CHAPTER

THE IMPACTS OF TRADE AND COMPLEMENTARY POLICY CHANGES ON SUSTAINABLE DEVELOPMENT

Channelling trade and investment into sustainable development is a difficult endeavour. As noted in chapter 4, it typically requires that trade and investment liberalization policies be accompanied by trade facilitation measures, as well as complementary environmental, social and other policies. In this chapter, a computable general equilibrium (CGE) model is used to empirically evaluate the economic, social and environmental impacts of alternative policy changes in Asia and the Pacific.[1]

The CGE analysis confirms that trade and investment liberalization are essential drivers of economic development. The economic growth and trade benefits from trade facilitation generally dwarf those from tariff liberalization and, to a lesser extent, those achieved through investment liberalization. While results vary across subregions, both trade facilitation and investment liberalization also contribute positively to reducing

inequality and undernourishment. However, the CGE analysis shows that liberalization policies increase CO_2 emissions at the regional level. Importantly, economic growth in Asia and the Pacific is enhanced when regional liberalization policies are complemented by domestic income redistribution and global implementation of the environmental commitments under the Paris Accord.

The impacts of alternative intraregional trade and investment liberalization strategies across the Asia-Pacific region are presented in the next section. This is followed by a review of the impacts of complementary domestic policies, namely CO_2 emissions reduction commitments and an income transfer from high-skill workers to low-skill workers, in section B. An overview of the CGE methodology used in this chapter is provided in annex 1.

A. IMPACT OF REGIONAL TRADE AND INVESTMENT LIBERALIZATION

In order to determine the economic, social, and environmental impact of regional trade and investment liberalization, four different strategies were considered. These are (1) simple tariff liberalization, (2) investment liberalization, (3) trade facilitation and (4) integrated liberalization.[2] The baseline year is 2015, and all policy changes are implemented incrementally throughout the period considered, 2015-2030. The economic impacts of the policy changes are captured through changes in gross domestic product (GDP) and trade levels; the social impact through changes in levels of inequality and undernourishment; and the environmental impact through changes in CO_2 emissions.

The policy changes are modeled as follows:

Scenario 1 – Enhanced tariff liberalization in the Asia-Pacific region ("Tariff liberalization").

> In this scenario, tariffs are gradually eliminated between members of the Regional Comprehensive Economic Partnership (RCEP) and Trans-Pacific Partnership (TPP) (minus the United States). In addition, other economies within the region introduce a 50% tariff reduction. This is in line with the current proliferation of bilateral, plurilateral and regional trade agreements, as well as the Regional Economic Cooperation and Integration (RECI) initiative at ESCAP.[3]

Scenario 2 – Investment liberalization in the Asia-Pacific region ("Investment liberalization").

> This scenario closely follows the approach outlined in scenario 1. Intraregional investment liberalization is simulated by gradually eliminating investment barriers between members of RCEP and TPP (minus the United States). In addition, other Asia-Pacific economies introduce a 50% investment barrier reduction.

Scenario 3 – Trade facilitation implementation in the Asia-Pacific region ("Trade facilitation").

> In this scenario, trade costs are reduced as a result of implementation of trade facilitation and paperless trade measures across Asia and the Pacific. Gradually, all the economies in the region reach the trade facilitation level of China.[4] Quantifying the impact of trade facilitation using an index is a complex undertaking, requiring in this case, a concordance between trade data and the trade facilitation implementation rates available from the ESCAP-led Global Survey on Trade Facilitation and Paperless Trade Implementation.[5]

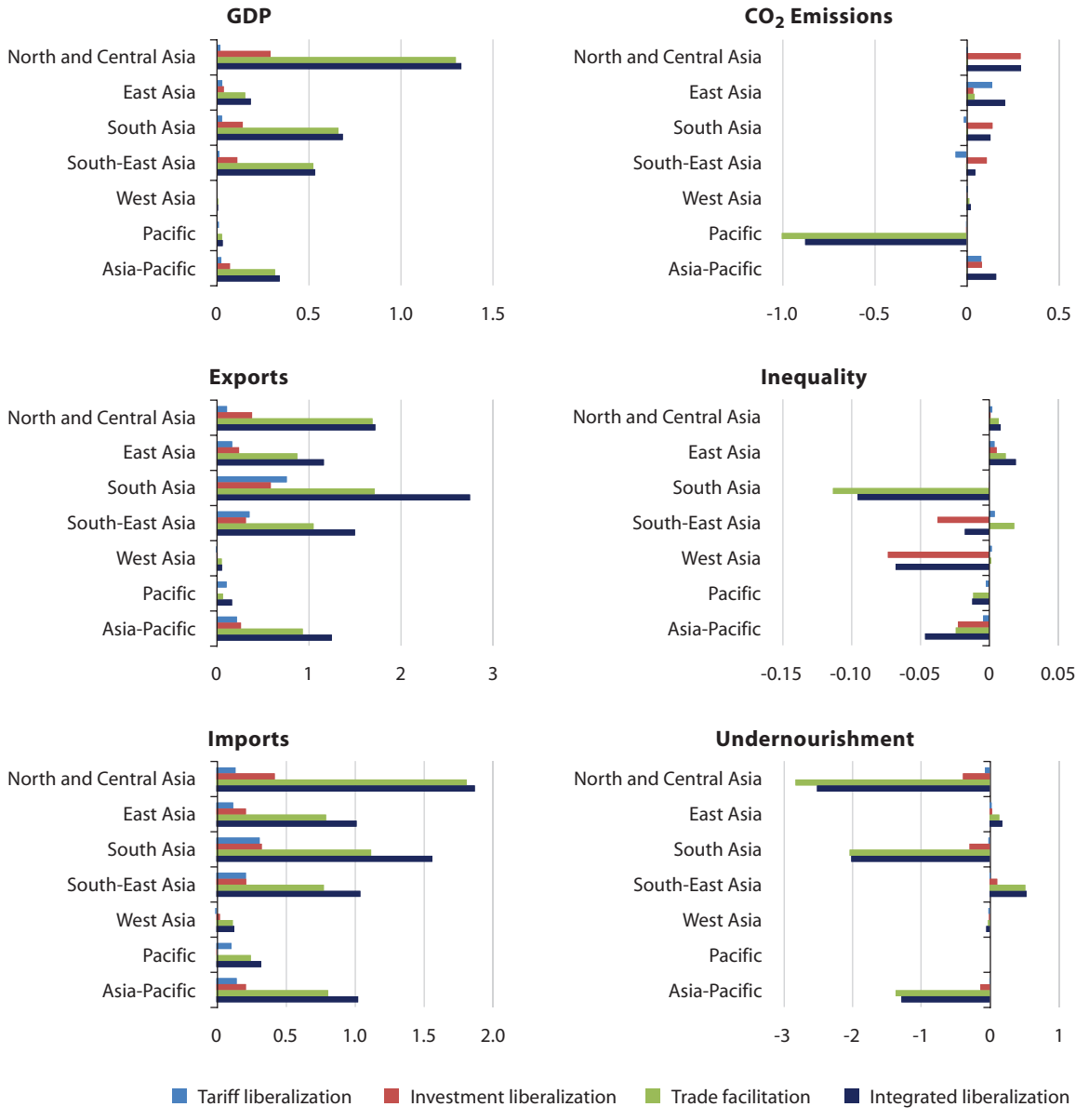
Scenario 4 – Simultaneous implementation of tariff liberalization, investment liberalization and trade facilitation ("Integrated liberalization").

