DMCC

THE FUTURE OF TRADE

2022

GLOBAL TRADE IN A NEW
ERA OF MULTILATERALISM

Introduction

THE FUTURE OF TRADE:
THE OPPORTUNITIES AHEAD

INTRODUCTION

The Future of Trade 2022 is the fourth edition of DMCC's biennial flagship report on the changing nature of global trade. In it, we examine the impact of technology, global economic trends, and geopolitics on the future of trade, with a focus on trade growth, supply chains, trade finance, infrastructure, and sustainability. The report presents updated scenarios for how trade will develop in 2022 and beyond, relevant for any reader involved in trade, trade policy, international investment, and the operation of businesses with global value chains.

This fourth edition frames world trade's capacity to drive global recovery as economies continue to open up after the COVID-19 pandemic. The analysis will look at multiple long-term recovery scenarios, both optimistic and pessimistic, many of them predicated on underlying issues such as trade finance, digitalisation, and infrastructure. The picture is still mixed when assessing the political will of governments to de-risk investments into such areas as the global economy recovers.

Geopolitics, as ever, will shape the trade landscape in 2022 and beyond. The report will discuss new developments in regionalism, bilateral trade, and global investment flows. US-China trade tensions constitute a continued risk to trade openness between the world's two largest economies. In practice, US President Biden's administration has embarked on a policy of 'America First' with a preference for 'Ally-shoring'.[1] Although not a base case scenario, the risk is that an extension of this type of policy in other countries could lead to a broader fragmentation of global trading relationships.

While nationalist – as opposed to protectionist – trade policies are likely to continue to dominate, there are signs of a growing resurgence in multilateralism. The report looks at them closely, including emerging trade corridors and emerging developments in intraregional trade, such as growth in Middle Eastern trade with the emerging and developing economies of Asia.

Bilateral, regional, and multiparty trade deals are another sign. China and Taiwan's stated bids to join the Comprehensive and

Introduction

Progressive Agreement for Trans-Pacific Partnership, in addition to the UK's ongoing accession process, offer opportunities for trade and bilateral investment. The recent signing by 10 Asian countries of the Regional Comprehensive Economic Partnership (RCEP) is a notable milestone, and the new Japanese prime minister, Fumio Kishida, has indicated a rapprochement with China, which could bring momentum to the long-term discussions on Pacific trade deals and, more widely, on progress in other regional deals. New types of trade deals, such as the UAE CEPA programme and the Singapore-UK Digital Economy Agreement, are also essential to the future of trade.

The US has unveiled its Indo Pacific Economic Framework for Prosperity, with 12 initial partners. It is not a trade agreement per se as it does not include market access or tariff reductions, but its aim is for the US to engage on trade and economic matters with Asia Pacific nations.

The nexus of digitalisation and trade remains core to the outlook. Innovative technologies continue to drive productivity gains and sustainable economic development. Trade and technology will continue to form a core part of this dynamic in 2022 and beyond. The Future of Trade 2022 presents and examines major new developments on this front, including crypto currencies and virtual assets. The rise and increasing development of central bank digital currencies stands to reshape global finance, trade, and investment. The report includes an analysis of both the opportunities and the economic impact of the further adoption of crypto technology in mainstream trade, business, and finance.

Following COP26, we also provide an important update on recent developments in sustainability. Compared even with the start of 2021, the level of urgency for climate adaptation among governments and multinational corporations has increased. We are now seeing a much more realistic approach and broader understanding of where we need to get to in terms of transitioning to a sustainable future. A key aspect of sustainability is the opportunities it presents for international businesses. The report aims to provide new insights from businesses and investors on sustainability and the potential risks in not incorporating sustainability into business practices.

Overall, recovery and sustainability frame this benchmark report. The clear imperative for businesses – both large and small – from across the globe is the need to better understand the longer-term direction and composition of global trade. Additionally, tectonic shifts in the global economy, driven by trade barriers, inflation-induced policy, and adapting to climate change, will make it necessary for businesses to change their approaches. This report includes practical recommendations for businesses on how to adapt to emerging trends in global trade and leverage the opportunities that will arise from these trends.

[1] https://www.atlanticcouncil.org/news/transcripts/transcript-us-treasury-secretary-janet-yellen-on-the-next-steps-for-russia-sanctions-and-friend-shoring-supply-chains/

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EXECUTIVE SUMMARY

At a time of conflict in Europe, geopolitical rivalry, inflationary pressures and concerns over economic growth, global trade has an encouragingly positive story to tell that may not be immediately obvious.

Multiple underlying factors are likely to support cross-border trade in both 2022 and in the years ahead: an increasingly regional focus; strength in the services side of trade; and digital innovation, especially in digital trade. Strategic geopolitical and climate considerations will also be supportive, while countries' energy transitions will accelerate in both developed and developing economies, providing another boost to trade.

The upshot is that global trade growth is expected to remain resilient in 2022 despite some slowing in pace. The upward trajectory is likely to continue in the years ahead, but the shape of trade will change significantly. The world appears to be at the dawn of a new era of multilateralism, the features of which include regionalism, sustainable trade and digital trade. The raft of new trade agreements and partnerships, including the recently launched Indo-Pacific Economic Framework for Prosperity (IPEF)[2] and the UAE CEPA programmes, are encouraging for the future of trade. Digital transformation will need to be central to governments and the private sector as this will further drive and facilitate trade liberalisation.

In addition, the rise and increasing development of central bank digital currencies stands to reshape global finance, trade, and investment.

The drivers of lower trade barriers will increase over the next several years. Pandemic-induced protectionism in certain goods is costly and distortionary. Given this, there is likely to be a migration towards loosening barriers. This would boost specialisation and reduce trade costs. As trade openness increases, production in each economy tends to decouple from domestic demand. Increasing competition vis-à-vis foreign producers instigates specialisation according to comparative advantage, lowering overall costs.

[2] https://www.whitehouse.gov/briefing-room/statements-releases/2022/05/23/fact-sheet-in-asia-president-biden-and-a-dozen-indo-pacific-partners-launch-the-indo-pacific-economic-framework-for-prosperity/

We expect the underlying, or structural, outlook for trade to be underpinned and shaped by **three tectonic shifts**:

- A lowering of trade barriers
- Soaring inflation and the policy responses to it
- The impact of the climate crisis on global trade

Central bank policy-tightening will become more widespread and pronounced to combat inflation, which will continue to climb in 2022. Fossil fuel prices are rising at an accelerating pace, driving up energy costs, while rising food prices have begun to hit home in many economies.

Central banks are already responding with higher interest rates, making borrowing more expensive worldwide, straining the ability of exporters to access credit and affordable finance.

The third shift comes from climate change. Global trade will be impacted by the climate crisis in terms of both the economic shocks and opportunities it will bring. Faced with supply shocks, government intervention may be needed to limit potential economic losses. This will involve re-incentivising the private sector and mobilising the public sector. Crucially, as our report highlights, adapting to climate change presents both business and public policymakers with risks (Eriksen et al., 2021). But it also provides markets for new, sustainable products and opportunities. Adapting to a new climate scenario[3] with a fitting economic growth path are inherently connected and trade policy will increasingly reflect this.

[3] The global response to the climate crisis has taken place along two interdependent tracks of mitigation, or actions to prevent further global warming through adaptation (de Coninck et al., 2018).

We are now seeing a much more realistic approach and broader understanding of where we need to get to in terms of transitioning to a sustainable future, and this represents a huge opportunity for business.

Beyond these shifts are several significant pivots in the trade landscape that could disrupt the status quo. Slower economic growth in China is one. Its policymakers are likely to continue a policy of promoting economic stability and managing a slower, albeit resilient growth rate. A second could involve the price of oil remaining at, or above, record levels, fuelling sharp growth disparities and associated political tensions. A third is the danger of a continued (and unsustainable) rise in debt defaults, which could fuel instability in fiscally vulnerable regions. More than half of low-income countries are in debt distress or at high risk of debt distress, threatening their ability to buy much-needed imports.

This environment may seem fraught with risk. But it also offers governments and business opportunities to act. For businesses, there should be an increased strategic emphasis on economic diversification to support resilience and sustainable initiatives against oil price shocks and climate-related uncertainty in production. To ensure robust, resilient production, risk management and production models should shift from just-in-time systems to having a greater focus on long-term strategic considerations and effective partnerships.

For governments, the opportunities lie in part in adapting and reprioritising public and private economic development strategies to meet growing demand for goods and services in digital economies, with a view to enhancing trade facilitation. In addition, continued trade liberalisation can and should be introduced. Examples of important policy initiatives include infrastructure development at key gateway facilities such as ports and airports. Additionally, liberalising transport services markets, including through relaxing restrictions on foreign direct investment, can promote consolidation and productivity upgrading, as well as knowledge spill over.

Below, we set out a series of detailed recommendations for business and government in response to each of the shifts we describe. Our over-arching conclusion is that there is an imperative to build more crisis-resilient economies – financing the shortfalls in

infrastructure and in trade finance. Lowering the cost and barriers to accessing trade finance is a crucial part of closing the ongoing shortfall. The trade finance gap is likely to have remained above the estimated US$1.7 trillion.[4] Tackling both trade and infrastructural financing gaps in a way that is consistent with the energy transition will be crucial. So, too, will be closing the digital divide between countries and sectors to bring the benefits of global trade to all.

The main findings of the Future of Trade report are:

- Trade growth will accelerate over the next five years despite the current economic upheaval of soaring inflation and slower economic growth
- A new form of multilateralism will emerge, central to which will be regionalisation
- Trade barriers will be lowered over the next three to five years
- Accelerated digital adoption will drive trade
- The rise in Central Bank Digital Currencies has the potential to reshape finance, trade and investment
- An increase in the trade in services will be a feature of the next five years
- Countries' energy transitions will play a key role in boosting trade
- Risks to trade growth include high oil prices, the slowdown in China, and monetary policy responses to soaring inflation.

[4] https://www.adb.org/publications/2021-trade-finance-gaps-growth-jobs-survey

KEY MESSAGES

CHAPTER I: THE FUTURE OF TRADE

Context

- Global trade growth is expected to remain resilient, at 3 per cent annually, in 2022. This would, however, mark a slowdown following 9.8 per cent growth in 2021.[5] Despite downgrades to 2022 global growth forecasts, sector-specific pent-up demand should continue, in spite of the impacts of the current conflict in Ukraine.
- Global trade should also remain robust over a five-year period despite the economic upheaval of soaring inflation, rising interest rates and slower growth. An increase is digital trade and trade is services, as well as the drive for sustainability and a general push for a reduction in trade barriers, should underpin global trade.
- Global GDP growth is expected to be driven by resilient cross-border trade in 2022 and beyond, underpinned by recovery in services trade, innovation and trade integration. Countries' energy transitions are likely to support import and export demand in both developed and developing economies.
- Global supply chain restructuring will continue to be a source of trade normalisation as firms seek new markets and investment opportunities to build resilient and flexible supply chains. This is likely to reinforce long-term growth in bilateral trade relationships.
- Trade dynamics will be influenced by big trends: changes in trade barriers; inflation-induced monetary and fiscal policy changes; and more climate change adaptation on the part of government and business.
- Upside risks to the oil and energy markets are likely to persist. Both the ongoing Russia-Ukraine conflict and a general hesitancy to raise OPEC production limits are likely to contribute to price pressures.

[5] https://www.wto.org/english/news_e/pres22_e/pr902_e.pdf

Recommendations for business

- Amid the current geopolitical and economic shocks, firms should increase strategic emphasis on economic diversification to support sustainable initiatives against climate-related uncertainty in production.
- For greater promotion of supply chain resilience, firms should look to diversify their sources of financing. Enhanced coordination between firms and financial intermediaries, particularly through greater intercompany credit, would help cushion against shocks.
- Boost trade facilitation processes through increased digitalisation, enabling faster customs procedures, to help offset increases in trade costs.

Recommendations for government

- Continue to prioritise filling trade financing gaps, that represent shortfalls in required trade finance for SMEs, including through export credit agencies and the expansion of working capital programmes.
- Make trade promotion a key policy priority.
- Government-guaranteed bank loans should be used to inject cash into supply chains during times of financial uncertainty and economic shocks. Additionally, these guaranteed loans could be securitised and financed by central banks.
- Prioritise digitalisation efforts in order to promote greater supply chain efficiency and resilience. This would continue to reduce trade costs by promoting more efficient customs and border clearance, improved quality of trade and transport logistics.

CHAPTER II: THE GEOPOLITICS OF TRADE

Context

- The global political landscape is likely to be shaped by key global pivots in 2022 and beyond: these will likely include the politics and economic pathways of a slowing China, oil at elevated levels, and the potential for disorderly debt dynamics.
- Slower growth in China, and the politics of this, as well as oil price and emerging market debt dynamics, could signal new paradigms that have implications for trade and investment.
- The global economic and political landscape will shift considerably with implications for global cross-border trade and investment. Middle powers'[6] growing economic clout will boost regionalism through emerging trade agreements.
- A new multilateralism is also likely to take hold. Old forms of multilateralism will fade, while new forms, such as increased regionalism, will drive cross-border trade in new sectors.
- In this context cross-border investment and trade could become increasingly geared to "ally-shoring" rather than bilateral investment flows being efficiency-seeking and driven by cost considerations.
- OPEC+ is critical for current global oil-price stability. Concerns over declining spare capacity could add to the inflationary oil price shock, which has been linked to the current conflict in Ukraine.
- As a result of the pandemic, global debt levels have surged. In 2020, total global debt reached 263 per cent of GDP, its highest level in half a century. Disorderly debt dynamics would limit debtor countries import demand.
- More than half of low-income countries are in debt distress or at high risk of debt distress; some countries have already defaulted, while debt restructurings have been completed or are underway in some countries.

[6] https://www.adb.org/publications/2021-trade-finance-gaps-growth-jobs-survey

Recommendations for business

- Much of the work in dealing with shocks means being prepared for them. To ensure robust, resilient production, risk management and production models should shift from just-in-time systems to having a greater focus on long-term strategic considerations and effective partnerships.
- Firms should further combine the advantages of sourcing domestic inputs to production with the opportunities offered by offshoring and international trade; an overarching policy objective should be grounded in domestic economic diversification for sustainability.
- Firms should upgrade investment in, and the promotion of, digital technologies that can improve information systems for risk management (such as with applications of the Internet of Things.); this would, in turn, help build response and forecasting mechanisms in relation to shocks.
- Amid new forms of multilateralism, and an increased trend to regionalism, firms should both diversify supplier connections and utilise and further build long-term relationships. The latter are typically associated with increased firm resilience and faster recovery after shocks.

Recommendations for government

- Governments should elevate economic diversification within policy agendas, to both build resilience against shocks, and to promote sustainable growth over the long term and strength in cross-border trade.
- In the light of the shift to "ally-shoring" by some policymakers, governments should not lose sight of the benefits of trade liberalisation in the promotion of stronger and broader-based growth.
- The prospect of unsustainable debt dynamics means that governments should build financial buffers in key sectors with a view to protecting affordable trade finance. Targeted stress tests should also be put in place, including for supply chains.
- China's economic slowdown is likely to be felt both regionally and globally. In order to ensure continued and durable investment and trade growth, policymakers need to continue to diversify their trade relationships through emerging trade deals.

CHAPTER III:
TECHNOLOGY AND THE FUTURE OF TRADE

Context

- Connectivity will be key to a more effective trade system in future, and technology will be the great enabler of that. The continued build-up of transparent, interoperable networks will be of primary importance to the global trade outlook.
- There are opportunities for countries to use technology to diversify their supplier bases. Emerging market economies becoming involved in global value chains will need to ensure that they have stable and attractive operating environments.
- All of this means increasing the amount and availability of scalable digital tools and technologies to promote broader connectivity. Digital scalability will promote both digital transformation and improvements in structural economic growth.
- Blockchain technologies have the potential to be disruptive for firms facing competition barriers, and for households that want to exercise more control and efficiency in their energy sources, with direct implications for the energy sector.

Recommendations for business

- Firms should collaborate with government to scale up investments significantly in order to build out more robust digital infrastructure ensuring accessible and affordable connectivity.
- Firms' resources should be devoted to developing production processes that promote economies of scale in innovative technologies, including in additive manufacturing, such as 3D printing.
- Firms should help government implement and manage broader trade facilitation digital systems and platforms; this would ensure more efficient interactions between importers, exporters, and authorities.

Recommendations for government

- Governments should reinvigorate their investment climate through facilitating imports of capital equipment, and through trade facilitation and reduced import duties on information and communications technology (ICT).
- Governments should adapt their economic development strategies to elevate the role of digitalisation and to meet growing demand for goods and services in digital economies, with a view to enhancing trade facilitation.
- Greater breadth and application of ICT should be integrated at all levels of education with a view to promoting economic clustering and industrial collaboration with firms, to foster export promotion.
- Governments (and businesses) need to incentivise ICT use among smaller firms to enable their effective integration into global digital value chains. This would include enshrining privacy and data protection standards.
- New types of trade agreements should be designed to enable growth of digital currencies which, in time, would promote interoperability between payments systems and facilitate an ecosystem that would foster growth in digital trade.

CHAPTER IV:
SUSTAINABILITY AND THE OUTLOOK FOR TRADE

Context

- Green finance, both public and private, will continue to expand, representing an opportunity for investors to scale green investments.
- Sustainable debt issuance could break another record in 2022, though current global debt dynamics may be a restraining factor.
- Much of the global economy is covered by governmental net-zero commitments. This is likely to mean increasing levels of regulation in the coming years. In the short term, this could restrain export growth; and yet, in the long run, the digital innovation that is likely to occur from complying with environmental regulations will boost exports.
- Global carbon trading markets will be reinvigorated by COP26 agreements that put in place some of the guidelines for how the markets will operate.
- China will continue to dominate the green tech sector. Of the three leading green energy technologies in the world — wind turbines, solar photovoltaics and electric vehicles — the last two technologies are overwhelmingly produced in China.
- The semiconductor sector will continue to be at the forefront of the green and digital transitions. An improvement in global semiconductor capacity is expected in 2022, and beyond, as capital and investment spending are increased to meet global demand.
- In the short term, the war in Ukraine, and sanctions imposed on Russia, are likely to further disrupt global semiconductor supply chains. One of the knock-on effects of US sanctions on Russia could be to increase Russian demand for semiconductor chips from China.

Recommendations for business

- Firms should prioritise green investments that aid in macroeconomic resilience and economic transformation, generate returns, and help meet net zero climate commitments.
- First and foremost, this should involve applying a low-carbon approach to operations and to the design of products and services, providing a competitive advantage over late adopters.
- Firms should devote further resources and funding to promoting sector and firm-relevant innovations to contribute to net zero commitments. Where relevant, exporters' usage of digital technology will be key to sustainable initiatives.

Recommendations for government

- Governments should agree to reporting standards for green finance to boost investor confidence. They should ensure that the application of regulations and standards is implemented in a coordinated manner.
- Governments should meet their commitments on catalysing green finance to drive investments, innovation, and blended finance initiatives aimed at adapting to climate change and meeting climate commitments.
- Collaboration with and advance notice of planned ESG regulations should be given to firms in order to allow companies enough time to develop sector specific strategies and company business models.
- A further scaling up of infrastructure investment is required to allow green technology to flourish at scale, to safeguard long-term sustainable trade and to help de-risk further infrastructural investment.

CHAPTER V:
STRUCTURAL GAPS IN TRADE AND INFRASTRUCTURE FINANCE

Context

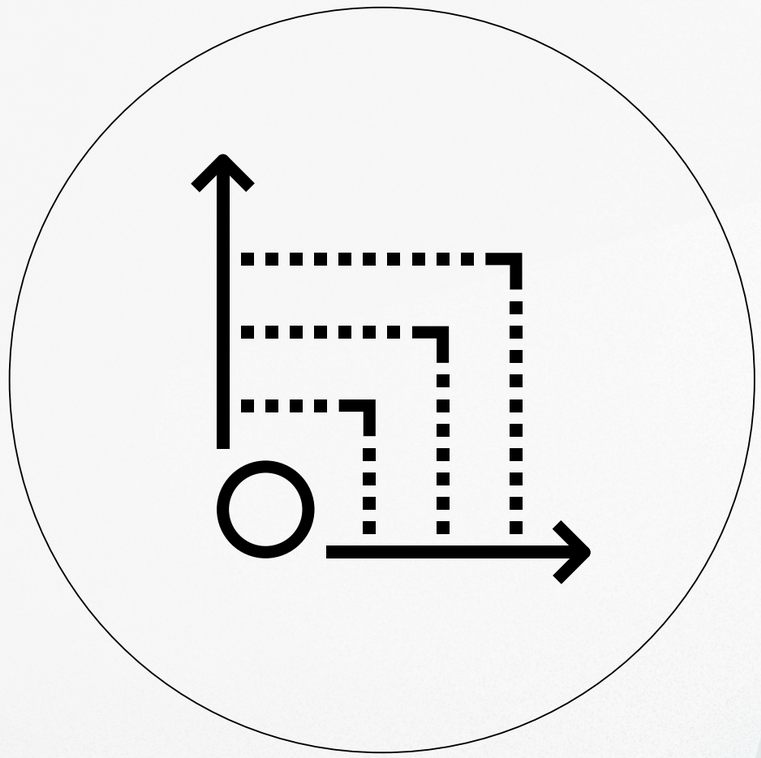
- Infrastructure – and renewed investment in infrastructure – will lower costs in transportation. But the spike in oil and commodity prices will exacerbate the trade financing gap for resource-constrained SMEs and constitutes a negative growth shock (of anywhere between 0.25 and 1 per cent depending on the economy).
- Fintech continues to help close the global trade finance gap, now likely to be over the US$1.7 trillion estimate; An illustration of this is the use of blockchain for payment systems, or machine learning for underwriting. These mechanism help connect micro enterprises and SMEs to investors.
- The mobilisation and further scaling of blended finance remains an important pathway to help close both the substantial trade finance gap and infrastructure financing gaps that have been, in part, exacerbated globally by the COVID-19 crisis.

Recommendations for business

- Increase co-investment initiatives with development finance institutions and multinational development banks in order to build a larger market for blended finance that would channel more financing into sustainable initiatives.
- Financial institutions and firms should start to pivot away from traditional models of bilateral investment transactions towards greater use of blended-finance funds and facilities in order to build sustainable investment initiatives.
- To close financing gaps, portfolio investments managed by financial institutions and non-bank financial institutions could be utilised to create larger deals (through structured funds), to increase diversification and scale up private finance.

Recommendations for government

- Policymakers need to strengthen the investment ecosystem and align it with climate-change mitigation policies to mobilise greater green investment, particularly in the renewable energy sector.
- Prioritise automation of trade facilitation, which has proven crucial for the cost efficiency of SMEs. For women-led businesses, automation also helps eliminate formalities that subject women entrepreneurs to discrimination.
- Greater standardisation in blended finance would simplify and lower transaction costs, as well as promote transparency. Closer coordination between pension funds and sovereign wealth funds would mobilise more blended finance.



CHAPTER I

THE FUTURE OF TRADE

SECTION ONE

THE OUTLOOK FOR GLOBAL TRADE

Five pillars of 2022 trade

Global trade growth is expected to remain resilient in 2022, despite the likelihood of it slowing somewhat in comparison with 2021. Notwithstanding several uncertainties, particularly regarding the short-term outlook for services trade, strong growth in demand for goods will prevail, in part a reflection of pent-up demand. This will support an acceleration in trade growth in the years ahead. An improvement in cross-border trade has already been supported by the easing of COVID-19 pandemic restrictions, by economic stimulus packages, and (for resource exporters) by recent rises in raw-materials prices.

Multiple underlying factors are likely to support cross-border trade in both 2022 and the years ahead. Increased regionalism, strength in services trade, and innovation will significantly boost prospects. Strategic geopolitical and climate considerations will also support these economic drivers: increased demand growth for sustainable goods will accelerate in both developed and developing economies.

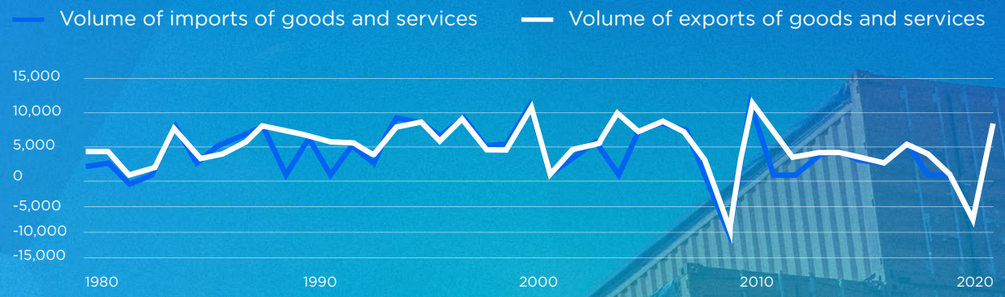
Increased regionalism: Regional trade agreements are becoming stronger and more prevalent, and include the Regional Comprehensive Economic Partnership (RCEP), involving the Asia-Pacific region, that came into force on 1 January 2022 and which, it is estimated, will eventually account for 30 per cent of world trade. Although trade growth remained uneven in 2021, it has since showed some signs of broadening. Additionally, trade flows are expected to accelerate strongly for developing countries, closing some of the disparity with richer ones. The United Nations Conference on Trade and Development (UNCTAD) valued global goods trade at US$5.6 trillion in the middle months of 2021, denoting an all-time record.

[7] https://unctad.org/system/files/official-document/ditcinf2022d1_en.pdf
[8] https://unctad.org/news/global-trade-hits-record-high-285-trillion-2021-likely-be-subdued-2022
[9] https://rcepsec.org/2022/01/14/rcep-agreement-enters-into-force/

FIGURE 1

Export and import growth in services trade

ANNUAL PERCENTAGE CHANGE



A significant catch-up in services trade: The gap between trade in goods, which has accelerated, and trade in services, which remains comparatively more moderate, is likely to narrow. Continued, albeit more moderate, services trade growth is likely given the recent bounce-back (***Figure 1***), given that global services trade regulations have shown signs of increased liberalisation, according to the OECD Services Trade Restrictiveness Index.[10] Additionally, notwithstanding China's slower growth prospects, services trade will expand significantly in emerging and developing economics, owing in large part to vast improvements in digital infrastructure and, in some cases, the transition from middle- to higher-income status.

Broad-based innovation: The powerful two-way relationship between trade and innovation is likely to strengthen in 2022 and beyond. The introduction of new and breakthrough technology will dominate the global trade outlook. Structurally,

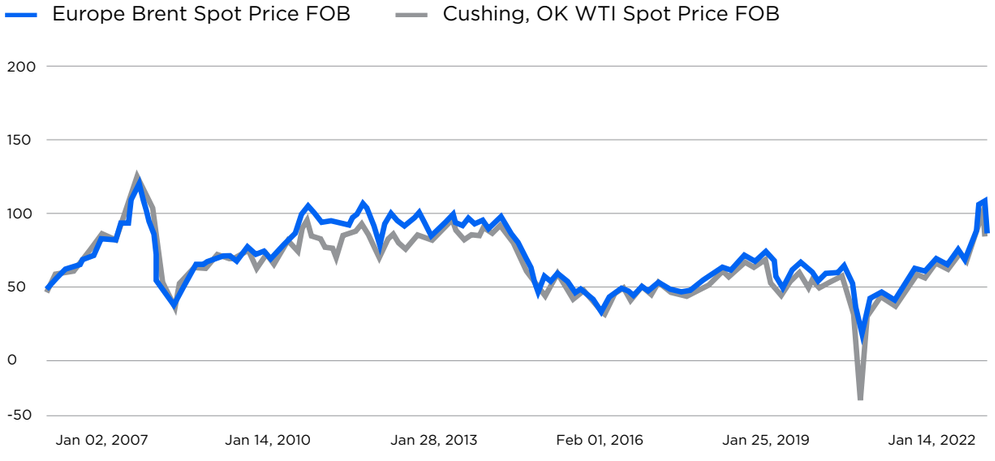
Regional **trade agreements** are increasing

[10] https://www.oecd.org/newsroom/services-trade-liberalised-in-2021-showing-significant-decrease-in-volume-and-effects-of-new-measures.htm

FIGURE 2

Export and import growth in services trade

DOLLARS PER BARREL



over the long term, exporter firms that engage in digitalisation will continue to see high profitability driven by productivity gains. Given this, trade, policy, and trade agreements will be critical in shaping incentives to innovate and invest – with the key mechanisms coming through to increase market size, competition, comparative advantage, and knowledge spill overs (Melitz and Redding, 2021). Several transformative technologies are emerging in unison and are self-reinforcing, which could create a global trade super-cycle. Digitalisation will make trade and business more efficient and transparent. Increased transparency will reduce risks for financial institutions and lenders, and also enable companies to build greater resilience and sustainability into their supply chains.

Commodity and energy market developments: High fuel and energy prices will have mixed and multifaceted impacts on cross-border trade, mainly benefiting exporters. In addition to continued large (and often unpredictable) drivers in demand, the current situation in Ukraine may continue to exert an influence on the market. High fuel prices have a knock-on impact on shipping costs, contributing to backlogs across major supply chains, a condition that may well continue. This will mean continued upside price pressures (***Figure 2***).

Strategic geopolitical considerations: Geopolitics will drive the need for further bilateral trade to consolidate essential geostrategic ties, particularly for the major world economies (Zhang, 2018; Brzezinski, 1997). The need to protect countries' own strategic interests and weaknesses in specific sectors will continue to be a decisive influence on the direction of trade. Since the onset of the COVID-19 pandemic, for example, the semiconductor industry has been facing headwinds due to unanticipated surges in demand and persisting supply constraints.

A resilient, equitable, and green recovery in global trade

The underlying resilience of the global economy, and the global trading system, will be of particular importance in the years ahead, given the likelihood of multiple shocks.

The COVID-19 crisis, and the prospect of increasingly frequent and intense natural and man-made disasters, raise important questions regarding the strength of the global economy to deal with multiple and unexpected shocks.

Crucially, the global trading system has both the capacity to propagate shocks and to mitigate them. Often, shocks transmission occurs through investment and trade links. Therefore, strengthening these links with a view to enhancing multiple forms of finance for economic development – will enable countries to be more economically resilient. Moreover, over the longer term, fostering sustainability and innovation ensures both income gains and structural improvements in underlying growth.

Trade will help build resilience in 2022, and beyond, though the following pathways:

- **Mobilisation of resources**: Trade liberalisation can generate the resources and knowledge spill over needed to prepare for crises and mitigate them by facilitating the provision of goods and services. Owing to its interconnected nature, international trade can increase an economy's exposure to risks and contribute to the transmission of shockwaves. But at the same time, it can bolster economic resilience, particularly when backed by domestic policies and effective global cooperation.
- **Trade aids economic diversification**: This can contribute to economic resilience by allowing countries to be less dependent on a limited number of importers, exporters, and a restricted number of sectors. Trade and diversification can also reduce reliance on vulnerable sectors with a view to protecting against climate risk.[11] Trade facilitation will boost trade integration and sustained diversification for emerging and developing economies' climate resilience, in particular (UNCTAD, 2018).
- **Trade integration**: The World Trade Organization's promotion of lower trade barriers and further international cooperation strengthens trade transparency and economic resilience, better preparing the world to deal with future crises. A more open, inclusive, predictable, and coordinated trade environment will ensure quicker recovery from future shocks. Risk-reduction measures and resilience policies in one country can have positive spill overs elsewhere (WTO, 2021).
- **Global value-chain restructuring**: Moves towards digitalisation, regionalisation and localisation of production, and diversification will reinvigorate a broader-based recovery in global growth and in cross-border trade (ADB, 2021). Increasingly, advanced economies are creating a growing share of value and employment in global value chains through innovation, digitalisation, and intellectual property (ibid.). Merchandise trade has rebounded faster than gross domestic product, propelled by fiscal and monetary stimuli, along with governments' broad restraint in the use of trade protectionism.

[11] https://unfccc.int/topics/resilience/resources/economic-diversification

Ultimately, building greater resilience is essential. Global COVID-19 infection rates remain intermittently high, driven in part by the continued spread of virus variants. In the light of this, several emerging and developing economies are experiencing notably weaker and more fragile recoveries compared with advanced economies – a development that has now been exacerbated by oil- and commodity-price developments, which stand to harm growth for resource importers. In the longer term, the economic scarring effects from the COVID-19 crisis on potential output could continue to reflect the pandemic's adverse impact on physical and human capital for some time.

Trade will help foster equity in 2022, and beyond, though the following pathways:

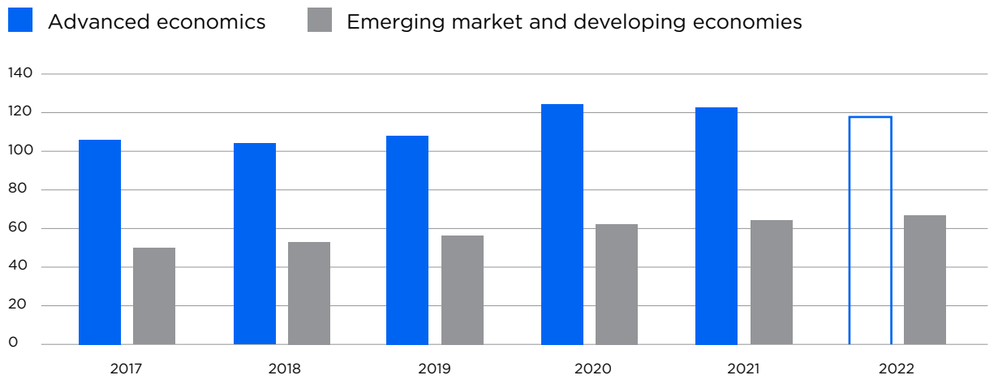
- **Recovery in the tourism sector**: So far, the pandemic recovery has seen a global boost in the trade in manufactured goods, particularly durable industrial goods. The increase in industrial production has been mirrored almost one-to-one by solid trade growth.[12] Significant strains in global supply chains that emerged in 2021 have abated, following the reversal of pandemic-related factory and port shutdowns, weather-induced logistics bottlenecks, and an acute shortage of semiconductors and shipping containers. The tourism industry, particularly important for several smaller developing economies, is now likely to strengthen, raising its contribution to economic growth within conducive policy frameworks (Vu and Hartley, 2021).

- **Debt forgiveness**: Increases in private as well as public debt (***Figure 3***) have left many emerging and developing market economies vulnerable to financial stress. Recovery has been further dampened by waning policy support and the start of policy-tightening in several economies, seeing a turn in financial conditions. Initiatives such as the Debt Service Suspension Initiative[13] are likely to have helped stabilise the macroeconomic and financial ecosystem in a few countries, thus enabling a recovery in trade and investment.

FIGURE 3

General government debt

PER CENT OF GDP



[12] https://www.oecd.org/coronavirus/policy-responses/international-trade-during-the-covid-19-pandemic-big-shifts-and-uncertainty-d1131663/
[13] https://www.worldbank.org/en/topic/debt/brief/covid-19-debt-service-suspension-initiative

- **A resurgence in sustainable trade**: Climate change is driving increases in extreme weather events, such as droughts, cyclones, and floods, which can have devastating effects. Safer production processes have reduced the frequency of technological and industrial disasters. And yet, rising inequality, increasing economic fragility, and growing political uncertainty and geopolitical tensions are augmenting the risk of conflicts. A reorientation of trade to products and services that are geared to climate resilience constitutes a key opportunity.

Trade will help foster equity in 2022, and beyond, though the following pathways:

- **Innovation**: The virtuous circle between trade and innovation will strengthen in 2022 and beyond, with new and ground-breaking technology continuing to dominate and shape the outlook. Structurally, international trade will continue to foster firms' profitability over the long term. Given this, trade, trade policy, and trade agreements will be critical in shaping incentives to innovate and invest. In 2022, the four key mechanisms through which international trade affects innovation and growth – increasing market size, boosting competition, comparative advantage, and knowledge spill overs – are likely to take centre stage (Melitz and Redding, 2021).

- **Energy market developments**: High fuel and energy prices will have several impacts on global trade dynamics. For one, high fuel prices are likely to continue to translate into elevated shipping costs, something that has already contributed to backlogs across major supply chains that could continue intermittently throughout 2022 (Schiffling and Kanellos, 2022; Coutts, 2022). However, resource exporters are likely to benefit from elevated energy prices, which could, in turn, incentivise economic diversification and transformation within resource-dependent economies. This would boost long-term sustainable growth.

- **Strategic geopolitical considerations**: Countries need to protect their strategic interests. This will also influence trade in a way that could foster more environmental sustainability. One illustration of this is the realignment of India's Vietnam policy with a view to promoting trade and investment in line with the United Nations Sustainable Development Goals (SDGs). It is, in part, driven by a desire to counterbalance China's geostrategic presence in Vietnam and in the Indo-Pacific region more generally (Aswani et al., 2021).

