD could lead to some realignment of global trade flows, favouring countries with higher economic, social and environmental standards. High-risk countries also adapt their trade pattern as a consequence of their partial exclusion from value chains with the EU. High-risk countries increase trade among themselves by 0.02%, seeking alternative markets within their peer group. Furthermore, high-risk countries expand their trade with non-EU countries by 0.04%, notably with the USA. This shift may have broader geoeconomic implications. It is crucial to note that many high-risk countries are important sources of raw materials needed e.g. for the green transition, and this shift in bilateral trade could potentially induce shortages or substantial price increases of critical raw materials like cobalt.

In the **escalation scenario**, the impact on bilateral trade is dramatic, particularly for high-risk countries. There is a substantial decline in international trade between the EU and high-risk countries, including China. The EU responds by increasing its intra-EU trade by 0.79%, while extra-EU trade takes a significant hit, especially imports, which decline by more than 6.3%. This drop is primarily driven by the cessation of imports of high-impact goods from high-risk countries, resulting in a substantial import decline of 35.8%. China, a key supplier of high-impact goods, experiences a severe decline of 22.9% in its exports to the EU. High-risk countries also reduce imports from the EU. Due to the decrease in demand from the EU, the high-risk countries depending on the exports to the EU, face a substantial decline in production, leading also to a decline in demand for EU products. Thus, the EU faces a 6.3% decrease in exports to China and a 7.2% decline in exports to other high-risk countries. The EU has to replace its imports of high-impact goods from high-risk countries by imports from countries complying with the CSDD. The due diligence requirements of the CSDD increase transition costs for firms and import prices and thus reduce competitiveness for EU Member States, especially relative to other high-income countries such as the USA. For the USA a substantial increase in exports (+4.0%) to the EU can be observed. Thus, this scenario suggests that the EU might lose geoeconomic influence, as trade dynamics shift in favour of other major economies, particularly those in the USA and China. This scenario also hints at broader realignments in global trade dynamics, with high-risk countries aligning more with the USA and China. This suggests that the EU could face drastic losses in international competitiveness relative to geoeconomic powers like the USA and China.

Turning to the **success scenario**, a more positive picture can be drawn, however, with only modest effects on bilateral trade. Nevertheless, this scenario shows that a close cooperation and assistance to high-risk countries in adhering to human, economic and social rights and in protecting the environment, can strengthen the integration of the EU with developing countries, as shown by the slight increase in imports to and exports from high-risk countries. The EU increases its imports from China by 0.10% and from other high-risk countries by 0.13%. EU exports

to China and other high-risk countries increase by the same magnitude as imports. Promoting the compliance with the CSDD in third countries also enhances the EU's global geoeconomic position, as both exports to and imports from the EU rise, even from low-risk countries, while trade between non-EU countries declines slightly. This strengthens the relationships of EU trading partners with the EU, increases the EU's competitiveness and diverts the trade of high-risk countries away from trade with China (-0.04% for exports and imports). This indicates that if the EU could strengthen its geoeconomic position on the global stage by strategically assisting high-risk countries in complying with human, social and economic rights, sustainability and environmental standards,.

The changes in bilateral trade due to the CSDD for Austria are similar to those observed for the EU.

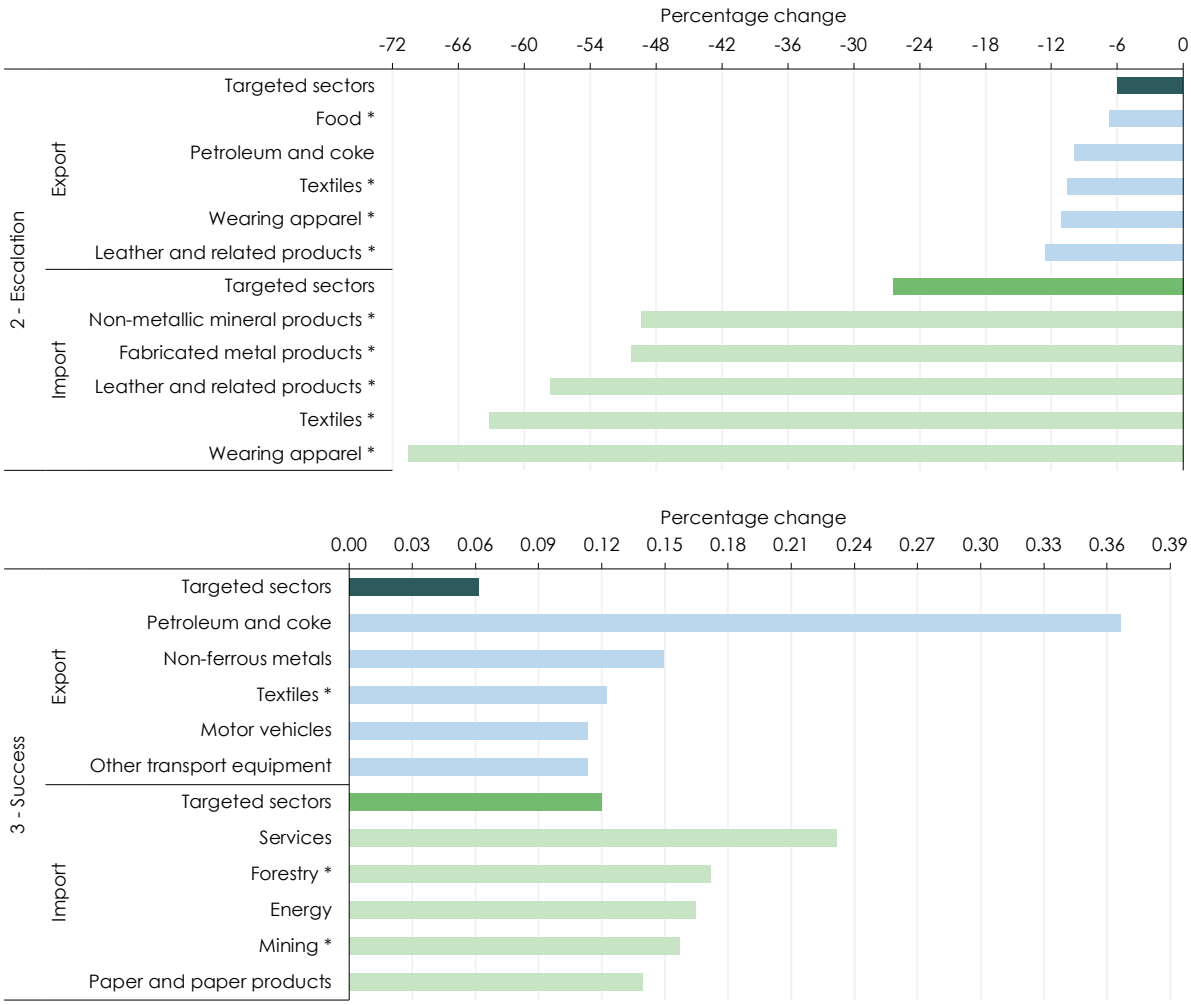
Examining the scenarios for shifts in sectoral trade resulting from the CSDD provides critical insights into how specific industries may be impacted by the changes in trade dynamics. In all scenarios, particularly high-impact sectors, as listed in Table 4.11, in extra-EU are affected. However, some high-impact sectors are affected significantly above average, as Figure 4.51 for extra-EU trade and Figure 4.52 for intra-EU trade reveal. These particularly include high-impact sectors such as apparel or textiles, which the EU substantially imports from high-risk countries, as shown in Figure 4.46. The targeted sectors in Figure 4.51 are the high-impact sectors as listed in Table 4.11. Since we do not explicitly model high-impact sectors and sectoral target groups in the implementation scenario, we particularly focus on the escalation and the success scenario in the sectoral analysis.

On average, in the **implementation scenario** imports of high-impact sectors decrease by 0.012%, with the textiles sector experiencing the strongest decline of 0.33% (see Tables in the Appendix B for detailed sectoral results for all scenarios). This reduction in imports is due to a shift from extra-EU to intra-EU trade, resulting in decreased exports in high-impact sectors. Notably, the wearing apparel and textile industries in the EU witness a strong increase in production and intra-EU trade, reflecting efforts to meet EU demand. Interestingly, for a high-risk country like China, the increase in trade friction has only a slight effect on trade patterns. Without assuming a specific sectoral target, exports of high-impact sectors in China decline on average by 0.03%, which is slightly less than the decline in exports of non-high-impact sectors on average. Table B18 in the Appendix shows sectoral results for China for all scenarios.

Turning to the two scenarios in focus. In the **escalation scenario**, we observe significant disruptions in sectoral trade, with sectors like wearing apparel, textiles, and leather and related products experiencing substantial declines in imports. EU imports of wearing apparel from extra-EU partners, as shown in Figure 4.51, decline by more than 70.6%. High-impact imports from extra-EU countries decline on average by 26%. The higher the reliance of the EU on high-impact imports from high-risk countries, the higher the reduction in imports of high-impact sectors. To cope with the loss of sourcing partners in high-risk countries for high-impact goods, the EU partly sources from low-risk countries and increases its production in sectors such as wearing apparel, textiles, and leather and related products. This increased production primarily stays within the EU, resulting in a decline of more than 10.6% in exports of these sectors for extra-EU trade, while intra-EU trade increases by more than 26.9% (see Tables in the Appendix B). However, this transition towards high-impact sectors is at the expense of unrelated, non-high-impact sectors like

non-ferrous metals, leading to a loss in competitiveness, due to higher costs and increased prices, and a reduction in overall welfare.

Figure 4.51: Sectoral trade effects for the extra-EU trade in targeted and most affected sectors – scenarios for the CSDD in comparison



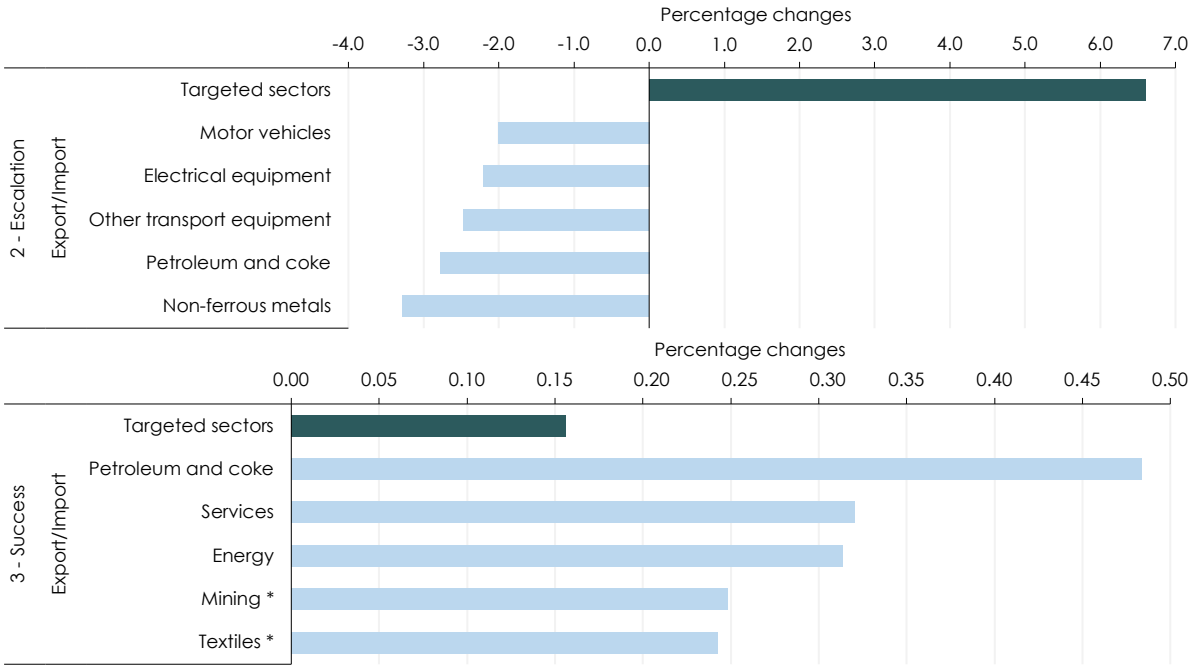
Note: The escalation scenario shows the most negatively affected sectors, while the success scenario shows the most positively affected sectors. The targeted sectors are the high-impact sectors as listed in Table 4.11.
Source: WIFO calculations based on the KITE model.

China, which is heavily impacted due to its large share of high-impact exports to the EU, increases trade in high-impact sectors with other countries with less restrictive regulations regarding human rights, social and economic rights, and environmental protection. However, China experiences an average decline in exports of high-impact sectors by 13.5%, with forestry, wearing apparel, and leather and related products being the most affected. This decline in exports to the EU is partly offset by an increase in exports to non-EU countries. Interestingly, trade in non-high-impact sectors, particularly in services, energy, and pharmaceuticals, gain in importance in Chinese exports and imports from and to the EU.

This sectoral reorientation in trade and production for the EU and China reflects strong dynamics and shifts in production induced by the CSDD. The EU seems to lose its comparative advantage in some capital-intensive sectors while the production and trade of high-impact goods become relatively more attractive for the EU.

In the **success scenario**, imports in all sectors from extra-EU sources increase, particularly in the services sector, which is dominated by imports from India. Figure 4.51 and Figure 4.52 show the most positively affected sectors in the success scenario. Imports of high-impact sectors increase by 0.12% in the extra-EU, suggesting that reduced trade frictions with high-risk countries positively impact trade relationships. This increases both exports and imports of the EU in all sectors, particularly with high-risk countries. Exports to extra-EU countries, especially in sectors like petroleum and coke, non-ferrous metals, textiles and motor vehicles and other transport equipment, increase by more than 0.12%. For intra-EU trade petroleum and coke, services, and energy benefit the most from reduced trade frictions and easier access to important inputs from abroad.

Figure 4.52: Sectoral trade effects for the intra-EU trade in targeted and most affected sectors – scenarios for the CSDD in comparison



Note: The escalation scenario shows the most negatively affected sectors, while the success scenario shows the most positively affected sectors. The targeted sectors are the high-impact sectors as listed in Table 4.11.
Source: WIFO calculations based on the KITE model.

Compared to the implementation scenario, in the success scenario, high-risk countries like China, shift their sectoral trade – albeit much more modestly – more towards exporting services, forestry, and energy, while exports of motor vehicles, chemicals and chemical products, petroleum and coke, sectors in which the EU has a comparative advantage, are slightly reduced. This suggests that cooperation in the implementation of due diligence regulations can lead to mutual benefits, strengthening relationships and access to important inputs from high-risk economies. Furthermore, it can reinforce existing comparative advantages of the EU and thus strengthen the international competitiveness of the EU.

4.6 The EU Regulation on Deforestation-Free Products (EUDR)

Deforestation is a significant and ongoing global challenge. According to the Food and Agriculture Organization of the United Nations (FAO and UNEP, 2020), the world lost about 420 mn hectares of forest between 1990 and 2020. Although rates have slowed, deforestation remains a major environmental threat with profound impacts on climate change, biodiversity and human well-being. According to FAO and UNEP (2020), the annual rate of deforestation between 2015 and 2020 is estimated at 10 mn hectares per year. To safeguard the world's forests and the benefits they provide to society, initiatives such as the EU Deforestation Initiative (DI) and other global efforts to promote sustainable land-use practices are essential.

Agricultural expansion is the main driver of forest loss globally (Pendrill et al., 2019A). The EU is one of the world's largest consumers of agricultural commodities, such as soy, palm oil, and beef, which are linked to deforestation in producer countries. These commodities are used in a wide range of products, from food to cosmetics and biofuels. The EU Regulation on Deforestation-Free Products (EUDR), a major regulatory act of the Deforestation Initiative (DI), aims to address these issues by requiring companies to demonstrate that products sold in the EU are free from deforestation, forest degradation and human rights abuses. The EUDR also recognises that deforestation is a complex and multifaceted problem that requires a comprehensive and coordinated response from all stakeholders. The initiative focuses on three key areas: (1) reducing EU consumption of products linked to deforestation, such as palm oil, soy and beef; (2) promoting sustainable land-use practices and forest management in producer countries; and (3) supporting the restoration and rehabilitation of degraded forests and other ecosystems.

4.6.1 The historical context and implementation steps so far

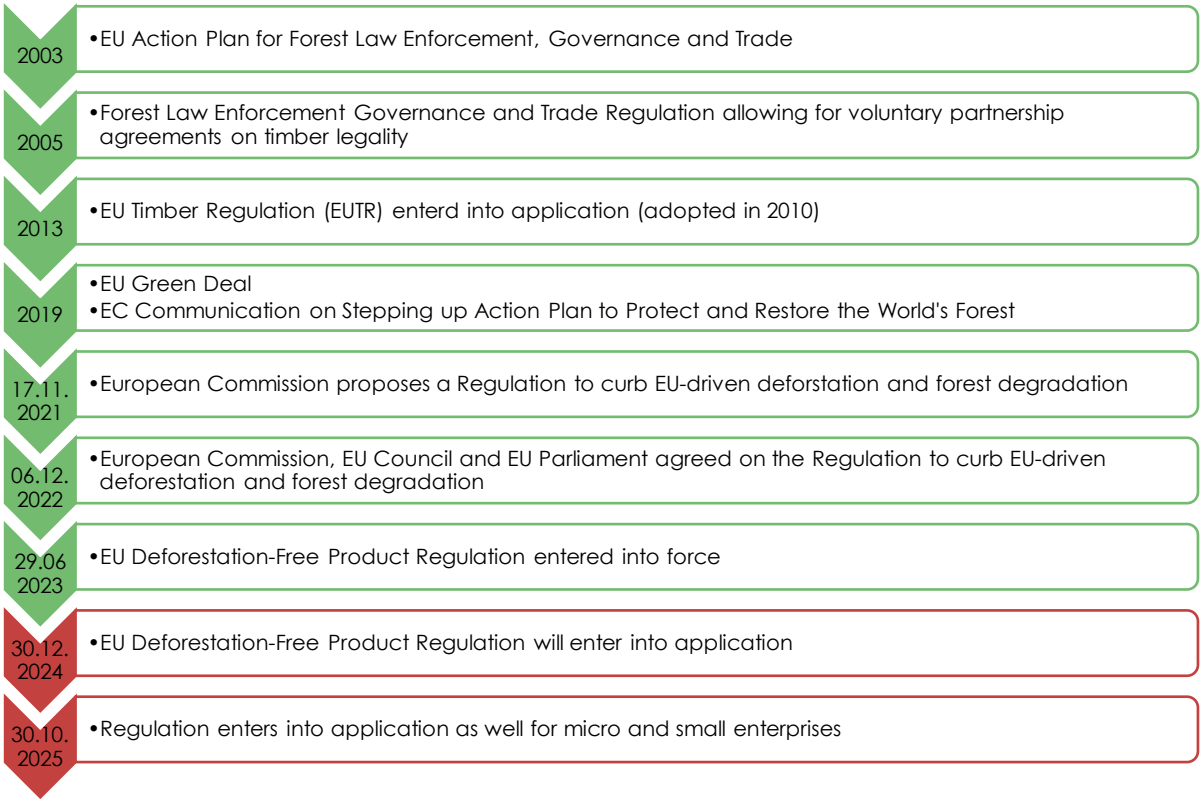
The EU Deforestation Initiative is a comprehensive policy framework to address the environmental, social and economic challenges associated with deforestation in the EU and globally. The DI follows the EU's recognition that stronger action is needed to address deforestation and its negative impacts on ecosystems, climate and welfare. The EU DI was launched in 2019, as part of the EU's broader efforts to promote sustainable land-use practices and combat climate change through the EU Green Deal. In its 2019 Action Plan to protect and restore the world's forests, the European Commission communicated that "the consumption of products from deforestation-free supply chains in the EU should be encouraged both via regulatory and non-regulatory measures, as appropriate" (European Commission, 2022).

The European Commission's proposal for a Regulation on Deforestation-Free Products, pushed by the EU Parliament, followed in late 2021. 12 months later, the Trilogue of EU legislators agreed on the EU Deforestation-Free Products Regulation (EUDR). On April 19, 2023, the EU Parliament voted in favour of the EUDR. The EU Council adopted the EUDR in May 2023. Shortly thereafter, on June 29, 2023, the EUDR entered into force. Operators, producers and traders have 18 months after the entry into force of the EUDR to implement the new rules[56]). Small and micro enterprises have until mid-2025 to adopt the EUDR.

[56]) Thus, the EUDR applies to products (except of timber and timber products) produced on or after June 29, 2023.

The EUDR replaces the EU Timber Regulation (EUTR). Introduced in 2013, the EUTR aimed to prohibit the placing of illegally harvested timber and timber products on the EU Single Market. Under the EUTR, operators placing timber and timber products on the EU market were required to conduct due diligence to verify the legality of their supply chains. The EUTR is based on the principles of Forest Law Enforcement, Governance and Trade (FLEGT), a broader EU initiative to combat illegal logging and promote sustainable forest management. The FLEGT Action Plan, launched in 2003, sets out a comprehensive strategy to tackle the problem of illegal logging and associated trade. Compared to the EUTR, the EUDR expands the scope of forest risk products to other products, from cacao to books, and enlarges the scope of due diligence requirements.

Figure 4.53: A timeline of implementation of the EU Deforestation-Free Product Regulation (EUDR)



Note: Dates as of October 24, 2023.
Source: WIFO presentation.

The EUDR thus builds on the EU's long-standing commitment to protect forests and promote sustainable forest management, which is reflected in a number of policies and programmes, including the EU Forest Strategy and the EU Timber Regulation. The EU DI is based on the principles of sustainable development, which emphasise the need to balance economic, social and environmental considerations in decision-making. The initiative recognises that tackling deforestation requires a shift towards more sustainable land-use practices that support the livelihoods of local communities, promote biodiversity conservation and mitigate the effects of

climate change. Through the EU DI, in particular the EUDR, the EU is demonstrating its leadership in promoting sustainable land-use practices and working towards a more sustainable future for all.

4.6.2 The EUDR in detail

The EUDR is introduced to establish mandatory due diligence requirements for companies placing forest risk commodities on the EU Single Market. The aim is to ensure that products sold in the EU do not contribute to deforestation, forest degradation or human rights abuses. In particular, it aims to reduce deforestation caused by agricultural expansion. In addition to reducing the production and consumption of deforestation-causing commodities in the EU and globally, the EU aims to reduce carbon emissions caused by the consumption and production of the products at risk by at least 32 mn tonnes per year[57]).

The European Commission's proposal included palm oil, beef, soy, coffee, cocoa, and timber as products to be covered by the anti-deforestation rules. During the legislative negotiations with the EU Parliament and Council, the scope of forest-risk commodities was extended to include rubber and other derivatives. In light of the discussion in the EU Parliament and the position of the EU Council, the scope of products is likely to be expanded in the future. Products under consideration include maize, poultry, sheep, goats, swine and related products made from forest risk commodities. The list of products covered will be reviewed and updated on a regular basis. A detailed list of the products covered by the EUDR and the products under consideration for extension can be found in Table A6 in the Appendix.

The EUDR applies to both domestic and imported goods. Both are subject to the same standards, with no country or product generally banned from the EU Single Market. Producers who comply with sustainability and responsible business practices will still be able to place their products on the EU Single Market. Since the EU expects that the demand for deforestation-free products increases in the EU when the EUDR applies, the EU plans to support sustainable business models worldwide. To qualify as a deforestation-free product, the product must be produced on land that has not been subject to deforestation or forest degradation after December 31, 2020. The European Commission is also proposing partnerships similar to the existing FLEGT voluntary partnerships for timber. Similar to the FLEGT voluntary partnerships for timber, these partnerships are intended to help to ensure that sustainable practices are adopted in partner countries around the globe and will promote responsible and sustainable forest management practices[58]).

The EUDR requires companies importing or producing forest risk commodities to conduct due diligence throughout their supply chains to identify and address potential risks of deforestation, forest degradation and human rights abuses. The European Commission's original proposal did not include human rights abuses, but as illegal logging and other activities in forest risk commodities are often linked to human rights abuses, as highlighted by the European Parliament (2022), the adopted EUDR includes the protection of human rights and indigenous peoples'

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[57]) https://environment.ec.europa.eu/topics/forests/deforestation/regulation-deforestation-free-products_en (last accessed April 19, 2023).

[58]) https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_5919 (last accessed April 19, 2023).

rights in the production process. The required due diligence includes conducting risk assessments, implementing mitigation measures, and monitoring and reporting on progress. To comply with the EUDR, companies must submit a declaration to a European information system confirming that they have effectively carried out due diligence and that their products meet EU standards. This declaration must also include critical monitoring information, including the geographical coordinates of the farm or plantation where the raw materials were grown. As a result, only legally produced products that do not cause deforestation or forest degradation, adhere to environmental standards, do not violate human rights and are covered by a due diligence statement can be placed on the EU Single Market. Any company placing a product listed in the EUDR on the EU Single Market must upload its due diligence statement to national authority, by using a designated information system established by the European Commission. By issuing a due diligence declaration, companies take responsibility for the compliance of the product with the EUDR.

The detailed due diligence obligations for each operator, producer and trader will be based on a benchmarking system developed by the European Commission[59]). The benchmarking system will be designed to help assess countries and their respective risk of deforestation and forest degradation caused by the commodity in question. Depending on the benchmark, certain minimum inspection standards will be set for the authorities that will oversee the implementation of the EUDR.

In the event of non-compliance with the EUDR, the company is required to take action to remedy the situation. Penalties, such as fines, product bans, confiscation of goods or products and related revenues, and temporary exclusion from public tenders, will also be applied in the event of non-compliance with the EUDR. The combination of penalties and corrective action requirements, together with the emphasis on sustainable practices, is intended to promote responsible and sustainable trading practices that prioritise environmental and social concerns.

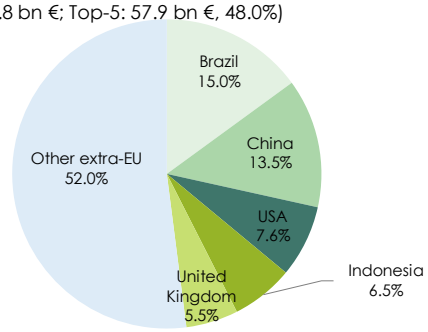
4.6.3 Detailed descriptive data analysis on potential impacts by sector and partner countries and results from the literature

A large proportion of deforestation and associated emissions can be attributed to international trade in raw materials. The EU is closely behind China in terms of the amount of deforestation associated with imports (Pendrill et al., 2019B). Figure 4.54 shows the sources of extra-EU imports. The majority of commodities covered by the EUDR, the so-called "deforestation-free products" covering cattle, cacao, coffee, palm oil, soy, rubber and wood, are imported from Brazil (15.0%). Brazil is particularly an important supplier of cattle, coffee, soya. In the case of soya, Brazil alone accounts for nearly half of EU soya imports. Oil palm is predominantly sourced from Indonesia (42.2%).

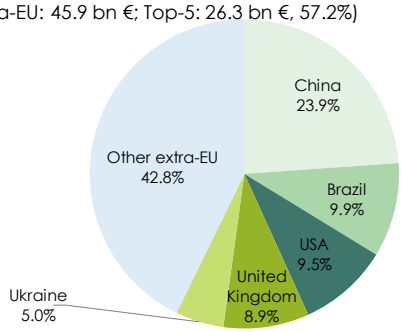
[59]) At the outset, following the initiation of the EUDR, all countries were classified as possessing a "standard" risk. Subsequently, the European Commission will categorise countries and regions as either low or high risk and release this roster no later than 18 months after the EUDR came into force.

Figure 4.54: EU partner of deforestation-free products

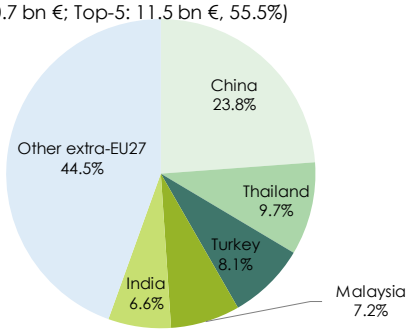
Deforestation
(Extra-EU: 120.8 bn €; Top-5: 57.9 bn €, 48.0%)



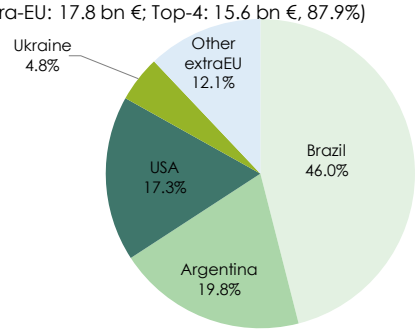
Wood
(Extra-EU: 45.9 bn €; Top-5: 26.3 bn €, 57.2%)



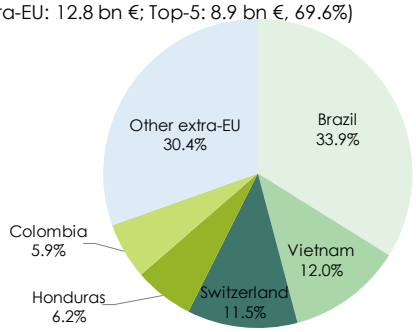
Rubber
(Extra-EU27: 20.7 bn €; Top-5: 11.5 bn €, 55.5%)



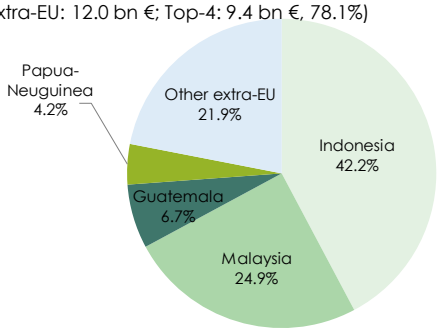
Soya
(Extra-EU: 17.8 bn €; Top-4: 15.6 bn €, 87.9%)



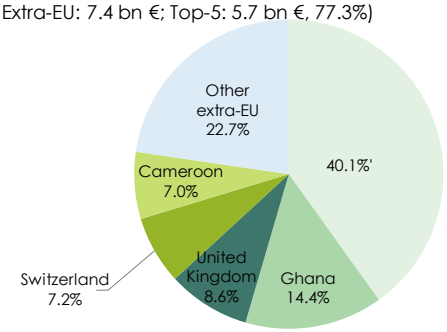
Coffee
(Extra-EU: 12.8 bn €; Top-5: 8.9 bn €, 69.6%)



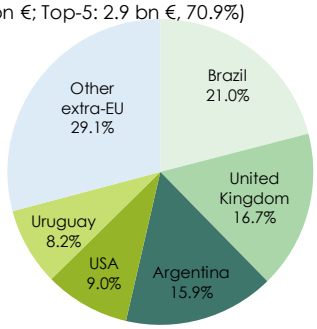
Oil palm
(Extra-EU: 12.0 bn €; Top-4: 9.4 bn €, 78.1%)



Cocoa
(Extra-EU: 7.4 bn €; Top-5: 5.7 bn €, 77.3%)



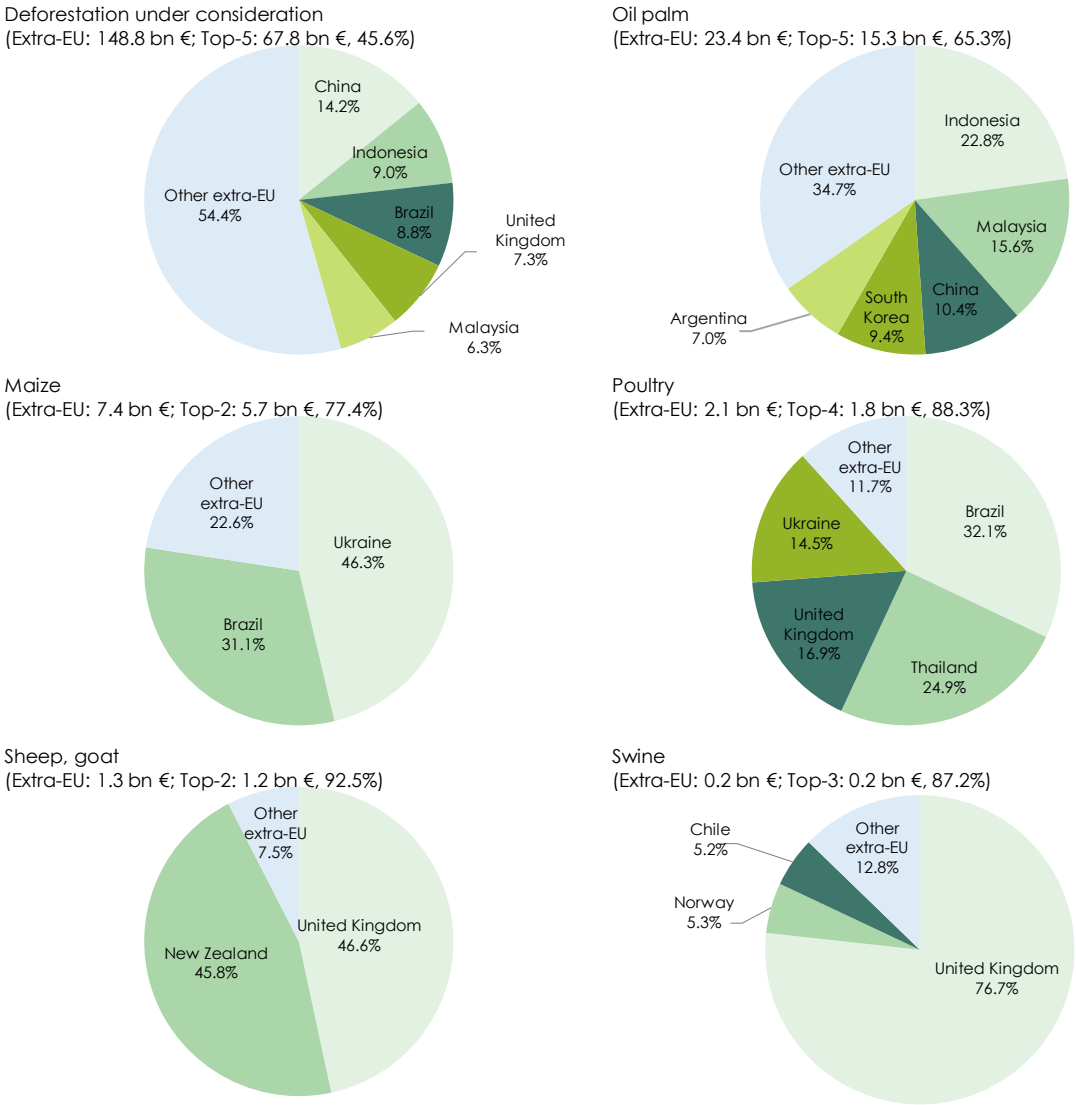
Cattle
(Extra-EU: 4.1 bn €; Top-5: 2.9 bn €, 70.9%)



Note: Import share of extra-EU partner countries in 2022.
Source: European Parliament (https://www.europarl.europa.eu/doceo/document/TA-9-2022-0311_EN.html), Eurostat, WIFO calculations.

Figure 4.55 shows the EU partners for the deforestation-free products under consideration. The extension of the scope of the regulation not only covers more commodities, but also some other products not yet included in the existing commodity categories. This extension also increases the number of potentially affected partner countries. However, for commodities such as sheep and goats or poultry, the volume of extra-EU imports is relatively small and depends on a relatively small number of extra-EU trading partners. Swine are mainly supplied by the United Kingdom (76.7%) and maize is mainly imported from Brazil (31.1%) or the Ukraine (46.3%).

Figure 4.55: EU partner of deforestation-free products under consideration

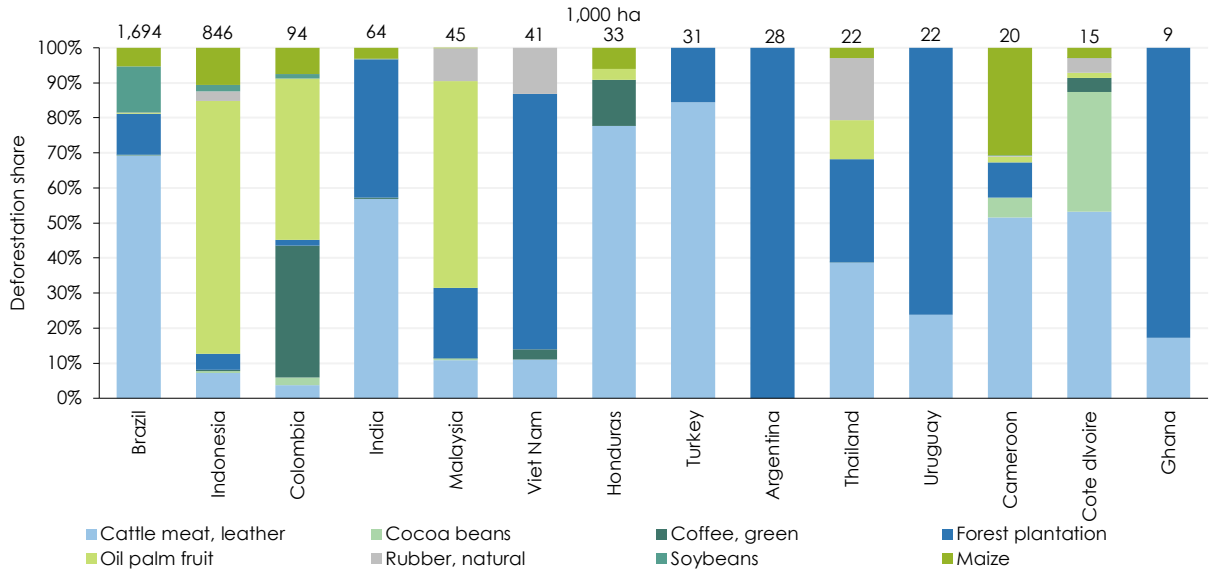


Note: Import share of extra-EU partner countries in 2022.
Source: European Parliament (https://www.europarl.europa.eu/doceo/document/TA-9-2022-0311_EN.html), Eurostat, WIFO calculations.

It is likely that the implementation of the EUDR might lead to changes in trade patterns, as companies that are unable to comply with the due diligence requirements may face market barriers. Such a drop in trade was observed after the implementation of the EUTR (Bosello et al., 2013; Polo et al., 2023). Rougieux and Jonsson (2021) show that import prices of timber in the EU increased while import quantities of tropical hardwood lumber decreased after the EUTR came into force. They suggest that this result is driven by a cessation of illegal timber production and a decline in legal timber production due to the high costs of complying with the due diligence requirements of the EUTR.

The aim of the DI, and the EUDR in particular, is to prevent deforestation and forest degradation. Reducing consumption of deforestation risk products could contribute to this goal. EU imports account for a large share of deforestation in partner countries (Pendrill et al., 2019A, 2019B). In particular, EU imports of beef, leather, timber and palm oil account for a large share of deforestation in partner countries. Figure 4.56 shows the contribution of deforestation-free products and the products proposed for a possible extension to forest loss in important trading partners for the respective goods. Brazil is the country most affected by forest loss. Based on the deforestation estimates of Pendrill et al. (2022), who provide information on deforestation embodied in the production of agricultural and forestry commodities for tropical deforestation, Brazil lost 1,694 th hectares of forest in 2018. Nearly 70% of this forest loss is due to the production of cattle meat and leather in Brazil. Indonesia, the EU's main supplier of palm oil, ranks second in terms of forest loss risk related to forest risk products as defined and discussed by the EU. Nearly three quarters of the total forest loss of 846 th hectares in Indonesia in 2018 can be attributed to palm oil production. Maize, which is not currently included in the EUDR, is also a significant contributor to deforestation in partner countries, particularly in Cameroon and Indonesia.

Figure 4.56: Contribution of selected commodities to forest loss in EU partner countries, 2018



Note: Data for the United Kingdom, the USA, Switzerland, China, Russia, Ukraine and South Korea is not available.
Source: Pendrill et al. (2022).

Pendrill et al. (2019B) show that a reduction in demand for forest-risk commodities, as is the aim of the EUDR, could reduce deforestation and forest degradation not only in the most important EU trading partners, but also globally. They stress that this will require policy interventions such as the implementation of supply chain transparency, certification schemes, and global cooperation. Thus, if due diligence is respected, the EUDR can have a significant positive impact on deforestation and forest degradation in EU trading partner countries and globally by reducing the consumption and production of forest risk goods. The EUTR and similar regulations have proven to improve product standards in timber and product quality (Borsky et al., 2018; Brusselaers and Buysse, 2018).

4.6.4 Quantifying the likely impact of the EUDR – scenarios and empirical specification

Using the KITE model (see chapter 3.2), we estimate the potential impact of the EUDR. As the EUDR is not yet in application, we have to assume that its implementation will have a similar impact as the EUTR, the predecessor of the EUDR (see chapter 4.6.3).

Thus, we first estimate the impact of the EUTR on cross-border timber trade using a structural gravity model. The estimates are based on bilateral trade data from the ITPD-E database for the industries covered by the EUTR, i.e. the forestry industry. The empirical structural gravity model is estimated as outlined in chapter 3.1. The bilateral trade policy measure (BTB_{ijkt-1}) includes an indicator for Preferential Trade Agreements (PTA_{ijkt-1}). Our variable of interest is a bilateral indicator variable whether the cross-border trade is affected by the EUTR. This variable takes on the value 1 from 2013 onwards for products covered by the EUTR. As the ITPD-E trade data does not disaggregate cross-border trade at the product level, it is necessary to impose the EUTR only on the share of products of the forestry industry covered by the EUTR. This way, we estimate the impact of the EUTR only for the products covered by the EUTR. All timber and timber products covered by the EUTR are also included in the EUDR, the EUDR includes even more products made of timber compared to the EUTR. Since the EUDR is more comprehensive than the EUTR, the estimates from the EUTR represent a lower bound for the impact of the EUDR.

Table 4.13: Gravity estimation of the timber regulation

	(1) PPMLHDFE
Preferential Trade Agreement (PTA)	-0.0142
	(0.0263)
EU Timber Regulation (EUTR)	-0.0013***
	(0.0003)
Constant	8.6802***
	(0.0738)
Observations	1,499,778

Note: The gravity models are estimated using the "ppmlhdfe" package of the STATA econometrics software (Correia et al., 2020). Robust standard errors clustered by country-product pairs in parentheses. *, ** and *** indicate statistical significance at the 10%-, 5%- and 1%-level, respectively. Control variables include according to Equation (3.2) distance-border effects, a time trend, exporter-product fixed effects, importer-product fixed effects as well as exporter-importer-product fixed effects.
Source: WIFO calculations.

Table 4.13 shows the results of estimating the gravity model using the Pseudo Poisson Maximum Likelihood estimator. Our estimate of the EUTR reveals a small, but significant negative impact

of the EUTR on cross-border timber trade. On average, the EUTR reduced trade of timber and timber products covered by the EUTR by 0.13%.

Our results are similar in sign to those of Bosello et al. (2013). Bosello et al. (2013) use a computable general equilibrium model to determine the impact of the EUTR. Their simulation, taking direct and indirect effects into account, shows a stronger decrease in international timber trade following the introduction of the EUT, as the regulation leads to an increase in the marginal cost of production.

In a next step, we simulate an **implementation scenario** of the EUDR by imposing the estimated impact of the EUTR on the respective products covered by the EUDR. This simulation allows to estimate the direct and indirect effects of the EUDR. Due to the high aggregation of the industries in the KITE model, we impose the estimated negative impact of the EUTR on the respective industry shares of products covered by the EUDR relative to the whole industry. For example, 71% of all EU forestry imports from Brazil and 19% of all EU imports of rubber and plastic products from China are accounted for by products covered by the EUDR. In the simulation, we implement the EUDR by imposing the EUTR effect only on the respective bilateral industry trade shares of products covered by the EUDR for each of the 65 industries. Further, note, that the scope of the EUDR is more comprehensive than the EUTR, particularly in terms of due diligence requirements, such that our estimates of the potential impact of the EUDR based on the EUTR represent a lower bound of the real effect.

In comparison to this implementation scenario, we simulate the effect of an **extension of the EUDR** to more products. We consider the products that were discussed for inclusion in the EUDR during the negotiation process, i.e. poultry, swine, sheep and goats, and maize and products made from the forest-risk products. Chapter 4.6.3 shows that the inclusion of additional products covered by the EUDR could contribute significantly to reduce global forest degradation and deforestation. For the EUDR extension scenario, we impose the negative impact of the EUTR on the industry trade shares of products covered by the EUDR and considered for extension.

We also evaluate an **escalation scenario** in which products that do not comply with the EUDR are banned from entering the EU Single Market. We therefore impose an import ban on countries where the production of the relevant products poses a risk of deforestation and the likelihood of non-compliance with the due diligence requirements, including human rights. Assuming that more than half of extra-EU trade of deforestation-free products or products made thereof might be affected, we impose a ban on imports from operators from countries supplying together at least 50% of extra-EU imports. Chapter 4.6.3 presents the trade shares of the top EU trading partners for each product group falling under the EUDR. Accordingly,

- wood and products made thereof from China, Brazil, the USA and the United Kingdom,
- rubber and products made thereof from China, Thailand, Turkey, Malaysia and India,
- coffee and products made thereof from Brazil, Vietnam and Switzerland,
- oil palm and products made thereof from Indonesia and Malaysia,
- cacao and products made thereof from Côte d'Ivoire and Ghana,
- soya and products made thereof from Brazil and Argentina, and
- cattle and products made thereof from Brazil, the United Kingdom and Argentina

are banned from entering the EU Single Market in the EUDR escalation scenario.