> This scenario combines all above mentioned policy changes to demonstrate the aggregate effect of tariff liberalization, investment liberalization and trade facilitation implementation. As will be discussed, combining liberalization policies amplifies the economic benefits offered by the individual scenarios. Moreover, some adverse effects created by one policy are negated by one of the others.

Figure 6.1 presents the effects of the policy changes for different subregions in Asia and the Pacific.[6] Effects are depicted in average annual changes relative to the baseline "*status quo*" extended to 2030. Overall, trade facilitation – which may be best understood in the context of this analysis in its broadest sense, i.e. as a reduction in non-tariff trade costs – promises the most economic gains compared to either tariff liberalization or investment

Figure 6.1 **Results of tariff liberalization, investment liberalization and trade facilitation scenarios, 2015-2030**

(annual percentage change)



liberalization. However, in the trade facilitation scenario, there are also substantial variations among countries and between subregions in terms of the environmental and social impacts. The greatest economic, social and environmental benefits are in the combined "integrated liberalization" scenario.

In the case of tariff liberalization (scenario 1), the results are comparably modest, as many of the countries in the region already have low tariff rates, as explained in chapter 1. Consequently, the impact of tariff liberalization on GDP is relatively small, ranging from 0.01% and 0.03% across subregions. In absolute terms, however, the effect on regional GDP is an annual increase of $6.5 billion.

"Tariff liberalization in the Asia-Pacific region can increase net exports of the region by $7 billion per year, highlighting the importance of global value chains."

The impacts of tariff reduction are more pronounced in trade. Exports increase on average 0.22% annually every year until 2030, while imports increase by 0.15%. In absolute terms, this is an annual increase of $17.8 billion and $10.7 billion for exports and imports, respectively. The almost 70% larger increase in exports compared to imports demonstrates the significance of the interlinkages between the economies through regional and global value chains. Decreasing import tariffs, while increasing imports, also enables countries to reduce input costs, improve variety and quality of intermediate goods, become more competitive and increase exports even more.

Tariff liberalization's effect on the environment regionally is almost negligible. CO_2 emissions remain relatively neutral, increasing overall by less than 0.1% annually. However, driven by the redistribution of production, subregions exhibit some variations. In particular, emissions in East Asia[7] increase 0.14% on average annually, or 12.9 million tonnes of oil equivalent (MTOE) per year.

Turning to the social impact, the effects of intra-regional tariff cuts on inequality within the region and subregions are not significant. This can be largely attributed to the tariff cuts taking place across-the-board (i.e. in all sectors and countries). Such cuts are likely to offset increased inequality in sectors displaced by trade with gains from export-oriented sectors of the economies. The impact on undernourishment is also insignificant in the region and subregions. While increased interregional trade may negatively affect some producers, the negative effects are offset by decreased prices, resulting in a net neutral effect in the region and the subregions.

The cumulative result of tariff liberalization is an increase in regional GDP of 0.3% and trade of 2.9% by 2030. This is consistent with the findings from Gilbert (2013), who found that a free trade agreement encompassing all members of ESCAP, which involved cutting all intraregional tariffs to zero, resulted in GDP increases ranging from 0.3% to 0.78%. This is smaller than, for example, estimates of the impact of TPP, forecasted by some to raise member countries' GDP by 1.1 % and trade by 11% (World Bank, 2016). However, tariff liberalization is only a small part of TPP, which also includes significant trade facilitation, investment liberalization as well as services liberalization commitments.

Turning to scenario 2, the economic impact of regional investment liberalization are significantly higher than that of tariff liberalization. This is consistent with the fact that, unlike for tariffs, foreign direct investment (FDI) restrictiveness remains high in many countries of the region.[8] Economic gains from investment liberalization largely follow the pattern of tariff liberalization outcomes at the regional and subregional level. GDP increases by 0.1%, or $19.5 billion annually, with North and Central Asia attracting much needed investment and experiencing the highest relative growth at 0.29%. Similarly, South Asia and South-East Asia experience significant annual GDP boosts of 0.14% and 0.11%, respectively.

"Economic gains from investment liberalization are significant, in particular in North and Central Asia where it could boost GDP by nearly 0.3% annually."

However, the growth mechanism of investment liberalization differs from the one for tariff liberalization. In the case of tariff liberalization, all changes in economic performance are trade driven. In contrast, improved economic performance from investment liberalization is driven by increase in capital stock, which may or may not increase trade. As a result, the impact of investment liberalization on trade varies across subregions. For example, exports in South Asia and South-East Asia are *below* those gained through tariff liberalization. North and Central Asia imports, on the other hand, significantly increase, growing at 0.38% per year. On average, however, regional exports and imports grow at 0.26% and 0.21% annually – only slightly higher than was achieved through tariff liberalization.

"Investment liberalization is more effective than tariff liberalization in reducing inequality and enhancing food security regionally"

Unlike tariff liberalization, investment liberalization decreases inequality in the region by 0.02% per year. Among all the subregions, inequality in South-East Asia and West Asia declines most significantly. Similarly, undernourishment, declines significantly across the region (falling 0.14% annually), and particularly in North and Central Asia and South Asia. In these subregions, undernourishment declines

by 0.39% and 0.29%, respectively. Therefore, investment liberalization reduces inequality and undernourishment more than tariff liberalization. The increases in capital stock allow more utilization of unskilled labour, and the combination of lower production costs and increased incomes makes food more affordable.

In terms of environmental impact, investment liberalization increases CO_2 emissions in the region by 0.1% or 13 MTOE annually, similar to the results for tariff liberalization. At the subregional level, North and Central Asia gains the most economically, but also has the highest CO_2 emission, an increase of 0.29% annually. The subregions' CO_2 emission increase stems from increased infrastructure investment. In South Asia and South-East Asia, emissions also increase significantly (0.14% and 0.11%, respectively).

Turning to scenario 3, trade facilitation has large and generally positive impacts across the region. Asia and the Pacific experiences an annual increase in GDP of 0.32%, which is equivalent to nearly $87 billion per year – 14 times more than under enhanced tariff liberalization, and four times more than under investment liberalization. The GDP growth is driven by trade, with Asia-Pacific exports and imports annually increasing by 0.93% and 0.81%, respectively. These results are consistent with the empirical literature, which generally finds the impact of trade facilitation to be much larger than trade liberalization (ADB and ESCAP, 2013; Gilbert, 2013).

"The impact of trade facilitation on GDP in Asia and the Pacific is 14 times larger than the impact from tariff liberalization."

While trade increases are much larger than under the tariff liberalization scenario, both policy changes show regional exports expanding more than imports, resulting in an increase in net exports of $16 billion per year (exports increase by $75 billion and imports by $59 billion). These results suggest that trade facilitation and paperless trade implementation and, more generally, enhancing regional connectivity to reduce trade costs, should be a top priority among policymakers.