SECTION TWO

TECTONIC SHIFTS AND THE DRIVERS OF TRADE

There is a strong and well-established link between structural change and cross-border trade. International trade fosters transformation – and vice versa. In an underlying sense, cross-border trade influences employment dynamics and value in multiple sectors. More specifically, trade influences and shifts the allocation of labour across sectors in an economy and can induce productivity changes at the company level. There are several tectonic shifts ahead that will influence trade dynamics. This section covers three of those shifts: trade barriers, inflation-induced policy changes, and adapting to climate change.

First tectonic shift: **Triggers for lower trade barriers will increase**

Protectionism is costly and distortionary (Kutlina-Dimitrova and Lakatos, 2017). By contrast, easing trade barriers[14] facilitates specialisation though creating comparative advantages for both the demand side (the importing country) and the supply side (the exporting country). An essential implication of this is that each economy's production decouples from domestic demand and becomes increasingly linked to foreign demand. This specialisation, in turn, can lead to increased employment and greater value-added in manufacturing.

Lower trade barriers come through two main channels: technology and policy.

- The trigger can be technological. Lower shipping costs, for example, followed the development and adoption of containerisation.
- Alternatively, lower trade barriers can originate from policy, such as lower quotas. Under a given set of trade barriers, policy changes also affect specialisation.

Changes in export costs are particularly important for low-income countries, where they are typically and comparatively higher (Hoekman and Nicita, 2011; Waugh, 2010). Additionally, the increase in preferential trade agreements among advanced economies has made breaking into some of the most profitable markets even more challenging.

As for predicting future trade, economic gravity models – which forecast bilateral trade flows based on the economic sizes and distance between two units – are instructive but have several shortcomings. They are, for example, based on a static theory rather than intra-cyclical trade or company dynamics. A key challenge in making predictions, therefore, is to identify whether the low (observed) trade flows in low-income countries reflect current or future expected high trade costs (Alessandria, Choi and Lu, 2017).

[14] The direct impact of new trade barriers introduced since mid-2018 is estimated to have been modest. The direct effect of increased protectionism on world GDP growth via trade flows, supply chains, and import costs appears to have been modest, reflecting the fact that tariffs to date have been largely contained to the US and China (Bank of England, 2019).

Second tectonic shift: **Inflation-induced policy changes**

Inflation continued to rise throughout the second half of 2021 and into early 2022. It is being driven by several factors of varying importance.

Fossil-fuel prices continue to accelerate, driving up energy costs and causing higher inflation. Rising food prices have contributed to higher inflation too. Meanwhile, ongoing supply-chain disruptions, in both ports and on land, and high post-pandemic demand for goods have all led to broadening price pressures, in both developing and developed economies. Higher import and producer prices have heightened this impact through multiple transmission mechanisms.

As a result of rising inflation, several central banks, including the US Federal Reserve, have started to tighten monetary policy multiple times, and are likely to continue to do so. The European Central Bank (ECB) has announced a phasing out of its asset purchase program (APP). The ECB has also committed to maintaining unchanged interest rates until after the end of the Governing Council's net purchases under the APP; it has intimated that any rate rises are likely to be gradual though guided by the bank's commitment to stabilise inflation at 2 per cent over the medium term.

Less accommodative US monetary policy is likely to prompt tighter global financial conditions. Emerging and developing economy financing conditions have tightened too, reflecting policy-rate hikes in several large countries, including Brazil and Mexico, and by several Asian central banks, such as Taiwan and South Korea. Of the nearly two dozen emerging and developing economies whose central bank announced or implemented asset purchase programmes in 2020, one third raised policy rates in 2021 (World Bank, 2021).

Higher interest rates make borrowing more expensive worldwide, straining public finances and the ability of exporters to access credit and affordable finance to transact effectively and easily. For countries with high foreign currency debt, the combination of tighter financial conditions and higher imported inflation will impact firms' investment and trading climate. This could, in turn, have a significant knock-on impact on cross-border trade – particularly in the form of lower import demand and deteriorating export competitiveness.

[15] https://www.ecb.europa.eu/press/pr/date/2022/html/ecb.mp220414~d1b76520c6.en.html

Third tectonic shift: **Greater climate adaptation**

The consensus recognition that climate-change impacts are accelerating and that the world will be subject to further global warming means countries must adapt to confront the crisis. Faced with supply shocks, government intervention may be needed to limit potential economic losses. This will involve both re-incentivising the private sector and mobilising the public sector. Crucially, adapting to climate change is far more than a series of technocratic measures aimed at changing practices; it is about changing the structural drivers of risk (Eriksen et al., 2021).

Adapting to climate change and economic growth are inherently connected; trade policy will increasingly acknowledge this. Establishing more resilient economies through a process of structural reform will involve reducing dependence on climate-sensitive activities and increasing green industrial policies. This will diversify production away from commodities, broaden the tax base, and generate new development finance.

Within the public sector, it is likely that there will also be moves to larger-scale public investment in renewable energy, green technologies, and green agricultural policy that protects small producers and the environment. This is to protect against shocks. Supply effects are common in all types of shocks but play a particularly evident role in climate-related and technological shocks (WTO, 2021). Policy responses to supply shocks take different forms – and it is likely that grants, loans, production subsidies, infrastructure investments, deregulation, and increases in funding for training will take on increased primacy.

How a household, community, business, or country adapts depends on their vulnerability to hazards, which is shaped in large part by the capacities they have for managing climate risks. In the light of this, in the years ahead, climate adaptation – and its structural impact on bilateral trade – will take on multiple forms. It is likely to involve changes in processes, practices, and structures (ranging from building higher bridges, to planting new varieties of more drought-tolerant maize, to relocating coastal communities).

Adapting will be essential in cross-border services trade, such as tourism. Trade in travel and tourism is affected by a wide range of climate shocks (Rossello et al., 2020). Individual travel decisions are influenced by various external factors, such as income and, more recently, the COVID-19 crisis (Gossling et al., 2021). All types of disasters and unexpected shocks can trigger a decline in international demand for tourism by impacting a country's asset base, reducing income, or increasing political or environmental uncertainty. Crucially, natural disasters can destroy travel-related infrastructure, influencing consumer perceptions.

[16] The global response to the climate crisis has taken place along two interdependent tracks of mitigation, or actions to prevent further global warming, by avoiding or reducing emissions and adaptation, or actions to prepare for the negative impacts of climate change (de Coninck et al., 2018). The two strategies are fundamentally intertwined, as the degree of adaptation needed ultimately depends on the degree of mitigation achieved.

[17] TRenewable energy production, for example, can operate at a low scale, thus opening up business opportunities for small firms and in rural areas.

Interview: **Kai Fehr**
Global Head of Trade and Working Capital, Standard Chartered

Do you expect to see growth in trade and services, as we emerge from the pandemic? And what is your view on the future of growth or reduction in trade globally?

The answer here is multifaceted. In terms of value, trade is increasing as inflation is causing prices for goods and commodities to rise. But supply chain disruptions have led global trade volumes to decline. Looking ahead, there are a few trends which will impact how trade is conducted. Firstly, wealth asymmetry is growing at a much faster rate than we have seen previously, eroding the middle class and leading to two different types of supply chain emerging. One will produce affordable consumer goods for the mass market, and the other will be for the luxury market. Secondly, you have supply chain disruption caused by COVID-19, such as ports closing and trade documents not being delivered, for example because couriers are ill. Thirdly, global workforces will be fundamentally altered by an ageing population and the advancement of new technologies, which will see lower-qualified workers replaced by AI and robots. Fourthly, there is an emerging fragmentation of global trading relationships. New trading clusters may emerge, such as a Western cluster or a Russia-China-India cluster, etc. This will reconfigure supply chains to allow for the efficient movement of money, energy, and goods within each cluster, but will lead to the decline of the globalised trade system that we know today. Some of this reconfiguration was already being seen pre-pandemic, for example with the movement of production from China into Vietnam.

How are companies and countries adapting as the world moves towards net-zero?

Net-zero is here to stay and the drive towards sustainability will be seen across all global trading clusters. Sustainability has become central in everyone's mind, and it is now almost mandatory for organisations and companies to adopt sustainable practices. Increasingly, companies will need to adhere to ESG standards and demonstrate that their products or services are sustainable in order to sell them. Consumers are also demanding these changes. Multinational companies with complicated supply chains and multiple suppliers will need to do greater due diligence. This is something that banks find quite interesting, as it creates the need to provide financial instruments that are sustainable and encourage sustainability within supply chains.

“Technology can increase supply chain transparency, but it is also vital to have insights regarding where financing is needed and then providing it to specific tiers of a supply chain.”

There is a need for greater financing to assist companies' energy transitions but also to help SME grow. What are the challenges and opportunities here?

Let us start with the smaller SMEs. The trade finance gap has grown by almost 60-70 per cent to 1.7 trillion dollars and there are two solutions to address that. One is technology. At Standard Chartered, technology has made it easier to onboard suppliers. An Enterprise Resource Planning (ERP)-based model can help get financing to businesses at all nodes of the supply chain. Facial recognition can also replace the need for SMEs to sign multiple documents in order to become a supplier. Secondly, to reduce the trade finance gap we need to reduce risk. Providing financing post-shipment is comparatively easier and less risky than providing pre-shipment finance to help fulfil SMEs' production and procurement. Technology, such as smart contracts and tokens can de-risk this financing, as it increases transparency throughout the supply chain. The future will see these technologies become more common globally.

Broadly what you are talking about here is decentralised finance - could you elaborate more?

Technology can increase supply chain transparency, but it is also vital to have insights regarding where financing is needed and then providing it to specific tiers of a supply chain. Coming back to the example of pre-shipment financing, it is difficult to provide this finance as there are multiple points in the supply

“Sustainability financing is here to stay, but we need more data to help with its implementation and transparency.”

chain where finance is required. Banks will generally only have risk appetite to finance the first and second tiers of a pre-shipment supply chain, so there is a requirement for new financial institutions to emerge that can finance tier-three, tier-four, and tier-five companies within supply chains as well. To overcome this, banks need to act as intermediaries for multi-channel financing platforms that pair a company’s credit appetite with the lenders who have the appropriate risk appetite. It would really help SMEs to have platforms that efficiently pairs credit and risk appetites of manufacturers and funders in a transparent fashion.

What about green finance?

It is a separate issue, and we need a very clear green financing framework. Banks have traditionally focused on financing renewable energy production. This is great but does not solve the problem alone. What we need is a framework for financing the entire supply chain to enable every single aspect of it to become sustainable. We need sustainability to be measurable in real-time at every node in the supply chain to provide accurate and widely accepted sustainability certificates and enable banks to make quick and effective decisions as to whether a trade instrument will receive financing or not. We are proud at Standard Chartered to be ahead of the curve and have a sustainable trade finance framework in place. Sustainability financing is here to stay, but we need more data to help with its implementation and transparency.

“Ultimately, I believe we will see evolution towards global and common carbon standards.”

One of the areas which we have been looking at is carbon trading and carbon borders. We’ve heard concerns that carbon borders could be used in a protectionist fashion and that we might see the emergence of multiple different jurisdictions across the world with different carbon prices and mechanisms in place. What are your views on this?

Ultimately, I believe we will see evolution towards global and common carbon standards. Carbon pricing and borders could be used for protectionism, but consumers are demanding sustainable products, so hopefully one standard that best meets consumers’ demands will prevail and be widely adopted. Predicting a timeline for this is difficult, but I’m very positive that underlying currents are pushing sustainable design, sourcing, and production to be a permanent feature of sustainable supply chains. This means there is no other alternative except to agree to a global and common standard over time. From a finance perspective, it would certainly be much easier to navigate a global and common standardised carbon market.

SECTION THREE

COMMODITY PRICE DEVELOPMENTS AND AN UPDATE OF THE DMCC COMMODITY TRADE INDEX

Trade will be a critical engine of growth in 2022 and beyond – particularly for the economies that are yet to fully recover from the economic scarring associated with the COVID-19 crisis. And yet, there is rising inflation, which will mean higher trade costs and prolonged supply-chain disruptions that will creep into commodities, including food and agricultural products.

An increase in trade costs, including both energy and non-energy components, will, in all likelihood, be a defining characteristic of the coming trade landscape. When it comes to trade, rising prices, trade costs, and energy costs could erode country (and counterparty) financing limits that support trade and could exacerbate trade financing gaps. There are other intermittent factors, such as the Suez Canal toll cost increase, which could be contributing factors in future.[18]

Higher oil and energy prices present multidimensional risks. On the downside, one such risk, albeit a moderate one, is a return of COVID-19-related restrictions (Patterson, 2022). But in the absence of such a development, upside risks to the oil and energy markets are likely to outpace downside factors for some time, particularly amid a protracted Russia-Ukraine conflict and a general hesitancy to raise OPEC production limits.

[18] https://www.reuters.com/business/egypts-suez-canal-increase-tolls-by-up-10-2022-02-27/?taid=621c0273af8d2b0001570206&utm_campaign=trueAnthem:+Trending+Content&utm_medium=trueAnthem&utm_source=twitter

Reductions in **trade costs** are associated with stronger trade growth

The importance of trade costs for the trade outlook is premised on the following:

- **Faster relative export growth**: This is linked to countries that engage in reducing trade costs, generating cost competitiveness (Decramer et. al., 2014). Bigger reductions in trade costs are associated with stronger trade growth. Therefore, policies to reduce trade costs can be effective in boosting integration into the global trading economy. Additionally, countries with lower trade costs tend to participate more in global value chains. Given this, the increase in trade costs (and the composition of trade costs) will be a core driver of relative trade performance in the years ahead. This is particularly true for economies that need to boost competitiveness.

- **Technology and competitiveness**: From a competitiveness standpoint, there is significant variability between the ease at which costs can be reduced from sector to sector. Some sectors have the potential for significant cost reduction (through gains from technology creation and its impact on upgrading and transforming production processes). Under the expansion of Industry 4.0 (the technology-driven fourth industrial revolution), manufacturing has the potential for significant reductions in cost.[19] This dynamic can also apply to labour-intensive sectors.

- **Distribution of productive resources**: Trade costs are crucial in that they affect the distribution of resources that are devoted to production. In a relative sense, trade costs affect the balance between sectors – one extreme being that, without trade costs, countries specialise according to their comparative advantage.[20] By contrast, when trade costs are high, specialisation decisions are distorted, leading to an anti-export bias (Hoekman and Shepherd, 2015). For example,

[19] This is to a greater degree than, for example, in agriculture (where the impact is notable but not as significant).

[20] Comparative advantage is defined here as carrying out a particular activity more efficiently than another party.

high trade costs (which can be seen as a form of protectionism) encourage resources to flow into agriculture at the expense of other high value-added sectors, such as manufacturing, where they can sometimes support an anti-export bias.

- **Global value-chain entry**: The ease with which manufacturers can participate in global value chains – the full gamut of how a product gets to market – is linked to lower trade costs. Such chains crucially bring together businesses and different aspects of the manufacturing process. Transport costs are, therefore, a key input[21] and border procedures need to be fast, reliable, and cost-effective for the business model to be successful. Global value chains offer significant opportunities for employment, production upgrading through inward investment and technology adoption and adaptation over time (Sampath, Padmashree, and Vallejo, 2018).

- **High trade costs and currency developments**: Currency undervaluation[22] as an industrial policy (as in China) can and has been seen in the past as a means to foster domestic manufacturing, largely by facilitating an external trade surplus (Rodrik, 2010). Yet, currency undervaluation can harm a country's comparative advantage by altering the composition of exports. Undervaluation may promote specialising away from high value-added manufacturing and, instead, favour specialisation in broader goods that are more sensitive to price fluctuations (Bergin, 2022). In other words, currency undervaluation may, in some cases, compromise economic transformation.

An expected acceleration in energy costs will disrupt the trade landscape

Oil prices are expected to continue to rise, owing to pent-up demand, geopolitical factors, OPEC production cuts, and market dynamics.[23] Both emerging and developed economies are likely to continue to see an acceleration (***Figure 4***). Oil-price increases – and, more specifically, oil-price shocks – can have multidimensional macroeconomic impacts, including on trade. Higher oil prices can also stifle economic growth through their effect on the supply and demand for non-oil goods. High oil prices also can reduce demand for other goods, because they reduce wealth, as well as induce uncertainty about the future (OECD, 2020).

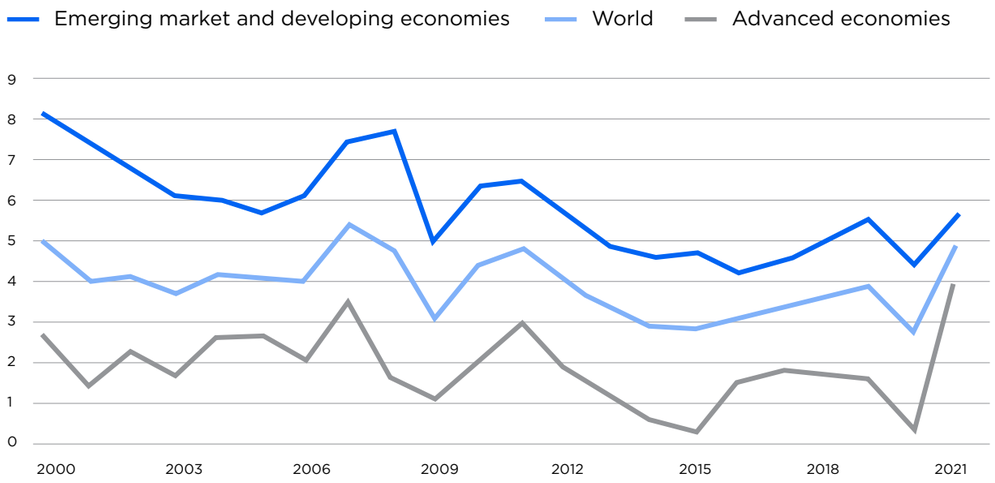
One way to analyse the effects of higher oil prices is to think about the higher prices as a tax on consumers (Fernald and Trehan, 2005). The simplest example occurs in the case of imported oil. The extra payment that US consumers make to oil producers can now no longer be spent on other kinds of consumption. Despite the effects on supply and demand, the correlation between oil-price increases and economic downturns in the United States is not perfect: not every sizeable oil-price increase has been followed by a recession. However, five of the last seven US recessions were preceded by considerable increases in oil prices (Sill, 2007).

[21] The OECD-WTO Trade in Value Added Database suggests that a country that has a higher participation index tends to export more of its goods as intermediate goods that are used in other countries' exports and imports more intermediate goods for use in its own exports. Both types of linkages are evidence of participation in GVCs.
[22] Currency undervaluation is defined broadly here as the level of the exchange rate that is below most estimates of long-term fair value for the particular currency.
[23] https://www.iea.org/reports/oil-2021

FIGURE 4

Consumer price inflation in emerging and developed economies

ANNUAL PERCENTAGE CHANGE, END OF PERIOD



Interpreting movements of inflation and growth directly in relation to oil-price shocks may be misleading, however. In the past, they have tended to coincide with other economic shocks. In the 1970s, there were large increases in commodity prices, which intensified the effects on inflation and growth. By contrast, the early 2000s were a period of high productivity growth, which offset the effect of oil prices on inflation and growth. Therefore, to determine whether the relationship between oil prices and other variables has truly changed over time, one must assess the context.[24] The current environment is one in which there are upside pressures on the oil price from both the demand side and the supply side.

De-anchoring of inflation expectations and trade prospects

Global inflation has risen at a faster pace than anticipated in recent months, resulting in steady upward revisions in forecasts.[25] Further increases in commodity and oil prices, continued strong demand for goods amid persistent supply bottlenecks and disruptions, and, in some economies, sustained currency depreciation could compound inflationary pressures (Ha, Stocker, and Yilmazkuday, 2020).

Additionally, large outbreaks of COVID-19 due to new variants could further disrupt global supply chains and transport logistics, further boosting global inflation pressures. A renewed

[24] https://www.frbsf.org/education/publications/doctor-econ/2007/november/oil-prices-impact-economy/
[25] https://www.philadelphiafed.org/surveys-and-data/real-time-data-research/spf-q1-2022

surge in energy prices could also result in sharply higher food prices, if it were to cause a sustained increase in the cost of agricultural inputs, such as fertilisers.

Increasingly pronounced labour shortages, particularly in sectors facing strong demand and tight supply, could further accentuate wage pressures that would, in turn, pass through to consumer price inflation. Advanced economies such as the United States, the United Kingdom, and Canada are particularly at risk, as they are experiencing significant inflationary pressures that could persist well into 2022. But among emerging and developing economies, inflationary pressures have also been rising.

It is likely that a prolonged period of upward surprises to inflation could cause consumers and firms to reassess their inflation expectations. In emerging and developing market economies, a one-per centage-point surprise in headline annual inflation has been found to raise medium-term inflation expectations by 0.2 of a per centage point a year (Kose et al., 2019). Higher inflation, once embedded in expectations, could weigh on both consumer and business confidence (Rudd, 2021). If inflation expectations rise above central-bank objectives, they could also lead to a potentially sharp adjustment of monetary policy, causing a sudden rise in borrowing costs, particularly in emerging economies (Arteta et al., 2015).

An update of the DMCC Commodity Trade Index

The DMCC Commodity Trade Index examines the current state of global trading hubs and compares the results with previous Future of Trade reports. An update of the index is provided, which ranks the most important countries in terms of their clout regarding the import and export of primary goods. Since the last Future of Trade report, the world has been heavily impacted by the COVID-19 pandemic and the associated supply-chain issues it has caused. As countries have imposed lockdowns at various points in time, manufacturing output has been limited in certain locations, creating supply-chain bottlenecks that have affected many businesses. The conflict in Ukraine has further caused a significant rise in commodities prices and increased political tensions across the globe.

Despite these significant geopolitical developments, this report shows that the top global commodities trading hubs have managed to maintain their positions over the past two years.

The key findings of the report include:

- The 2022 Commodity Trade Index results show that the US maintained its position as the top global trading hub.
- Despite scoring best overall, the US didn't record the highest score for any of the three pillars of the Commodity Trade Index:
  - commodity endowment factors,
  - locational and trading partner factors, and
  - institutional factors.
- The UAE received the top score for the commodity endowment factors pillar, thanks to its large reserves of natural resources.
- Meanwhile, the Netherlands scored top for locational and trading partner factors, while Hong Kong took the first spot for institutional factors.

The DMCC Commodity Trade Index

In this report, we produce the third iteration of the Commodity Trade Index, allowing us to reassess the performance of top trading hubs and compare how the relative rankings have changed over time.

The Commodity Trade Index assesses the role of ten key commodities trading hubs within global trade. The index also assesses which global locations can expect to maintain their status as a trading hub. It incorporates ten indicators to produce an index score for the US, Netherlands, Singapore, the UK, the UAE, Switzerland, Hong Kong, China, South Africa, and Nigeria. This is the third iteration of the Commodity Trade Index, after it was first introduced in the 2018 Future of Trade report and refreshed in 2020.

The Commodity Trade Index looks at three major factors important to commodity trade via ten individual sub-indicators. The data underlying the indicators are taken from sources such as the World Bank or the United Nations.[26]

The ten indicators analysed are:

- **Locational and trading partner factors**

1. Headquarters locations of major commodities trading houses
2. Proximity to markets (based on commodity export data)
3. Commodity trade partner tariffs on primary goods

- **Commodity endowment factors**

4. Tonnes of oil exported annually
5. Hub's share of global commodity trade for coffee, grains, sugar, gold, diamonds, soya beans, tea, cotton, silver, animals and animal products, and plastic
6. Natural-resource rents as a share of GDP

- **Institutional factors**

7. Financial services infrastructure
8. Attractiveness of the tax regime
9. Strength of regulatory enforcement
10. Logistics performance

In order to create the index, the data for each indicator were standardised and scaled within the 0 per cent to 100 per cent range. They were also adjusted for outliers and then combined to create the composite index. Each of the three sub-categories is given equal weighting. For more detail on how the Commodity Trade Index was created, please refer to the appendix later in this section.

[26] For a detailed methodology and list of sources and references, please see the appendix in this section.

Commodity Trade Index results

Country	Commodity endowment factors (%)	Locational and trading partner factors (%)	Institutional factors (%)	Index score 2022 (%)
United States of America	54	56	63	58
United Arab Emirates	74	2	72	50
Netherlands	6	77	63	48
Switzerland	9	66	69	48
United Kingdom	19	45	70	45
Hong Kong SAR, China	11	39	83	44
Singapore	2	49	74	41
China	34	21	42	32
South Africa	10	24	30	21
Nigeria	33	15	0	16

Source: *See appendix*

As shown in the table, the USA stands as the top trading hub on the 2022 index, with a score of 58 per cent. This is five points above the USA score of 53 per cent in the last report, when the country also took top position by a very small margin over the UAE. Meanwhile, the UAE stands in second place, with a score of 50 per cent, down from 53 per cent in 2020.

The USA maintained its position at the top of the table thanks to its robust scores across the three pillars of the index, scoring above 50 per cent across the board. The USA scores most strongly relative to other countries for its commodity endowment factors, where a score of 54 per cent puts it in second place. The USA economy makes up a large share of global soft-commodity trade, where it comes top out of the ten hubs studied. In particular, the USA is dominant in the soya trade.

The USA ranked third out of the hubs studied for the locational and trading factors pillar, behind the Netherlands and Switzerland. Many global commodities companies are headquartered in the USA. Cargill is located in Minnetonka, Minnesota and Koch Industries in Wichita, Kansas, to give examples. Other key cities for trading commodities in the USA include Houston, New York, and Chicago. These dominant cities in commodities trade drive up the score for the USA overall.

The USA scored weakest for institutional factors in the 2022 index, with a ranking of sixth place for this pillar. The country's relatively high rate of corporation tax weakens its score. Having said that, the USA scores well for its financial services infrastructure and logistics performance.

Commodity Trade Index results 2018 and 2020

Country	Index score 2018 (%)	Rank 2018	Index score 2020 (%)	Rank 2020
United States of America	47	5	53	1
United Arab Emirates	56	1	53	2
Netherlands	54	2	48	3
Switzerland	49	3	47	4
United Kingdom	49	4	46	5
Hong Kong SAR, China	39	7	45	6
Singapore	40	6	41	7
China	30	8	33	8
South Africa	20	9	23	9
Nigeria	16	10	22	10

Source: *See appendix*

The UAE placed second on the Commodity Trade Index, matching its performance in 2020, despite performing relatively better than the US for both commodity endowment factors and institutional factors. In particular, the UAE has the top score for commodity endowment factors, driven by its large natural supply of oil. Indeed, the UAE has scored top for this pillar of the index in every iteration of the Commodity Trade Index.

However, the score for the UAE has been dragged down by locational and trading partner factors, for which it only receives a 2 per cent score. This is a drop of 13 per centage points compared with last year, driven by some of the UAE's trading partners raising tariffs on imports. Furthermore, the data points to trade trends switching, so that the UAE no longer exports as much to countries to which it is geographically close. This has weakened its score for the proximity-to-markets pillar.

The outlook is positive. Of particular importance is the raft of emergent trade deals. There are plans for the UAE to sign 8 Comprehensive Economic Partnership Agreement (CEPA) deals in 2022 and 27 CEPA deals in total as it looks to boost trade and foreign direct investment. The CEPA deals form a key part of the UAE's plan to double its economy from AED 1.4 trillion to AED 3 trillion in seven years[27], averaging 5-6 per cent growth each year.

[27] http://wam.ae/en/details/1395303024109

- **The India-UAE CEPA** was signed in May between India and the UAE. The UAE Ministry of Economy has stated that, by 2030, the UAE-India CEPA would add US$9 billion, or 1.7 per cent, to UAE gross domestic product; exports are expected to increase by $7.6 billion, adding 1.5 per cent, and imports are expected to rise US$14.8 billion, adding 3.8 per cent. The CEPA agreement with India is expected to boost non-oil trade between the two countries to $100 billion in five years, from US$60 billion currently.

- **The UAE-South Korea CEPA** is expected to be finalised by the end of 2022.[28] The agreement with South Korea aims to enhance the economic partnership between the two countries to a minimum of US $20 billlion in the next three to five years. Moreover, the UAE-South Korea CEPA deal is to include deals to reduce greenhouse gas emissions, and crucially, to develop green technology.

- **The UAE-Turkey CEPA** is expected to double bilateral trade from US$13.7 billion to US$27.4 billion. This CEPA is geared to facilitating trade, easing access to credit insurance and affordable finance for investment projects that are jointly undertaken by the two countries. There is also an explicit policy agenda to diversify trade and promote knowledge and talent exchange between the two countries.[29]

- The UAE is currently in negotiations with Indonesia, Israel, Georgia and the Philippines. A CEPA between the UAE and Israel will follow buoyant growth in bilateral trade between the two countries which is estimated to have exceeded US$ 1 billion in the first quarter of 2022, according to statements by the UAE Minister of State for Foreign Trade during the World Economic Forum in Davos.

27

Trade agreements currently underway between the **UAE** and other markets

The UAE also placed third place on the institutional factors pillar, driven by its business friendly tax framework and strong performance for logistics of trade.

The Netherlands placed third overall on the Commodity Trade Index in 2022. Although the country scored relatively weakly for its commodity endowments and institutional factors, it is best for locational and trading partner factors. As part of the EU, the Netherlands benefits from free trade with neighbouring countries and also conducts most of its trade with other EU countries, meaning it scores highly for the proximity-to-markets indicator.

Switzerland saw an index score of 48 per cent on the 2022 Commodity Trade Index, just below the Netherlands. Coming in at fourth place in the 2022 iteration of the index, Switzerland has fallen from its third-place position in the 2018 report. Like the Netherlands, Switzerland benefits from low tariffs on its exports to trading partners. In fifth place, the UK's score is driven by its institutions with strong regulatory enforcement in place and a good logistics performance score. This comes despite Brexit making trade with partner countries more challenging.

Hong Kong and Singapore came sixth and seventh, respectively, dragged down by their lack of commodity endowments. However, these countries scored best when it came to institutional factors, with Hong Kong receiving the top score for this pillar. Hong Kong benefits from strong financial services infrastructure and good logistics performance, while Singapore has very strong regulatory enforcement.

Despite good commodity endowments, China ranked in eighth place on the Commodity Trade Index. China only scored 21 per cent and 42 per cent on the locational and trading partner factors and institutional factors, respectively. However, this is a slight improvement on the 2020 index scores of 20 per cent and 39 per cent, respectively. South Africa placed ninth on the index, with a score of 21 per cent, down from the 2020 score of 23 per cent. South Africa scores poorly for commodity endowment factors, with the natural-resource rents indicator falling since the last report. South Africa's institutional factors pillar has also fallen by seven per centage points since the 2020 report, with its logistics performance score weakening, showing that it became more difficult to transport general merchandise to and from South Africa.

Nigeria came in fourth place for its commodity endowment factors on the 2022 Commodity Trade Index, thanks to its large oil reserves. However, its overall score was dragged down by its locational and trading partner factors and institutional factors. Overall, despite the rankings between the ten trade hubs remaining similar between 2020 and 2022, the spread between the top and bottom hubs became wider in the latest report. The USA pulled ahead to stand eight per centage points above the UAE's score, while in 2020, both countries scored 53 per cent (after rounding). At the other end of the spectrum, Nigeria's score fell by six per centage points to stand at 16 per cent. UK, Hong Kong, and South Africa also saw declines in their index scores.

This widening of the gap between the top and bottom scoring trade hubs over the course of the pandemic could suggest that the pandemic has widened pre-existing gaps between countries in terms of their importance for commodities trade. Looking ahead, 2022 is likely to see countries continue to struggle with supply-chain issues as trade is heavily impacted by continued measures to control the coronavirus.

In the future, we may see the UK suffer more impacts from its decision to leave the EU. Since the end of the Brexit transition period in December 2020, the full impacts of Brexit have been overshadowed by the effects of the pandemic. However, as countries recover from COVID-19, and following the introduction of border checks and tariff barriers after the end of the transition period in January 2021, we may soon be able to see the impact on trade of the UK's decision to leave the EU single market.

The impacts of the Russian invasion of Ukraine and associated sanctions on Russia are also likely to persist over the course of 2022, which will continue to impact commodity prices across the world.

[28] https://www.reuters.com/world/uae-south-korea-agree-talks-trade-deal-2021-10-14/
[29] https://www.mofaic.gov.ae/en/mediahub/news/2022/4/28/28-04-2022-uae-turkey

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Appendix to the DMCC Commodity Trade Index

Commodity Trade Index methodology

The ten commodities trading hubs analysed are:

1. **United States**
2. **United Arab Emirates**
3. **Netherlands**
4. **United Kingdom**
5. **Switzerland**
6. **Singapore**
7. **Hong Kong**
8. **China**
9. **South Africa**
10. **Nigeria**

Each hub is scored based on its performance as measured by the particular indicator. For each indicator, the same set of steps is followed, allowing us to assign a value between 0 per cent and 100 per cent to each hub:

- In order to account for outliers, each data point is checked to determine if it falls outside of the mean +/- 2 standard deviations range.
- The min-max approach is used to assign an index value to each hub. Specifically, the following formula is used (data point – series min) / (series max – series min).
- For indicators where a lower figure signified a better performance, the inverse of the data point or its negative equivalent is used.

Once scores between 0 per cent and 100 per cent are assigned to each hub within each indicator based on the previous steps, the indicators are assigned to one of three sub-indices (locational and trading partner index, commodity endowment index, and institutional index), which are weighted equally to give the overall index score.

Methodology changes

In previous years of the DMCC Commodity Trade Index, the Centre for Economics and Business Research (Cebr) has used Doing Business Indicators from the World Bank as the basis for the institutional factors pillar of the report. However, these indicators have since been shown to have methodological issues and have been discontinued. Therefore, Cebr has replaced these indicators with alternative sources. Updates have also been made to the two previous iterations of the Commodity Trade Index, the results of which are referenced in this report, with the new sources for data.

Commodity Trade Index data sources

	Indicator	Summary	Source	Year
Locational and trading partner factors	Headquarters locations of major commodities trading houses	Locations of global and regional headquarters of the largest commodities trading companies are analysed and used to assign points to each hub	Various commodities trading companies' websites	2022
	Proximity to markets (based on commodity export data)	The sum-product of the share of each hub's commodity exports by trading partner and distance to trading partner is calculated and then assigned an index value	Commodities export data: UN Distance data: CEPII	Latest (2020–2021)
	Commodity trade partner tariffs on primary goods	The sum-product of the share of each hub's commodity exports by trading partner and each trading partner's average tariff on primary goods is calculated and then assigned an index value	Commodities export data: UN Primary goods tariff data: World Bank	Latest (2020–2021)
Commodity endowment factors	Tons of oil exported annually	Total annual crude-oil exports by weight, by hub	UN	2020
	Hub's share of global soft-commodity trade for key commodities	Total annual coffee, grain, sugar, gold, diamonds, soya bean, tea, cotton, silver, animals and animal products, and plastic trade by value, by hub	UN	2020
	Natural-resource rents as a share of GDP	Total natural-resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents. Estimates are calculated as the difference between the price of a commodity and the average cost of producing it	World Bank	2019
Institutional factors	Financial services infrastructure (measured by domestic credit to private sector)	The extent to which domestic lenders are willing to lend to the private sector is used to analyse hubs	World Bank	2020
	Attractiveness of the tax regime (measured by rate of corporation tax)	Analyses the rate of tax businesses must pay to operate in each trading hub	Tax Foundation	2021
	Strength of regulatory enforcement	This indicator measures how the rule of law is experienced and perceived worldwide based on household and expert surveys in 139 countries and jurisdictions. In particular, we focus on regulatory enforcement	World Justice Project	2021
	Logistics performance	Measures how easy or difficult it is in each country to transport general merchandise	World Bank	2018

SECTION FOUR

THE DRIVERS AND DYNAMICS BEHIND TRADE RECOVERY

Despite the multitude of geopolitical and economic risks – including those in relation to the energy market – trade growth is still likely to gain momentum in 2022 and beyond. Overall, pent-up demand in key sectors will be a key driver of trade, including the rapid recovery in global goods consumption since mid-2020. The sectors that are particularly important to watch in the years ahead are manufacturing, energy, and maritime trade.

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There are five factors in particular that are likely to ensure a recovery in the global economy in general, and cross-border trade in particular:

- **Pent-up demand for energy**: Oil exporters are expected to reap the benefits of higher global oil prices and positive COVID-19 developments, including high vaccination rates in Gulf Cooperation Council (GCC) economies. Some economies will also benefit from record-high natural gas prices.