The outcomes of these three scenarios are measured in terms of deviations from the KITE baseline, reflecting the status-quo in the year 2014 with the EUTR in place. With the implementation of the EUDR, the production costs of products covered by the EUDR as well as trade costs, including the trade frictions imposed by the due diligence requirements, might increase particularly for extra-EU markets.

4.6.5 Trade and welfare effects of the EUDR

This chapter presents the simulation results of the three scenarios as described in the previous chapter. We first discuss the welfare effects and then look in detail at the trade impact of the implementation, extension, and escalation of the EUDR.

Figure 4.57: Welfare effects for Austria, the EU and selected countries – scenarios for the EUDR in comparison

Note: Welfare is measured by the change in real GDP.
Source: WIFO calculations based on the KITE model.

The effect of the three scenarios on welfare is defined by changes in real income. Figure 4.57 depicts the percentage change in welfare for the EU, Austria, the USA, China, Brazil, and Indonesia for the different scenarios. The USA, China, Brazil and Indonesia are among the top countries, from which the EU predominantly sources deforestation-free products as defined by the EUDR (see chapter 4.6.3). Our estimation reveals that the **implementation** of the EUDR has only a relatively small effect on the welfare for the EU and Austria. The loss in real income for the EU amounts to 0.00022% and for Austria to 0.00012%[60]). The small income loss might be driven by higher import prices for deforestation-free products. Producers facing higher restrictions on placing their goods on the EU market could face higher production costs, which could lead to

[60]) This corresponds to an absolute loss in real income of $ 0.5 mn for Austria and $ 33.1 mn for the EU.

higher prices for affected products from third countries. If the implementation of the EUDR is as smooth as the implementation of the EUTR, the welfare loss for third countries will also be relatively small. Countries such as Brazil or Indonesia, which provide a substantial share of deforestation-free products for the EU, may only lose a small fraction of their real income, even if they depend on the exports of products covered by the EUDR. The **extension** of the product coverage of the EUDR, i.e. the inclusion of the products under consideration has a negligible impact on welfare. The inclusion of the products under consideration does not increases the welfare loss substantially for any country[61]). However, if operators in countries do not comply with the EUDR and will be expelled from placing their products on the EU Single Market, this might lead to a substantial decline in welfare, for the EU, including Austria, and the considered countries. Our simulation of such an **escalation** shows a welfare loss of 0.05% for the EU and 0.03% for Austria[62]) if the top trading partners of deforestation-free products fail to comply with the EUDR. Also, the respective partner countries are affected, but to a lesser extent than the EU. Brazil, which experiences a ban for wood, soya, coffee and cattle, shows a welfare loss of around 0.02%. This difference in welfare losses can be attributed to shifts in the sourcing pattern of EU enterprises. EU companies choose to procure goods from markets complying with the EUDR, even if it entails higher production costs.

This adjustment in sourcing patterns is well visible in Figure 4.58, which shows the percentage change in exports and imports for Austria, the EU, the USA, China, Brazil, and Indonesia. The **implementation** and **extension** of the EUDR appear to have only a negligible impact on total trade. Thus, the application of the EUDR does not seem to result in a significant competitive disadvantage for the EU if operators in third countries are able to comply with the regulation. If a substantial share of deforestation-free products is not allowed to enter the EU Single Market, we observe a comparably more substantial reduction in total trade. In the EUDR **escalation** scenario, the EU is estimated to reduce its total exports by around 0.20% to and its imports from all trading partners by around 0.27%. The decline of exports is particularly strong for countries affected by the EUDR, e.g. for Brazil, we estimate a decline by 0.87% in total exports. The decline in exports for the affected countries due to the non-compliance with the EUDR is connected to a lower income for the affected countries, leading to a decline in production and consumption, which is partly represented by the associated decline in total imports. Other markets, which do not have regulations similar to the EUDR, might profit from lower import prices due to excess supply of deforestation-free products banned from the EU Single Market. For such markets total imports could increase, as shown for the USA in the EUDR escalation scenario. Thus, for the EU and Austria, an escalation of the EUDR poses a threat to the competitiveness in terms of total trade. Furthermore, for less developed countries, the high product standards required to comply with the EUDR might jeopardise the integration into international markets and trade-driven development for countries that are heavily reliant on commodity trade or trade in products made from the EUDR covered goods.

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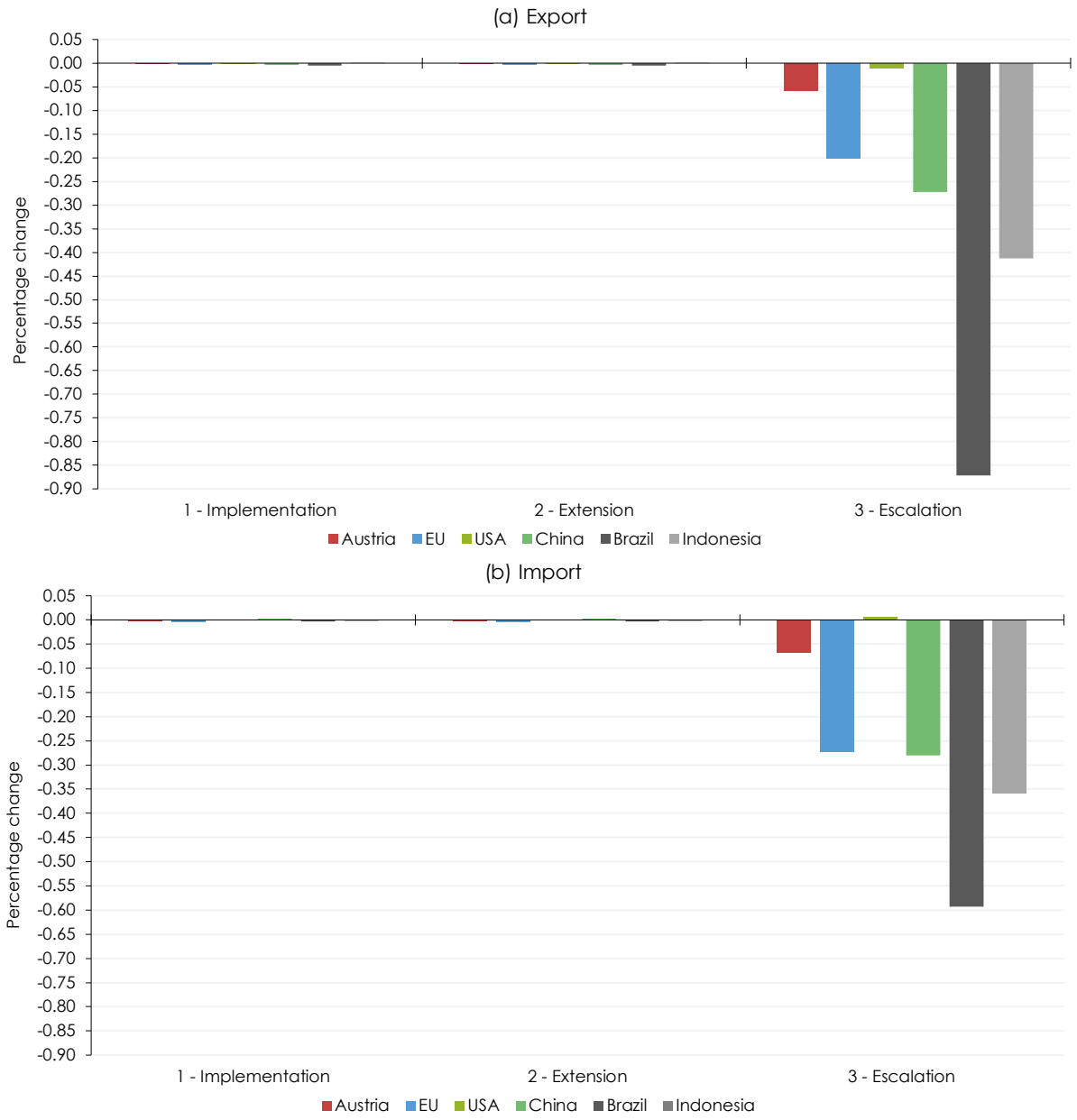
[61]) In absolute terms, Austria loses additionally $ 0.1 mn in real income and the EU loses additionally $ 5.9 mn in real income.

[62]) Measured in absolute changes, real GDP in the EU declines by $ 7.1 bn, whereas Austria's real GDP shrinks by $ 101.0 mn.

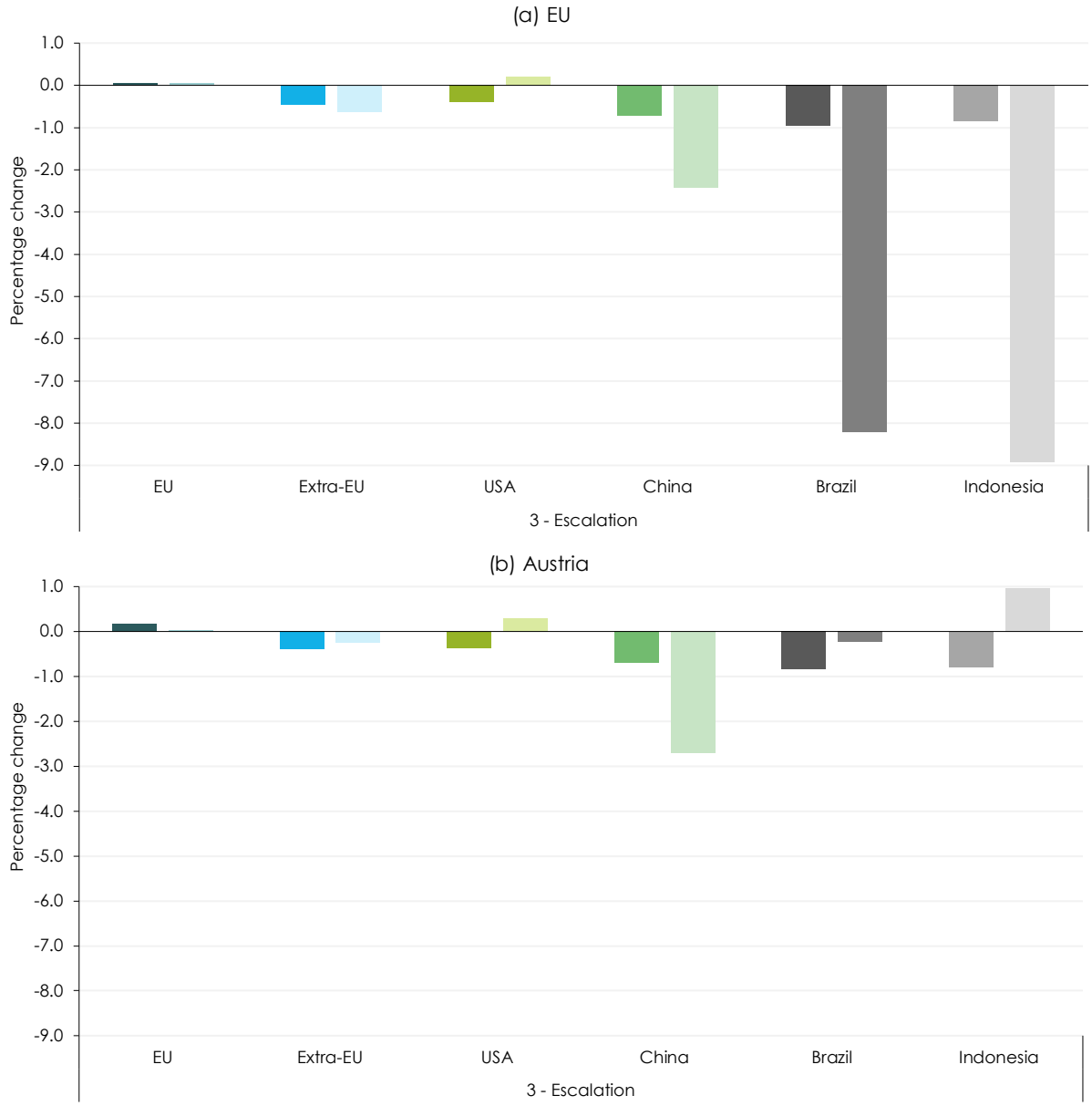
Figure 4.58: Total trade effects for Austria, the EU and selected countries – scenarios for the EUDR in comparison



Source: WIFO calculations based on the KITE model.

The trade diversion effect induced by the EUDR becomes even more evident, when examining the bilateral trade flows of the EU and Austria with the main trading partners and the sectoral composition of the trade flows. For the purpose of this detailed analysis, we concentrate on the EUDR **escalation** scenario, as total trade and welfare effects for the implementation and extension scenarios are small (almost non-existent), and thus negligible. Details of the bilateral trade and sectoral effects of the EUDR implementation and extension scenarios are presented in Figure B2 in the Appendix.

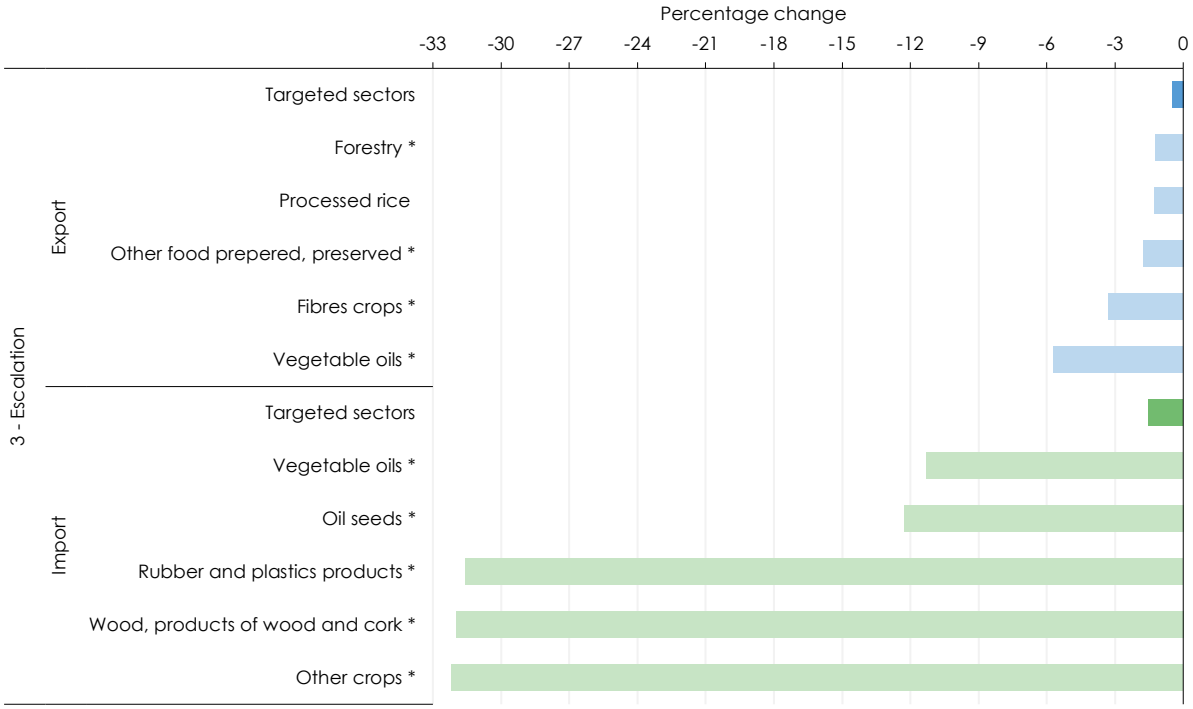
Figure 4.59: Bilateral trade effects for the EU and Austria with selected countries in the escalation scenario of the EUDR



Note: Exports displayed in dark colours and imports in light colours.
Source: WIFO calculations based on the KITE model.

Figure 4.59 illustrates the impact of the EUDR on bilateral trade relations for the EU and Austria, with their main trading partners. For both the EU and Austria, intra- EU exports and imports (represented in dark and light colours, respectively) increase slightly, while extra-EU exports and imports decline. If certain products are prohibited from being sourced from partner countries that do not comply with the EUDR, the EU needs to reorient its trade towards other markets. This reorientation is costly and involves sourcing from both the EU Single Market as well as the USA. Imports from countries severely affected by import bans related to the EUDR, as modelled in our escalation scenario, experience a significant decrease in EU imports. EU imports from Brazil and Indonesia decline by more than 8%. For Austria, however, we observe an increase in imports from Indonesia by 1%. This growth is driven by a reorientation of sourcing. In the escalation scenario, Indonesia faces an EU ban on oil palm, which hurts the Indonesian economy. But since other commodities from Indonesia are not affect by the EUDR or comply with the EUDR, Indonesia is able to offset part of its loss in oil palm exports to the EU by exports of other commodities, particularly to Austria. Hence, countries complying with the EUDR and producing EUDR covered commodities could potentially offset their loss or even benefit from an increase in imports to the EU.

Figure 4.60: Sectoral trade effects for the extra-EU trade in most negatively affected sectors in the escalation scenario of the EUDR



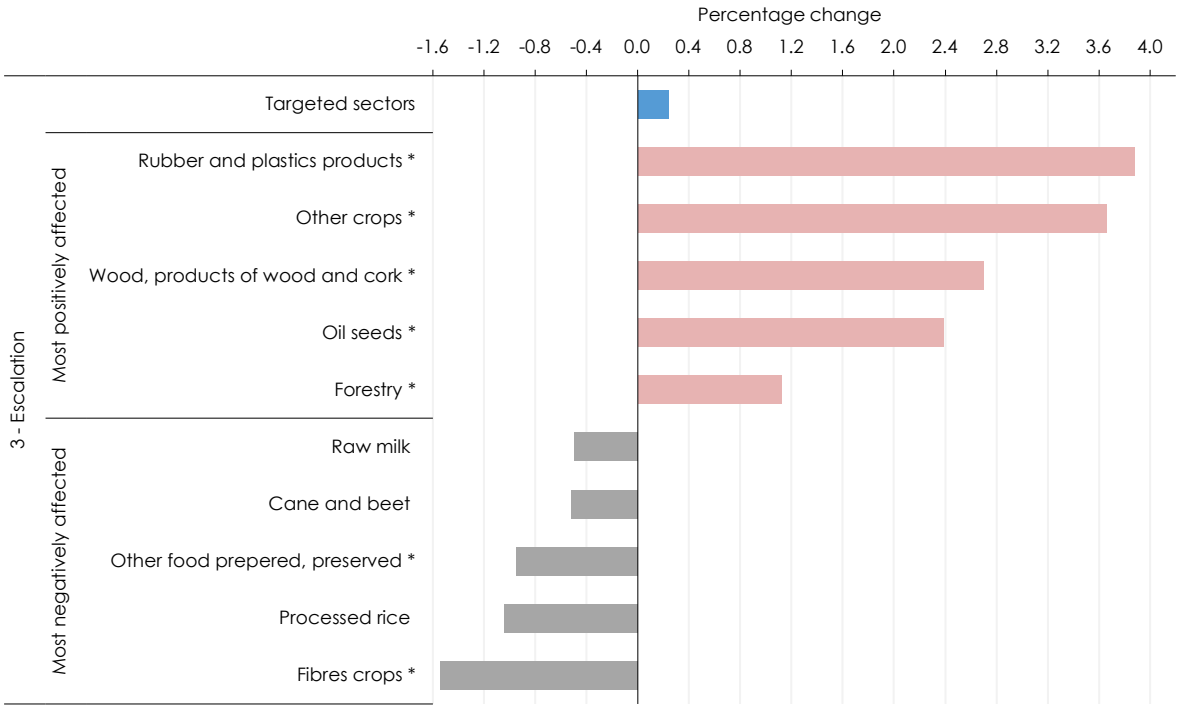
Note: * = sector contains products from the EUDR list. Targeted sectors include all EUDR goods, as specified in the EU Regulation (see Table A6 in the Appendix).
Source: WIFO calculations based on the KITE model.

In addition to imports, export flows are also affected, albeit to a lesser extent. Extra-EU exports decline by 0.47%, which is primarily driven by a decline in exports to the most affected partner countries. Exports from Austria and the EU to China decline by 0.7%, to Brazil by around 0.9%

and to Indonesia by 0.8%. Looking at the sectoral breakdown of the total trade effects for the EU and Austria in the EUDR **escalation** scenario, the sectors most affected are those comprising the targeted deforestation-free products. Figure 4.60 indicates that the targeted sectors lose between 1.5% (imports) and 0.5% (exports) in extra-EU trade relations, while intra-EU trade in targeted products increases by 0.2%. The largest negative impacts can be observed for sectors that are most hit by EUDR and for which the EU displays a relatively high concentration on supplier markets. Particularly the sectors other crops, wood and wood products and rubber and plastics products experience a substantial decline in extra-EU imports of more than 31%. However, these three sectors account, for only 2.5% of total extra-EU imports. Overall, the targeted sectors, account for half of extra-EU imports. Extra-EU exports decline particularly for vegetable oils (-5.7%) and fibres crops (-3.3%).

Figure 4.61 reveals that the decline in the targeted sectors of extra-EU trade is accompanied by an increase in intra-EU trade in the same targeted sectors. Overall, intra-EU trade in targeted sectors increases by 0.2%. In particular, EU Member States trade more in rubber and plastic products (+3.9%), other crops (+3.7%), wood and wood products (+2.7%), and oil seeds (+2.4 among each other. Intra-EU trade declines predominantly in sectors not directly covered or not yet covered by the EUDR (raw milk and sugar cane and sugar beet each -0.5%, processed rice -1.1%) Thus, there is a shift in agricultural trade within the EU Single Market.

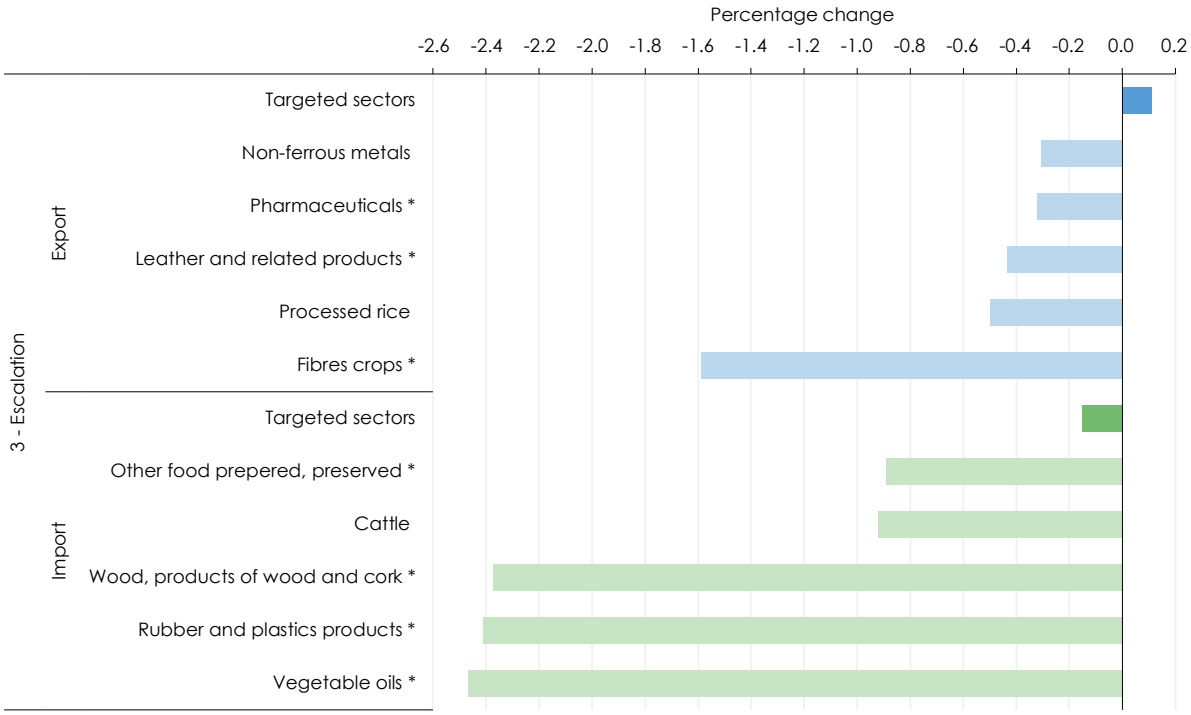
Figure 4.61: Sectoral trade effects of the EUDR for intra-EU trade in most affected sectors in the escalation scenario



Note: * = sector contains products from the EUDR list. Targeted sectors include all EUDR goods, as specified in the EU Regulation (see Table A6 in the Appendix).
Source: WIFO calculations based on the KITE model.

Examining the changes in sectoral trade for Austria, as presented in Figure 4.62, provides comprehensive insight into a single EU Member State. For Austria, we observe that the reorientation of the sourcing pattern from extra-EU to intra-EU trade balances the overall trade effect of the targeted sectors. If major operators of targeted products are banned from entering the EU market, as assumed in the escalation scenario, Austria observes a decline of imports of vegetable oils (-2.5%), rubber and plastic products (-2.4%) and wood, products of wood and cork (-2.4%). To offset the effect of the ban, Austria appears to be increasing production in these sectors at higher costs, resulting in an increase in exports such as vegetable oils, which grow by approximately 6.1%. Exports of fibre crops (-1.6%) and mining (-0.27%) decline in line with sectors heavily reliant on targeted products, such as inputs to pharmaceutical production. The tables in the Appendix B provide a complete list of sectoral results, both for the implementation scenario and the extension scenario.

Figure 4.62: Sectoral trade effects of the EUDR for Austria in most negatively affected sectors in the escalation scenario



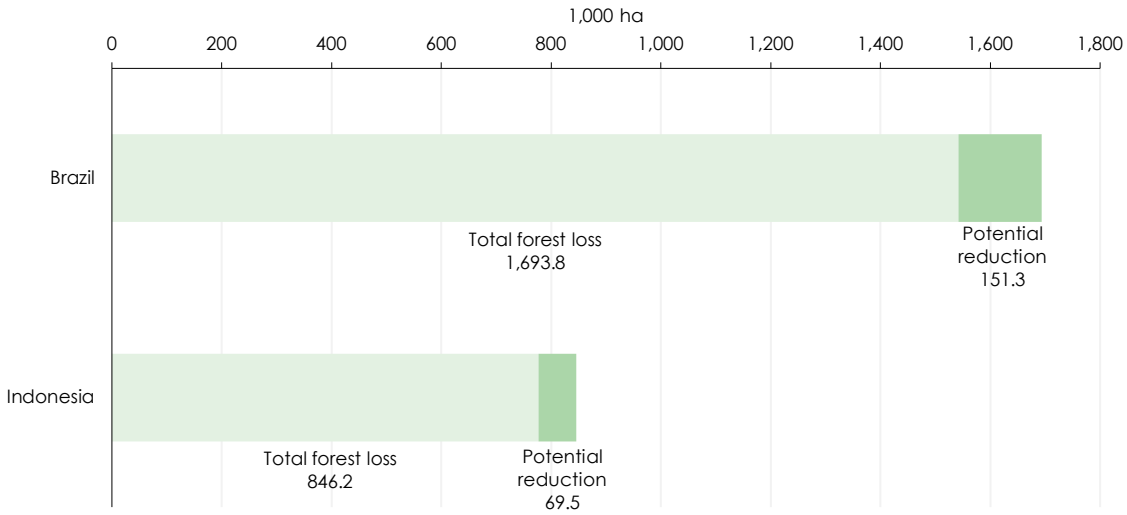
Note: * = sector contains products from the EUDR list. Targeted sectors include all EUDR goods, as specified in the EU Regulation (see Table A6 in the Appendix).
Source: WIFO calculations based on the KITE model.

4.6.6 Environmental effects of the EUDR

The EU is a major consumer of deforestation-free products. As a result of the reduction in bilateral trade as shown in chapter 4.6.5, consumption of deforestation-free products will be reduced. This reduction in bilateral EU trade can be translated into an improvement in the deforestation and forest degradation. Building on Pendrill et al. (2022) and our estimated reduction in bilateral trade, as estimated in the escalation scenario, we can derive the environmental effects of the EUDR. Figure 4.63 shows the impact of the reduction in bilateral trade between

the EU and the two main suppliers of deforestation-free products, Brazil and Indonesia, on forest loss in these two countries. An 8% reduction in bilateral trade between the EU and Brazil has the potential to decrease the attribution of embodied deforestation area in Brazil by more than 151 th ha. For Indonesia, we estimate a reduction in the attribution of embodied deforestation area of more than 69 th ha. Thus, the decline in imports from third countries that supply a major share of deforestation-free products to the EU has the potential to substantially reduce the forest degradation in third countries.

Figure 4.63: Potential of the EUDR to reduce forest loss, 2018



Source: Pendrill et al. (2022). WIFO calculations.

Note that this potential improvement in forest conservation and restoration is based on the escalation scenario. This potential environmental effect is a minimum effect of the EUDR as it only considers the impact of reduced bilateral trade, without taking into account potential improvements from more sustainable land use, as required by due diligence for the deforestation-free commodities. Increased compliance with the EUDR by operators in key trading partners could potentially further increase the positive impact on forest conservation, forest restauration, and sustainable land use.

Without similar environmental regulation to protect forests in other countries, trade diversion to countries with lower deforestation regulations will limit the potential positive impact of the EU on the reduction of forest loss. Considering reductions in total trade induced by the EUDR for Brazil, i.e. taking global trade diversion effects into account, the resulting reduction in forest loss in Brazil is of only 15 th ha, which is a tenth of the original impact. Thus, multilateral corporations are necessary to globally improve sustainable land use, forest conservation and forest restauration.

4.7 Carbon Border Adjustment Mechanism (CBAM)

Reducing greenhouse gas emissions is a cornerstone of current economic and climate policy. Already in 2005, the EU launched the world's first and largest cap-and-trade carbon market, the EU Emission Trading System (ETS)[63]). In course of the 2015 Paris Agreement the scope of carbon pricing initiatives increased continuously to achieve nationally determined contributions and combat climate change. As of April 1, 2023, there are 73 global carbon pricing initiatives in place, including both carbon taxes and ETS[64]). However, existing schemes still only cover 23.2% of global greenhouse gas emissions and only cover carbon emissions emitted within the jurisdictions that run these schemes. Moreover, unilateral policy measures led to varying carbon pricing schemes across countries, increasing the risk of carbon leakage, e.g. the relocation of carbon-intensive production to third countries, and loss of competitiveness at the expense of the most ambitious countries. Currently the risk of carbon leakage in the EU is addressed by free allocation of ETS allowances and financial measures. With a view to further reducing carbon emissions the European Commission has proposed the so-called Carbon Border Adjustment Mechanism (CBAM). Complementing the ETS, it is based on a system of certificates to cover the embedded emissions in products being subsequently imported into the EU.

4.7.1 The historical context and implementation steps so far

In December 2019, the European Commission announced the European Green Deal[65]), which commits the EU to reach carbon neutrality by 2050 and included a commitment to put forward a proposal for a carbon border measure for selected sectors in the "Fit-for-55" package expected in the first half of 2021. The mechanism seeks to ensure that EU's climate objectives are not undermined by shifting carbon-intensive production outside the EU and to level the playing field between European and foreign emitters by imposing a carbon price on imports of certain carbon-intensive goods from outside the EU.

As part of the "Fit-for-55" package[66]) the European Commission presented a proposal for a regulation implementing a CBAM in July 2021. Preparatory work by the Commission included an inception impact assessment and a public consultation in 2020. At the same time, the Parliament's Committee on Environment, Public Health and Food Safety (ENVI) prepared an own initiative report entitled "Towards a WTO-compatible EU carbon border adjustment mechanism"[67]), proposing an extended scope for the scheme, an earlier phase-out of free allowances and a special treatment for least developed countries. Thus, before the Commission published its proposal, the European Parliament set out its positions on CBAM and adopted a resolution on a "WTO-compatible EU carbon border adjustment mechanism"[68]) on March 10, 2021, which

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[63]) https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en.

[64]) A detailed overview offers the World Bank Carbon Pricing Dashboard (https://carbonpricingdashboard.worldbank.org/).

[65]) https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en.

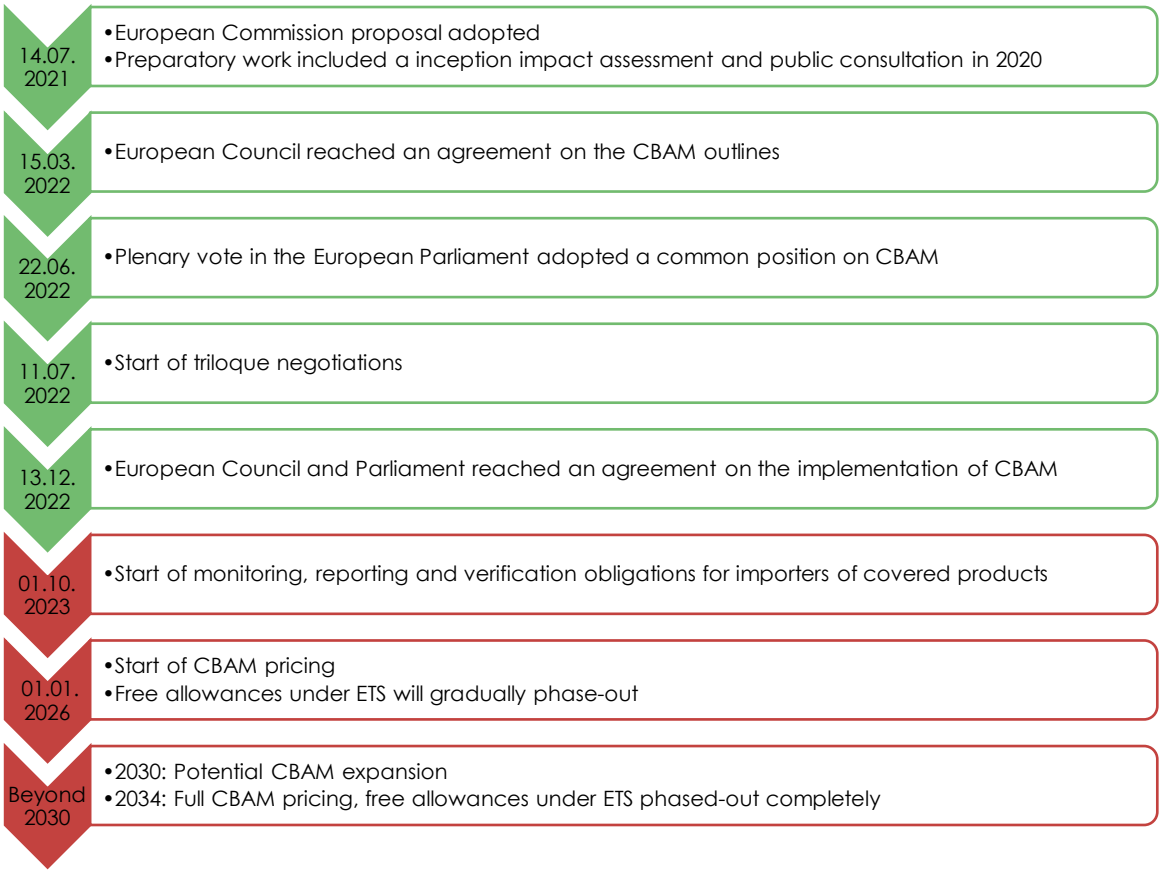
[66]) The "Fit-for-55" package arises as key set of measures from the European Green Deal. One of the main goals of the package is to reduce net greenhouse gas emissions in the EU by at least 55% by 2030, compared to 1990 (https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55-the-eu-plan-for-a-green-transition/).

[67]) https://www.europarl.europa.eu/doceo/document/A-9-2021-0019_EN.html.

[68]) https://www.europarl.europa.eu/doceo/document/TA-9-2021-0071_EN.html.

supports the carbon pricing scheme with the noted amendments as long as it is compatible with WTO rules and prioritises climate rather than protectionist objectives at the forefront.

Figure 4.64: A timeline of implementation of the Carbon Border Adjustment Mechanism (CBAM)



Note: Dates as of October 24, 2023.
Source: WIFO presentation.

On July 14, 2021, the Commission adopted its proposal for a CBAM, which would equalize the carbon price between domestic products and imports in selected sectors. Initially, the first draft considered four policy options for a possible CBAM design: 1) import tax; 2) ETS extension; 3) notional ETS with a separate pool of allowances; 4) consumption tax (excise or VAT type). In terms of compatibility with WTO rules a notional ETS was chosen as preferred option, whereby importers of covered products need to purchase so-called CBAM certificates at a price that mirrors the auctioned price of EU emission allowances under ETS.

On September 9, 2021, the Commission presented the CBAM proposal in the ENVI committee and the ENVI committee adopted its report with the proposed changes on May 17, 2022. On March 15, 2022, the EU Council reached an agreement on the CBAM outlines, introducing minor changes to the initial proposal, while keeping the discussion open upon the termination of free allowances and the compensation for exporter losses in competitiveness.

Introducing substantial changes to the original proposal, the plenary vote in the Parliament has adopted a common position on CBAM and ETS on June 22, 2022. The revised report introduces changes to the Commission's proposed timeline and a gradually phase-out of free allocation in the ETS. Both the Council and the Parliament, suggest the Commission to establish a "Carbon Club" through an alliance of countries which have in place carbon pricing instruments in order to foster the dialogue with EU's trading partners and strengthen international cooperation on climate policy with third countries.

Subsequently, trilogue negotiations started on July 11, 2022, and in December 2022 the EU Council and Parliament reached an agreement on the regulation[69]) and implementation of CBAM[70]). Accordingly, CBAM rules will apply from October 1, 2023, but with a transition period during which importers are limited to report the required CBAM allowances[71]). From January 2026, importers in sectors covered by CBAM will be required to surrender CBAM certificates to cover embedded emissions of their products. In contrast to the original European Commission's proposal, indirect emissions will be addressed. The final agreement also extended the scope of CBAM and will cover iron and steel, cement, aluminium, fertilisers, electricity and hydrogen, as well as some intermediate products and a limited number of downstream products. CBAM is designed to replace the mechanism of free emission allowances under the ETS. To ensure equivalence and non-discrimination between domestic and imported goods the goal is to transfer gradually from a system of free allowances under ETS to a carbon border measure, whereas the border charge on imported goods is closely linked to the carbon pricing policy of the internal market.

With the implementation of CBAM the EU sets a new example in climate leadership and external climate policy. The EU will be the first global actor to adopt a carbon border measure, but the unilateral imposed trade measure for the first time extends the concept of domestic carbon pricing to imports, inducing "territorial extension" under WTO rules. Thus, while CBAM has the potential to accelerate global climate action, it could simultaneously foster new trade disputes and animosity among EU's major trading partners.

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[69]) The "compromise text" was released in January 2023 and needs to be formally approved by both the European Parliament and the Council before being published in the Official Journal of the EU (https://data.consilium.europa.eu/doc/document/ST-16060-2022-INIT/en/pdf). The CBAM regulation officially entered into force the day following its publication in the Official Journal of the EU on May 16, 2023 (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ%3AL%3A2023%3A130%3ATOC).

[70]) The Implementing Regulation (C(2023) 5512 final) was adopted by the European Commission on August 17, 2023. It specifies the reporting obligations, the application rules and the methodology for calculating embedded emissions (https://eur-lex.europa.eu/resource.html?uri=cellar:376830d4-3d05-11ee-aaec-01aa75ed71a1.0022.02/DOC_1&format=PDF).

[71]) A summary including links to all relevant documents is provided by https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en.

4.7.2 The CBAM in detail

CBAM is a mechanism for handling differences in climate ambition and carbon pricing. The main objective of the proposed carbon border measure is to equalize the carbon price paid for products made in the EU under ETS rules and imports. Thereby, CBAM aims to reduce the risk of carbon leakage, level the playing field between EU industries and importers and incentive non-EU countries to increase their climate ambition. To achieve this goal importers of covered products are required to surrender CBAM certificates that reflect the carbon price of the embedded emissions in the covered products that are imported into the EU.

In this way, CBAM works in parallel with the ETS by applying a carbon price to imported goods that is equivalent to the carbon price faced by EU industries under the ETS. While CBAM gradually phases-in, free allocation of ETS allowances will gradually phase-out over a 9-year period, from 2026 till 2034. As specified by the EU reductions to free emission allowances will accelerate over time (measured by the percentage of total allowances to be phased out): 2026 -2.5%, 2027 -5%, 2028 -10%, 2029 -22.5%, 2030 -48.5%, 2031 -61%, 2032 -73.5%, 2033 -86%, 2034 -100%. At the same speed as free allowances under ETS phase-out, CBAM will gradually phase-in (starting in 2026 till full phase-in by 2034). Thus, the mechanism will apply only to the share of emissions that do not benefit from free allowances under the EU ETS in the same industry in a specific year.

Initially, CBAM will apply to the most carbon-intensive sectors: iron and steel, cement, fertilisers, aluminium, electricity, and hydrogen, as well as some intermediate products and a limited number of downstream products related to these industries, such as screws and bolts[72]). Before the end of the transition period, the Commission is required to assess whether further products at risk of carbon leakage, such as organic chemicals, polymers, crude petroleum and petroleum products will extend the scope of coverage with the aim of covering all ETS goods[73]) from 2030 onwards. In terms of geographical coverage, the measure will apply to imports from non-EU countries except countries participating in the ETS, i.e., Iceland, Liechtenstein, Norway or linked to the ETS, i.e., Switzerland. Table 4.14 provides a detailed overview of key design features of CBAM.

[72]) The EU Implementing Regulation (C(2023) 5512 final) clearly identifies in the Annex the targeted products by CN codes (Table A7 in the Appendix, https://eur-lex.europa.eu/resource.html?uri=cellar:376830d4-3d05-11ee-aaec-01aa75ed71a1.0022.02/DOC_2&format=PDF).

[73]) Such as glass, ceramics, lime, pulp, paper, cardboard, acids and bulk organic chemicals.

Table 4.14: Key design features of CBAM

Design features	
Mechanism	Notional ETS; importers of covered goods need to purchase CBAM certificates and surrender these certificates to cover the emissions embedded in the imported CBAM goods.
Trade flows	Imports of covered CBAM goods except for low value shipments and goods moved or used in the context of military activities.
Geographical scope	Imports from all countries, except for countries covered by the ETS (i.e. EEA countries) or fully linked with the ETS (i.e. Switzerland).
Product scope	(1) Cement, (2) electricity, (3) fertilisers, (4) iron and steel, (5) aluminium, and (6) hydrogen as well as some precursors and downstream products.
Emission scope	Embedded emissions cover both direct emissions and indirect emissions of imported CBAM goods and should be determined on actual emissions. If actual emissions cannot be adequately determined embedded emissions are based on default values (average emission intensity, increased by a mark-up).
CBAM charge	The price for CBAM certificates will mirror the weekly average price of emission allowances auctioned under the ETS. Carbon prices paid in the originating country will be deducted.
Free allowances	Over a nine-year period between 2026 and 2034 free allocation of ETS allowances will gradually phase-out as CBAM gradually phases-in.
Use of revenues	Any revenue generated from 2026 onwards will be allocated toward the general EU budget.
Timetable for implementation	2023-2025: transitional reporting-only period; from 2026: full implementation of CBAM, entailing the obligation to purchase and surrender CBAM certificates.

Source: WIFO presentation.

In the interim period, importers of targeted products are required to report embedded emissions on a quarterly basis to the EU. Embedded emissions cover both direct emissions, i.e. emissions resulting from the production processes of imported CBAM products as well as indirect emissions, i.e. emissions associated with the production of electricity, which is a necessary input into the production process of imported CBAM products. Initially, this definition only applies to cement and fertilizers, while for iron and steel, aluminium and hydrogen only direct emissions will be considered (see Table A7 in the Appendix). Direct embedded emissions should be determined by actual emission levels. If emission levels cannot be adequately determined, default values will be used based on the average emission intensity of each exporting country and for each CBAM good, increased by a mark-up.

Once the measure enters into force, authorised importers[74]) need to submit a yearly declaration similar to the declaration report during the transitional period. Hence, they are required to verify the total embedded emissions and to purchase and surrender the corresponding number of CBAM certificates. The price of CBAM certificates will be defined by the weekly average auction price of ETS allowances[75]) expressed in € per tonne of CO_2 emitted, taking into account carbon prices already paid during the production of the imported good. This provides a strong incentive for EU trading partners to introduce carbon pricing in their own markets.

[74]) Before the full implementation of CBAM enters into force, importers need to apply for the status of authorised CBAM declarants. These declarants are required (i) to submit a quarterly CBAM report specifying the quantity of CBAM goods imported to the EU, the total amount of embedded emissions, and the number of corresponding CBAM certificates, (ii) to purchase and (iii) surrender CBAM certificates equal to the total embedded emissions. From January 1, 2026, only authorised CBAM declarants will be able to import CBAM products into the EU.

[75]) Currently the ETS price exceeds 95 € per tonne of CO_2, but the price of CO_2 has risen significantly over the last few years (https://tradingeconomics.com/commodity/carbon).

While CBAM addresses the issues of carbon leakage on the EU market, measures to prevent carbon leakage on exports are missing. Hence, EU exporters raised concerns about their competitiveness abroad, as exporters are also contested by producers from countries with less environmental ambitions. While the current agreement leaves this critical issue on an export rebate pending, the Commission will assess the risk of carbon leakage for EU exports by 2025. Thus, beyond 2030 the measure may be extended regarding the scope of covered CBAM goods, the scope of embedded emissions and EU export competitiveness.

Regarding the role of carbon border adjustments alongside other policy tools to address the problem of leakage and competitiveness, the basic intention of the carbon border measure is to contribute to climate objectives and to encourage partner countries to decarbonize production processes by levelling the playing field in carbon pricing between the EU and third-country producers. Hence, the measure aims to converge global climate actions as agreed in the Paris Agreement in order to reduce greenhouse gas emissions. However, the adoption of a unilateral measure with extraterritorial outreach to adjust for uneven climate policies has raised many controversies. Particularly, the potential use as a kind of trade protectionism, as well as EU's intention to enforce sustainability goals beyond borders by imposing its regulatory power in the area of environmental policy are contentious issues. Furthermore, the complex nature of the measure has reignited a longstanding controversy over its legality and design features.