Although trade facilitation results in large regional trade gains, CO_2 emissions increase only marginally – and in any case less than with investment liberalization. The modest increase compared to tariff liberalization is the result of increased economic activity in North and Central Asia, South Asia and South-East Asia. On the other hand, in this scenario, emissions in the Pacific decline by 1% annually, helping to offset increases in other subregions.

Trade facilitation decreases inequality within the region overall. While the decrease is generally small, it is larger than those gained through tariff or investment liberalization. This result is mainly due to changes in South Asia, and, to a lesser extent, the Pacific. South Asia has some of the most inefficient trade procedures in the region. Only those of the small island developing States in the Pacific are worse. The results for the Pacific region as a whole are heavily moderated by Australia and New Zealand, who in contrast to other countries in the region have some of the highest trade facilitation implementation rates in Asia and the Pacific.[9] Significant improvements in trade facilitation in low-income economies of South Asia and the Pacific could reduce inequality by increasing their export of traditionally labour-intensive goods (e.g. textiles) and boosting both the employment and wages of unskilled labour. However, the rise in inequality in other subregions highlights the necessity of complementary policies (as discussed in chapter 4).

"By 2030, trade facilitation could reduce undernourishment in Asia and the Pacific region by over 20% from 2015 levels."

Trade facilitation also leads to significant reduction in undernourishment in Asia and the Pacific. In this scenario, undernourishment decreases by an average of 1.4% annually. By 2030, this is a reduction of over 20% overall in the region. The results, however, are not uniform. Malnourishment increases slightly in South-East Asia (0.52% annually) due to the displacement of the agricultural sector by other higher value-added sectors. Nevertheless, trade facilitation appears to be a promising strategy for reducing undernourishment in the region and contributing to Sustainable Development Goal 2 to achieve zero hunger. Overall, trade facilitation leads to more balanced sustainable development outcomes than either tariff or investment liberalization, highlighting the importance of reducing trade costs (see box 6.1).

Box 6.1

Reducing trade costs in Asia and the Pacific: key findings from an analysis of trade procedures in developing countries

Since 2009, ESCAP, Asian Development Bank and other development partners have analysed over 50 import and export processes in Asia and the Pacific.[a] A meta-analysis of these Business Process Analysis (BPA) studies reveals the following about reducing trade costs:

- **Implementation of basic trade facilitation measures should be consistently enforced.**

Simple trade facilitation measures, such as the provision of customs clearance services during holidays and weekends or the harmonization of work hours at border checkpoints on both sides of a land border, are sometimes not implemented. The trade facilitation situation varies significantly depending on the border crossings used within each country. Central authorities, therefore, need to promote a change of mindset among the staff of trade control agencies in terms of the importance of trade facilitation and their role in it. Also worth considering is the development of change management programmes that encourage officials to develop and test simple and pragmatic trade facilitation solutions in consultation with the private sector – and/or officials on the other side of the border if possible.

- **Paperless trade, including development of national and regional single windows, needs to be prioritized.**

Preparation of documents and the exchange of information among various parties involved account for the largest share of the time required to complete an import or export process. As such, the development of single window facilities for submission and processing of information and documents is important. Paperless trade systems should enable submission of information to not only regulatory and control agencies but also to public and private actors along the transaction chain. Participation in the United Nations treaty on paperless trade facilitation may be helpful in this regard.[b] At the same time, increased use of information and communications technology (ICT) and the development of related infrastructure should be pursued more vigorously.

- **Hard infrastructure investment is needed to support implementation of more efficient trade procedures.**

Almost all BPA studies point to a serious lack of physical trade-related and border infrastructure in many developing countries, in particular least developed countries. Upgrading physical infrastructure is the second most frequent recommendation made in BPA studies. (The first is implementing electronic trade data and documentation systems).

- **Physical inspections should be minimized whenever possible and all organizations involved in the trade process should adopt risk management techniques.**

Inspection and testing procedures increase the average transaction time required to complete export and import processes, and they reduce predictability and timeliness. Inspections are often required at various stages of the import and export processes: for imports, typically at the border, and for exports, often as part of document preparation. The frequency of inspections should be minimized through risk management. While customs often have some form of risk management system in place, other regulatory agencies do not. Recommendations worth considering and promoting include: building the capacity of these non-customs agencies, developing inter-agency risk management systems, encouraging joint (multi-agency) inspections, and establishing certification programmes where the quality and other characteristics of goods can be ensured through control of the production process at the factory.

- **Encourage a healthy competition among transport, logistics and other trade-related service providers.**

The BPA studies showed the key role that is played by service providers in the trade process. Aside from preparation of documents, which is often outsourced in part to service providers, inland carriage and handling and terminal handling are the most time-consuming procedures in the import and export processes. Providing traders with access to a variety of high quality and affordable services is therefore essential in reducing the cost and time of import and export processes. Consequently, countries trying to improve trade performance should carefully review policies related to transport and other trade-related service sectors, to ensure that existing service providers are not unduly protected and have clear incentive to provide the efficient services.

Box 6.1 *(continued)*

- **Reviewing payment systems and their efficiency may reveal new opportunities for improving trade facilitation performance.**

In the overall trade process, the payment process is often time consuming. While in some cases this is due to the payment method (e.g. open account method) or negotiated payment terms, some of the process analyses revealed delays in receiving payment of up to two weeks after all necessary documents specified in the letter of credit had been submitted to the bank. In order to facilitate trade, payment systems need to be reviewed and the efficiency and practices of financial intermediaries should be evaluated. The latter is particularly critical since the analysis also revealed that the cost of letters of credit represented, in some cases, nearly half of the direct cost of exporting a 20-foot container.

- **Consider industry-specific trade facilitation programmes in particular for agriculture.**

The product-specific BPA studies clearly highlighted that the differences in the complexity and length of the trade process depend on the type of goods traded. Industry or sector-specific bottlenecks may best be addressed through the implementation of industry- or sector-specific trade facilitation programmes. This finding is consistent with macro-level results from analysis of ESCAP-World Bank international trade cost data. These show that countries with low manufacturing trade costs do not necessarily have low agricultural trade costs (and viceversa).

- **Full and inclusive representation of the private sector is essential.**

Reducing the time and cost of trade transactions cannot be done without the support of the private sector. All procedures and steps in the import and export processes involve the private sector, while only some of them involve national regulatory authorities directly. While governments could, and should, streamline the procedures that they control (e.g. customs and other regulatory procedures), they also need to encourage private sector collaboration to achieve significant results. Private sector stakeholders (e.g. transport, logistics service providers and customs brokers, manufacturers, small and medium-sized enterprises, ICT service providers) have different levels of incentive to support trade facilitation. Governments should, therefore, ensure more inclusive representation of the private sector in national trade facilitation bodies (or similar institutions in charge of enabling trade).

- **National trade facilitation performance monitoring mechanisms are needed to identify the real and most important barriers to trade efficiency.**

Regulatory authorities have a limited view of the entire trade process. They are often only aware of their own internal efficiency, or inefficiency. Traders also have limited awareness and information about procedural bottlenecks. Instead, intermediaries often hold a lot of the information on the time and cost of specific procedures. Governments should, therefore, consider establishing national Trade and Transport Facilitation Monitoring Mechanisms (TTFMM)[c] as envisaged in UN/CEFACT Recommendation No. 42. Similarly, embedding performance measurement and monitoring into the ICT systems being developed as part of paperless trade initiatives, such as customs automation systems and Radio-Frequency Identification (RFID) tracking of container systems, should also be considered, as such systems could provide real-time information and performance data.