- **Activity and employment in the tourism sector**: If the right conditions exist, the travel and tourism sector will continue to rebound to deliver economic and employment benefits we have not seen since before the pandemic, although the bulk of the strength should be seen more towards 2023 than this year, as social distancing measures are eased globally.[30] Global leaders will have to consider the economic and employment benefits of boosting consumer confidence by allowing fully vaccinated travellers to move freely.

- **Rebounding trade in manufactured goods**: Firing up the manufacturing sector will be the top priority for China, Japan, India, Russia, Germany, Turkey, the UK, and the USA, which, together, account for about 60 per cent of world GDP (Temel and Phumpiu, 2021). The real-estate and wholesale sectors come next.

[30] https://www.un.org/en/coronavirus/it-imperative-we-rebuild-tourism-sector

- **Maritime trade-led growth**. More than 11 billion tonnes of cargo were carried by sea in pre-pandemic 2019, including vital food and medical goods, energy, and raw materials, as well as manufactured goods (Vicente, 2021). The disruption of shipping-related services[31] due to COVID-19, however, led to delays in border crossings and increased port congestion. Despite this, digitalisation of port- and logistic-related services boosted the ability to deliver essential port activities, and fast lanes, for medical cargo, food items, and other essential services (UNCTAD, 2021). Crisis management also involved coordinating with key stakeholders and increasing communication channels (Wignaraja et al., 2021). These should continue to enhance growth.

- **Maritime trade transformation**: Larger container ships and autonomous ships (or e-navigation)[32] are an additional promising trend. Several ports are also investing in renewable energy, which will increase resilience in cross-border trade. Investment in solar capacity and in cleaner fuels for their operations will be of critical importance. Global shipping, from container ships to cruise ships, is also investing heavily in new energy-efficiency technologies and cleaner fuels (IRENA, 2021). This initiative further supports resilience-building. Although shipping and port activities are mature industries, technological innovations raise long-term growth prospects for business and employment.

11bn

Tonnes of cargo carried by sea in **pre-pandemic** 2019

[31] Shipping-related services such as freight forwarding, warehousing, transit, and trans-shipment of cargoes and in logistics.

[32] https://www.imo.org/en/OurWork/Safety/Pages/eNavigation.aspx

Looking ahead: Resilience and strength within the wider Middle East

There is broad-based optimism in relation to the outlook for trade in the Middle East, and for the UAE's trade outlook in particular, with rising commodity prices expected to increase the value of the UAE's oil and gold trade, which, together, made up almost half of UAE trade in 2020. Rising oil prices will increase UAE government expenditure, providing another boost for UAE trade. Finally, the UAE government's openness to digitalisation, crypto currencies, and new technology could also boost trade. DMCC's crypto centre was cited as a safe environment for blockchain and crypto companies in which to operate and grow.

Within the wider Middle East, trade could be further boosted, particularly in the pharmaceutical industry, if governments invested in R&D and encouraged local production through regulatory changes and incentives. States in the Middle East and North Africa are more focused on negotiating free-trade agreements bilaterally, rather than on brokering multilateral regional agreements. There is broad-based concern that rising food prices, exacerbated by current developments in Ukraine, could lead to economic and financial market volatility.

50%

Size of **UAE's oil and gold trade** as a share of its total trade in 2020

Global trade will continue to prove resilient. Although services trade growth remains muted, the scope for a re-acceleration is significant. Trade openness matters in shaping the strength of economies' recoveries. GDP growth has recovered faster in countries with strong pre-existing trade links to countries with few COVID-19 cases, underscoring the circuitry between trade, economic growth, and risk management.

Continued trade liberalisation can and should be introduced. Examples of important policy initiatives include infrastructure development at key gateway facilities such as ports and airports. Additionally, liberalising transport services markets, including through relaxing restrictions on foreign direct investment, can promote consolidation and productivity upgrading, as well as knowledge spill over.

Appropriately calibrated policies are essential for trade promotion, particularly when the overriding goal is for cross-border trade to contribute to speeding up economic recovery, especially amid multiple shocks. Trade promotion and facilitation are important recovery mechanisms for many developing and least-developed countries, which have limited ability to spur economic recovery through fiscal stimulus packages.

Key takeaways

1. Global trade growth is expected to remain resilient, at 3 per cent annually, in 2022. This would, however, mark a slowdown following 9.8 per cent growth in 2021.[33] Despite downgrades to 2022 global growth forecasts, sector-specific pent-up demand should continue, in spite of the impacts of the current conflict in Ukraine.

2. Global trade should also remain robust over a five-year period despite the economic upheaval of soaring inflation, rising interest rates and slower growth. An increase is digital trade and trade is services, as well as the drive for sustainability and a general push for a reduction in trade barriers, should underpin global trade.

3. Global GDP growth is expected to be driven by resilient cross-border trade in 2022 and beyond, underpinned by recovery in services trade, innovation and trade integration. Countries' energy transitions are likely to support import and export demand in both developed and developing economies.

4. Global supply chain restructuring will continue to be a source of trade normalisation as firms seek new markets and investment opportunities to build resilient and flexible supply chains. This is likely to reinforce long-term growth in bilateral trade relationships.

5. Trade dynamics will be influenced by big trends: changes in trade barriers; inflation-induced monetary and fiscal policy changes; and more climate change adaptation on the part of government and business.

6. Upside risks to the oil and energy markets are likely to persist. Both the ongoing Russia-Ukraine conflict and a general hesitancy to raise OPEC production limits are likely to contribute to price pressures.

Recommendations for businesses:

1. Amid the current geopolitical and economic shocks, firms should increase strategic emphasis on economic diversification to support sustainable initiatives against climate-related uncertainty in production.

2. For greater promotion of supply chain resilience, firms should look to diversify their sources of financing. Enhanced coordination between firms and financial intermediaries, particularly through greater intercompany credit, would help cushion against shocks.

3. Boost trade facilitation processes through increased digitalisation, enabling faster customs procedures, to help offset increases in trade costs.

Recommendations for governments:

1. Continue to prioritise filling trade financing gaps, that represent shortfalls in required trade finance for SMEs, including through export credit agencies and the expansion of working capital programmes.

2. Make trade promotion a key policy priority.

3. Government-guaranteed bank loans should be used to inject cash into supply chains during times of financial uncertainty and economic shocks. Additionally, these guaranteed loans could be securitised and financed by central banks.

4. Prioritise digitalisation efforts in order to promote greater supply chain efficiency and resilience. This would continue to reduce trade costs by promoting more efficient customs and border clearance, improved quality of trade and transport logistics.

[33] https://www.wto.org/english/news_e/pres22_e/pr902_e.pdf

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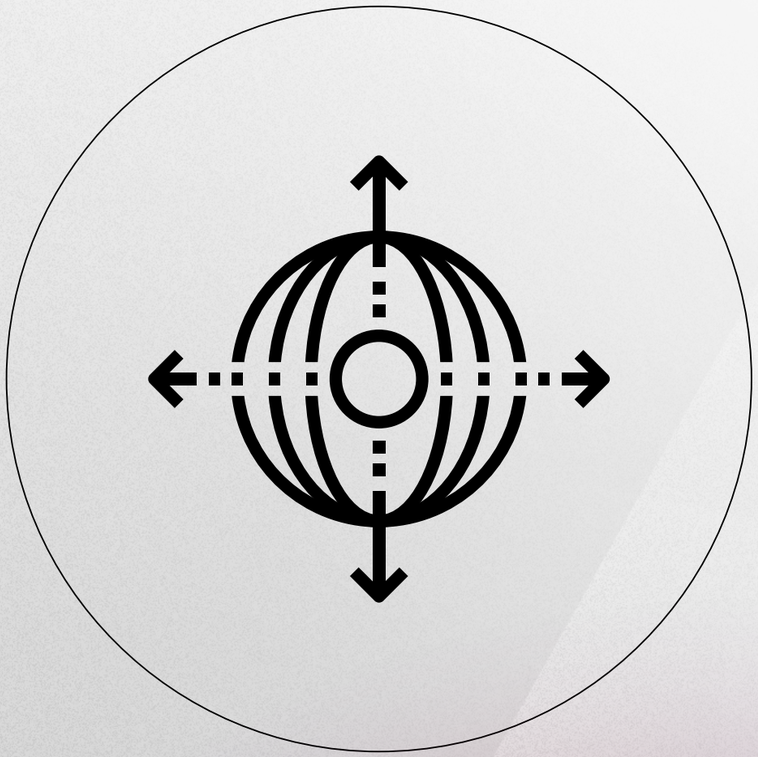


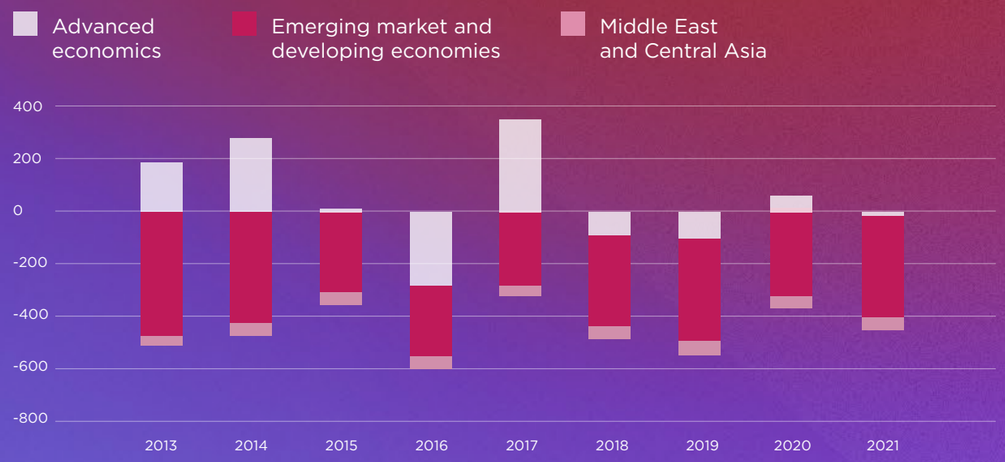
CHAPTER II

THE GEOPOLITICS OF TRADE

FIGURE 5

Net foreign direct investment

US DOLLARS



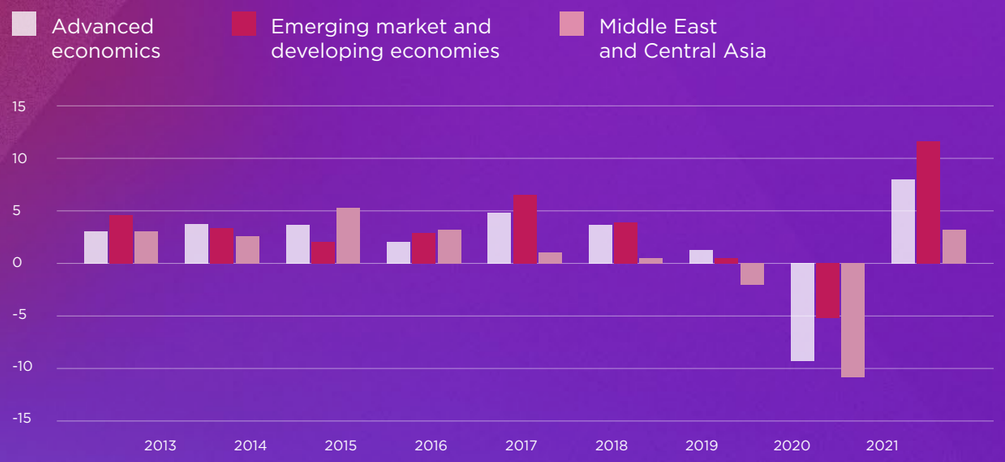
Capital flows have decreased since the **Great Recession**.

CHAPTER II: The geopolitics of trade

FIGURE 6

Exports of goods and services

ANNUAL PERCENTAGE CHANGE



The recovery in economic growth in the first half of 2021 lifted merchandise trade above its pre-pandemic peak.[34] However, since the start of 2022, growth in international trade has started to lose some momentum. While there is little systematic evidence indicating that the world economy has entered an era of de-globalisation (BIS, 2018), there are political challenges ahead. This section presents some of the geopolitical headwinds and pivots that are likely to underlie the trade outlook.

Geopolitical tensions in relation to the current situation in Ukraine are likely to exacerbate the slowdown in trade growth, in part through fuelling protectionism in certain sectors, including in food and energy. The shift away from globalisation to new norms such as "friend-shoring" or "ally-shoring"[35] could take multiple forms. The geopolitical shift will be further shaped by pandemic-induced economic scarring and vaccine inequality, aggravating policy tensions across countries (Antras, 2020). In addition, the spectrum of tensions associated with recent oil-price developments is likely to feature prominently.

The world trade-to-GDP ratio – a standard measure of globalisation – has recovered from its late 2008 low, as has export growth. But there is also a worrying trend in the collapse in cross-border investment (***Figures 5 and 6***). The relative dominance of capital flows and multinational activity in overall economic activity has declined since the Great Recession, even if they remain at high levels in comparison with those in the early 2000s. Cross-border trade is likely to remain strong, in contrast to developments pertaining to finance-led globalisation and cross-border investments.

[34] https://www.wto.org/english/news_e/pres21_e/pr889_e.htm
[35] https://www.bloomberg.com/news/articles/2021-06-24/-onshoring-is-so-last-year-the-new-lingo-is-friend-shoring

SECTION ONE

GLOBAL PIVOTS WILL DEFINE THE NEAR-TERM TRADE LANDSCAPE

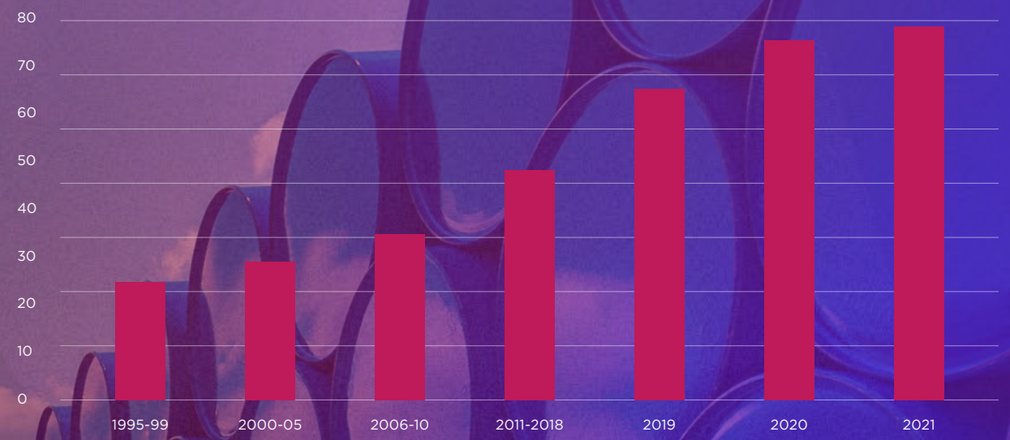
There is strong evidence that new economic and political paradigms are underway, with explicit implications for trade and investment. The global landscape is likely to be characterised by multiple pivots, which include:

CHAPTER II: The geopolitics of trade

FIGURE 7

General government debt in China (gross)

PER CENT OF GDP



Pivot 1:

The politics behind slower growth in China

President Xi Jinping's policies to restrain the domestic technology sector and, increasingly, the property sector, highlight significant downside risks to the outlook. Longer-term underlying concerns also include energy shortages (particularly in relation to current tensions), China's demographic downtrend, subdued productivity, and, crucially, accelerating debt (***Figure 7***). China's overall debt is well over 250 per cent of GDP. Additionally, there are internal and external implications.

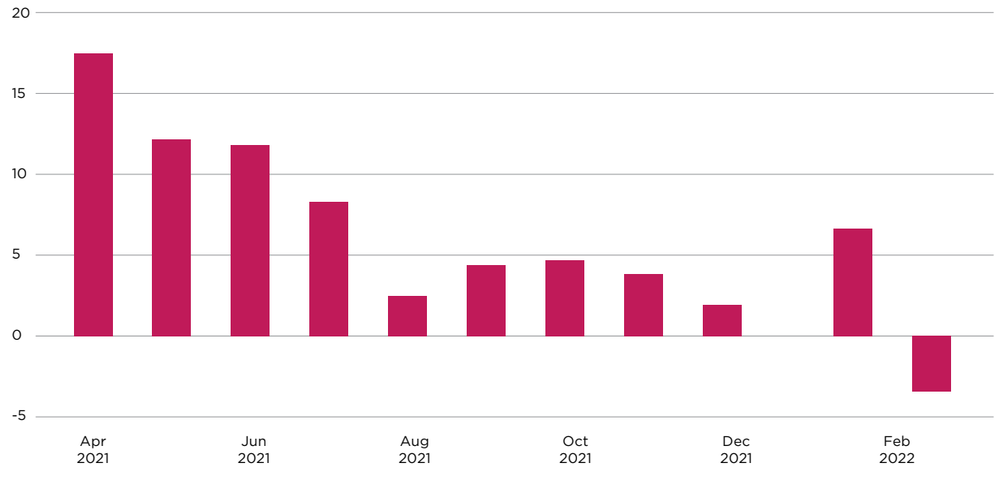
- Global and regional economic stability. China has, in recent years, driven near 30 per cent of global growth (Kemp, 2019). Given this, a slowing Chinese economy could significantly influence regional and economic growth around the world, while potentially also disrupting financial markets and supply chains. The attendant loss of wealth and employment could spark tensions. Additionally, a sharper than expected slowdown, or an economically struggling China, could also unravel global financial stability and political relations with regional partners.

- Labour strikes. Chinese prefectures that have experienced a more severe export slowdown witnessed a significant increase in the incidence of labour strikes (Campante et al., 2019). This has been accompanied by a heightened emphasis in such prefectures on upholding domestic stability. The literature suggests that in the past, China's local leaders have been held to account on yardsticks related to political stability (ibid.) as well as economic metrics.

FIGURE 8

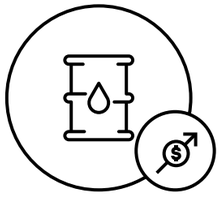
Annual retail sales growth in China

ANNUAL PERCENTAGE CHANGE



- China's faltering consumer confidence and demand for consumer goods. This has been muted, owing in part to the economic, health, and social impacts of the COVID-19 crisis. Faced with this, the Chinese government has not made enough progress in transitioning to a consumption-led economy. Consumption and retail sales growth have decelerated on the whole (***Figure 8***). Strengthening purchasing power, either through the renminbi, or boosting wages and the social safety net, would support household sentiment, potentially along with uptake of the digital renminbi.

Looking ahead, China's policymakers are likely to continue a policy of promoting economic stability and managing a slower, albeit resilient, growth rate in the economy. A significant part of the growth story will be China's trade and investment position. A key global pivot will be the degree to which the government's renewed focus on stability fosters newfound strength – and a structural shift higher – in consumption-led growth. This would strengthen the government's mandate and bolster cross-border trade. Import demand would likely follow suit, which would have knock-on effects for major global exporters. This would be one side of China's stated "dual circulation strategy", with the other being support for greater domestic economic autonomy.



Pivot 2:

Oil at, or above record levels

The price of oil could remain elevated in the light of current geopolitical developments and particularly if OPEC+ supply does not change significantly from current levels. An oil-price pivot – essentially, a resetting of the "normal" level – would be disruptive not just because of the higher cost but because of what it could signify: structurally lower net production and a decisive shift in the terms of trade for oil- producing economies.

Production developments in non-OPEC oil states – the United States and Russia, in particular – will warrant attention. The two states together produce 30 per cent of the world's oil. Production rises in the former, or cuts and/or continued sanctions in the latter's production as a result of the war in Ukraine, will be significant for cross-border trade. We explore the key drivers behind the oil pivot that could define the geopolitical landscape:

- OPEC+ is critical for current global oil-price stability. Concerns over spare capacity have amplified the effect of geopolitics, making the market highly sensitive to anything that could be perceived as a supply threat. Over the past months, that sensitivity has been shown in response to the war in Ukraine and the subsequent global sanctions that have been imposed on Russia as a result.

- The impact of higher oil prices on trade will fuel sharp growth disparities and associated political tensions. The direct effect of a high oil-price shock on the GDP growth rate of oil-exporting countries is positive. The largest oil-exporting countries (Iran, Russia, UAE, Indonesia, and Kazakhstan) are likely to benefit in terms of a positive terms-of-trade adjustment – although the impact is not always unambiguous, given country-specific petroleum import dynamics (as well as sanctions regimes).

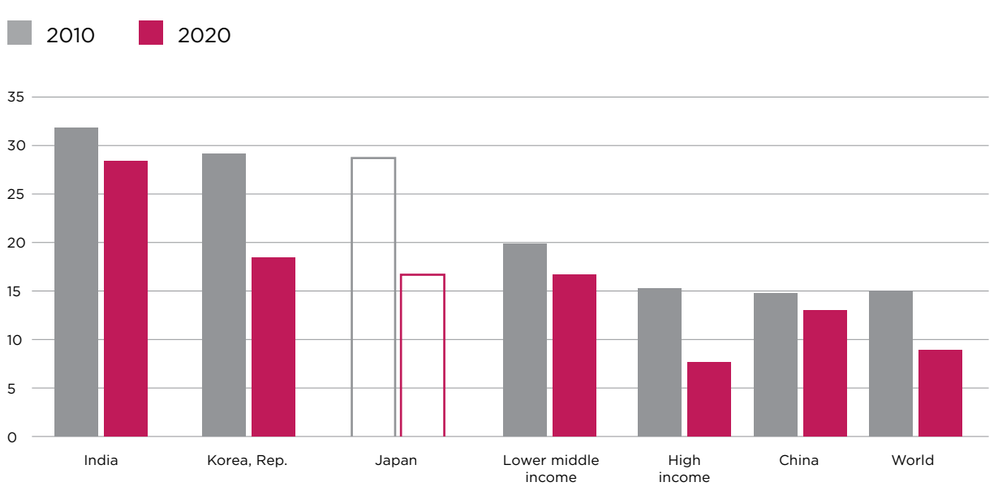
30%

United States and **Russia's** combined share of the world's oil production

FIGURE 9

Japan's fuel import share in context

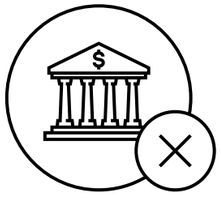
PERCENTAGE SHARE OF TOTAL IMPORTS



- significant oil importers and play a major role in the global oil market in their respective choices of oil providers (***Figure 9***). They have shown varying degrees of diversification in sourcing their oil imports (Vivoda and Manicorn, 2011). Japan's resource dependence is likely to continue to inform its long history of resource diplomacy in relation to the Middle East and other oil-exporting economies more generally (Thorarinsson, 2018).

- Shifting trade balances, and the political response to them, typically manifest most in economic terms in small open economies and oil-importing countries. A temporary oil-price increase unambiguously improves the trade balance for resource-rich economies (Le and Chang, 2013). But the nature of any oil-price change – whether it is demand- or supply-driven – is significant for global trade balances, particularly when financial interdependence is high.

A number of overlapping factors is likely to influence the future market for oil, linked to economic and geopolitical consequences, while cross-border trade and investment will be shaped by which countries have primary resources and which don't. Inevitably, current developments and how they are resolved will influence the trajectory for energy, commodity, and food prices. In addition, the capacity of households, businesses, and governments to adapt and engage in climate-change mitigation strategies, together with the characteristics of the energy system, will have a decisive influence on the energy market. This will also serve to develop more robust energy policies and strategies to anticipate and prevent geopolitical tensions.



Pivot 3:

A rise in debt defaults

The COVID-19 crisis and the pandemic-induced global recession of 2020 have led to a surge in global debt levels to US$226 trillion.[36] The rise in debt has led to several countries initiating debt restructurings, while many others are in, or at high risk of, debt distress and may also eventually need debt relief.

More than half of low-income countries are in debt distress or at high risk of debt distress; some countries have already defaulted on their debt; and restructurings have been completed in some, or are underway in others (World Bank, 2022). Debt was already elevated going into the crisis, but in some cases, it is now at a record high, complicating responses to new virus mutations and accelerating inflation.

In 2020, total global debt reached 263 per cent of GDP, its highest level in half a century (Kose, Nagle et al., 2021). The build-up has been broad-based, with rapid growth in both government and private debt; in advanced, emerging market, and developing economies; and in external and domestic debt (ibid.).

Borrowing by governments has accounted for slightly more than half of the global debt increase, with the global public debt ratio jumping to a record 99 per cent of GDP.

Private debt from non-financial corporations and households has also reached new highs. Debt increases are particularly striking in advanced economies, where public debt rose from around 70 per cent of GDP in 2007 to 124 per cent of GDP in 2020. Private debt, on the other hand, rose at a more moderate pace, from 164 to 178 per cent of GDP over the same period.

263%

Global debt level against GDP in 2020

[36] https://blogs.imf.org/2021/12/15/global-debt-reaches-a-record-226-trillion/

In the coming years, debt will impact trade and geopolitics as follows:

- **A "debt standstill" will mitigate the impact of a fragmented creditor base**. Historically, several umbrella frameworks coordinated debt relief to multiple debtor countries from multiple creditors on common principles. They offered substantial – but protracted – debt stock reductions that were typically preceded by a series of less ambitious debt-relief efforts. However, future umbrella frameworks for debt restructuring will face greater challenges than those in the past, owing to the more fragmented creditor base.

- **A growing link between political and debt instability**. Debt instability will impact the ability of debtor countries to foster an adequate investment climate for trade promotion and is likely to increase political instability. The global political environment may continue to be less reliable for sovereigns (Smith, 2019). Emerging market debt is a particular risk. In these economies, government debt rose by 9 per centage points to 63 per cent of GDP in 2020, the fastest one-year increase in the past three decades. Contingent government liabilities are likely to have risen because of loans and loan guarantees to corporates, while debt incurred by state-owned enterprises will also have increased (Melecky, 2021).

- **Rising borrowing costs will add to debt instability**. Interest-rate rises to combat inflation will further impinge on exporters' sentiment and willingness to invest and engage in trade. In many emerging markets, policy rates have already increased and further rises are expected. Central banks are also planning to reduce their large purchases of government debt and other assets in advanced economies – how this reduction is carried out will have implications for economic recovery and fiscal policy. Monetary policy is now appropriately shifting focus to rising inflation and inflation expectations.

[37] At the start of the pandemic, the World Bank and the International Monetary Fund urged the G20 to set up the debt service suspension initiative (DSSI). Established in May 2020, the DSSI helped countries concentrate their resources to tackle the COVID-19 crisis: https://www.worldbank.org/en/topic/debt/brief/covid-19-debt-service-suspension-initiative.

[38] The G20 Common Framework provides a structure to initiate debt restructuring for low-income, IDA-eligible countries, but largely avoids the issue of outright debt reductions.

The long-term effects of the international debt situation will be difficult to resolve. The need for high-debt countries to increase exports, while managing their respective (and for some, unfavourable) debt-to-reserve ratios, will prove particularly challenging. Increasingly, industrialised countries may see a loss of their export markets while absorbing more imports – thus leading to increased protectionist pressures. A concerted effort by all industrialised countries will be required to avoid this.

Additionally, high-debt countries will be under pressure to avoid economic adjustment (in the form of austerity), given the already entrenched social, political, and economic consequences of the COVID-19 crisis, which has already resulted in a disproportionate amount of economic scarring in the emerging and developing economies. They will want to avoid prolonging – or exacerbating – conditions of poor and deteriorating growth and loss of cross-border trade.

Looking ahead, the degree to which highly indebted economies continue to liberalise their trade regimes will be of particular importance. These countries could hamper their own chances for recovery. Failure to liberalise, increase cross-border trade, and adopt more outward-looking economic policies will mean a continuation of structurally lower economic growth rates, lower productivity, and less efficient export production. At the same time, failure of these economies to institute reforms and to further liberalise trade regimes could undermine the industrialised nations' efforts to tackle protectionist pressures, ultimately leading to decreased access for the high-debt countries' exports.

9% to 63%

The rise of debt levels against GDP for **emerging markets** in 2020

SECTION TWO

REGIONALISM, MULTI-LATERALISM, AND THE NEW TRADE ORDER

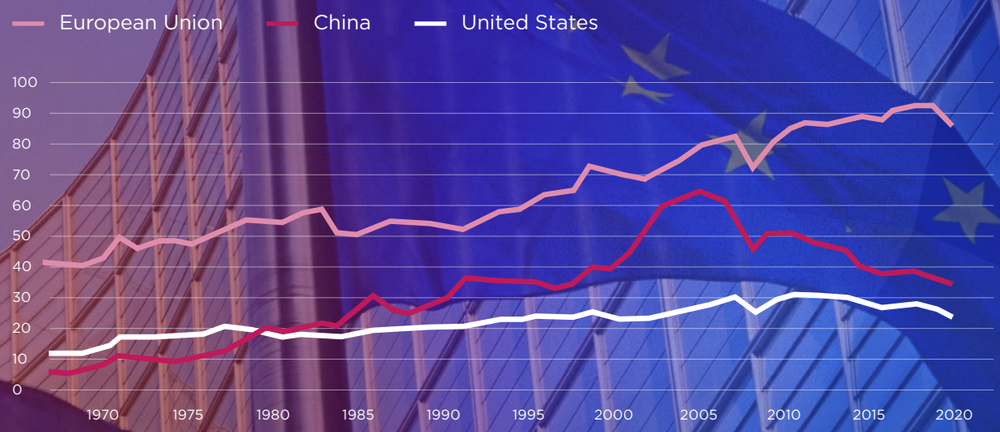
Both the economic and political landscapes will shift considerably in the coming years, with implications for global cross-border trade and investment. Actions by middle powers[39] (such as South Africa, the UAE, and Australia) and local trade agreements will lead to greater regionalism.

[39] Middle powers are thought of as countries that shape regional or global geopolitics in collaboration with others but lack the capabilities associated with superpowers (Chapnick, 1999).

FIGURE 10

Export and import growth in services trade

ANNUAL PERCENTAGE CHANGE



Regionalism will reshape trade and investment, owing in part to structural changes in global supply chains and risk management in relation to health, climate, financial, and economic shocks. The political will of the middle powers will fuel a dynamic whereby locational advantage could increasingly dominate trade patterns.

In addition to the rise of regionalism, a new multilateralism is likely to take hold. Old forms of multilateralism are likely to fade, while new forms of multilateralism will be catalytic in driving cross-border trade in new sectors, including in the arenas of digitalisation and sustainability. This multilateralism is likely to spur cross-border trade and investment where there is a political will to do so. It may pertain to certain sectors that are the most innovative and where there is an overlap in priorities of the major economies – particularly the United States, China, and the European Union.

Regionalism and a new multilateralism are likely to give rise to a new trade order.

Any re-ordering of global trade would continue to include the United States and China (the G2) as the key economies within the global trading system, with a stabilisation in their overall trade shares (Figure 10). Their respective and joint positions will be counterbalanced by the new and multiple trading agreements that will gain in prominence in the next few years. The Regional Comprehensive Economic Partnership, the Trans-Pacific Partnership, and a host of other regional trade agreements will challenge the dominance of individual economies. Crucially, the new trade order will likely see a shift from the predominance of the oil/non-oil dichotomy to cross-border trade in digital goods and services (UN, 2021).

The rise of regionalism

Middle powers are likely to expand their influence in 2022 and beyond. This is in part because the larger, great powers are likely to be more domestically focused. Additionally, the great powers focus largely on each other, allowing for other regional actors to grow in importance. In 2021, some of the G20 middle powers – including Japan, Australia, and India – accelerated collaboration with the United States on their shared goal of a free and open Indo-Pacific.[40] Early vaccine rollouts by middle powers (including Israel, Chile, and Singapore) were also instrumental in generating insights and policies in relation to the COVID-19 crisis.

The Indo-Pacific will continue to be the foremost arena in geostrategic competition, so middle powers in this region will be most consequential in 2022. Japan, under a new prime minister, will leverage its trade relationships and international development programmes throughout Asia. Australia will continue to bolster its traditional alliances (for example, through its security partnership with the UK and the United States via AUKUS[41]). India will leverage its "Act East Policy" to engage ASEAN. ASEAN countries are likely to strengthen economic relations with one another and key middle powers, to counterbalance overdependence on either the US or Chinese economies.

Looking ahead, regional trade agreements (RTAs) are likely to boost regional trade in the following ways:

- **The political will to participate in RTAs will grow**. RTAs are likely to involve more countries beyond their traditional regional zone. Significantly, RTAs have emerged between countries and entities in different regions and continents (for example, the EU-Mexico or the US-Israel trade relationships). In most cases, these agreements are bilateral in nature, concluded by two entities, including RTAs themselves, as with the EU-Mercosur pact.

- **RTAs will have a knock-on effect on policy agendas**. New-generation[42] RTAs increasingly cover trade in goods and relevant regulatory areas, including trade in services, cross-border investment, competition policy, intellectual property rights, and environment and development cooperation. This is deeper integration than previously. Developing countries have also adopted RTAs as the core of their national development strategies.

- **RTAs are already spreading**. Developing countries have actively participated in RTAs within their respective regions (South-South) and with developed countries (North-South). In Africa, on average, each country has belonged to four RTAs over the past decade (Yang and Gupta, 2005). In the Asia-Pacific region, ASEAN, SAARC (the South Asian Area for Regional Cooperation), and ECO (the Economic Cooperation Organization) already exist. ASEAN was a precursor to the ASEAN Free Trade Area (AFTA), which is likely to grow in membership. Considerable gains are likely to result from a lowering of barriers, including on labour mobility. Involvement in global value chains then becomes easier because of increased regional specialisation and the reduced importance of scale (OECD, 2013).

[40] https://www.whitehouse.gov/briefing-room/statements-releases/2021/09/24/joint-statement-from-quad-leaders/
[41] https://commonslibrary.parliament.uk/research-briefings/cbp-9335/
[42] https://www.oecd.org/trade/topics/regional-trade-agreements/

The risks and challenges of RTAs need to be monitored:

- **RTAs sometimes result in inward-looking, discriminatory protectionism**. They can compete for spheres of influence and become self-contained. Large RTAs – those whose membership covers a large share of global trade – can potentially have harmful effects for non-members, leading to net trade diversion rather than net trade creation (Liu, 2016). Technology transfer, investment flow, and how they interact with net trade creation, crucially impact the degree to which trade agreements impact economic growth (ibid.).

- **RTAs may reduce incentives for multilateral approaches to trade liberalisation**. This could inhibit policy areas linked with market access and standard setting. Developing countries might have to contend with a lesser degree of flexibility and policy space under RTAs that function largely as negotiating forums (Gleeson et al., 2018). This could threaten the viability of the multilateral trading system.

- **Overlapping RTA membership could cause inadvertent and unnecessary conflict** (Jakobeit et. al., 2005). With increasing numbers of countries being members of several RTAs simultaneously, this could create competing and possibly antagonistic blocs that would erode multilateralism. Overlapping membership could also pose significant administrative burdens for small countries with limited capacity to negotiate and weak institutional memory.

- **Regionalism can come at an economic cost**. Some of the benefits of recent globalisation, such as high growth rates, reduced poverty, and opportunities for lesser-skilled workers, can be lost if there is only a regional focus (Enderwick and Buckley, 2020). The costs of establishing regional supply chains can be considerable, particularly in locations that lack supporting services, specialist suppliers, or efficient transport and communication links. Even when established, such chains can bring higher costs.

Increased regionalism will lead to **expanded influence** for middle powers

Looking ahead, the systemic interaction between multilateralism and regionalism will define global trade. Although there are some downsides, RTAs promote quicker, freer, and deeper integration with strong discipline on trade-related policies. Asia's economies have started to strengthen their supply chains' resistance to future shocks by engaging in regional diversification and by reducing supply-chain redundancies. Tokyo, for example, has announced a US$2.2 billion stimulus package to help Japanese companies move production lines out of China. Given South Asia's availability of labour-intensive services, its young population, and a supportive policy environment, the region could replace China in its manufacturing capacity.

[43] https://www.bloomberg.com/news/articles/2020-04-08/japan-to-fund-firms-to-shift-production-out-of-china

The future of multilateralism

A new era of geopolitical polarisation has begun. The degree to which the great powers cooperate – rather than compete – with each other will have a decisive influence on how dominant multilateralism is likely to be. Cooperation and dialogue are all the more important if competition outpaces working together. In any scenario, multilateralism is important, as a means of stabilising relations and preventing conflicts among the great powers (Ruggie, 1992).

The COVID-19 crisis has underscored the importance of multilateralism and how it needs to change to accommodate shifting trade patterns and changing geopolitical relations. There is the increasing notion that China's economy is becoming the single-most important juncture in global and regional supply chains – and, as it continues to liberalise its financial system, as a financial centre of gravity. But the dynamics of the pandemic highlighted the unsustainable nature of Asia's heavy dependence on China for its trade needs. In 2019 alone, eight of China's top 15 trading partners were economies in Asia.[44]

An open, equitable, rule-based, predictable, and non-discriminatory multilateral trading system represents the best ecosystem to ensure broad-based development for other developed and emerging economies.