Introducing carbon pricing on imports immediately impacts EU's major trading partners of CBAM goods, like China, Russia and Turkey (see chapter 4.7.3 for details). Thus, CBAM puts pressure on trading partners to introduce carbon pricing schemes, while third countries may decide to compensate their domestic producers for the additional CBAM cost or pass-on parts of the charge to EU consumers, depending on the bargaining power. Alternatively, some countries will file complaint at the WTO or introduce tit-for-tat actions or other measures to counteract the carbon border mechanism. But CBAM also incorporates a critical feature, as it gives the EU a unique ability to sanction trade policy via financial penalties. Particularly, if importers fail to surrender CBAM certificates and thus, comply with the obligations from the regulation, the EU will apply penalties similar to those applied within the EU in case of infringement of ETS. Hence, the implementation of the border measure is another potential source for trade tensions which evoke the adoption of retaliatory tariffs, that may target similar goods or other goods of economic and political importance.

However, CBAM will not only shield EU industries from carbon leakage but also incentivizes other countries to adopt compatible carbon pricing schemes. The adoption of this measure – the first of this kind – reaffirms EU's role of climate leadership and reveals features to launch a Climate Club, as kind of "coalition of the willing" to govern a closer international cooperation on carbon pricing. As Canada and the United Kingdom[76]) are planning suchlike policies, a multilateral forum for international cooperation on climate policy, as established by the G7[77]), may serve as an open dialogue platform to cooperate on CBAM, facilitate its implementation during the

[76]) According to the Inflation Reduction Act, the USA decided to support decarbonisation and the development of green technologies by offering tax incentives.

[77]) https://www.bmwk.de/Redaktion/EN/Pressemitteilungen/2022/12/20221212-g7-establishes-climate-club.html.

transitional period and ease tensions among EU's major trading partners. Although the USA decided to pursue a distinct strategy to promote the decarbonisation of their economy, policies, such as CBAM, provide the opportunity for the EU and the USA to reinforce the transatlantic alliance by leveraging their market influence to encourage worldwide decarbonisation endeavours.

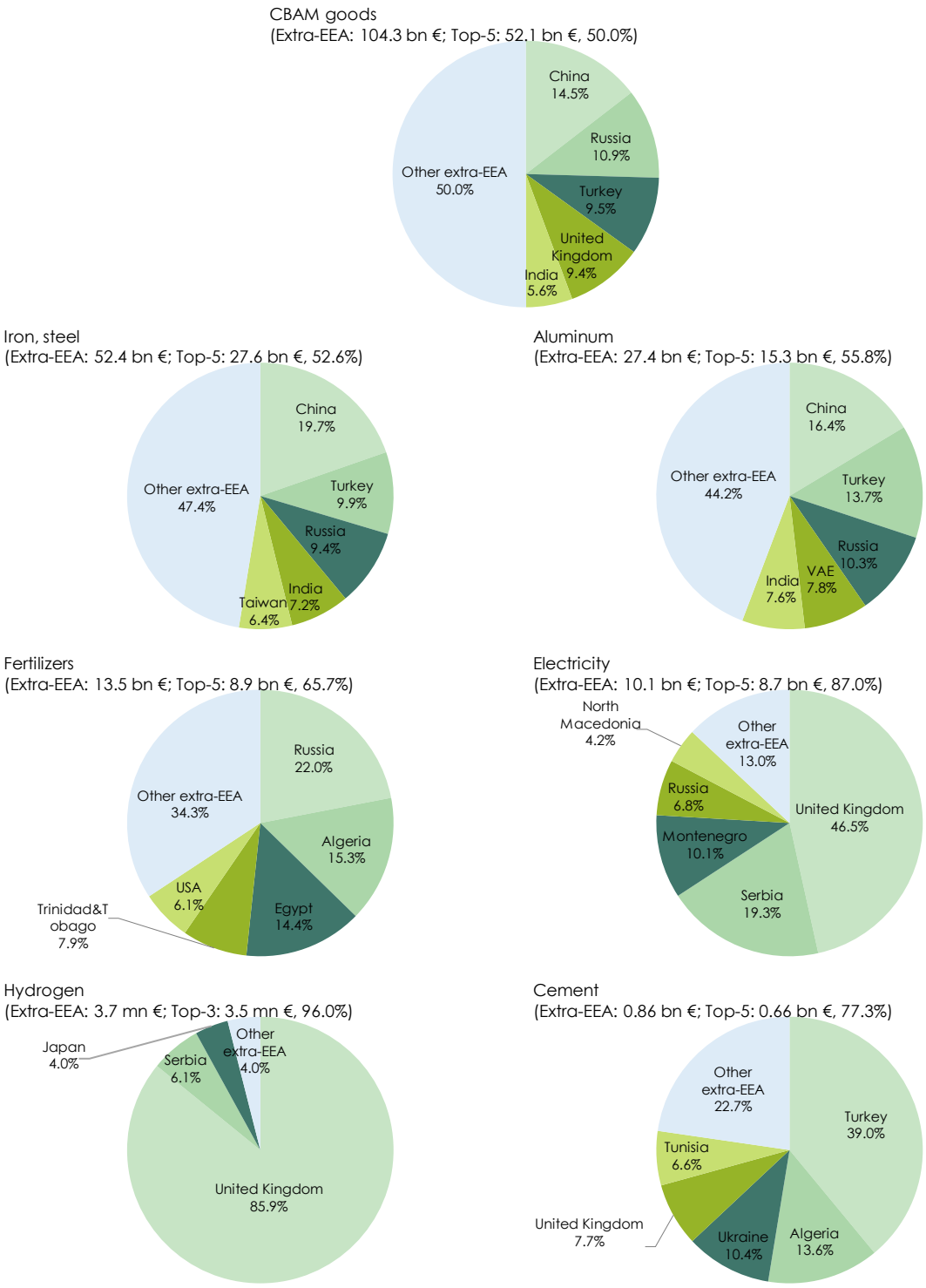
4.7.3 Detailed descriptive data analysis on potential impacts by sector and partner countries and results from the literature

In order to evaluate the potential impact of CBAM of non-EEA countries (not members of the European Economic Area (EEA) and Switzerland), the study analyses the EU imports of targeted CBAM goods from key trading partners for the year 2022. We first look which countries are likely most affected overall, and then gauge at each covered product group in detail, as Figure 4.65 displays.

In 2022, the EU imported CBAM goods in the amount of € 104.3 bn from non-EEA countries, whereby the five most important countries account for € 52.1 bn. In an overall perspective, China is by far the largest provider of CBAM goods to the EU, accounting for 14.5% of total CBAM imports. Over the last 5 years, China has replaced Russia from the first place as Russia's importance has declined due to the Ukraine crisis. However, it should be noted that Russia is the second most significant country, responsible for around 11% of CBAM imports, with Turkey, the United Kingdom, and India following closely behind.

Looking in more detail at the CBAM goods concerned reveals that among the specific product groups EU imports of iron and steel (52.4 bn €) as well as aluminium (27.4 bn €) from non-EEA countries are largest. For both product groups China is the most important supplier, followed by Tukey and Russia, whereby the importance of Turkey as supplier of these goods has increased substantially since 2019 as against Russia. Overall, the top-5 trading partners account for more than 50% of overall imports from non-EEA countries. For fertilisers, Russia is by far the largest exporter to the EU, covering one fifth of EU imports, followed by Algeria (15.3%) and Egypt (14.4%). But also imports from the USA will be subject to CBAM as transatlantic trade ties represent 6.1% of EU fertiliser imports. In terms of electricity, EU imports are highly concentrated among the top-5 trading partners, accounting for 87.0% of total imports form non-EEA countries. With a share of 46.5% the United Kingdom is by far the largest EU supplier, however, exports from the United Kingdom surged only recently and replaced Serbia as top EU supplier, which now ranks second and covers almost 20% of EU extra-EEA imports. Additionally, the EU imports a substantial amount of electricity from Montenegro (10.1%), Russia (6.8%) and North Macedonia (4.2%). In terms of CBAM exposure, the United Kingdom is exceptionally affected by hydrogen supplies as more than 85% of EU imports originate from the United Kingdom in 2022. Serbia (6.1%) and Japan (4.0%), with much smaller shares, also rank among the top three most important hydrogen exporters. These three countries together account for 96.0% of EU imports from non-EEA countries. While EU imports of cement, with a trade volume of € 0.86 bn, are of minor importance, the top-5 suppliers accounting for around 77% of EU extra-EEA imports will be impacted by CBAM. Representing 39.0% of EU cement imports, Turkey is the largest supplier, followed by Algeria (13.6%), Ukraine (10.4%), the United Kingdom (7.7%) and Tunisia (6.6%).

Figure 4.65: Exposure of non-EEA countries to CBAM goods in 2022



Note: Measured by EU extra-EEA imports. For a detailed list of CBAM goods see Table A7 in the Appendix. Non-EEA countries include all countries not part of the European Economic Area (EEA) and Switzerland.
Source: Eurostat, WIFO calculations.

The descriptive analysis of non-EEA countries' trade ties with the EU highlights that many different countries will be affected by CBAM. While the final impact of CBAM depends on the actual level of embedded carbon emissions, the analysis of trade flows shows that the EU represents an important market for some targeted CBAM goods and countries involved. Thus, the exposure to CBAM seems substantial for some country-good combinations and bears the risk of trade tensions. A recent analysis using a multidimensional CBAM Opposition Index based on a combination of various indicators – e.g. trade ties with the EU, carbon intensity, litigiousness in the World Trade Organization (WTO), domestic public opinion on climate change, and capacity for innovation – finds that countries like Iran, Ukraine, the USA, the United Arab Emirates, Egypt, China, India, Kazakhstan, Russia, and Belarus are most likely to mount opposition to CBAM (Overland and Sabyrbekov, 2022). The findings of the study also reveal that CBAM opposition varies across different dimensions. While large countries such as the USA, Russia, China, and India are likely to use the WTO platform to oppose CBAM, resistance in Ukraine, Bosnia and Herzegovina, Serbia, and Vietnam is largely driven by the carbon intensity of their energy supply. Interestingly, the analysis shows that Japan takes a neutral position and therefore, Japan will be an important interlocutor for the EU in implementing CBAM. The analysis by Overland and Sabyrbekov (2022) also indicates that for the viability of the EU's carbon border measure coordination with China and/or the USA as large economies and powerful opponents is essential for a successful implementation.

Given the complex and extensive nature of CBAM, there exists a variety of research on CBAM, addressing different aspects of the measure, such as carbon leakage (Böhringer et al., 2017; Branger and Quirion, 2014), legal compliance with WTO rules (Balistreri et al., 2019), design issues (Cosbey et al., 2019), the ability to induce global climate cooperation (Al Khourdajie and Finus, 2020) and possible impacts for the EU and third countries (Tagliapietra and Wolff, 2021; Bellora and Fontagné, 2022) as well as an overall assessment of the measure (Mehling et al., 2019; Dröge, 2021).

A recent analysis by Bellora and Fontagné (2022) investigates the effectiveness and impact of the EU border adjustment mechanism. While the introduction of a CBAM can significantly reduce carbon leakage, this comes with costs at the EU level. Quantitative findings show that EU GDP will shrink by 1.6% in 2040 compared to the baseline scenario. However, these calculations do not take into account the climate damage that higher emission levels would cause. According to Bellora and Fontagné (2022), exports decrease as EU exporters lose competitiveness on third markets, because emissions are entirely subject to CO_2 pricing, as no rebates for exporters are currently foreseen. Exporters can therefore not invoice the exported goods without tax as in the case of VAT. In addition, the EU ETS price will increase, and EU exporters will further lose competitiveness in the domestic market. The model results also suggest relatively strong effects for third countries. While EFTA countries as well as the United Kingdom would benefit from the introduction, as these countries are also subject to CO_2 pricing and therefore have less adjustment costs, the EU's bilateral trade relations with India and China are particularly negatively affected. This is essential in terms of potential retaliatory measures by third countries and the design of our scenarios (see chapter 4.7.4).

4.7.4 Quantifying the likely impact of the CBAM – Scenarios

The **baseline scenario** mimics the implementation of CBAM as designed by the EU regulation. It will cover the targeted CBAM goods as specified in Table A7 in the Appendix and considers the gradual phase-out of free allowances under ETS by assuming that EU producers and importers face the same carbon price. In the KITE model, targeted CBAM goods bear a CO_2 tax within the EU, while imports to the EU face a CO_2 charge with respect to their embodied carbon emissions. Particularly, given the price development of ETS permits over the last year the scenarios assume a CO_2 price of 100 € per tonne. This scenario assumes that the EU alone introduces such a pricing scheme.

In relation to the baseline scenario, we will further consider two potential scenarios displaying the reaction of trading partners to the introduction of CBAM by the EU: 1) an escalation scenario and 2) a success scenario.

The **escalation scenario** assumes that the introduction of such border adjustment causes trade tensions and leads the affected trading partners to take retorsion measures. The scenario assumes that, as an immediate tit-for-tat action, the trading partners (as represented in Figure 4.65) impose a carbon tariff on imports of targeted CBAM goods from the EU that is equivalent to the carbon price of the EU. The **success scenario**, on the other hand, assumes a successful implementation of the measure that creates an incentive for the trading partners to decarbonize their own industry and adopt similar CO_2 pricing schemes in their own markets. The scenario assumes that countries planning suchlike policies, like the USA, the United Kingdom, Canada and Japan, co-ordinately introduce carbon pricing schemes and border adjustment mechanisms. This mirrors the recent decision of the G7 countries (Canada, France, Germany, Italy, Japan, the United Kingdom, and the USA) to set up an international Climate Club to support decarbonisation and boost international climate ambition and mitigation policies.

We simulate the implementation of CBAM and the two potential scenarios with the KITE model a computable general equilibrium model of the global economy and international trade which also incorporates carbon emissions (see chapter 3.2 for further details). To assess the extent and impact of targeted CBAM goods for EU trade flows by trading partner we consider for each sector concerned the bilateral import share of goods affected by CBAM relative to the total import value of the sector for the year 2022. For this purpose, we translate the respective targeted CBAM goods at the HS level to the GTAP sector classification and use the import shares of the targeted goods as input for the simulations. Specifically, the targeted CBAM goods concern 13 GTAP sectors, e.g. mining, petroleum and coke, chemicals and chemical products, pharmaceuticals, rubber and plastic products, other non-metallic mineral products, iron and steel, non-ferrous metals, fabricated metal products, electrical equipment, machinery and equipment, other manufacturing and electricity. Depending on the import share of targeted goods, the respective GTAP sectors are subject to higher carbon prices. On average, import shares in the concerned GTAP sectors vary between 1.2% and 61.3% at the EU level.

4.7.5 Trade and welfare effects of the CBAM

With the implementation of CBAM the EU seeks to reduce the risk of carbon leakage, level the playing field between EU industries and importers and incentive non-EU countries to increase their climate ambition. However, these ambitious environmental goals of climate mitigation policies induce economic costs, not only in targeted CBAM sectors. Introducing CBAM will increase the price of imports, while EU exporters will lose competitiveness on third country markets by adopting CBAM with no rebate to exporters. Thus, while environmental effects, such as curbing carbon leakage and reducing CO_2 emissions are expected to be positive, macroeconomic effects, such as real income changes, can be negative, especially since external costs of climate change, known as social costs of carbon, are disregarded in this setting. Against this background, we consider three policy scenarios (see chapter 4.7.4 for more details):

- Scenario 1 ("Implementation"): implementation of CBAM by the EU.
- Scenario 2 ("Retaliation"): all trading partners counter CBAM with retaliatory measures on targeted imports from the EU.
- Scenario 3 ("Climate Club"): the EU together with Canada, Japan, the United Kingdom and the USA set up an international Climate Club.

The outcomes of these three scenarios are measured in terms of deviations from the baseline, reflecting the status-quo in the year 2014 with ETS in place. With the implementation of CBAM carbon prices will rise and thus induce higher costs for imports as well higher prices for carbon-intensive production within the EU. This increase in EU production costs translates into a loss of competitiveness on third markets, but at the same time also makes EU domestic production and intra-EU trade more expensive, as compared to the baseline scenario. Across all scenarios we assume that the tax revenues are distributed lump-sum to the consumers.

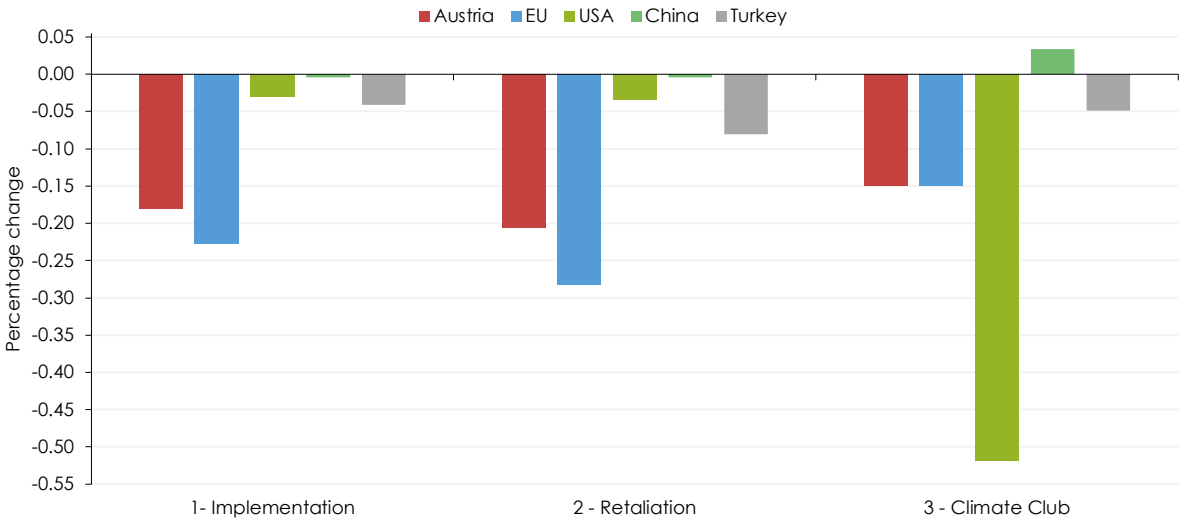
Starting with the macroeconomic impact, Figure 4.66 provides the welfare effects, defined as real income changes, of the EU and Austria across the three scenarios, and in comparison to the results for the USA, China and Turkey. As the results for **scenario 1 ("Implementation")** show the EU decision to implement CBAM uniquely reveals a loss in real income by the EU of 0.23%, while the Austrian economy will lose slightly less (-0.18%)[78]). This mirrors the findings of the literature. As the EU introduces a carbon tax on domestic production EU products become more expensive and less competitive internationally. To avoid carbon leakage the EU "protects" itself against imports of carbon-intensive goods by imposing a tariff on certain CBAM goods. Thus, imports become more expensive and consequently consumers as well as producers pay more for imported goods or intermediates and hence, experience welfare losses.

Looking at the economic outcome of third countries reveals almost negligible negative welfare effects. In particular, real income in the USA is expected to decrease only slightly by 0.03%, while welfare in China remains almost unchanged. Similarly, Turkey experiences a negligible welfare loss of 0.04%. Thus, as expected introducing more ambitious climate goals comes at economic costs, especially for the EU imposing higher carbon prices. But at the same time

[78]) This corresponds to an absolute change in real income of $ 765.1 mn for Austria and $ 34.6 bn for the EU.

external costs of climate change related to extreme weather situations, such as droughts and floods, which become more likely, are not considered in this model setting.

Figure 4.66: Welfare effects for Austria, the EU and selected countries – scenarios for the CBAM in comparison



Note: Welfare is measured by the change in real GDP.
Source: WIFO calculations based on the KITE model.

Assuming that the implementation of CBAM by the EU will be reacted with retaliation measures by all trading partners reveals more severe welfare effects for (almost) all countries due to the knock-on impact of these countermeasures. In particular, under **scenario 2 ("Retaliation")** EU welfare falls by 0.28% (compared to -0.23% under scenario 1), whereas real income in Austria declines by 0.21% (-0.18% in scenario 1)[79]- However, the effects are now also significantly more negative for Turkey (-0.08% as compared to -0.04%), while real income hardly changes in the USA (-0.03%) and China (0.00%) in response to the countermeasures. Hence, countering CBAM by employing retaliation measures is also costly for the imposing countries but given the economic size of China and the USA and their trade ties with other non-EU countries makes them less vulnerable.

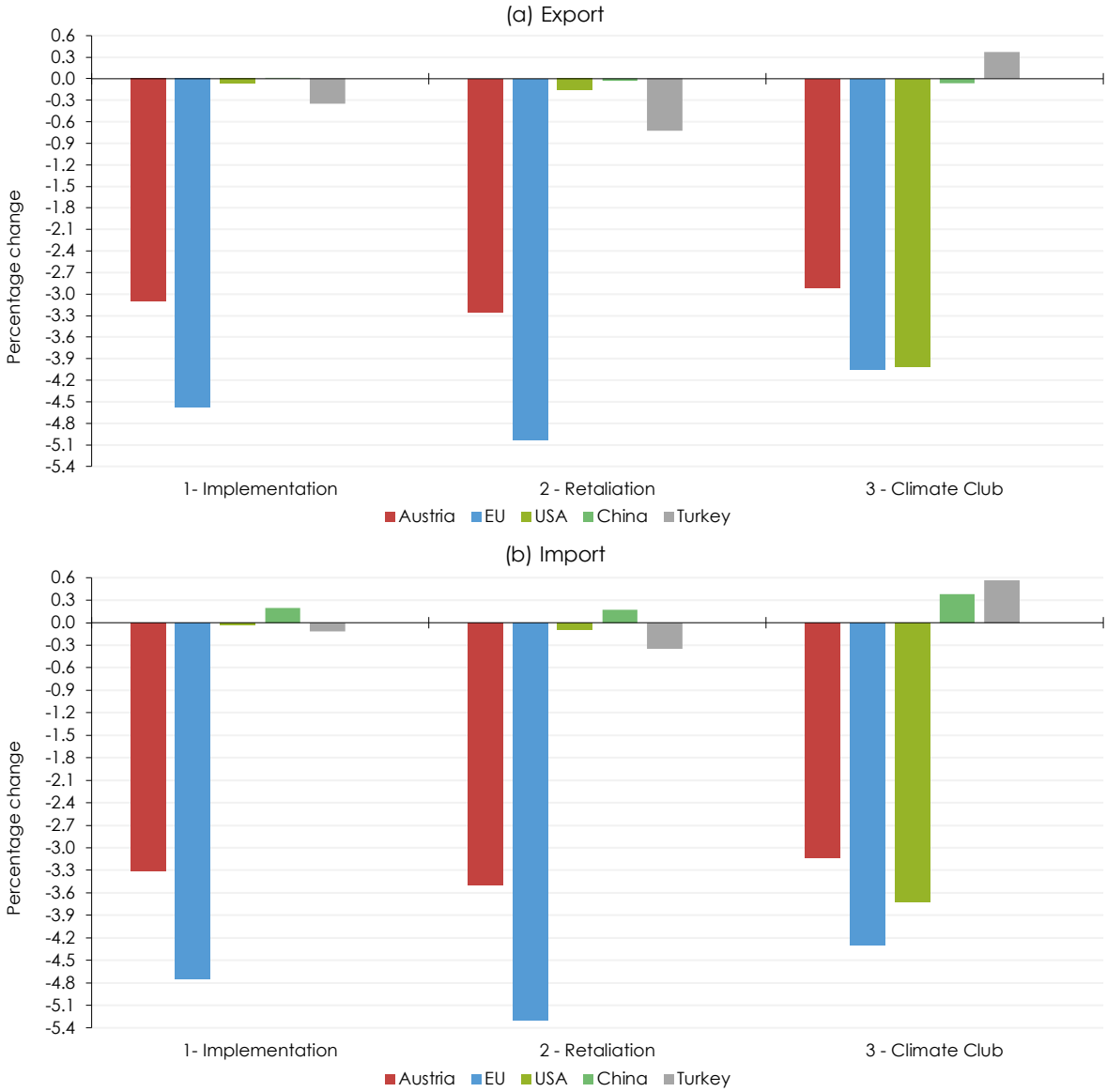
Our success scenario assumes that the G7 countries together with the EU set up an international Climate Club and co-ordinately introduce carbon pricing schemes and a border adjustment mechanism. This joint approach of the most important industrialised countries results in the lowest welfare losses for the EU and Austria. Under **scenario 3 ("Climate Club")**, the welfare effects for both, the EU and Austria, amount to -0.15%[80]), as trading partners, like the USA, now face similar carbon pricing schemes and competitive disadvantages of EU production are mitigated. However, as the USA introduce a carbon tax on domestic production and a tariff on

[79]) Measured in absolute changes, real GDP in Austria declines by $ 877.6 mn, whereas EU real GDP shrinks by $ 43.0 bn.

[80]) This corresponds to an absolute change in real income of $ 636.1 mn for Austria and $ 22.7 bn for the EU.

imports, as proposed by CBAM, the economy now faces significant welfare losses (-0.52%)[81]) as it is less competitive internationally. In contrast, for countries not part of the Climate Club, such as China and Turkey, the real income changes are negligible (China: +0.03%; Turkey: -0.05%).

Figure 4.67: Total trade effects for Austria, the EU and selected countries – scenarios for the CBAM in comparison



Source: WIFO calculations based on the KITE model.

[81]) Measured in absolute changes, real GDP in the USA declines by $ 108.7 bn.

As the EU uniquely introduces a border adjustment mechanism trade patterns will adjust in response to higher carbon prices paid for imports to the EU. Subsequently, CBAM will shift trade shares away from the EU, thereby changing global trade patterns between the EU, the USA and China. These adjustments are also supported by our results for total trade, as Figure 4.67 shows. Since CBAM targets EU imports from third countries, trade effects are more severe for imports than for exports. Under **scenario 1 ("Implementation")** EU imports shrink by 4.76%, while EU exports decline by 4.58%. As Austria's trade relations are strongly intertwined with the EU Single Market, total trade effects for Austria are slightly less affected. Particularly, imports and exports decline by 3.31% and 3.10%, respectively. While the EU loses trade shares, total trade effects for EU's important trading partners are heterogenous. Besides Turkey (export -0.35%, import -0.11%), which experiences the greatest exposure to CBAM (see chapter 4.7.3), total trade for the USA (export -0.07%, import -0.04%) is deteriorating slightly. In contrast, trade patterns of China seem hardly affected and even indicate a minor gain in trade shares (export +0.01%, import +0.19%).

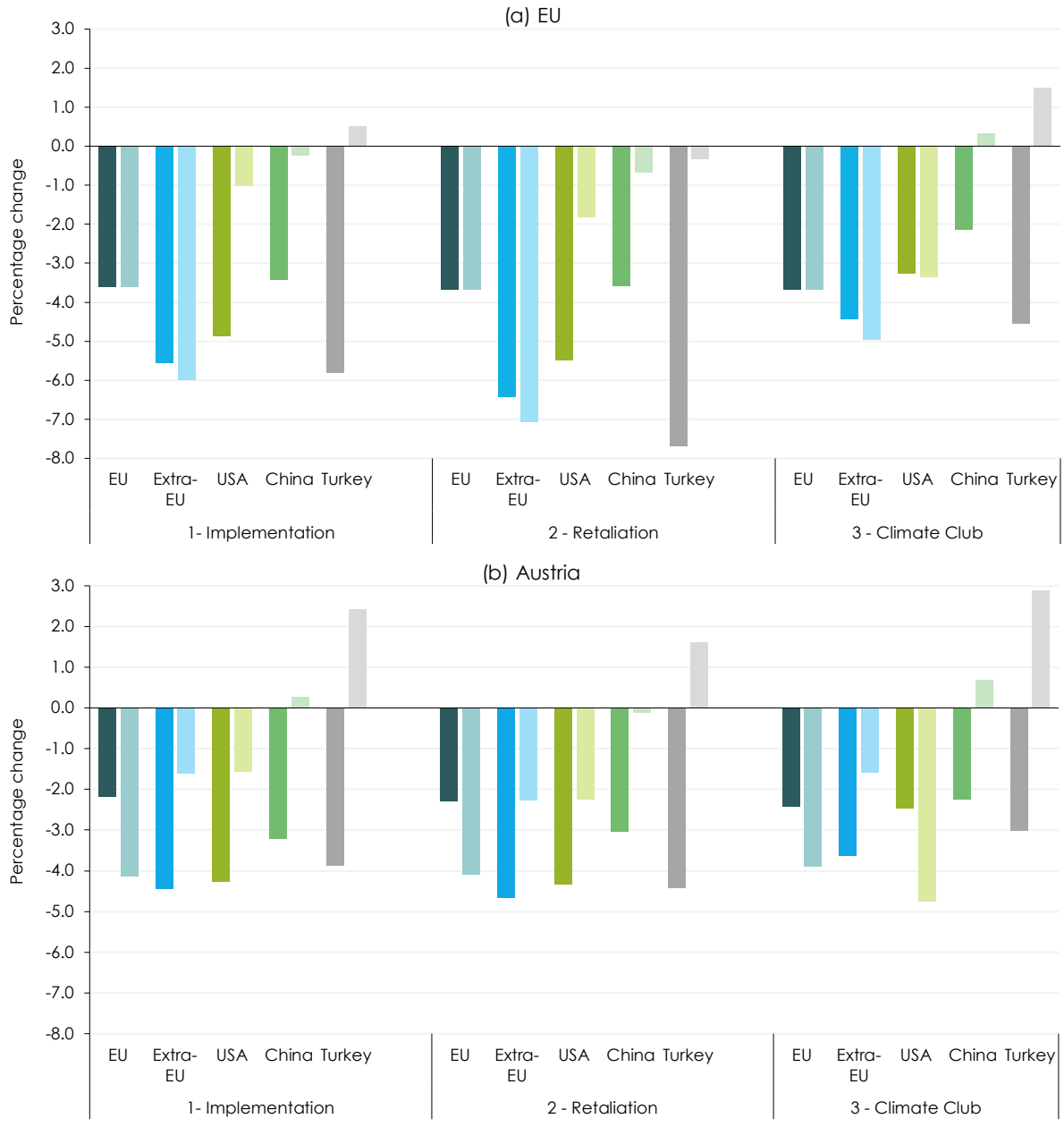
Imposing retaliatory measures reinforces the negative trade impact for all countries. In specific, under **scenario 2 ("Retaliation")** total trade of the EU (export -5.03%; import -5.30%) and Austria (export -3.25%; import -3.50%) suffers significant losses (see Figure 4.67). However, also total trade for the most important partner countries (Turkey, USA, China) deteriorates, as compared to scenario 1. Thus, our findings support the fact, that imposing countermeasures amplifies trade diversion effects, which also hurts the imposing countries. Given the high exposure to CBAM goods, especially trade flows of Turkey are hit substantially.

Since competitive disadvantages of the EU are mitigated under **scenario 3 ("Climate Club")** total trade of the EU and Austria improves slightly, as compared to scenario 1. However, as the USA face higher carbon prices and lose competitiveness on third markets, US exports and imports decline significantly by 4.01% and 3.73%, respectively. Consequently, trade shares of the Climate Club countries decrease at the expense of countries not part of the Climate Club. In particular, total trade for Turkey expands slightly (exports 0.37%; imports 0.56%), whereas Chinese total trade changes are negligible and point to opposite directions (exports -0.07%; imports 0.38%).

A closer look at the bilateral trade effects of the EU and Austria with most important trading partners supports the overall trade diversion effects for the EU in detail. As Figure 4.68 illustrates, EU exports to (dark colour) and EU imports from (light colour) the respective trading partners decrease substantially. In line with our expectations, splitting EU total trade into trade relations with third parties and trade ties among EU Member States reveals that extra-EU trade patterns are more affected by trade diversion than intra-EU trade relations. In particular, under **scenario 1 ("Implementation")** EU imports from third countries shrink by 6.0%, EU exports to third countries decline by 5.6%. However, also a reorientation on the EU market is more costly given higher CO_2 prices and thus reduces intra-EU trade by 3.6%. Looking at EU's bilateral trade relations with Turkey, the USA and China indicates that exports are hit harder than imports, as the EU becomes less competitive internationally. In particular, EU exports to Turkey decrease by 5.8%, those to the USA by 4.9% and to China by 3.4%. Turning to EU imports reveals, that imports from the USA are hit hardest (-1.0%), while supplies from China remain almost constant (-0.2%). Interestingly, EU's imports from Turkey increase slightly (+0.5%). This positive result is mainly driven by

services imports. Looking at bilateral trade effects without services (bilateral trade effects excluding services are not reported in this study but are available upon request) illustrates that EU imports from Turkey decrease by 1.4%, at the same time imports from the USA and China also decline more strongly if services trade is excluded.

Figure 4.68: Bilateral trade effects for the EU and Austria with selected countries – scenarios for the CBAM in comparison



Note: Exports displayed in dark colours and imports in light colours.
Source: WIFO calculations based on the KITE model.

Turning to the bilateral trade effects of Austria shows a similar picture, even though the findings stress the strong ties with EU countries. Especially, imports from the EU (-4.1%) and exports to third countries (-4.5%) are hit hardest by CBAM. In contrast, exports to other EU countries decline by 2.2%, while imports from third countries shrink by 1.6%. Given the importance of the USA as target market, Austrian exports to the USA decline most strongly (-4.3%), followed by exports to Turkey (-3.9%) and China (-3.2%). Also imports from the USA decrease by 1.6%, while imports from Turkey (2.4%) and China (0.3%) increase slightly, due to services imports. Bilateral imports excluding services show clearly negative effects.

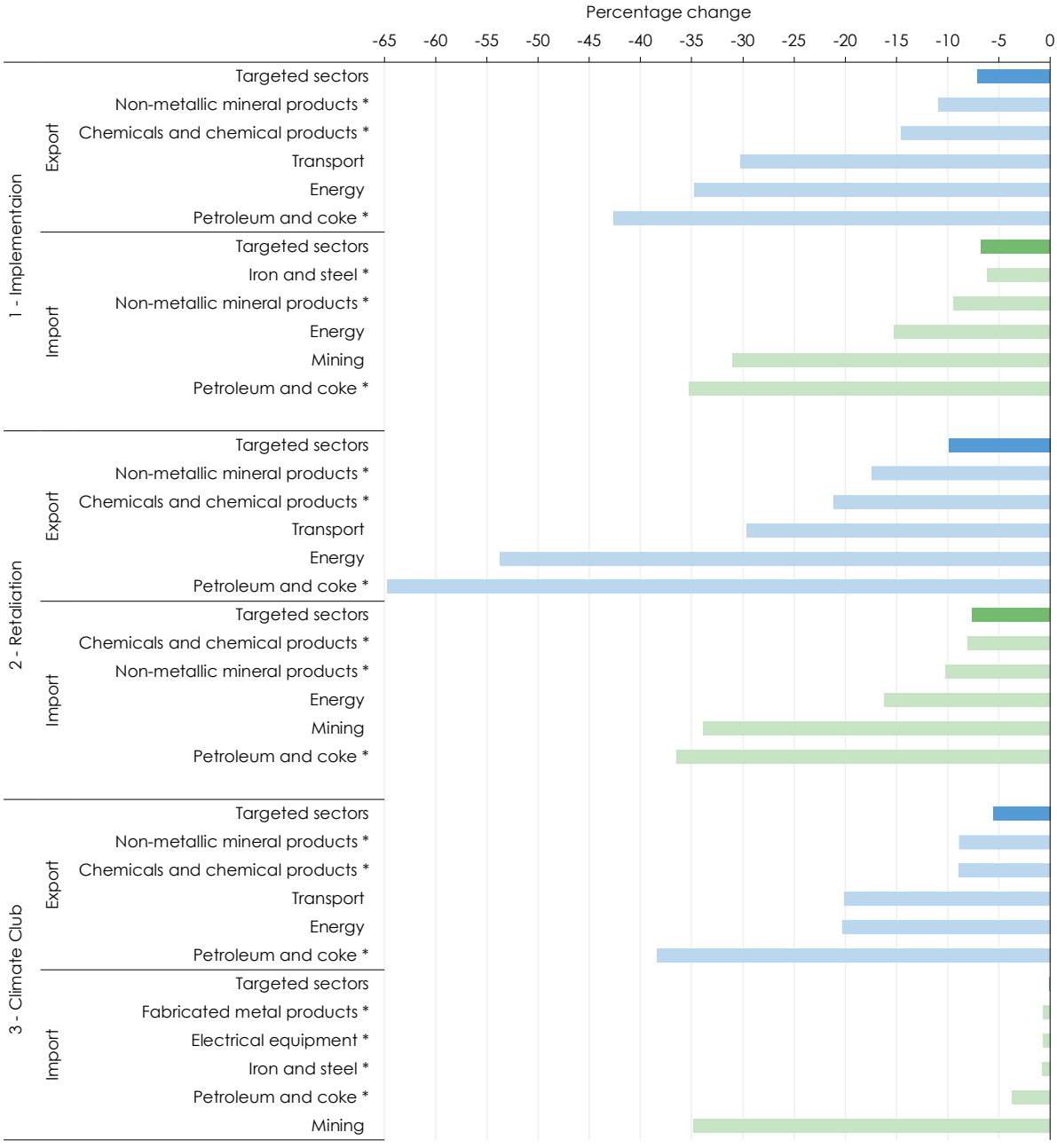
Looking at the bilateral trade changes under **scenario 2 ("Retaliation")** reveals that, as expected, countermeasures predominantly affect EU trade with third countries (exports -6.4%; imports -7.1%), whereas intra-EU trade experiences hardly any changes (-3.7%), as compared to scenario 1. In particular, EU imports from Turkey, the USA and China are now showing much steeper declines. As the trading partners impose a tariff on imports from the EU, EU exports to these markets decline more strongly, especially trade flows with Turkey are affected severely in scenario 2 (export -7.7%; import -0.3%). The picture is similar for Austria's bilateral trade relations. Hence, trade relations with third countries deteriorate severely due to the countermeasures, although the negative knock-on effects of the countermeasures are not as pronounced as at the EU level. A possible explanation for this is that Austria's foreign trade is very strongly oriented toward the Single Market.

Under **scenario 3 ("Climate Club")** extra-EU trade flows to the most important trading partners (USA, Turkey, China) improve and turn less negative as compared to scenario 1, as the EU is not uniquely imposing CBAM. However, EU exports to third countries still decline by 4.4%, while imports shrink by 5.0%. In comparison to scenario 1, EU exports to the USA become more competitive and improve significantly (-3.3%), while imports get more expensive and decrease even stronger by 3.4%. Interestingly, EU's imports from Turkey and China increase (+1.5%; +0.3%). This positive result is again mainly driven by services imports (bilateral trade effects excluding services are not reported in this study but are available upon request). Looking at bilateral trade effects without services illustrates that EU imports from Turkey and China remain almost constant. Looking at the bilateral trade flows for Austria reveals similar findings as at the EU level and confirms that exports to third countries improve in course of the joint carbon pricing approach. Especially exports to the USA become more competitive, but still decline by 2.5%. In contrast, imports from the USA decrease by 4.8%, while imports from Turkey (+2.9%) and China (+0.7%) expand, but again a large part of the gain is attributable to services imports.

Turning to the sectoral breakdown of the trade effects for the EU and Austria reveals significant differences across sectors. In particular, the sectors concerned by CBAM (as specified in the EU Regulation, see Table A7 in the Appendix) are exposed to higher carbon prices, and thereby mostly affected by trade diversion effects. Overall, targeted sectors in extra-EU trade relations lose between 7.1% (exports) and 6.7% (imports) under **scenario 1 ("Implementation"),** while intra-EU trade in targeted sectors shrinks by 5.4%. However, some specific sectors are affected significantly above average, as Figure 4.69 for extra-EU trade and Figure 4.70 for intra-EU trade displays. As our modelling results show (see Tables in the Appendix B for a complete list of sectoral results) the largest sectoral impacts occur in the sectors directly targeted by CBAM, such

as petroleum and coke, chemicals, non-metallic mineral products or iron and steel. However, also other energy-intensive sectors, like mining, transport or energy are strongly impacted by CBAM, even though these sectors make up only smaller parts of the EU's total trade value.

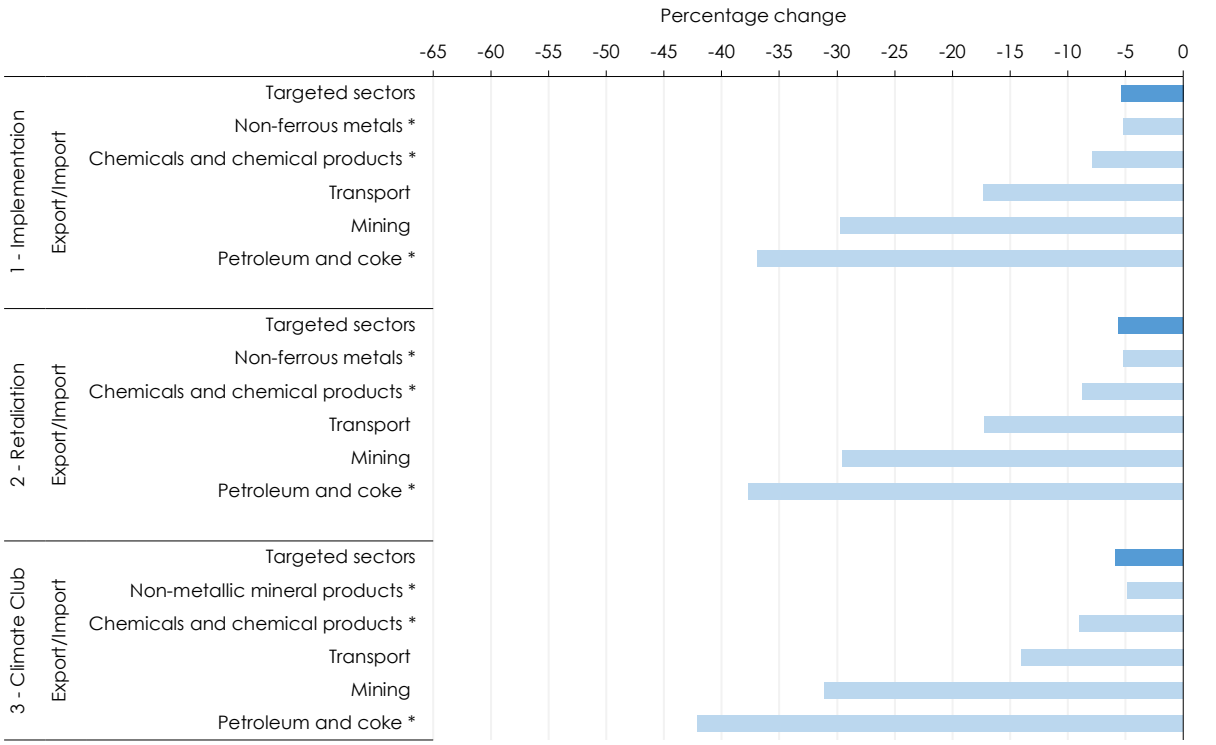
Figure 4.69: Sectoral trade effects of CBAM for the extra-EU in most negatively affected sectors across three scenarios



Note: * = sector contains products from the CBAM list. Targeted sectors include all CBAM goods, as specified in the EU Regulation (see Table A7 in the Appendix).
Source: WIFO calculations based on the KITE model.