More notes on reducing trade costs in Asia and the Pacific are available from www.unescap.org/resources/notes-reducing-trade-costs-asia-and-pacific.

Notes:

[a] ESCAP Trade Process Analysis Database (TPAD) and links to individual BPA studies, are available from http://unnext.unescap.org/tools/business_process.asp.

[b] Information about the Framework Agreement on Facilitation of Cross-border Paperless Trade in Asia and the Pacific is available from www.unescap.org/resources/framework-agreement-facilitation-cross-border-paperless-trade-asia-and-pacific

[c] Guidance on implementation of TTFMM is available from www.unescap.org/resources/towards-national-integrated-and-sustainable-trade-and-transport-facilitation-monitoring. The global recommendation on TTFMM adopted in April 2017 is available from https://www.unece.org/fileadmin/DAM/cefact/recommendations/rec42/ECE_TRADE_C_CEFACT_2017_8E_R1_Rec42.pdf.

The final policy change investigated combines tariff liberalization, investment liberalization and trade facilitation (scenario 4). This "integrated liberalization" approach provides the highest overall economic benefit and increases GDP for the region by 0.34% annually, or $94 billion. The increase is largely driven by gains from trade facilitation, which by itself accounts for 0.32% increase in annual GDP.

"An integrated approach to trade and investment liberalization can increase the region's exports by $101 billion and imports by $75 billion per year."

In addition, integrated liberalization increases trade significantly more than any of the other stand-alone policy changes. Exports and imports are projected to increase by 1.25 % and 1.03%, respectively ($101 billion and $75 billion in absolute terms, per year), and the region's increased annual net exports could reach more than $25 billion. This is about $10 billion more than with trade facilitation alone. This integrated approach facilitates the participation of countries in global value chains and significantly increases the competitiveness of regional exports. This integrated liberalization scenario provides strong evidence of the important synergies that can be achieved by liberalizing and facilitating trade and investment.

In terms of CO_2 emissions, the negative effects of the investment liberalization and tariff liberalization scenarios accumulate, resulting in an increase of 0.16% in emissions for the region, or approximately 24 MTOE per year. The North and Central Asia, East Asia, and South-East Asia regions are largely responsible for the regional increase. In the Pacific, on the other hand, there is a large relative decrease, but this does not affect the regional results significantly, given the relatively low contribution of that subregion to total regional emissions.

The integrated liberalization approach magnifies the small reductions in inequality observed under the trade facilitation and investment liberalization scenarios. Despite inequality increasing modestly in East Asia, and to a lesser extent North and Central Asia, inequality falls by an average of 0.05% per year at the regional level. However, the extent and the drivers of these reductions vary across subregions. For instance, South Asia and West Asia both experience particularly significant inequality reductions. In South Asia, investment liberalization reduces inequality whereas trade facilitation leads to the reductions in West Asia.

Interestingly, the integrated liberalization approach does not show synergies between the liberalization and facilitation scenarios in terms of food security. Rather, undernourishment worsens marginally compared to the stand-alone trade facilitation scenario (see figure 6.1). Similar to the trade facilitation scenario, undernourishment still decreases significantly in most subregions, but it increases slightly in South-East Asia. This is the result of complex interactions between trade and investment liberalization in the agriculture and food sector.

The four regional trade and investment liberalization strategies examined result in economic benefits in all subregions at both the subregional and regional levels. However, due to increased economic activity, CO_2 emissions rise in all subregions except the Pacific. In addition, inequality and undernourishment outcomes vary widely at the subregional level. These results confirm the need for complementary domestic policies to mitigate adverse outcomes from liberalization, as well as the importance of careful evidence-based policymaking based on each country's and subregion's characteristics.

B. THE IMPACT OF COMPLEMENTARY POLICIES: THE PARIS ACCORD ON CLIMATE CHANGE AND INCOME TRANSFERS

The analysis presented in the previous section suggests that complementary policies are needed to address the mixed social and environmental outcomes associated with trade and investment liberalization in the Asia-Pacific region. Accordingly, this section explores how specific domestic policies can help channel trade and investment liberalization towards sustainable development globally. To do so, three additional policy scenarios and their economic, social, and environmental impact are analysed, as follows:

Scenario 5 – Implementation of Paris Accord ("Paris Accord")

The previous policy simulations (scenarios 1-4) do not include constraints on emissions, and as such, emissions rise in each. In this

scenario, all signatories of the Paris Accord globally reduce CO_2 emissions in accordance with agreed levels in the Agreement.[10]

Scenario 6 – Domestic Welfare transfer in Asia-Pacific ("Income transfer")

This scenario addresses inequality through a 3% redistribution of income from skilled to unskilled labour, taking place in all Asia-Pacific economies. Specific policies to achieve this objective could include welfare payments to low-income households, government subsidies and progressive taxation.

Scenario 7 – Combined trade, environmental and social policies ("Combined scenario")

This final scenario combines integrated liberalization (scenario 4) with the Paris Accord and welfare transfers. It shows the interlinkages between what are sometimes thought of as diametrically opposed policies and demonstrates that environmental and social goals can be achieved in parallel with trade-driven economic development.

The results of the simulations are presented in figure 6.2 below. As a reference, the "integrated liberalization" strategy (scenario 4) is presented in all graphs. As in the previous section, the percentage changes shown are average annual changes druing the period 2015-2030. Although they may look relatively small, they accumulate to significant changes over the time period examined.

In the Paris Accord scenario, the effect on GDP across the Asia-Pacific region is, contrary to expectations, mildly positive, a modest 0.1% per annum.[11] The economies of South Asia and South-East Asia grow by 0.38% and 0.34% respectively, driven largely by the growth in the renewable energy sector of these economies. However, due to the oil-centred economy of the Islamic Republic of Iran, West Asia GDP declines by 0.5% per annum.

"Implementation of the Paris Accord is not expected to negatively impact growth of the Asia-Pacific region as a whole, and it may, in fact, boost growth in South Asia and South-East Asia through the development of the renewable energy sector."

The Paris Accord implementation includes cutting emission commitments by countries outside the region, which also affect economic growth outcomes in Asia and the Pacific. For example, relative to the status-quo without emission constraints, GDP in the United States and the European Union annually contracts 0.18% and 0.62%, respectively. The biggest reductions in output growth globally are in the petrochemical industries, with an annual reduction of 2.2% of output, while the renewables sector sees a 2.4% annual output growth.

Exports in Asia and the Pacific remain unchanged under the Paris Accord scenario. The subregional breakdown shows that exports in South Asia rise significantly by 0.5% per year and 0.1% in West Asia, whereas they decrease by 0.1% in the Pacific and South-East Asia. At the same time, imports decline by 0.14% in the region, falling by 0.6% in South Asia and 0.4% in South-East Asia. The declines in these two subregions are partially the result of their reliance on fossil fuel imports by both subregions, which have been reduced to meet the Paris Accord obligations.