Looking ahead to the next decade, there are key markers for whether regional integration constitutes a building block or an obstacle to multilateralism:

- **A stronger rules-based system**. The evolution of the multilateral trading system to RTAs poses a major policy challenge. The rules affecting RTAs are increasingly likely to ensure that the agreements are effective instruments for promoting more equitable trade liberalisation. But the proliferation of RTAs has generated calls for the multilateral system and rules affecting RTAs to be strengthened, to minimise the possible harmful effects of RTAs on third countries and to avoid practices that are deemed to be discriminatory.

- **Promoting South-South trade agreements**. The link between developing and developed economies (North-South) will remain of particular importance when it comes to multilateralism. But the development dimension needs to be taken into account – which is not always reflected in the multilateral trading system (Weinhardt and Schofer, 2021). Market access, entry opportunities, and domestic policy in developing economies is of primary importance in the promotion of long-term growth in cross-border trade (ibid).

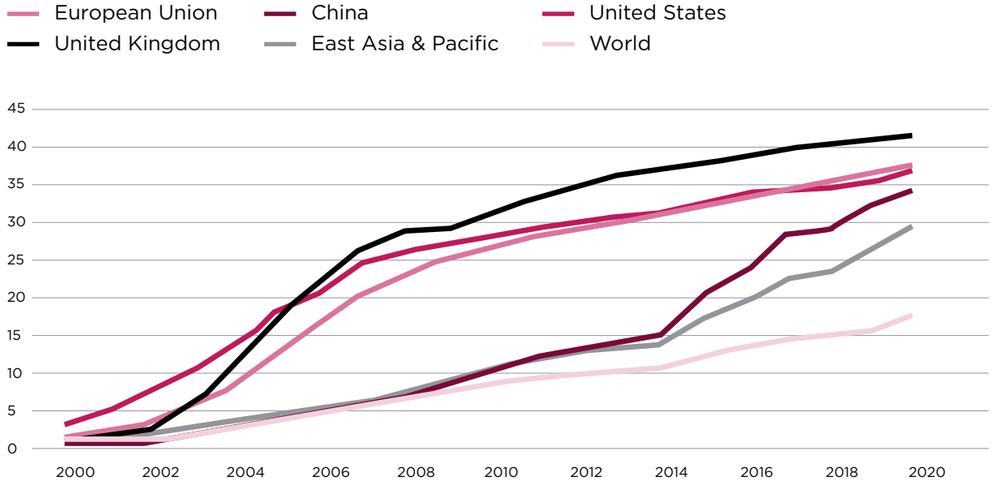
- **Development objectives in RTAs**. Specific policies targeting the development, trade, and financial needs of developing countries is necessary to mould RTAs into effective instruments for sustainable development. Policies touching on special- and differential-treatment issues to ensure country-specific development are necessary.

RTAs are effective instruments in extending the breadth and depth of trade liberalisation to areas not covered multilaterally, such as intellectual property rights, investment, and government procurement. Additionally, regional integration informs development strategy for many developing countries. Given this, developing policy coherence between multilateralism in cross-border trade and deeper regionalism is a major challenge and opportunity to be addressed by countries, their regional organisations, and the WTO.

[44] https://www.worldstopexports.com/chinas-top-import-partners/

FIGURE 11

Fixed broadband subscriptions (per 100 people)



New and diverse forms of multilateralism

Increased fragmentation in global supply chains, increased digital connectivity, and growing environmental volatility are likely to mean that local disruptions have unpredictable wider impacts. Digital ties and coordination of such systems simply accelerate the transmission of shocks (Reeves and Varadarajan, 2020). The management of global value chains, too, has contributed to the risk of costly disruptions. The governance of such networks has focused on social and strategic mechanisms (Kano et al., 2020). Value chains have increasingly been managed with a view to anticipating adverse shocks and coordinating effectively in response to them.

A new multilateralism in trade is likely to be characterised by:

- **Deeper digitalisation**. Looking ahead, a key question is the way in which digitalisation will reinforce multilateralism, and particularly the degree to which digital and information gaps will be covered by policymakers and the private sector in coordination with each other. A recalibration in globalisation towards exponential growth in digital exchange could bring about a more equitable and inclusive global economy (OECD, 2017). Globalisation has already been undergoing a transformation (through digital depth (***Figure 11***) that will address some of its perceived failings and yield a new multilateralism. This could occur through increased transparency, information exchange, and technological innovations that enhance connectivity.

- **Greater regionalism**. This will have significant implications for foreign direct investment (FDI) and could perpetuate recent weaknesses. The likely reductions in

interregional knowledge and cross-border FDI flows would correspond with increases in intraregional flows. A move to a more regionally based international economy offers the possibility of a better balance of national and international interests, helping to counter growing populism, nationalism, and protectionism. Although regionalisation may lower global welfare by reducing the scale of production and raising costs versus multilateralism, emerging technologies could be used to increase resilience and maintain efficiency. Global supply chains might be physically shorter, but regional specialisation would increase.

- **Re-shoring and near-shoring**. Moving production home, or nearby, is likely to continue at a modest pace and has largely been limited to specific sectors.[45] Global trading hubs, including China, Germany, and the United States, are likely to dominate (Enderwick and Buckley, 2020).[46] Cross-border investment and trade will become increasingly market-seeking (expanding market share) rather than efficiency-seeking (driven by low-costs).[47] Vertical FDI, i.e. expanding existing projects, will be complemented by growing horizontal investment, or expanding by buying existing projects. Increased competition for FDI means there will be a need for effective regional coordination, investment promotion, and targeted industrial policy aimed at economic diversification. The higher efficiency costs of increased regionalisation and re-shoring must be offset against the opportunities to create a more inclusive and equitable global trading system.

Cross-border investment to become **increasingly market-seeking** rather than efficiency-seeking.

[45] https://www.europarl.europa.eu/RegData/etudes/STUD/2021/653626/EXPO_STU(2021)653626_EN.pdf

[46] Survey evidence by Kearney indicates that there is a growing willingness for reshoring back to the US by American companies, driven by manufacturers placing higher importance on supply chain resilience when compared to cost considerations: https://www.kearney.com/operations-performance-transformation/us-reshoring-index.

[47] Market-seeking foreign direct investment is driven by an interest in serving domestic or regional markets. Efficiency-seeking investment denotes investment that seeks to benefit from competitive factors in international markets (Fruman, 2016).

China in a new multilateralism

As China's expansionary Belt and Road Initiative (BRI) projects pick up again over the next few years, they could constitute a new framing for the BRI,[48] with a sequence of projects that will be more sustainable, and green, in nature. Rebounding post-COVID-19 economics and trade are likely to help mobilise and channel finance into sustainable initiatives. It could be that in the short-term, some infrastructure projects will be put on hold. Despite this, the longer-term outlook is still likely to be characterised by China's outbound investment projects, both regionally and internationally.

Asian infrastructure and connectivity projects will find themselves at the intersection of competition and cooperation between China and other investor economies. Illustrative of this is Japan, that has decades of experience in infrastructural investment (Hong, 2018). It is an economy that is well-known for high standards in infrastructure development, transparency, and its willingness to cancel loans to smaller nations in need (Kriss and Marcelo, 2021). Japan's interventions could prove to be an important and reliable alternative to China's when it comes to asserting its presence in cross-border investment and trade.

China-centred global growth will continue as a key theme. If post-pandemic globalisation accelerates, it is possible that the United States may reject it, while China continues to embrace it (given the huge growth benefits China has enjoyed). A more China-centric focus is likely to emerge in Beijing, underpinned by an acceleration of the Belt and Road Initiative. This could occur in the light of the growing concentration of political power and centrality in decision-making within China's Central Communist Party.

US regionalisation is occurring as it seeks to decouple from China in certain sectors (Joshi, 2020). This has manifested in a number of ways, including by limiting access to assets such as technology and the ability to finance market access. As with a number of other economies, these initiatives are framed as a means through which the United States aims to safeguard its national security, also reflecting US-China tensions. A number of countries have broadened their interpretation of critical assets and infrastructure, effectively ruling out any further foreign investment in certain sectors (OECD, 2020).[49]

China could fuel "chained globalisation". Chinese firms will expand their operations in East Asia, where producers of intermediate products will then bolster Chinese manufacturing (Farrell and Newman, 2020). New trade agreements, such as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership and the Regional Comprehensive Economic Partnership, offer future potential for the region as a counterbalance to (already established) institutions. Despite being the engine of growth for the East Asia region, China faces a challenge that other regional members do not: how to balance interregional sales to markets, including the United States and Europe, with growing intraregional production systems.

As a counterbalance to the East Asia region, the United States has already reinstated its trade agreement with Mexico and Canada, offering access to complementary resources, including raw materials. Asia

[48] https://www.china-briefing.com/news/the-green-belt-and-road-initiative/

[49] The implementation of tariffs across a wide range of sectors implies a deeper level of uncoupling.

leads in digitalisation and the region is likely to couple innovation with labour-intensive and Industry 4.0 tech-driven production. The North America region will see private-sector innovation-based growth (based, in part, on more diversified forms of funding).

Other nations – including India, the United Kingdom and Japan – could play a decisive role in shaping the multilateral world order. India may provide an alternative to China for the production of such goods as pharmaceuticals, auto parts, and possibly electronics (Govindarajan and Bagla, 2020). The position of the United Kingdom in a global economy that may be moving towards greater regionalisation would need to be further strengthened by further bilateral trade deals.

Looking at the new trade order

Finance-led globalisation has been in transition since the 2008 financial crisis. An essential global relationship that helps, in part, to explain this change is the evolving and multifaceted US-China economic relationship, which is increasingly characterised by competition. In tandem with this, localisation and regionalisation have been filling gaps inherent in the global economy as it has retreated (Wang and Sun, 2021).

Indeed, we may be facing a multi-polar world dominated by three large regions: North America, Europe, and a China-centric Asia. There are three catalysts for this:

A multi-polar world may be dominated by **North America**, **Europe** and a **China-centric Asia**.

1 THE US-CHINA TRADE RELATIONSHIP

After both countries weathered the financial crisis, the United States and China became increasingly competitive. China's domestic economic reforms and growing ambition in global economic governance were among several factors to drive this. After he consolidated and centralised power within China's political system, President Xi Jinping was more confident and capable in carrying out substantial reforms in both the domestic and international domain.

- Domestically, China's administration has clearly aimed to change China's growth model to one driven by domestic consumption and innovation, instead of inexpensive exports and low-efficiency investments. Not only has China demonstrated its plan to steer away from labour-intensive industries to high-tech manufacturing, it has also showed its ambitions by releasing the national blueprint "Made in China 2025",[50] which highlights that China aims to be a world leader in scientific and technological innovation by 2050.

- China has increasingly become a proactive participant in global economic governance. The trade- and investment-expanding Belt and Road Initiative and China's founding of the Asian Infrastructure Investment Bank to fund infrastructural projects across multiple countries are clear examples. Of particular importance for the nature of cross-border trade will be the degree to which both institutions are used as a complement to institutions such as World Bank and the International Monetary Fund, or, more likely, used as a counterweight to the largely US-dominated order of financial and economic governance.

- China's upgrading from labour-intensive exports to more capital- and technology-intensive products has brought it into more direct competition with advanced and industrialised economies. China's increasingly sophisticated trade structure has meant that China's complementarity with industrialised countries (the United States, Japan, and Germany) has been diminishing. Conversely, competition with newly industrialising economies (India and Indonesia) and resource countries (Australia and Russia) has been decreasing.[51]

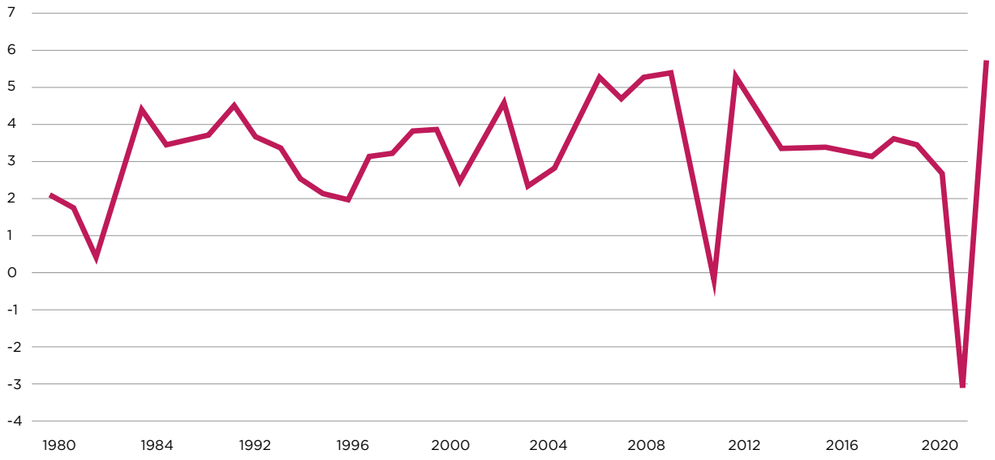
China aims to lead **scientific and technology innovation** by 2050

[50] https://english.www.gov.cn/2016special/madeinchina2025/
[51] https://www.rieti.go.jp/en/china/13060502.html

FIGURE 12

Global GDP growth

ANNUAL PERCENTAGE CHANGE



2 GLOBAL PRODUCTION MECHANISMS

- Economic globalisation has been, to a great degree, driven by complex transnational global value chain (GVC) activities,[52] the share of which grew faster than that of traditional and simple GVCs. The 2008 financial crisis was a watershed moment, accounting for a significant decline in GVC activities. After the decline of international trade in 2009, GVC activities took two years to return to the pre-crisis level, which aligned with the sharp V-shaped recovery of the global economy (***Figure 12***). After 2011, the relative importance of domestic production activities was increasing significantly, while traditional, simple, and complex GVCs were in decline.

- How GVCs change in the years ahead will underpin the political economy on which the global trading system is predicated – approximately 70 per cent of international trade involves GVCs.[53] It is likely that the increase in regionalism will translate into shorter, potentially simpler and more flexible value chains in countries' production processes. This will then mean that trade could become more regional in nature and in scope in certain sectors in the years ahead.

[52] https://iap.unido.org/articles/what-are-global-value-chains-and-why-do-they-matter

[53] https://www.oecd.org/trade/topics/global-value-chains-and-trade/

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54%

Share of the world's GDP **produced by countries occupying just 10%** of the world's land area

3 ECONOMIC HUBS

- Typically, the three major hubs of traditional trade are Germany, China, and the United States,[54] along with the links between them. Simple global value chain activities are, to a great extent, concentrated within each of the three regions, except for the United States' and Germany's indirect link through the Netherlands. Complex GVC activities, meanwhile, are more often found among regional trading partners, supporting the idea that while some aspects of globalisation are in retreat, localisation and regionalisation could become more dominant.

- New economic hubs will be formed in relation to a changing economic geography. This is likely to occur in lower- and lower-middle income emerging and developing economies. This owes to the fact that high-income regions are almost entirely concentrated in temperate zones. Additionally, over half (54 per cent) of the world's GDP is produced by countries occupying just 10 per cent of the world's land area (Henderson et al., 2000). This concentration makes economic re-clustering likely.

[54] This can be arrived at through network analysis (see Huggins and Thompson, 2017, for example).

SECTION THREE

NATIONALISM IN 2020s TRADE

From the start of the COVID-19 crisis in early 2020, there have been concerns around rising nationalism (Wang, 2021),[55] particularly when it comes to trade of the protectionist variety. The global pandemic and the response by governments in most countries have created an emergency on a scale like few other events in modern history.

[55] Nationalism is defined here as an ideology and set of practices that value membership in a nation more than belonging to other groups (Bieber, 2022). Nationalism here can also constitute de-globalisation, and the politics of fear.

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The response appears to make nationalism a salient solution as many populations look to support their own communities (ibid.).

Although liberalised trade has been the basic premise in the last 70 years, the pandemic reshaped trade policies in many countries. The reasons are both to ensure enough supply and to mitigate price increases in certain instances. The EU, for example, regardless of its common trade policy, allowed individual countries to introduce export limits in the special case of protecting health outcomes.[56]

The rise of exclusionary nationalism might not be the inevitable consequence of the pandemic. It has, in some cases, reinforced pre-existing nationalist dynamics (Bieber, 2022). The recent trajectory of nationalism can be seen in governments suspending or reducing citizens' mobility, in the rise of biases against some groups perceived to be associated with the pandemic, in the strengthening of borders, and in the push for de-globalisation.

Turning to protectionist policies will ultimately not prove beneficial. Turning inwards will not help tackle health crises and will exacerbate the generally weaker economic and financial state of emerging and developing trading economies. Ultimately, more protectionism will hinder the collaborative spirit that the human race will need to defeat the COVID-19 crisis – as well as future crises and shocks (Baldwin and Evenett, 2020). Trade is not a part of the problem – it is an essential part of the solution (ibid.).

[56] https://www.europarl.europa.eu/factsheets/en/sheet/38/free-movement-of-goods

Looking ahead, protectionism and nationalism could impact the trade and investment landscape in the following ways:

- **The erosion of a global rules-based trade mechanism does not augur well**. But the new economic order will nonetheless be defined by standard-setting that pertains to cutting-edge technologies. China is using all the levers of industrial policy to gain technological primacy in areas such as AI and quantum computing.

- **There is likely to be greater control of foreign direct investment**. This will be alongside heightened oversight and regulation of some types of cross-border investment. Several governments, including those of the United States, Australia, and Japan,[57] have tightened their screening of FDI.[58] 2020 was a record year for FDI restrictions; 50 new measures were approved globally compared to the 21 measures recorded in 2019.[59] The COVID-19 crisis and its associated economic scarring weakened companies in strategic sectors at risk of foreign takeover.

- **Domestic economic security could form the overriding policy agenda**. This is particularly likely in economies that have rapidly liberalised or have been subject to increased downside risks. Governments are likely to expand their toolkit to restrict trade and investment flows in order to focus on risk mitigation and the management of shocks and volatility – particularly when it comes to commodity price (and financial market) volatility, given the direct pathways to growth.

FDI restrictions **more than doubled** with the COVID-19 crisis

[57] https://www.mofo.com/resources/insights/200522-japan-restrictions-foreign-investment.html
[58] https://www.investmentmonitor.ai/analysis/top-fdi-locations-continue-to-tighten-their-screening-regulations
[59] https://unctad.org/system/files/official-document/wir2021_en.pdf

Nationalism and protectionism will not hinder trade

Looking ahead, intermittent nationalism is likely to continue and be seen in different areas. It is unclear whether the world will continue to be confronted with what some have termed "coronationalism" (Ozkirimli, 2020) or whether a renewed global solidarity will be an offset.

Ultimately, however, nationalism will not hinder cross-border trade to a significant degree, given that the significant economic costs of protectionism are not sustainable in the long term. Mitigating factors for the rise in protectionist tendencies are likely to increase, particularly as the global economy stages a recovery, albeit a moderate and uneven one.

Mitigating factors against nationalism could include the following:

- **Self-sufficient production and import-substitution are vulnerable to shocks** (Bonadio et al., 2021). In an analysis of 64 countries, the drop in economic activity from the pandemic was just as large (and in some cases larger, at 30 per cent) when supply chains were renationalised. The shift to available domestic goods did not increase resilience; the domestic economy was also affected by lockdowns. In addition, localised production is more vulnerable to shocks, because it takes on most of the pressure from crises.

- **Nationalist economic policies bring lower levels of economic activity and income**. An exploration of two versions of the global economy – whereby, firstly, there is production fragmentation in global value chains, and, secondly, where production is more localised (and businesses and consumers rely less on foreign suppliers) – unambiguously highlighted the benefits of trade. The findings were that localised systems (with less trade, less fragmentation of production, and fewer interconnections, i.e., less internationalisation) are characterised by significantly lower levels of economic activity and incomes.

- **Re-localisation results in less efficiency and less stability on a global level**. International (fragmented) production is exposed to country-specific and sector-generic shocks – as in the case of the COVID-19 pandemic – but the impact of the pandemic is more negative for GDP, consumption, and production when production is localised. The shift towards a localised regime would reduce welfare and global real GDP by more than 5 per cent, on average (Arriola et al., 2020).

Looking ahead to the outlook for trade, there is an important distinction between risk management and protectionist decoupling. When international companies map out their business strategies, they must factor in heightened risks – protectionism, national security controls, and economic lockdowns.

[60] This analysis includes 64 countries and 33 sectors to calculate the economic effect of the COVID-19 pandemic (Bonadio et al., 2021).
[61] These scenarios correspond to simulations in the OECD METRO model: https://www.oecd.org/trade/topics/metro-trade-model/

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SECTION FOUR

THE POLITICS OF SUPPLY CHAINS

A defining characteristic of the COVID-19 crisis has been the disruption to global supply chains: 94 per cent of Fortune 1000 companies reported experiencing supply-chain disruptions from the crisis, with approximately three quarters reporting negative or strongly negative impacts.

The response from multiple firms was that a continued disproportionate reliance on foreign suppliers (particularly to source basic inputs) was imprudent and that a switch to local supply networks was needed to manage risk.

Several factors – spanning the political, financial, and economic realms – are likely to shape how much supply chains now normalise, or at least see less, disruption than of late.

Since the COVID-19 crisis struck, entrenched practices, such as just-in-time delivery and lean manufacturing have prompted supply shortages in multiple sectors (including electronics, textiles, and manufacturing goods).

94%

Share of Fortune 1000 companies reporting **supply-chain disruption** from the pandemic

[55] Nationalism is defined here as an ideology and set of practices that value membership in a nation more than belonging to other groups (Bieber, 2022). Nationalism here can also constitute de-globalisation, and the politics of fear.

[56] https://www.europarl.europa.eu/factsheets/en/sheet/38/free-movement-of-goods

Core economic drivers behind normalisation and resilience in global value chains:

- **The changing role of automation in production processes**. Global supply chains are likely to continue to change. Automation and digitalisation play a key role and make reshoring (bringing manufacturing home) easier. For GVCs to change their geographical scope and move manufacturing closer to the point of consumption is a matter not only of responding to recent disruptions but also of using new technologies to exercise more management, strategy, and foresight.

- **Demand forecasting will strengthen GVCs**. The role of machine learning is important when it comes to forecasting. Machine-learning tools can pick changes in retail trends in a short timeframe and swiftly adjust demand projections. Investing in in-house machine-learning capabilities will be important for supply-chain resilience (Belhadi et al., 2021). More broadly, investment in automation to bolster such technologies as the Internet of Things, cloud computing, and 5G, can make it possible to create new sources of data for forecasting.[64]

- **Greater risk management**. Activity in semiconductor supply chains can trigger a knock-on effect in a large number of prominent industries (Panwar et al., 2022). A well-prepared (downstream) firm in the semiconductor supply chain will experience only a 5 per cent decline in sales due to a supply-chain disruption. In contrast, an unprepared company will suffer a 35 per cent decline, according to McKinsey Global Institute Analysis.[65] In this sense, a "well-prepared" company is defined as one that does dual sourcing and increases supplier resiliency. Many organisations (62 per cent) now say increasing supply-chain resilience is a key priority.[66]

68%

Share of companies reported to be **diversifying their supplier base** (Capgemini 2020)

- **Organisations' expansion of their supplier base and manufacturing footprint**. The COVID-19 crisis has highlighted the risks inherent in supply chains that have been optimised for cost at the expense of resilience (Shih, 2020). The focus on cost has meant organisations frequently relied on single sourcing or sourcing from specific geographies that offered cost advantages. Businesses will now have to expand their sourcing to make their networks more resilient: as many as 68 per cent of organisations in one study are now actively investing in diversifying their supplier base and 62 per cent are diversifying their manufacturing base (Capgemini, 2020).

- **Reshoring tends to be costly**. Most firms are tending to veer towards developing a more diversified supplier base (OECD, 2016) rather than reshoring, given that the process of doing the latter is too costly for capital-, knowledge-, or natural resource-intensive sectors.[67] Choosing a location is based on a unique blend of geographical and resource-based advantages, some of which are not easily replicated elsewhere (Sharma et al., 2004). This leads to other businesses trusting one foreign subsidiary to maintain supply, even when the pandemic hit (Ryan et al., 2022).

Looking ahead, the changing economic role of GVCs will be profoundly important in social, economic, and industrial development, both regionally and globally. They will continue to operate within expansive policy frameworks that include hard laws and soft laws (IGLP, 2016), including macroeconomic and FDI policies that are constantly being changed in response to shocks.

The role of the public sector will be important in normalising supply chains. Public-private relationships underwent a remarkable shift during the COVID-19 crisis (Gereffi, 2020), including governments acting as buyers of medical supplies and facilitators of local industry. Of particular importance in future is government support for unprecedented collaborations for R&D and innovation.

[64] Splice Machine, a San Francisco-based company, has created a predictive platform that follows a learn-predict-plan-and-act cycle to inform inventorying decisions.
[65] https://www.mckinsey.com/business-functions/sustainability/our-insights/could-climate-become-the-weak-link-in-your-supply-chain
[66] https://www.capgemini.com/wp-content/uploads/2020/11/Fast-forward_Report.pdf
[67] https://www.cips.org/supply-management/news/2020/august/report-highlights-1tn-cost-of-supply-chain-reshoring/

Geopolitics, and particularly the tendency of governments to prioritise economic independence in strategic products, could complicate traditional cross-border trading relationships in the years ahead. Supply chains will inevitably be reshaped as a result, and because of other factors, including rapid digitalisation.

Technology companies, manufacturers, automakers, life sciences companies, and renewable-energy companies will generate – and be most affected by – feedback loops generated by these policy and geopolitical dynamics.

Geopolitical dynamics will continue to be felt within cross-border trading relationships through such factors as asset prices (including oil prices and exchange rates), as well as in real economic activity and changes in trade policy and shifts to regional trading priorities at the expense (at times) of globalisation.

Key takeaways

1. The global political landscape is likely to be shaped by key global pivots in 2022 and beyond: these will likely include the politics and economic pathways of a slowing China, oil at elevated levels, and the potential for disorderly debt dynamics.
2. Slower growth in China, and the politics of this, as well as oil price and emerging market debt dynamics, could signal new paradigms that have implications for trade and investment.
3. The global economic and political landscape will shift considerably with implications for global cross-border trade and investment. Middle powers'[68] growing economic clout will boost regionalism through emerging trade agreements.
4. A new multilateralism is also likely to take hold. Old forms of multilateralism will fade, while new forms, such as increased regionalism, will drive cross-border trade in new sectors.
5. In this context cross-border investment and trade could become increasingly geared to "ally-shoring" rather than bilateral investment flows being efficiency-seeking and driven by cost considerations.
6. OPEC+ is critical for current global oil-price stability. Concerns over declining spare capacity could add to the inflationary oil price shock, which has been linked to the current conflict in Ukraine.
7. As a result of the pandemic, global debt levels have surged. In 2020, total global debt reached 263 per cent of GDP, its highest level in half a century. Disorderly debt dynamics would limit debtor countries import demand.
8. More than half of low-income countries are in debt distress or at high risk of debt distress; some countries have already defaulted, while debt restructurings have been completed or are underway in some countries.

[68] Middle powers are thought of as countries that shape regional or global geopolitics in collaboration with others but lack the capabilities associated with superpowers (Chapnick, 1999).

Recommendations for businesses:

1. Much of the work in dealing with shocks means being prepared for them. To ensure robust, resilient production, risk management and production models should shift from just-in-time systems to having a greater focus on long-term strategic considerations and effective partnerships.
2. Firms should further combine the advantages of sourcing domestic inputs to production with the opportunities offered by offshoring and international trade; an overarching policy objective should be grounded in domestic economic diversification for sustainability.
3. Firms should upgrade investment in, and the promotion of, digital technologies that can improve information systems for risk management (such as with applications of the Internet of Things.); this would, in turn, help build response and forecasting mechanisms in relation to shocks.
4. Amid new forms of multilateralism, and an increased trend to regionalism, firms should both diversify supplier connections and utilise and further build long-term relationships. The latter are typically associated with increased firm resilience and faster recovery after shocks.

Recommendations for governments:

1. Governments should elevate economic diversification within policy agendas, to both build resilience against shocks, and to promote sustainable growth over the long term and strength in cross-border trade.
2. In the light of the shift to "ally-shoring" by some policymakers, governments should not lose sight of the benefits of trade liberalisation in the promotion of stronger and broader-based growth.
3. The prospect of unsustainable debt dynamics means that governments should build financial buffers in key sectors with a view to protecting affordable trade finance. Targeted stress tests should also be put in place, including for supply chains.
4. China's economic slowdown is likely to be felt both regionally and globally. In order to ensure continued and durable investment and trade growth, policymakers need to continue to diversify their trade relationships through emerging trade deals.

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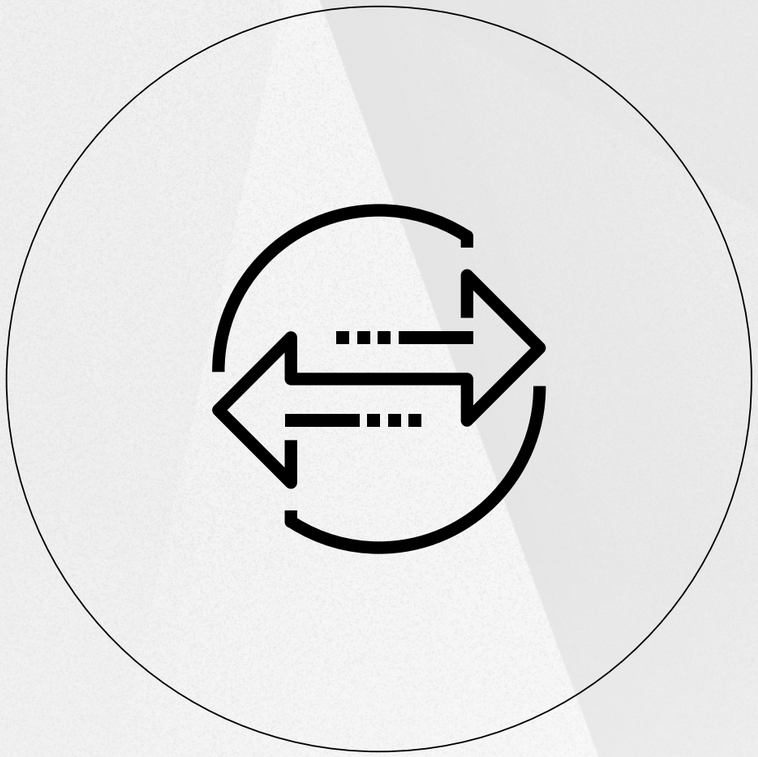


CHAPTER III

TECHNOLOGY AND THE FUTURE OF TRADE

CHAPTER III: Technology and the Future of Trade

Technology will offer opportunities for countries to **diversify their supplier base** and reduce dependence on traditional hubs

The COVID-19 crisis has underscored the value of digital networks as a means of connecting during crises and unexpected shocks. They are and will continue to be of primary importance to global trade: the increase in scalable digital tools and technologies to promote broader connectivity will be essential. Digital expansion and transformation will promote the prospects for structural economic growth, make old modes of trade and business easier, and enable the creation of entirely new ways of trading (Ciurak and Ptashkina, 2018).

Trade liberalisation and digital transformation will continue to be defining meeting points for policymakers, government, and the private sector. To start, trade openness leads to productivity gains at the company level (Perla et al., 2015). This applies both when scaling up existing technology and when adopting new technology.

Open trade increases the spread of profits via increased export opportunities and foreign competition, induces more rapid technology adoption, and generates faster growth (ibid.). Trade-induced productivity effects are widely documented, particularly at the company level (Holmes and Schmitz, 2010; Pavcnik, 2002).

Countries seeking to reduce their dependence on traditional hubs could use technology to diversify their supplier base. Technology will continue to offer opportunities to restructure supply lines (as an example, frontier technologies, such as 3D printing, will facilitate reshoring and/or providing complementary supply sources). New technologies may also prompt companies to seek greater internal flexibility, including work practices and the use of virtual technology, transient outsourcing, and pop-up enterprises, also known as asset-light strategies (Casella and Formenti, 2018).

SECTION ONE

IMPLICATIONS OF TECHNOLOGY FOR THE GLOBAL TRADE OUTLOOK

Transparent, compatible, and connective trade networks will continue to be supported by a spectrum of new and innovative digital technologies. Just as with the COVID-19 crisis, the likelihood of economic and political shocks will continue to underscore the value of digital technology.

For example, the widespread use of blockchain platforms could facilitate the integration of disparate networks.

The spectrum of developed and scalable tools and digital technologies will continue to be a core driving factor for trade. Opening up to cross-border trade typically increases profits and market depth and breadth by increasing export opportunities; it induces more rapid technology adoption and generates faster growth (Perla et al., 2015).[69]

Trade and technology: a self-reinforcing cycle

A company's incentive to adopt technology depends on two competing forces: the expected benefit and the cost.

Open trade and technology will create a self-reinforcing cycle in the years ahead. Trade-technology drivers are likely to include the following:

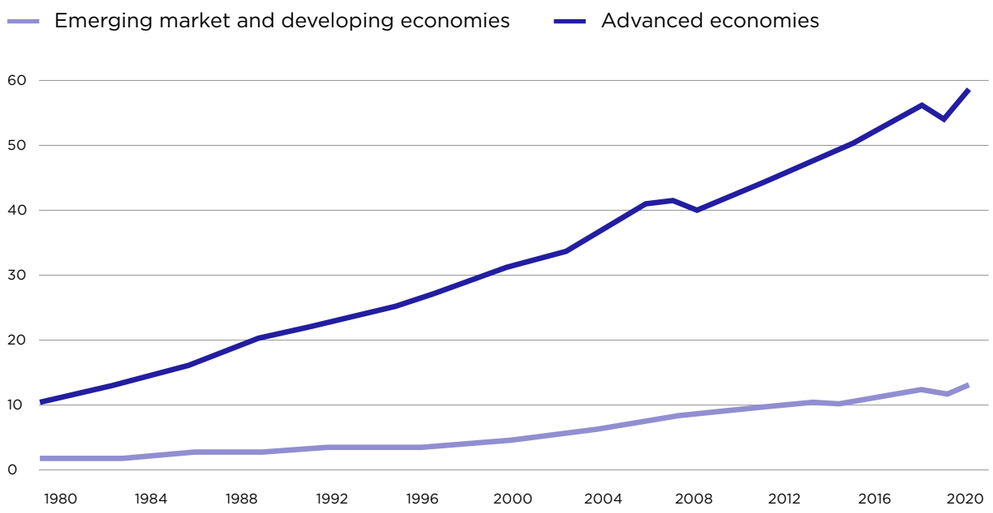
- Blockchain technology could further improve efficiency and market access. Blockchain technologies are helping to maintain the operation of key sectors primarily through easier cash-flow management and by ensuring payment systems are functioning. Blockchain technologies have the potential to be disruptive features in areas such as market penetration and tackling competition barriers, particularly in the energy sector (Andoni et al., 2019).

[69] There are welfare effects in this analysis linked to the loss of variety and reallocation of labour away from production.

FIGURE 13

A multidecade view of productivity

GROSS DOMESTIC PRODUCT PER CAPITA, CURRENT PRICES



- **Trade openness will influence the spread of technology and the growth of economies**. There are significant reallocation effects of trade liberalisation (low-productivity firms exit, high-productivity exporting firms expand). On the whole, trade leads to faster productivity gains. The pace of productivity gains accelerated in both emerging and developed economies as trade liberalisation increased, at, or just following the start of the '00s (***Figures 13 and 14***). In both the Euro area (19) and the United States, productivity growth was 10 and 8 per cent respectively between 2000 and 2006.[70] In emerging economies, trade liberalisation has spurred productivity and innovation (Shu and Steinwender, 2019).