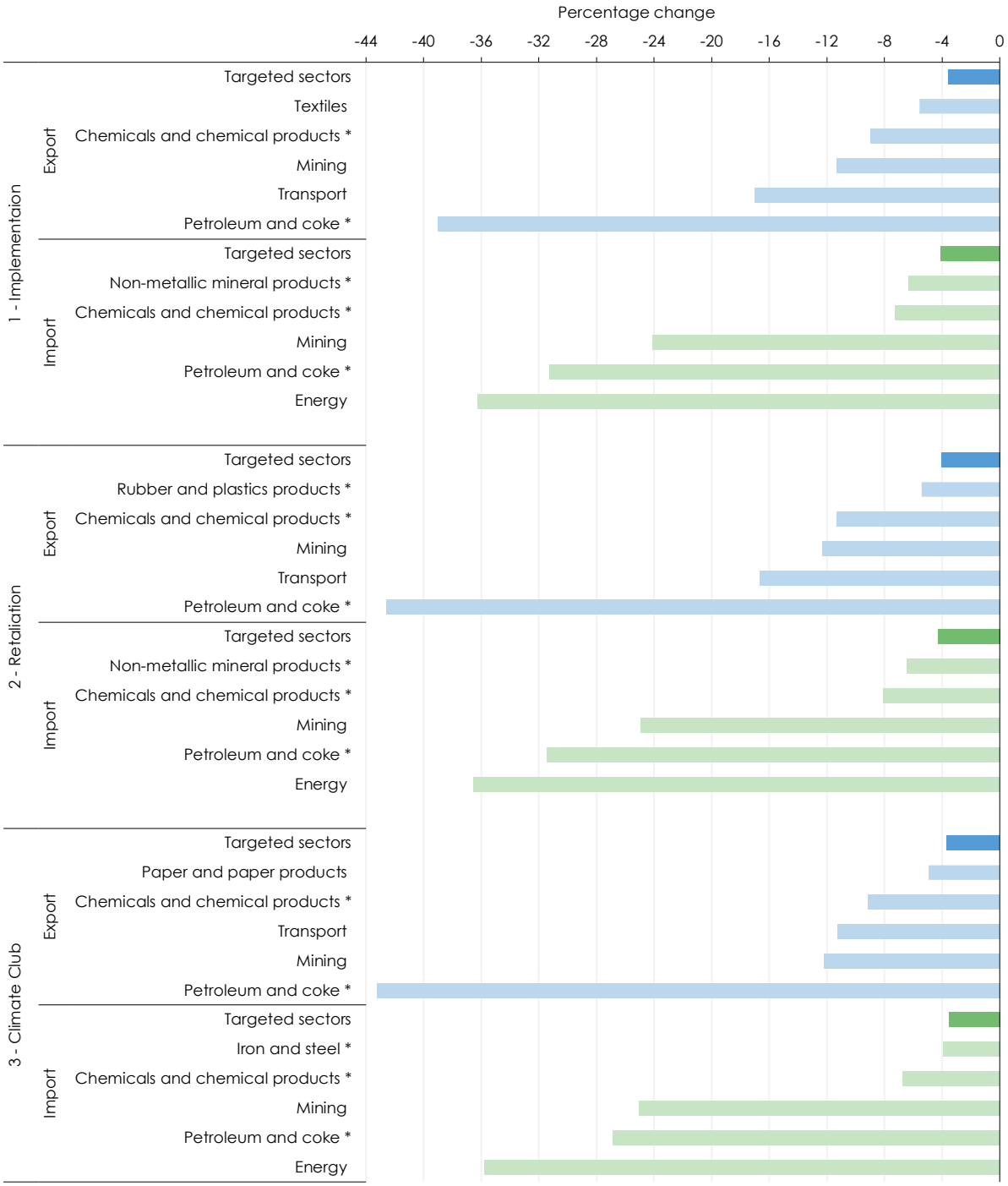
Under **scenario 1 ("Implementation")**, trade patterns of the petroleum and coke sector, directly targeted by CBAM (as highlighted with an asterisk), are affected substantially. In specific, extra-EU trade in this sector declines between 42.6% (exports) and 35.3% (imports). As Figure 4.69 illustrates also sectors not directly included in CBAM, such as the energy and transport sector, are also massively affected and EU exports to third countries in these two sectors decrease by 34.7% and 30.3%, respectively. In comparison, exports of the chemical industry and of non-metallic mineral products decline by 14.6% and 10.9%, respectively. In terms of EU imports from third countries, demand for mining products (-31.0%) and energy imports (-15.2%), both sectors not included in CBAM, are hit substantially. But also imports of non-metallic mineral products (-9.5%) and iron and steel (-6.2%), which are directly targeted by CBAM, are also among the most affected sectors. Given higher prices in EU production not only extra-EU trade relations are negatively affected, but also intra-EU trade flows change accordingly, as Figure 4.70 depicts. Similar to the findings for extra-EU trade patterns, intra-EU trade flows of the petroleum and coke sector (-36.9%), mining sector (-29.7%) and transport sector (-17.4%) are hit hardest. Intra-EU trade flows of the chemical industry, directly taxed with higher carbon prices by CBAM, decline by 7.9%, while non-ferrous metals shrink by 5.2%.

Figure 4.70: Sectoral trade effects of CBAM for the intra-EU in most negatively affected sectors across three scenarios



Note: * = sector contains products from the CBAM list. Targeted sectors include all CBAM goods, as specified in the EU Regulation (see Table A7 in the Appendix).
Source: WIFO calculations based on the KITE model.

Figure 4.71: Sectoral trade effects of CBAM for Austria in most negatively affected sectors across three scenarios



Note: * = sector contains products from the CBAM list. Targeted sectors include all CBAM goods, as specified in the EU Regulation (see Table A7 in the Appendix).
Source: WIFO calculations based on the KITE model.

Figure 4.71 depicts similar sectoral trade results for Austria, although trade flows of the targeted sectors show lower negative effects (-3.6% for exports and -4.1% for imports) than the EU average. Similar to the EU results, petroleum and coke exports are most negatively affected by CBAM. Again, also non-targeted sectors, like mining and transport are among the sectors most negatively impacted under scenario 1. Looking at Austrian imports, the sectoral impact mirrors the findings for EU internal market trade. Similar to the EU results, Austrian energy imports (-36.3%), along with the petroleum and coke sector (-31.3%) and mining (-24.1%) are by far the most negatively affected sectors. However, due to higher import prices also chemical imports (-7.2%) as well as imports of non-metallic mineral products (-6.3%) decline sharply.

Under **scenario 2 ("Retaliation")**, our sectoral findings for the EU show that particularly extra-EU trade suffers strongly from the retaliation measures. In comparison to the results of scenario 1 trade flows in the most important product groups decline even stronger, indicating that retaliation measures enhance trade diversion effects. Given the countermeasures, extra-EU trade in targeted sectors shrinks by 9.9% (exports) and 7.6% (imports), in specific. In contrast, intra-EU trade in targeted sectors (-5.6%) shows hardly any changes. As Austria is highly dependent on the EU market, the countermeasures have little weight in the Austrian trade pattern and the effects are quite similar to those of scenario 1.

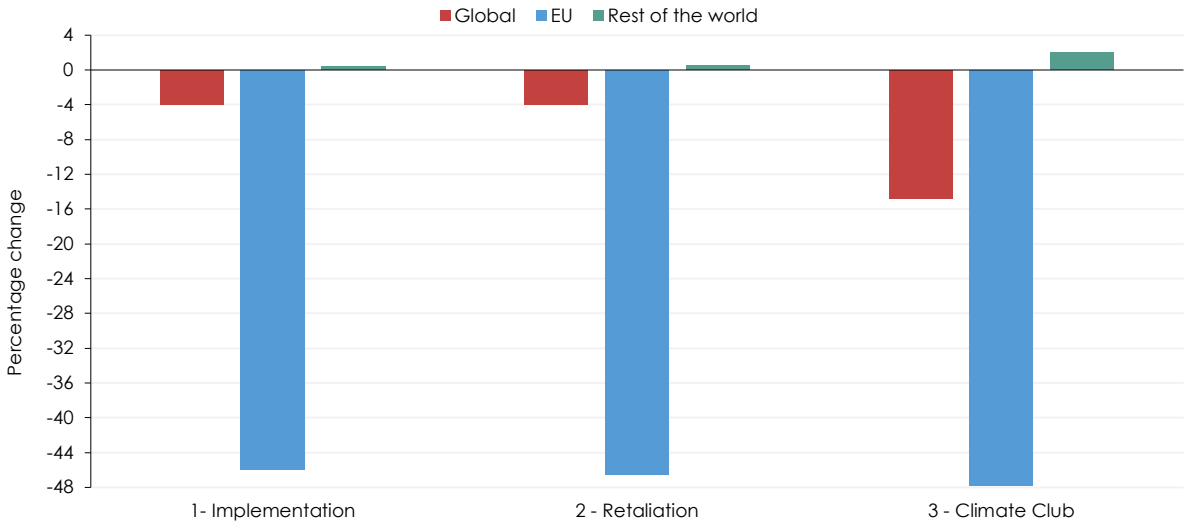
The improved competitiveness of the EU under **scenario 3 ("Climate Club")** is also reflected in the sectoral trade effects. The declines in the most affected sectors in extra-EU trade are consistently smaller, while intra-EU trade shows hardly any change. Particularly, extra-EU exports in the targeted sectors decrease by 5.6% (compared to -7.1% in scenario 1) and exports of the most affected sector petroleum and coke decrease by 38.4%, followed by energy (-20.3%) and transport (-20.1%). In contrast, EU imports from third countries in the targeted sectors remain unchanged. While mining imports (-34.8%) continue to decline sharply, imports of other targeted sectors, such as petroleum and coke, iron and steel, electrical equipment and fabricated metal products, benefit and show only minor import declines. Since Austria's trade pattern is strongly focused on the Single Market, changes in sectoral trade flows, similar to intra-EU trade, turn out to be very small.

4.7.6 Environmental effects of the CBAM

While imposing more ambitious carbon pricing induces welfare losses for the imposing countries, especially the EU and Austria, but also the USA, in case of a joint proceeding to set up an international Climate Club, our findings allow us to capture the environmental effects related to CBAM. Figure 4.72 portrays the potential to reduce carbon emissions globally, as well as at the EU level. In line with recent literature on CBAM, CBAM is an effective tool to reduce CO_2 emissions and avoid carbon leakage. A unique EU carbon pricing scheme (**scenario 1 "Implementation"**) cuts emissions of the EU by 45.9%, which translates into a global emission reduction by 4.0%. Thus, this unilateral approach by the EU can only make a small contribution to global climate protection. Turning to **scenario 2 ("Retaliation")**, our results highlight that the introduction of countermeasures by trading partners has little impact on the emission level, both globally and at the EU level. In contrast, multilateral cooperation in climate policy (**scenario 3 "Climate Club"**) reduces greenhouse gas emissions substantially. While EU emissions further decrease slightly as compared to scenario 1 (-47.8%), an international Climate Club creates an incentive for other industrialised countries, such as the USA, to reduce their emissions.

Consequently, global emissions fall by -14.8%, whereas emissions in countries outside the Climate Club now increase by 2.0%. This boost of a joint climate policy approach is also supported in recent literature (Mahlkow et al., 2021). As an alternative measure, a simple back-of-the-envelope calculation shows that this global emission reduction of 14.8% corresponds with 5.46 bn tonnes of less carbon emissions annually. Expressing the emission reductions in terms of economic benefits of preventing damages, known as the social costs of carbon, is an influential metric to assess the net benefits of climate policy. Current estimates of the social costs of carbon (costs of the damages caused by emitting an additional tonne of CO_2) range around 180 $/tonne (Rennert et al., 2022). Multiplying the change in global CO_2 emissions as result of the Climate Club with the cost estimate reveals that internalising these social costs of carbon yields welfare benefits worth $ 983 bn. This represents a multiple of the welfare loss of the EU ($ -22.7 bn) and the USA ($ -108.7 bn) together under scenario 3 and emphasises the favourable cost-benefit-ratio of implementing a Climate Club.

Figure 4.72: CO_2 emission effects of CBAM worldwide and for the EU across three scenarios



Source: WIFO calculations based on the KITE model.

5. Summary and conclusions

Confronted with rising geopolitical tensions and the deterioration of global institutions such as the WTO, the EU acknowledged the need to effectively respond to non-rule-based trade policies adopted by its trading partners as part of their geopolitical strategies. To address this, the EU conducted a review of its trade policy, introducing the concept of "open strategic autonomy" and advocating for an "open, sustainable, and determined trade policy".

In line with this, the EU has developed and implemented several key trade policy instruments to safeguard the European Single Market from unfair trade practices. These include the Anti-Coercion Instrument (ACI), the updated Enforcement Regulation (ER), the International Procurement Instrument (IPI), level playing field provisions in the EU-UK Trade and Cooperation Agreement (LPF), the Directive on Corporate Sustainability Due Diligence (CSDD), and environmentally relevant instruments like the Carbon Border Adjustment Mechanism (CBAM) and the Deforestation Regulation (EUDR). These instruments aim to uphold EU interests and values, including sustainability, human rights, and social standards, while addressing threats and opportunistic behaviour from trading partners. On the other hand, all new instruments carry the risk of protectionism, of conflict escalation and retaliation, as well as a more inward focus for the EU. Therefore, it is crucial to carefully consider the use of trade policy instruments, to explore alternatives and to continue to support the rules-based design of global competition set by the WTO as well as EU free trade agreements.

This study provides a comprehensive overview of the various EU initiatives and new trade policy instruments, tracing their historical context and development, design and operation. Moreover, the study provides a model-based quantitative assessment of the expected long run welfare and trade effects of these trade policy measures, based on specific scenarios simulated using the KITE general equilibrium global economic and trade model.

In the following, the main findings and conclusions for each of the new trade policy instruments and initiatives are presented.

5.1 Defensive trade policy measures related to the ACI and the ER

5.1.1 Key findings – ACI

The Anti-Coercion Instrument (ACI) is the EU's response to coercive measures used by other countries to influence EU policy decisions. At the end of October 2023, the legal act was adopted by the Council and is now awaiting signature, which his expected by November 22, 2023. Its primary objective is to serve as a more credible deterrent and to establish conditions for the EU to effectively threaten reciprocal sanctions. The ACI operates through a multi-stage process, prioritising dialogue to de-escalate tensions, with countermeasures as a last resort. These countermeasures can encompass all types of trade policy measures, such as tariffs, import/export restrictions, or financial measures, but they should be proportionate to the damage caused by the rival party's coercive actions.

To assess the potential impact of ACI measures on welfare and trade, we simulated three scenarios using the KITE model. These scenarios, based on empirical analysis of applied trade measures, focus on the EU's relationship with China and outline a hypothetical trade dispute in three stages: initiation of coercion (scenario 1 "Chinese restrictions on German car imports"),

implementation of EU countermeasures (scenario 2 "EU tariffs on Chinese chemicals and electrical equipment"), and escalation with Chinese retaliation (scenario 3 "Chinese retaliatory trade restrictions on iron and steel, machinery, and equipment"). The primary aim of the ACI is to discourage such trade disputes. In this sense the resulting welfare and trade effects illustrate the potential losses that could be prevented if the instrument proves successful.

The impact on welfare and total trade remains relatively modest. The cumulative real income loss for the EU and Austria in all three phases of the simulated trade dispute is 0.01%, while China experiences a 0.06% reduction. These minor changes in real income translate to an absolute decrease of $ 1.6 bn for the EU and of $ 31 mn for Austria. Despite the low impact the simulation results provide us with some important insights:

- They demonstrate that the country implementing restrictive trade policies cannot avoid suffering from its own actions and may even be the most affected party.
- A scenario with EU countermeasures shows how the ACI can effectively present a credible threat and act as a deterrent to the opposing party. The selected countermeasures in this scenario nearly offset the EU's losses from the initial phase, while China incurs additional losses roughly equivalent to the EU losses experienced as a result of China's coercive actions.
- The findings also emphasise differential impacts of different trade policy measures applied. Export controls have the largest negative impact on bilateral exports, while tariffs have the smallest. Moreover, tariffs and non-tariff barriers can have divergent welfare impacts on the implementing country. Tariffs generate revenues for the implementing country and, depending on factors such as market power, country size and substitution elasticities, foreign producers may absorb part of the tariff cost through price reductions to avoid a significant loss of competitiveness. This could lead to positive welfare effects for the implementing country, as demonstrated for the EU in the second simulated scenario.
- Regarding trade effects, simulations of the trade conflict with China indicate that the trade of the two direct rival countries is most negatively affected, while the USA see a slight improvement in their export position. Austria's trade is less affected than the EU average, as its trade in motor vehicles and other transport equipment with China benefits from substitution effects with German products. In addition, there is a shift in intra-EU trade to avoid Chinese import restrictions on German cars in the initial stage of the dispute. In general, bilateral trade patterns of the EU and Austria shift away from China, leading to slightly increased exports to the USA and higher imports from Germany. However, the effect on total intra-EU trade is minimal.
- At the sectoral level, trade policy measures have the most pronounced impact on the directly targeted sectors. In addition, sectors closely linked to the targeted sectors through supply chains also experience more significant trade effects. Trade diversion effects, which shift trade from extra-EU to intra-EU, vary in magnitude. In particular, the electrical equipment and chemicals sectors show stronger trade diversion from China, leading to increased intra-EU trade. For Austria, there are notable differences in the effects. Motor vehicles and other transport equipment industries are less negatively affected compared to the EU average. Conversely, key supplier industries such as metals, rubber and plastics, and electrical

equipment experience more significant effects, reflecting strong production ties with Germany. The results for trade also indicate that Member States and sectors are affected differently, leading to an uneven distribution of costs among Member States and sectors and distributional consequences.

5.2 Key findings – ER

The revised EU Enforcement Regulation (ER) came into effect on February 13, 2021, granting the EU the authority to take trade actions if a third country obstructs dispute resolution. Consequently, if a nation refuses to comply with a panel's decision, the European Commission can impose retaliatory measures or suspend concessions, even in cases where the WTO's Appellate Body is unable to act. These modifications also extend to comparable situations in other international trade agreements where dispute resolution mechanisms are dysfunctional. The ER operates on the same principles as the ACI. It is structured as a multi-stage process, that prioritises diplomatic dialog and de-escalation. Countermeasures are considered a measure of last resort, and when they are applied, they adhere to the principle of proportionality, ensuring they do not exceed the harm caused. Like the ACI, the ER offers a broad array of countermeasures, encompassing tariffs as well as various non-tariff measures (NTMs), import and export controls, as well as restrictions on public procurement.

To assess the potential welfare and trade impacts of measures under the ER the study again outlines three distinct scenarios, each simulated using the KITE model: (1) Russia's adoption of protectionist measures against the EU (scenario1 "Russian tariffs on imports of the EU motor vehicle and other transport sector"); (2) implementation of EU countermeasures (scenario 2 "EU tariffs on Russian imports of chemicals, computer and electrical products, machinery and equipment, electrical equipment, iron and steel and non-ferrous metals"); and (3) escalation of the conflict, with Russian retaliation (scenario 3 "additional Russian retaliatory trade restrictions on agricultural and food products as well as machinery and equipment"). The simulation results exclusively demonstrate the direct effects of the trade dispute being analysed within various ER scenarios measured as deviations from the model's base year 2014 and do not encompass the repercussions of countersanctions implemented in response to Russia's invasion of Ukraine in 2022. The analysis also had to exclude the mineral, gas and oil sectors due to very instable and unreliable model results related to the high volatility in the (nominal) trade flows considered.

The simulation results provide another example of how restrictive trade policies can often have unintended consequences for the country implementing them. In the hypothetical trade conflict with Russia, both the EU and Austria experience minimal impacts on their welfare and trade (Austria: -0.007% or $ -30 mn; EU: -0.006% or $ -952 mn). Russian welfare and trade losses, although relatively small in all three phases of the trade dispute, are notably higher than those of the EU, with a cumulated welfare loss of 0.04% and total trade loss of 0.85%.

Scenario 2, which involves EU countermeasures under the updated ER rules, highlights the challenge of devising credible and effective reciprocal sanctions that are also proportionate to the initial protective measures the EU is responding to. Although the EU's retaliatory trade volume matches that of scenario 1, it only partially offsets the EU losses from the first stage. Russia still

faces the greatest welfare loss, but contrary to the EU's intentions, the overall welfare loss is reduced compared to scenario 1.

The resulting trade effects in the hypothetical trade conflict with Russia under the ER follow a similar pattern to those observed for the ACI. Trade is predominantly influenced in the countries and sectors directly involved in the conflict, with Russia experiencing the most significant trade losses. The USA observe marginal enhancements in their trade position. For sectors not directly targeted, the trade effects are minimal. Nevertheless, the sectors closely linked in production to the targeted sectors experience the greatest impact across all simulated scenarios. Notably, the non-ferrous metals and chemicals sectors show a more significant trade diversion, with a shift from extra-EU trade to increased intra-EU trade.

5.2.1 Conclusions – ACI and ER

Trade policy uncertainty has surged in recent years and EU Member States more often feel compelled to comply with certain demands under the threat of economic repercussions. Both the ACI and the ER address these challenges while navigating the delicate balance between promoting free trade and multilateralism and employing unilateral defensive measures to enhance and safeguard the EU's own interests.

Accordingly, these tools should be designed to de-escalate disputes, prevent new trade barriers, and avoid escalation spirals. The notable increase in sanctions is a cause for concern, signifying that many implicit or explicit threats have proven ineffective, resulting in a higher number of conflicts escalating. Hence, the cornerstone of successful implementation of both defensive trade policy instruments revolves around formulating credible threats and efficient reciprocal sanctions. This in turn places high demand on the design of the instruments and in addition to the credibility of threats, the following principles are particularly relevant:

- emphasising deterrence as the primary goal, with the use of countermeasures as a last resort;
- employing multi-stage procedures, where consultation with the third state always comes first;
- limiting application to instances involving evident and substantial violations of international law;
- ensuring proportionality in responses;
- upholding transparency and predictability in the EU's counteractions, potentially establishing ground rules at the multilateral level;
- fostering international coordination, including collaboration, information exchange, and cooperation with like-minded countries; and
- coordinating the application of the new trade policy instruments to ensure consistency.

Most of these principles apply to the Anti-Coercion Instrument as well as to the updated ER. However, the analysis has highlighted several challenges in the practical use and implementation of the instruments:

- *Wide and vague definition of triggering events*, i.e. the circumstances under which the European Commission can or must take action. While this offers flexibility in applying the instrument, it also invites subjectivity and potential disagreements among EU stakeholders. Ultimately, qualitative decisions are needed that must be based on the largest possible evidence. Quantitative thresholds at which the instrument is used are hardly imaginable.
- *Ambiguity in defining countermeasures and assessing proportionality*: The study's findings emphasise the challenge of devising credible and effective reciprocal trade measures that align with the initial protective actions the EU is countering. To assess proportionality accurately, it is essential to thoroughly detail, quantify, and specify equivalent responses using transparent methodologies and model-based analyses. Relying solely on the volume of trade, as is commonly done, is insufficient when implementing countermeasures under the defensive policy instruments.
- *Decision-making processes:* The legal basis for the instruments is the common commercial policy, falling under EU competence without subsidiarity. Yet, because the ACI delves into geopolitical matters touching foreign and security policy, this prompts questions about the exclusive competence of the EU. Clarification is necessary regarding competences within the EU. As an accompanying measure, speeding up decision-making in the EU Council for foreign and security policy is vital. Moreover, as defensive trade measures invariably affect the EU's economy, the implementation of mechanisms to mitigate the unevenly distributed costs of these measures among Member States, companies, and sectors could enhance collective support for such trade policy actions.

Finally, the attractiveness of the EU Single Market is a key prerequisite to the effectiveness of the new instruments as the potency of threats to restrict market access correlates directly with the depth, size, and dynamism of the EU internal market.

5.3 The IPI as an offensive trade policy tool

5.3.1 Key findings – IPI

The International Procurement Instrument (IPI) entered into force on August 29, 2022. It is intended to serve as a mechanism for the EU to promote access for EU companies to international procurement markets while simultaneously limiting or excluding access to the EU market for companies, goods and services from countries that impose discriminatory measures against the EU. Thus, rather than functioning as a mere defensive tool, the IPI is designed as an offensive tool, implemented to ensure that EU companies have the same level of market access in public procurement as the EU provides to other countries. The IPI primarily applies to third countries without WTO Government Procurement Agreement (GPA) membership or an EU free trade agreement featuring a public procurement chapter, such as China, India, or Brazil. The IPI imposes a minimum threshold of € 15 mn for infrastructure projects and € 5 mn for goods and services procurement contracts. Exceptions include bidders from least developed countries (LDCs) as well as small and medium-sized enterprises (SMEs). Furthermore, the application of the IPI is limited by the availability of alternative sources to supply when all bidders originate from the country facing IPI measures.

The process is designed to be multi-stage and the principle of proportionality of measures is prescribed. In the absence of an agreement, bidders from the third country face restricted access to or total exclusion from the EU market. The restriction involves either a 100% price increase on bids or a 50% reduction in total evaluation points awarded during the procurement review. Moreover, all procurement procedures covered by the IPI must consider social, environmental, and labour law standards. This represents a ground-breaking development in international trade law, as measures previously centred on product characteristics ("hazardous goods") rather than production processes ("goods produced under poor conditions abroad").

According to OECD data, public procurement typically accounts for about 10% to 20% of GDP on average across OECD countries. While this presents significant trading opportunities, countries have shown considerable reluctance to liberalise their public procurement markets for international competition. In fact, the empirical analysis conducted in this study highlights a notable escalation of protectionist measures in public procurement, with the USA being the primary driver of this trend over time.

Even if the PP in the EU is de jure relatively open to foreign bidders, de facto openness of EU PP markets remains small. According to the empirical analysis in this study, even after deducting indirect awards won in the EU by subsidiaries of third countries, a share of 80.6% is awarded to firms from within the same country, leaving a meagre 8.6% of goods and services sourced from other EU countries. The USA is the most important extra-EU market in EU public procurement accounting for a share of 2.7% and a share of 8% of all PP orders is awarded to other non-EU markets. China still plays a minor role (0.1%). The (manufacturing) sectors most often included in public procurement contracts awarded to non-EU firms and exceeding the benchmarks set by the IPI over the period 2009 to 2022 include medical equipment and pharmaceuticals, office and computing machinery, transport equipment, software and information systems and energy.

The economic consequences of the instrument are difficult to assess due to the poor quality of the data on public procurement. For this reason, the empirical analysis in this study was not able to identify the welfare and trade effects of the instrument.

5.3.2 Conclusions – IPI

In the process of IPI implementation many reservations were voiced by Member States. In addition to contentious issues regarding the exact procedure, discussions have focused on the potential cost-increasing effects resulting of reduced competition, which would be borne by public budgets, as well as possible retaliatory measures by affected countries. Many EU companies, including those in Austria, receive important public procurement contracts abroad and there is fear that retaliatory measures could ultimately result in additional obstacles rather than improved market access. As offensive trade policy measures directly intervene in the policies of partner countries, they increase the risk of retaliatory measures (including the further closure of their procurement markets) and may lead to increased protectionism and trade conflict, especially if they are carried out in a non-transparent manner and when such actions are inconsistent with WTO rules. The EU's low share of imports in procurement undermines the EU's position and arguments in trade disputes over public procurement and in the implementation

of the IPI. Inconsistencies with WTO rules should be prevented so as not to undermine EU-stated aims of open trade and the importance of multilateralism.

The instrument applies most of the principles outlined for the ACI and ER to ensure successful implementation and to minimise the danger of new trade barriers and spirals of escalation. While many procedures are well-defined, similar challenges to those encountered by the ACI and ER arise regarding the determination of "triggering events" (when under what circumstances investigations are initiated or not), issues surrounding the assessment of proportionality of countermeasures and the role of Member States in the decision-making processes.

5.4 Level playing field and non-trade objectives

5.4.1 Key findings – LPF

The EU advocates for open international markets and market access for foreign companies in the EU Single Market, but European firms often encounter barriers in non-EU markets. The Level Playing Field (LPF) provisions in the EU-United Kingdom Trade and Cooperation Agreement (EU-UK TCA) of 2021 aim to ensure fair competition and sustainability in trade between the EU and the United Kingdom. The LPF provisions encompass various regulatory aspects, but subsidies and state aid as well as labour, social, environment and climate standards constitute a threat to regulatory divergence between the United Kingdom and the EU, in particular.

In the assessment of welfare and trade effects of the LPF provisions a focus is put on the impact of subsidies and state aid and three distinct scenarios are analysed. The **status quo scenario** represents the state of affairs as of 2021/2022 between the EU and the United Kingdom adhering to the LPF provisions as outlined in the TCA. This scenario underscores the importance of LPF compliance in maintaining trade and fair competition. The impact on welfare is relatively small, with marginal declines in economic welfare for both the EU and the United Kingdom. The trade effects are more pronounced, with a slight decrease in exports for both parties. The **no divergence scenario** assumes that the United Kingdom continues to align with the LPF standards that were in place prior to the Brexit vote. In this case sectoral distortions and bilateral trade diversion are further lowered compared to the status-quo scenario.

In the event of substantial regulatory divergence, subsidies and state aid lead to trade distortions. Under this scenario the United Kingdom significantly increases subsidies and state aid (**divergence scenario)** departing significantly from the TCA's LPF provisions. While the United Kingdom experiences increased domestic production and international competitiveness, its overall welfare declines by 0.02% due to the associated costs and sectoral economic distortions. This translates to an absolute loss in real GDP by $ 631.9 mn. Importantly, such a strong deviation from the LPF has significant implications for international competition. United Kingdom's subsidies and state aid increase exports to both EU and non-EU countries. This in turn benefits the EU through increased demand and supply from the United Kingdom. However, these trade distortions reduce the EU's competitiveness in sectors where the United Kingdom applies subsidies and state aid, resulting in a slight decrease in EU welfare by 0.0004% ($ -53.2 mn absolute change in real income).

5.4.2 Conclusions – LPF

The LPF provisions within the EU-UK TCA represent a critical cornerstone for maintaining fair competition and stability in their post-Brexit trade relations at the multifaceted intersection of economic growth, environmental sustainability, labour and social standards, subsidies and state aid. Adhering to the LPF provisions constitutes a complex trade-off between the sovereignty of a region and fair competition. The following conclusions can be drawn:

- Subsidies and state aid are often used strategically. The simulations demonstrate that while an excessive use of subsidies and state aid can boost domestic production and competitiveness, they must be employed carefully to ensure their benefits outweigh the associated costs and economic distortions, domestically and internationally. In case of the United Kingdom, the welfare enhancing impact is close to zero. Thus, any use of subsidies and state aid should be evaluated carefully before applied to minimise adverse impacts on international competitiveness.
- While the likelihood of strong divergence in regulations between the EU and the United Kingdom is relatively low, given the long EU membership of the United Kingdom, cooperation and a dialogue between the EU and the United Kingdom, as well as with other trading partners, are vital components for effectively preventing and resolving potential trade disputes arising from subsidies and state aid. Encouraging transparency in the application of subsidies and state aid, along with information sharing between the EU and the United Kingdom, will enhance trust and cooperation, fostering a more conducive environment for resolving trade challenges and thereby limiting the risk of retaliation. A coordination and harmonisation of subsidies and state aid regulations across trading partners prevents any competitive imbalances.
- The risk of retaliation to the LPF provisions is limited since the LPF provisions are governed by the TCA. Further, as former member of the EU, a significant portion of the United Kingdom's regulations and standards align with those established by the EU making a strong regulatory divergence less likely. Moreover, the mechanisms within the LPF are specifically designed to facilitate future convergences and manage potential divergences in standards. Therefore, the LPF provisions constitute a guiding framework for the coordination of rules and standards in the evolving EU-UK relationship.
- Regular monitoring and periodic reviews of the LPF's impact on welfare and trade are important tools for making evidence-based policy adjustments. The stipulated review in 2026, as outlined in the TCA, will be a critical milestone for assessing the LPF's effectiveness and making any necessary adjustments.

5.4.3 Key findings – CSDD

The EU proposal for a Directive on Corporate Sustainability Due Diligence (CSDD) from 2022, in trilogue since June 2023, stresses the role of firms in promoting sustainable and responsible business conduct along global value chains. Due diligence obligations as proposed by the CSDD will generate both costs and benefits for EU firms and those with significant turnover in the EU Single Market, as well as their suppliers. The prevention, mitigation and remedy of adverse impacts on human rights, social and economic standards and the environment by firms is the most important intended benefit. The main cost drivers include compliance costs, such as costs

of establishing and operating the due diligence procedures as well as transition costs of the firm's operations and value chains.

To assess the effects of the CSDD on welfare and trade, the model-based analysis relies on additional trade frictions induced by deep trade agreements including provisions on responsible business conduct. As high-risk countries are more likely to violate human rights and social, economic and environmental standards differential effects for this country group are derived and three distinct scenarios are simulated using the KITE model: an implementation scenario of the CSDD, a success scenario, in which all EU partner countries are assumed to comply with the stringent CSDD requirements and an escalation scenario assuming non-compliance of high-risk countries in high-impact sectors.

The **implementation** of the CSDD has relatively modest welfare effects. While welfare increases for low-risk countries, like the EU for which welfare increases by 0.01% ($ 1.4 bn in real GDP), welfare declines for high-risk countries on average by 0.005%. Trade diverts from high-risk countries towards countries more likely to comply with the CSDD. As to the EU, intra-EU trade in high-impact sectors increases at the cost of imports from high-risk countries. This diversion results in higher trade costs, and a decline in both exports and imports, limiting potential welfare gains from higher economic, social and environmental standards. For high-risk countries, this trade diversion leads to a decline in their real income.

The **success scenario** brings further benefits. Global welfare increases modestly, including positive welfare gains for the EU (+0.02% or $ 3.0 bn in real GDP), Austria (+0.03% or $ 114.2 mn in real GDP), and high-risk countries (+0.002%). Additionally, total trade improves for EU trading partners. Especially EU trade flows expand and bilateral trade relationships with high-risk countries are intensified. Thus, while implementation of the CSDD (scenario1) is mostly to the benefit of the EU and imposes challenges to high-risk economies, effective implementation of the Directive, as demonstrated in the success scenario, can lead to positive effects on trade and welfare by promoting sustainability and facilitating the integration of high-risk countries into international markets.

Under the **escalation scenario** both, high-risk countries (-0.3%) and the EU (-1.0%) experience more substantial welfare losses, with a significant decline in international trade. - These changes in real income translate to an absolute decrease of $ 155.9 bn for the EU and of $ 2.6 bn (-0.6%) for Austria. EU imports of high-impact sectors like wearing apparel, textiles or minerals decline by more than 26%. Imports are substituted by (inefficient) EU production in these sectors and intra-EU trade increases as consequence. This has detrimental effects on the EU's international competitiveness. In particular, the EU is found to lose competitiveness relative to the USA and China, two important geoeconomic powers, which strengthen their trade relations with high-risk economies and among each other.

5.4.4 Conclusions – CSDD

With the CSDD Directive, the EU generated an important policy lever to enhance due diligence and responsible business conduct beyond the borders of the EU. The findings underscore the complex interplay between due diligence obligations, welfare and international competitiveness.

- While the CSDD can on one hand promote due diligence along global value chains, it – on the other hand – increases the risk of a gradual loss of competitiveness and geoeconomic influence for the EU. The risk of fines or lawsuits could make European companies more risk-averse, exiting from markets where potential human right and environmental violation may happen. In particular, the EU sources critical raw materials from countries with a high-risk of non-compliance to the due diligence obligations. Loosing access to these sourcing channels could disrupt the green transition, hinder the EU's broader sustainability goals and impose a threat to the future competitiveness of the EU. Investing in research and development is one possible solution to enhance the EU's economic resilience.
- CSDD also induces adverse impacts on developing countries, particularly to those reliant on high-impact exports, i.e. exports related to textiles, wearing apparel, agriculture and food products, mining and minerals and metal products, to the EU. The disruptions in sectoral trade and the associated welfare losses as shown for the escalation scenario highlight the importance of proactive policy measures to manage the transition towards sustainability in developing countries.

Thus, supporting developing countries by partnerships, development assistance or initiatives such as the Global Gateway is essential to mitigate the negative humanitarian and economic consequences. At the same time, diplomatic efforts with major trading partners and geoeconomic powers, like the USA, could reduce the risk of retaliatory actions and promote cooperative initiatives that facilitate the harmonisation of international sustainability standards, while reducing the burden of due diligence obligations.

- An effective implementation of the CSDD, as demonstrated in the success scenario, including a transparent, non-discriminatory due diligence process, can be achieved by a promotion of due diligence guidelines, a harmonisation of due diligence reporting standards, certification schemes and risk management requirements, and an engagement of the civil society in the implementation process of the CSDD.

The effectiveness of the EU in nudging third countries to comply with the due diligence obligations of the CSDD depends on the strength of the trade relationship and the importance of the EU Single Market for these markets.

5.5 Environmental objectives

5.5.1 Key findings – EUDR

Deforestation is a major global issue, leading to profound consequences for climate change, biodiversity, and human well-being. The EU Regulation on Deforestation-Free Products (EUDR), which will enter into application at the end of 2024, aims to address this problem by targeting the main driver of global forest loss and agricultural expansion. The EUDR replaces the EU Timber Regulation (EUTR) and covers a wide range of products of wood, rubber, soya, coffee, oil palm, cacao, and cattle. For these deforestation-free products due diligence is required throughout the supply chains. Non-compliance can result in penalties and product bans, to ensure that only legal and responsible produced deforestation-free products enter the EU Single Market.

Using the KITE model, the potential impact of the implementation of the EUDR based on the observed impact of its predecessor, the EUTR, is estimated. The **implementation** of the EUDR has relatively small trade and welfare effects for the EU and Austria. Real income decreases in absolute terms by $ 33.1 mn for the EU and by $ 0.5 mn for Austria. Moreover, **expanding** the product coverage has a negligible additional impact on welfare and trade. Therefore, broadening the product coverage of the EUDR to maize, poultry, sheep, goat, swine and further oil palm and wood products might not put the EU at a significant competitive disadvantage, but could enhance its positive impact in combating deforestation.

In an **escalation** scenario, where operators in major EU trading partners of deforestation-free products do not comply with the EUDR and are banned from the EU Single Market, trade and welfare declines, particularly for the EU. However, the overall decline for the EU by 0.05% and for Austria by 0.02% remains small. These welfare losses translate to an absolute decrease in real income by $ 7.1 bn for the EU and by $ 101.0 mn for Austria. EU businesses need to reorientate their sourcing patterns towards markets complying with the EUDR, potentially leading to higher production and trade costs. A sectoral breakdown reveals that the targeted sectors experience the most substantial impact, with declines in extra-EU trade for rubber and plastic products, wood, products of wood and cork and other crops of more than 31%. While extra-EU exports and imports decline, trade within the EU increases, particularly in sectors affected by the EUDR. Thus, there is a shift of production and trade towards intra-EU trade, albeit at higher costs. For Austria, the reorientation of sourcing from extra-EU to intra-EU trade balances the loss in extra-EU trade in targeted sectors, leading to a stronger production focus on the agriculture sector in Austria. The decline in imports from third countries providing a major share of deforestation-free products to the EU has the potential to reduce the loss and degradation of forests in third countries due to the reduction in production of these products in major EU trading partners.

Note however, that our estimates represent a lower bound due to the EUDR's stricter product requirements compared to the EUTR, assuming a smooth implementation of the EUDR due diligence requirements. Hence, the full impact of the EUDR will depend on an effective implementation of the EUDR in cooperation with important trading partners, mainly in developing countries. On the one hand, increased compliance with the EUDR by operators in key trading partners reduces potential negative impacts on EU welfare, trade and competitiveness. On the other hand, it increases the positive impact on forest conservation, forest restauration, and sustainable land use.

5.5.2 Key findings – CBAM

In December 2022 the European Parliament, the Commission and the Council agreed to implement a mechanism, the Carbon Border Adjustment Mechanism (CBAM), to ensure that EU's ambitious climate objectives are not undermined by shifting carbon-intensive production outside the EU. To achieve this goal importers of covered products are required to surrender CBAM certificates that reflect the carbon price of the embedded emissions in the covered products that are imported into the EU. At the same time CBAM gradually replaces the system of free allowances and thus, increases the incentive for EU producers to curb emissions, while imposing a protection against carbon leakage.

Quantifying the implementation of CBAM (scenario 1 "Implementation") and two potential policy scenarios (scenario 2 "Retaliation" and scenario 3 "Climate Club") with the KITE model, shows that CBAM is an effective tool to cut emissions at the EU level, and thus, to reduce carbon leakage. Specifically, a sole implementation of CBAM **(scenario 1 "Implementation")** cuts emissions of the EU by 45.9%, which translates into a global emission reduction by 4.0%. However, this comes at economic cost, not only for targeted sectors. As the EU introduces a carbon tax on domestic production EU products become more expensive and less competitive internationally. At the same time imposing a tariff on certain CBAM goods increases the price of imports.

Under **scenario 1 ("Implementation")** the EU experiences a welfare loss of 0.23%, while the Austrian economy suffers less (-0.18%). These changes in real income translate to an absolute decrease of $ 34.6 bn for the EU and of $ 765.1 mn for Austria. In contrast, welfare of the USA and China remains almost unchanged, as trade diversion predominately shifts trade shares away from the EU. As bilateral trade effects stress, extra-EU trade patterns (exports -5.6%; imports -6.0%) are more affected by trade diversion than intra-EU trade relations (-3.6%). The bilateral trade effects for Austria show that especially imports from the EU (-4.1%) and exports to third countries (-4.5%) are hit hardest by CBAM. Our sectoral findings highlight substantial differences across sectors. In general, the largest sectoral impacts are in the sectors directly targeted by CBAM. However, some specific energy-intensive sectors are affected significantly above average. Particularly, EU trade patterns of the petroleum and coke sector decrease by more than one third. Overall, targeted sectors in extra-EU trade relations lose between 7.1% (exports) and 6.7% (imports), while intra-EU trade in targeted sectors shrinks by 5.4%. We find similar sectoral trade results for Austria, although trade flows of the targeted sectors deteriorate less (-3.6% for exports and -4.1% for imports) than for the EU.

S**cenario 2 ("Retaliation")** reflects potential retaliation effects by trading partners, and thus includes knock-on effects. Our results show that welfare and trade effects turn out to be more severe. Particularly, welfare in the EU and Austria decrease by 0.28% ($ -43 bn) and 0.21% ($ -877.6 mn), respectively. The bilateral trade effects reveal that retaliation measures mainly affect EU trade with third countries (exports -6.4%; imports -7.1%), while intra-EU trade experiences smaller changes (-3.7%), as compared to scenario 1. Similarly, Austria's bilateral trade effects highlight that trade relations with third countries deteriorate due to the countermeasures, although the negative knock-on effects of the countermeasures are not as pronounced as at the EU level.

Our findings at the sectoral level for the EU indicate that particularly extra-EU trade suffers strongly from retaliation measures. In particular, extra-EU trade in targeted sectors shrinks by 9.9% (exports) and 7.6% (imports), while intra-EU trade in targeted sectors (-5.6%) shows hardly any deterioration as compared to scenario 1. As Austria is highly dependent on the EU market, the countermeasures have little weight in the Austrian trade pattern and the effects are quite similar to those of scenario 1.

Incentivising other countries to curb emissions and to set up a "Climate Club" is an explicit objective of EU's climate goals. Hence, our success scenario assumes that the G7 countries together with the EU co-ordinately introduce carbon pricing schemes and border adjustment mechanisms. **Scenario 3 ("Climate Club")** yields the lowest real income change for the EU and Austria. Specifically, the welfare loss of the EU and Austria is reduced to 0.15% (or $ -22.7 bn and $ -636.1 mn, respectively), as trading partners, like the USA, now face similar carbon pricing schemes and losses of EU competitiveness are mitigated. However, as the USA raise carbon prices, they become less competitive internationally and face significant welfare losses (-0.52% or $- 108.7 bn). As the EU is not uniquely imposing CBAM, extra-EU trade flows to the most important trading partners (USA, Turkey, China) improve and turn less negative. But still, EU exports to third countries decline by 4.4%, while extra-EU imports decrease by 5.0%. The transatlantic trade ties reveal that EU exports to the USA become more competitive and shrink less than in other scenarios (-3.3%), while imports from the USA get more expensive and decrease even stronger by 3.4%. Austria's bilateral trade flows reveal similar findings as at the EU level and confirm the pick-up in exports due to improved competitiveness. This new setting in relative prices under scenario 3 is also reflected in the sectoral trade effects. The declines in the most affected sectors in extra-EU trade are consistently smaller, while intra-EU trade shows hardly any change. In particular, extra-EU exports in the targeted sectors decrease by 5.6%. In contrast, EU imports from third countries in targeted sectors remain constant. Since Austria's trade pattern is strongly focused on the EU Single Market, changes in trade flows, similar to intra-EU trade, are negligible.

While a sole and uncoordinated European CO_2 pricing scheme has a very limited potential to reduce global emissions, multilateral cooperation in climate policy reveals the largest reduction in global emissions. In specific, under **scenario 3 ("Climate Club")** global emissions fall by 14.8%, equivalent to 5.46 bn tonnes of less carbon emissions annually. Expressing the emission reduction in terms of benefits of avoided damage, known as social costs of carbon, and assuming a recent cost estimate of 180 $/tonne yields welfare benefits from cost internalisation of around $ 983 bn. This represents a multiple of the welfare loss of the EU ($ -22.7 bn) and the USA ($ -108.7 bn) together under scenario 3. This highlights the favourable cost-benefit-ratio of a Climate Club.

5.5.3 Environmental conclusions

The EUDR and the CBAM are both regulations intended to achieve the ambitious climate and environmental objectives of the EU. The EUDR aims to reduce deforestation and forest degradation and EU CBAM aims to reduce the risk of carbon leakage. As our modelling results illustrate, the macroeconomic impacts of both measures are likely to be small. Even if the long-term economic costs of a stringent climate and environmental policy by the EU are bearable, short-term economic and social effects of rising CO_2 prices and rising costs for deforestation-free products need to be addressed, as trade diversion effects at the sectoral level are substantial and unevenly distributed.

- Rising CO_2 prices will place a particularly heavy burden on energy-intensive manufacturing sectors, such as petroleum and coke, mining, energy, chemicals and non-metallic mineral products. For this reason, climate policy initiatives need to be accompanied by socio-political measures, e.g. by temporary transfer payments for particularly hard-hit sectors and households. Revenues from CO_2 taxation can be used for this purpose. At the same time,

EU's ambitious climate policy offers competitive advantages for national economies through incentives for research and investment.

- Potential legal and diplomatic implications of the proposed EU CBAM highlight the importance of key design elements. The most significant political costs of a unilaterally imposed CBAM by the EU arise from the risk of retaliatory trade measures that trading partners could apply. This would both reduce the effectiveness of the EU CBAM and impose further economic costs. As the results support, trade retaliation leads to moderately reinforced welfare and trade losses, which would mostly be borne by the EU.
- Rising costs for deforestation-free products are driven by efforts to satisfy the due diligence requirements and related shifts in the sourcing pattern for affected commodities. Particularly a trade diversion of wood, products of wood and cork, rubber and plastic products, and crops to high-income countries is associated with a substantial cost increase. Producers, also within the EU, with more sustainable production practices can gain market shares in the EU Single Market.
- Assisting operators to comply with the stringent due diligence requirements and facilitating the administrative process might help to reduce the additional costs of deforestation-free products. The higher the compliance of operators in major trading partner countries, the lower the potential adverse impact on welfare, trade, and competitiveness for the EU and the respective partner country and the higher the potential environmental impact. The risk of retaliation measures in case of the EUDR is relatively low since the EU is not among the main exporters of global forest-risk products.