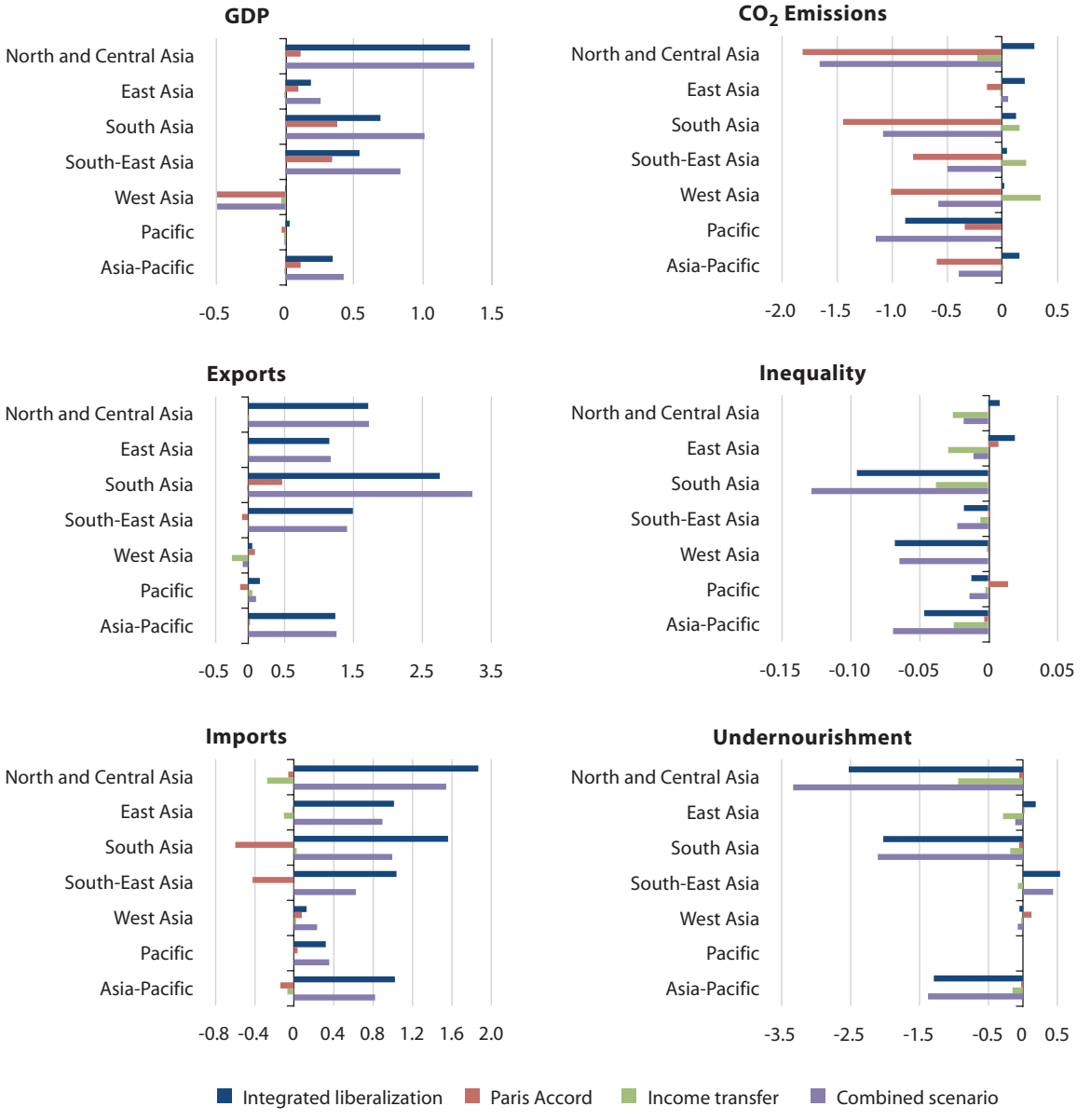
Following implementation of the Paris Accord, CO_2 emissions, as expected, fall across the region by 0.6% annually.[12] Subregionally, North and Central Asia is projected to have the largest decline (1.8% per year). In contrast, the largest overall emitter, East Asia, which contributes nearly two thirds of the region's emissions, has the lowest relative decline of 0.13%.[13]

The Paris Accord does not have any significant effect on inequality in the region. Undernourishment also does not change significantly for the region as whole, but effects differ across subregions. While falling somewhat in North and Central Asia and South Asia, it rises slightly in West Asia due to the dependence on oil and the subsequent loss of economic activity. Added to the decrease in GDP in the subregion, this highlights that CO_2 emissions reduction commitments and the move to renewable energies are likely to negatively impact oil producing countries.

After the Paris Accord scenario, the impacts of the income transfers scenario are examined. Since income is redistributed from high-skilled workers to low-skilled workers within each economy, no impact on GDP at the regional and subregional levels are registered. This result is in line with economic findings that show the economic effects of tax increases on high income earners are net neutral.[14] Similarly,

Figure 6.2 **Results for Paris Accord, income transfer, integrated liberalization and combined scenarios, 2015-2030**

(annual percentage change)



income transfers do not affect exports and imports at the aggregate level. However, small movements are apparent at the subregional level, with West Asia exports contracting by 0.2%, and North and Central Asia imports shrinking by 0.3%. As low-skilled workers have more disposable income, they require a different product mix and rely on fewer imports.

Overall, in the income transfer scenario, emissions do not increase in the region, but there is noticeable variation among subregions. While CO_2 emissions decrease in North and Central Asia by 0.2%, the emissions in South Asia, South-East Asia and West Asia increase by 0.2%, 0.2% and 0.4%, respectively. While not evident in the GDP effect, these increases are most likely due to the rising income of lower-skilled workers and their subsequent consumption of for more energy intensive products. North and Central Asia's emissions decrease indicates the product mix demand by low-skilled workers is less

energy intensive in that subregion. The results illustrate that even income redistribution policies have the potential to impact emissions, with the direction of the impact depending on the product mix facing unskilled/low-income consumers.

"Income redistribution policies have the potential to impact imports, exports and CO_2 emissions in opposite directions in different subregions."

As expected, the income transfer policy reduces within-country inequality in all subregions as well as in the region as a whole. Inequality decreases by 0.03% per annum in Asia and the Pacific, with the largest decreases in South Asia, which has one of the highest rates of inequality in the region (ESCAP, 2015). Similarly, undernourishment falls across the region by 0.15%, with the strongest effects in North and Central Asia, East Asia and South Asia, the three subregions with the highest levels of undernourishment in the region.

The final scenario (scenario 7) estimates the impact of integrated liberalization in Asia and the Pacific (scenario 4) when countries implement the Paris Accord commitments and income transfer policies. The combined effect is a net positive result regionally on the economic, social and environmental variables under consideration. Moreover, this combined scenario offsets most of the negative impacts seen in stand-alone policies. However, the results also show that some subregions still experience adverse effects. This underscores the need for the policy mix to take into account subregional and country level differences, particularly in light of different policy priorities.

The overall impact on GDP is an increase in annual growth of 0.4%, or $116 billion. This is larger than the effect from integrated liberalization alone, meaning that there is a high level of complementarity among the policies. Over the 15-year period considered, the policy mix results is an increase in regional GDP of $1.7 trillion, or over 6% of the regional GDP.