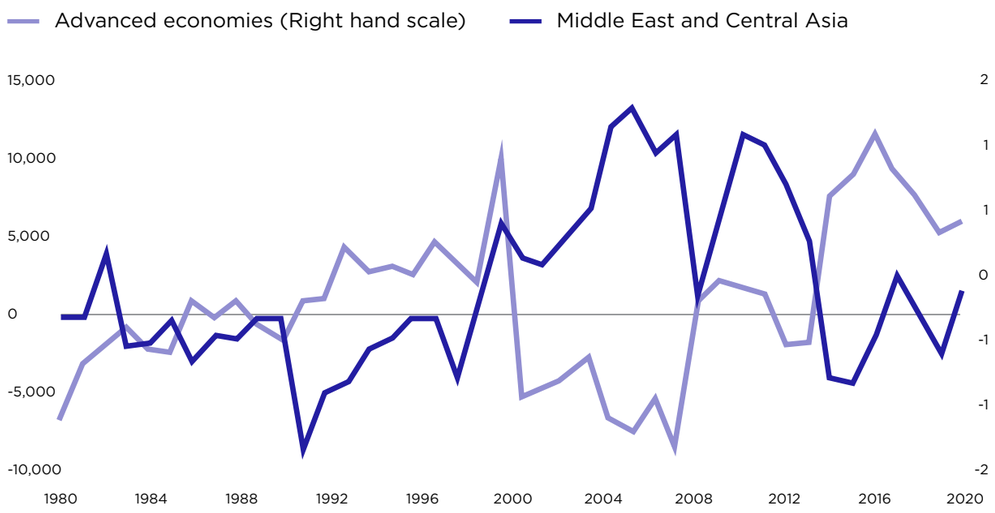
- **Increasing technology R&D ensures gains from trade**. R&D subsidies have tended to be effective as a policy response to foreign competition, particularly set against the raising of trade barriers (Egli and Westermann, 2003). R&D subsidies help national firms compete without giving up gains from trade. Optimal trade policy crucially depends on maintaining export markets and boosting productivity; R&D subsidies lead to welfare gains owing to accelerated domestic innovation in intermediate goods production (Akcigit et al., 2018).

[70] Estimates are taken the Organisation for Economic Co-operation and Development (OECD) database.

FIGURE 14

A multidecade view of productivity

GROSS DOMESTIC PRODUCT PER CAPITA, CURRENT PRICES



Looking to future pathways between digital technology and trade

The next generation of digital technologies stands to reshape trade in multifaceted and unprecedented ways. Digital innovations will have both a more varied and complex effect on trade in the years ahead (Lund and Bughin, 2019). Specific developments pertaining to digital platforms, blockchain, and the Internet of Things will continue to reduce transaction and logistics costs, thereby supporting trade (WTO, 2018).

The full impact of new technologies, in their entirety, is still unclear. Some technologies may reduce trade flows by changing the economics and location of production. New digital technologies could also dampen goods trade, while, instead, increasing trade in services and cross-border data exchange, as found in previous research (Freund and Weinhold, 2002).

The following sections outline recent developments in core digital technologies and the degree to which digital skills development and digital infrastructure will feed through to cross-border trade.

Blockchain technology will continue to be of benefit for cross-border trade.

Given its broad capacity for data recording in a secure and encrypted digital format through providing real-time information on transactions between different parties, blockchain use in the global financial system has grown. It has spread from its application in the crypto-currency sector to a broader range of activities,[71] including some that are directly or indirectly related to foreign trade.

When it comes to trade, blockchain makes goods traceable, guarantees the security of payments and financing, facilitates the verification of digital quality and origin certifications, enables real-time sharing of information at different stages of trade, and helps improve how related public and private services operate.

Crucially, blockchain can both simplify and increase cross-border trade, contribute to competitive improvements, and help reduce transaction costs. This will continue to be the case in complex areas such as logistics, transportation, customs, financing, and administrative procedures between companies.

Innovative uses of blockchain in the next few years:

- Blockchain-based trade finance will continue to increase and grow in importance for developing and emerging economies. This will, in turn, help unlock access to blockchain finance, particularly in Africa (Benjelloun, 2021).
- An illustration of the success of blockchain-based trade finance can be found with emergent innovative firms; Consensys handles and has unlocked billions of dollars in digital assets through global blockchain technology; Hyperledger has revolutionised program management for open source blockchain projects.
- Blockchain will improve trade by solving existing problems efficiently (faster implementation) and satisfying the core need for trust. The technology continues to make inroads in global supply chains, providing lower transaction costs, easier customs clearance, more efficient delivery, and increased exports.
- Blockchain has brought about a reduction of up to 80 per cent in data entry requirements (Ganne, 2018), which has, in turn, supported trade facilitation. This will have the knock-on effect of allowing for greater depth and breadth in markets as smaller participants are able to enter the market at lower cost. Smaller emerging and open economies will continue to see aggregate benefits (ADB, 2020).
- As well as reducing transaction times, blockchain commissions are lower and without maximum limits, which is especially advantageous for exporting SMEs and other entities that would normally not have affordable access (OECD, 2021).[72]
- Blockchain technology allows for traceability; the ability to accurately track cross-border shipments is crucial to the verifiability of standards and certifications, as well as the reliability and timeliness of delivery (UNECE, 2020).

[71] https://blogs.iadb.org/integration-trade/en/blockchain-technology-a-new-opportunity-for-international-trade/

[72] This includes, for example, access to finance for smallholder farmers without bank accounts.

At its core, the widespread adoption of digital technology is intimately linked with economic transformation, which brings a multitude of challenges. Chief among these challenges is acquiring and building the investment and mechanisms required to adopt and scale a new technology. Implementing a new technology, integrating it with existing systems, and maintaining blockchain technology infrastructure over time all require significant investments for countries with limited resources (Choi et al., 2020).

As this disruptive technology continues to mature, blockchain will penetrate the economic infrastructure of trade in multiple ways through efficiency gains. The lack of interoperability with other systems, however, raises the risk that, because of diverse data formats and security protocols, trading partner countries may not be able to "speak" to each other. Additionally, as blockchain systems scale and add users, data transmission can slow (Casino et al., 2019). However, significant progress has been made, with companies, such as R3, creating computing platforms for direct multi-party applications and secure cross-institutional data sharing.[73]

Looking ahead, blockchain technologies will continue to streamline the ways in which organisations can track and verify the authenticity of trade documentation, reducing transaction time and cost. This is likely to yield specific benefits for micro, small and medium-sized businesses that have less administrative capacity and lower access to the working capital to weather payment delays. Blockchain will significantly help tackle bottlenecks to open trading as a viable option for a wider group of businesses, therefore driving inclusive growth.

Additive manufacturing offers a powerful impetus to trade

Recently, increasing attention has been paid to the growing role of additive manufacturing,[74] or 3D printing. These printing mechanisms play a similar role to those applying to automation more broadly. The direct trade effects of 3D printing can be trade-reducing, because they allow for easier domestic production (Freund et al., 2019). But 3D printing has, nonetheless, positive impacts on trade through both increased productivity and higher input demand (D'Aveni, 2015), with China's aviation industry an example of growing demand and application of the technology.[75]

There are also cost and environmental benefits to additive manufacturing, in that the process can reduce waste and energy use (Cook, 2020). Additive manufacturing will boost trade via:

- **Accelerated prototyping**. Additive manufacturing expedites product development by enabling the creation of prototypes that can be produced faster and at lower cost, compared with lengthier traditional production methods. Several prototypes can be printed before committing to production, leaving less room for error. Additionally, any changes to original specifications are made digitally, reducing the modification costs to achieve the desired result. This mechanism stands to continue to disrupt trade in manufacturing in a significant manner through faster product development (Rapid, 2021).

[73] https://www.r3.com/trust-technology/

[74] Additive manufacturing (AM) is defined here as the technological process of building 3D objects by adding substances to manufacture or create an object. AM uses computer-aided design (CAD) software to guide digital hardware that produces detailed geometric shapes. Through the deposit of layer upon layer of material, AM enables the creation of lighter, stronger parts and systems that bring digital flexibility and efficiency to manufacturing operations: https://additivemanufacturing.com/basics/.

[75] https://www.computerweekly.com/news/450419631/Chinas-aviation-industry-to-boost-demand-for-3D-printing

- **Customisation**. Manufacturing with 3D printers offers design innovation and creative freedom in product design. The ability to easily alter original designs means that AM offers greater opportunity for businesses to provide customised products, at different price points, to their clients. Product customisation becomes a simple and scalable proposition that harnesses both time sensitivity and economies of scale (Lacroix, 2021), thus boosting the scope for cross-border trade significantly.

- **Energy savings and environmental benefits**. 3D printing offers an advantage to businesses seeking to improve manufacturing sustainability – particularly in terms of waste reduction and energy savings. Additive manufacturing has less need for ancillary equipment and reduces the amount of raw material required for manufacturing, resulting in a lower environmental impact (Walter and Marcham, 2020) whilst presenting significant cost savings.

Looking ahead, the scope for additive manufacturing to impact trade is likely to grow significantly by virtue of its capacity to create nearly any geometric form, to reduce the weight of an object while still maintaining stability, and to include flexibility in the production process. Additive manufacturing methods help reduce the number of component defects and improve part availability (Coro et al., 2019). It also allows manufacturers to print entire components with unprecedented precision. These technological innovations create new markets, and they will also continue to expand and facilitate domestic and cross-border market access for firms that are able to function efficiently and competitively.

Digital twin technology will boost cross-border trade

Digital twin technology – the ability to create a real-time virtual representation of a physical object – will enhance and shape cross-border trade in manufacturing at multiple levels.[76] It gives insights into the production process that, over the longer term, benefits trade, particularly in manufacturing sectors. It applies to distribution and the use of finished manufacturing products by customers throughout the entire life cycle of the product, as well as for the development of future goods.[77]

Survey data reveals that 13 per cent of organisations implementing Internet of Things projects – creating physical objects embedded with sensors, software, etc. – already use digital twin technology, while 62 per cent are either in the process of establishing it or plan to do so.[78]

The growing use of digital twin technology has been significant across several industries and sectors (Botin-Sanabria et al., 2022), particularly through cloud computing. By using a blend of cognitive technologies and computing in the testing phase of a product,[79] digital twins can determine which products companies should concentrate their efforts on and which products need to be phased out.

Digital twin technology impacts the future of trade through:

[76] https://www.networkworld.com/article/3280225/what-is-digital-twin-technology-and-why-it-matters.html
[77] At the component level, it is focused on a single, highly critical component within the manufacturing process. At the asset level, it creates a digital twin of a single piece of equipment within a production line. At the system level, it uses a digital twin to monitor and improve an entire production line. Finally, at the process level, digital technology looks at the entire manufacturing process – from product and process design and development, to manufacturing and production: https://slcontrols.com/benefits-of-industry-4-0/
[78] https://www.gartner.com/en/newsroom/press-releases/2019-02-20-gartner-survey-reveals-digital-twins-are-entering-mai
[79] https://www.ibm.com/topics/what-is-a-digital-twin

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- **Access to a detailed, intricate view of a distant physical asset**. It enables stakeholders to foresee maintenance failures (through recreation models that capture risk factors). Digital twinning also helps companies develop innovations in manufacturing, R&D, supply-chain management, service, and logistics (Kersten et al., 2017). Some of the leading players in the digital twin sector are Oracle, General Electric, Microsoft, PTC, ANSYS, Siemens, IBM, and Dassault Systèmes.

- **Digital twinning allows for the safe removal of unnecessary products, functionality, or components**, saving time and resources.[80] Manufacturing companies are already using digital twins to augment industrial processes and offer better approaches to decrease costs, monitor assets, streamline maintenance, diminish downtime, and empower the making of connected products.[81] For instance, German packaging systems manufacturer Optima digitally maps and examines its transport system using digital twin technology developed by Siemens.

- **Offering sector-wide benefits**. In the automotive sector, a digital twin can enable the convergence of existing gaps between physical and virtual versions of product prototypes, shop-floor production, and the actual vehicle on the road. Companies are also using it for predictive maintenance by identifying deviations and anomalies in company operations.

Digital twin technology will change and mature, producing outputs that are increasingly fine-tuned and valuable. This will increase the reliability of equipment and production lines and have knock-on effects in the form of improved productivity, reduced risk, and lower maintenance costs (through predictive analysis on maintenance issues). Faster production times and new business opportunities will be paradigm-shifting for global trade.

[80] https://www.ascm.org/ascm-insights/scm-now-impact/real-benefits-from-digital-twins/
[81] https://www.analyticsinsight.net/understanding-the-importance-of-digital-twin-and-its-applications/

Interview: **Craig Burchell**
Senior Vice-President of Global Trade Affairs, Huawei

Craig Burchell is a trade lawyer with 30 years' experience advising governments and stakeholders around the world on law, business, and policy in the technology sector. Craig is a selected member of the B20/G20 Trade & Investment Global Task Force, the WEF Advisory Board on Digital FDI, the OECD-EMNet Advisory Group, and the International Expert's Group on the WTO's Investment Facilitation Agreement.

Which technology will have the greatest impact on driving growth in global trade over the next five years?

I believe digital power and intelligent power clouds will have the greatest impact in the coming years. We are facing a future with twin transitions; digital and green. A bright green digital future if we manage it properly. Both will influence the evolution of supply chains tremendously. Consider data networks where electricity is 60 per cent of the total cost of ownership ("TCO") over 10 years. From 2016-20 data volume increased 30 per cent year on year. If that trend continues there will be a 14-fold increase over the next decade. So, reducing the footprint of data networks and international supply chains is a key issue. Huawei is pioneering network-wide energy management that enables operators and industry to reduce their carbon footprints as they embrace digital and green transformations. We expect that 3,000 GW of solar panels will be enough to power 80 per cent of ICT infrastructure in 2030.

So sustainable technologies are needed to ensure the increased data storage required to facilitate future trade flows, will not have as large an environmental impact?

Yes, and there is much more. Take DMCC in Dubai; the world's most interconnected free port, part of a global hub for trade and tourism made possible by UAE's visionary leadership investing in cutting edge 5G infrastructure, The Jumeirah Lakes district is a wonderful example of a digital modern whole port ecosystem. Supply chain nodes across the world can increase their competitiveness through digitalizing and hyper automating the entire port infrastructure with new technologies such as AI, IoT, 5G, autonomous in-port driving, automated loading / unloading. Green Sites, Green Equipment Room, and Green Data Center solutions all help save energy and reduce carbon emissions, and enable operators across the world to advance their own net-zero targets.

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Data volume may **increase 14-fold** over the next decade

The digital era envisioned by UAE's National Agenda and "Projects of the 50" is supported by UAE's Energy Strategy 2050 to transition to clean energy. Supply chain ecosystem nodes will increasingly switch to renewable energy sources such as solar. China's Qinghai province hosts the world's largest photovoltaic power plant, covering an area of more than 20 square kilometres and delivers clean energy to the east coast of China where some of the world's largest port ecosystems are located. In Ningxia Province, the world's largest agrivoltaic plant, adds 3.8 billion kilowatts of electricity to the national grid. Both are built on Huawei cutting edge photovoltaic technology.

The COVID-19 pandemic increased the uptake of digitalisation. How will this impact the Future of Trade?

Greater working from home certainly accelerated the adoption of many new digital applications and brought digitalisation forward by several years. As economies recover after COVID-19, we can expect to see an evolution to digital smart and sustainable supply chains. Digitalisation will open up new export opportunities for companies benefitting from high-speed broadband networks and good connectivity. Certain countries are working on implementing bilateral digital corridors; A pioneering example is the new Singapore-UK Digital Economy agreement, and I believe this sort of bilateral collaboration will become more common, especially across the Middle East and South East Asia as trade volumes pick up.

“...digitalisation could enable over 350 million businesses to export goods and services”

How will digitalisation impact the Future of Trade?

DMCC findings suggest digitalisation could enable over 350 million more businesses to export goods and services through digital commerce, boosting global trade significantly. UAE leaders plan to increase investment in ICT infrastructure by 8 per cent each year to reach US$23 billion by 2024. With this they aim to make UAE a global testbed for advanced technologies and innovation. In my estimation, two examples of digitalisation that will have a great impact on the Future of Trade are: “Smart Ports” and “All-digital transactions”

Ningbo-Zhoushan Port, near Shanghai has ranked No1 in the world for 13 consecutive years. It has the World’s No 1 Private 5G Network which contributed to Ningbo handling 1.22 billion tonnes of cargo in 2021. Ningbo Port has invested heavily in Smart Port digitalisation with fully integrated solutions involving 5G, AI, IoT, energy, power and other new technologies. This has improved competitiveness and energy efficiency through high-speed, high-capacity real time 5G networks for remote control, HD video, automated driving, high-precision positioning and others. Gantry cranes are remotely controlled though high-speed cloud technology. Over 120 5G Smart trucks auto-navigate the port. 5G tugboat piloting increased turnover by 10 per cent, and berthing efficiency by 70 per cent. Ningbo Port digitalisation is built on a Huawei’s cutting edge advanced private 5G network and SmartPort solution specially designed for the port scenario.

“All-digital transactions” is a low-cost / high return investment that can unlock multi-million US dollars of value. Global Container Shipping generates 28.5 billion bills of lading a year globally but only 0.1 per cent are electronic. Digitalising the supply chain ecosystem could increase physical trade values by nearly 14 per cent, reduce trade related business costs by 80 per cent over 5 years, cut trade financing costs 70 per cent, reduce cross-border compliance cost by 80 per cent and processing times by 75 per cent. All together transaction costs could fall to 0.7 per cent of total trade (from the current 3 per cent). This would create an enormous amount of value. These are findings are from new independent research conducted for Huawei and ICC to support a project for a “Modern Digital Trade Ecosystem”.

Could data localisation increase in the future, reducing data sharing across borders and these potential gains?

The key question for me is access rights to data and how this is regulated. I do not believe the so-called “data localisation” issue will be of the magnitude or difficulty that many say it will be. Especially when looked at in the wider context and when you factor in the gains from advanced cloud infrastructure, on fast 5G data networks. Broadly speaking there are three approaches to data management. For convenience they might be called US, European and China approaches. The key to resolving differences and creating business certainty is convergence wherever possible on digital ecosystem governance and to embrace co-existence and interoperability where convergence is not possible.

How do you see US-China tensions evolving over the next five years? Do you believe there will be decoupling in certain sectors?

Evidence suggests they will have only a modest impact overall on the Future of Trade. Data for 2021 shows US-China trade rebounded in 2021 to surpass its pre-pandemic levels. The data on 2021 trade volumes also shows very little evidence of regionalisation and that globalisation involving long-distance supply chains is continuing strongly. Globalisation is far from dead in my view; it is evolving again.

Decoupling is not the best way forward because it leads to wasted resources, global inefficiencies, less choice, more expensive devices, and limits the sharing of technology for all. Having said that, there are signs of decoupling in advanced technologies. The answer is more global collaboration to build a global digital ecosystem based on common global standards. The next generation of data networks, 6G, will only achieve its full potential with 6G unified global standards. That should be the priority focus, not talk of decoupling.

SECTION TWO

DIGITAL ENABLERS FOR COMPETITIVENESS AND RECOVERY

Digital trade is increasingly important for trade – particularly when it comes to the promotion of productivity and competition. In broad terms, digital trade comprises both digitally ordered trade in goods and services, i.e., cross-border e-commerce, and digitally-delivered trade (services delivered internationally through the internet or other networks).[82]

[82] Digital trade is defined here as "all trade that is digitally ordered and/or digitally delivered". Under this definition, digitally delivered trade is "international transactions that are delivered remotely in an electronic format, using computer networks" and digitally ordered trade is "the international sale or purchase of a good or service, conducted over computer networks by methods specifically designed for the purpose of receiving or placing orders" (UNCTAD, 2022).

The former is a subset of e-commerce. In 2020, 24 per cent of firms received orders online and more than 40 per cent of firms placed orders online (UNCTAD, 2022).

Upgrades to digital depth and connectivity in emerging and developing countries will be essential for the future of trade, particularly as they recover from the COVID-19 crisis. But countries, notably those in Asia, continue to vary in their economic readiness for digital trade (Asia House, 2022).

Progress in digital depth is key: in 2020, global services exports fell by 20 per cent compared with 2019, but exports of digitally deliverable services (those that can be delivered remotely) contracted by a comparatively muted 1.8 per cent.[83] Digital uptake varies by company size. On average, large firms are twice as likely to sell online compared with small firms. Meanwhile, an estimated 1.5 billion people (27 per cent of the global population aged 15 and older) shopped online in 2019. Within the OECD, the share of people shopping online increased by 5.2 per centage points in 2020 – the largest rise since records began in 2005.[84]

How digital trade builds resilience to trade shocks

- **Firms that engage in digital trade are more resilient to crises**, as seen during the COVID-19 pandemic. First, digital trade has increased the scale, scope, and speed of trade (López-González and Ferencz, 2018). Second, countries and firms engaged in digital trade appear to have been able to implement and cope with containment measures imposed to curtail the spread of the virus, such as physical-distancing policies, closures of schools and shops, and travel bans.

- **Digital trade can help offset some of the economic losses in traditional sectors as a result of COVID-19**. Using data from the 2020 World Bank Enterprise Survey of 23 countries, Banga and te Velde (2020) found a positive correlation between the per centage of firms in a country that have adopted a digital response to the crisis (increased online business activity) and the per centage of firms that have increased exports compared with the previous year (2019).[85]

[83] https://unctad.org/news/trade-data-2020-confirm-growing-importance-digital-technologies-during-covid-19

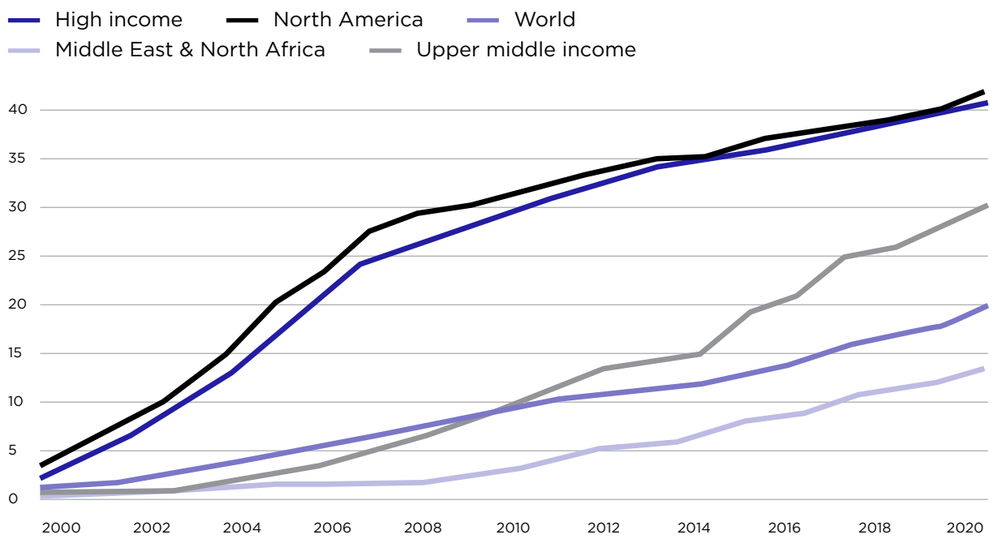
[84] https://www.statista.com/topics/871/online-shopping/#topicHeader__wrapper

[85] Moreover, using data from 1,182 firms across four African countries – Niger, Togo, Zambia, and Zimbabwe – the authors found that more than 70 per cent of firms with a digital response reported having adjusted or converted production.

FIGURE 15

The digital divide across high income and middle income economies

FIXED BROADBAND SUBSCRIPTIONS (PER 100 PEOPLE)



The ability to shift activities online and to engage in digital trade depends on a range of factors or digital enablers[86]

- Closing the digital divide. There exists a continued digital divide between high income and middle-income economies, in terms of access to and uptake of digital infrastructure and technologies (***Figure 15***). Lower income economies are even further behind in terms of their digital depth. Broader digital infrastructure, digital access, and funding digital-skills development (in e-commerce, mobile financial services, online payment systems, and trade logistics) are important areas to tackle in order to close the access gap.
- Fostering effective cross-border usage of data. Digital trade is underpinned by the cross-border exchange of data. Crucially, data serve multiple purposes. Not only can data be traded themselves, they also ease the route of digital trade. Data are at the core of new and rapidly growing business models around cloud computing, the Internet of Things, and 3D printing (Yang and Gu, 2021) In certain instances, geopolitical tensions may make cross-border use of data more difficult.
- E-commerce data availability. The availability of consistent e-commerce statistics is currently limited. Business-to-business transactions account for the bulk (82 per cent) of e-commerce (UNCTAD, 2022). However, the share that is international, and therefore forms part of digital trade, has not yet been determined (ibid.). Given this, there is a need to agree on measurement methods for cross-border e-commerce.
- The depth of use of robots. In terms of robot density, Singapore, Canada, and Australia are above the world average (of 74 units), with Singapore having the highest level by far, at 918 units per 10,000 employees in 2019. The electronics industry (particularly semiconductors) is the primary driver for industrial robots in Singapore. Some consumer electronics segments have also witnessed a positive demand shock from the COVID-19 crisis.[87]

[86] https://www.oecd.org/coronavirus/policy-responses/leveraging-digital-trade-to-fight-the-consequences-of-covid-19-f712f404/

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Looking ahead: Digital drivers for the post-COVID-19 recovery

Digital trade is increasingly seen as the key means to mitigate economic losses from the COVID-19 crisis and to help aid recovery from the pandemic. On the one hand, the pandemic has accelerated the scope of a digital-led recovery; on the other, the existing digital divide across (and within) countries has been exacerbated (Banga and Raga, 2021).

Supply-side shocks from the pandemic are illustrative. Information and communications technology (ICT) goods manufacturing suffered heavily from lockdowns, social-distancing policies, shortages of material inputs from trading partners, and border restrictions. The magnitude of the supply-side shock to ICT goods manufacturing is likely to be higher in some developing countries where finding substitutes for imports is difficult (ibid.).

- Digital transformation will reduce the costs of engaging in international trade, changing both how and what we trade, and contributing to growing competitiveness (Lopez-Gonazalez and Ferencz, 2018).
- Well-established policy areas, such as with trade facilitation, will be disrupted, but, equally, developed and streamlined with digitalisation. New issues such as cross-border data flows can, however, raise new challenges.
- More internet penetration leads to a greater degree of trade openness; on aggregate, a 10 per cent increase in bilateral digital connectivity raises goods trade by nearly 2 per cent and services trade by more than 3 per cent.[88]
- Digitalisation is important for all sectors, including agriculture, natural resources, and textiles; however, it is essential for exports in higher value-added manufacturing and digitally deliverable services.
- Digitalisation is also associated with countries drawing greater benefits from regional trade agreements (RTAs).[89] When combined with an RTA, a 10 per cent increase in digital connectivity gives rise to an additional 2.3 per cent growth in goods exports.[90]

[87] https://ifr.org/ifr-press-releases/news/robot-race-the-worlds-top-10-automated-countries
[88] https://www.oecd-ilibrary.org/sites/89a7542c-en/index.html?itemId=/content/component/89a7542c-en
[89] https://www.oecd.org/trade/topics/regional-trade-agreements/
[90] https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=TAD/TC/WP(2018)3/FINAL&docLanguage=En

Interview: **James Emmett**
Senior Advisor Digital Assets, Oliver Wyman

James Emmett is a seasoned advisor and executive within finance, technology, regulation, and law. He was previously Group General Manager of HSBC and CEO of the bank's Europe operations. James has also served on the UK's Payment Strategy Forum, the UK's International Trade & Industry Group, the Banking Commission of the International Chamber of Commerce, the WTO Expert Advisory Group on Trade Finance, and the B20 Trade & Investment group.

We have recently seen geopolitical disruption from Russia's invasion of Ukraine, including rising commodity prices. What impact will this have on the Future of Trade?

The regionalisation of trade is already a trend and will accelerate. This is likely to lead to regional trade blocs. Companies will also look to regionalise supply chains to improve their resilience. The important questions for firms to ask is how do you evaluate risk in supply chains? And how do you identify critical components within supply chains? Regionalisation will undoubtedly cause some changes in flows on the commodity side, but also on the consumer side. Supply chains for certain commodities will be restructured, which will increase prices. You will see a stronger push towards renewables, which we are already seeing in Western markets as a reaction to global commodity price increases.

Will this inflationary pressure lead to a demand shock, and therefore reduced trade going forward?

Will we see a demand shock? Yes, undoubtedly, and you will see consumers budgeting and reducing demand due to inflation. But what impact will that have on trade volumes? It also depends on how things change on the supply side. I am particularly worried about wheat exports from Ukraine and Russia. Some of the supply shocks we will see are going to be felt most acutely in emerging markets, and that will have knock-on effects on global trade.

Regarding price increases for commodities such as oil and natural gas, there are two sides of the debate currently playing out. On one hand you have oil producing nations saying they need more investment in oil to increase supply, and on the other hand you have policymakers arguing that this is a great opportunity to now decarbonise and make supply chains more sustainable. Is the latter now inevitable?

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"...we need renewable energy sources online and increased energy-storage before completely divesting from carbon-emitting fuels"

The important question to address is to what extent are we prepared to reduce our dependence on carbon-intensive fuels, whilst we wait for renewable energy sources to come online. The reality is that we need renewable energy sources online and increased energy storage infrastructure before completely divesting from carbon-emitting fuels. Energy storage is particularly important as there will be times when the wind does not blow or the sun does not shine, meaning energy will need to be drawn from storage terminals. Technological advances in battery technology will be needed to improve energy storage, but before then we will be confronted by whether we respond to renewable energy shortages by burning more fossil fuels or by making energy savings through cutting production.

Which technology will have the greatest impact on driving global trade over the next five years?

We have already discussed the risks of regionalisation to global trade and the need for greater sustainability. There needs to be greater data standardisation and interoperability to provide end-to-end transparency within global supply chains. This will help increase supply chain resilience, increase sustainability, increase efficiency, and enable greater financing. The WTO needs to focus on how we can drive international policy coordination in this area. Distributed Ledger Technology (DLT) is one way to increase transparency within supply chains. Trade is a function of various conditions and obligations placed on

producers and suppliers, and collateral is needed to facilitate transactions. Whether this collateral is backed up by a Central Bank Digital Currency (CBDC) or stable coin, et cetera, DLT enables this collateral to be placed on the blockchain and made visible to all parties involved, increasing confidence. DLT can create conditionality, and confidence, and encourages trade, which could help close the US$1.7 trillion trade finance gap. Additionally, DLT should lower the cost of trade finance instruments, and therefore could lead to higher trading volumes.

What are the obstacles to implementing blockchain and DLT at scale?

We need access to consistent, accurate, and interoperable data that is not specific to one platform. When using data, if garbage comes in, then garbage will come out. We are seeing governments move forward on digitising trade, including customs procedures, inspection certificates, and introducing single windows for exports. So, managing any frictions between countries that come from the uptake of these digital solutions will be important, and ensuring data is standardised and can move and be moved across multiple different pathways and systems will also be important, especially to reduce trading costs.

Do you believe future trends are pointing towards greater data sharing or greater data localisation?

There are trends towards data localisation, particularly in financial services and the requirement for Personally Identifiable Information (PII) to be stored in one location. Generally, trade related commercial information has not been subject to the same levels of data localisation. The bigger issue here is how to ensure common data standards across jurisdictions and perhaps more importantly, how do you ensure different customs and other related bodies are interfacing, so that we can share trade data to increase transparency and interrogate it better to uncover inefficiencies. That is a very hard job to do, but it would remove several trade frictions and allow global trade to function in a much smoother manner.

Which digital currency do you anticipate will have the greatest aspect on global trade? CBDCs, stable coins, or cryptocurrencies?

I think the jury is still out. Trading counterparties are looking for two very clear things. Firstly, the availability of finance, which makes using conditional payment structures and digital trade instruments to facilitate trade important. Secondly, counterparties want to use currency that is not significantly volatile and that does not have credit risk associated with them. In its simplest form, the central question is can I get paid in the currency and is it going to be the amount I expected? Starting with CBDCs. CBDCs reflect physical fiat currency, but are currently not really being used for trade, but could be useful in the future. I think CBDCs could play a critical role in international trade and indeed, a more efficient and transparent trading system. One advantage is the instantaneous of settlements in CBDCs. Another advantage is that the currency is represented by a claim on a Central Bank. But currently it will take some time before CBDCs are used in trade. Regarding stable coins, there are different types. There is a group that are linked to a very transparent reserve which is audited, providing confidence and minimising the stablecoin risk. These have the greatest potential together with CBDCs to be used in international trade. There are also stable coins without a reserve (algorithmic stable coins) which use different algorithms to try and create the stability required to create confidence to trade in it – these have a greater risk profile and are therefore less likely to be used. Finally, regarding crytpoassets such as bitcoin, there is often volatility which makes them less desirable for use in any form of substantial real-world trade, but we may see them used in smaller trades, in particular in markets where there is a constraint on the availability of correspondent banking.

Finally, where do you stand on Decentralised Finance (DeFi)? Particularly in terms of offering an alternative to blockchain plugging the global trade finance gap.

DeFi has many different meanings to many different people and blockchain is an inherent foundation to DeFi. One of the most interesting aspects of DeFi for international trade are smart contracts. What are smart contracts? They are contracts that are wrapped on blockchain that cannot be revoked and will do certain things subject to certain actions taking place. There is other interesting activity taking place in the DeFi world from which real benefits can occur, but those benefits are going to arise when they can bridge into either a regulated or a more visible world. What do I mean by that? There is a lot of financing capability that is being developed. You have heard of yield farming and staking, and while all of that is great, are we seeing real benefit coming or material different from these new means of getting financing to individuals? There is going to be real innovation that comes out, but there is going to need to be a bridge into some form of regulation, to mitigate risks and increase certainty. The real issue with DeFi's uptake will come from trading counterparties' aversion to the risk of potential volatility and operational risk. The more interesting component is the underlying blockchain technology. Blockchain has been around for several years now, but so far in terms of trade, we have always used it to digitise documents and to centralise data. DeFi allows us to put value and identity in there as well, marrying data with value, in a way that automatically makes and reconciles payments subject to certain conditions, which is quite transformative.

SECTION THREE

DIGITALISATION, FREE-TRADE PACTS, AND TRADE POLICY

Over time, digital commitments within trade agreements have expanded. Increasingly, they have included issues of market access and the governance of the cross-border movement of digital goods and services.

As a result, there has been increasing inclusion of digital provisions in free-trade agreements at the multilateral, regional, and bilateral levels (WTO, 2021). Eighty-six countries, accounting for 90 per cent of global trade, are currently engaged in WTO negotiations on a Joint Statement Initiative on e-commerce.[91]

Digital provisions in trade agreements are likely to continue to expand in breadth and scale as the importance of the digital economy grows – both in the exchange of digital services and goods, and in the way digitalisation eases trade itself. Between 2001 and 2016, there were 69 regional trade agreements (RTAs) that included a standalone e-commerce chapter or article(s). There were also 21 other RTAs that had provisions addressing paperless trading, digital rights management, or general promotion (Wu, 2017).

Digital commitments can be divided into three categories:

- Market access. Provisions covering customs duties, valuation issues, movement of service providers, and access to data.
- Rules and regulations. Provisions that include covering intellectual property rights, protection of personal information, and consumer protection competition.
- Trade facilitation commitments. Provisions that would include commitments covering paperless trade, e-signatures, and digital authentication.

[91] https://www.wto.org/english/tratop_e/ecom_e/joint_statement_e.htm

Digitalisation and Asian trade pacts

Preferential trade agreements (PTAs) that include digital trade rules will be a dominant and crucial driver of future relationships. In Asia-Pacific, the Regional Comprehensive Economic Partnership (RCEP)[92] has expanded to include commitments on customs duties, unsolicited commercial electronic messages, and non-discrimination of digital products. The Comprehensive and Progressive Trans-Pacific Partnership (CPTPP) also includes non-discrimination of digital products, source codes, principles on access to and use of the internet for electronic commerce, online consumer protection, electronic authentication, electronic signatures, and personal information protection.[93]

The digital provisions in other agreements (for example, the Digital Economy Partnership Agreement between Chile, New Zealand, and Singapore, and the Singapore-Australia Digital Economy Agreement[94]) exceed those of the CPTPP. They include provisions on electronic invoicing, electronic payments, cooperation on competition policy, submarine telecommunications cables, the location of computing facilities for financial services, data innovation, open government data, digital identities, standards and conformity assessment for digital trade, artificial intelligence, and fintech cooperation. Despite this, adding more and meaningful provisions to such agreements can be an uphill task, given the current disparity in respective national digital economies.[95] Trade agreements with robust e-commerce chapters nonetheless have the potential to increase trade in goods and in digital services among member countries. While empirical evidence suggests that such PTAs may promote deeper digital commitments, there is also a growing body of evidence of the economic value added of digital commitments. This is the case globally and particularly in developing and emerging economies where e-commerce is growing in importance. The African Union's Digital Transformation Strategy 2020–2030 identifies negotiations on the African Continental Free Trade Area as a unique platform to discuss harmonisation and the reduction of the regulatory burdens on cross-border services trade and e-commerce across the continent (Banga et al., 2021).