Given the welfare implication for the EU, additional environmental trade policy interventions, such as supply chain transparency, and certification schemes might be essential to fight climate change and environmental degradation. Different instruments in the political discussion might increase the effectiveness of European climate and environmental policy. They also have the potential to increase the incentive for other countries to adopt more ambitious climate protection targets.

- While carbon pricing alone will not be sufficient for the EU to attain net zero emissions by 2050, CBAM enables the EU to apply higher carbon prices without losing industrial competitiveness. As the modelling results show, the potential environmental benefits of reduced CO_2 emissions, both at the EU level and globally, may be substantial. While a sole and uncoordinated European CO_2 pricing scheme has a very limited potential to reduce global emissions, this scenario is associated with substantial reductions in European emissions.
- Similarly, the EUDR potential to reduce deforestation and forest degradation could be enhanced by international coordinated efforts. Our modelling results suggest that some of the environmental benefits of reduced EU imports in deforestation-free products might be offset by increased trade of main supplier countries of deforestation-free products with less environmentally regulated extra-EU countries. Since the EU Member States are among the main consumers, but not among the main producers of deforestation-free products, the impact of the EU alone on deforestation and forest degradation is limited.

Effective climate and environmental protection are thus only possible through multilateral co-operation. An internationally coordinated approach and good communication are also crucial to avoid trade disputes. Thus, the EU should push for the creation of climate and environmental policy alliances, such as a Climate Club, energy or decarbonisation alliances, forest partnerships or partnerships on deforestation-free products legality, which provide incentives for cooperation and lower the risk of trade tensions.

- In line with recent intentions, the EU, together with the USA and other G7 countries, should form a Climate Club. The estimation of such a scenario reveals the largest reduction in global emissions and internalising the social cost of carbon yields considerable welfare gains, emphasising the favourable cost-benefit ratio of a Climate Club. Therefore, the increased ambition of mitigating climate change in the EU needs to be accompanied with further measurements to boost climate ambitions outside the EU as the unilateral competitive policy scheme shows less capacity in dealing with such imbalanced climate efforts.
- Partnerships and international cooperation might also help to assist in the due diligence assessment and verify the legality of trade in deforestation-free products. As an example, the Forest Law Enforcement, Governance and Trade action plan, which promotes legal and responsible trade in timber products and provides an example of international cooperation in timber trade, could be extended to cover all deforestation-free products. This could help mitigate the adverse impact on welfare and trade for the EU and its affected trading partners, while promoting sustainable land use, forest restoration and conservation.

6. References

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Appendix A – Data

Table A1 provides an overview of all the databases used in the descriptive analysis and in the estimation of the gravity model.

Table A1: Data sources

Database	Acronym	Variables retrieved	Years for the descriptive analysis	Years for the model estimation	Countries	Original sector classification	Reclassification
International Trade and Production Database for Estimation	ITPD-E	Exports, imports, domestic trade		1992-2019, 2009-2019 (GTA)	265 (121 GTAP countries)	ITPD-E industry	CPC
Includes: Dynamic gravity dataset of the US International Trade Commission	DGD	Geographical distance, border information, joint membership in preferential trade agreements		1992-2019			
Global Trade Alert Database	GTA	Trade policy measures	2009-2022	2009-2019	153 (121 GTAP countries)	CPC	
Non-trade objectives database	NTO	Provisions on responsible business conduct, human rights, economic and social rights and environmental protection	1990-2020	1992-2019 (ITPD-E)	265 ITPD-E countries		
Includes: Design on Trade Agreements	DESTA	Joint membership in preferential trade agreements					
Dispute Settlement Gateway of the WTO	WTO disputes	WTO disputes, Appellate Body cases	1996-2021		Affected GTAP countries	Products, sectors (no standard class.)	
WIFO Public Procurement Tenders	WIFO PP	PP awards and number > € 5 mn	2006-2022		EU, extra-EU, USA, China	CPV	
Includes: Tenders Electronic Daily	TED	PP awards and number					
Includes: BvD Amadeus firm level data	AMADEUS	Firm ownership data					
Eurostat trade data	Eurostat	Import shares by product and partner	2012, 2014, 2015, 2021, 2022		EU Member States	HS	CPC

Note: CPC = Central Product Classification; CPV = Common Procurement Vocabulary; HS = Harmonised System.
Source: WIFO presentation.

The International Trade and Production Database (ITPD-E)

Data on bilateral trade in goods is retrieved from the International Trade and Production Database for Estimation (ITPD-E). The ITPD-E contains consistent data on international and domestic trade flows at the industry level. It is constructed using reported administrative data and intentionally does not include information estimated by statistical techniques, which makes the ITPD-E well suited for estimation of economic models, such as the gravity model of trade (Borchert et al., 2021, 2022). To match trade data to the GTA trade policy data, correspondence tables prepared as part of this project were applied to convert ITPD-E industry classifications to CPC three-digit product classes (197 product categories). Table A2 provides an overview of the product classes covered. Furthermore, the sample was restricted to exporting and importing countries that are also included in the GTAP 10 database (Aguiar et al., 2019) which was developed as part of the Global Trade Analysis Project and in turn is an important data source of the KITE model (see chapter 3). Table A3 reports the countries covered in this study. Since all policy variables in the GTA are lagged by 1 year, the trade data used covers the years 2009 to 2019 and a total of 121 exporter and importer countries of goods. The ITPD-E dataset additionally integrates the dynamic gravity dataset (DGD) of the US International Trade Commission (Gurevich and Herman, 2018) delivering information on country geographic and cultural characteristics such as common borders, colonial ties, distance to other countries, languages spoken. In this study we retrieve information on joint membership in preferential trade agreements as well as the geographical distances between trading partners.

The Global Trade Alert (GTA) database

The GTA database is one of the most comprehensive databases on national trade policies imposed since 2009 for 153 countries. GTA data provides information on the targeted sectors, the trading partners most likely affected as well as the date of implementation and the date of removal of trade restrictions. It covers tariff measures, trade defence measures (i.e. anti-dumping, anti-subsidy, safeguards and anti-circumvention policies) and a wide range of non-tariff measures (NTMs) from import and export controls to financial constraints, international property rights (IPR) protection or public procurement restrictions to state aid and subsidies or capital controls. A further advantage of the GTA dataset is its clear distinction between discriminatory and non-discriminatory non-tariff measures (NTMs), a distinction not usually made in other datasets (such as e.g. TRAINS). A specificity of the GTA is, that it excludes trade policy interventions taken by governments under some higher motive relating to health or safety, national security and environmental concerns. For that reason, technical barriers to trade (TBT) as well as sanitary and phytosanitary standards (SPS) measures are only included in the GTA if the reference to a higher motive is contested and there is evidence that the measure was in fact implemented for protectionist reasons. This also implies that the GTA database records much fewer TBT and SPS measures than in other databases[82]).

In this study we focus on policies that affect trade in goods, excluding measures affecting services trade, labour migration and foreign direct investment. Furthermore, we only include

[82]) For more details on the GTA see Evenett and Fritz (2020). https://www.globaltradealert.org/global_dynamics.

protectionist measures (i.e. "discriminatory" measures marked by a red triangle in the GTA) in the analysis and ignore all measures covered in the GTA that are liberalising measures to the benefit of trade in goods. To match the policy dataset with the ITPD-E trade data as well as the KITE model, the sample retrieved for this study covers the years 2009 to 2019 and 121 implementing and affected countries matching the countries covered in the KITE model which is used for simulations in this study. The country sample includes individual EU countries and if the policy measure is taken at the supranational level of the EU, all complying countries are marked as implementing countries. While the trade policy measures covered in the GTA are most often implemented at the disaggregated level of products and the data reports some of the interventions at the 6-digit product level of the "Harmonised System" (HS6), this information is very incomplete and cannot be used in estimations. Therefore, the policy data is retrieved at the 3-digit CPC level of product classes with much less missing information.

Several important steps had to be taken to adapt the original GTA policy data used in the analysis and in the estimation of the gravity model in this study.

First, the intervention types listed in the GTA database were grouped into 8 distinct groups listed in Table A4.

Second, dummy variables indicating whether a certain measure is in force in a respective year or not are constructed based on the time span given by the year of implementation and the year of removal.

Third, missing and incomplete information on the CPC sectors affected was inserted based on careful screening and reading the relevant underlying reports pertaining to the relevant intervention IDs.

Fourth, for each of the policy measures implemented by a country, the original GTA provides information on which trading partners are most likely affected in a given sector. The identification of affected partners is based on exports exceeding $ 1 mn of the respective product a year prior to the implementation of the policy (Evenett, 2019). This might be useful for purely descriptive analyses but might lead to an endogeneity bias if used in estimation (Kinzius et al., 2019). Thus, instead of relying on trade data to identify affected countries we took enormous effort to adapt the dataset to include a bilateral structure of the measures only if the respective partner countries are named in the title of the intervention or in the more detailed reports underlying each intervention provided in the GTA. All remaining measures were treated as affecting all trading partners (this mostly pertains to public procurement measures).

The Non-trade objectives dataset

The dataset on non-trade issues in preferential trade agreements (Lechner, 2022) is a comprehensive dataset covering the issues and scope of non-trade related objectives in trade agreements between 1945 and 2020. The non-trade objectives (NTO) dataset codes issues related to social, labour and environmental standards occurring in preferential trade agreements based on raw information for each preferential trade agreements as documented in the Design of Trade Agreements (DESTA) database (Dür et al., 2014). Particularly, non-trade objective information on economic and social rights (i.e. right to development, right to health, social

protection, right to education, rights to work, rights at work), human rights (i.e. the right to life and liberty, freedom from slavery and torture, freedom of opinion and expression, and similar), environmental protection (i.e. any activity to maintain or restore the quality of environmental media – such as water, air, soil, forests, animals, plants - through preventing the emission of pollutants or reducing he presence of polluting substances in environmental media), and issues on responsible business conduct of firms (i.e. corporate social responsibility and business engaging in or supporting volunteering or ethically-oriented practices) are used for our analysis.

Since the NTO database is a trade agreement specific dataset, it needs to be transferred into a bilateral structure of trading partners to estimate the structural gravity model. Merging the NTO database with the ITPD-E involves several steps. To construct a bilateral panel dataset, the NTO database is combined with four datasets from DESTA. Particularly, the master file and indices file of DESTA, the dyadic version and the dyadic withdrawal file of DESTA were used. The obtained dyadic dataset provides information on the presence of a preferential trade agreement and whether it contains provisions related to human rights, economic and social rights, environmental protection, or responsible business conduct for each bilateral country pair. Throughout this merging process, we thoroughly cleaned the dataset. If the year of entry into force was missing, it was replaced with the year of signature plus two, as in Lechner and Wüthrich (2018). Where the year of entry into force was missing for a withdrawal treaty, the year of entry into force was replaced with the signature year. Additionally, it was assumed that the depth index is consistent for all agreements referencing to the same base treaty, and that accession entries are not deeper than their corresponding base treaties. If multiple PTAs entered into force in the same year, it was assumed that those agreements were active and combined. Consequently, all PTA dummies are considered valid. However, if PTAs enter into force in different years, the new PTA replaces the old one. For EU agreements, it is assumed that they are built upon one another. In addition, the maximum value of each non-trade provision is assumed to hold for each year within the EU. In a final step, this dyadic dataset of preferential trade agreements and their provisions on non-trade objectives was merged with the sectoral trade information from the ITPD-E.

Other data sources

Data on WTO disputes was downloaded from the WTO dispute settlement gateway. Diverse datasets published in this gateway were merged to build a comprehensive database of WTO disputes as well as cases transferred to the appellate body at the product and sector level. The data is used for the descriptive analysis in chapter 4.2.3. complementing the information retrieved from the GTA.

The data on public procurement awards, was sourced from a WIFO-database that interconnects data on direct awards from the EU's Tenders Electronic Daily (TED) database (revealing direct cross-border awards only) and company data from the Amadeus database, so that indirect awards, e.g. to subsidiaries from third countries, can also be taken into account. For this study the relevant data was retrieved at the industry level (in the CPV classification) for the years 2009 to 2022. To match more closely to likely cases falling under the IPI-instrument the data was further restricted to public procurement contracts over € 5 mn.

Table A2: Central Product Classification (CPC Version 2.1) – 3-digit sectors

Code	Sector
011	Cereals
012	Vegetables
013	Fruits and nuts
014	Oilseeds and oleaginous fruits
015	Edible roots and tubers with high starch or inulin content
016	Stimulant, spice and aromatic crops
017	Pulses (dried leguminous vegetables)
018	Sugar crops
019	Forage products; fibre crops; plants used in perfumery, pharmacy, or for insecticidal, fungicidal or similar purposes; beet, forage plant and flower seeds; natural rubber; living plants, cut flowers and flower buds; unmanufactured tobacco; other raw vegetable materials
021	Live animals
022	Raw milk
023	Eggs of hens or other birds in shell, fresh
024	Reproductive materials of animals
029	Other animal products
031	Wood in the rough
032	Non-wood forest products
041	Fish, live, not for human consumption
042	Fish live, fresh or chilled for human consumption
043	Crustaceans, live, fresh or chilled
044	Molluscs live, fresh or chilled
045	Other aquatic invertebrates, live, fresh or chilled
049	Other aquatic plants and animals
110	Coal and peat
120	Crude petroleum and natural gas
130	Uranium and thorium ores and concentrates
141	Iron ores and concentrates, other than roasted iron pyrites
142	Non-ferrous metal ores and concentrates (other than uranium or thorium ores and concentrates)
151	Monumental or building stone
152	Gypsum; anhydrite; limestone flux; limestone and other calcareous stone, of a kind used for the manuf. of lime or cement
153	Sands, pebbles, gravel, broken or crushed stone, natural bitumen and asphalt
154	Clays
161	Chemical and fertilizer minerals
162	Salt and pure sodium chloride; sea water
163	Precious and semi-precious stones; pumice stone; emery; natural abrasives; other minerals
171	Electrical energy
172	Coal gas, water gas, producer gas and similar gases, other than petroleum gases and other gaseous hydrocarbons
173	Steam and hot water
174	Ice and snow
180	Natural water
211	Meat and meat products
212	Prepared and preserved fish, crustaceans, molluscs and other aquatic invertebrates
213	Prepared and preserved vegetables, pulses and potatoes
214	Prepared and preserved fruits and nuts
215	Animal fats
216	Vegetable oils
217	Margarine and similar preparations
218	Cotton linters
219	Oil-cake and other residues resulting from the extraction of vegetable fats or oils; flours and meals of oil seeds or oleaginous fruits, except those of mustard; vegetable waxes, except triglycerides; degras; residues resulting from the treatment of fatty substances or animal or vegetable waxes
221	Processed liquid milk, cream and whey
222	Other dairy products
223	Eggs, in shell, preserved or cooked
231	Grain mill products
232	Starches and starch products; sugars and sugar syrups n.e.c.
233	Preparations used in animal feeding; lucerne (alfalfa) meal and pellets
234	Bakery products
235	Sugar and molasses
236	Cocoa, chocolate and sugar confectionery
237	Macaroni, noodles, couscous and similar farinaceous products
239	Food products n.e.c.
241	Ethyl alcohol; spirits, liqueurs and other spirituous beverages
242	Wines

Table A2/continued

Code	Sector
243	Malt liquors and malt
244	Soft drinks; bottled mineral waters
250	Tobacco products
261	Natural textile fibres prepared for spinning
262	Man-made textile staple fibres processed for spinning
263	Textile yarn and thread of natural fibres
264	Textile yarn and thread of man-made filaments or staple fibres
265	Woven fabrics (except special fabrics) of natural fibres other than cotton
266	Woven fabrics (except special fabrics) of cotton
267	Woven fabrics (except special fabrics) of man-made filaments and staple fibres
268	Special fabrics
271	Made-up textile articles
272	Carpets and other textile floor coverings
273	Twine, cordage, ropes and cables and articles thereof (including netting)
279	Textiles n.e.c.
281	Knitted or crocheted fabrics
282	Wearing apparel, except fur apparel
283	Tanned or dressed furskins and artificial fur; articles thereof (except headgear)
291	Tanned or dressed leather; composition leather
292	Luggage, handbags and the like; saddlery and harness; other articles of leather
293	Footwear, with outer soles and uppers of rubber or plastics, or with uppers of leather or textile materials, other than sports footwear, footwear incorporating a protective metal toe- cap and miscellaneous special footwear
294	Sports footwear, except skating boots
295	Other footwear, except asbestos footwear, orthopaedic footwear and skating boots
296	Parts of footwear; removable insoles, heel cushions and similar articles; gaiters, leggings and similar articles, and parts thereof
311	Wood, sawn or chipped lengthwise, sliced or peeled, of a thickness exceeding 6 mm; railway or tramway sleepers (cross-ties) of wood, not impregnated
312	Wood continuously shaped along any of its edges or faces; wood wool; wood flour; wood in chips or particles
313	Wood in the rough, treated with paint, stains, creosote or other preservatives; railway or tramway sleepers (cross-ties) of wood, impregnated; hoopwood, split poles, wooden sticks and the like
314	Boards and panels
315	Veneer sheets; sheets for plywood; densified wood
316	Builders' joinery and carpentry of wood (including cellular wood panels, assembled parquet panels, shingles and shakes)
317	Packing cases, boxes, crates, drums and similar packings, of wood; cable-drums of wood; pallets, box pallets and other load boards, of wood; casks, barrels, vats, tubs and other coopers' products and parts thereof, of wood (including staves)
319	Other products of wood; articles of cork, plaiting materials and straw
321	Pulp, paper and paperboard
322	Books, in print
323	Newspapers and periodicals, daily, in print
324	Newspapers and periodicals, other than daily, in print
325	Printed maps; music, printed or in manuscript; postcards, greeting cards, pictures and plans
326	Stamps, cheque forms, banknotes, stock certificates, brochures and leaflets, advertising material and other printed matter
327	Registers, account books, notebooks, letter pads, diaries and similar articles, blotting-pads, binders, file covers, forms and other articles of stationery, of paper or paperboard
328	Composed type, prepared printing plates or cylinders, impressed lithographic stones or other impressed media for use in printing
331	Coke and semi-coke of coal, of lignite or of peat; retort carbon
332	Tar distilled from coal, from lignite or from peat, and other mineral tars
333	Petroleum oils and oils obtained from bituminous materials, other than crude; preparations n.e.c. containing by weight 70% or more of these oils, such oils being the basic constituents of the preparations
334	Petroleum gases and other gaseous hydrocarbons, except natural gas
335	Petroleum jelly; paraffin wax, micro- crystalline petroleum wax, slack wax, ozokerite, lignite wax, peat wax, other mineral waxes, and similar products; petroleum coke, petroleum bitumen and other residues of petroleum oils or of oils obtained from bituminous materials
336	Radioactive elements and isotopes and compounds; alloys, dispersions, ceramic products and mixtures containing these elements, isotopes or compounds; radioactive residues
337	Fuel elements (cartridges), for or of nuclear reactors
341	Basic organic chemicals
342	Basic inorganic chemicals n.e.c.
343	Tanning or dyeing extracts; tannins and their derivatives; colouring matter n.e.c.
344	Activated natural mineral products; animal black; tall oil; terpenic oils produced by the treatment of coniferous woods; crude dipentene; crude para-cymene; pine oil; rosin and resin acids, and derivatives thereof; rosin spirit and rosin oils; rum gums; wood tar; wood tar oils; wood creosote; wood naphtha; vegetable pitch; brewers' pitch
345	Miscellaneous basic chemical products
346	Fertilizers and pesticides
347	Plastics in primary forms

Table A2/continued

Code	Sector
348	Synthetic rubber and factice derived from oils, and mixtures thereof with natural rubber and similar natural gums, in primary forms or in plates, sheets or strip
351	Paints and varnishes and related products; artists' colours; ink
352	Pharmaceutical products
353	Soap, cleaning preparations, perfumes and toilet preparations
354	Chemical products n.e.c.
355	Man-made fibres
361	Rubber tyres and tubes
362	Other rubber products
363	Semi-manufactures of plastics
364	Packaging products of plastics
369	Other plastics products
371	Glass and glass products
372	Non-structural ceramic ware
373	Refractory products and structural non-refractory clay products
374	Plaster, lime and cement
375	Articles of concrete, cement and plaster
376	Monumental or building stone and articles thereof
379	Other non-metallic mineral products n.e.c.
381	Furniture
382	Jewellery and related articles
383	Musical instruments
384	Sports goods
385	Games and toys
386	Roundabouts, swings, shooting galleries and other fairground amusements
387	Prefabricated buildings
389	Other manufactured articles n.e.c.
391	Wastes from food and tobacco industry
392	Non-metal wastes or scraps
393	Metal wastes or scraps
399	Other wastes and scraps
411	Basic iron and steel
412	Products of iron or steel
413	Basic precious metals and metals clad with precious metals
414	Copper, nickel, aluminium, alumina, lead, zinc and tin, unwrought
415	Semi-finished products of copper, nickel, aluminium, lead, zinc and tin or their alloys
416	Other non-ferrous metals and articles thereof (including waste and scrap of some metals); cermets and articles thereof
421	Structural metal products and parts thereof
422	Tanks, reservoirs and containers of iron, steel or aluminium
423	Steam generators, (except central heating boilers) and parts thereof
429	Other fabricated metal products
431	Engines and turbines and parts thereof
432	Pumps, compressors, hydraulic and pneumatic power engines, and valves, and parts thereof
433	Bearings, gears, gearing and driving elements, and parts thereof
434	Ovens and furnace burners and parts thereof
435	Lifting and handling equipment and parts thereof
439	Other general-purpose machinery and parts thereof
441	Agricultural or forestry machinery and parts thereof
442	Machine-tools and parts and accessories thereof
443	Machinery for metallurgy and parts thereof
444	Machinery for mining, quarrying and construction, and parts thereof
445	Machinery for food, beverage and tobacco processing, and parts thereof
446	Machinery for textile, apparel and leather production, and parts thereof
447	Weapons and ammunition and parts thereof
448	Domestic appliances and parts thereof
449	Other special-purpose machinery and parts thereof
451	Office and accounting machinery, and parts and accessories thereof
452	Computing machinery and parts and accessories thereof
461	Electric motors, generators and transformers, and parts thereof
462	Electricity distribution and control apparatus, and parts thereof
463	Insulated wire and cable; optical fibre cables
464	Accumulators, primary cells and primary batteries, and parts thereof
465	Electric filament or discharge lamps; arc lamps; lighting equipment; parts thereof
469	Other electrical equipment and parts thereof
471	Electronic valves and tubes; electronic components; parts thereof

Table A2/continued

Code	Sector
472	Television and radio transmitters; television, video and digital cameras; telephone sets
473	Radio broadcast and television receivers; apparatus for sound and video recording and reproducing; microphones, loudspeakers, amplifiers, etc.
474	Parts for the goods of classes 4721 to 4733 and 4822
475	Disks, tapes, solid-state non-volatile storage devices and other media, not recorded
476	Audio, video and other disks, tapes and other physical media, recorded
478	Packaged software
479	Cards with magnetic strips or chip
481	Medical and surgical equipment and orthopaedic appliances
482	Instruments and appliances for measuring, checking, testing, navigating and other purposes, except optical instruments; industrial process control equipment; parts and accessories thereof
483	Optical instruments and photographic equipment, and parts and accessories thereof
484	Watches and clocks, and parts thereof
491	Motor vehicles, trailers and semi-trailers; parts and accessories thereof
492	Bodies (coachwork) for motor vehicles; trailers and semi-trailers; parts and accessories thereof
493	Ships
494	Pleasure and sporting boats
495	Railway and tramway locomotives and rolling stock, and parts thereof
496	Aircraft and spacecraft, and parts thereof
499	Other transport equipment and parts thereof

Source: WIFO presentation.

Table A3: GTAP country list

ISO 3-digit	Country	ISO 3-digit	Country	ISO 3-digit	Country
ALB	Albania	HUN	Hungary	ROU	Romania
ARE	United Arab Emirates	IDN	Indonesia	RUS	Russia
ARG	Argentina	IND	India	RWA	Rwanda
ARM	Armenia	IRL	Ireland	SAU	Saudi Arabia
AUS	Australia	IRN	Iran	SEN	Senegal
AUT	Austria	ISR	Israel	SGP	Singapore
AZE	Azerbaijan	ITA	Italy	SLV	El Salvador
BEL	Belgium	JAM	Jamaica	SVK	Slovakia
BEN	Benin	JOR	Jordan	SVN	Slovenia
BFA	Burkina Faso	JPN	Japan	SWE	Sweden
BGD	Bangladesh	KAZ	Kazakhstan	TGO	Togo
BGR	Bulgaria	KEN	Kenya	THA	Thailand
BHR	Bahrain	KGZ	Kyrgyzstan	TJK	Tajikistan
BLR	Belarus	KHM	Cambodia	TTO	Trinidad and Tobago
BOL	Bolivia	KOR	Republic of Korea	TUN	Tunisia
BRA	Brazil	KWT	Kuwait	TUR	Turkey
BRN	Brunei Darussalam	LAO	Lao	TWN	Taiwan
BWA	Botswana	LKA	Sri Lanka	TZA	Tanzania
CAN	Canada	LTU	Lithuania	UGA	Uganda
CHE	Switzerland	LUX	Luxembourg	UKR	Ukraine
CHL	Chile	LVA	Latvia	URY	Uruguay
CHN	China	MAR	Morocco	USA	USA
CIV	Côte d'Ivoire	MDG	Madagascar	VEN	Venezuela
CMR	Cameroon	MEX	Mexico	VNM	Vietnam
COL	Colombia	MLT	Malta	XAC	South Central Africa
CRI	Costa Rica	MNG	Mongolia	XCA	Rest of Central America
CYP	Cyprus	MOZ	Mozambique	XCB	Rest of Caribbean
CZE	Czech Republic	MUS	Mauritius	XCF	Rest of Central Africa
DEU	Germany	MWI	Malawi	XEA	Rest of East Asia
DNK	Denmark	MYS	Malaysia	XEC	Rest of Eastern Africa
DOM	Dominican Republic	NAM	Namibia	XEE	Rest of Eastern Europe
ECU	Ecuador	NGA	Nigeria	XEF	Rest of EFTA
EGY	Egypt	NIC	Nicaragua	XER	Rest of Europe
ESP	Spain	NLD	Netherlands	XNA	Rest of North America
EST	Estonia	NOR	Norway	XNF	Rest of North Africa
ETH	Ethiopia	NPL	Nepal	XOC	Rest of Oceania
FIN	Finland	NZL	New Zealand	XSA	Rest of South Asia
FRA	France	OMN	Oman	XSC	Rest of SACU
GBR	United Kingdom	PAK	Pakistan	XSE	Rest of Southeast Asia
GEO	Georgia	PAN	Panama	XSM	Rest of South America
GHA	Ghana	PER	Peru	XSU	Rest of Former Soviet Union
GIN	Guinea	PHL	Philippines	XTW	Rest of the World
GRC	Greece	POL	Poland	XWF	Rest of Western Africa
GTM	Guatemala	PRI	Puerto Rico	XWS	Rest of Western Asia
HKG	Hong Kong	PRT	Portugal	ZAF	South Africa
HND	Honduras	PRY	Paraguay	ZMB	Zambia
HRV	Croatia	QAT	Qatar	ZWE	Zimbabwe

Source: WIFO presentation.

Table A4: Types of protectionist policies

Tariffs	
Import tariff	
Trade defence measures	
Anti-circumvention	
Anti-dumping	
Anti-subsidy	
Safeguard	
Non-tariff barriers	
Import controls • Import ban • Import licensing requirement • Import monitoring • Import quota • Import tariff quota • Import-related non-tariff measure, nes • Internal taxation of imports • Trade balancing measure • Trade payment measure Public procurement • Public procurement access • Public procurement localisation • Public procurement preference margin • Public procurement, nes Capital controls • Control on personal transactions • Control on comm. tansact. investment instruments • Control on credit operations	Export controls • Export ban • Export licensing requirement • Export quota • Export tariff quota • Export tax • Export-related non-tariff measure, nes • Foreign customer limit Subsidies and state aid • Bailout (capital injection or equity participation.) • Financial assistance in foreign market • Financial grant • In-kind grant • Interest payment subsidy • Production subsidy • State loan • Tax of social insurance relief • State aid, nes Other instruments • Technical barrier to trade (TBT, SPS) • Intellectual property protection (IPR)

Source: GTA, WIFO presentation.

Table A5: High-risk countries

Country	Source
Afghanistan	CAHRA, ITUC
Algeria	ITUC
Bahrain	ITUC
Bangladesh	ITUC
Belarus	ITUC
Brazil	ITUC
Burkina Faso	CAHRA
Burundi	CAHRA, ITUC
Cambodia	ITUC
Cameroon	CAHRA
Central African Republic	CAHRA, ITUC
Chad	CAHRA
China	ITUC
Colombia	CAHRA, ITUC
Democratic Republic of Congo	CAHRA
Ecuador	ITUC
Egypt	CAHRA, ITUC
Eritrea	CAHRA, ITUC
Eswatini	ITUC
Ethiopia	CAHRA
Guatemala	ITUC
Haiti	ITUC
Honduras	ITUC
Hongkong	ITUC
India	CAHRA, ITUC
Indonesia	ITUC
Iran	ITUC
Iraq	ITUC
Jordan	ITUC
Kazakhstan	ITUC
South Korea	ITUC
Kuwait	ITUC
Laos	ITUC
Libya	CAHRA, ITUC
Malaysia	ITUC
Mali	CAHRA
Mozambique	CAHRA
Myanmar	CAHRA, ITUC
Niger	CAHRA
Nigeria	CAHRA
Occupied Palestinian Territory	ITUC
Pakistan	CAHRA, ITUC
Philippines	CAHRA, ITUC
Somalia	CAHRA, ITUC
South Sudan	CAHRA, ITUC
Sudan	CAHRA, ITUC
Syria	ITUC
Turkey	CAHRA, ITUC
Thailand	ITUC
Tunisia	ITUC
Ukraine	CAHRA
United Arab Emirates	ITUC
Venezuela	CAHRA
Yemen	CAHRA, ITUC
Zimbabwe	CAHRA, ITUC

Source: ITUC (https://www.globalrightsindex.org/de/2022/countries/afg-2), EU (https://www.cahraslist.net/cahras), WIFO presentation.

Table A6: Deforestation product list

CN code	CN name	Categories
0102	Live bovine animals	Cattle
0201	Meat of bovine animals, fresh or chilled	Cattle
0202	Meat of bovine animals, frozen	Cattle
020610	Fresh or chilled edible offal of bovine animals	Cattle
020621	Frozen edible bovine tongues	Cattle
020622	Frozen edible bovine livers	Cattle
020629	Frozen edible bovine offal (excl. tongues and livers)	Cattle
021020	Meat of bovine animals, salted, in brine, dried or smoked	Cattle
160250	Prepared or preserved meat or offal of bovine animals (excl. sausages and similar products, finely homogenised preparations put up for retail sale as infant food or for dietetic purposes, in containers of a net weight of <= 250 g, preparations of liver and meat extracts and juices)	Cattle
4101	Raw hides and skins of bovine "incl. buffalo" or equine animals, fresh, or salted, dried, limed, pickled or otherwise preserved, whether or not dehaired or split (excl. tanned, parchment-dressed or further prepared)	Cattle
4104	Tanned or crust hides and skins of bovine "incl. buffalo" or equine animals, without hair on, whether or not split (excl. further prepared)	Cattle
4107	Leather further prepared after tanning or crusting "incl. parchment-dressed leather", of bovine "incl. buffalo" or equine animals, without hair on, whether or not split (excl. chamois leather, patent leather and patent laminated leather, and metallised leather)	Cattle
18	Cocoa and cocoa preparations	Cocoa
0901	Coffee, whether or not roasted or decaffeinated; coffee husks and skins; coffee substitutes containing coffee in any proportion	Coffee
1005	Maize or corn	Maize
110220	Maize "corn" flour	Maize
110313	Groats and meal of maize "corn"	Maize
11032040	Maize pellets	Maize
11041950	Rolled or flaked maize grains	Maize
110423	Hulled, pearled, sliced, kibbled or otherwise worked maize grains (excl. rolled, flaked, pellets and flour)	Maize
110812	Maize starch	Maize
151521	Crude maize oil	Maize
151529	Maize oil and fractions thereof, whether or not refined, but not chemically modified (excl. crude)	Maize
19041010	Prepared foods obtained by swelling or roasting cereals or cereal products based on maize	Maize
230210	Bran, sharps and other residues of maize "corn", whether or not in the form of pellets, derived from sifting, milling or other working	Maize
23069005	Oilcake and other solid residues, whether or not ground or in the form of pellets, resulting from the extraction of vegetable fats or oils from maize "corn" germ	Maize
120710	Palm nuts and kernels	Oil palm
1511	Palm oil and its fractions, whether or not refined (excl. chemically modified)	Oil palm
151321	Crude palm kernel and babassu oil	Oil palm
151329	Palm kernel and babassu oil and their fractions, whether or not refined, but not chemically modified (excl. crude)	Oil palm
1517	Margarine, other edible mixtures or preparations of animal or vegetable fats or oils and edible fractions of different fats or oils (excl. fats, oils and their fractions, partly or wholly hydrogenated, inter-esterified, re-esterified or elaidinised, whether or not refined, but not further prepared, and mixtures of olive oils and their fractions)	Oil palm
230660	Oilcake and other solid residues, whether or not ground or in the form of pellets, resulting from the extraction of palm nuts or kernels	Oil palm
290517	Dodecan-1-ol "lauryl alcohol", hexadecan-1-ol "cetyl alcohol" and octadecan-1-ol "stearyl alcohol"	Oil palm
290545	Glycerol	Oil palm
291570	Palmitic acid, stearic acid, their salts and esters	Oil palm
291590	Saturated acyclic monocarboxylic acids, their anhydrides, halides, peroxides and peroxyacids; their halogenated, sulphonated, nitrated or nitrosated derivatives (excl. formic acid and acetic acid, mono-, di- or trichloroacetic acids, propionic acid, butanoic and pentanoic acids, palmitic and stearic acids, their salts and esters, and acetic anhydride)	Oil palm
3401	Soap; organic surface-active products and preparations for use as soap, in the form of bars, cakes, moulded pieces or shapes, whether or not containing soap; organic surface-active products and preparations for washing the skin, in the form of liquid or cream and put up for retail sale, whether or not containing soap; paper, wadding, felt and nonwovens, impregnated, coated or covered with soap or detergent	Oil palm

Table A6/continued

CN code	CN name	Categories
3823	Industrial monocarboxylic fatty acids; acid oils from refining; industrial fatty alcohols	Oil palm
3824	Prepared binders for foundry moulds or cores; chemical products and preparations for the chemical or allied industries, incl. mixtures of natural products, n.e.s.	Oil palm
3826	Biodiesel and mixtures thereof, not containing or containing < 70 % by weight of petroleum oils or oils obtained from bituminous minerals	Oil palm
0105	Live poultry, "fowls of the species Gallus domesticus, ducks, geese, turkeys and guinea fowls"	Poultry
0207	Meat and edible offal of fowls of the species Gallus domesticus, ducks, geese, turkeys and guinea fowls, fresh, chilled or frozen	Poultry
020990	Poultry fat, not rendered or otherwise extracted, fresh, chilled, frozen, salted, in brine, dried or smoked	Poultry
02109939	Meat, salted, in brine, dried or smoked (excl. of swine, bovine animals, reindeer, sheep or goats, primates, whales, dolphins and porpoises "mammals of the order Cetacea", manatees and dugongs "mammals of the order Sirenia", seals, sea lions and walruses, reptiles, and meat, salted, in brine or dried, of horses)	Poultry
160231	Meat or offal of turkeys "Gallus domesticus", prepared or preserved (excl. sausages and similar products, and finely homogenised preparations put up for retail sale as infant food or for dietetic purposes, in containers of a net weight of <= 250 g, preparations of liver and meat extracts and juices)	Poultry
160232	Meat or offal of fowls of the species "Gallus domesticus", prepared or preserved (excl. sausages and similar products, finely homogenised preparations put up for retail sale as infant food or for dietetic purposes, in containers of a net weight of <= 250 g, preparations of liver and meat extracts and juices)	Poultry
160239	Prepared or preserved meat or meat offal of ducks, geese and guinea fowl of the species domesticus (excl. sausages and similar products, finely homogenised preparations put up for retail sale as infant food or for dietetic purposes, in containers of a net weight of <= 250 g, preparations of liver and meat extracts and juices)	Poultry
4001	Natural rubber, balata, gutta-percha, guayule, chicle and similar natural gums, in primary forms or in plates, sheets or strip	Rubber
4005	Compounded rubber, unvulcanised, in primary forms or in plates, sheets or strip (excl. mixtures of natural rubber, balata, gutta-percha, guayule, chicle and similar natural gums containing synthetic rubber or factice derived from oils)	Rubber
4006	Rods, bars, tubes, profiles and other forms of unvulcanised rubber, incl. mixed rubber, and articles of unvulcanised rubber, incl. mixed rubber (excl. plates, sheets and strip which, apart from basic surface-working, have not been cut, or have merely been cut into square or rectangular shapes)	Rubber
4007	Vulcanised rubber thread and cord (excl. ungimped single thread with a diameter of > 5 mm and textiles combined with rubber thread, e.g. textile-covered thread and cord)	Rubber
4008	Plates, sheets, strip, rods and profile shapes, of vulcanised rubber (excl. hard rubber)	Rubber
4010	Conveyor or transmission belts or belting, of vulcanised rubber	Rubber
4011	New pneumatic tyres, of rubber	Rubber
4012	Retreaded or used pneumatic tyres of rubber; solid or cushion tyres, tyre treads and tyre flaps, of rubber	Rubber
4013	Inner tubes, of rubber	Rubber
4015	Articles of apparel and clothing accessories, incl. gloves, mittens and mitts, for all purposes, of vulcanised rubber (excl. hard rubber and footwear and headgear and parts thereof)	Rubber
4016	Articles of vulcanised rubber (excl. hard rubber), n.e.s.	Rubber
4017	Hard rubber, e.g. ebonite, in all forms, incl. waste and scrap; articles of hard rubber, n.e.s.	Rubber
0104	Live sheep and goats	Sheep, goats
0204	Meat of sheep or goats, fresh, chilled or frozen	Sheep, goats
1201	Soya beans, whether or not broken	Soya
120810	Soya bean flour and meal	Soya
1507	Soya-bean oil and its fractions, whether or not refined (excl. chemically modified)	Soya
2304	Oilcake and other solid residues, whether or not ground or in the form of pellets, resulting from the extraction of soya-bean oil	Soya
0103	Live swine	Swine
0203	Meat of swine, fresh, chilled or frozen	Swine
021011	Hams, shoulders and cuts thereof of swine, salted, in brine, dried or smoked, with bone in	Swine
021012	Bellies "streaky" and cuts thereof of swine, salted, in brine, dried or smoked	Swine
021019	Meat of swine, salted, in brine, dried or smoked (excl. hams, shoulders and cuts thereof, with bone in, and bellies and cuts thereof)	Swine
020910	Pig fat, free of lean meat, not rendered or otherwise extracted, fresh, chilled, frozen, salted, in brine, dried or smoked	Swine
4401	Fuel wood, in logs, billets, twigs, faggots or similar forms; wood in chips or particles; sawdust and wood waste and scrap, whether or not agglomerated in logs, briquettes, pellets or similar forms	Wood

Table A6/continued

CN code	CN name	Categories
4402	Wood charcoal, incl. shell or nut charcoal, whether or not agglomerated (excl. wood charcoal used as a medicament, charcoal mixed with incense, activated charcoal and charcoal in the form of crayons)	Wood
4403	Wood in the rough, whether or not stripped of bark or sapwood, or roughly squared (excl. rough-cut wood for walking sticks, umbrellas, tool shafts and the like; wood in the form of railway sleepers; wood cut into boards or beams, etc.)	Wood
4406	Railway or tramway sleepers "cross-ties" of wood	Wood
4407	Wood sawn or chipped lengthwise, sliced or peeled, whether or not planed, sanded or end-jointed, of a thickness of > 6 mm	Wood
4408	Sheets for veneering, incl. those obtained by slicing laminated wood, for plywood or for other similar laminated wood and other wood, sawn lengthwise, sliced or peeled, whether or not planed, sanded, spliced or end-jointed, of a thickness of <= 6 mm	Wood
4409	Wood, incl. strips and friezes for parquet flooring, not assembled, continuously shaped "tongued, grooved, rebated, chamfered, V-jointed beaded, moulded, rounded or the like" along any of its edges, ends or faces, whether or not planed, sanded or end-jointed	Wood
4410	Particle board, oriented strand board "OSB" and similar board "e.g. waferboard" of wood or other ligneous materials, whether or not agglomerated with resins or other organic binding substances (excl. fibreboard, veneered particle board, cellular wood panels and board of ligneous materials agglomerated with cement, plaster or other mineral bonding agents)	Wood
4411	Fibreboard of wood or other ligneous materials, whether or not agglomerated with resins or other organic bonding agents (excl. particle board, whether or not bonded with one or more sheets of fibreboard; laminated wood with a layer of plywood; composite panels with outer layers of fibreboard; paperboard; furniture components identifiable as such)	Wood
4412	Plywood, veneered panel and similar laminated wood (excl. sheets of compressed wood, cellular wood panels, parquet panels or sheets, inlaid wood and sheets identifiable as furniture components)	Wood
4413	Metallised wood and other densified wood in blocks, plates, strips or profile shapes	Wood
4414	Wooden frames for paintings, photographs, mirrors or similar objects	Wood
4415	Packing cases, boxes, crates, drums and similar packings, of wood; cable-drums of wood; pallets, box pallets and other load boards, of wood; pallet collars of wood (excl. containers specially designed and equipped for one or more modes of transport)	Wood
4416	Casks, barrels, vats, tubs and other coopers' products parts thereof, of wood, incl. staves	Wood
4418	Builders' joinery and carpentry, of wood, incl. cellular wood panels, assembled flooring panels, shingles and shakes, of wood (excl. plywood panelling, blocks, strips and friezes for parquet flooring, not assembled, and pre-fabricated buildings)	Wood
4701	Mechanical wood pulp, not chemically treated	Wood
4702	Chemical wood pulp, dissolving grades	Wood
4703	Chemical wood pulp, soda or sulphate (excl. dissolving grades)	Wood
4704	Chemical wood pulp, sulphite (excl. dissolving grades)	Wood
4801	Newsprint as specified in Note 4 to chapter 48, in rolls of a width > 28 cm or in square or rectangular sheets with one side > 28 cm and the other side > 15 cm in the unfolded state	Wood
4802	Uncoated paper and paperboard, of a kind used for writing, printing or other graphic purposes, and non-perforated punchcards and punch-tape paper, in rolls or in square or rectangular sheets, of any size, and hand-made paper and paperboard (excl. newsprint of heading 4801 and paper of heading 4803)	Wood
4803	Toilet or facial tissue stock, towel or napkin stock and similar paper for household or sanitary purposes, cellulose wadding and webs of cellulose fibres, whether or not creped, crinkled, embossed, perforated, surface-coloured, surface-decorated or printed, in rolls of a width > 36 cm or in square or rectangular sheets with one side > 36 cm and the other side > 15 cm in the unfolded state	Wood
4804	Uncoated kraft paper and paperboard, in rolls of a width > 36 cm or in square or rectangular sheets with one side > 36 cm and the other side > 15 cm in the unfolded state (excl. goods of heading 4802 or 4803)	Wood
4805	Other paper and paperboard, uncoated, in rolls of a width > 36 cm or in square or rectangular sheets with one side > 36 cm and the other side > 15 cm in the unfolded state, not worked other than as specified in Note 3 to this chapter, n.e.s.	Wood
4806	Vegetable parchment, greaseproof papers, tracing papers and glassine and other glazed transparent or translucent papers, in rolls of a width > 36 cm or in square or rectangular sheets with one side > 36 cm and the other side > 15 cm in the unfolded state	Wood
480700	Composite paper and paperboard "made by sticking flat layers of paper or paperboard together with an adhesive", not surface-coated or impregnated, whether or not internally reinforced, in rolls of a width > 36 cm or in square or rectangular sheets with one side > 36 cm and the other side > 15 cm in the unfolded state	Wood
4808	Corrugated paper and paperboard "with or without glued flat surface sheets", creped, crinkled, embossed or perforated, in rolls of a width > 36 cm or in square or rectangular sheets with one side > 36 cm and the other side > 15 cm in the unfolded state (excl. goods of heading 4803)	Wood

Table A6/continued

CN code	CN name	Categories
4809	Carbon paper, self-copy paper and other copying or transfer papers, incl. coated or impregnated paper for duplicator stencils or offset plates, whether or not printed, in rolls of a width > 36 cm or in square or rectangular sheets with one side > 36 cm and the other side > 15 cm in the unfolded state	Wood
4810	Paper and paperboard, coated on one or both sides with kaolin "China clay" or other inorganic substances, with or without a binder, and with no other coating, whether or not surface-coloured, surface-decorated or printed, in rolls or in square or rectangular sheets, of any size (excl. all other coated papers and paperboards)	Wood
4811	Paper, paperboard, cellulose wadding and webs of cellulose fibres, coated, impregnated, covered, surface-coloured, surface-decorated or printed, in rolls or in square or rectangular sheets, of any size (excl. goods of heading 4803, 4809 and 4810)	Wood
4812	Filter blocks, slabs and plates, of paper pulp	Wood
4813	Cigarette paper, whether or not cut to size or in the form of booklets or tubes	Wood
4814	Wallpaper and similar wallcoverings of paper; window transparencies of paper	Wood
4816	Carbon paper, self-copy paper and other copying or transfer papers, in rolls of a width of <= 36 cm or in rectangular or square sheets with no side measuring > 36 cm in the unfolded state, or cut into shapes other than rectangles or squares, together with full duplicator stencils and offset plates of paper, whether or not in boxes	Wood
4817	Envelopes, letter cards, plain postcards and correspondence cards, of paper or paperboard; boxes, pouches, wallets and writing compendiums, of paper or paperboard, containing an assortment of paper stationery (excl. letter cards, postcards and correspondence cards with imprinted postage stamps)	Wood
4818	Toilet paper and similar paper, cellulose wadding or webs of cellulose fibres, of a kind used for household or sanitary purposes, in rolls of a width <= 36 cm, or cut to size or shape; handkerchiefs, cleansing tissues, towels, tablecloths, serviettes, bedsheets and similar household, sanitary or hospital articles, articles of apparel and clothing accessories, of paper pulp, paper, cellulose wadding or webs of cellulose fibres	Wood
4819	Cartons, boxes, cases, bags and other packing containers, of paper, paperboard, cellulose wadding or webs of cellulose fibres, n.e.s.; box files, letter trays, and similar articles, of paperboard of a kind used in offices, shops or the like	Wood
4820	Registers, account books, notebooks, order books, receipt books, letter pads, memorandum pads, diaries and similar articles, exercise books, blotting pads, binders, folders, file covers, manifold business forms, interleaved carbon sets and other articles of stationery, of paper or paperboard; albums for samples or for collections and book covers, of paper and paperboard	Wood
4821	Paper or paperboard labels of all kinds, whether or not printed	Wood
4822	Bobbins, spools, cops and similar supports of paper pulp, paper or paperboard, whether or not perforated or hardened	Wood
482320	Filter paper and paperboard, in strips or rolls of a width <= 36 cm, in rectangular or square sheets, of which no side > 36 cm in the unfolded state, or cut to shape other than rectangular or square	Wood
482340	Rolls, sheets and dials, printed for self-recording apparatus, in rolls of a width <= 36 cm, in rectangular or square sheets of which no side > 36 cm in the unfolded state, or cut into dials	Wood
482369	Trays, dishes, plates, cups and the like, of paper or paperboard (excl. of bamboo paper or bamboo paperboard)	Wood
482370	Moulded or pressed articles of paper pulp, n.e.s.	Wood
482390	Paper, paperboard, cellulose wadding and webs of cellulose fibres, in strips or rolls of a width <= 36 cm, in rectangular or square sheets, of which no side > 36 cm in the unfolded state, or cut to shape other than rectangular or square, and articles of paper pulp, paper, cellulose wadding or webs of cellulose fibres, n.e.s.	Wood
49	Printed books, newspapers, pictures and other products of the printing industry, manuscripts, typescripts and plans	Wood
940330	Wooden furniture for offices (excl. seats)	Wood
940340	Wooden furniture for kitchens (excl. seats)	Wood
940350	Wooden furniture for bedrooms (excl. seats)	Wood
940360	Wooden furniture (excl. for offices, kitchens and bedrooms, and seats)	Wood
94039030	Parts of furniture, of wood, n.e.s. (excl. seats)	Wood
940610	Prefabricated buildings of wood, whether or not complete or already assembled	Wood

Source: European Parliament (https://www.europarl.europa.eu/doceo/document/TA-9-2022-0311_EN.html), WIFO presentation.