"Economic growth from regional trade and investment liberalization in Asia and the Pacific are further enhanced by global implementation of environmental commitments and domestic welfare transfer policies."

Under the combination scenario, the subregions benefitting the most economically are North and Central Asia (annual growth of 1.4%), South Asia (1.0%) and South-East Asia (0.8%). However, GDP in oil-dependent West Asia shrinks as a result of the implementation of the Paris Accord. Moreover, none of the modelled trade policy changes (scenarios 1-4) lead to significant GDP gains for this subregion either. As such, this highlights the difficulty oil-exporting countries may face operating in a more sustainable global economy.

The effect on exports and imports in the final scenario is largely additive. Exports increase regionally by 1.3%, and imports increase by 0.8%, resulting in net annual export increases of over $60 billion. Total trade, however, is slightly lower when liberalization and complementary policies are combined, than when integrated liberalization alone is implemented (scenario 4).

Carbon emissions are driven down by the Paris Accord implementation. They fall across the region and also negate some of the negative increases due to trade integration polices. Overall, there is a 0.4% reduction in the region, with only East Asia not showing significant reduction in CO_2 emissions – explained by the region's highest growth in exports in absolute terms. Campagnolo and Davide (2017) also find that emissions under the Paris Agreement simulations may increase in some countries because of weak mitigation targets in the national determined contributions.

Both inequality and undernourishment fall under the combined economic, social and environmental policy scenario. Inequality falls in all subregions as a result primarily of trade facilitation and income transfer effects. In West Asia, trade facilitation decreases inequality, whereas in the Pacific and East Asia, income transfers offset the increased inequality due to trade facilitation. Undernourishment also falls in most subregions, decreasing by 1.4% annually, or by 20% between 2015 and 2030. The fall in undernourishment is essentially driven by trade facilitation, which facilitate the movement of agricultural and food products at lower costs.

This last scenario's superior economic, social and environmental outcomes highlight the fact that social, environmental and trade and investment policies can be synergetic. They can promote better development outcomes than can be achieved with stand-alone

policies. However, this requires multilateral cooperation (as in the case of the Paris Accord) and deeper regional integration. Indeed, the results strongly support cooperative and coordinated implementation of environmental and social policies in regional trade and investment integration efforts, including to ensure that these policies do not create unnecessary or unintended barriers to trade. Encouragingly, new generation regional trade agreements already do this to a large extent (e.g. RCEP and TPP in this region), encompassing an ever-wider range of economic, social and environmental issues during negotiations.

C. CONCLUSION

The CGE analysis presented in this chapter aimed at deepening our understanding of the impact of different trade and selected complementary policies on economic and social development as well as the environment in Asia and the Pacific. The effects of regional tariff liberalization, investment liberalization, and trade facilitation on economic growth, trade, CO_2 emissions, inequality and undernourishment were analysed, individually and when implemented in an integrated policy package. The effects of emission reduction commitments under the Paris Agreement, as well as of domestic income transfers in Asia-Pacific countries were also analysed, as example of complementary policies needed to channel trade and investment into sustainable development.

The analysis highlighted the importance of tariff and investment liberalization and facilitation as a key driver of economic growth. An integrated approach to tariff and investment liberalization and facilitation is preferred, boosting trade by over $175 billion annually and partly reducing negative social and environmental impacts associated with individual liberalization policies.[15] The results suggest that lowering trade and investment barriers regionally in an integrated manner increases the competitiveness of regional firms in the global market by enabling them to effectively participate in global value chains.

Gains from liberalization are mainly driven by trade facilitation, whose economic impact significantly outweighs that of tariff and investment liberalization. In the context of the model, trade facilitation may be interpreted broadly as reduction in trade costs, including but not limited to the implementation of trade facilitation and paperless trade measures included in the World Trade Organization Trade Facilitation Agreement and the Framework Agreement on Facilitation of Cross-border Paperless Trade in Asia and the Pacific.

Finally, the CGE analysis confirms the need for complementary social and environmental policies to better channel trade and investment into sustainable development. Indeed, while the social and environmental impacts from liberalization are typically not large at the regional level, they vary substantially across subregions in both significance and direction.[16] Importantly, the combined effect of integrated liberalization, domestic welfare transfers and global Paris Accord implementation is a higher level of economic growth in Asia and the Pacific than what is achieved through integrated liberalization alone, while inequality and CO_2 emissions are also mitigated. Increasing multilateral and regional cooperation on trade and investment as well as social and environmental issues is key to achieving positive outcomes across all three pillars of sustainable development.

Endnotes

[1] The Global Trade Analysis Project (GTAP) model and its extension are used for the analysis. See annex 1 for details.

[2] Considering the possibility that the current protectionist rhetoric in some country could materialize, we also evaluate the outcome of a global tariff war in annex 2. Such a scenario leads to a sharp fall in trade in most subregions, reducing regional GDP by $110 billion a year and significantly worsening undernourishment.

[3] The simulation covers only tariff reductions in merchandise trade, hence the results should be interpreted with caution as they underestimate the benefits arising from high-quality trade agreements that incorporate service liberalization and promote competition through other provisions, which can magnify gains.

[4] The trade facilitation implementation levels are from the United Nations Global Survey on Trade Facilitation and Paperless Trade Implementation 2015, available from https://unnext.unescap.org/content/global-survey-trade-facilitation-and-paperless-trade-implementation-2015

[5] This is the first attempt known to examine the impact of trade facilitation implementation in the region using general equilibrium modeling.

[6] Definitions of subregions are in table A.1.3 in annex 1. More disaggregated and country level findings are available in Narayan and others (2017).

[7] Subregions in this analysis differ slightly from the country coverage of ESCAP subregions. In particular, West Asia (Islamic Republic of Iran and Turkey) is considered separately from South Asia. See table A.1.3 in annex 1.

[8] See for example, FDI Regulatory Restrictiveness Index in Figure 4 in OECD (2017).

[9] For the 2017 results see https://unnext.unescap.org/content/global-survey-trade-facilitation-and-paperless-trade-implementation-2017

[10] More information on the Paris Accord and nationally determined contributions (NDCs) is available from http://unfccc.int/paris_agreement/items/9485.php. In the simulation, the United States is assumed to be implementing its commitments. According to Article 28 of the Paris Accord, the earliest date for the United States to completely withdraw from the agreement is November 4, 2020.

[11] This approximately equals the effects of the investment liberalization scenario in section B.

[12] This is equivalent to 88 MTOE per year.

[13] At the global level, CO_2 emissions annually decline by 1.3% in emissions, or 19.5% between 2015 and 2030. These results are in line with Campagnolo and Davide (2017), who similarly model a 19% decline in emissions from the status quo.

[14] In practice, however, this result may not always hold, as excessive high-income taxes may inadvertently drive some investment out of countries to seek tax shelters and lead to more tax-evasions practices affecting revenue collected.

[15] An integrated approach to liberalization, combining trade and investment liberalization and trade facilitation, enables South-East Asia to offset small increases in inequality evident in the stand-alone trade facilitation scenario. Similarly, an integrated liberalization approach enables South Asia, which has the highest rates of undernourishment in the region, to reduce it by 2% annually.