[92] On 1 January 2022, the RCEP agreement entered into force for Indonesia, Australia, South Korea, Malaysia, Myanmar, Philippines, Brunei Darussalam, Cambodia, China, Japan, Lao PDR, New Zealand, Singapore, Thailand, and Viet Nam. For further details, see: https://asean.org/rcep-agreement-enters-into-force/

[93] https://www.mfat.govt.nz/assets/Trade-agreements/TPP/Text-ENGLISH/14.-Electronic-Commerce-Chapter.pdf

[94] Singapore-Australia Digital Economy agreement (SADEA) is Singapore's second digital economy agreement (DEA): https://www.mti.gov.sg/Improving-Trade/Digital-Economy-Agreements/The-Singapore-Australia-Digital-Economy-Agreement

[95] https://www.dfat.gov.au/trade/services-and-digital-trade/australia-and-singapore-digital-economy-agreement

CHAPTER III: Technology and the Future of Trade

Defining challenges ahead for digital commitments

- **Categorisation of goods and services**. This is a core issue within e-commerce that is blocking progress on digital trade. WTO members have differed as to whether products that can now be delivered online should be categorised as goods (under GATT) or as services (under the GATS).

- **Disparate developmental stages**. Economic integration is affected by the different stages of development within ASEAN and the need to balance national ambitions and regional integration. Given this, the pace of integration – and digital adoption – is often determined by the slowest-growing economy.

- **Digital skills development**. For several ASEAN economies, this will be crucial in fostering broader and deeper digitalisation, given the significant share of jobs in Asia-Pacific that are likely to be impacted by digital innovation – for example, automation (OECD, 2021a).

- **Digital sovereignty**. Digital sovereignty remains a highly contested, politically sensitive issue (Pohle and Thiel, 2020). Of particular interest will be how it is translated and transformed in practice into the functioning of institutions and legal practices.

- **Tackling data restrictions**. Data restrictions can affect a local economy negatively through their impact on the productivity and job-creation ability of local companies. Digital trade is facilitated by and dependent on the cross-border movement of data.[96]

Digital sovereignty **remains highly contested**

Further international architecture is likely to emerge, aimed at optimising the benefits of data exchange within the framework of individual public policy objectives. A range of commonalities will continue to emerge within and between policy instruments (OECD, 2021b). Whether through unilateral mechanisms, trade agreements, or multilateral arrangements, there appears to be consensus on the dual goals of safeguarding data and enabling its flow across borders (ibid.).

[92] A range of unilateral mechanisms for safeguarding cross-border transfers exists. Governments have been using a range of instruments to ensure that, upon crossing a border, data are granted the desired degree of protection or oversight. However, there is no one, single mechanism to enable what has come to be called "data free flows with trust". Governments pursue different, or even multiple and complementary, approaches (Casalini et al., 2021).

SECTION FOUR

CRYPTO CURRENCIES, DIGITAL CURRENCIES, AND CRYPTO ASSETS

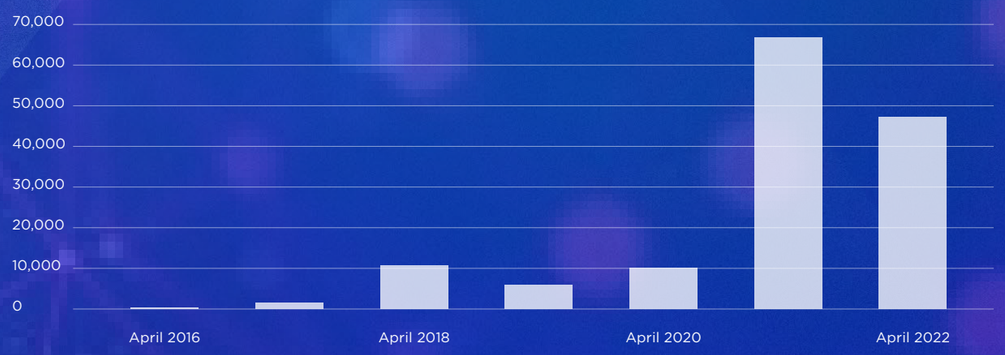
New forms of digital money and varied payments systems have been instrumental in making cross-border trade and investment more efficient and secure. Secure online-payments systems are changing the ways in which payments for goods and services are made (Bezhovski, 2016); crypto currencies[97] and central bank digital currencies stand to transform cross-border trade further in the years ahead.

[97] A crypto currency is defined here as a type of crypto asset that is electronic cash based on a decentralised distributed ledger technology (DLT). For further details, see: https://www.bankofengland.co.uk/knowledgebank/what-are-cryptocurrencies

FIGURE 16

The continued rise of Bitcoin

1 BTC PER USD



The emergence and growth of virtual currencies[98] will continue to challenge the traditional model of fiat currencies, given that they are issued without the involvement or backing of governments. Some are based on so-called distributed ledger technologies that provide complete and secure transaction records without using a central registry. These, therefore, allow for direct peer-to-peer transactions and eliminate the need for a central clearinghouse.

Crucially, distributed ledger technology can strengthen efficiency by reducing transaction times and costs, especially across borders (BIS, 2017). In the longer term, these technologies have the potential to deepen financial inclusion by offering secure and lower-cost payments options (ibid.). Beyond payments systems, the technology can impact a wide range of markets (including through equity exchanges and settlement systems), thus helping financial-market integration (ECB, 2017).

Virtual currencies do not fully correspond with the traditional function of money (He et al., 2016).

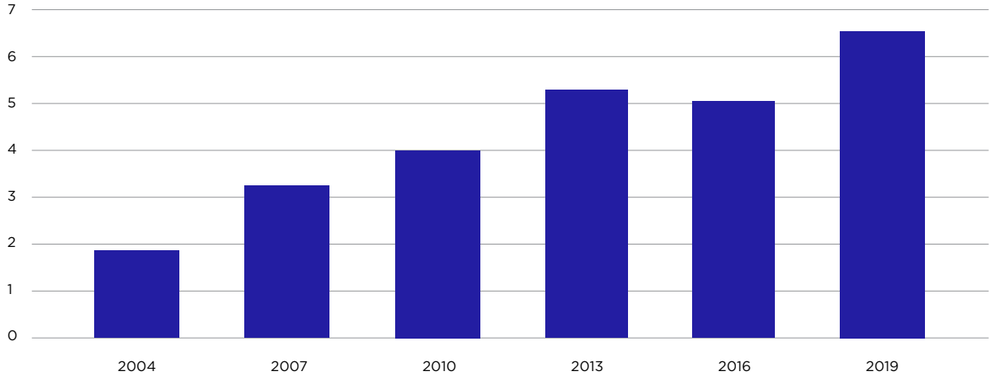
- **High price volatility**. This limits their ability to serve as a reliable store of value. The volatility of bitcoin prices, for example, is extreme and almost 10 times higher than the volatility of major exchange rates (Baur and Dimpfl, 2021). Virtual currencies are neither state nor (for the most part) private-entity liabilities. What's more, prices and volatility appear to be unrelated to economic or financial factors, making them hard to hedge or forecast (Yermack, 2013). At the time of writing, Bitcoin's value has reversed its past gains against the US dollar over the past year (***Figure 16***).

- **Comparatively small (but growing) market capitalisation**. At approximately US$1.3 trillion currently,[100] global crypto-currency market capitalisation is growing. This compares with the global foreign exchange market, which is now likely to have exceeded estimates of US$6.6 trillion per day.[101] The still-limited acceptance of virtual currencies significantly restricts their use as a medium of exchange or as a store of value.

[98] Virtual currency schemes comprise two key elements: (i) the digital representation of value or currency that can be transferred between parties and (ii) the underlying payment and settlement mechanisms, including the distributed ledger system (He et al., 2016).
[99] Fiat money is defined here as government-issued currency that is not currently backed by a physical commodity (such as gold) but is guaranteed by the government. For further details, see: https://corporatefinanceinstitute.com/resources/knowledge/economics/fiat-money-currency/
[100] https://coinmarketcap.com/
[101] https://www.bis.org/statistics/rpfx19_fx.htm

FIGURE 17

Global (OTC) foreign exchange turnover



- **Virtual currencies do not function as an independent unit of account**. In other words, they are not an independent store of value. Illustrative of this is that retailers who accept payment in virtual currencies will quote a price in fiat currency. Rather than being used to measure the value of goods and services directly, a particular basket of goods and services will be valued in a fiat currency that is then converted to virtual currencies (EBA, 2014).

Recent developments in crypto currencies

In addition to the exponential growth in crypto currencies,[102] where digital assets are traded in the US dollar, bourgeoning crypto-currency markets in emerging market economies also continue to grow. In Russia, India, and China, digital assets are expanding (Anisiuba et al., 2021). But the transmission and spill over between crypto-currency markets is still at an early stage of development (Huynh, 2019). The market for computer-generated currencies has grown significantly in terms of new currencies, an expanding consumer base, and greater overall foreign exchange transaction frequency (***Figure 17***). So, digital currencies comprise a growing and competitive market, where many players enter and compete. Bitcoin, for example, has shown signs of being an effective financial hedging mechanism as a digital asset (Rudolph et al., 2021; Dyhrberg, 2015).

Free entry into the market has possibly induced network effects where one currency could dominate (Gandal and Halaburda, 2016). When one particular currency becomes more popular (easily and expediently attracting new users amid a perception that it has become useful), there is a circular reinforcement effect, which leads to greater use and circulation (ibid.).

Most existing literature has often assumed that crypto currencies are only traded directly for the US dollar, thereby potentially foreclosing the understanding of peculiar dynamics in other economies or markets where they are traded directly for other conventional currencies. Despite this, competition between bitcoin and its rivals is increasing to be traded with other, particularly emerging-market, fiat currencies.

[102] There are more than 10,000 crypto currencies worldwide. For further details, see: https://www.statista.com/statistics/863917/number-crypto-coins-tokens/

Digital currencies and trade

Digital currencies are ultimately designed as mediums of exchange, using cryptography, to keep transactions secure and to control further creation of additional units of the currency (Gerba and Rubio, 2019). As such, they could increase efficiency in cross-border payments. The crypto system presents new opportunities for cross-border trade, given its capacity to provide a faster, and cost-effective cross-border payment system (ibid). For digital currencies that rely on distributed ledger technology, money could be sent and received almost instantaneously and at any time.

Digital currency developments could continue to boost trade, including as follows:

- Speed and efficiency in cross-border payments. Human interaction is often required in the process of verifying the sender's and recipient's information – for example, for anti-money laundering and combating terrorism-financing purposes (FSB, 2021). As a result, the speed of payment is often determined by the extent to which the business hours of the sending institution and the receiving institution overlap, and whether the sending and receiving institutions rely on the same messaging standards (ibid.).

- Alternative credit information for trade finance. In the light of the US$1.7 trillion global trade financing gap (ADB, 2020), which heavily impacts small and medium-sized businesses that typically don't have established credit histories, public ledgers of digital currencies could be used to share payment and financial history to underwrite loans for importing and exporting. At the same time, strong privacy protocols would need to be enforced to facilitate effective and transparent functioning.

US$1.7tn

Global **trade financing gap** in 2020

- Traditional financial institutions' settlement and cross-border payments via digital currencies. Digital currency use on a large scale is still some way off, particularly in the cross-border setting. There are multiple technical and regulatory drivers, including a link to financial sector development (Saiedi et al., 2021). Crucially, a basic level of interoperability between central bank digital currencies (based on access and settlement arrangements) would be needed to facilitate cross-border use in two (or more) jurisdictions (BIS, 2021). Such arrangements can connect both wholesale and retail central bank digital currencies across borders and necessarily would require strong cooperation among central banks, and include technological, market-structure, and legal aspects (ibid.).

While the potential benefits may help increase trade volume for certain countries, the structural impact of digital currencies on trade is still in question. The fundamentals of international trade, which depend, in part, on comparative advantage, take a while to experience longer-lasting change. Some economies, for example, are challenged by development or diversification. These challenges will continue, notwithstanding a higher level of digitalisation.

Signs of greater breadth and depth in the crypto-currency market would include a higher level of market capitalisation, increasing interest in emerging technologies (such as Ethereum), other "smart contract" blockchains, and decentralised finance.

If greater digitalisation is to promote sustainable cross-border trade and investment, it will require a multifaceted, coordinated, and targeted policy approach. Both businesses and government should respond to potential future shifts in innovation and technology, and align strategies and policies to gain competitive advantage.

Any policy response to virtual currencies will need to strike a balance between addressing risks and abuses, while also avoiding over-regulation that could stifle innovation (He et al., 2016). The initial focus should be on the most pressing concerns – including financial integrity, consumer/investor protection, and tax evasion.

Effective policy coordination will be required at both national and international levels. Virtual currencies combine different elements of electronic payment systems, currencies, and commodities that span the responsibilities of several types of regulators at the national level. Developing international standards and best practices is needed to provide guidance on the most appropriate regulatory responses and harmonisation.

Key takeaways

1. Connectivity will be key to a more effective trade system in future, and technology will be the great enabler of that. The continued build-up of transparent, interoperable networks will be of primary importance to the global trade outlook.

2. There are opportunities for countries to use technology to diversify their supplier bases. Emerging market economies becoming involved in global value chains will need to ensure that they have stable and attractive operating environments.

3. All of this means increasing the amount and availability of scalable digital tools and technologies to promote broader connectivity. Digital scalability will promote both digital transformation and improvements in structural economic growth.

4. Blockchain technologies have the potential to be disruptive for firms facing competition barriers, and for households that want to exercise more control and efficiency in their energy sources, with direct implications for the energy sector.

Recommendations for businesses:

1. Firms should collaborate with government to scale up investments significantly in order to build out more robust digital infrastructure ensuring accessible and affordable connectivity.

2. Firms' resources should be devoted to developing production processes that promote economies of scale in innovative technologies, including in additive manufacturing, such as 3D printing.

3. Firms should help government implement and manage broader trade facilitation digital systems and platforms; this would ensure more efficient interactions between importers, exporters, and authorities.

Recommendations for governments:

1. Governments should reinvigorate their investment climate through facilitating imports of capital equipment, and through trade facilitation and reduced import duties on information and communications technology (ICT).

2. Governments should adapt their economic development strategies to elevate the role of digitalisation and to meet growing demand for goods and services in digital economies, with a view to enhancing trade facilitation.

3. Greater breadth and application of ICT should be integrated at all levels of education with a view to promoting economic clustering and industrial collaboration with firms, to foster export promotion.

4. Governments (and businesses) need to incentivise ICT use among smaller firms to enable their effective integration into global digital value chains. This would include enshrining privacy and data protection standards.

4. New types of trade agreements should be designed to enable growth of digital currencies which, in time, would promote interoperability between payments systems and facilitate an ecosystem that would foster growth in digital trade.

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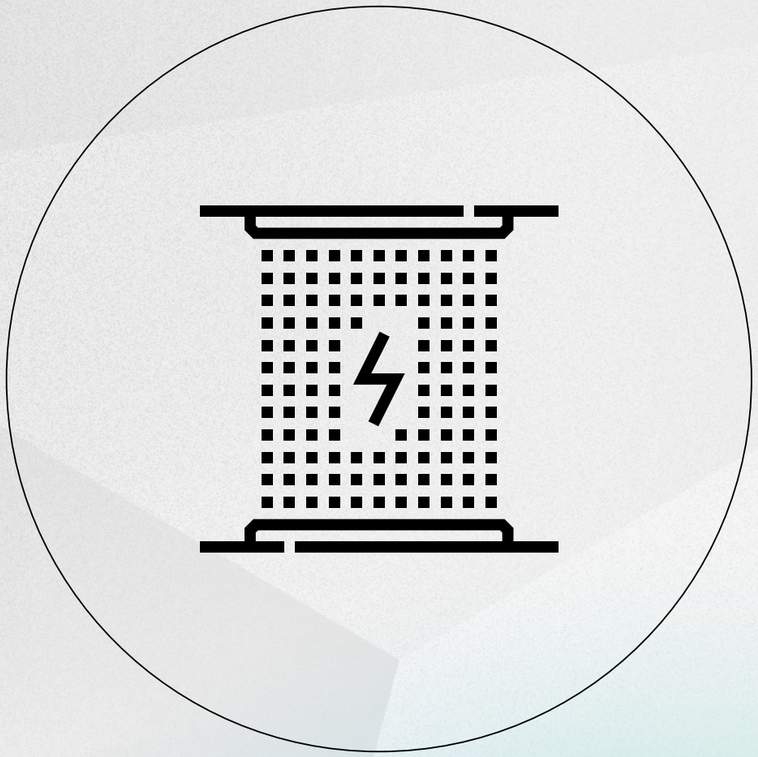

CHAPTER IV

SUSTAIN-ABILITY AND THE FUTURE OF TRADE

CHAPTER IV: Sustainability and the Future of Trade

Trade can be an **essential tool** in the fight against climate change

If left unchecked, climate change will leave millions of people facing uncertain water and agricultural conditions, as well as coping with dangerous levels of heat and rising ocean levels (IPCC, 2022).[103]

Expansions of trade in its current form will have a negative impact on the climate through greater emissions, more pollution, and increased environmental degradation. An illustration of this lies within the shipping industry. Currently, shipping is responsible for 4 per cent of greenhouse gas emissions and the air-cargo sector accounts for an additional 2.4 per cent (EESI, 2019). It is vital, therefore, that global trade becomes more sustainable, and that the trade in goods and services with beneficial environmental impacts increases dramatically in the coming years.

Crucially, trade can also have a positive impact, in that open markets can aid the transfer of technology, goods, and capital that are vital to the mitigation of climate change. Trade can also support wider environmental, social, and governance goals (OECD, 2022). Trade can be an essential tool in the fight against climate change – from providing the raw materials for sustainable technology to getting the latest practices and climate data from intellectual hubs out onto the front line. This is a global issue that requires a global response, and global trade has a key role to play.

To meet the commitments made in the Paris Agreement to limit the levels of global warming, the world is going to have to move away from a model of energy consumption generated by the burning of fossil fuels towards one that uses less energy generated from different and more environmentally friendly sources. What we do and how we do it will need to change, and that will require huge amounts of green infrastructure to be built and financed, creating opportunities for those able to meet this demand.

The world has pledged to boost the amount of green finance available to low- and middle-income countries to help them adapt to and mitigate climate change. At the same time, major industrial nations are striving to decarbonise their own domestic economies. This is creating and driving supply and demand for environmental goods and services that will reshape global trade patterns.

This is not a short-term trend. Demand will continue to increase as legacy infrastructure is decommissioned and replaced by greener alternatives, which, once they are in place, will need to be maintained before being replaced by more sustainable technology, as the demand for older, dirty technology fades.
Failure to collectively tackle the climate crisis would have profound impacts on the future of trade. It would range from extreme weather events causing damage to commercial property and impinging on supply chains, to shifting weather patterns impacting the traditional agricultural products and exports of vital regions, to the political instability that would arise from climate breakdown and the mass movement of climate refugees.

This is being recognised by consumers, who are looking to use their purchasing power to promote greener practices, and among investors, with several notable firms using their shareholdings to vote against practices that are not aligned with environmental and social governance goals. Government regulations also look set to increase as the decade progresses, meaning that companies that don't get ahead of the curve risk not only reputational damage but also being left behind by more environmentally innovative competitors.

Being green is no longer a "nice to have" way of connecting with socially minded consumers – it is quickly becoming a requirement of doing business in the 21st century. It provides huge opportunities for companies to invest in new markets that will grow dramatically in the coming years and help protect the planet as they do so.

[103] IPCC (2022), Climate Change 2022. Impacts, Adaption and Vulnerability. Summary for Policymakers: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FinalDraft_FullReport.pdf

Interview: **David Hone**
Chief Climate Change Adviser, Shell

The energy industry has been crucial to global economic growth over the last century. What should the role of oil majors be during the energy transition?

It is a pivotal question and there are two main things to point out. Firstly, we should not forget the word 'transition', which is different to the word 'change'. A new global energy system will not emerge tomorrow. This is a generational shift that will take between twenty-five years to a century to complete, particularly if the complete transition away from fossil fuels is the goal. During this transition we must make sure there is a continuous energy supply to meet society's needs. We may already be feeling some of the effects of the energy transition on energy supplies. In general, we have seen a period of lower investment in oil and gas. Today's tight market is more a result of the COVID-19 pandemic than the energy transition, but highlights the need for oil majors to ensure there are energy supplies to meet future demand. In the long-term, oil firms need to decide what services they want to supply as non-fossil fuel sources of energy are secured. In Shell's case the discussion is shifting towards becoming a company that provides energy from a more diverse mix of sources than just oil and gas.

What will the impact of green technologies, such as hydrogen, Carbon Capture Utilization and Storage (CCUS), have on the energy transition as well as greening global trade?

Apart from the actual change in the energy that we use, there will be a change in the way in which energy is supplied. The energy transition looks set to be focussed around local and regional solutions. For example, it is unlikely that electricity generated in South America will be used in China, but electricity will likely be shared within regions. This could encourage the greater regionalisation of trade. As for hydrogen, it is not clear whether the business model for the hydrogen sector will gravitate towards a local or global model. There is still not yet a full understanding of whether shipping hydrogen as a fuel (as we do with LNG) is viable. CCUS is an interesting area. We've seen it implemented on a local level where the requisite geology for it is available. But we are also moving into the complex world of carbon removal, where carbon dioxide is removed from the atmosphere in one place to balance emissions somewhere else. This could have interesting implications for carbon pricing, carbon credits, and the carbon trade.

"The energy transition will not happen overnight and what is challenging is that there is misalignment between society's energy needs and the carbon budget"

There is global focus on rising energy costs and inflation. Can energy markets play a role in stemming this?

The oil and gas industry is a very price responsive industry. Periods of low prices result in reduced investment and the reverse is true during periods of high prices. For example, Shell has recently announced a major acquisition in India which would have been more difficult two years ago when oil prices were around US$30. We are going to need fossil fuels for some time as the energy transition gathers pace, but the license to produce fossil fuels is being challenged, which risks creating a shortfall in energy and price rises. A more thoughtful discussion is required across society about everybody's role in the energy transition.

Does the energy transition and sustainability increase the risk of inflation?

No, I do not think that is necessarily the case. It is about finding balance. The energy transition will not happen overnight and what is challenging is that there is misalignment between society's energy needs and the carbon budget that is remaining in terms of the carbon that we can emit. The carbon budget suggests that emissions must be halved this decade, which effectively means halving fossil fuels by 2030. This puts enormous pressure on where we get energy from.

“Carbon border adjustment mechanisms are a positive concept, but I doubt how quickly they can be implemented in practice”

Where do you see the future of carbon borders and pricing in terms of regulating energy markets? A concern we frequently hear is that the future could see multiple different carbon trading regimes, which businesses will need to navigate, increasing costs of doing business. Is this where the future is heading? Or will we be able to negotiate a comprehensive global carbon pricing architecture that will be easier to navigate?

The Carbon Border Adjustment Mechanism (CBAM), whilst good in theory, is going to be difficult to implement in practice. If you look around the world, countries are following different pathways to mitigate emissions. Some have very transparent carbon prices, while other countries have mandates that cloud carbon prices. For instance, if the EU looked at a producer in British Columbia, who have an explicit carbon pricing system, the EU can then equate that to their price and decide on what the adjustment mechanism might look like. On the other hand, a similar producer in Texas, has no explicit carbon price to report, but faces other implicit costs and requirements around renewable energy and green technologies. So how do you equate those two? Should it be judged based on whether they have the same pledge for net-zero emissions? Or do you go by the explicit carbon produced?

Creating a system that considers all those variabilities is challenging. Carbon

“Were every country moving along the same ambitious pathway to a green transition, then you would not need carbon border adjustments.”

border adjustment mechanisms are a positive concept, but I doubt how quickly they can be implemented in practice. For example, the benchmarking mechanism that evolved into the EU Emissions Trading System took years to emerge and many iterations to fine-tune it before coming into use. Alterations to this mechanism are still ongoing. An additional challenge arises if different regions have different carbon border adjustments, as it could lead to higher trading costs.

Another problem is that carbon border adjustments result from a failure of the Paris process. Were every country moving along the same ambitious pathway to a green transition, then you would not need carbon border adjustments. Carbon border adjustments are only needed because you have different levels of ambition globally.

Your comments on the Paris process leads on nicely to my next question. We’ve got COP27 and COP28 coming up in Egypt and the UAE respectively. What should we be on the lookout for during these conferences?

These two COPs are going to be entirely different. COP28 is when we will see the global stocktake on the implementation of the Paris Agreement, which could see finger pointing between countries. In my view, COP28 will therefore be a more landmark event than COP27. COP27 will be more process-oriented and will focus on setting the agenda for future environmental action.

SECTION ONE

GREEN FINANCE AND IMPACTS ON THE TRADE LANDSCAPE

The transition to low-carbon, more sustainable trade requires significant upfront capital investment. To achieve net zero by 2050, the world will need to spend US$275 trillion on energy and land-use systems (McKinsey, 2022). This, however, pales into insignificance against the potential costs of either inaction or delayed action, which could range from 5–20 per cent of global GDP by the end of the century (Stern, 2006).

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US$275tn

Spend required on **energy** and **land-use systems** to achieve net zero by 2050

The diversion of resources into managing continued shocks will have persistent, cumulative, and diverse impacts on the ability to engage in cross-border trade. Climate policies are therefore needed to safeguard bilateral trade.

Climate finance has therefore been a major topic of negotiation at multiple United Nations Conference of Parties meetings, including COP26, held in Glasgow, Scotland, in November 2021. The discussions were both practical – with many countries stipulating they simply did not have the money to pay for the transition – and moral – with others arguing that those who had benefited from the availability of cheap fossil fuels should come to the aid of those now unable to use fossil fuels for their own development.

At COP15 in Copenhagen, it was agreed that climate financing should reach US$100 billion a year by 2020, and at COP21 in Paris, it was agreed to extend that deadline to 2025. Unfortunately, so far, the world has fallen short of the goal – not least because of the recent economic scarring from the COVID-19 pandemic. But the latest estimates suggest that only US$79.6 billion was pledged in pre-pandemic 2019 (OECD, 2021). Donor countries, however, remain largely committed to the target of US$100 billion, giving some hope that in a post-COVID world, the funding will at least increase.

The demand for capital in this sector will only increase. The United Nations Environment Programme (UNEP) estimates that the costs of adapting to climate change will be between US$140 and US$300 billion a year by 2030 and between US$280 and US$500 billion a year by 2050. The demand for capital to fund environmental goods and services is there and is expected to increase over time, which presents huge market opportunities to generate the supply.

Driving green finance forward

There is widespread acceptance among countries that the levels of green finance being made available need to increase to meet the demands for trade in environmental goods and services. In addition to providing capital, high-level multinational bodies are developing structures to help scale up both public and private investments and to help ensure multiplier effects for both environmental outcomes and economic development.

At its 2021 summit in Rome, the G20 re-established the Sustainable Finance Working Group, with the aim of setting priorities for sustainable finance and suggesting policy actions to G20 members to help scale up green-finance initiatives.

Although none of its recommendations are binding on national governments, the Group will report every year and its publications will provide a forward-looking analysis that identifies current issues and suggests directions of travel for member countries, should they wish to establish specific policies covering these areas. As such, the report provides regular insight into the immediate future of green finance globally and its potential impacts on global trade. The five key areas of focus were:

- **Focus Area 1**: Market development and approaches to align investments to sustainability goals. Focus Area 1 identifies the numerous initiatives and methodologies, policy goals, and use cases that have proliferated in an attempt to align investments with sustainability goals. To prevent a patchwork of regulatory or certification frameworks, which may increase transaction costs, the Group suggests jurisdictions seek to enact their own policies to prioritise international compatibility. It also calls on international bodies to improve their technical knowledge of both the interlinkages of established and soon-to-be-established frameworks, but also of the science underpinning it all, to ensure widespread best practices.

- **Focus Area 2**: Consistent, comparable, and decision-useful information on sustainability risks, opportunities, and impacts. Focus Area 2 backs the work of the International Financial Reporting Standards Foundation, including its proposed International Sustainability Standards Board, to provide a baseline for the quality and transparency of sustainability-related information to help investors make decisions based on accurate information.

- **Focus Area 3**: Assessment and management of climate and sustainability risks. Although there is increasing awareness of the scientific risk associated with climate change and the need to take action to prevent the worst-case scenarios from unfolding, Focus Area 3 suggests there is comparatively little understanding of the economic risks associated with a heating planet. The report suggests major institutions, including central banks, need to investigate the climate-based financial risks they face and then take actions to mitigate them. These include investments in both dirty and clean industries, damage to physical assets because of extreme weather, exposure to government policies aimed at tackling climate change, and potential changes to growth expectations, inflation, income distribution, and economic outlays brought about by a transition to a low-carbon economy.

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How will green finance **meet the demands for trade** in environmental goods and services?

- **Focus Area 4**: The role of international finance institutions, public finance, and policy incentives. Focus Area 4 suggests there is untapped potential to gear many multilateral institutions to fighting climate change. The report says the G20 should encourage multinational development banks to increase their ambitions to fight climate change and use not only their resources to fund projects but also their clout to de-risk investments for the private sector.

- **Focus Area 5**: Cross-cutting issues, such as financing the climate transition and digital solutions (G20, 2021). Focus Area 5 calls for international organisations to pay more attention to the potential of digitalisation when it comes to tackling climate change. It makes no specific recommendations on how to do so, but highlights sustainable reporting, the identification of products, assets, and transactions as areas of future interest.

Taken as a whole, the Working Group Report provides indications of where the current issues in mobilising green financing lie, together with insight into the areas that policymakers are looking at to try to make the system more efficient.

The G7, which met in June 2021 in Cornwall in the UK, commissioned a report on economic resilience. In it, the authors noted that different finance streams were appropriate for different technologies, depending on their current stage of development. For more mature technologies, such as solar and wind, the report recommended guaranteed public purchases and clear regulatory standards to drive the economies of scale required to make the technologies competitive globally.

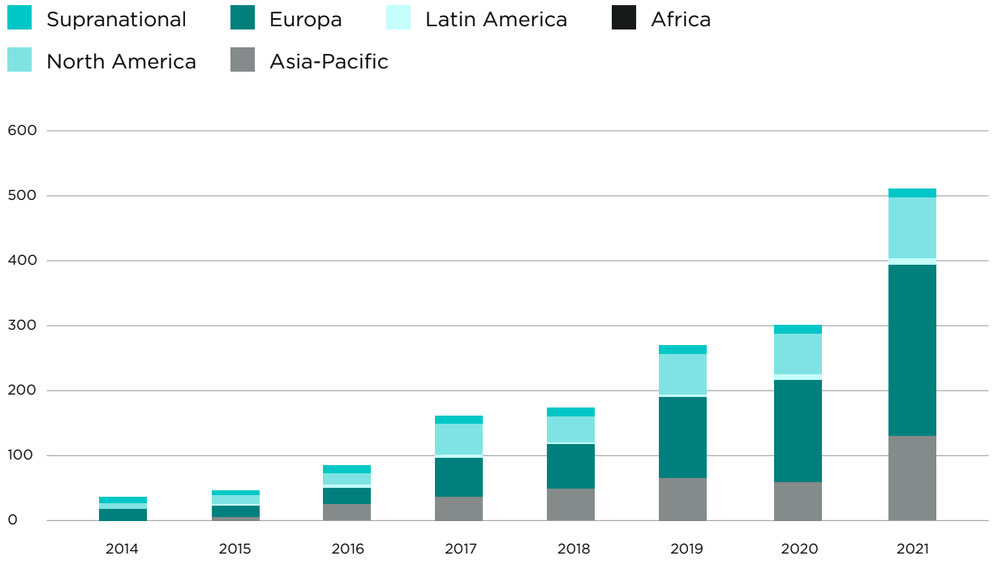
Other technologies, such as hydrogen and fusion, still require large-scale public funding for research and development, which, the report said, could be financed through green bonds (see below).

The report raised the effectiveness of carbon pricing but stopped short of making a policy recommendation to its members to implement it. Nor did it suggest the most effective level at which to price carbon (G7, 2021).

As with the G20 roadmap, the G7's report gave a clear direction for future policy and a steer on how the governments of seven of the largest global economies are thinking about the challenges and opportunities of trade and sustainability.

FIGURE 18

Green bonds: A regional snapshot



Key developments in green finance that stand to bolster sustainable trade

Greater depth and breadth in the green bond market.[104] The first green bond was issued by the World Bank in November 2008 – and since then the growth of such instruments has been "explosive" (World Bank, 2021). Analysis by the Climate Bonds Initiative estimates that the green-bond market was worth just over half a trillion dollars in 2021, which is the highest on record and continues a trend of 10 consecutive years of expansion. Over the past five years alone, the market has seen significant growth (***Figure 18***), which is set to continue, with annual issuance predicted to top US$1 trillion by 2023 and US$5 trillion by 2025 (Climate Bonds Initiative, 2022).

Globally, 36 per cent of the proceeds from green bonds have gone on energy, 28 per cent on buildings, 18 per cent on transport, 8.8 per cent on water, 3.36 per cent on waste, 3.83 per cent on land use, 0.46 per cent on industry, 0.33 per cent on ICT, and the remaining 1.59 per cent on unspecified projects (World Bank, 2021). From 2014 to Q2 2021, the cumulative top green bond-issuing nations were the United States (US$261.3 billion), China (US$151.6 billion), France (US$148 billion), Germany (US$122.4 billion), and the Netherlands (US$65.8 billion). In Asia over the same period, the highest green-bond issuers (excluding China) were Japan (US$31.7 billion), India (US$16.5 billion), South Korea (US$15.4 billion), and Singapore (US$14.6 billion) (ibid.).

A greener Europe. Europe is home to the largest market for green, sustainable, and social-issue bonds, with the European Union the largest issuer (Climate Bonds Initiative, 2020). It is an area of robust growth, and in addition to green bonds being issued by individual sovereign countries, the EU as an entity began green bond issuance in 2021 to support the NextGenerationEU recovery programme, further diversifying the market with high-quality bonds. The issue was 11 times oversubscribed and the final order book exceeded €135 billion (Sivaramakrishnan et al., 2021), suggesting continued high demand in the future. Further driving demand for environmental goods and services in Europe is a stipulation in the EU's Recovery and Resilience Plan, which requires that 37 per cent of the funds allocated to member countries are devoted to green transition projects (ibid.).

In addition to issuing bonds, last year, the European Commission published proposals for the EU Green Bond Standard aimed at improving the transparency and accountability of the financial instrument. The EU hopes to create a gold standard, which ensures that investors can be confident about the projects their money will be spent on, spurring future activity. The proposed standards would require:

- **Alignment with EU definitions**: The standards would require that issuers must allocate 100 per cent of the proceeds raised by green bonds to economic activities that meet the EU taxonomy (categorisation) requirements by the time the bonds mature.
- **Detailed reporting**: The proposal sets out some detailed requirements, particularly on pre- and post-issuance reporting.
- **Review and supervision**: The proposed standards set out detailed provisions regarding external reviewers. They are required to register with the European Securities and Markets Authority and will need to meet the conditions for registration on an ongoing basis (Herbert Smith Freehills, 2022).

The proposals are currently being considered by the European Parliament and will need to be signed off by the European Council of national EU governments. The current proposals stipulate that the standards will be mandatory for all green bonds – a tightening of original proposals, which suggested a voluntary approach. Note, nonetheless, that the proposal to make the standard mandatory is causing some pushback amid concern that, with the market still in its infancy, the move will spook investors.

Some critics are also concerned that the EU's drive to ensure a "gold standard" will mean it has set the bar so high that many issuers will be unable to meet it, thereby stifling the market. The International Capital Markets Association, for example, argues that the proposals could lead to a contraction and concentration of the market and potentially drive prospective investors to other less-regulated markets (ICMA, 2022).

Despite these headwinds, the EU green bond market is expected to show robust growth this year and into the future. The EU has pledged to issue up to €250 billion in green bonds to support the bloc's pandemic recovery fund, and EU green bond issuance is predicted to grow by €50–75 billion in 2022 over the previous year (NN Investment Partners, 2021).

[104] Green bonds allow investors to funnel capital directly to environmental projects. For example, when considering where to invest, the World Bank focuses on the following areas for its green bonds: renewable energy, energy efficiency (including energy-efficient buildings), sustainable waste management, sustainable land use (including sustainable forestry and agriculture), biodiversity conservation, clean transportation, sustainable water management (including clean and/or drinking water), and climate-change adaptation.