Table A7: CBAM product list

CN code	CN name	CBAM
25070080	Kaolin and other kaolinic clays, calcined	Cement
25231000	Cement clinkers	Cement
25232100	White Portland cement, whether or not artificially coloured	Cement
25232900	Other Portland cement	Cement
25233000	Aluminous cement	Cement
25239000	Other hydraulic cements	Cement
27160000	Electrical energy	Electricity
28080000	Nitric acid; sulphonitric acids	Fertilisers
2814	Ammonia, anhydrous or in aqueous solution	Fertilisers
28342100	Nitrates of potassium	Fertilisers
3102	Mineral or chemical fertilisers, nitrogenous	Fertilisers
31051000	Mineral or chemical fertilisers of animal or vegetable origin, in tablets or similar forms, or in packages with a gross weight of <= 10 kg	Fertilisers
31052010	Mineral or chemical fertilisers containing phosphorus and potassium, with a nitrogen content > 10 % by weight on the dry anhydrous product (excl. those in tablets or similar forms, or in packages with a gross weight of <= 10 kg)	Fertilisers
31052090	Mineral or chemical fertilisers containing nitrogen, phosphorus and potassium, with a nitrogen content <= 10 % by weight on the dry anhydrous product (excl. those in tablets or similar forms, or in packages with a gross weight of <= 10 kg)	Fertilisers
31053000	Diammonium hydrogenorthophosphate "diammonium phosphate" (excl. that in tablets or similar forms, or in packages with a gross weight of <= 10 kg)	Fertilisers
31054000	Ammonium dihydrogenorthophosphate "monoammonium phosphate", whether or not mixed with diammonium hydrogenorthophosphate "diammonium phosphate" (excl. that in tablets or similar forms, or in packages with a gross weight of <= 10 kg)	Fertilisers
31055100	Mineral or chemical fertilisers containing nitrates and phosphates (excl. ammonium dihydrogenorthophosphate "Monoammonium phosphate", diammonium hydrogenorthophosphate "Diammonium phosphate", and those in tablets or similar forms, or in packages with a gross weight of <= 10 kg)	Fertilisers
31055900	Mineral or chemical fertilisers containing the two fertilising elements nitrogen (excl. nitrate) and phosphorus but not nitrates (excl. ammonium dihydrogenorthophosphate "monoammonium phosphate", diammonium hydrogenorthophosphate "diammonium phosphate" in tablets or similar forms, or in packages with a gross weight of <= 10 kg)	Fertilisers
31059020	Mineral or chemical fertilisers containing the two fertilising elements nitrogen and potassium, or one principal fertilising substance only, incl. mixtures of animal or vegetable fertilisers with chemical or mineral fertilisers, containing > 10% nitrogen by weight (excl. in tablets or similar forms, or in packages with a gross weight of <= 10 kg)	Fertilisers
31059080	Mineral or chemical fertilisers containing the two fertilising elements nitrogen and potassium, or one main fertilising element, incl. mixtures of animal or vegetable fertilisers with chemical or mineral fertilisers, not containing nitrogen or with a nitrogen content, by weight, of <= 10% (excl. in tablets or similar forms or in packages of a gross weight of <= 10 kg)	Fertilisers
26011200	Agglomerated iron ores and concentrates, other than roasted iron pyrites	Iron, steel
7201	Pig iron and spiegeleisen, in pigs, blocks or other primary forms	Iron, steel
720211	Ferro-manganese, containing by weight > 2% of carbon	Iron, steel
720219	Ferro-manganese, containing by weight <= 2% carbon	Iron, steel
720241	Ferro-chromium, containing by weight > 4% of carbon	Iron, steel
720249	Ferro-chromium, containing by weight <= 4% of carbon	Iron, steel
720260	Ferro-nickel	Iron, steel
7203	Ferrous products obtained by direct reduction of iron ore and other spongy ferrous products, in lumps, pellets or similar forms	Iron, steel
7205	Granules and powders of pig iron, spiegeleisen, iron or steel (excl. granules and powders of ferro-alloys, turnings and filings of iron or steel, radioactive iron powders "isotopes" and certain low-calibre, substandard balls for ballbearings)	Iron, steel
7206	Iron and non-alloy steel in ingots or other primary forms (excl. remelting scrap ingots, products obtained by continuous casting and iron of heading 7203)	Iron, steel
7207	Semi-finished products of iron or non-alloy steel	Iron, steel
7208	Flat-rolled products of iron or non-alloy steel, of a width >= 600 mm, hot-rolled, not clad, plated or coated	Iron, steel
7209	Flat-rolled products of iron or non-alloy steel, of a width of >= 600 mm, cold-rolled "cold-reduced", not clad, plated or coated	Iron, steel
7301	Sheet piling of iron or steel, whether or not drilled, punched or made from assembled elements; welded angles, shapes and sections, of iron or steel	Iron, steel
7302	Railway or tramway track construction material of iron or steel, the following: rails, check-rails and rack rails, switch blades, crossing frogs, point rods and other crossing pieces, sleepers (cross-ties), fish- plates, chairs, chair wedges, sole plates (base plates), rail clips, bedplates, ties and other material specialised for jointing or fixing rails	Iron, steel
7303	Tubes, pipes and hollow profiles, of cast iron	Iron, steel

Table A7/continued

CN code	CN name	CBAM
7304	Tubes, pipes and hollow profiles, seamless, of iron (other than cast iron) or steel	Iron, steel
7305	Other tubes and pipes (for example, welded, riveted or similarly closed), having circular cross-sections, the external diameter of which exceeds 406.4 mm, of iron or steel	Iron, steel
7306	Other tubes, pipes and hollow profiles (for example, open seam or welded, riveted or similarly closed), of iron or steel	Iron, steel
7307	Tube or pipe fittings (for example, couplings, elbows, sleeves), of iron or steel	Iron, steel
7308	Structures (excluding prefabricated buildings of heading 9406) and parts of structures (for example, bridges and bridge-sections, lockgates, towers, lattice masts, roofs, roofing frameworks, doors and windows and their frames and thresholds for doors, shutters, balustrades, pillars and columns), of iron or steel; plates, rods, angles, shapes, sections, tubes and the like, prepared for use in structures, of iron or steel	Iron, steel
7309	Reservoirs, tanks, vats and similar containers for any material (other than compressed or liquefied gas), of iron or steel, of a capacity exceeding 300 l, whether or not lined or heat-insulated, but not fitted with mechanical or thermal equipment	Iron, steel
7310	Tanks, casks, drums, cans, boxes and similar Containers, for any material (other than compressed or liquefied gas), of iron or steel, of a capacity not exceeding 300 l, whether or not lined or heat-insulated, but not fitted with mechanical or thermal equipment	Iron, steel
7311	Containers for compressed or liquefied gas, of iron or steel	Iron, steel
7318	Screws, bolts, nuts, coach screws, screw hooks, rivets, cotters, cotter pins, washers (including spring washers) and similar articles, of iron or steel	Iron, steel
7326	Other articles of iron or steel	Iron, steel
7601	Unwrought aluminium	Aluminium
7603	Aluminium powders and flakes	Aluminium
7604	Aluminium bars, rods and profiles	Aluminium
7605	Aluminium wire	Aluminium
7606	Aluminium plates, sheets and strip, of a thickness exceeding 0.2 mm	Aluminium
7607	Aluminium foil (whether or not printed or backed with paper, paper-board, plastics or similar backing materials) of a thickness (excluding any backing) not exceeding 0.2 mm	Aluminium
7608	Aluminium tubes and pipes	Aluminium
7609	Aluminium tube or pipe fittings (for example, couplings, elbows, sleeves)	Aluminium
7610	Aluminium structures (excluding prefabricated buildings of heading 9406) and parts of structures (for example, bridges and bridge-sections, towers, lattice masts, roofs, roofing frameworks, doors and windows and their frames and thresholds for doors, balustrades, pillars and columns); aluminium plates, rods, profiles, tubes and the like, prepared for use in structures	Aluminium
7611	Aluminium reservoirs, tanks, vats and similar containers, for any material (other than compressed or liquefied gas), of a capacity exceeding 300 litres, whether or not lined or heat-insulated, but not fitted with mechanical or thermal equipment	Aluminium
7612	Aluminium casks, drums, cans, boxes and similar containers (including rigid or collapsible tubular containers), for any material (other than compressed or liquefied gas), of a capacity not exceeding 300 litres, whether or not lined or heat-insulated, but not fitted with mechanical or thermal equipment	Aluminium
7613	Aluminium Containers for compressed or liquefied gas	Aluminium
7614	Stranded wire, cables, plaited bands and the like, of aluminium, not electrically insulated	Aluminium
7616	Other articles of aluminium	Aluminium
280410	Hydrogen	Hydrogen

Source: Council of the European Union (https://data.consilium.europa.eu/doc/document/ST-16060-2022-INIT/en/pdf), WIFO presentation.

Appendix B – Additional tables and figures

Table B1: Sectoral trade effects of the ACI for Austria across three scenarios

	Export						Import					
	1 - Coercive act		2 - EU countermeasures		3 - Retaliation		1 - Coercive act		2 - EU countermeasures		3 - Retaliation	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	-0.232	10.75	-0.090	20.58	-0.430	34.98	-0.062	10.10	-0.223	20.48	-0.238	30.34
Agriculture	0.013	0.88	0.004	0.88	0.031	0.88	0.005	2.33	0.000	2.33	0.004	2.33
Beverages, tobacco products	0.008	1.27	-0.004	1.27	0.017	1.27	0.007	0.61	0.013	0.61	0.010	0.61
Cattle meat	-0.006	0.30	-0.007	0.30	0.007	0.30	0.024	0.16	0.039	0.16	0.031	0.16
Chemicals and chemical products	0.035	4.61	0.183	4.61	0.260	4.61	0.014	5.00	-0.002	5.00	0.031	5.00
Computer, electronic, optical prod.	-0.004	5.86	-0.044	5.86	-0.038	5.86	-0.034	7.96	-0.012	7.96	-0.088	7.96
Electrical equipment	-0.084	5.22	0.348	5.22	0.382	5.22	-0.050	5.38	-0.620	5.38	-0.667	5.38
Energy	-0.051	0.68	-0.111	0.68	-0.054	0.68	0.019	2.18	0.033	2.18	0.022	2.18
Fabricated metal products	-0.114	4.40	-0.127	4.40	-0.194	4.40	-0.014	3.27	0.009	3.27	-0.156	3.27
Iron and steel	-0.126	4.57	-0.118	4.57	-0.222	4.57	-0.062	2.40	-0.046	2.40	-0.333	2.40
Leather and related products	0.034	0.66	-0.014	0.66	0.040	0.66	-0.013	1.36	-0.007	1.36	-0.018	1.36
Machinery and equipment nec	0.006	9.83	-0.063	9.83	-1.326	9.83	0.003	7.46	-0.009	7.46	-0.176	7.46
Milk, dairy products	0.006	0.75	0.000	0.75	0.020	0.75	0.049	0.53	0.049	0.53	0.067	0.53
Mining	0.063	0.24	-0.002	0.24	0.167	0.24	-0.120	2.96	-0.022	2.96	-0.158	2.96
Motor vehicles *	-0.264	9.21	-0.469	9.21	-0.444	9.21	-0.066	8.94	-0.137	8.94	-0.168	8.94
Non-ferrous metals	-0.094	3.22	-0.071	3.22	-0.044	3.22	-0.066	4.06	-0.001	4.06	-0.056	4.06
Non-metallic mineral products	0.000	1.34	-0.034	1.34	0.026	1.34	0.022	1.26	0.029	1.26	0.022	1.26
Other food prepared, preserved	-0.009	2.20	-0.020	2.20	0.007	2.20	0.030	2.69	0.036	2.69	0.042	2.69
Other manufacturing	-0.013	2.47	-0.039	2.47	-0.014	2.47	0.003	2.91	0.012	2.91	-0.012	2.91
Other meat	-0.012	0.72	-0.011	0.72	0.002	0.72	0.033	0.60	0.037	0.60	0.042	0.60
Other transport equipment *	-0.036	1.54	-0.127	1.54	-0.071	1.54	-0.027	1.15	0.002	1.15	-0.141	1.15
Paper and paper products	0.010	3.12	-0.019	3.12	0.037	3.12	0.057	2.29	0.049	2.29	0.088	2.29
Petroleum and coke	0.001	0.60	0.014	0.60	0.044	0.60	0.004	2.60	0.011	2.60	0.012	2.60
Pharmaceuticals	0.058	5.39	0.012	5.39	0.092	5.39	0.019	4.24	0.014	4.24	0.029	4.24
Processed rice	0.163	0.00	0.090	0.00	0.298	0.00	-0.019	0.03	-0.001	0.03	-0.021	0.03
Rubber and plastics products	-0.115	2.66	-0.147	2.66	-0.110	2.66	0.002	2.93	-0.003	2.93	-0.011	2.93
Services	0.025	23.44	-0.055	23.44	0.059	23.44	-0.055	19.19	0.004	19.19	-0.105	19.19
Sugar and molasses	0.013	0.12	0.007	0.12	0.040	0.12	0.018	0.10	0.014	0.10	0.017	0.10
Textiles	0.061	1.20	-0.045	1.20	0.069	1.20	0.011	1.04	-0.014	1.04	0.003	1.04
Vegetable oils	0.033	0.19	0.011	0.19	0.065	0.19	-0.001	0.39	-0.003	0.39	0.006	0.39
Wearing apparel	0.012	0.96	-0.005	0.96	0.020	0.96	0.007	3.00	0.016	3.00	0.006	3.00
Wood, products of wood and cork	-0.001	2.36	-0.020	2.36	-0.001	2.36	0.031	0.99	0.024	0.99	0.018	0.99

Note: * = targeted sectors.
Source: WIFO calculations based on the KITE model.

Table B2: Sectoral trade effects of the ACI for the EU across three scenarios

	Export						Import					
	1 - Coercive act		2 - EU countermeasures		3 - Retaliation		1 - Coercive act		2 - EU countermeasures		3 - Retaliation	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	-1.283	13.46	-0.630	25.84	-0.804	36.73	-0.278	9.41	-0.433	20.21	-0.438	28.25
Agriculture	0.016	2.31	-0.010	2.31	0.011	2.31	-0.015	2.66	-0.008	2.66	-0.022	2.66
Beverages, tobacco products	0.013	1.28	0.000	1.28	0.018	1.28	-0.016	0.79	-0.006	0.79	-0.019	0.79
Cattle meat	0.013	0.24	0.009	0.24	0.013	0.24	-0.023	0.29	-0.002	0.29	-0.033	0.29
Chemicals and chemical products	0.060	7.78	0.120	7.78	0.190	7.78	-0.019	6.68	-0.177	6.68	-0.177	6.68
Computer, electronic, optical prod.	0.026	5.86	-0.007	5.86	0.003	5.86	-0.064	7.23	-0.028	7.23	-0.111	7.23
Electrical equipment	0.016	4.61	0.367	4.61	0.406	4.61	-0.155	4.13	-1.106	4.13	-1.174	4.13
Energy	0.043	0.62	-0.005	0.62	0.043	0.62	-0.046	0.76	-0.016	0.76	-0.060	0.76
Fabricated metal products	-0.004	2.48	-0.028	2.48	-0.079	2.48	-0.122	2.03	-0.089	2.03	-0.245	2.03
Iron and steel	-0.063	2.74	-0.058	2.74	-0.164	2.74	-0.116	2.49	-0.088	2.49	-0.629	2.49
Leather and related products	0.052	1.21	-0.024	1.21	0.046	1.21	-0.036	1.34	-0.025	1.34	-0.047	1.34
Machinery and equipment nec	0.077	8.15	-0.001	8.15	-1.736	8.15	-0.060	5.54	-0.050	5.54	-0.225	5.54
Milk, dairy products	0.033	0.87	0.013	0.87	0.042	0.87	0.012	0.61	0.013	0.61	0.016	0.61
Mining	0.090	0.89	-0.022	0.89	0.123	0.89	-0.044	8.11	0.000	8.11	-0.040	8.11
Motor vehicles *	-1.465	10.46	-1.592	10.46	-1.555	10.46	-0.309	7.07	-0.360	7.07	-0.417	7.07
Non-ferrous metals	0.011	2.34	-0.006	2.34	0.024	2.34	-0.130	2.48	-0.045	2.48	-0.127	2.48
Non-metallic mineral products	0.038	1.21	-0.002	1.21	0.048	1.21	-0.052	0.95	-0.033	0.95	-0.063	0.95
Other food prepared, preserved	0.027	2.79	0.005	2.79	0.037	2.79	-0.027	2.53	-0.008	2.53	-0.033	2.53
Other manufacturing	0.025	2.89	-0.019	2.89	0.009	2.89	-0.067	2.51	-0.043	2.51	-0.093	2.51
Other meat	0.025	0.77	0.010	0.77	0.033	0.77	-0.009	0.57	0.003	0.57	-0.010	0.57
Other transport equipment *	-0.647	3.00	-0.754	3.00	-0.681	3.00	-0.186	2.34	-0.193	2.34	-0.250	2.34
Paper and paper products	0.046	2.09	0.007	2.09	0.066	2.09	-0.019	1.68	-0.009	1.68	-0.017	1.68
Petroleum and coke	0.004	2.36	-0.010	2.36	0.007	2.36	-0.026	3.30	0.006	3.30	-0.017	3.30
Pharmaceuticals	0.074	4.52	0.020	4.52	0.097	4.52	-0.004	3.51	-0.001	3.51	-0.006	3.51
Processed rice	0.059	0.02	-0.048	0.02	0.094	0.02	-0.045	0.04	0.001	0.04	-0.054	0.04
Rubber and plastics products	0.010	2.74	-0.053	2.74	-0.006	2.74	-0.124	2.55	-0.101	2.55	-0.152	2.55
Services	0.085	21.55	0.002	21.55	0.105	21.55	-0.129	22.25	-0.067	22.25	-0.183	22.25
Sugar and molasses	0.021	0.13	0.003	0.13	0.024	0.13	-0.008	0.14	0.002	0.14	-0.011	0.14
Textiles	0.065	1.09	-0.047	1.09	0.038	1.09	-0.066	1.26	-0.046	1.26	-0.084	1.26
Vegetable oils	0.028	0.46	-0.003	0.46	0.029	0.46	-0.013	0.64	0.003	0.64	-0.015	0.64
Wearing apparel	0.021	1.71	-0.006	1.71	0.021	1.71	-0.037	2.83	-0.010	2.83	-0.044	2.83
Wood, products of wood and cork	0.024	0.82	-0.011	0.82	0.012	0.82	-0.037	0.67	-0.023	0.67	-0.068	0.67

Note: * = targeted sectors.
Source: WIFO calculations based on the KITE model.

Table B3: Sectoral trade effects of the ACI for the extra-EU across three scenarios

	Export						Import					
	1 - Coercive act		2 - EU countermeasures		3 - Retaliation		1 - Coercive act		2 - EU countermeasures		3 - Retaliation	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	-2.265	14.13	-1.344	25.44	-1.608	36.74	-0.366	5.82	-1.369	13.86	-1.256	19.31
Agriculture	0.050	1.56	-0.008	1.56	0.048	1.56	-0.033	2.27	-0.004	2.27	-0.043	2.27
Beverages, tobacco products	0.029	1.45	0.002	1.45	0.038	1.45	-0.039	0.44	-0.015	0.44	-0.051	0.44
Cattle meat	0.044	0.10	0.014	0.10	0.055	0.10	-0.076	0.21	-0.021	0.21	-0.097	0.21
Chemicals and chemical products	0.113	7.07	0.001	7.07	0.113	7.07	-0.088	4.80	-0.908	4.80	-0.975	4.80
Computer, electronic, optical prod.	0.069	5.42	0.006	5.42	0.074	5.42	-0.109	8.23	-0.036	8.23	-0.156	8.23
Electrical equipment	0.145	4.24	0.012	4.24	0.125	4.24	-0.258	3.25	-3.954	3.25	-4.097	3.25
Energy	0.104	0.41	-0.011	0.41	0.116	0.41	-0.118	0.70	-0.033	0.70	-0.143	0.70
Fabricated metal products	0.097	2.19	0.034	2.19	0.089	2.19	-0.214	1.27	-0.119	1.27	-0.331	1.27
Iron and steel	0.040	1.87	0.019	1.87	0.012	1.87	-0.120	1.34	-0.063	1.34	-1.689	1.34
Leather and related products	0.085	1.10	-0.013	1.10	0.091	1.10	-0.099	1.35	-0.016	1.35	-0.105	1.35
Machinery and equipment nec	0.138	9.44	0.025	9.44	-2.942	9.44	-0.164	4.10	-0.075	4.10	-0.359	4.10
Milk, dairy products	0.059	0.66	0.005	0.66	0.073	0.66	-0.047	0.11	-0.023	0.11	-0.071	0.11
Mining	0.087	1.01	-0.019	1.01	0.086	1.01	-0.051	15.85	0.002	15.85	-0.051	15.85
Motor vehicles *	-2.743	10.34	-2.913	10.34	-2.801	10.34	-0.461	3.38	-0.397	3.38	-0.533	3.38
Non-ferrous metals	0.150	1.86	0.032	1.86	0.168	1.86	-0.203	2.14	-0.067	2.14	-0.209	2.14
Non-metallic mineral products	0.096	1.11	0.022	1.11	0.121	1.11	-0.156	0.58	-0.063	0.58	-0.188	0.58
Other food prepared, preserved	0.068	2.28	0.014	2.28	0.089	2.28	-0.079	1.75	-0.022	1.75	-0.103	1.75
Other manufacturing	0.068	3.14	0.000	3.14	0.064	3.14	-0.118	2.37	-0.045	2.37	-0.140	2.37
Other meat	0.065	0.59	0.014	0.59	0.080	0.59	-0.074	0.17	-0.029	0.17	-0.096	0.17
Other transport equipment *	-0.961	3.79	-1.091	3.79	-0.977	3.79	-0.235	2.44	-0.180	2.44	-0.297	2.44
Paper and paper products	0.114	1.55	0.024	1.55	0.151	1.55	-0.122	0.70	-0.035	0.70	-0.153	0.70
Petroleum and coke	0.029	2.09	-0.015	2.09	0.026	2.09	-0.034	4.00	0.015	4.00	-0.022	4.00
Pharmaceuticals	0.106	5.11	0.030	5.11	0.138	5.11	-0.057	3.04	-0.013	3.04	-0.077	3.04
Processed rice	0.109	0.01	-0.063	0.01	0.166	0.01	-0.103	0.05	0.030	0.05	-0.137	0.05
Rubber and plastics products	0.165	1.96	0.027	1.96	0.170	1.96	-0.243	1.57	-0.113	1.57	-0.273	1.57
Services	0.172	26.49	0.036	26.49	0.220	26.49	-0.182	27.99	-0.079	27.99	-0.254	27.99
Sugar and molasses	0.051	0.07	0.004	0.07	0.060	0.07	-0.041	0.10	0.001	0.10	-0.048	0.10
Textiles	0.138	0.90	-0.025	0.90	0.118	0.90	-0.155	1.24	-0.028	1.24	-0.159	1.24
Vegetable oils	0.047	0.27	-0.015	0.27	0.049	0.27	-0.047	0.64	0.004	0.64	-0.054	0.64
Wearing apparel	0.045	1.26	-0.003	1.26	0.054	1.26	-0.065	3.55	-0.011	3.55	-0.073	3.55
Wood, products of wood and cork	0.073	0.67	0.005	0.67	0.087	0.67	-0.114	0.37	-0.023	0.37	-0.150	0.37

Note: * = targeted sectors.
Source: WIFO calculations based on the KITE model.

Table B4: Sectoral trade effects of the ACI for the intra-EU across three scenarios

	Export/Import					
	1 - Coercive act		2 - EU countermeasures		3 - Retaliation	
	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	-0.241	12.82	0.036	26.23	-0.031	36.72
Agriculture	-0.002	3.04	-0.011	3.04	-0.008	3.04
Beverages, tobacco products	-0.007	1.12	-0.003	1.12	-0.007	1.12
Cattle meat	0.005	0.37	0.008	0.37	0.002	0.37
Chemicals and chemical products	0.018	8.46	0.216	8.46	0.252	8.46
Computer, electronic, optical prod.	-0.009	6.28	-0.019	6.28	-0.055	6.28
Electrical equipment	-0.091	4.96	0.659	4.96	0.638	4.96
Energy	0.014	0.82	-0.003	0.82	0.007	0.82
Fabricated metal products	-0.082	2.76	-0.075	2.76	-0.207	2.76
Iron and steel	-0.115	3.58	-0.097	3.58	-0.253	3.58
Leather and related products	0.025	1.32	-0.033	1.32	0.009	1.32
Machinery and equipment nec	-0.002	6.91	-0.036	6.91	-0.150	6.91
Milk, dairy products	0.018	1.08	0.017	1.08	0.024	1.08
Mining	0.094	0.78	-0.026	0.78	0.170	0.78
Motor vehicles *	-0.263	10.57	-0.349	10.57	-0.382	10.57
Non-ferrous metals	-0.078	2.81	-0.030	2.81	-0.068	2.81
Non-metallic mineral products	-0.009	1.31	-0.020	1.31	-0.011	1.31
Other food prepared, preserved	0.000	3.28	-0.001	3.28	0.002	3.28
Other manufacturing	-0.024	2.65	-0.041	2.65	-0.053	2.65
Other meat	0.002	0.95	0.008	0.95	0.005	0.95
Other transport equipment *	-0.135	2.25	-0.206	2.25	-0.201	2.25
Paper and paper products	0.007	2.61	-0.002	2.61	0.018	2.61
Petroleum and coke	-0.015	2.63	-0.007	2.63	-0.008	2.63
Pharmaceuticals	0.034	3.95	0.008	3.95	0.047	3.95
Processed rice	0.041	0.03	-0.043	0.03	0.068	0.03
Rubber and plastics products	-0.074	3.49	-0.096	3.49	-0.101	3.49
Services	-0.047	16.80	-0.049	16.80	-0.070	16.80
Sugar and molasses	0.009	0.18	0.002	0.18	0.010	0.18
Textiles	0.016	1.28	-0.063	1.28	-0.016	1.28
Vegetable oils	0.019	0.65	0.002	0.65	0.021	0.65
Wearing apparel	0.007	2.14	-0.008	2.14	0.002	2.14
Wood, products of wood and cork	-0.009	0.96	-0.022	0.96	-0.038	0.96

Note: * = targeted sectors.
Source: WIFO calculations based on the KITE model.

Table B5: Sectoral trade effects of the ER for Austria across three scenarios

	Export						Import					
	1 - Protectionist act		2 - EU countermeasures		3 - Retaliation		1 - Protectionist act		2 - EU countermeasures		3 - Retaliation	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	-0.371	10.75	-0.073	44.06	-0.178	50.49	-0.110	10.10	-0.064	42.36	-0.094	49.78
Agriculture	0.008	0.88	0.005	0.88	0.000	0.88	0.006	2.33	0.003	2.33	-0.099	2.33
Chemicals and chemical products	0.011	4.61	0.170	4.61	0.208	4.61	-0.005	5.00	-0.010	5.00	-0.002	5.00
Computer, electronic, optical prod.	0.002	5.86	-0.005	5.86	0.000	5.86	-0.025	7.96	-0.033	7.96	-0.068	7.96
Electrical equipment	-0.030	5.22	-0.052	5.22	-0.030	5.22	-0.061	5.38	-0.079	5.38	-0.100	5.38
Energy	0.009	0.68	0.000	0.68	0.052	0.68	0.001	2.18	0.024	2.18	0.007	2.18
Fabricated metal products	-0.014	4.40	-0.046	4.40	-0.055	4.40	-0.036	3.27	-0.049	3.27	-0.132	3.27
Food	0.007	5.55	0.002	5.55	-0.250	5.55	0.000	5.09	0.002	5.09	-0.033	5.09
Iron and steel	-0.025	4.57	-0.017	4.57	-0.065	4.57	-0.038	2.40	-0.088	2.40	-0.191	2.40
Leather and related products	0.002	0.66	-0.011	0.66	0.012	0.66	-0.006	1.36	-0.008	1.36	-0.013	1.36
Machinery and equipment nec	0.009	9.83	-0.010	9.83	-0.492	9.83	-0.033	7.46	-0.054	7.46	-0.134	7.46
Mining	0.085	0.24	-0.023	0.24	0.158	0.24	-0.042	2.96	0.015	2.96	-0.056	2.96
Motor vehicles *	-0.219	9.21	-0.244	9.21	-0.226	9.21	-0.074	8.94	-0.089	8.94	-0.104	8.94
Non-ferrous metals	-0.018	3.22	0.226	3.22	0.246	3.22	-0.032	4.06	-0.032	4.06	-0.060	4.06
Non-metallic mineral products	0.009	1.34	0.000	1.34	0.030	1.34	-0.011	1.26	-0.009	1.26	-0.019	1.26
Other manufacturing	0.000	2.47	-0.028	2.47	-0.012	2.47	-0.009	2.91	-0.011	2.91	-0.024	2.91
Other transport equipment *	-1.278	1.54	-1.312	1.54	-1.271	1.54	-0.387	1.15	-0.391	1.15	-0.463	1.15
Paper and paper products	0.013	3.12	0.005	3.12	0.040	3.12	0.006	2.29	0.002	2.29	0.003	2.29
Petroleum and coke	0.037	0.60	-0.043	0.60	0.059	0.60	-0.031	2.60	0.069	2.60	-0.010	2.60
Pharmaceuticals	0.025	5.39	-0.001	5.39	0.049	5.39	0.005	4.24	-0.001	4.24	0.005	4.24
Rubber and plastics products	-0.030	2.66	-0.050	2.66	-0.032	2.66	-0.022	2.93	-0.036	2.93	-0.052	2.93
Services	0.033	23.44	0.007	23.44	0.080	23.44	-0.032	19.19	-0.011	19.19	-0.077	19.19
Textiles	0.014	1.20	-0.024	1.20	0.024	1.20	-0.014	1.04	-0.024	1.04	-0.023	1.04
Wearing apparel	0.001	0.96	-0.007	0.96	0.004	0.96	-0.004	3.00	-0.003	3.00	-0.012	3.00
Wood, products of wood and cork	0.008	2.36	0.002	2.36	0.023	2.36	0.007	0.99	0.003	0.99	-0.012	0.99

Note: * = targeted sectors.
Source: WIFO calculations based on the KITE model.

Table B6: Sectoral trade effects of the ER for the EU across three scenarios

	Export						Import					
	1 - Protectionist act		2 - EU countermeasures		3 - Retaliation		1 - Protectionist act		2 - EU countermeasures		3 - Retaliation	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	-0.349	13.46	-0.108	44.93	-0.180	53.82	-0.106	9.41	-0.109	37.96	-0.129	46.25
Agriculture	0.007	2.31	-0.002	2.31	-0.014	2.31	-0.004	2.66	-0.001	2.66	-0.165	2.66
Chemicals and chemical products	0.011	7.78	0.095	7.78	0.122	7.78	-0.012	6.68	-0.136	6.68	-0.144	6.68
Computer, electronic, optical prod.	0.006	5.86	-0.018	5.86	-0.011	5.86	-0.017	7.23	-0.043	7.23	-0.072	7.23
Electrical equipment	-0.012	4.61	-0.056	4.61	-0.032	4.61	-0.063	4.13	-0.088	4.13	-0.108	4.13
Energy	0.026	0.62	0.017	0.62	0.045	0.62	-0.011	0.76	0.010	0.76	-0.024	0.76
Fabricated metal products	-0.004	2.48	-0.053	2.48	-0.056	2.48	-0.041	2.03	-0.054	2.03	-0.112	2.03
Food	0.008	6.57	-0.001	6.57	-0.256	6.57	-0.006	5.62	0.001	5.62	-0.046	5.62
Iron and steel	-0.023	2.74	-0.032	2.74	-0.078	2.74	-0.047	2.49	-0.228	2.49	-0.320	2.49
Leather and related products	0.011	1.21	-0.008	1.21	0.020	1.21	-0.011	1.34	-0.009	1.34	-0.017	1.34
Machinery and equipment nec	0.015	8.15	-0.025	8.15	-0.488	8.15	-0.029	5.54	-0.042	5.54	-0.103	5.54
Mining	0.060	0.89	-0.040	0.89	0.113	0.89	-0.032	8.11	0.042	8.11	-0.019	8.11
Motor vehicles *	-0.366	10.46	-0.405	10.46	-0.381	10.46	-0.109	7.07	-0.124	7.07	-0.140	7.07
Non-ferrous metals	-0.007	2.34	0.121	2.34	0.143	2.34	-0.045	2.48	-0.258	2.48	-0.292	2.48
Non-metallic mineral products	0.011	1.21	-0.009	1.21	0.018	1.21	-0.014	0.95	-0.010	0.95	-0.023	0.95
Other manufacturing	0.006	2.89	-0.018	2.89	0.000	2.89	-0.018	2.51	-0.017	2.51	-0.033	2.51
Other transport equipment *	-0.290	3.00	-0.324	3.00	-0.293	3.00	-0.096	2.34	-0.100	2.34	-0.119	2.34
Paper and paper products	0.017	2.09	-0.016	2.09	0.002	2.09	-0.004	1.68	-0.010	1.68	-0.027	1.68
Petroleum and coke	-0.007	2.36	0.019	2.36	0.002	2.36	-0.031	3.30	0.054	3.30	-0.012	3.30
Pharmaceuticals	0.019	4.52	-0.002	4.52	0.030	4.52	-0.001	3.51	-0.001	3.51	-0.006	3.51
Rubber and plastics products	-0.010	2.74	-0.060	2.74	-0.038	2.74	-0.048	2.55	-0.057	2.55	-0.081	2.55
Services	0.029	21.55	0.005	21.55	0.055	21.55	-0.032	22.25	-0.012	22.25	-0.062	22.25
Textiles	0.010	1.09	-0.038	1.09	-0.002	1.09	-0.025	1.26	-0.026	1.26	-0.040	1.26
Wearing apparel	0.006	1.71	-0.002	1.71	0.012	1.71	-0.009	2.83	-0.004	2.83	-0.016	2.83
Wood, products of wood and cork	0.012	0.82	-0.015	0.82	-0.014	0.82	-0.014	0.67	-0.012	0.67	-0.036	0.67

Note: * = targeted sectors.
Source: WIFO calculations based on the KITE model.

Table B7: Sectoral trade effects of the ER for the extra-EU across three scenarios

	Export						Import					
	1 - Protectionist act		2 - EU countermeasures		3 - Retaliation		1 - Protectionist act		2 - EU countermeasures		3 - Retaliation	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	-0.586	14.13	-0.228	44.03	-0.369	51.03	-0.123	5.82	-0.292	29.68	-0.320	35.42
Agriculture	0.019	1.56	-0.003	1.56	0.047	1.56	-0.013	2.27	0.000	2.27	-0.335	2.27
Chemicals and chemical products	0.028	7.07	-0.047	7.07	0.001	7.07	-0.031	4.80	-0.779	4.80	-0.820	4.80
Computer, electronic, optical prod.	0.019	5.42	-0.016	5.42	0.015	5.42	-0.027	8.23	-0.063	8.23	-0.102	8.23
Electrical equipment	0.036	4.24	-0.027	4.24	0.028	4.24	-0.082	3.25	-0.101	3.25	-0.151	3.25
Energy	0.050	0.41	0.007	0.41	0.087	0.41	-0.044	0.70	-0.004	0.70	-0.084	0.70
Fabricated metal products	0.034	2.19	-0.034	2.19	0.019	2.19	-0.058	1.27	-0.025	1.27	-0.109	1.27
Food	0.020	5.44	-0.003	5.44	-0.577	5.44	-0.018	3.48	0.000	3.48	-0.069	3.48
Iron and steel	0.017	1.87	-0.029	1.87	0.003	1.87	-0.056	1.34	-0.774	1.34	-0.888	1.34
Leather and related products	0.023	1.10	-0.003	1.10	0.042	1.10	-0.024	1.35	-0.007	1.35	-0.037	1.35
Machinery and equipment nec	0.040	9.44	-0.019	9.44	-0.801	9.44	-0.048	4.10	-0.058	4.10	-0.150	4.10
Mining	0.030	1.01	-0.028	1.01	0.045	1.01	-0.038	15.85	0.047	15.85	-0.030	15.85
Motor vehicles *	-0.648	10.34	-0.700	10.34	-0.646	10.34	-0.135	3.38	-0.113	3.38	-0.167	3.38
Non-ferrous metals	0.028	1.86	-0.155	1.86	-0.093	1.86	-0.066	2.14	-1.029	2.14	-1.103	2.14
Non-metallic mineral products	0.030	1.11	-0.007	1.11	0.050	1.11	-0.034	0.58	-0.010	0.58	-0.056	0.58
Other manufacturing	0.020	3.14	-0.013	3.14	0.022	3.14	-0.028	2.37	-0.008	2.37	-0.042	2.37
Other transport equipment *	-0.417	3.79	-0.456	3.79	-0.409	3.79	-0.107	2.44	-0.089	2.44	-0.134	2.44
Paper and paper products	0.041	1.55	-0.022	1.55	0.039	1.55	-0.032	0.70	0.003	0.70	-0.056	0.70
Petroleum and coke	-0.008	2.09	0.017	2.09	-0.007	2.09	-0.048	4.00	0.077	4.00	-0.027	4.00
Pharmaceuticals	0.028	5.11	-0.002	5.11	0.046	5.11	-0.014	3.04	0.000	3.04	-0.028	3.04
Rubber and plastics products	0.044	1.96	-0.037	1.96	0.037	1.96	-0.069	1.57	-0.021	1.57	-0.088	1.57
Services	0.054	26.49	0.011	26.49	0.098	26.49	-0.047	27.99	-0.017	27.99	-0.094	27.99
Textiles	0.034	0.90	-0.030	0.90	0.031	0.90	-0.044	1.24	-0.007	1.24	-0.057	1.24
Wearing apparel	0.019	1.26	0.000	1.26	0.035	1.26	-0.014	3.55	-0.004	3.55	-0.025	3.55
Wood, products of wood and cork	0.031	0.67	-0.011	0.67	0.002	0.67	-0.054	0.37	0.000	0.37	-0.067	0.37

Note: * = targeted sectors.
Source: WIFO calculations based on the KITE model.

Table B8: Sectoral trade effects of the ER for the intra-EU across three scenarios

	Export/Import					
	1 - Protectionist act		2 - EU countermeasures		3 - Retaliation	
	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	-0.098	12.82	0.003	45.81	-0.016	56.50
Agriculture	0.002	3.04	-0.001	3.04	-0.044	3.04
Chemicals and chemical products	-0.003	8.46	0.210	8.46	0.219	8.46
Computer, electronic, optical prod.	-0.005	6.28	-0.020	6.28	-0.033	6.28
Electrical equipment	-0.052	4.96	-0.080	4.96	-0.082	4.96
Energy	0.015	0.82	0.021	0.82	0.025	0.82
Fabricated metal products	-0.034	2.76	-0.067	2.76	-0.114	2.76
Food	0.000	7.66	0.001	7.66	-0.035	7.66
Iron and steel	-0.043	3.58	-0.033	3.58	-0.118	3.58
Leather and related products	0.002	1.32	-0.011	1.32	0.002	1.32
Machinery and equipment nec	-0.018	6.91	-0.033	6.91	-0.077	6.91
Mining	0.097	0.78	-0.055	0.78	0.197	0.78
Motor vehicles *	-0.101	10.57	-0.127	10.57	-0.132	10.57
Non-ferrous metals	-0.030	2.81	0.298	2.81	0.294	2.81
Non-metallic mineral products	-0.005	1.31	-0.010	1.31	-0.009	1.31
Other manufacturing	-0.010	2.65	-0.024	2.65	-0.025	2.65
Other transport equipment *	-0.085	2.25	-0.111	2.25	-0.104	2.25
Paper and paper products	0.003	2.61	-0.013	2.61	-0.020	2.61
Petroleum and coke	-0.006	2.63	0.020	2.63	0.009	2.63
Pharmaceuticals	0.008	3.95	-0.002	3.95	0.010	3.95
Rubber and plastics products	-0.039	3.49	-0.072	3.49	-0.078	3.49
Services	-0.007	16.80	-0.005	16.80	-0.012	16.80
Textiles	-0.007	1.28	-0.044	1.28	-0.024	1.28
Wearing apparel	-0.001	2.14	-0.003	2.14	-0.001	2.14
Wood, products of wood and cork	0.000	0.96	-0.017	0.96	-0.024	0.96

Note: * = targeted sectors.
Source: WIFO calculations based on the KITE model.