[16] For example, while South and West Asia experience reductions in inequality through integrated liberalization, East Asia sees modest increases.

REFERENCES

Arvis, Jean-François, and others (2012). Trade costs in the developing world: 1995 – 2010. ARTNeT Working Paper Series, No. 121, December. Bangkok: ESCAP. Available from www.unescap.org/sites/default/files/AWP%20No.%20121.pdf.

Asian Development Bank and United Nations, Economic and Social Commission for Asia and the Pacific (2013). *Designing and Implementing Trade Facilitation in Asia and the Pacific*. Manila: Asian Development Bank. Available from www.unescap.org/resources/designing-and-implementing-trade-facilitation-asia-and-pacific-2013-update.

Campagnolo, Lorenza, and Mannella Davide (2017). Can the Paris deal boost SDGs achievement? An assessment of climate mitigation co-benefits or side-effects on poverty and inequality. Fondazione Eni Enrico Mattei Working Papers, No. 1215. Available from http://services.bepress.com/feem/paper1215.

Ciuriak, Dan, and Jingliang Xiao (2014). The impact of the Canada-Korea Free Trade Agreement as negotiated. *Journal of East Asian Economic Integration*, vol. 18, No. 4, pp. 425-461.

Da Silva, Jorge (2017). How can aid for trade help advance the Sustainable Development Goals? *Bridges Africa*, vol. 6, No. 5. Geneva: International Centre for Trade and Sustainable Development. Available from https://www.ictsd.org/bridges-news/bridges-africa/news/how-can-aid-for-trade-help-advance-the-sustainable-development.

European Commission (2017). Ex-ante study of the EU-Australia and EU-New Zealand trade and investment agreements – Final Report. Brussels. Available from http://trade.ec.europa.eu/doclib/docs/2017/april/tradoc_155505.pdf.

Gilbert, John (2013). The economic impact of new regional trading developments in the ESCAP region. *Asia-Pacific Development Journal*, vol. 20, No. 1, June. Available from www.unescap.org/sites/default/files/chap-1-Gilbert.pdf.

Hertel, Thomas, ed. (1997). *Global Trade Analysis: Modeling and Applications*. Cambridge: Cambridge University Press.

Horridge Mark (2011). GTAPAdjust—a programme to balance or adjust a GTAP database. Melbourne: Centre of Policy Studies, Monash University.

Keywan, Riahi, and others (2017). The shared socioeconomic pathways and their energy, land use, and greenhouse gas emissions implications: an overview. *Global Environmental Change*, vol. 42, pp. 153-168. Available from http://dx.doi.org/10.1016/j.gloenvcha.2016.05.009.

Mirza, Tasneem, and Thomas W. Hertel (2007). The role of trade facilitation in South Asian economic integration. Asian Development Bank Project Report. Manila.

Narayanan G., Badri, and others (2016). Trade facilitation in the Commonwealth: an economic analysis margin. *Journal of Applied Economic Research*, vol. 10, No. 3, pp. 305-336.

Narayanan G., Badri, and Jean Balie (2017). Trade policy, domestic support and food security. Paper presented at the 20th Annual Conference of Global Economic Analysis, Purdue University.

Narayanan G., Badri, and others (2017). Impact of trade and investment liberalization in Asia and the Pacific. Asia-Pacific Research and Training Network on Trade Working Paper (forthcoming). Bangkok: ESCAP.

Organisation for Economic Co-operation and Development (2017). Is investment protectionism on the rise? Evidence from the OECD FDI Regulatory Restrictiveness Index. Note provided as background information at the Global Forum on International Investment, 6 March 2017, OECD, Paris. Available from www.oecd.org/investment/globalforum/2017-GFII-Background-Note-Is-investment-protectionism-on-the-rise.pdf.

Peters, Jeffrey (2016). The GTAP-Power Data Base: disaggregating the electricity sector in the GTAP Data Base. *Journal of Global Economic Analysis*, vol. 1, No. 1, pp. 209-250. Available from https://jgea.org/resources/jgea/ojs/index.php/jgea/article/view/15/5.

United Nations, Economic and Social Commission for Asia and the Pacific (2015). *Economic and Social Survey of Asia and the Pacific 2015 – Part I: Making Growth More Inclusive for Sustainable Development.* Sales No. E.15.II.F.7. Available from www.unescap.org/publications/economic-and-social-survey-asia-and-pacific-2015-making-growth-more-inclusive.

World Bank (2016). Topical issue – Potential macroeconomic implications of the Trans-Pacific Partnership. *Global Economic Prospects: Spillovers amid Weak Growth*. Chapter 4. Washington, D.C. Available from http://pubdocs.worldbank.org/en/847071452034669879/Global-Economic-Prospects-January-2016-Implications-Trans-Pacific-Partnership-Agreement.pdf.

ANNEX 1 – Methodology overview

This chapter uses a global computable general equilibrium (CGE) model based on the Global Trade Analysis Project-Power (GTAP-POWER) model and database (Peters, 2016), which features reach sectoral and country level details for Asia and the Pacific. This extension of the standard GTAP model (Hertel, 1997) is used because it captures rich details of different types of energy, including various forms of renewable energy and fossil fuels, as well as the CO_2 emissions associated with them.

The model also integrates models from other studies. The first, developed by Narayanan and Balie (2017), is an econometric framework that assess the impact of food production and supply on undernourishment. The second, developed by Ciuriak and Xiao (2014), is a recursive dynamic model based on the Monash framework on investment dynamics and investment identified by sector and countries of origin and destination. Results from this model are used to introduce dynamic effects in the comparative static framework used. Furthermore, inequality is examined as an outcome of model simulations by looking at the divergence between the real wages of skilled and unskilled labor. The modeling of inequality follows European Commission (2017), while trade facilitation is modeled following Mirza and Hertel (2007) and Narayan and others (2016).

The reference year for the GTAP data base is 2011; however, recent macro-level data is used to adjust this dataset to 2015 using the GTAPAdjust tool (Horridge, 2011) – refer to table A.1.1 below. Unemployment is assumed in labour markets using a unit-elastic labour supply, which is a middle path between horizontal and vertical labour supply curves, and is also supported by econometric literature on labour supply elasticities.

Importantly, all results are changes from a baseline scenario, where standard GDP, labour force and population growth follow the IIASA's Sustainable Socio-Economic Pathways (Keywan and others 2017) – see table A.1.2 below. This provides a "business as usual" view of the world that is based on econometric analysis. When these variables grow at rates consistent with their past growth rates, trade is expected to broadly grow and emissions to increase, both owing to the real growth in the global economy as projected based on the past performance. As for inequality and food security, much would depend on the extent of income growth for different types of laborers and countries as well as the agricultural and food sectors.

While more disaggregated groups are used to run the model, results are presented using subregional and regional groupings shown in table A.1.3.