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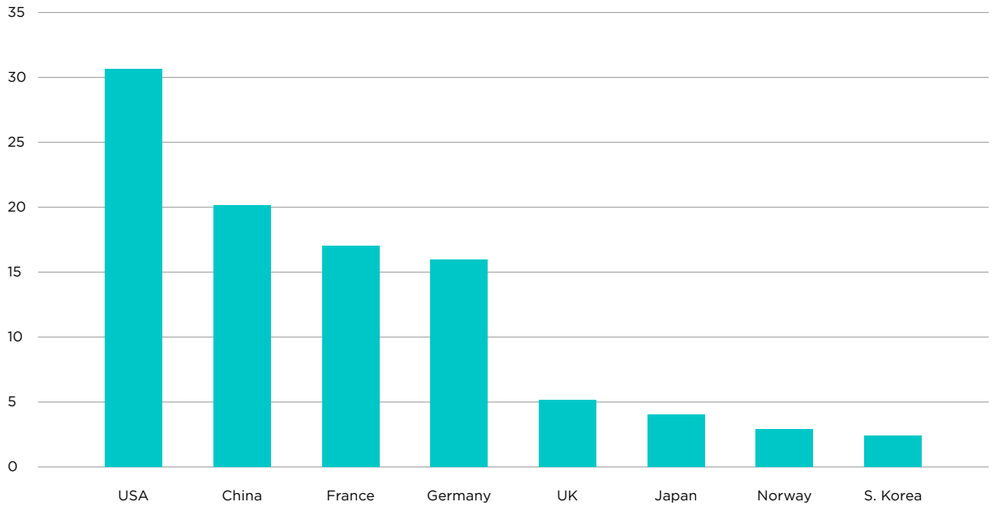
FIGURE 19

Green bond issuance: A snapshot

US$, BILLIONS



Asia's green expansion. Asia is also home to a dynamic and growing market (***Figure 19***) in green bonds, one which is expected to grow and diversify over the coming decade. The market is expected to broaden, with more private-sector involvement alongside increased public-sector supply. Asia-Pacific is ranked the third-largest region for total green bond issuance, behind Europe and North America, but significantly ahead of Latin America.

Asia's financing needs are significant. The UN Economic and Social Commission for Asia and the Pacific estimates the region requires US$1.5 trillion a year in funding to achieve its UN Sustainable Development Goals – a third of which are directly related to clean energy and climate change – by 2030 (UNESCAP, 2019). Last year, the demand from investors outstripped supply and green bonds were 5.7 times oversubscribed.

There is still significant room for increased demand. China has set itself a target of peaking its carbon emissions by 2030 and then becoming carbon-neutral by 2060. This will require more than US$14.7 trillion to be invested over the next 30 years (Colenbrander et al., 2021). Of particular concern will be high energy-use industries, such as construction and steel.

Japan and South Korea are the other two mature markets in the region, and both have set a target of becoming carbon-neutral by 2050.

South Korea's issuances have remained relatively stable in recent years, but, after unveiling a Green New Deal last year, which set out the country's path through the transition to a low-carbon economy, the country's Ambassador for Climate Change, Yoo Yeon-Chul, promised to set out policies to achieve the transition, which may help direct and scale up investment.

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The emergence of a green private sector. Driven, in part, by the emergence of new environmental markets, as well as consumer, shareholder, and reputational pressure, the private sector has generated its own environmental momentum. Despite some concerns about the short-term returns on such investments, this looks set to continue to grow in the short, medium, and long terms.

In recent years, a plethora of alliances, initiatives, and organisations has sprung up aimed at helping steer private companies through the climate-change transition and to use their commercial strength to help push it forward.

Last year, the Principles for Responsible Investment, a UN-supported network of international investors, passed 3,500 signatories with combined control of more than US$120 trillion in assets. The principles are:

Principle 1: Incorporation of (environmental, social, and governance) criteria into investment analysis and decision-making.

Principle 2: Being active investors and incorporating ESG issues into policies and practices.

Principle 3: Seeking appropriate ESG disclosure by the entities in which signatories invest.

Principle 4: Promotion, acceptance and implementation within the investment industry.

Principle 5: Working together to enhance effectiveness in implementing the principles.[105]

Principle 6: Reporting activities and progress towards implementing the principles.

In the run-up to COP26 in Glasgow, the former governor of the Bank of England, Mark Carney, also established the Glasgow Financial Alliance for Net Zero, bringing together existing and new net-zero finance initiatives in one sector-wide coalition. It is designed to help leading financial institutions accelerate the drive towards net zero.

Although efforts to agree a complete ban on investment in new fossil-fuel projects ultimately failed at COP26, there are signs that private companies are pushing for stricter environmental and social criteria. This trend will continue, particularly in Europe and North America.

More broadly, pay tied to corporate social responsibility has jumped above 20 per cent at Russell 3000 companies, up from 7 per cent in 2018, according to Institutional Shareholder Services ESG. More than 1,500 pension funds, universities, and other organisations managing approximately US$40 trillion have announced that they will divest from fossil-fuel assets, doubling from five years ago (Nikkei Asia, 2022).

While this shows the long-term direction of investment, there may be some short-term turbulence. Oil prices have spiked recently, because of supply-chain issues and geopolitical tensions. As a result, oil and gas may look attractive in the short term to investors. But the overall trend away from fossil fuels looks certain to continue, although there are likely to be corrections in global markets between now and Global Net Zero, due for 2070, by when India has announced it will catch up with others to be carbon neutral.

[105] Principles for Responsible Investment: https://www.unpri.org/about-us/about-the-pri

Interview: **Aik Hoe Lim**
Director, Trade and Environment Division, World Trade Organization

We have recently seen geopolitical disruption from Russia's invasion of Ukraine, including rising commodity prices. What impact will this have on the Future of Trade and on greening global trade?

We have witnessed a large shock to the global system but have to remain optimistic and look at how we can resolve the current crisis. Keeping supply chains open, secure, stable, and predictable, particularly relating to food, has become even more critical. To address likely food price rises, we need to work to minimise obstacles and restrictions. This will be a big challenge and requires governments, the private sector, and other stakeholders, to come together to address supply chain shocks. What may seem appealing in the short term is not going to work in the longer term. And we should look towards more trade facilitation measures to overcome the current crisis, not less. More specifically on sustainability and the greening of global trade, which has advanced so much over the last few years, we are seeing governments moving forward on the green agenda, announcing dates, plans and pledges to meet net-zero targets. International trade can be a key enabler to help governments meet their targets. So, I remain optimistic and believe that trade can help provide solutions. We do have a crisis going on right now, but it does not mean that we should shift course on the sustainability agenda.

There has been some commentary that the energy transition and sustainability agenda might increase inflation, for example by increasing costs on businesses having to navigate carbon borders and carbon prices. What is your view on how the drive towards sustainability will impact the Future of Trade?

Sustainability impacts trade in several ways. In terms of transporting goods across borders, one question is how can we decarbonise trade logistics, including transport? Another focus needs to be on production, and how we produce goods in a carbon efficient manner. While decarbonising these areas will increase costs in the short-term, they can also reduce costs over the long term. Renewable energy, for example, is one sector where we are seeing costs fall quickly and energy specialists believe costs could fall even further. At the same time, green investment on the scale we need could lead to supply bottlenecks and upward price pressures that have been dubbed 'greenflation'. So, there is need for some policy-management in terms of avoiding a high-inflation

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"...seventy jurisdictions have or are considering implementing some form of carbon pricing. What businesses and governments fear is a fragmented global system where different jurisdictions have different types of pricing and regulatory mechanisms"

situation, but the cost-savings involved in introducing new technologies could also be very high.

One interesting impact arising from adopting renewable energy is that it can insulate countries from geopolitical risks. For example, once you have a wind turbine producing energy domestically, you become more energy self-sufficient and less dependent on other countries to deliver oil and natural gas to you. Is this something that the WTO sees as well?

We would agree that it is good for nations to diversify their energy sources. In trade, your risk exposure tends to decrease the more you diversify. Renewable energy reduces the dependency on fossil fuel supply chains. Geopolitical risks will not completely disappear, but they may change in nature. To develop the necessary renewable energy infrastructure there needs to be access to certain raw materials, as well as relevant goods and services rather than a constant supply of fossil fuels. Trade policy and multilateral co-operation play a critical role in ensuring greater transparency and certainty in supply chains. Lowering trade barriers to environmental goods and services would also further reduce the cost of renewable energy and lower the capital costs of building climate-resilient infrastructure.

How will carbon trading and pricing impact the future of trade?

Approximately seventy jurisdictions have or are considering implementing some form of carbon pricing. What businesses and governments fear is a fragmented global system where different jurisdictions have different types of pricing and regulatory mechanisms. Some jurisdictions have very advanced plans on carbon border adjustment mechanisms, but they have not yet been implemented. The future carbon trading landscape is not completely clear at this moment in time, so it is difficult to say with great certainty what the future impact will be. The WTO wants to see less fragmentation and more global alignment, and is calling for more collaboration between governments and international organisations to reduce fragmentation. More international

co-operation on carbon pricing would be more effective from a climate perspective and also reduce costs for businesses operating across jurisdictions, and help avoid frictions, or place disproportionate burdens on poor countries.

But is global alignment on carbon pricing realistic? Will the future be one of multiple carbon jurisdictions that businesses will have to navigate, or an overarching global system that reduces complexity for businesses?

A global carbon system or global carbon price would be the ideal scenario. Will we get there? At this moment in time, not easily, but it does not mean that we should try to get more international cooperation. We need, for instance, greater regulatory dialogue and cooperation between different jurisdictions to reduce divergences and to standardise carbon accounting methodology across jurisdictions. Attempting to achieve alignment of standards and methodologies is not something new to the global economy and we need to utilise international standards organisations to help find alignment on the standards that are needed for carbon pricing. The private sector will also play an important role in influencing and shaping standards and methodologies for carbon accounting.

What about concerns that countries can use carbon pricing as a veiled form of protectionism, leading to more trade disputes in the future?

We would hope that countries' carbon pricing plans are linked concretely to climate objectives. Trade frictions and increased trade costs do sometimes arise because systems are different. Countries may also be tempted to protect certain industries by using carbon pricing. We must work hard to avoid disguised protectionism. And that is why the WTO system is, here. To try to avoid such situations from arising. WTO experience of dispute settlement cases has been that by avoiding unjustifiable or arbitrary discriminatory elements, the resulting environmental measures were often more coherent and effective in protecting the environment.

How are developing nations going to cope in a world of carbon borders and pricings, and how can we scale up green finance to assist these nations' decarbonisation strategies in a practical and efficient way?

Finance is going to be a big factor. The investments needed to mitigate against and adapt to climate change will add up to trillions. We are still far short of the financing which countries need to achieve their Nationally Determined Contributions. For carbon pricing or carbon border adjustment mechanisms to work, you need to calculate the carbon content of the goods you are exporting and developing countries will need to have that infrastructure in place. More finance will be needed to allow developing nations to accurately measure carbon and demonstrate they are complying with carbon standards. Climate-related trade policies must be framed with a just transition in mind, with transition times for developing countries

to find carbon alternatives, but also the financing for them to leapfrog the dirty infrastructure stage and directly build sustainable alternatives. In fact, this should be viewed as an investment opportunity. Two-thirds of Africa's infrastructure is yet to be built, and there is every opportunity to build this infrastructure greener and better and trade can be instrumental in making this happen.

Clearly, technological advances will be required to measure and analyse large carbon data sets. What technology do you believe will have the greatest impact on greening global trade over the next five years or so?

Digitalisation is progressing very quickly, and its impact can already be seen in different parts of international trade. Digitalisation enables efficiency gains in trade, which translates into environmental gains. Digitalisation enables goods to cross borders more efficiently, reducing congestion and waiting times, and these reductions can provide solid gains in terms of reducing carbon emissions. But digitalisation will also increase the volume of trade, which poses a challenge to environmental sustainability, so the availability of clean technologies to decarbonise the entire logistics infrastructure that underpins trade will be important. Finally, renewable energy generation will also be vital to reducing international trade's contribution to carbon emissions by making production cleaner.

What other environmental regulations do you foresee coming into effect and impacting trade?

One emerging trend is the need for global supply chains to source goods sustainably, for example, ensuring products are not leading to deforestation or a loss of biodiversity. This is leading to increased uptake of certification and traceability solutions within supply chains. Some of these changes are being pushed by legislation, while the rest are being pushed by the private sector. Consumers are also demanding better environmental performance and due diligence in supply chains.

Do you expect poor ESG performers to be dumped from supply chains over the next five years? If so, are the standards, technologies, and metrics available or advanced enough to allow companies to assess the ESG performance of their suppliers?

There are gaps that need bridging, and this will be a challenge, especially for large companies. It is possible that suppliers who cannot show that they meet certain standards are excluded from supply chains. One challenge is ensuring SMEs and developing nations are not left out. The costs associated with measuring carbon emissions and adhering to standards could increase costs for SMEs, hindering their ability to trade. Some solutions include greater access to finance, reducing the costs of compliance, and enabling global alignment on standards to make it simpler to comply. For these reasons, international standardisation bodies, policymakers, and the private sector, all have a key role to play.

SECTION TWO

RISK FACTORS AND CHALLENGES

Despite the momentum behind green finance globally, there are several risks that could hold back the market's full potential. We have identified several in the short-to-medium term:

- **Greenwashing**[106] has presented a reputation risk for firms for several years, but with environmental concerns becoming increasingly mainstream, entities that are regarded as attempting to mislead consumers by claiming to share their values for commercial gain risk damaging their relationships. Such practices have also put firms in legal trouble for making misleading environmental claims. As an increasing number of companies become subject to sustainability reporting requirements, environmental claims will face increased scrutiny in the coming years and may be subject to legal challenge (Sustainable Fitch, 2020). A report by the British government estimates that 70 per cent of people want their investments to be good for society and the planet (HM Government, 2019). Meanwhile, to drive investment, the IMF notes, investors must have confidence about where their money is being invested. Greenwashing presents a major challenge and requires proper regulatory oversight and verification mechanisms to avoid it (IMF, 2021).

- **A regulation jigsaw**. There is no universally recognised standard of reporting. Several jurisdictions are currently in the process of drafting standards (e.g., the EU), but this raises the problem of market fragmentation. With different criteria in different markets, the cost and barriers for entry would rise. A smorgasbord of regulations also potentially increases the appeal of markets with less stringent reporting conditions, which, in time, could damage green financing's effectiveness in tackling climate change.

- **Geopolitical risk**. The start of 2022 has seen significant increases in energy prices. This has, in part, reflected supply-chain issues and the Ukraine crisis. It is too early to identify any long-term trends in trade that would be directly related to the current situation in Ukraine. And yet, the short-term consequences alone show the scale of risk geopolitical instability represents. Numerous other potential flash points exist globally. Some are well documented, while others could spring up as the result of severe short-term factors. Geopolitical tensions can dovetail with domestic politics, with the result that inflation and thereby the cost-of-living increase as the world transitions to a low-carbon economy. These pressures, combined with likely increasing levels of extreme weather and other side effects of climate change, are likely to lead to global political instability, generating a feedback loop. Any such incidents are likely to further disrupt the global economy and could redirect financing to short-term needs over long-term green structural changes.

[106] Greenwashing is a term used to describe claims of environmental credentials that are not matched by corresponding action.

CHAPTER IV: Sustainability and the Future of Trade

70%

Share of **people who want their investments** to be good for society and the planet

In its recent *Global Financial Stability Report*, the IMF noted that the current size of the green finance market is too small to drive the required global transition to net zero. The IMF estimates that up to US$20 trillion will be required by 2050 to meet net-zero pledges. By its own numbers, current investment stands at US$3.6 trillion. Up to 70 per cent of the additional funding is expected to come from private sources (IMF, 2021). The scale of investor demand and support from the highest levels of government, however, means green finance growth will continue and that will have profound implications for the wider trade of environmental goods and services around the world.

Challenges ahead: scaling up the Green New Deal alongside carbon markets

In the face of the global threat posed by climate change, government policy and regulation aimed at reducing the emission of greenhouse gases will have profound implications for domestic economies and global trade. Companies and consumers will be required to eschew practices that are increasingly banned or taxed, moving instead towards environmentally friendly alternatives. This shift will have a huge impact on global trade flows.

Long-term signalling of intent and short-term targets will influence companies' strategic plans over the coming decade as they aim to adapt to a changing regulatory environment and take advantage of what will be introduced in the years ahead. The last year has seen a flurry of high-level conferences and pronouncements on the future trend for fossil-fuel consumption. This section looks at what has been announced and what can be expected.

The race to net zero and the emergence of the Green New Deal

Countries, cities, and companies have, in increasing numbers, set net-zero targets on their carbon emissions. The concept of net zero means that in addition to emissions reduction, any carbon emissions that are produced will be offset elsewhere – via investment in projects to fight climate change, or via the purchase of carbon credits. This has the dual benefit of allowing entities to set ambitious targets for their own carbon emissions while also giving themselves leeway if technology or behavioural change does not occur at the speed required to eliminate all carbon from their activities.

Net-zero pledges have been supported by a slew of Green New Deals. These should put in place the funding and policies to secure the required change to domestic and international infrastructures. Currently, 136 countries have a net-zero target (World Resources Institute, 2021), covering 85 per cent of global emissions and 90 per cent of global GDP (Net Zero Tracker, 2022). If these targets are met, most global revenue will be carbon-neutral by the last quarter of the century. Noticeably, India – the world's third-largest emitter – has a target of 2070 by which to reach carbon neutrality.

Elsewhere, commitments come in many forms, with some countries writing their pledges into law, others writing it into policy, and yet others having only made non-binding pledges or proposals. Despite this, there is momentum behind the concept of net zero, and it has extended beyond national governments, with individual cities and companies also setting themselves carbon-neutral targets.

136
Countries that have a **net-zero** target

These pledges are in line with the wording of the Paris Agreement on climate change, in which countries agreed "to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century" (United Nations, 2015). The pledges provide a clear indication of the direction of travel and end-goal for the global economy. Companies whose business models rely heavily on carbon emissions will encounter an increasingly difficult business environment as the century progresses.

While net-zero pledges have been welcomed by environmental campaigners, there are challenges. For example, many of the governments currently making these pledges are unlikely to be in power by the time the pledges need to be met. And, while a goal of net zero by the middle of the century gives a clear indication of the direction of travel, it is not in itself a detailed policy about how to achieve the goal. Nor does it address the short-term need to reduce carbon emissions now to avoid the effects of climate change being locked in before net zero is attainable. Nor does it provide companies with any sort of guidance on how to adapt their day-to-day operations.

By the end of COP26, 151 countries had submitted new climate plans (known as nationally determined contributions, or NDCs) to slash their emissions by 2030 (ibid). An agreement is also in place to revisit these commitments by the end of 2022 to see if they can be made more ambitious and to ensure they align with the stated ambitions of the Paris Agreement. The next round of NDCs, scheduled for 2025, will cover the period up to 2035. This common timeframe will give investors and the private sector clarity about what will need to be done over the next decade and will give a steer to business about the rate of change directed from governments.

A pledge by 109 countries to reduce methane emissions by 30 per cent by 2030, and the agreement by 141 countries to halt and reverse deforestation by the same date, were also announced at Glasgow. These further emphasise that the global economy will increasingly be moving towards a world where the environmental impact of actions will have to be front and centre of any decision-making – or risk falling foul of impending government domestic regulation.

The challenge of carbon-market development

Setting a price on carbon has often been cited as a prime tool in the fight against climate change. The mechanism has two main environmentally beneficial outcomes. The first is that it exacts a cost on using carbon, which incentivises alternatives. The second is that it generates revenue that can then be redirected into needed climate-change adjustment and mitigation projects.

There is growing momentum behind the idea of imposing a cost on carbon and removing external price fluctuations in an area with a huge global impact, although there are concerns that the additional costs could create a drag on trade (World Bank, 2021). At the G20 meeting of finance ministers in Venice in 2021, the final communiqué mentioned carbon pricing as one of a wide set of tools for the first time (Reuters, 2021b).

There are 65 carbon-pricing initiatives globally, covering 21.5 per cent of global emissions (World Bank, 2021). Perhaps most notably, China launched its emissions-trading system in July 2021, with an opening price of 48 yuan (US$7.51) per tonne.[107]

But there is currently a wide divergence, even among G20 nations, in carbon prices. It ranges from none in Saudi Arabia to €95.95 per tonne in the UK. These prices are expected to rise in the coming years to meet obligations under the Paris Agreement. The IMF has suggested a carbon-price floor of US$75/metric tonnes of carbon-dioxide equivalent for high-income countries, US$50 for middle-income countries, and US$25 for low-income countries (Parry et al., 2021).

EU costing carbon in imports

A raft of global regulations presents several issues for global trade. For example, it can have the unintended consequence of making jurisdictions with lower carbon prices or fewer environmental regulations more competitive in global trade. Conversely, it punishes domestic entities by increasing their overheads, making them less competitive than less environmentally friendly competitors. Differing regulations incentivise companies to shop around for the best carbon price rather than focusing on reducing their emissions – the opposite of the policy's intention.

In a bid to prevent this, the European Union is poised to implement a Carbon Border Adjustment Mechanism (CBAM). The stated aim is to avoid "carbon leakage" by imposing a cost on imports that have not already paid an equivalent price for their carbon in their countries of origin. Initially, the plans will apply to the carbon-intensive imports of electricity, iron and steel, cement, aluminium, and some fertilisers, but it could be extended to other sectors in the future (UK in a Changing Europe, 2021).

Several of the EU's trading partners have raised concerns about the additional costs that CBAMs are likely to impose, particularly low- and middle-income countries, which are dependent on the EU for exports of carbon-intensive products. Concerns have also been raised about whether the regulations comply with WTO rules. The EU is adamant that the plans are WTO-compliant, but there remains suspicion that the rules will act as a barrier to trade and will potentially fall foul of the WTO's most-favoured-nation equality principle (because the price of imports will vary depending on the nation of origin and the price of carbon in its domestic market). The policy has also been criticised as veiled protectionism that will kick off a cycle of retaliatory trade practices, which could damage the global trade system (Lim et al., 2021).

Questions have also been raised about CBAMs' compliance with the Paris Agreement. Although the scheme is designed to help reduce global emissions, some have raised concerns about its compliance with the principle of Common by Differentiated Capacities and Principles in the Paris Agreement (Berahab, 2022). If implemented, CBAMs could signify a major change in global policy, triggering copy-cat legislation. However, it is also possible significant global opposition and technical obstacles will mean that the policy will not be implemented (UK in a Changing Europe, 2021).

65
Carbon-pricing **initiatives** globally

Carbon trading as an essential tool to fight the climate crisis

The notion of global carbon markets[108] has been around for decades. Although the first attempt to establish a global system for carbon credits and offsets collapsed amid accusations of greenwashing and human-rights abuses, COP26 negotiations reinvigorated the concept. Carbon trading is once again being spoken of as a major tool in the fight against climate change – with big implications for global trade.

There has, however, been some criticism of these markets from campaigners who see them as licences for the wealthy to pollute and not directly contribute to the overall reduction in carbon emissions that is required if the world is to meet its targets.

In 1997, world leaders established the first scheme for a global carbon market in Kyoto. The agreement put in place the Clean Development Mechanism (CDM), as well as "cap and trade", policies such as the EU's Emissions Trading Scheme, set up in 2005.

The EU scheme established a system whereby industries were granted permits to release carbon. For every unit of carbon released, firms had to return a permit to the regulator. The number of permits was capped and steadily reduced over time. Industries in which companies reduced their carbon emissions were allowed to trade any unneeded permits, thus creating both a regulatory and commercial incentive to reduce emissions. The scheme is credited with reducing the EU's carbon emissions by

[107] https://www.scmp.com/week-asia/health-environment/article/3154206/cop26-carbon-pricing-climate-change-silver-bullet

[108] The basic principle behind carbon trading is that for every tonne of carbon emitted somewhere, another tonne is captured or prevented from being emitted somewhere else. Because climate change is a global problem, and the atmosphere has no national boundaries, any carbon emitted anywhere has the potential to cause global warming. The inverse is also true, that it does not matter where the carbon is offset or saved if the global calculation results in a zero-sum result. This opens the possibility to save or offset a tonne of carbon in markets that are less costly than where the emissions took place, making the practice more appealing and scalable to commercial entities.

1.2 billion tonnes between 2008 and 2016 (Bayer and Aklin, 2020).

Despite this, there remains a clamour for effective carbon markets. The Environmental Defence Fund advocacy group estimates that carbon markets could reduce the cost of meeting climate-change targets by between 59 per cent and 79 per cent, and that if those savings were reinvested, the world could significantly step up its emissions-reduction ambitions (Environmental Defence Fund, 2019).

Many countries with substantial and diverse natural resources are also interested in the proposals, as it provides them with a commercial incentive to maintain biodiversity and acts as an important economic counterbalance to the potential monetary value of exploiting these resources.

As a result, the Paris Agreement included a section on the creation of carbon markets. Article 6 of the Agreement laid out the principles of a global market for carbon and explicitly stated that countries can use trading to count towards their own emissions-reduction targets. But it left several key decisions unresolved, such as the fate of credits under the old CDM scheme and the principle of double counting emissions reductions.

A key agreement reached at COP26 sought to address some of these concerns while also seeking to breath fresh life into a market that could be key to short-term emissions targets, especially in heavily polluting industries such as aviation, mining, and heavy industry. This agreement is likely to spur renewed interest in and engagement with carbon markets, and could help establish a new and vital market, which helps both limit climate emissions and build resilience against climate change – an economic and environmental win-win.

Carbon markets 2.0 will be a focal point

The Glasgow Climate Pact established several important rules and set out how things will develop in carbon-compliance markets. The Pact states that no tax will be levied on bilateral trade of offsets, although 5 per cent of proceeds from the centralised system will go to funding for low-income countries to adapt to climate change. This system will be overseen by the United Nations, with a supervisory board. Once the board has been appointed, rules of procedure and credit-calculation methodologies will have to be established, which some industry experts predict will take two years (Nicholls, 2022).

Negotiators in Glasgow managed to reach an agreement on several key sticking points, which dogged progress on carbon markets since the Paris Agreement. The first was the fate of credits issued under the CDM. Under the new agreement, all credits issued before 2013 will no longer be valid, but all those issued subsequently will continue to operate within the system.

The second was the issue of double counting. Some countries wanted any carbon credits they generated to count towards their own nationally determined contributions under the Paris Agreement, but then be allowed to sell those to other countries who would also count the reductions under their own nationally determined contributions. Under the Glasgow Pact, this has been prohibited. Instead, countries that generate credits will be able to decide if they wish to count the credit themselves or sell them. Carbon credits generated from saving or regenerating the environment or from installing renewable energy will be state assets that can either be used or sold to other countries or companies.

This, it is hoped, will build demand for project financiers, developers, and operators in middle- and low-income countries, with governments seeing these projects as opportunities rather than just as obligations. There remain some questions about the exact role of these credits in companies' targets. Although these credits will be able to count towards a company's overall carbon footprint measurement, they will not be able to count against a company's targets for internal carbon production.

US$ 180bn
Estimated value of **Voluntary Carbon Market** by 2030

Looking ahead: The future of carbon markets

The Paris Agreement and Glasgow Climate Pact established the rules for the governance of the Compliance Carbon Market. But there is an additional route open to companies and investors looking to diversify their portfolios or offset their emissions: the Voluntary Carbon Market. It was notable that the Glasgow Pact did not seek to regulate the Voluntary Carbon Market. This is a system of credits and offsets brought by entities who wish to reduce their carbon footprint but are not under any regulatory pressure to do so. This will allow the sector to continue to innovate and experiment as the market becomes more mature.

The value of the Voluntary Carbon Market surpassed US$1 billion in 2021 (Ecosystem Marketplace, 2021) and is expected to expand rapidly in the coming years. The Taskforce on Scaling Voluntary Carbon Markets (TSVCM) estimates that under certain scenarios, the market could be worth US$180 billion by 2030 (TSVCM, 2021) and demand could reach 100 times its current value. What's more, the Voluntary Carbon Market is regarded as potentially more scalable than the global Compliance Carbon Market (McKinsey, 2021).

The TSVCM-backed Integrity Council for Voluntary Carbon Markets and the Voluntary Carbon Markets Initiative are both planning to publish principles and guidance on the functioning of the market. This should help provide investors and companies with additional confidence to buy carbon credits and report them.

The City of London has identified six requirements to drive the market to maturity:

- Governance structures
- Expertise in all aspects of the market
- A central hub to bring together buyers and suppliers
- Access to capital
- Innovation environmental accounting methods
- Improved trade infrastructure to improve transparency and efficiency (City of London, n.d.).

Experts identify three main problems with the market as it currently exists, from both an environmental and investment perspective.

One is additionality: this is whether the project would have taken place regardless of the investment. Another is permanence: for many nature-based projects, guaranteeing that they remain a carbon trap is difficult. For example, carbon-credits forests could burn down (Clean Energy Wire, 2021). Finally, there is leakage: can a project guarantee that the carbon credit it has generated hasn't simply resulted in carbon emissions being released at another site instead, leading to increased emissions?

These issues will need to be addressed if the market is appeal to investors and result in improved environmental conditions.

The market could also look very different in the years ahead. Currently, offsets are generated by individual projects, mostly through environmental safeguarding or the expansion of renewable energy infrastructure. These suffer from many of the issues outlined above. But there is potential for these credits to be generated in alternative ways. For example, energy companies could make their services more efficient, or encourage their customers to use less energy. Such savings could be compared with not acting and the credits for the difference could be sold by the company on the market. Similar approaches could be used by other companies, thereby generating a commercial incentive for them to green their production (Mendelson et al., 2021).

Both the Compliance and Voluntary Carbon Markets look set to flourish in the long term. The potential scale has positive implications for trade by directing capital, although for these projects to meet their environmental commitments and therefore prove to be a sound investment, standards and governance structures must be trusted. They will include the following aspects:

- **Future regulation**. As the world continues to work towards its climate-change and global emissions targets, regulations and policy will continually adapt to meet the new, lower emissions targets. New regulations are already being announced that will place obligations on companies.
- **Sustainability reporting**. Since 6 April 2022, the largest firms in the UK have been required to disclose climate-related financial information. This is in line with recommendations from the Taskforce on Climate-Related Financial Disclosures to help investors better understand their exposure to climate risk. Before these were introduced, the UK announced plans to introduce further disclosure requirements on the broader definition of sustainability. This will include requirements for companies – including in financial services – to make sustainability disclosures. Asset managers and asset owners that manage or administer assets on behalf of others (including occupational pension schemes) must disclose how they take sustainability into account. Designers of investment products will have to report on the products' sustainability impact and the relevant financial risks and opportunities (HM Treasury, 2021). This is part of a trend. The US Securities and Exchange Commission is moving forward with proposals that require companies to disclose data on emissions from their activities and from the energy required to power those activities (Financial Times, 2022). China has also introduced updated environmental disclosure requirements, updating its 2015 policy.

11m

Plastic production in metric tons, **leaked into the ocean** in 2016

- **Reducing plastics pollution**. It was announced in March 2022 that the UN will begin negotiations on a treaty to deal with plastics pollution. Agreed at the UN Environment Assembly in Nairobi, work on the new treaty will focus on the issue of plastics pollution in the oceans but will also address the life cycle of plastic from production and use to disposal. Plastics production reached 348 million metric tons in 2017 (Pew, 2020: p. 16) and 11 million metric tons leaked into the ocean in 2016 (ibid.: p. 15). An Intergovernmental Negotiating Committee will come into force in the second half of 2022, with a draft agreement slated for the end of 2024. Contentious issues are likely to include whether the treaty's strictures should be legally binding and how it should be financed. Plans for a treaty have been endorsed by dozens of financial-sector firms, retailers, major brands, and producers.[109] These all point to an evolving regulatory market with new rules and policies introduced to tackle specific environmental problems. Regulations already in operation will likewise be adjusted to consider new emissions targets.

[109] Plastic Pollution Treaty: https://www.plasticpollutiontreaty.org/

SECTION THREE

DIGITAL INNOVATION THAT BOOSTS SUSTAINABILITY IN TRADE

Technology is fundamental to our efforts to create a more sustainable global economy. This is the case whether it is the technology required to fuel the energy transition, for new and innovative ways to increase efficiency, or for helping to remove carbon directly from the atmosphere.

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How the twin forces of technological change and the drive towards sustainability interact will have major implications for 21st-century global trade.

In the short term, demand for specific materials and commodities that are essential for the low-carbon transition will help diversify trade flows and help continue to drive new markets. But eventually, fewer things will need to be traded as the demand for physical fuel continues to decrease (Krane and Idel, 2021).

When demand for these legacy goods falls, new trade in the technologies of the future and the services required to support them will shape trade flows. And as demand for technology continues, the technology industry itself will have to consider its own obligations, ranging from the vast amount of energy required to run huge data centres to the proliferation of devices in homes and the environmental impact of manufacturing, charging, and eventually disposing of them.

Trade in sustainable technology

Today, the manufacturing of technology vital for the green transition is dominated by China. It currently has 66 per cent of the world's solar-module manufacturing capacity, 50 per cent of global manufacturing capacity for wind turbines, and 88 per cent of global manufacturing capacity for lithium-ion storage batteries (Wood MacKenzie, 2022).

These sectors are vital for energy generation, storage, and our move away from fossil fuel-powered transportation. Last year, China exported 500,000 electric vehicles (EVs), making it the largest global exporter of such products (Nikkei Asia, 2021). The EV market is likely to be a key growth sector in the coming years, with jurisdictions such as the EU introducing bans on the sales of new combustion-engine vehicles from 2035 (Reuters, 2021a).

Despite growing demand, the environmental technology sector has had to confront some recent turmoil. Last year, the cost of solar modules and wind turbines rose, and batteries are expected to follow suit this year, the first time in a decade the trend line has been upwards for several key renewable technologies. Supply-chain issues, the rising cost of raw materials, and higher transport costs have piled price rises onto projects currently in the planning or construction phases (Wood MacKenzie, 2022). In contrast to this global trend, China has driven investment to record levels and the country's production of solar modules is growing faster than global demand.

This manufacturing capacity is, in part, due to increasing domestic demand for electricity, putting pressure on China's commitment to reach peak carbon emissions before 2030 (Reuters, 2021). It is also underpinned by a dominant position in the production of many of the key elements required for the transition economy. By some estimates, China produces 97 per cent of the rare earth elements that are essential to the production of electronics (Teufel Dreyer, 2020). In December 2021, a merger between China's three-largest rare-earths companies was approved, giving one state-owned company control over 70 per cent of China's rare earths output (Financial Times, 2021). Trade with China will be vital for those countries looking to meet carbon-reduction targets and move towards a cleaner economy.

There are, however, some sectors, such as hydrogen and carbon capture and storage, where China does not have a dominant position. The shock from the COVID-19 pandemic has also caused many to reconsider the potential risk of having a supply chain so dominated by a single country. The sector might, therefore, be ripe for diversification to maximise the potential of the full suite of green technologies, and to protect against supply-chain disruptions and geopolitical risk.

The importance of carbon capture and storage technology

There are several technologies in widespread use – solar, etc. – which can be used to wean the wider power grid off its reliance on fossil fuels. Unfortunately, these technologies lack the intense energy output needed by heavy industries such as steel and cement. An alternative to cutting back emissions in such industries, at least in the short term, is carbon capture and storage.

Carbon is captured from the industrial process in one of three ways:[110]

- **Post-combustion**, where the CO2 is isolated from the other gaseous outputs and then removed before leaving the chimney.

- **Pre-combustion**, where the CO2 is removed in advance by reacting the fuel with oxygen, air, or steam before use.

- **Using oxyfuel**, which involves burning fossil fuels with almost pure oxygen to generate only steam and CO2 as by-products, making it easier to capture post-combustion (House of Commons Library, 2017).

Carbon-capture technologies can nonetheless trap up to 95 per cent of emitted CO2 (Carbon Capture and Storage Association, 2022). This is particularly important for industries that are difficult to run off renewables, and, as such, both the International Energy Agency and the UN's Intergovernmental Panel on Climate Change have noted carbon capture's importance to the short-term transition of energy use. There are currently 27 commercial carbon-capture, usage, and storage facilities operating globally. With plans for another

68%

China's market share of **solar-module** manufacturing capacity

[110] Only the first of these can be retrofitted to existing power generators, however; the others are required to be installed during construction.

100 announced in 2021, carbon capture has momentum behind it to grow in the coming years (International Energy Agency, 2021).

A perhaps greater driver of trade in this sector is what to do with the captured carbon. Once carbon has been removed from industrial production it is then compressed into liquid form and can then be transported. But to where?

The plan during the first generation of this technology was to bury the carbon at least 1 km underground in depleted oil and gas fields or underground aquifers. The United States is estimated to have enough underground storage for 500 years-worth of its current emissions (Biniek et al., 2020). This, however, represents pure cost, so such projects have lacked investment.