Table B9: Sectoral trade effects of the LPF for Austria across three scenarios

	Export						Import					
	1 - Status quo		2 - No divergence		3 - Divergence		1 - Status quo		2 - No divergence		3 - Divergence	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Agriculture	-0.002	0.88	0.003	0.88	0.001	0.88	-0.012	2.33	-0.001	7.50	-0.010	2.33
Beverages, tobacco products	-0.014	1.29	0.000	1.29	-0.012	1.29	-0.021	0.61	-0.001	2.34	-0.022	0.61
Cattle meat	-0.006	0.30	-0.001	0.30	-0.004	0.30	-0.013	0.16	-0.003	0.10	-0.015	0.16
Chemicals and chemical products	-0.048	4.72	-0.021	4.72	-0.033	4.72	-0.029	5.07	-0.009	0.60	-0.027	5.07
Computer, electronic, optical prod.	-0.062	5.78	-0.017	5.78	-0.052	5.78	-0.032	7.99	-0.017	0.61	-0.037	7.99
Electrical equipment	-0.043	5.18	-0.037	5.18	-0.035	5.18	-0.033	5.42	-0.024	2.69	-0.034	5.42
Energy	-0.068	0.67	0.007	0.67	-0.061	0.67	-0.028	2.23	-0.007	2.33	-0.026	2.23
Fabricated metal products	0.004	4.38	-0.011	4.38	0.012	4.38	-0.028	3.30	-0.020	0.53	-0.036	3.30
Iron and steel	-0.001	4.57	-0.017	4.57	-0.004	4.57	-0.026	2.42	-0.024	0.39	-0.041	2.42
Leather and related products	-0.002	0.65	0.004	0.65	0.000	0.65	-0.006	1.37	-0.004	1.00	-0.005	1.37
Machinery and equipment nec	-0.042	9.76	-0.055	9.76	-0.088	9.76	0.152	7.50	0.039	2.64	0.195	7.50
Milk, dairy products	-0.038	0.74	-0.005	0.74	-0.035	0.74	-0.026	0.53	-0.001	3.00	-0.025	0.53
Mining	0.039	0.24	0.016	0.24	0.051	0.24	-0.022	3.14	-0.018	0.16	-0.018	3.14
Motor vehicles	-0.081	9.26	-0.080	9.26	-0.074	9.26	-0.022	8.99	-0.024	0.03	-0.019	8.99
Non-ferrous metals	-0.015	3.32	-0.021	3.32	-0.009	3.32	-0.021	4.13	-0.020	4.30	-0.021	4.13
Non-metallic mineral products	-0.005	1.32	0.003	1.32	-0.001	1.32	-0.011	1.27	-0.004	2.93	-0.011	1.27
Other food prepared, preserved	-0.085	2.17	-0.007	2.17	-0.080	2.17	-0.064	2.69	-0.001	1.27	-0.065	2.69
Other manufacturing	-0.011	2.46	0.000	2.46	-0.003	2.46	-0.007	2.93	-0.004	1.37	-0.009	2.93
Other meat	-0.005	0.69	0.000	0.69	-0.004	0.69	-0.012	0.60	-0.001	2.23	-0.012	0.60
Other transport equipment	-0.050	1.59	-0.026	1.59	-0.117	1.59	-0.037	1.15	-0.021	5.07	-0.045	1.15
Paper and paper products	-0.004	3.15	-0.002	3.15	0.005	3.15	-0.012	2.34	0.000	1.05	-0.008	2.34
Petroleum and coke	-0.007	0.59	-0.004	0.59	0.004	0.59	-0.007	2.64	-0.003	2.95	-0.015	2.64
Pharmaceuticals	-0.037	5.55	-0.005	5.55	-0.024	5.55	-0.016	4.30	-0.003	18.37	-0.015	4.30
Processed rice	0.012	0.00	0.025	0.00	0.020	0.00	-0.008	0.03	-0.003	7.99	-0.007	0.03
Rubber and plastics products	-0.014	2.66	-0.009	2.66	-0.009	2.66	-0.022	2.95	-0.011	3.14	-0.022	2.95
Services	0.028	23.26	0.016	23.26	0.037	23.26	-0.024	18.37	-0.016	3.30	-0.035	18.37
Sugar and molasses	0.002	0.12	0.004	0.12	0.006	0.12	-0.011	0.10	0.000	4.13	-0.010	0.10
Textiles	-0.014	1.23	-0.009	1.23	-0.010	1.23	-0.017	1.05	-0.011	1.15	-0.018	1.05
Vegetable oils	-0.031	0.19	0.001	0.19	-0.026	0.19	-0.027	0.39	-0.002	8.99	-0.023	0.39
Wearing apparel	-0.001	0.95	0.001	0.95	0.000	0.95	-0.006	3.00	-0.003	2.42	-0.006	3.00
Wood, products of wood and cork	0.003	2.33	0.000	2.33	0.005	2.33	-0.008	1.00	-0.002	5.42	-0.008	1.00

Source: WIFO calculations based on the KITE model.

Table B10: Sectoral trade effects of the LPF for the EU across three scenarios

	Export						Import					
	1 - Status quo		2 - No divergence		3 - Divergence		1 - Status quo		2 - No divergence		3 - Divergence	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Agriculture	-0.014	2.31	0.002	2.31	-0.012	2.31	-0.019	2.68	-0.004	2.68	-0.018	2.68
Beverages, tobacco products	-0.017	1.29	-0.001	1.29	-0.015	1.29	-0.026	0.80	-0.002	0.80	-0.030	0.80
Cattle meat	-0.013	0.25	-0.001	0.25	-0.012	0.25	-0.014	0.30	-0.006	0.30	-0.017	0.30
Chemicals and chemical products	-0.105	7.82	-0.061	7.82	-0.097	7.82	-0.055	6.75	-0.026	6.75	-0.059	6.75
Computer, electronic, optical prod.	-0.062	5.81	-0.019	5.81	-0.049	5.81	-0.025	7.29	-0.012	7.29	-0.033	7.29
Electrical equipment	-0.069	4.56	-0.060	4.56	-0.054	4.56	-0.027	4.16	-0.021	4.16	-0.025	4.16
Energy	-0.048	0.62	0.004	0.62	-0.036	0.62	-0.047	0.75	-0.009	0.75	-0.044	0.75
Fabricated metal products	-0.010	2.47	-0.008	2.47	0.009	2.47	-0.010	2.07	-0.017	2.07	-0.013	2.07
Iron and steel	-0.011	2.72	-0.016	2.72	0.004	2.72	-0.015	2.52	-0.022	2.52	-0.031	2.52
Leather and related products	-0.004	1.18	0.004	1.18	-0.002	1.18	-0.008	1.35	-0.005	1.35	-0.008	1.35
Machinery and equipment nec	0.104	8.18	-0.045	8.18	0.077	8.18	0.074	5.58	0.013	5.58	0.215	5.58
Milk, dairy products	-0.028	0.87	-0.004	0.87	-0.025	0.87	-0.040	0.62	-0.007	0.62	-0.041	0.62
Mining	0.026	0.86	0.020	0.86	0.047	0.86	-0.020	8.36	-0.017	8.36	-0.021	8.36
Motor vehicles	-0.061	10.56	-0.070	10.56	-0.050	10.56	-0.025	7.15	-0.024	7.15	-0.017	7.15
Non-ferrous metals	-0.022	2.34	-0.026	2.34	-0.002	2.34	-0.022	2.51	-0.024	2.51	-0.020	2.51
Non-metallic mineral products	-0.019	1.21	-0.003	1.21	-0.011	1.21	-0.018	0.96	-0.007	0.96	-0.018	0.96
Other food prepared, preserved	-0.096	2.81	-0.012	2.81	-0.090	2.81	-0.097	2.56	-0.014	2.56	-0.102	2.56
Other manufacturing	-0.022	2.88	0.000	2.88	-0.013	2.88	-0.008	2.55	-0.006	2.55	-0.016	2.55
Other meat	-0.010	0.78	0.001	0.78	-0.009	0.78	-0.014	0.57	-0.004	0.57	-0.016	0.57
Other transport equipment	-0.020	2.99	0.025	2.99	-0.053	2.99	-0.006	2.34	0.004	2.34	0.073	2.34
Paper and paper products	-0.016	2.12	-0.001	2.12	-0.006	2.12	-0.018	1.70	-0.007	1.70	-0.020	1.70
Petroleum and coke	-0.045	2.45	-0.023	2.45	-0.044	2.45	-0.020	3.36	-0.010	3.36	-0.022	3.36
Pharmaceuticals	-0.063	4.71	-0.013	4.71	-0.053	4.71	-0.019	3.59	-0.006	3.59	-0.026	3.59
Processed rice	-0.001	0.03	0.013	0.03	0.005	0.03	-0.017	0.04	-0.009	0.04	-0.017	0.04
Rubber and plastics products	-0.029	2.74	-0.011	2.74	-0.015	2.74	-0.024	2.58	-0.013	2.58	-0.029	2.58
Services	0.016	21.24	0.015	21.24	0.024	21.24	-0.015	21.26	-0.017	21.26	-0.027	21.26
Sugar and molasses	-0.006	0.13	0.002	0.13	-0.004	0.13	-0.010	0.14	-0.003	0.14	-0.010	0.14
Textiles	-0.083	1.12	-0.070	1.12	-0.076	1.12	-0.017	1.27	-0.015	1.27	-0.020	1.27
Vegetable oils	-0.039	0.47	-0.001	0.47	-0.037	0.47	-0.032	0.66	-0.007	0.66	-0.029	0.66
Wearing apparel	-0.003	1.69	0.001	1.69	-0.001	1.69	-0.006	2.82	-0.006	2.82	-0.007	2.82
Wood, products of wood and cork	-0.003	0.81	0.000	0.81	0.009	0.81	-0.009	0.68	-0.008	0.68	-0.011	0.68

Source: WIFO calculations based on the KITE model.

Table B11: Sectoral trade effects of the LPF for the extra-EU across three scenarios

	Export						Import					
	1 - Status quo		2 - No divergence		3 - Divergence		1 - Status quo		2 - No divergence		3 - Divergence	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Agriculture	0.004	1.57	0.008	1.57	0.006	1.57	-0.013	2.30	-0.008	2.30	-0.016	2.30
Beverages, tobacco products	-0.007	1.45	0.001	1.45	-0.005	1.45	-0.014	0.44	-0.003	0.44	-0.036	0.44
Cattle meat	-0.002	0.11	0.006	0.11	0.005	0.11	-0.011	0.21	-0.011	0.21	-0.019	0.21
Chemicals and chemical products	-0.137	7.13	-0.094	7.13	-0.134	7.13	-0.008	4.85	-0.010	4.85	-0.046	4.85
Computer, electronic, optical prod.	-0.087	5.36	-0.035	5.36	-0.063	5.36	-0.012	8.43	-0.018	8.43	-0.028	8.43
Electrical equipment	-0.110	4.17	-0.115	4.17	-0.072	4.17	-0.013	3.32	-0.031	3.32	-0.002	3.32
Energy	0.000	0.42	0.017	0.42	0.028	0.42	-0.016	0.69	-0.017	0.69	-0.014	0.69
Fabricated metal products	-0.011	2.16	-0.002	2.16	0.047	2.16	-0.012	1.32	-0.024	1.32	0.004	1.32
Iron and steel	-0.006	1.84	-0.006	1.84	0.067	1.84	-0.018	1.38	-0.023	1.38	-0.040	1.38
Leather and related products	-0.003	1.05	0.006	1.05	0.000	1.05	-0.010	1.40	-0.014	1.40	-0.012	1.40
Machinery and equipment nec	0.090	9.48	-0.104	9.48	0.109	9.48	-0.015	4.14	-0.024	4.14	0.543	4.14
Milk, dairy products	-0.005	0.65	0.002	0.65	-0.001	0.65	-0.020	0.11	-0.006	0.11	-0.062	0.11
Mining	0.017	0.97	0.021	0.97	0.038	0.97	-0.023	16.63	-0.019	16.63	-0.025	16.63
Motor vehicles	-0.098	10.44	-0.120	10.44	-0.070	10.44	-0.022	3.32	-0.029	3.32	0.028	3.32
Non-ferrous metals	-0.017	1.85	-0.031	1.85	0.038	1.85	-0.018	2.19	-0.026	2.19	-0.010	2.19
Non-metallic mineral products	-0.017	1.09	-0.002	1.09	-0.004	1.09	-0.013	0.58	-0.017	0.58	-0.020	0.58
Other food prepared, preserved	-0.030	2.29	-0.005	2.29	-0.020	2.29	-0.006	1.74	-0.007	1.74	-0.029	1.74
Other manufacturing	-0.033	3.12	0.001	3.12	-0.018	3.12	-0.007	2.45	-0.011	2.45	-0.027	2.45
Other meat	-0.003	0.60	0.008	0.60	0.000	0.60	-0.009	0.16	-0.010	0.16	-0.021	0.16
Other transport equipment	-0.035	3.76	0.027	3.76	-0.029	3.76	-0.018	2.44	-0.014	2.44	0.238	2.44
Paper and paper products	-0.011	1.58	0.009	1.58	0.007	1.58	-0.013	0.68	-0.009	0.68	-0.048	0.68
Petroleum and coke	-0.063	2.23	-0.039	2.23	-0.063	2.23	-0.013	4.11	-0.009	4.11	-0.018	4.11
Pharmaceuticals	-0.095	5.35	-0.022	5.35	-0.092	5.35	-0.016	3.03	-0.012	3.03	-0.060	3.03
Processed rice	0.004	0.02	0.015	0.02	0.009	0.02	-0.028	0.05	-0.027	0.05	-0.032	0.05
Rubber and plastics products	-0.032	1.96	-0.013	1.96	0.003	1.96	-0.013	1.59	-0.021	1.59	-0.040	1.59
Services	0.025	26.20	0.026	26.20	0.039	26.20	-0.026	26.51	-0.027	26.51	-0.046	26.51
Sugar and molasses	0.007	0.08	0.008	0.08	0.007	0.08	-0.010	0.10	-0.008	0.10	-0.015	0.10
Textiles	-0.177	0.93	-0.157	0.93	-0.165	0.93	-0.016	1.24	-0.023	1.24	-0.026	1.24
Vegetable oils	-0.002	0.28	0.009	0.28	-0.004	0.28	-0.006	0.66	-0.010	0.66	-0.006	0.66
Wearing apparel	0.001	1.23	0.003	1.23	0.004	1.23	-0.007	3.55	-0.010	3.55	-0.008	3.55
Wood, products of wood and cork	0.004	0.66	0.007	0.66	0.035	0.66	-0.013	0.38	-0.016	0.38	-0.019	0.38

Source: WIFO calculations based on the KITE model.

Table B12: Sectoral trade effects of the LPF for the intra-EU across three scenarios

	Export/Import					
	1 - Status quo		2 - No divergence		3 - Divergence	
	%-change	%-share	%-change	%-share	%-change	%-share
Agriculture	-0.023	3.04	-0.001	3.04	-0.020	3.04
Beverages, tobacco products	-0.030	1.13	-0.002	1.13	-0.028	1.13
Cattle meat	-0.016	0.38	-0.003	0.38	-0.017	0.38
Chemicals and chemical products	-0.080	8.49	-0.034	8.49	-0.066	8.49
Computer, electronic, optical prod.	-0.041	6.25	-0.006	6.25	-0.038	6.25
Electrical equipment	-0.036	4.94	-0.016	4.94	-0.040	4.94
Energy	-0.073	0.81	-0.004	0.81	-0.068	0.81
Fabricated metal products	-0.009	2.77	-0.013	2.77	-0.020	2.77
Iron and steel	-0.013	3.58	-0.021	3.58	-0.028	3.58
Leather and related products	-0.005	1.30	0.003	1.30	-0.004	1.30
Machinery and equipment nec	0.124	6.91	0.034	6.91	0.035	6.91
Milk, dairy products	-0.041	1.09	-0.007	1.09	-0.039	1.09
Mining	0.037	0.76	0.019	0.76	0.059	0.76
Motor vehicles	-0.026	10.69	-0.022	10.69	-0.030	10.69
Non-ferrous metals	-0.025	2.81	-0.023	2.81	-0.027	2.81
Non-metallic mineral products	-0.020	1.32	-0.004	1.32	-0.017	1.32
Other food prepared, preserved	-0.141	3.31	-0.017	3.31	-0.138	3.31
Other manufacturing	-0.010	2.65	-0.001	2.65	-0.006	2.65
Other meat	-0.015	0.95	-0.003	0.95	-0.015	0.95
Other transport equipment	0.006	2.25	0.022	2.25	-0.092	2.25
Paper and paper products	-0.019	2.64	-0.006	2.64	-0.014	2.64
Petroleum and coke	-0.031	2.66	-0.011	2.66	-0.028	2.66
Pharmaceuticals	-0.021	4.10	-0.001	4.10	-0.003	4.10
Processed rice	-0.003	0.04	0.013	0.04	0.003	0.04
Rubber and plastics products	-0.028	3.50	-0.010	3.50	-0.024	3.50
Services	0.001	16.43	-0.002	16.43	0.001	16.43
Sugar and molasses	-0.011	0.18	0.000	0.18	-0.008	0.18
Textiles	-0.018	1.29	-0.009	1.29	-0.014	1.29
Vegetable oils	-0.055	0.65	-0.005	0.65	-0.051	0.65
Wearing apparel	-0.004	2.14	-0.001	2.14	-0.004	2.14
Wood, products of wood and cork	-0.008	0.95	-0.005	0.95	-0.008	0.95

Source: WIFO calculations based on the KITE model.

Table B13: Sectoral trade effects of the LPF for the United Kingdom across three scenarios

	Export						Import					
	1 - Status quo		2 - No divergence		3 - Divergence		1 - Status quo		2 - No divergence		3 - Divergence	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Agriculture	-0.026	0.77	-0.001	0.77	-0.123	0.77	-0.001	2.16	0.001	2.16	0.000	2.16
Beverages, tobacco products	-0.014	1.61	0.006	1.61	-0.091	1.61	0.001	1.15	0.003	1.15	0.010	1.15
Cattle meat	-0.018	0.19	-0.005	0.19	-0.069	0.19	-0.003	0.34	0.001	0.34	0.017	0.34
Chemicals and chemical products	-0.007	6.39	0.038	6.39	-0.286	6.39	-0.025	4.79	0.007	4.79	-0.008	4.79
Computer, electronic, optical prod.	-0.014	5.16	0.020	5.16	-0.262	5.16	-0.015	8.01	-0.002	8.01	0.140	8.01
Electrical equipment	-0.052	2.36	-0.017	2.36	0.137	2.36	-0.042	3.69	-0.014	3.69	0.282	3.69
Energy	-0.022	0.11	0.000	0.11	-0.157	0.11	-0.050	0.50	0.003	0.50	0.108	0.50
Fabricated metal products	0.010	1.20	0.011	1.20	0.297	1.20	-0.014	1.68	-0.011	1.68	0.494	1.68
Iron and steel	-0.004	1.81	-0.004	1.81	-0.058	1.81	-0.004	1.16	-0.014	1.16	0.699	1.16
Leather and related products	0.017	0.38	0.025	0.38	-0.083	0.38	0.000	1.40	-0.002	1.40	0.015	1.40
Machinery and equipment nec	0.097	5.12	0.022	5.12	5.353	5.12	0.022	4.78	0.029	4.78	0.599	4.78
Milk, dairy products	-0.029	0.32	-0.003	0.32	-0.120	0.32	-0.006	0.53	0.005	0.53	0.011	0.53
Mining	-0.028	1.97	-0.001	1.97	-1.168	1.97	0.004	5.35	0.004	5.35	0.164	5.35
Motor vehicles	-0.068	9.54	-0.118	9.54	0.149	9.54	-0.055	9.57	-0.008	9.57	0.074	9.57
Non-ferrous metals	0.044	8.02	0.007	8.02	0.134	8.02	0.015	4.74	-0.007	4.74	0.329	4.74
Non-metallic mineral products	0.022	0.51	0.035	0.51	-0.043	0.51	-0.019	0.88	-0.001	0.88	0.055	0.88
Other food prepared, preserved	-0.081	1.56	0.021	1.56	-0.295	1.56	0.005	2.81	0.005	2.81	0.044	2.81
Other manufacturing	0.040	2.09	0.050	2.09	-0.251	2.09	0.000	3.45	-0.002	3.45	0.082	3.45
Other meat	-0.010	0.25	-0.001	0.25	-0.063	0.25	-0.005	0.99	0.003	0.99	0.005	0.99
Other transport equipment	-0.068	4.29	-0.017	4.29	2.727	4.29	-0.030	2.02	0.011	2.02	0.433	2.02
Paper and paper products	0.008	1.36	0.040	1.36	-0.147	1.36	-0.006	1.66	0.005	1.66	0.070	1.66
Petroleum and coke	-0.055	2.33	0.008	2.33	-0.241	2.33	-0.012	2.94	-0.002	2.94	0.048	2.94
Pharmaceuticals	-0.076	3.76	-0.019	3.76	-0.469	3.76	-0.015	3.69	0.003	3.69	-0.006	3.69
Processed rice	-0.056	0.01	-0.007	0.01	-0.337	0.01	-0.001	0.09	0.000	0.09	0.004	0.09
Rubber and plastics products	0.021	1.80	0.039	1.80	-0.154	1.80	-0.014	2.17	-0.007	2.17	0.171	2.17
Services	-0.004	35.21	0.000	35.21	-0.183	35.21	0.002	23.16	-0.001	23.16	0.163	23.16
Sugar and molasses	-0.014	0.08	-0.001	0.08	-0.069	0.08	-0.002	0.15	0.001	0.15	-0.007	0.15
Textiles	0.044	0.72	0.032	0.72	-0.171	0.72	0.002	1.13	-0.004	1.13	0.094	1.13
Vegetable oils	-0.050	0.12	0.005	0.12	-0.174	0.12	-0.006	0.33	0.002	0.33	-0.029	0.33
Wearing apparel	-0.002	0.87	0.003	0.87	-0.069	0.87	-0.001	3.82	-0.003	3.82	0.010	3.82
Wood, products of wood and cork	-0.001	0.09	0.006	0.09	-0.111	0.09	0.003	0.86	-0.001	0.86	0.140	0.86

Source: WIFO calculations based on the KITE model.

Figure B1: High-impact sectors with a share of less than 50% of extra-EU trade

Source: EC 2022/0051(COD), ITUC (https://www.globalrightsindex.org/de/2022/countries/afg-2), EU (https://www.cahraslist.net/cahras), Eurostat, WIFO calculations.

Table B14: Sectoral trade effects of the CSDD for Austria across three scenarios

	Export						Import					
	1 - Implementation		2 - Escalation		3 - Success		1 - Implementation		2 - Escalation		3 - Success	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	0.116	18.08	3.356	18.08	0.128	18.08	0.064	19.35	-7.167	19.35	0.134	19.35
Agriculture *	0.085	0.66	3.357	0.66	0.088	0.66	0.094	1.51	-3.030	1.51	0.108	1.51
Beverages, tobacco products *	0.037	1.06	-0.964	1.06	0.058	1.06	0.086	0.49	-2.508	0.49	0.095	0.49
Chemicals and chemical products	0.180	3.86	-1.043	3.86	0.201	3.86	0.170	4.09	1.450	4.09	0.182	4.09
Computer, electronic, optical prod.	0.082	4.74	-1.377	4.74	0.108	4.74	0.057	6.44	-0.349	6.44	0.114	6.44
Electrical equipment	0.129	4.24	-1.943	4.24	0.143	4.24	0.096	4.37	-0.667	4.37	0.152	4.37
Energy	0.157	0.55	-1.202	0.55	0.219	0.55	0.158	1.80	0.867	1.80	0.189	1.80
Fabricated metal products *	0.106	3.59	0.029	3.59	0.130	3.59	0.120	2.66	-6.700	2.66	0.155	2.66
Fishing *	0.082	0.00	-0.701	0.00	0.110	0.00	0.111	0.04	-5.493	0.04	0.146	0.04
Food *	0.132	3.45	2.466	3.45	0.138	3.45	0.123	3.63	-4.317	3.63	0.147	3.63
Forestry *	0.167	0.05	1.754	0.05	0.175	0.05	0.159	0.33	-2.418	0.33	0.183	0.33
Iron and steel *	0.083	3.74	0.961	3.74	0.101	3.74	0.121	1.95	-2.255	1.95	0.143	1.95
Leather and related products *	0.208	0.53	15.803	0.53	0.180	0.53	0.067	1.10	-5.929	1.10	0.111	1.10
Machinery and equipment nec	0.093	7.99	-1.853	7.99	0.127	7.99	0.110	6.05	-0.415	6.05	0.143	6.05
Mining *	0.272	0.20	7.736	0.20	0.276	0.20	-0.234	2.54	-22.189	2.54	0.106	2.54
Motor vehicles	0.164	7.58	-1.791	7.58	0.225	7.58	0.125	7.25	-0.849	7.25	0.159	7.25
Non-ferrous metals	0.229	2.72	-2.150	2.72	0.254	2.72	0.177	3.33	-0.630	3.33	0.196	3.33
Non-metallic mineral products *	0.087	1.08	0.237	1.08	0.121	1.08	0.124	1.03	-8.506	1.03	0.170	1.03
Other manufacturing	0.091	2.01	-1.044	2.01	0.117	2.01	0.071	2.36	0.001	2.36	0.122	2.36
Other transport equipment	0.098	1.30	-2.698	1.30	0.155	1.30	0.115	0.93	-0.638	0.93	0.149	0.93
Paper and paper products	0.152	2.58	-0.185	2.58	0.183	2.58	0.184	1.89	0.050	1.89	0.204	1.89
Petroleum and coke	0.157	0.49	-16.742	0.49	0.468	0.49	0.464	2.13	7.827	2.13	0.342	2.13
Pharmaceuticals	0.093	4.55	-2.166	4.55	0.135	4.55	0.098	3.46	-0.529	3.46	0.110	3.46
Rubber and plastics products	0.201	2.18	-1.488	2.18	0.216	2.18	0.138	2.38	0.623	2.38	0.163	2.38
Services	0.090	19.05	-2.815	19.05	0.160	19.05	0.198	14.82	2.445	14.82	0.304	14.82
Textiles *	0.218	1.01	14.596	1.01	0.214	1.01	0.150	0.85	5.177	0.85	0.191	0.85
Wearing apparel *	0.152	0.78	24.761	0.78	0.122	0.78	0.051	2.42	-9.737	2.42	0.090	2.42
Wood, products of wood and cork *	0.128	1.91	1.478	1.91	0.142	1.91	0.155	0.80	-4.033	0.80	0.182	0.80

Note: * = targeted sectors (see Table 4.11).
Source: WIFO calculations based on the KITE model.

Table B15: Sectoral trade effects of the CSDD for the EU across three scenarios

	Export						Import					
	1 - Implementation		2 - Escalation		3 - Success		1 - Implementation		2 - Escalation		3 - Success	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	0.096	17.34	1.589	17.34	0.118	17.34	0.070	22.12	-11.367	22.12	0.136	22.12
Agriculture *	0.070	1.75	1.753	1.75	0.084	1.75	0.064	1.85	-10.835	1.85	0.096	1.85
Beverages, tobacco products *	0.036	1.06	-1.781	1.06	0.058	1.06	0.072	0.62	-4.973	0.62	0.087	0.62
Chemicals and chemical products	0.126	6.47	-1.568	6.47	0.167	6.47	0.137	5.26	1.311	5.26	0.169	5.26
Computer, electronic, optical prod.	0.066	4.81	-1.368	4.81	0.100	4.81	0.023	5.68	-0.165	5.68	0.099	5.68
Electrical equipment	0.100	3.77	-2.817	3.77	0.131	3.77	0.057	3.24	-0.414	3.24	0.139	3.24
Energy	0.198	0.51	-1.353	0.51	0.238	0.51	0.209	0.59	1.575	0.59	0.248	0.59
Fabricated metal products *	0.088	2.04	-1.251	2.04	0.118	2.04	0.083	1.61	-14.537	1.61	0.147	1.61
Fishing *	0.136	0.10	1.440	0.10	0.148	0.10	0.106	0.16	-3.112	0.16	0.127	0.16
Food *	0.107	4.40	-1.817	4.40	0.135	4.40	0.097	3.81	-9.621	3.81	0.147	3.81
Forestry *	0.147	0.07	0.823	0.07	0.168	0.07	0.136	0.08	-9.086	0.08	0.191	0.08
Iron and steel *	0.076	2.25	-0.783	2.25	0.101	2.25	0.080	1.97	-10.104	1.97	0.119	1.97
Leather and related products *	0.124	0.97	10.217	0.97	0.131	0.97	0.029	1.05	-14.637	1.05	0.111	1.05
Machinery and equipment nec	0.066	6.76	-3.185	6.76	0.115	6.76	0.083	4.35	0.127	4.35	0.140	4.35
Mining *	0.097	0.71	-2.309	0.71	0.155	0.71	0.084	6.51	-5.050	6.51	0.161	6.51
Motor vehicles	0.099	8.73	-2.876	8.73	0.156	8.73	0.122	5.57	-0.989	5.57	0.166	5.57
Non-ferrous metals	0.146	1.93	-4.265	1.93	0.202	1.93	0.130	1.96	-0.877	1.96	0.169	1.96
Non-metallic mineral products *	0.097	1.00	-0.696	1.00	0.129	1.00	0.095	0.75	-12.651	0.75	0.162	0.75
Other manufacturing	0.068	2.38	-2.055	2.38	0.101	2.38	0.050	1.99	0.402	1.99	0.116	1.99
Other transport equipment	0.083	2.47	-3.394	2.47	0.150	2.47	0.098	1.82	-0.487	1.82	0.145	1.82
Paper and paper products	0.138	1.75	-1.193	1.75	0.172	1.75	0.178	1.32	1.194	1.32	0.208	1.32
Petroleum and coke	0.277	2.02	-5.976	2.02	0.431	2.02	0.218	2.62	2.397	2.62	0.243	2.62
Pharmaceuticals	0.060	3.90	-2.183	3.90	0.104	3.90	0.093	2.79	-0.186	2.79	0.106	2.79
Rubber and plastics products	0.148	2.26	-2.519	2.26	0.173	2.26	0.113	2.01	0.348	2.01	0.182	2.01
Services	0.104	17.55	-2.882	17.55	0.178	17.55	0.152	16.56	2.446	16.56	0.267	16.56
Textiles *	0.194	0.92	13.029	0.92	0.193	0.92	0.035	0.99	-13.989	0.99	0.179	0.99
Wearing apparel *	0.088	1.40	13.311	1.40	0.091	1.40	-0.018	2.20	-32.030	2.20	0.078	2.20
Wood, products of wood and cork *	0.106	0.67	0.410	0.67	0.129	0.67	0.104	0.53	-9.972	0.53	0.157	0.53

Note: * = targeted sectors (see Table 4.11).
Source: WIFO calculations based on the KITE model.

Table B16: Sectoral trade effects of the CSDD for the extra-EU across three scenarios

	Export						Import					
	1 - Implementation		2 - Escalation		3 - Success		1 - Implementation		2 - Escalation		3 - Success	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	-0.013	14.50	-6.005	14.50	0.062	14.50	-0.012	24.39	-26.422	24.39	0.120	24.39
Agriculture *	-0.014	1.28	-3.132	1.28	0.036	1.28	-0.010	1.52	-33.159	1.52	0.075	1.52
Beverages, tobacco products *	-0.002	1.24	-2.377	1.24	0.029	1.24	0.037	0.33	-15.915	0.33	0.066	0.33
Chemicals and chemical products	0.012	6.10	-3.669	6.10	0.110	6.10	-0.018	3.67	3.531	3.67	0.083	3.67
Computer, electronic, optical prod.	-0.019	4.59	-1.572	4.59	0.058	4.59	-0.069	6.37	0.669	6.37	0.071	6.37
Electrical equipment	-0.020	3.56	-3.557	3.56	0.078	3.56	-0.171	2.51	2.492	2.51	0.082	2.51
Energy	-0.025	0.36	-4.644	0.36	0.088	0.36	0.078	0.52	3.173	0.52	0.165	0.52
Fabricated metal products *	-0.007	1.85	-4.365	1.85	0.056	1.85	-0.094	1.00	-50.243	1.00	0.104	1.00
Fishing *	0.004	0.03	-2.533	0.03	0.070	0.03	0.051	0.16	-8.442	0.16	0.092	0.16
Food *	-0.001	3.43	-6.723	3.43	0.073	3.43	-0.074	2.30	-34.859	2.30	0.092	2.30
Forestry *	-0.049	0.03	-4.865	0.03	0.048	0.03	0.015	0.05	-30.117	0.05	0.172	0.05
Iron and steel *	-0.006	1.57	-3.765	1.57	0.040	1.57	-0.026	1.05	-40.457	1.05	0.083	1.05
Leather and related products *	-0.036	0.90	-12.545	0.90	0.087	0.90	-0.194	1.06	-57.620	1.06	0.056	1.06
Machinery and equipment nec	-0.016	8.10	-4.403	8.10	0.074	8.10	-0.084	3.13	3.200	3.13	0.087	3.13
Mining *	-0.045	0.83	-6.628	0.83	0.080	0.83	0.075	12.57	-5.450	12.57	0.157	12.57
Motor vehicles	0.009	8.92	-3.793	8.92	0.113	8.92	-0.091	2.51	2.577	2.51	0.059	2.51
Non-ferrous metals	0.017	1.58	-5.805	1.58	0.149	1.58	-0.006	1.66	2.465	1.66	0.077	1.66
Non-metallic mineral products *	-0.012	0.94	-4.253	0.94	0.065	0.94	-0.127	0.44	-49.389	0.44	0.115	0.44
Other manufacturing	-0.003	2.67	-2.893	2.67	0.062	2.67	-0.066	1.85	2.170	1.85	0.079	1.85
Other transport equipment	0.015	3.21	-3.962	3.21	0.113	3.21	0.004	1.84	1.503	1.84	0.080	1.84
Paper and paper products	-0.013	1.35	-3.937	1.35	0.082	1.35	-0.023	0.51	4.559	0.51	0.139	0.51
Petroleum and coke	0.080	1.90	-9.916	1.90	0.366	1.90	0.064	3.11	6.039	3.11	0.074	3.11
Pharmaceuticals	0.006	4.57	-2.900	4.57	0.074	4.57	0.041	2.29	1.417	2.29	0.051	2.29
Rubber and plastics products	-0.007	1.67	-4.671	1.67	0.095	1.67	-0.174	1.20	4.415	1.20	0.105	1.20
Services	-0.044	22.40	-4.652	22.40	0.087	22.40	0.031	20.04	4.191	20.04	0.232	20.04
Textiles *	-0.035	0.80	-10.578	0.80	0.122	0.80	-0.326	0.94	-63.226	0.94	0.107	0.94
Wearing apparel *	-0.025	1.05	-11.139	1.05	0.053	1.05	-0.129	2.69	-70.565	2.69	0.055	2.69
Wood, products of wood and cork *	-0.009	0.56	-3.613	0.56	0.059	0.56	-0.114	0.29	-45.786	0.29	0.108	0.29

Note: * = targeted sectors (see Table 4.11).
Source: WIFO calculations based on the KITE model.

Table B17: Sectoral trade effects of the CSDD for the intra-EU across three scenarios

	Export/Import					
	1 - Implementation		2 - Escalation		3 - Success	
	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	0.168	19.92	6.609	19.92	0.156	19.92
Agriculture *	0.115	2.18	4.347	2.18	0.110	2.18
Beverages, tobacco products *	0.084	0.90	-1.039	0.90	0.094	0.90
Chemicals and chemical products	0.219	6.80	0.143	6.80	0.214	6.80
Computer, electronic, optical prod.	0.137	5.00	-1.199	5.00	0.134	5.00
Electrical equipment	0.198	3.96	-2.212	3.96	0.174	3.96
Energy	0.311	0.65	0.316	0.65	0.314	0.65
Fabricated metal products *	0.160	2.22	1.111	2.22	0.166	2.22
Fishing *	0.161	0.16	2.213	0.16	0.163	0.16
Food *	0.170	5.28	1.077	5.28	0.171	5.28
Forestry *	0.203	0.10	2.449	0.10	0.202	0.10
Iron and steel *	0.117	2.86	0.704	2.86	0.132	2.86
Leather and related products *	0.250	1.04	27.991	1.04	0.165	1.04
Machinery and equipment nec	0.174	5.54	-1.566	5.54	0.169	5.54
Mining *	0.274	0.61	3.044	0.61	0.248	0.61
Motor vehicles	0.183	8.56	-2.007	8.56	0.197	8.56
Non-ferrous metals	0.228	2.25	-3.283	2.25	0.236	2.25
Non-metallic mineral products *	0.185	1.05	2.169	1.05	0.181	1.05
Other manufacturing	0.148	2.12	-1.101	2.12	0.146	2.12
Other transport equipment	0.192	1.80	-2.474	1.80	0.209	1.80
Paper and paper products	0.225	2.12	0.399	2.12	0.224	2.12
Petroleum and coke	0.436	2.13	-2.783	2.13	0.484	2.13
Pharmaceuticals	0.129	3.28	-1.277	3.28	0.143	3.28
Rubber and plastics products	0.233	2.80	-1.353	2.80	0.215	2.80
Services	0.332	13.15	-0.147	13.15	0.320	13.15
Textiles *	0.355	1.04	29.496	1.04	0.243	1.04
Wearing apparel *	0.150	1.72	26.867	1.72	0.112	1.72
Wood, products of wood and cork *	0.184	0.76	3.112	0.76	0.176	0.76

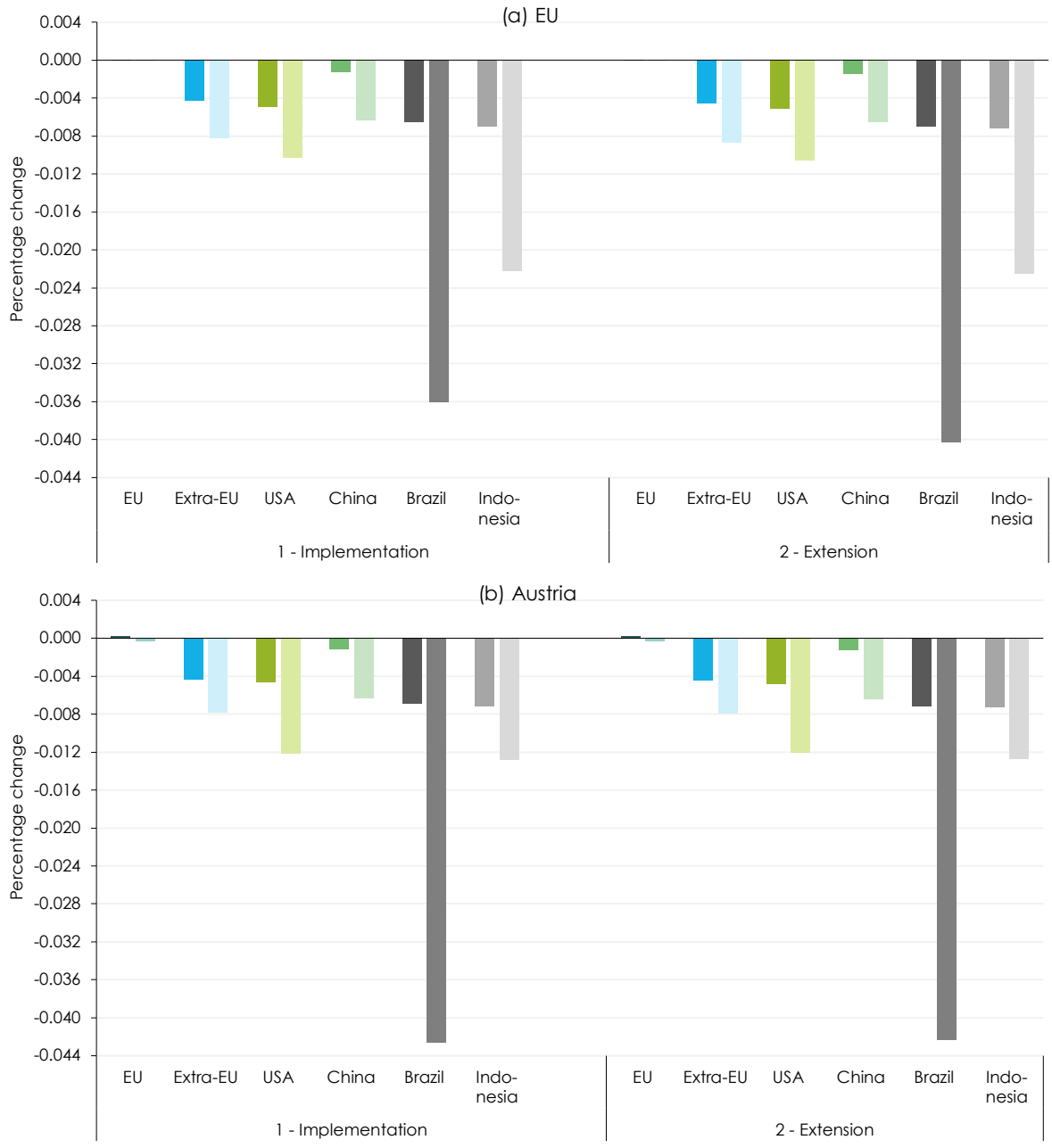
Note: * = targeted sectors (see Table 4.11).
Source: WIFO calculations based on the KITE model.

Table B18: Sectoral trade effects of the CSDD for China across three scenarios

	Export						Import					
	1 - Implementation		2 - Escalation		3 - Success		1 - Implementation		2 - Escalation		3 - Success	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	-0.031	22.24	-13.537	22.24	0.009	22.24	-0.052	23.34	-2.698	23.34	-0.002	23.34
Agriculture *	-0.030	0.66	-12.681	0.66	0.011	0.66	-0.022	2.84	-2.026	2.84	0.002	2.84
Beverages, tobacco products *	-0.007	0.10	-7.516	0.10	0.010	0.10	-0.018	0.27	-1.309	0.27	0.008	0.27
Chemicals and chemical products	-0.046	3.41	2.013	3.41	-0.003	3.41	-0.032	6.26	-2.245	6.26	0.009	6.26
Computer, electronic, optical prod.	-0.022	21.64	0.835	21.64	0.010	21.64	-0.018	13.74	-0.089	13.74	0.001	13.74
Electrical equipment	-0.055	6.68	1.902	6.68	0.008	6.68	-0.035	2.47	-1.978	2.47	0.021	2.47
Energy	-0.068	0.05	4.049	0.05	0.044	0.05	-0.080	0.05	-4.288	0.05	0.008	0.05
Fabricated metal products *	-0.031	2.72	-14.209	2.72	0.013	2.72	-0.031	0.69	-2.790	0.69	0.019	0.69
Fishing *	-0.011	0.06	-4.777	0.06	0.008	0.06	-0.051	0.09	-1.817	0.09	0.001	0.09
Food *	-0.025	1.35	-10.544	1.35	0.011	1.35	-0.032	1.64	-2.868	1.64	0.010	1.64
Forestry *	-0.100	0.01	-28.356	0.01	0.045	0.01	-0.043	0.41	-1.918	0.41	-0.003	0.41
Iron and steel *	-0.009	2.28	-6.260	2.28	0.003	2.28	-0.014	0.93	-1.281	0.93	0.005	0.93
Leather and related products *	-0.056	3.13	-17.424	3.13	0.004	3.13	-0.044	0.37	-10.486	0.37	0.023	0.37
Machinery and equipment nec	-0.046	6.53	2.197	6.53	0.008	6.53	-0.034	5.18	-2.549	5.18	0.021	5.18
Mining *	0.006	0.18	-4.213	0.18	0.008	0.18	-0.068	14.15	-2.431	14.15	-0.008	14.15
Motor vehicles	-0.030	1.70	2.307	1.70	-0.007	1.70	-0.034	4.51	-3.577	4.51	0.053	4.51
Non-ferrous metals	-0.052	1.20	2.570	1.20	-0.001	1.20	-0.045	3.48	-2.056	3.48	0.008	3.48
Non-metallic mineral products *	-0.025	1.55	-9.647	1.55	0.012	1.55	-0.035	0.38	-2.547	0.38	0.011	0.38
Other manufacturing	-0.029	3.99	1.613	3.99	0.011	3.99	-0.023	1.28	-1.904	1.28	0.015	1.28
Other transport equipment	-0.078	1.17	2.008	1.17	0.006	1.17	-0.038	1.49	-3.023	1.49	0.039	1.49
Paper and paper products	-0.031	0.78	2.805	0.78	0.014	0.78	-0.054	0.89	-2.619	0.89	0.011	0.89
Petroleum and coke	-0.050	1.18	2.589	1.18	-0.001	1.18	-0.039	1.24	-2.180	1.24	0.004	1.24
Pharmaceuticals	-0.128	0.42	2.965	0.42	0.000	0.42	-0.061	0.60	-4.739	0.60	0.046	0.60
Rubber and plastics products	-0.045	2.47	2.671	2.47	0.009	2.47	-0.036	1.44	-2.389	1.44	0.014	1.44
Services	-0.194	4.32	4.988	4.32	0.085	4.32	-0.075	10.72	-4.571	10.72	0.014	10.72
Textiles *	-0.041	3.32	-10.850	3.32	0.007	3.32	-0.041	0.88	-7.529	0.88	0.011	0.88
Wearing apparel *	-0.026	6.34	-17.591	6.34	0.011	6.34	-0.028	0.27	-4.792	0.27	0.016	0.27
Wood, products of wood and cork *	-0.029	0.53	-12.076	0.53	0.013	0.53	-0.038	0.42	-2.182	0.42	0.003	0.42

Note: * = targeted sectors (see Table 4.11).
Source: WIFO calculations based on the KITE model.

Figure B2: Bilateral trade effects of the EUDR for the EU and Austria with selected countries across three scenarios



Note: Exports displayed in dark colours and imports in light colours.
Source: WIFO calculations based on the KITE model.