Table A.1.1 **Absolute initial (2015) values**

	GDP	Exports	Imports	CO_2 Emissions	Inequality	Under-nourishment
	(2015 Billions of United States dollars)					
Asia-Pacific	27 520	8 070	7 347	15 006	0.23	10.28
East Asia	17 248	4 561	3 953	9 190	0.26	12.40
South-East Asia	2 524	1 383	1 346	1 149	0.40	10.75
South Asia	2 584	536	697	1 990	0.43	20.70
West Asia	1 223	605	588	502	0.34	2.12
North and Central Asia	2 287	661	458	1 764	0.32	3.70
Pacific	1 655	323	305	412	0.62	–
Latin America	5 099	910	871	1 148	0.02	–
Sub Saharan Africa	4 144	978	844	571	0.27	32.40
Other Africa	3 473	925	772	523	0.42	1.50
Europe	17 502	7 130	7 379	2 145	0.46	–
North America	18 905	2 330	3 178	5 611	0.31	–
Global	76 641	20 342	20 391	25 004	–	–

Table A.1.2 Baseline scenario – annualized percentage changes by 2030

	GDP	Exports	Imports	CO_2 Emissions	Inequality	Under-nourishment
Asia-Pacific	3.67	1.98	2.33	0.76	-0.04	-0.19
East Asia	4.26	6.63	6.46	4.26	-0.03	4.26
South-East Asia	7.38	0.58	1.84	0.04	-0.02	7.38
South Asia	2.32	0.18	2.12	0.07	–	-0.43
West Asia	1.70	1.41	0.29	0.15	–	-0.26
North and Central Asia	3.30	2.05	1.77	0.13	-0.03	-0.48
Pacific	3.70	1.87	2.04	0.64	0.00	–
Latin America	2.25	1.15	1.26	0.11	-0.03	–
Sub Saharan Africa	4.44	3.58	1.42	0.07	–	-0.70
Other Africa	1.62	1.00	0.95	0.09	-0.20	-0.27
Europe	2.91	1.23	1.74	0.07	–	–
North America	2.49	1.40	1.34	0.11	-0.04	–

Table A.1.3 Subregional and regional country groups

Region/Subregion	Country groups
Asia-Pacific	
East Asia	China; Hong Kong, China; Japan; Republic of Korea; Mongolia; Taiwan Province of China; Rest of East Asia
South-East Asia	Cambodia; Indonesia; Lao People's Democratic Republic; Malaysia; Philippines; Singapore; Thailand; Viet Nam; Rest of South-East Asia
South Asia	Bangladesh; India; Nepal; Pakistan; Sri Lanka; Rest of South Asia
West Asia	Islamic Republic of Iran; Turkey
North and Central Asia	Armenia; Azerbaijan; Georgia; Kazakhstan; Kyrgyzstan; the Russian Federation
Pacific	Australia; New Zealand; Rest of Oceania
Latin America	Argentina; Bolivia; Brazil; Chile; Colombia; Ecuador; Paraguay; Peru; Uruguay; Venezuela; Rest of South America; Costa Rica; Guatemala; Honduras; Nicaragua; Panama; El Salvador; Rest of Central America; Dominican Republic; Jamaica; Puerto Rico; Trinidad and Tobago; Caribbean
Sub Saharan Africa	Benin; Burkina Faso; Cameroon; Cote d'Ivoire; Ghana; Guinea; Nigeria; Senegal; Togo; Rest of Western Africa; Central Africa; South Central Africa; Ethiopia; Kenya; Madagascar; Malawi; Mauritius; Mozambique; Rwanda; Tanzania; Uganda; Zambia; Zimbabwe; Rest of Eastern Africa; Botswana; Namibia; South Africa; Rest of South African Customs Union
Other Africa	Egypt; Morocco; Tunisia; Rest of North Africa
Europe	Austria; Belgium; Cyprus; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Latvia; Lithuania; Luxembourg; Malta; Netherlands; Poland; Portugal; Slovakia; Slovenia; Spain; Sweden; United Kingdom; Switzerland; Norway; Rest of EFTA; Albania; Bulgaria; Belarus; Croatia; Romania; Ukraine; Rest of Eastern Europe; Rest of Europe
North America	Canada; United States; Mexico; Rest of North America

ANNEX 2 – Impact of a global trade war

As discussed in chapter 1, while regional and global trade prospects have been improving, the risk of a renewed wave of trade protectionism remains. Therefore, a global trade war, where the trade protectionist measures initiated by one or a few countries ultimately leads to other countries retaliating, is modeled. Specifically, the simulation shows the effects of all countries raising import tariffs to their bound levels globally between 2015 and 2030.[a]

Table A.2 shows the overall impact of the WTO-consistent tariff hikes. GDP falls in all, varying annually between 0.2% in Latin America to 0.9% in Europe. This leads to an overall global reduction in GDP of $380 billion a year, or a nearly $5 trillion loss by 2030. The significant reduction is driven by trade, as expected, with exports and imports both plummeting globally. CO_2 emissions, on the other hand, are reduced due to overall lower economic activity. Tariff hikes do not affect inequality because wages for skilled and unskilled labour are affected equally. However, undernourishment increases significantly across all regions.

Overall, Asia-Pacific's GDP decreases more than $110 billion per year – amounting to a cumulated loss of $1.4 trillion loss between 2017 and 2030. The North and Central Asia subregion sees the most significant reduction in GDP of 0.7%, or $16 billion annually. In absolute terms, East Asia's GDP decreases the most by over $51 billion. The declines in GDP are directly caused by reduced trade, but there is significant variation across subregions. South Asia exports decline a dramatic 38% annually, while West Asia and the Pacific exports decline by only 5% a year on average. The difference in the effect is largely due to the export product mix, i.e. subregions that are most affected have exports that are more susceptible to being blocked by increases in applied rates. In terms of imports, the countries in West Asia and North and Central Asia have the most policy space (i.e. their applied tariff levels are much lower than their bound tariff rates), so imports in these subregion shrink the most, falling by more than 30%. CO_2 emissions decline in most countries as economies across the region slip into depressions, but emissions actually increase in South-East Asia due to an increase in local production of previously imported products. In terms of undernourishment, the most serious impact is in West Asia, which sees an increase of 3.4% a year, underscoring the danger the tariff war poses for the poor.

Table A.2 **Results of a hike in tariffs globally (percentage deviations from the baseline)**

	GDP	Exports	Imports	CO_2 Emissions	Under-nourishment
Asia-Pacific	-0.4	-19	-17	-0.4	1.5
East Asia	-0.3	-13	-7	-1.3	1.5
South-East Asia	-0.3	-25	-14	0.1	0.9
South Asia	-0.3	-38	-8	-0.1	0
West Asia	-0.3	-5	-38	0	3.4
North and Central Asia	-0.7	-15	-31	-0.1	1.8
Pacific	-0.4	-5	-5	-0.4	N/A
Latin America	-0.2	-13	-22	-1.8	N/A
Sub Saharan Africa	-0.7	-3	-27	-1.1	2.4
Other Africa	-0.5	-6	-10	-2.6	1.6
Europe	-0.9	-37	-16	-0.2	N/A
North America	-0.3	-15	-26	-1.9	N/A

Endnotes

[a] The size of the tariff increase by each country will depend on their "policy space" – commonly also referred to as "water" in tariff rates. The bound rates in certain countries remain considerably higher than their applied rates (table A.2). This allows policymakers to react in case of import surges by increasing applied rates without violating WTO commitments. The magnitude of policy space varies substantially between Asia-Pacific economies, with, for example, Hong Kong, China not having any at all and Bangladesh having more than 100%.