Table B19: Sectoral trade effects of the EUDR for Austria across three scenarios

	Export						Import					
	1 - Implementation		2 - Extension		3 - Escalation		1 - Implementation		2 - Extension		3 - Escalation	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	-0.0008	50.58	-0.0008	50.58	0.1130	49.36	-0.0057	53.58	-0.0058	53.60	-0.1529	52.41
Beverages, tobacco products	-0.0013	1.29	-0.0014	1.29	-0.1807	1.29	-0.0016	0.60	-0.0018	0.60	-0.3840	0.60
Cane and beet	-0.0009	0.01	-0.0009	0.01	-0.0501	0.01	-0.0013	0.00	-0.0012	0.00	-0.1506	0.00
Cattle *	0.0004	0.10	0.0012	0.10	0.1327	0.10	-0.0005	0.08	0.0003	0.08	-0.9218	0.08
Cattle meat *	0.0021	0.30	0.0038	0.30	-0.0336	0.30	-0.0019	0.16	-0.0030	0.16	-0.3707	0.16
Chemicals and chemical products *	-0.0017	4.74	-0.0014	4.74	0.1379	4.74	-0.0004	5.10	-0.0005	5.10	0.4981	5.08
Computer, electronic, optical prod. *	-0.0010	5.78	-0.0010	5.78	-0.1741	5.80	-0.0002	7.99	-0.0004	7.99	-0.0352	7.98
Electrical equipment	-0.0015	5.19	-0.0016	5.19	-0.2224	5.20	-0.0006	5.44	-0.0007	5.44	-0.0838	5.43
Energy	-0.0034	0.67	-0.0034	0.67	-0.1061	0.66	0.0010	2.23	0.0010	2.23	0.1739	2.23
Fabricated metal products	-0.0015	4.39	-0.0015	4.39	-0.1383	4.39	-0.0007	3.31	-0.0007	3.31	-0.0382	3.31
Fibres crops *	-0.0157	0.00	-0.0158	0.00	-1.5877	0.00	0.0023	0.01	0.0023	0.01	0.1764	0.01
Fishing	-0.0034	0.00	-0.0035	0.00	-0.2636	0.00	0.0011	0.04	0.0012	0.04	0.1197	0.04
Forestry *	0.0031	0.07	0.0031	0.07	0.8945	0.07	-0.0036	0.41	-0.0036	0.41	0.8414	0.41
Iron and steel *	-0.0012	4.60	-0.0013	4.60	-0.1255	4.60	-0.0012	2.44	-0.0013	2.44	-0.1016	2.43
Leather and related products *	-0.0016	0.65	-0.0017	0.65	-0.4359	0.65	-0.0029	1.36	-0.0029	1.36	-0.0536	1.36
Machinery and equipment nec	-0.0015	9.74	-0.0016	9.74	-0.1421	9.74	-0.0001	7.49	-0.0002	7.49	-0.0015	7.49
Milk, dairy products	-0.0010	0.74	-0.0009	0.74	-0.0844	0.74	-0.0006	0.53	-0.0006	0.53	-0.1580	0.53
Mining	-0.0055	0.24	-0.0056	0.24	-0.2632	0.24	0.0038	3.14	0.0039	3.14	0.3738	3.17
Motor vehicles	-0.0017	9.31	-0.0018	9.31	-0.2309	9.33	-0.0005	9.01	-0.0006	9.01	-0.1196	9.01
Non-ferrous metals	-0.0027	3.36	-0.0027	3.36	-0.3039	3.34	-0.0013	4.17	-0.0014	4.17	-0.1749	4.15
Non-metallic mineral products *	-0.0014	1.32	-0.0015	1.32	-0.1484	1.32	-0.0013	1.27	-0.0013	1.27	0.0582	1.27
Oil seeds *	0.0078	0.11	0.0084	0.11	2.7202	0.11	0.0140	0.17	0.0136	0.17	4.6431	0.17
Other animal products *	0.0002	0.11	0.0016	0.11	0.1045	0.11	-0.0006	0.27	-0.0003	0.27	-0.2705	0.27
Other crops *	0.0058	0.06	0.0059	0.06	3.5330	0.06	-0.0036	0.32	-0.0035	0.32	-0.7121	0.32
Other food prepared, preserved *	0.0007	2.16	0.0008	2.16	0.3498	2.17	-0.0040	2.69	-0.0042	2.69	-0.8904	2.68
Other grains *	-0.0002	0.11	0.0008	0.11	-0.1778	0.11	0.0010	0.20	-0.0004	0.20	0.3595	0.20
Other manufacturing *	-0.0010	2.45	-0.0010	2.45	-0.1193	2.46	-0.0012	2.91	-0.0012	2.91	-0.0279	2.91
Other meat *	-0.0004	0.69	0.0005	0.69	-0.1256	0.69	-0.0005	0.60	-0.0008	0.60	-0.1442	0.60
Other transport equipment	-0.0027	1.59	-0.0028	1.59	-0.2607	1.59	-0.0003	1.15	-0.0003	1.15	-0.0478	1.15
Paper and paper products *	0.0005	3.14	0.0005	3.14	-0.1733	3.15	-0.0052	2.34	-0.0052	2.34	0.0319	2.33
Petroleum and coke *	-0.0011	0.59	-0.0010	0.59	0.0401	0.59	0.0007	2.64	0.0007	2.64	0.0756	2.63
Pharmaceuticals *	-0.0027	5.53	-0.0027	5.53	-0.3216	5.52	-0.0005	4.29	-0.0006	4.29	-0.0928	4.28
Processed rice	-0.0065	0.00	-0.0059	0.00	-0.4980	0.00	0.0008	0.03	0.0009	0.03	0.1447	0.03
Raw milk *	-0.0018	0.00	-0.0018	0.00	-0.0792	0.00	0.0015	0.00	0.0017	0.00	-0.0970	0.00
Rice (seed, paddy) *	-0.0055	0.00	-0.0055	0.00	-0.2916	0.00	0.0069	0.00	0.0077	0.00	0.8466	0.00
Rubber and plastics products *	0.0005	2.67	0.0003	2.67	2.3927	2.67	-0.0012	2.95	-0.0013	2.95	-2.4104	2.95
Services	-0.0029	23.17	-0.0030	23.17	-0.2903	23.11	-0.0120	18.30	-0.0120	18.30	0.2278	18.38
Sugar and molasses	-0.0017	0.12	-0.0017	0.12	-0.0761	0.12	0.0000	0.10	0.0001	0.10	-0.0039	0.10
Textiles *	-0.0022	1.24	-0.0024	1.24	-0.1623	1.24	-0.0002	1.05	-0.0002	1.05	0.3300	1.05
Vegetable oils *	0.0209	0.19	0.0214	0.19	6.0553	0.19	-0.0054	0.39	-0.0066	0.39	-2.4679	0.39
Vegetables and fruit *	-0.0001	0.13	0.0001	0.13	0.1253	0.13	0.0005	0.68	0.0003	0.68	0.0626	0.69
Wearing apparel *	-0.0006	0.95	-0.0006	0.95	-0.0861	0.95	0.0000	2.98	0.0000	2.98	0.0280	2.99
Wheat (seed, other) *	0.0005	0.15	0.0008	0.15	0.0156	0.15	0.0013	0.11	0.0010	0.11	0.4716	0.11
Wood, products of wood and cork *	0.0016	2.33	0.0015	2.33	1.5205	2.33	-0.0060	1.00	-0.0060	1.00	-2.3748	0.99
Wool *	0.0020	0.03	0.0034	0.03	-0.0153	0.03	-0.0006	0.04	-0.0010	0.04	0.1956	0.04

Note: * = sector contains products from the EUDR list. Targeted sectors include all EUDR goods, as specified in the EU Regulation (see Table A6in the Appendix).
Source: WIFO calculations based on the KITE model.

Table B20: Sectoral trade effects of the EUDR for the EU across three scenarios

	Export						Import					
	1 - Implementation		2 - Extension		3 - Escalation		1 - Implementation		2 - Extension		3 - Escalation	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	-0.0018	53.77	-0.0019	53.80	-0.1008	52.34	-0.0083	54.13	-0.0086	54.17	-0.5650	52.87
Beverages, tobacco products	-0.0021	1.28	-0.0023	1.28	-0.5004	1.29	-0.0031	0.80	-0.0041	0.80	-0.2948	0.80
Cane and beet	-0.0024	0.01	-0.0025	0.01	-0.5290	0.01	-0.0020	0.01	-0.0020	0.01	-0.4478	0.01
Cattle *	-0.0016	0.10	-0.0014	0.10	-0.5100	0.10	0.0014	0.07	0.0011	0.07	-0.1364	0.07
Cattle meat *	-0.0007	0.24	-0.0003	0.24	-0.3694	0.25	-0.0115	0.30	-0.0201	0.30	-0.0762	0.30
Chemicals and chemical products *	-0.0025	7.87	-0.0025	7.87	-0.0013	7.87	0.0000	6.78	-0.0004	6.78	0.4799	6.77
Computer, electronic, optical prod. *	-0.0012	5.81	-0.0013	5.81	-0.1803	5.83	-0.0001	7.29	-0.0005	7.29	-0.0444	7.28
Electrical equipment	-0.0015	4.57	-0.0017	4.57	-0.3074	4.57	-0.0003	4.17	-0.0004	4.17	-0.0602	4.17
Energy	-0.0028	0.62	-0.0029	0.62	-0.1620	0.62	0.0013	0.75	0.0013	0.75	0.1808	0.75
Fabricated metal products	-0.0014	2.48	-0.0015	2.48	-0.1689	2.48	-0.0004	2.08	-0.0004	2.08	-0.0211	2.07
Fibres crops *	-0.0107	0.02	-0.0110	0.02	-2.7667	0.02	0.0002	0.02	0.0001	0.02	0.2120	0.02
Fishing	-0.0015	0.12	-0.0015	0.12	-0.2053	0.12	0.0009	0.20	0.0010	0.20	-0.0066	0.20
Forestry *	0.0023	0.08	0.0022	0.08	0.6055	0.08	-0.0197	0.10	-0.0197	0.10	1.2516	0.10
Iron and steel *	-0.0011	2.74	-0.0011	2.74	-0.1113	2.74	-0.0009	2.54	-0.0009	2.54	-0.0783	2.53
Leather and related products *	-0.0008	1.18	-0.0010	1.18	-0.4122	1.18	-0.0020	1.35	-0.0020	1.35	-0.0140	1.35
Machinery and equipment nec	-0.0018	8.16	-0.0019	8.16	-0.2235	8.16	0.0003	5.57	0.0003	5.57	0.0916	5.57
Milk, dairy products	-0.0024	0.87	-0.0026	0.87	-0.3682	0.87	-0.0009	0.62	-0.0010	0.62	-0.2459	0.62
Mining	-0.0122	0.86	-0.0123	0.86	-0.3320	0.85	0.0019	8.39	0.0020	8.39	0.1464	8.39
Motor vehicles	-0.0019	10.59	-0.0020	10.59	-0.3487	10.61	-0.0003	7.19	-0.0004	7.19	-0.1228	7.18
Non-ferrous metals	-0.0026	2.36	-0.0027	2.36	-0.3676	2.35	-0.0006	2.54	-0.0007	2.54	-0.1591	2.53
Non-metallic mineral products *	-0.0012	1.21	-0.0013	1.21	-0.1688	1.20	-0.0027	0.96	-0.0027	0.96	0.0665	0.96
Oil seeds *	0.0069	0.13	0.0074	0.13	2.0879	0.13	-0.0123	0.26	-0.0174	0.26	-6.1807	0.26
Other animal products *	-0.0023	0.27	-0.0019	0.27	-0.5648	0.27	-0.0019	0.24	-0.0015	0.24	-0.2327	0.24
Other crops *	0.0038	0.31	0.0039	0.31	2.3028	0.31	-0.0383	0.48	-0.0384	0.48	-16.3663	0.48
Other food prepared, preserved *	-0.0047	2.80	-0.0053	2.80	-1.2735	2.80	-0.0037	2.55	-0.0042	2.55	-0.2234	2.55
Other grains *	-0.0008	0.16	0.0000	0.16	-0.2987	0.16	-0.0037	0.17	-0.0131	0.17	-0.3158	0.17
Other manufacturing *	-0.0015	2.87	-0.0016	2.87	-0.2963	2.88	-0.0016	2.54	-0.0016	2.54	0.0128	2.54
Other meat *	-0.0017	0.78	-0.0012	0.78	-0.3419	0.78	-0.0022	0.57	-0.0081	0.57	-0.1786	0.57
Other transport equipment	-0.0026	2.98	-0.0027	2.98	-0.3386	2.98	-0.0002	2.33	-0.0002	2.33	-0.0536	2.33
Paper and paper products *	-0.0001	2.12	-0.0002	2.12	-0.2520	2.12	-0.0118	1.70	-0.0117	1.70	-0.0057	1.70
Petroleum and coke *	-0.0001	2.45	-0.0001	2.45	-0.0286	2.46	0.0009	3.36	0.0009	3.36	0.1004	3.35
Pharmaceuticals *	-0.0037	4.69	-0.0037	4.69	-0.2935	4.70	-0.0004	3.57	-0.0006	3.57	-0.0631	3.57
Processed rice	-0.0076	0.03	-0.0073	0.03	-1.1058	0.03	0.0015	0.04	0.0013	0.04	-0.0647	0.04
Raw milk *	-0.0032	0.00	-0.0036	0.00	-0.7217	0.00	0.0020	0.00	0.0018	0.00	0.1629	0.00
Rice (seed, paddy) *	-0.0036	0.00	-0.0033	0.00	-0.4334	0.00	-0.0015	0.00	-0.0012	0.00	0.0339	0.00
Rubber and plastics products *	-0.0004	2.75	-0.0005	2.75	2.1613	2.75	-0.0046	2.59	-0.0046	2.59	-6.6003	2.58
Services	-0.0032	21.18	-0.0033	21.18	-0.3225	21.13	-0.0144	21.19	-0.0143	21.19	0.2323	21.27
Sugar and molasses	-0.0019	0.13	-0.0020	0.13	-0.2487	0.13	0.0000	0.14	0.0000	0.14	-0.1063	0.14
Textiles *	-0.0021	1.12	-0.0023	1.12	-0.2259	1.12	0.0000	1.27	0.0000	1.27	0.3662	1.27
Vegetable oils *	-0.0017	0.47	-0.0035	0.47	-1.7551	0.47	-0.0184	0.66	-0.0196	0.66	-5.5436	0.66
Vegetables and fruit *	-0.0005	0.80	-0.0005	0.80	-0.1829	0.80	-0.0016	0.92	-0.0020	0.92	-0.1547	0.92
Wearing apparel *	-0.0009	1.68	-0.0009	1.68	-0.1237	1.69	0.0000	2.80	0.0000	2.80	0.0767	2.81
Wheat (seed, other) *	-0.0008	0.28	-0.0008	0.28	-0.1088	0.28	-0.0055	0.14	-0.0069	0.14	-0.1605	0.14
Wood, products of wood and cork *	0.0006	0.81	0.0006	0.81	1.2468	0.81	-0.0145	0.67	-0.0145	0.67	-6.6237	0.67
Wool *	0.0010	0.05	0.0020	0.05	-0.1499	0.05	-0.0031	0.07	-0.0042	0.07	0.0535	0.07

Note: * = sector contains products from the EUDR list. Targeted sectors include all EUDR goods, as specified in the EU Regulation (see Table A6in the Appendix).
Source: WIFO calculations based on the KITE model.

Table B21: Sectoral trade effects of the EUDR for the extra-EU across three scenarios

	Export						Import					
	1 - Implementation		2 - Extension		3 - Escalation		1 - Implementation		2 - Extension		3 - Escalation	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	-0.0048	49.79	-0.0051	49.80	-0.5044	48.78	-0.0196	50.33	-0.0204	50.38	-1.5375	49.76
Beverages, tobacco products	-0.0029	1.45	-0.0031	1.45	-0.5399	1.45	-0.0085	0.44	-0.0117	0.44	0.1400	0.44
Cane and beet	-0.0027	0.01	-0.0029	0.01	-0.5481	0.01	-0.0004	0.00	-0.0003	0.00	0.0417	0.00
Cattle *	-0.0054	0.08	-0.0064	0.08	-0.9189	0.08	0.0042	0.02	-0.0026	0.02	0.4675	0.02
Cattle meat *	-0.0054	0.11	-0.0073	0.11	-0.5075	0.11	-0.0354	0.21	-0.0629	0.21	0.4266	0.21
Chemicals and chemical products *	-0.0042	7.19	-0.0046	7.19	-0.4646	7.19	0.0021	4.88	0.0000	4.88	0.6810	4.87
Computer, electronic, optical prod. *	-0.0021	5.37	-0.0024	5.37	-0.1866	5.39	0.0002	8.42	-0.0005	8.42	0.0606	8.39
Electrical equipment	-0.0023	4.17	-0.0025	4.17	-0.3792	4.17	0.0007	3.33	0.0007	3.33	0.2450	3.32
Energy	-0.0067	0.42	-0.0070	0.42	-0.5062	0.42	0.0038	0.69	0.0039	0.69	0.3955	0.69
Fabricated metal products	-0.0022	2.17	-0.0023	2.17	-0.2446	2.17	0.0006	1.32	0.0006	1.32	0.1861	1.32
Fibres crops *	-0.0137	0.03	-0.0142	0.03	-3.2792	0.03	0.0026	0.02	0.0021	0.02	1.2178	0.03
Fishing	-0.0031	0.04	-0.0032	0.04	-0.2011	0.04	0.0030	0.21	0.0032	0.21	0.1916	0.21
Forestry *	-0.0065	0.04	-0.0066	0.04	-1.2215	0.04	-0.0643	0.07	-0.0642	0.07	1.4817	0.07
Iron and steel *	-0.0008	1.85	-0.0009	1.85	-0.1087	1.85	0.0000	1.39	0.0000	1.39	0.0178	1.39
Leather and related products *	-0.0030	1.05	-0.0031	1.05	-0.5009	1.06	-0.0049	1.40	-0.0048	1.40	0.3165	1.40
Machinery and equipment nec	-0.0027	9.46	-0.0028	9.46	-0.3555	9.46	0.0017	4.13	0.0018	4.13	0.3483	4.12
Milk, dairy products	-0.0043	0.64	-0.0048	0.64	-0.5154	0.64	0.0029	0.11	0.0029	0.11	0.1596	0.11
Mining	-0.0081	0.97	-0.0083	0.97	-0.3122	0.96	0.0028	16.67	0.0029	16.67	0.1706	16.67
Motor vehicles	-0.0027	10.45	-0.0029	10.45	-0.4606	10.47	0.0023	3.33	0.0024	3.33	0.2998	3.33
Non-ferrous metals	-0.0030	1.87	-0.0031	1.87	-0.4277	1.87	0.0019	2.21	0.0019	2.21	0.0758	2.21
Non-metallic mineral products *	-0.0033	1.09	-0.0034	1.09	-0.3146	1.09	-0.0103	0.58	-0.0103	0.58	0.3612	0.57
Oil seeds *	-0.0001	0.04	-0.0010	0.04	0.4759	0.04	-0.0269	0.32	-0.0362	0.32	-12.2839	0.32
Other animal products *	-0.0043	0.18	-0.0055	0.18	-0.8686	0.18	-0.0044	0.10	-0.0071	0.10	0.5385	0.10
Other crops *	-0.0040	0.20	-0.0042	0.20	-0.6212	0.20	-0.0748	0.56	-0.0750	0.56	-32.1924	0.56
Other food prepared, preserved *	-0.0085	2.28	-0.0097	2.28	-1.7613	2.28	-0.0070	1.74	-0.0080	1.74	1.2687	1.74
Other grains *	-0.0016	0.10	-0.0021	0.10	-0.0980	0.10	-0.0100	0.12	-0.0393	0.12	-0.1857	0.12
Other manufacturing *	-0.0029	3.11	-0.0030	3.11	-0.3945	3.12	-0.0037	2.44	-0.0036	2.44	0.2451	2.44
Other meat *	-0.0036	0.60	-0.0043	0.60	-0.4815	0.60	-0.0125	0.16	-0.0650	0.16	0.3215	0.16
Other transport equipment	-0.0030	3.75	-0.0031	3.75	-0.3897	3.75	0.0016	2.43	0.0016	2.43	0.1491	2.43
Paper and paper products *	-0.0078	1.58	-0.0079	1.58	-0.4917	1.58	-0.0796	0.68	-0.0795	0.68	0.4520	0.68
Petroleum and coke *	0.0000	2.23	-0.0001	2.23	-0.1089	2.24	0.0017	4.12	0.0016	4.12	0.1454	4.10
Pharmaceuticals *	-0.0045	5.33	-0.0047	5.33	-0.3604	5.34	0.0030	3.02	0.0023	3.02	0.1518	3.01
Processed rice	-0.0109	0.02	-0.0114	0.02	-1.2539	0.01	0.0074	0.05	0.0067	0.05	0.6692	0.05
Raw milk *	-0.0044	0.00	-0.0049	0.00	-0.8678	0.00	0.0038	0.00	0.0035	0.00	0.4839	0.00
Rice (seed, paddy) *	-0.0048	0.00	-0.0049	0.00	-0.6721	0.00	-0.0001	0.00	-0.0001	0.00	0.3680	0.00
Rubber and plastics products *	-0.0047	1.96	-0.0050	1.96	-1.0331	1.96	-0.0202	1.59	-0.0200	1.59	-31.5639	1.59
Services	-0.0070	26.15	-0.0072	26.15	-0.5008	26.08	-0.0259	26.43	-0.0258	26.43	0.4208	26.54
Sugar and molasses	-0.0035	0.08	-0.0037	0.08	-0.2631	0.08	0.0024	0.10	0.0025	0.10	0.1543	0.10
Textiles *	-0.0042	0.94	-0.0045	0.94	-0.5683	0.93	0.0007	1.24	0.0009	1.24	0.7647	1.25
Vegetable oils *	-0.0157	0.28	-0.0201	0.28	-5.7164	0.28	-0.0423	0.67	-0.0441	0.67	-11.2967	0.67
Vegetables and fruit *	-0.0019	0.47	-0.0021	0.47	-0.1314	0.47	-0.0043	0.72	-0.0055	0.72	-0.0726	0.72
Wearing apparel *	-0.0019	1.22	-0.0020	1.22	-0.1942	1.22	0.0002	3.54	0.0002	3.54	0.1817	3.54
Wheat (seed, other) *	-0.0014	0.36	-0.0015	0.36	-0.0500	0.35	-0.0246	0.07	-0.0315	0.07	-0.0033	0.06
Wood, products of wood and cork *	-0.0057	0.66	-0.0058	0.66	-0.9360	0.66	-0.0678	0.38	-0.0677	0.38	-31.9947	0.38
Wool *	-0.0026	0.03	-0.0031	0.03	-0.2942	0.03	-0.0085	0.08	-0.0121	0.08	0.1736	0.08

Note: * = sector contains products from the EUDR list. Targeted sectors include all EUDR goods, as specified in the EU Regulation (see Table A6in the Appendix).
Source: WIFO calculations based on the KITE model.

Table B22: Sectoral trade effects of the EUDR for the intra-EU across three scenarios

	Export/Import					
	1 - Implementation		2 - Extension		3 - Escalation	
	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	0.0008	57.62	0.0008	57.66	0.2378	55.76
Beverages, tobacco products	-0.0012	1.12	-0.0013	1.12	-0.4516	1.13
Cane and beet	-0.0022	0.01	-0.0023	0.01	-0.5166	0.01
Cattle *	0.0009	0.12	0.0018	0.12	-0.2526	0.12
Cattle meat *	0.0006	0.38	0.0017	0.38	-0.3320	0.38
Chemicals and chemical products *	-0.0011	8.53	-0.0007	8.53	0.3736	8.52
Computer, electronic, optical prod. *	-0.0005	6.24	-0.0005	6.24	-0.1751	6.24
Electrical equipment	-0.0009	4.95	-0.0010	4.95	-0.2495	4.95
Energy	-0.0008	0.81	-0.0008	0.81	0.0101	0.81
Fabricated metal products	-0.0008	2.78	-0.0008	2.78	-0.1121	2.77
Fibres crops *	-0.0036	0.01	-0.0031	0.01	-1.5414	0.01
Fishing	-0.0012	0.20	-0.0012	0.20	-0.2061	0.20
Forestry *	0.0048	0.12	0.0048	0.12	1.1238	0.12
Iron and steel *	-0.0012	3.60	-0.0012	3.60	-0.1126	3.60
Leather and related products *	0.0009	1.30	0.0007	1.30	-0.3432	1.30
Machinery and equipment nec	-0.0005	6.90	-0.0006	6.90	-0.0500	6.91
Milk, dairy products	-0.0013	1.09	-0.0014	1.09	-0.2849	1.09
Mining	-0.0172	0.76	-0.0173	0.76	-0.3566	0.74
Motor vehicles	-0.0011	10.73	-0.0012	10.73	-0.2440	10.74
Non-ferrous metals	-0.0024	2.83	-0.0025	2.83	-0.3294	2.82
Non-metallic mineral products *	0.0004	1.31	0.0004	1.31	-0.0527	1.31
Oil seeds *	0.0082	0.21	0.0090	0.21	2.3857	0.21
Other animal products *	-0.0013	0.36	-0.0001	0.36	-0.4217	0.36
Other crops *	0.0074	0.41	0.0076	0.41	3.6608	0.41
Other food prepared, preserved *	-0.0021	3.30	-0.0023	3.30	-0.9509	3.30
Other grains *	-0.0004	0.21	0.0009	0.21	-0.3849	0.21
Other manufacturing *	0.0001	2.64	0.0000	2.64	-0.1851	2.64
Other meat *	-0.0005	0.94	0.0007	0.94	-0.2566	0.95
Other transport equipment	-0.0020	2.24	-0.0020	2.24	-0.2566	2.24
Paper and paper products *	0.0043	2.64	0.0043	2.64	-0.1143	2.64
Petroleum and coke *	-0.0002	2.66	-0.0001	2.66	0.0362	2.66
Pharmaceuticals *	-0.0027	4.08	-0.0025	4.08	-0.2097	4.08
Processed rice	-0.0062	0.04	-0.0056	0.04	-1.0453	0.03
Raw milk *	-0.0014	0.00	-0.0015	0.00	-0.4989	0.00
Rice (seed, paddy) *	-0.0025	0.00	-0.0020	0.00	-0.2220	0.00
Rubber and plastics products *	0.0020	3.51	0.0019	3.51	3.8772	3.50
Services	0.0028	16.37	0.0028	16.37	-0.0502	16.38
Sugar and molasses	-0.0012	0.18	-0.0013	0.18	-0.2428	0.18
Textiles *	-0.0006	1.30	-0.0008	1.30	0.0112	1.29
Vegetable oils *	0.0041	0.65	0.0034	0.65	-0.1340	0.65
Vegetables and fruit *	0.0000	1.11	0.0001	1.11	-0.2035	1.12
Wearing apparel *	-0.0003	2.13	-0.0003	2.13	-0.0848	2.13
Wheat (seed, other) *	0.0002	0.20	0.0004	0.20	-0.2073	0.20
Wood, products of wood and cork *	0.0049	0.95	0.0049	0.95	2.6971	0.95
Wool *	0.0028	0.07	0.0045	0.07	-0.0809	0.07

Note: * = sector contains products from the EUDR list. Targeted sectors include all EUDR goods, as specified in the EU Regulation (see Table A6in the Appendix).
Source: WIFO calculations based on the KITE model.

Table B23: Sectoral trade effects of the CBAM for Austria across three scenarios

	Export						Import					
	1 - Implementation		2 - Retaliation		3 - Climate Club		1 - Implementation		2 - Retaliation		3 - Climate Club	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	-3.6	44.50	-4.1	44.50	-3.7	44.50	-4.1	41.94	-4.3	41.94	-3.5	41.94
Agriculture, forestry, fishing	-1.8	0.88	-1.8	0.88	-1.8	0.88	-1.3	2.33	-1.3	2.33	-1.3	2.33
Beverages, tobacco products	-1.8	1.29	-1.8	1.29	-1.9	1.29	-0.3	0.61	-0.4	0.61	-0.4	0.61
Cattle meat	-1.7	0.30	-1.7	0.30	-1.6	0.30	0.3	0.16	0.3	0.16	0.3	0.16
Chemicals and chemical products *	-8.9	4.72	-11.3	4.72	-9.1	4.72	-7.2	5.07	-8.1	5.07	-6.7	5.07
Computer, electronic, optical prod.	-1.0	5.79	-0.9	5.79	-1.0	5.79	-0.4	7.99	-0.4	7.99	-0.5	7.99
Electrical equipment *	-1.6	5.18	-1.6	5.18	-1.5	5.18	-0.5	5.42	-0.5	5.42	-0.3	5.42
Energy	30.1	0.67	23.5	0.67	32.2	0.67	-36.3	2.23	-36.5	2.23	-35.8	2.23
Fabricated metal products *	-2.1	4.38	-2.1	4.38	-2.1	4.38	-1.1	3.30	-1.1	3.30	-1.0	3.30
Iron and steel *	-3.1	4.57	-3.5	4.57	-3.3	4.57	-4.4	2.42	-4.6	2.42	-3.9	2.42
Leather and related products	-2.7	0.65	-2.6	0.65	-2.4	0.65	-0.6	1.37	-0.7	1.37	-0.6	1.37
Machinery and equipment nec *	-1.5	9.76	-1.5	9.76	-1.6	9.76	-0.6	7.50	-0.6	7.50	-0.5	7.50
Milk, dairy products	-0.8	0.74	-0.9	0.74	-0.9	0.74	-0.4	0.53	-0.4	0.53	-0.4	0.53
Mining	-11.3	0.24	-12.3	0.24	-12.2	0.24	-24.1	3.14	-24.9	3.14	-25.1	3.14
Motor vehicles	-1.0	9.26	-0.8	9.26	-0.9	9.26	-0.6	8.99	-0.6	8.99	-0.6	8.99
Non-ferrous metals *	-3.3	3.32	-3.5	3.32	-2.9	3.32	-2.6	4.13	-2.7	4.13	-2.4	4.13
Non-metallic mineral products *	-2.4	1.32	-3.8	1.32	-2.3	1.32	-6.3	1.27	-6.5	1.27	-3.9	1.27
Other food prepared, preserved	-1.2	2.17	-1.2	2.17	-1.1	2.17	-0.7	2.69	-0.8	2.69	-0.8	2.69
Other manufacturing *	-0.9	2.46	-0.9	2.46	-1.1	2.46	-0.1	2.93	-0.1	2.93	0.1	2.93
Other meat	-0.6	0.69	-0.6	0.69	-0.6	0.69	-0.2	0.60	-0.1	0.60	-0.1	0.60
Other transport equipment	-1.8	1.59	-1.5	1.59	-1.9	1.59	-1.1	1.15	-1.1	1.15	-0.5	1.15
Paper and paper products	-5.0	3.15	-5.0	3.15	-4.9	3.15	-1.8	2.34	-1.8	2.34	-1.8	2.34
Petroleum and coke *	-39.0	0.59	-42.6	0.59	-43.3	0.59	-31.3	2.64	-31.5	2.64	-26.9	2.64
Pharmaceuticals *	-3.4	5.55	-3.8	5.55	-3.5	5.55	-1.2	4.30	-1.5	4.30	-1.1	4.30
Processed rice	4.2	0.00	4.5	0.00	5.0	0.00	-0.8	0.03	-0.9	0.03	-0.9	0.03
Rubber and plastics products *	-4.9	2.66	-5.4	2.66	-4.8	2.66	-2.2	2.95	-2.4	2.95	-1.9	2.95
Services (without transport)	-0.5	17.39	-0.1	17.39	-1.3	17.39	-0.1	14.10	-0.4	14.10	0.9	14.10
Sugar and molasses	-2.7	0.12	-2.7	0.12	-2.5	0.12	-0.9	0.10	-0.9	0.10	-0.8	0.10
Textiles	-5.6	1.23	-5.3	1.23	-4.8	1.23	-1.6	1.05	-1.7	1.05	-1.6	1.05
Transport	-17.0	5.87	-16.7	5.87	-11.3	5.87	5.3	4.27	4.9	4.27	1.2	4.27
Vegetable oils	-4.9	0.19	-4.8	0.19	-4.6	0.19	-1.5	0.39	-1.5	0.39	-1.5	0.39
Wearing apparel	-1.6	0.95	-1.6	0.95	-1.5	0.95	-0.1	3.00	-0.1	3.00	-0.1	3.00
Wood, products of wood and cork	-2.9	2.33	-2.9	2.33	-2.9	2.33	-1.0	1.00	-0.9	1.00	-0.9	1.00

Note: * = sector contains products from the CBAM list. Targeted sectors include all CBAM goods, as specified in the EU Regulation (see Table A7 in the Appendix).
Source: WIFO calculations based on the KITE model.

Table B24: Sectoral trade effects of the CBAM for the EU across three scenarios

	Export						Import					
	1 - Implementation		2 - Retaliation		3 - Climate Club		1 - Implementation		2 - Retaliation		3 - Climate Club	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	-6.2	42.08	-7.6	42.08	-5.7	42.08	-5.9	36.65	-6.4	36.65	-3.7	36.65
Agriculture, forestry, fishing	-2.2	2.31	-2.1	2.31	-1.9	2.31	-0.8	2.68	-0.9	2.68	-0.8	2.68
Beverages, tobacco products	-1.0	1.29	-0.9	1.29	-1.1	1.29	-0.4	0.80	-0.5	0.80	-0.5	0.80
Cattle meat	-1.2	0.25	-1.2	0.25	-1.1	0.25	-0.2	0.30	-0.4	0.30	-0.3	0.30
Chemicals and chemical products *	-10.9	7.82	-14.3	7.82	-9.0	7.82	-7.3	6.75	-8.5	6.75	-5.1	6.75
Computer, electronic, optical prod.	-0.8	5.81	-0.7	5.81	-0.7	5.81	-0.5	7.29	-0.5	7.29	-0.6	7.29
Electrical equipment *	-1.7	4.56	-1.6	4.56	-1.4	4.56	-1.2	4.16	-1.3	4.16	-1.1	4.16
Energy	-6.9	0.62	-13.6	0.62	-3.8	0.62	-2.7	0.75	-3.3	0.75	5.7	0.75
Fabricated metal products *	-1.9	2.47	-1.9	2.47	-1.7	2.47	-1.4	2.07	-1.5	2.07	-1.3	2.07
Iron and steel *	-4.2	2.72	-4.9	2.72	-4.1	2.72	-4.7	2.52	-4.9	2.52	-3.3	2.52
Leather and related products	-1.5	1.18	-1.2	1.18	-1.1	1.18	-0.4	1.35	-0.5	1.35	-0.5	1.35
Machinery and equipment nec *	-1.6	8.18	-1.6	8.18	-1.6	8.18	-0.9	5.58	-1.1	5.58	-0.9	5.58
Milk, dairy products	-1.4	0.87	-1.2	0.87	-1.2	0.87	-0.6	0.62	-0.7	0.62	-0.6	0.62
Mining	-16.1	0.86	-16.2	0.86	-17.4	0.86	-30.9	8.36	-33.7	8.36	-34.6	8.36
Motor vehicles	-1.7	10.56	-1.4	10.56	-1.3	10.56	-0.8	7.15	-0.8	7.15	-0.7	7.15
Non-ferrous metals *	-5.7	2.34	-6.4	2.34	-4.6	2.34	-2.6	2.51	-3.0	2.51	-2.1	2.51
Non-metallic mineral products *	-7.2	1.21	-10.3	1.21	-6.6	1.21	-5.8	0.96	-6.1	0.96	-2.6	0.96
Other food prepared, preserved	-2.0	2.81	-1.8	2.81	-1.8	2.81	-0.2	2.56	-0.4	2.56	-0.4	2.56
Other manufacturing *	-0.8	2.88	-0.7	2.88	-0.9	2.88	-0.4	2.55	-0.5	2.55	-0.2	2.55
Other meat	-1.1	0.78	-1.0	0.78	-1.0	0.78	-0.4	0.57	-0.5	0.57	-0.5	0.57
Other transport equipment	-1.3	2.99	-0.9	2.99	-1.3	2.99	-0.8	2.34	-0.8	2.34	-0.4	2.34
Paper and paper products	-3.9	2.12	-3.7	2.12	-3.4	2.12	-1.5	1.70	-1.7	1.70	-1.7	1.70
Petroleum and coke *	-39.5	2.45	-49.8	2.45	-40.4	2.45	-36.0	3.36	-37.0	3.36	-19.6	3.36
Pharmaceuticals *	-1.2	4.71	-1.3	4.71	-1.4	4.71	-0.4	3.59	-0.6	3.59	-0.2	3.59
Processed rice	-5.6	0.03	-4.7	0.03	-3.8	0.03	0.6	0.04	0.2	0.04	0.0	0.04
Rubber and plastics products *	-4.4	2.74	-4.8	2.74	-3.7	2.74	-2.5	2.58	-2.7	2.58	-1.8	2.58
Services (without transport)	0.3	16.47	0.9	16.47	-0.6	16.47	-0.6	16.82	-1.1	16.82	0.3	16.82
Sugar and molasses	-1.9	0.13	-1.7	0.13	-1.6	0.13	-0.5	0.14	-0.7	0.14	-0.7	0.14
Textiles	-4.4	1.12	-4.0	1.12	-3.3	1.12	-0.7	1.27	-0.9	1.27	-1.0	1.27
Transport	-25.7	4.76	-25.3	4.76	-18.0	4.76	6.9	4.43	6.3	4.43	1.3	4.43
Vegetable oils	-3.2	0.47	-3.1	0.47	-2.7	0.47	-0.4	0.66	-0.6	0.66	-0.6	0.66
Wearing apparel	-0.6	1.69	-0.5	1.69	-0.5	1.69	0.0	2.82	-0.1	2.82	-0.1	2.82
Wood, products of wood and cork	-3.1	0.81	-2.8	0.81	-2.7	0.81	-1.2	0.68	-1.4	0.68	-1.2	0.68

Note: * = sector contains products from the CBAM list. Targeted sectors include all CBAM goods, as specified in the EU Regulation (see Table A7 in the Appendix).
Source: WIFO calculations based on the KITE model.

Table B25: Sectoral trade effects of the CBAM for the extra-EU across three scenarios

	Export						Import					
	1 - Implementation		2 - Retaliation		3 - Climate Club		1 - Implementation		2 - Retaliation		3 - Climate Club	
	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	-7.1	40.37	-9.9	40.37	-5.6	40.37	-6.7	28.96	-7.6	28.96	0.0	28.96
Agriculture, forestry, fishing	-2.7	1.57	-2.3	1.57	-2.2	1.57	1.0	2.30	0.7	2.30	0.6	2.30
Beverages, tobacco products	-1.3	1.45	-1.0	1.45	-1.4	1.45	0.3	0.44	0.0	0.44	-0.1	0.44
Cattle meat	-2.6	0.11	-2.3	0.11	-2.4	0.11	1.1	0.21	0.7	0.21	0.6	0.21
Chemicals and chemical products *	-14.6	7.13	-21.1	7.13	-8.9	7.13	-6.1	4.85	-8.1	4.85	2.4	4.85
Computer, electronic, optical prod.	-0.8	5.36	-0.6	5.36	-0.8	5.36	-0.2	8.43	-0.3	8.43	-0.5	8.43
Electrical equipment *	-1.8	4.17	-1.8	4.17	-1.5	4.17	-0.7	3.32	-1.2	3.32	-0.7	3.32
Energy	-34.7	0.42	-53.7	0.42	-20.3	0.42	-15.2	0.69	-16.2	0.69	7.2	0.69
Fabricated metal products *	-2.1	2.16	-2.2	2.16	-1.8	2.16	-0.6	1.32	-1.1	1.32	-0.7	1.32
Iron and steel *	-4.3	1.84	-6.0	1.84	-3.9	1.84	-6.2	1.38	-6.6	1.38	-0.8	1.38
Leather and related products	-1.7	1.05	-1.3	1.05	-1.3	1.05	0.6	1.40	0.2	1.40	0.1	1.40
Machinery and equipment nec *	-1.9	9.48	-1.9	9.48	-1.9	9.48	-0.4	4.14	-0.9	4.14	-0.5	4.14
Milk, dairy products	-2.5	0.65	-2.1	0.65	-2.1	0.65	0.6	0.11	0.2	0.11	0.2	0.11
Mining	-5.1	0.97	-5.5	0.97	-6.3	0.97	-31.0	16.63	-33.9	16.63	-34.8	16.63
Motor vehicles	-2.1	10.44	-1.7	10.44	-1.6	10.44	0.8	3.32	0.3	3.32	-0.1	3.32
Non-ferrous metals *	-6.6	1.85	-8.3	1.85	-4.5	1.85	0.9	2.19	0.1	2.19	1.4	2.19
Non-metallic mineral products *	-10.9	1.09	-17.5	1.09	-8.9	1.09	-9.5	0.58	-10.2	0.58	3.0	0.58
Other food prepared, preserved	-3.2	2.29	-2.7	2.29	-2.8	2.29	1.7	1.74	1.2	1.74	1.2	1.74
Other manufacturing *	-1.1	3.12	-0.9	3.12	-1.3	3.12	-0.3	2.45	-0.7	2.45	0.1	2.45
Other meat	-1.8	0.60	-1.5	0.60	-1.5	0.60	1.0	0.16	0.6	0.16	0.6	0.16
Other transport equipment	-1.3	3.76	-0.8	3.76	-1.3	3.76	-0.2	2.44	-0.6	2.44	0.4	2.44
Paper and paper products	-5.9	1.58	-5.3	1.58	-4.8	1.58	3.7	0.68	2.9	0.68	2.0	0.68
Petroleum and coke *	-42.6	2.23	-64.8	2.23	-38.4	2.23	-35.3	4.11	-36.5	4.11	-3.7	4.11
Pharmaceuticals *	-1.8	5.35	-2.0	5.35	-1.7	5.35	-0.3	3.03	-0.9	3.03	0.7	3.03
Processed rice	-7.7	0.02	-6.2	0.02	-4.8	0.02	4.6	0.05	3.6	0.05	2.7	0.05
Rubber and plastics products *	-6.3	1.96	-7.6	1.96	-4.8	1.96	-0.5	1.59	-1.5	1.59	1.4	1.59
Services (without transport)	0.5	19.91	1.4	19.91	-1.0	19.91	-1.1	20.82	-1.9	20.82	0.6	20.82
Sugar and molasses	-2.7	0.08	-2.3	0.08	-2.2	0.08	1.4	0.10	0.9	0.10	0.7	0.10
Textiles	-5.6	0.93	-4.9	0.93	-4.0	0.93	2.7	1.24	2.0	1.24	1.1	1.24
Transport	-30.3	6.29	-29.6	6.29	-20.1	6.29	22.2	5.69	21.1	5.69	10.9	5.69
Vegetable oils	-4.6	0.28	-4.1	0.28	-3.8	0.28	2.0	0.66	1.5	0.66	1.2	0.66
Wearing apparel	-1.2	1.23	-0.9	1.23	-1.0	1.23	0.3	3.55	0.0	3.55	-0.1	3.55
Wood, products of wood and cork	-3.8	0.66	-3.3	0.66	-3.3	0.66	2.4	0.38	1.8	0.38	1.6	0.38

Note: * = sector contains products from the CBAM list. Targeted sectors include all CBAM goods, as specified in the EU Regulation (see Table A7 in the Appendix).
Source: WIFO calculations based on the KITE model.

Table B26: Sectoral trade effects of the CBAM for the intra-EU across three scenarios

	Export/Import					
	1 - Implementation		2 - Retaliation		3 - Climate Club	
	%-change	%-share	%-change	%-share	%-change	%-share
Targeted sectors	-5.4	43.73	-5.6	43.73	-5.9	43.73
Agriculture, forestry, fishing	-2.0	3.04	-1.9	3.04	-1.8	3.04
Beverages, tobacco products	-0.6	1.13	-0.7	1.13	-0.6	1.13
Cattle meat	-0.8	0.38	-0.9	0.38	-0.8	0.38
Chemicals and chemical products *	-7.9	8.49	-8.8	8.49	-9.0	8.49
Computer, electronic, optical prod.	-0.8	6.25	-0.7	6.25	-0.7	6.25
Electrical equipment *	-1.6	4.94	-1.4	4.94	-1.3	4.94
Energy	7.2	0.81	6.8	0.81	4.6	0.81
Fabricated metal products *	-1.7	2.77	-1.7	2.77	-1.5	2.77
Iron and steel *	-4.2	3.58	-4.3	3.58	-4.1	3.58
Leather and related products	-1.4	1.30	-1.2	1.30	-1.0	1.30
Machinery and equipment nec *	-1.2	6.91	-1.2	6.91	-1.2	6.91
Milk, dairy products	-0.7	1.09	-0.7	1.09	-0.7	1.09
Mining	-29.7	0.76	-29.5	0.76	-31.1	0.76
Motor vehicles	-1.3	10.69	-1.1	10.69	-0.9	10.69
Non-ferrous metals *	-5.2	2.81	-5.2	2.81	-4.7	2.81
Non-metallic mineral products *	-4.3	1.32	-4.5	1.32	-4.8	1.32
Other food prepared, preserved	-1.2	3.31	-1.2	3.31	-1.1	3.31
Other manufacturing *	-0.4	2.65	-0.4	2.65	-0.4	2.65
Other meat	-0.6	0.95	-0.7	0.95	-0.6	0.95
Other transport equipment	-1.3	2.25	-1.1	2.25	-1.3	2.25
Paper and paper products	-2.8	2.64	-2.8	2.64	-2.6	2.64
Petroleum and coke *	-36.9	2.66	-37.7	2.66	-42.1	2.66
Pharmaceuticals *	-0.4	4.10	-0.3	4.10	-0.9	4.10
Processed rice	-4.7	0.04	-4.0	0.04	-3.4	0.04
Rubber and plastics products *	-3.3	3.50	-3.3	3.50	-3.2	3.50
Services (without transport)	0.1	13.14	0.1	13.14	0.0	13.14
Sugar and molasses	-1.5	0.18	-1.5	0.18	-1.4	0.18
Textiles	-3.6	1.29	-3.4	1.29	-2.7	1.29
Transport	-17.4	3.28	-17.3	3.28	-14.1	3.28
Vegetable oils	-2.7	0.65	-2.6	0.65	-2.3	0.65
Wearing apparel	-0.4	2.14	-0.3	2.14	-0.2	2.14
Wood, products of wood and cork	-2.5	0.95	-2.5	0.95	-2.3	0.95

Note: * = sector contains products from the CBAM list. Targeted sectors include all CBAM goods, as specified in the EU Regulation (see Table A7 in the Appendix).
Source: WIFO calculations based on the KITE model.