But there are now growing opportunities for using liquified carbon, which could open new markets and drive trade:

- The most commercially viable use may be in enhanced oil recovery. As CO2 is currently used to boost the productivity of a well, there are already established markets.
- CO2 could also be locked into concrete by using a new type of cement that is 25 per cent CO2. As a major emitter, the cement industry could, in effect, create a large portion of its own raw material.
- Through a chemical reaction with hydrogen, captured CO2 can also be used to make synthetic fuels, including aviation fuel.
- In the longer term, the used for captured carbon could also include the manufacturing of carbon fibre and the creation of carbon-based plastics (ibid.).

500

Years-worth US estimated **underground storage** of its current emissions

These opportunities present real commercial value to a by-product that, up until now, has represented an environmental or regulatory cost. A shift in emphasis could enable a commercial incentive to help drive decarbonisation.

For this to take place, however, three issues need to be overcome for these projects to become scalable: capture costs need to fall; there needs to be improved regulatory incentives; and tech and innovation need to create markets for captured CO2.

Other carbon-capture techniques that remove carbon from the atmosphere – for example, by planting rapid-growth carbon-absorbing biomass before burning them and capturing and storing the carbon – have the potential to become increasingly attractive as the world uses up its remaining carbon budget and moves beyond the 1.5 degrees of warming cited in the Paris Agreement as the globally accepted goal (ibid.).

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Leveraging the advantages of hydrogen

While some industries will need to capture their carbon emissions, at least in the short term, others are looking at ways to avoid generating any at all. One alternative fuel is hydrogen, which is enjoying "unprecedented political and business momentum" (International Energy Agency, 2019). The advantages of hydrogen are impressive. The element is the most abundant in the universe, it can be consumed at source or transported as either a gas or a liquid and can be used directly as a fuel or used to generate electricity. On top of that, at the point of combustion, a hydrogen fuel cell emits only steam and condensed water.

Hydrogen can potentially be used in transport fuels for planes, ships, road vehicles, and trains, and can also be used to help heat people's homes through electricity generation. Despite its abundance, hydrogen easily reacts with other chemicals and so doesn't exist in a pure form on Earth. It therefore needs to be produced through a process of electrolysis, where electricity is passed through water, splitting it into its component parts of hydrogen and oxygen. Alternative methods using photo-electrolysis (using sunlight to split water), or algae are in the preliminary research phase. Green hydrogen uses electricity produced through renewables to create hydrogen.

Several countries have recently announced large-scale plans to invest in the hydrogen economy. The United States has announced plans to invest US$100 million over five years into hydrogen and fuel-cell technology R&D (US Department of Energy, 2020). In 2021, the EU launched a €2 billion industrial partnership in clean hydrogen (Kurmayer, 2021). The UK has its own hydrogen strategy and expects its domestic sector to be worth £900 million by 2030 and potentially £13 billion by 2050, when hydrogen-based energy could account for 20–35 per cent of consumption (Department for Business, Energy and Industrial Strategy, 2021).

The fuel's versatility makes it an attractive alternative to fossil fuels in transport and heating, and the element's abundance increases its attractiveness. Recent political commitments have set the stage for increased scaling of the technology in the coming years.

Big Data and AI to drive new forms of sustainable trade

Artificial Intelligence (AI) is one of the most innovative technologies operating in the environmental sector. Its scale and scope present numerous opportunities to drive both new trade and green traditional trade. AI refers to a suite of technologies that allow machines and computers to take in data from their environments, process this data, take actions, and then learn ways to make better decisions in the future to augment human decision-making.

A discussion paper by McKinsey in 2018 identified 135 uses worldwide of AI that directly supported the UN Sustainable Development Goals (McKinsey, 2018). AI can be used to boost performance in energy grids, precision agriculture, supply chains, environmental monitoring, and weather prediction. By augmenting the decision-making process in key areas, AI can help generate large-scale practices and help enable individual ones that reduce the resource and energy intensity of human activities (Nishant et al., 2020). A more recent report by PWC estimates that by 2030, application of AI could generate a 4.4 per cent boost to global GDP while also helping save 4 per cent of global emissions (PWC, n.d.: p. 8).

There are, however, risk factors that might hinder the uptake of AI. Although many of these technologies can be used to boost ESG goals, the same technologies can be used for other practices, such as public monitoring. It will therefore be vital to get public consent for such technologies to ensure they are able to provide the maximum level of public good. As such, regulation monitoring the use of these powerful technologies will be vital. AI also relies on a host of supporting technologies to be able to input the data and then carry out the decisions. The installation of these supporting technologies, although potentially adding cost, will also be vital to ensure that the opportunities presented by AI are achieved.

4.4%

Estimated **boost to GDP** through application of AI

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Greening the technology sector

Technology can be a vital tool to help us reduce our emissions and more towards a zero-carbon economy. Unfortunately, it is not a magic bullet. The tech industry itself has a large carbon footprint, which is only expected to grow in the coming years. Technology has accounted for as much as 2-3 per cent of global emissions (Global e-Sustainability Initiative, 2015). But consumer demand for technology is increasing, a trend that will be exacerbated by the demand for technological solutions to help with environmental problems. Under current trends, technology's contribution to global carbon emissions could rise to 17 per cent of the world's carbon footprint by 2030 (Belkhir and Elmeligi, 2018).

By 2030, end-user devices such as laptops, phones, and data cards will account for 47.2 per cent of information and communications technology emissions. Data centres will take up another 28.8 per cent, and networks 24 per cent (Global e-Sustainability Initiative, 2015: p. 19). Energy consumption is the key driver in this change, but supply chains, particularly regarding rare earth metals, which are essential in the production of many technologies, will also play a key role.

This presents a great innovation challenge: we need technology to help us fight climate change but expanding the use of technology will drive up demand for energy, placing added stress on renewables. For example, because of its reliance on data centres and the amount of power required by them, Bitcoin activities use more energy than Norway (Cambridge University Centre for Alternative Finance Index, 2022).

As result, a raft of technology companies has signed up to pledges such as the Green Tech Pledge, Race to Net Zero, and the European Green Digital Coalition to green their business activities. This will likely drive demand and innovation within the sector, with positive knock-on effects for the rest of the economy. Technology can undoubtedly help us drive down emissions. The proper application of technology could help reduce global emissions by 17 per cent (Global e-Sustainability Initiative, 2015: p. 92). It is therefore vital that we embrace its capabilities and encourage its trade, so the advantages can be as widespread as possible to help aid sustainability drives across the planet.

17%

Possible reduction of **global emissions** through proper application of technology

SECTION FOUR

SPOTLIGHT ON SEMI-CONDUCTORS

The global semiconductor industry looks set to be one of the most vital industries of the 21st century.[111] Semiconductors are used in a range of electronics, from consumer tech to industrial energy systems to cutting-edge defence technology.

With the upcoming growth of sectors such as the Internet of Things, and the global expansion of new infrastructure to reduce energy use and to fight climate change, the demand for semiconductors looks set to dramatically expand. These devices are already vital components of the global economy and the fight against climate change. Because of their role in the future of green technology, we take a close look at the state of the industry, its projected risks and opportunities, how it is expected to flourish in the years ahead – and how it will all impact trade.

The term semiconductor refers to the properties of a particular substance, in particular its ability to conduct electricity. Certain substances, such as gold, easily conduct an electrical signal; others, such as rubber, do not. Semiconductors conduct electricity, but not to the same standard as traditional conductors, such as cables. Crucially, they can change their properties based on environmental conditions. The addition of heat or light can make the semiconductor more receptive to electrical impulses; the addition of impurities can also change its behaviour. This adaptability makes them extremely useful, as they can be "programmed" to allow currents to pass along them but only in a certain direction, or only in certain conditions.

This adaptability has made semiconductors, and the electronic chips made from them, ubiquitous in a range of electronics, including smartphones, household appliances, ATMs, and electric transportation. Despite the widespread adoption of semiconductors, creating a chip can take months, must be done in advanced clean rooms, and requires precision equipment (Reuters, 2021c).

Global trade in semiconductors has more than doubled in the last 20 years. In 2000, semiconductor sales stood at US$204.4 billion globally. In 2021, sales reached US$555.9 billion, an increase of 26.2 per cent on 2020 (Semiconductor Industry Association, 2022).

174%
Growth of **semiconductor sales** between 2000-2021

[111] The science that underpins semiconductors relies on elements of quantum physics that are not yet widely understood. This raises the possibility that as demand for semiconductors increases, so will our understanding of the processes involved in them, making them more efficient and more adaptable in the future, and spurring future innovation and the creation of new, as-yet-unknown markets.

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The global market is dominated by six big players: the United States, South Korea, Taiwan, Japan, China, and the Netherlands. But even as these countries dominate the global revenue charts, there are discrepancies among them, and particularly in what generation of chips can be manufactured. Some of the emergent trends include:

- **The United States accounts for 47 per cent of semiconductor revenue by country**, with second-placed South Korea generating 19 per cent of global revenue (Deloitte, 2020).

- **Asia-Pacific is the hub of the global semiconductor industry**, notwithstanding the United States' dominance. As well as four of the top six revenue-generating countries, the region accounts for 60 per cent of global sales, with China alone accounting for 30 per cent (Deloitte, 2020: p. 2).

- **Demand from consumer technology companies is set to continue**, but over the coming years, demand will diversify as an increasingly large number of uses for semiconductors begin to go mainstream.

For example, semiconductors are vital for the functioning of electric vehicles, from the energy systems that power them to the onboard computers that control their systems. As regulations begin to slow the demand for traditional combustion engines, the demand for electric vehicles will increase, driving the need for more semiconductors.

The semiconductor industry's role in sustainability

Semiconductors are integral to many of the technologies that will be vital as the world moves towards a net-zero carbon future. They are embedded in devices that help optimise energy usage in transportation, manufacturing, and consumer goods, which are key to both global emissions and trade's contribution to global emissions.

They will also enable the goods and services of the future, including driverless cars, and smart grids and cities. Semiconductors are also of vital importance for the communication systems that will allow all these systems to flourish.

Energy efficiency will be vital as demand for electronic devices – and the associated energy they consume – increases with the mainstreaming of the Internet of Things, where household devices are connected, allowing for improved monitoring and performance of these appliances (European Semiconductor Industry Association, 2021). Superconductors will play a large role in building energy efficiency.

But the semiconductor industry is not immune from the energy demands and greenhouse gas regulations effecting all companies. Taiwan Semiconductor Manufacturing Company (TSMC), the world's largest chipmaker, is responsible for 5 per cent of Taiwan's electrical consumption, according to figures from Greenpeace (Taipei Times, 2020). It also used 63 million tonnes of water in 2019. TSMC is not the only chip manufacturer on the island and this level of water consumption has led to tensions between the industry and the island's farming community (New York Times, 2021).

The industry's continued demand for energy could help drive demand in the renewable energy sector. TSMC has announced plans to reach net zero by 2050, and, as part of that, has signed a deal with Danish firm Ørsted to buy energy directly from its wind farm in the Taiwan Strait (Guardian, 2021). Such innovative solutions will be vital to ensure the industry can reach its potential, while also safeguarding the environmental benefits that its technology enables.

60%

Asia Pacific's market share of the global semiconductor industry

Geopolitical dynamics will continue to underpin trade in semiconductors

The semiconductor industry has been described by the current US administration as the "DNA of technology" and vital to 21st-century geopolitical competition (White House, 2021: p. 23). Meanwhile, the EU regards semiconductors as strategic assets with geopolitical implications and China has aims of "technology independence".

The supply-chain disruptions caused by the COVID-19 pandemic meant that many companies had to cease production. This disruption, along with the strategic importance of some of the new technology that advanced semiconductor chips will make possible, is causing multiple jurisdictions to try to safeguard their economically and geopolitically important supply chains. This is driving policies that will shape the technology industry for decades to come. Recent policies include:

- **The EU unveiled the European Chip Act earlier this year**. It seeks to boost the EU's market share of semiconductor chips to 20 per cent by 2030, coughing up €11 billion on R&D to help achieve its goal (European Commission, 2022). The Commission argues that semiconductor chips are so vital to a range of important future industries – cloud computing, telecoms, space and defence technology, etc. – that securing access to high-quality semiconductors will dictate the bloc's ability to act militarily, economically, and industrially (ibid.).

- **The United States is seeking to pass the CHIPS for America Act**, with US$52 billion in funding to spark innovation and investment (White House, 2022) in the tech industry it leads in design, but not manufacturing. The bill also has incentives to support the manufacture, research, and supply-chain security of semiconductor chips (US Congress, 2020). The United States also has restrictions in place aimed at limiting China's ability to produce chips measuring 10 nanometres or smaller, particularly those regarded as "dual use", with applications in military technology (Reuters, 2021c).

- **China's move towards "technology independence**" has been informed by some of these restrictions. Currently, China spends US$300 billion on semiconductors annually (Thomas, 2021). In 2020, it spent more money importing semiconductors than it spent importing oil (Technode, 2021). The Chinese government is encouraging its domestic companies to take the reins, but there has not been any significant shift in market share (Thomas, 2021). China announced plans to invest US$1.4 trillion between 2020 and 2025 on advanced technologies, echoing its '"Made in China 2025" programme.[112] In 2019, it formally created a state-backed fund (worth approximately US$29 billion)[113] to support Beijing's efforts to build its own semiconductor supply chain from chip design to manufacturing.

Taiwan holds a key position in the global semiconductor industry. The island holds a dominant position in making the most advanced semiconductor chips. TSMC alone accounts for a 90 per cent market share in advanced chips, which are vital for cutting-edge technology in both the civilian and military markets (Reuters, 2021c). In Q1 2021, half of all Taiwanese exports to mainland China were semiconductors (ibid.). The semiconductor industry accounts for 15 per cent of Taiwan's GDP. TSMC capital investment was estimated to be US$28 billion in 2021, compared with Taiwan's defence budget of US$16 billion (Financial Times, 2021a). This gives the island a huge stake in the global economy from which to base its domestic economy. And yet, should there be any disruption to production in Taiwan, it will have global ramifications.

Looking ahead: the semiconductor industry

The semiconductor industry is now truly an "essential industry", whose importance has only been highlighted by the recent shortages (Deloitte, 2022). The COVID-19 pandemic increased demand and limited supply, causing a global shortage and missed global revenue of more than US$500 billion (ibid.). The growing importance of semiconductors was further highlighted by the range of industries that were affected.

Market research suggests demand is expected to continue to exceed supply until at least 2023, yet despite this, 95 per cent of the industry expects to see increased revenue this year (KPMG, 2022) and industry revenue is expected to be 50 per cent higher than it was in 2019 (Deloitte, 2022). The industry is looking to scale up its activities. Mergers and acquisitions reached US$118 billion in 2020 (Burkacky et al., 2021a) and companies are looking to increase their output.

TSMC are building a new production plant, which will be the world's first facility to produce 3-nanometre chips. It is also building a new research and data centre, and it was reported the company was looking to boost its monthly wafer production (the basis for chips) by 70 per cent year on year by the end of 2021 (FT, 2021a). Meanwhile, Toshiba will spend US$89 million in 2022 to increase production of power semiconductors – a 45 per cent increase over last year's investment (Nikkei Asia, 2022a).

Around US$3 trillion in investment will be needed over the next decade to ensure the semiconductor industry keeps up with global demand (Varas et al., 2021). The three areas expected to drive revenue are wireless communications, the Internet of Things, and the automotive sector, according to an industry survey (KPMG, 2022). The following drivers will also be important:

- As countries ramp up their 5G infrastructure, the demand for communication tech will also increase, all of which requires semiconductors.
- Similarly with the Internet of Things, the improvement of the connectivity of currently unconnected devices will require a further expansion of communication technology.
- The demand for electric cars, as a result of government regulation, will result in increased production, which will require more semiconductors.
- Despite being an essential technology for vital markets of the future, Chip nationalism, supply chains, and talent top the concerns of industry insiders (KPMG, 2022).
- The imposition of regulations, tariffs, and potential national security policies all have the potential to place restrictions on the growth of the industry.
- Continued supply-chain disruption due to COVID lockdowns and the associated backlogs are expected to be a short-term drag on the sector.

As the industry expands rapidly, there are fears that the availability of talent in an extremely complex manufacturing process may not be able to keep up. In mature markets, such as South Korea, this is already happening. This might be alleviated by the expansion of the industry into places like Israel, Singapore, and Europe, but competition for high-level talent at the cutting edge of the industry will likely continue (KPMG, 2022) (Deloitte, 2022). The most advanced technology, with the greatest opportunities to revolutionise the sustainability sector, lies with the smallest chips. In 2020, only TSMC and Samsung were manufacturing 5-nanometre chips; and no European country was producing chips smaller than 22 nanometres (European Parliament, 2021). All the world's advanced semiconductor manufacturing capacity – defined as below 10 nanometres – is concentrated in Taiwan and South Korea, although the latter only accounts for 8 per cent of capacity (Varas et al., 2021). This gives the respective economies and the region significant scope to boost bilateral trade.

US$1.4tn

China's announced investment in **advanced technologies** between 2020-2025

[112] https://www.scmp.com/tech/policy/article/3085362/china-has-new-us14-trillion-plan-seize-worlds-tech-crown-us
[113] https://about.bnef.com/blog/china-invests-29-billion-to-beat-u-s-semiconductors/

Key takeaways

1. Green finance, both public and private, will continue to expand, representing an opportunity for investors to scale green investments.
2. Sustainable debt issuance could break another record in 2022, though current global debt dynamics may be a restraining factor.
3. Much of the global economy is covered by governmental net-zero commitments. This is likely to mean increasing levels of regulation in the coming years. In the short term, this could restrain export growth; and yet, in the long run, the digital innovation that is likely to occur from complying with environmental regulations will boost exports.
4. Global carbon trading markets will be reinvigorated by COP26 agreements that put in place some of the guidelines for how the markets will operate.
5. China will continue to dominate the green tech sector. Of the three leading green energy technologies in the world — wind turbines, solar photovoltaics and electric vehicles — the last two technologies are overwhelmingly produced in China.
6. The semiconductor sector will continue to be at the forefront of the green and digital transitions. An improvement in global semiconductor capacity is expected in 2022, and beyond, as capital and investment spending are increased to meet global demand.
7. In the short term, the war in Ukraine, and sanctions imposed on Russia, are likely to further disrupt global semiconductor supply chains. One of the knock-on effects of US sanctions on Russia could be to increase Russian demand for semiconductor chips from China.

Recommendations for businesses:

1. Firms should prioritise green investments that aid in macroeconomic resilience and economic transformation, generate returns, and help meet net zero climate commitments.
2. First and foremost, this should involve applying a low-carbon approach to operations and to the design of products and services, providing a competitive advantage over late adopters.
3. Firms should devote further resources and funding to promoting sector and firm-relevant innovations to contribute to net zero commitments. Where relevant, exporters' usage of digital technology will be key to sustainable initiatives.

Recommendations for governments:

1. Governments should agree to reporting standards for green finance to boost investor confidence. They should ensure that the application of regulations and standards is implemented in a coordinated manner.
2. Governments should meet their commitments on catalysing green finance to drive investments, innovation, and blended finance initiatives aimed at adapting to climate change and meeting climate commitments.
3. Collaboration with and advance notice of planned ESG regulations should be given to firms in order to allow companies enough time to develop sector specific strategies and company business models. A further scaling up of infrastructure investment is required to allow green technology to flourish at scale, to safeguard long-term sustainable trade and to help de-risk further infrastructural investment.

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CHAPTER IV: Sustainability and the Future of Trade

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CHAPTER V

STRUCTURE GAPS IN TRADE AND INFRA-STRUCTURAL FINANCE

Structural gaps will **influence trade** in the years ahead

Persistent structural gaps within and between the world's economies will decisively influence trade in the years ahead. At the centre is the need to close the gaps through structural change. But such change – and the reform processes that drive it – is challenging at the best of times: COVID-19 and the current situation in Ukraine – with the associated economic shocks and financial volatility – have exacerbated the difficulties.

In this section, we look at three structural gaps that are particularly relevant for trade – in financing trade, in infrastructure, and between private and public financing. All need and can benefit from reform, particularly given recent crises.

A declining availability of private trade-credit lines has had a knock-on effect on low- to middle-income countries, which has, in turn, coincided with a growing infrastructure gap. There has been a shortfall in export credit and, in some cases, adequate fiscal resources to make trade finance available to businesses, according to WTO Director-General Ngozi Okonjo-Iweala.[114] This has meant that the dearth of trade finance has been an obstacle to trade growth, as well as keeping poorer nations poor.

After having hit a record high of US$35.2 billion[115] in 2017, multilateral development bank (MDB) finance has continued to cover only a comparatively small amount of the trade

[114] https://www.wto.org/english/news_e/news21_e/trfin_17may21_e.htm

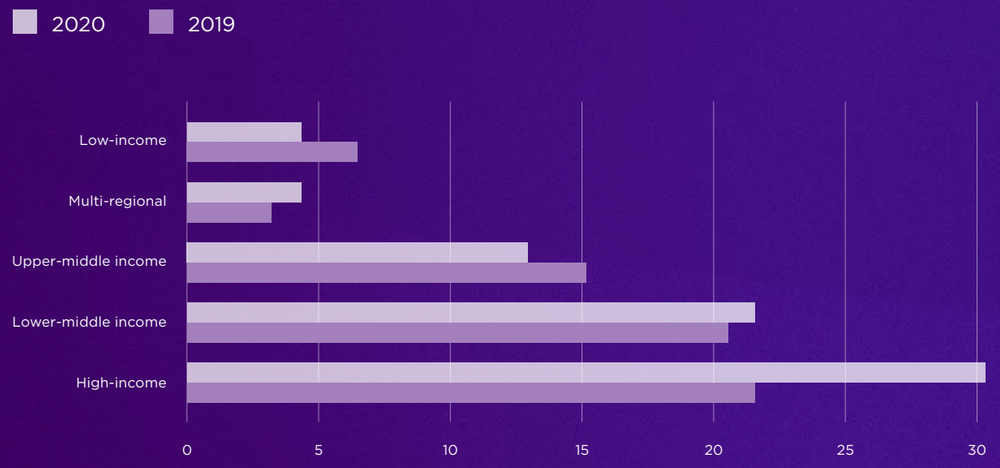
[115] https://www.worldbank.org/en/news/press-release/2018/06/13/mdb-climate-finance-hit-record-high-of-us352-billion-in-2017

CHAPTER V: Structural gaps in trade and infrastructural finance

FIGURE 20

MDB climate finance by income levels of borrowing (2019-2020)

US$, BILLION



finance gap, which, in 2020, was measured at US$1.7 trillion (ADB, 2021). Multilateral development banks have nonetheless continued to finance and/or provide guarantees in the poorest parts of the world. In 2018, these programmes supported around US$30 billion in trade transactions. The WTO, development finance institutions, and MDBs continue to be crucial in filling the gap or, at least, stopping it from widening across the country income spectrum (***Figure 20***).

Similarly, for infrastructure, there is a need for more resources, with the largest shortfall seen in emerging and developing economies that actively engage in cross-border trade. Developing countries need to invest approximately 4.5 per cent of GDP[116] to achieve infrastructure-related Sustainable Development Goals (SDGs) and stay on track to limit climate change.

Most governments do not have adequate resources on their own to fully finance their infrastructure needs – particularly after the succession of shocks – which makes private-sector participation essential. Approximately US$35 trillion in assets were held by pension funds at end-2020[117] (and approximately US$10.5 trillion were held by sovereign wealth funds in 2021).[118] Yet, their contribution to global investment in developing-country infrastructure remains negligible.[119]

[116] https://www.worldbank.org/en/topic/publicprivatepartnerships/publication/beyond-the-gap---how-countries-can-afford-the-infrastructure-they-need-while-protecting-the-planet

[117] https://www.oecd.org/daf/fin/private-pensions/Pension-Funds-in-Figures-2021.pd

[118] https://www.statista.com/statistics/1267499/assets-under-management-of-swfs-worldwide/

SECTION ONE

THE IMPORTANCE OF CLOSING TRADE FINANCING GAPS

Trade is an important driver of economic development; it needs finance to grow. Credit and credit insurance help facilitate trade by bridging the gap between exporters' and importers' differing expectations about when payment should be made (WTO, 2016).

CHAPTER V: Structural gaps in trade and infrastructural finance

80%

Share of global trade **covered by credit** or short-term payment guarantees

But such financing is often taken for granted in developed countries, because importers and exporters are backed by mature financial industries. Financing gaps between countries can also be problematic for sustainable trade. It is therefore important for the future of overall trade to identify financing gaps and address them (ibid.).

Safeguarding trade finance is particularly important during times of crises – or unexpected shocks – given its short-term orientation. An estimated 80 per cent of global trade is covered by credit or short-term payment guarantees.[120] But approximately half of the trade financing gap is in developing countries (Castell and Gonzalez Behar, 2021; Auboin and Gonzalez Behar, 2020; Auboin, 2015). This is likely to increase further as supply chains rotate to poorer developing countries.

In industrialised countries, the depth and breadth of the financial and insurance sectors help cover trade finance gaps during difficult conditions. The gap emerges, however, when requests for trade finance are due to the lack of ability to assess creditworthiness (owing to a lack of collateral), which entails risk assessment mechanisms that might not be available. Recognition of creditworthiness is more difficult for companies that cannot provide collateral or detailed financial documentation – indicating the need for new financing instruments and mechanisms to assess risk for SMEs (OECD, 2015). Given this backdrop, therefore, trade finance may be an even greater concern for SMEs in developing countries, and particularly in emerging market economies, as they account for an ever-increasing share of global trade.[121]

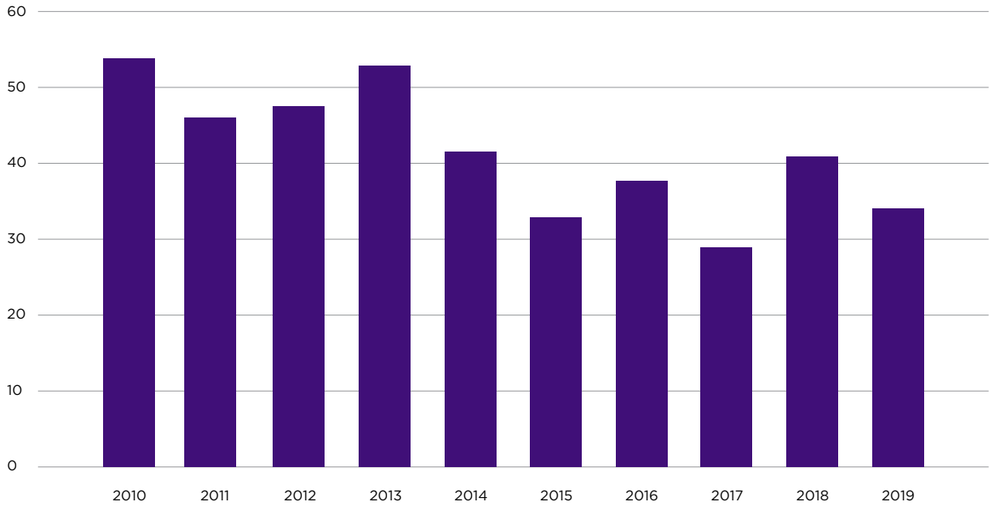
This section outlines the ways in which trade finance gives rise to sustainable trade and the ways in which obstacles to trade finance can be tackled in the years ahead – including through mechanisms such as fintech and upgrading the knowledge and digital skills-base in both developed and developing open economies.

[120] https://iccwbo.org/publication/icc-trade-register-report/
[121] https://www.worldbank.org/en/topic/smefinance

FIGURE 21

Arrangement official export credits

US$, BILLIONS



To facilitate and develop sustainable trade in the years ahead, trade finance has to overcome the following hurdles:

- **Lack of access to the knowledge and skills required for trade**. Adequate provision of trade finance, and liberalisation, are essential as developing economies seek to benefit from the trade opportunities offered by shifting patterns of production (Fan and Liu, 2021). Financial-sector capacity to support the trade sector has stagnated, according to certain metrics (***Figure 21***). The development of a deeper and more varied financial ecosystem would aid in the channelling of finance and the transfer of knowledge. Post-financial crisis, global banks are less inclined to invest in many developing counties (BIS, 2018). This harms the prospects for the supply of trade finance in the very locations where there are significant gaps.

- **The shortage of trade finance during periods of crisis**. During the Asian and Latin American financial crises, credit crunches at the country level affected both exports and imports to the point of stoppage (WTO, 2020). Elements of market failure include herd reactions by banks, confusion between counterparty and country risks on the part of investors, and gaps between perceived and actual credit risk (Auboin, 2015). The COVID-19 crisis and its economic impact is a single unforeseeable shock and governments cannot rely on mechanisms used in past crises to cover gaps in trade finance.[122]

[122] https://www.oecd.org/coronavirus/policy-responses/trade-finance-in-the-covid-era-current-and-future-challenges-79daca94/

- **Rejections of funding for small and medium-sized enterprises**. SMEs tend to be the most credit constrained.[123] Estimates project that half of SME trade finance requests are rejected, compared with only 7 per cent for multinational corporations. Some 68 per cent of companies in a survey also said they did not seek alternatives after being rejected. This disparity has continued, leading to a perception that credit constraints may constitute a "new normal" for SMEs (OECD, 2015). Firms in the survey cited price constraints as the key systemic bottleneck to obtaining trade finance.

- **Lack of information about SMEs**. This results in more credit rationing of SMEs, higher costs of "screening", and higher interest rates from banks than charged for larger enterprises (Beck and Demirgüç-Kunt, 2006). Incomplete information on firms' performance metrics (such as productivity) is linked with credit constraints for both domestic and exporting firms. But exporting firms – which bear an additional risk in the form of larger gaps between production and sales – have tended to experience even tighter credit constraints (Feenstra et al., 2011).

The macroeconomic and financial backdrop is such that the trade finance gap will widen in the near term. Notwithstanding this, there is significant potential for digital technology to help close the gap – either via streamlining onboarding processes for SMEs, or by opening the sector up to new sources of liquidity.

Digital and fintech will help as follows:

- **Fintech adoption and uptake will be supported by demographics in emerging markets**. Emerging markets comprise more than 85 per cent of the world's population yet produce less than half that per centage in global economic input.[124] Fintech (largely software, applications, and other tech created to automate traditional finance) meets demands from small businesses and exporters, filling the gaps left by traditional financial institutions. Additionally, for regions that are experiencing political uncertainty and unrest (and, in some cases, fragile or unstable governments) the alternative provision of finance can contribute to economic resilience.

- **Fintech helps cover unbanked individuals and SMEs**. Estimates suggest that providing services to individuals without bank accounts could generate US$200 billion in global bank revenues.[125] Fintech carries lower overhead costs and enables companies to reach a larger portion of the population. According to recent statistics, an increasing proportion of people surveyed prefer to manage investments with an app rather than through a traditional bank, making this method of managing finances a preferred way for many across the globe, according to the UK Financial Conduct Authority.

- **Fintech enhances data usage and transparency**. Funding isn't the only disadvantage with which micro, small, and medium-sized enterprises are faced. Their small size and lack of connections within the larger global economy mean wider information gaps. Fintech companies, however, can be catalytic in changing actual market structures by tackling information inequalities (Feyen et al., 2021). This is done through the provision of electronic data across entire trade regions and financial cycles: fintech connects smaller companies to investors, lines of credit, business data, and tools to control their financial data. It can transform local economies worldwide.

[123] Women-owned SMEs face even more difficulty: about 70 per cent of applications were totally or partially rejected (Wragg, 2021).
[124] https://www.imf.org/en/News/Articles/2015/09/28/04/53/sp020416
[125] https://www.ey.com/en_cz/news/2018/01/improved-financial-inclusion-could-boost-global-bank-revenues-by-us-200b

SECTION TWO

INFRA-STRUCTURE GAPS, OPPORTUNITIES, AND CHANGE

There is a significant link between infrastructure development and sustainable trade performance. In Asia, there is a significant long-term impact of the state of infrastructure (transport, telecommunications, energy, and the financial sector) on exports and trade deficits (Rehman et al., 2020).

FIGURE 22

Private particiaption in infrastructure

INVESTMENT COMMITMENTS IN INFRASTRUCTURE PROJECTS WITH PRIVATE PARTICIPATION IN EMERGING MARKET AND DEVELOPING ECONOMIES

The link will continue to be an important driver for global economic growth because the availability of infrastructure enhances connectivity and, in turn, trade promotion.

The gap between countries with good infrastructure and those without is significant, estimated to reach US$15 trillion by 2040.[126] Ongoing concern over inflation, economic scarring from the COVID-19 crisis, and growing fiscal and monetary constraints is currently dampening investor appetite for infrastructure development; this has coincided with pressure on governments seeking to finance it (UN, 2021). There are expectations that the increasingly uneven nature of the economic recovery will result in an even larger infrastructure funding gap. Moreover, private participation in infrastructural investment has been comparatively low in the larger emerging markets (***Figure 22***).[127]

Of primary importance, given countries' climate commitments, is the added dimension of promoting infrastructure for green growth.

The following elements will impact infrastructure financing throughout 2022 and beyond:

- **Investor risk aversion**. This is likely to remain elevated, given the geopolitical tensions in several regions and anticipated (and unanticipated) monetary tightening to stem growing inflation. There are likely to be "safe haven" capital outflows from countries deemed to be vulnerable (with significant economic scarring that has not been adequately matched with fiscal or monetary stimulus) and from countries where there are elements of

[126] https://outlook.gihub.org/?utm_source=GIHub+Homepage&utm_medium=Project+tile&utm_campaign=Outlook+GIHub+Tile
[127] https://www.aiib.org/en/news-events/news/2022/2022-AIIB-Expects-Bigger-Infra-Funding-Gap-Cyclical-Tensions.html

financial vulnerability (such as a high and unsustainable level of debt). This could, in turn, impact the ability to finance necessary and long-term infrastructure investments.

- **COP26 announcements and climate commitments**. Climate-change policies, particularly those of the major emitting economies, stand to significantly alter both the planning and funding of infrastructure investments. Regions with outsized infrastructural finance gaps will need both to channel increasing amounts of capital and redistribute it to the renewable sector and to energy-efficient transmission and distribution projects. Infrastructure that can adapt and be resilient to weather shocks, will – out of necessity – need to be scaled up. Both management of stranded assets (those subjected to unexpected write-downs, for example) and an expanded ecosystem for blended finance will be key to getting the right infrastructure for expanded cross-border trade.

- **Digital innovation** (Nambisan et. al., 2017). Collaborative delivery models[128] and procurement based on outcomes rather than methodology will help foster innovation, break silos,[129] and drive the best use of technology. Crucially, digital innovation will play an essential role in infrastructure projects that improve physical connectivity; it will aid strengthening supply chains and logistics operations. The incorporation of digitalisation in the built environment (houses, streets, transportation, etc.) and associated projects will involve significant structural shifts – including incentivising supply chains for digital delivery (Lobo and Whyte, 2017) and fostering strategic shifts at the managerial level (Papadonikolaki et al., 2022).

Lack of new infrastructure exacerbates cost and inflation pressures

COVID-19 lockdowns, labour shortages, and strains on logistics networks led to shipping-cost increases and significantly lengthened delivery times (Kamali and Wang, 2021) – although some of those pressures are now easing. This includes on trans-Pacific eastbound routes (constituting the main sea link from China to the United States).

But in the absence of renewed investment, infrastructure capacity constraints are likely to result in renewed cost pressures. Underlying supply constraints (such as with backlogs and port delays, labour shortages, supply-chain disruptions moving inland, shipping industry challenges, and few carriers) suggest that there are structural factors that are indicative of cost pressures.

Higher shipping costs and goods shortages will contribute to inflation. The United Nations Conference on Trade and Development (UNCTAD) projects that if container freight rates remain elevated throughout 2023, they could increase global import and consumer prices by 10.6 per cent and 1.5 per cent, respectively.[130] This cost would be disproportionately borne by small, developing islands, which heavily rely on imports that arrive by sea.

Higher freight rates will transmit inflation to low-value-added products. And here too, smaller developing exporting economies would be likely to become less competitive and see a significant loss in export revenues – constituting a sizeable economic shock. Moreover, the final prices of products that are highly integrated into global value chains, such as electronics and computers, will also be more affected by higher freight rates.

[128] Collaborative delivery models encompass a variety of collaborative methods in projects, including public-private partnerships (PPP).
[129] https://www.aiib.org/en/news-events/news/2022/2022-AIIB-Expects-Bigger-Infra-Funding-Gap-Cyclical-Tensions.html
[130] https://unctad.org/news/high-freight-rates-cast-shadow-over-economic-recovery

Aligning infrastructure with renewable energy and climate commitments

Real economy and infrastructure investments are increasingly aligning with several initiatives relating to energy transition. For example, in the building sector, carbon dioxide (CO2) emissions (including both direct and indirect emissions from upstream energy production) reached 10 gigatons in 2019, an all-time high that represented 28 per cent of all energy-related CO2 emissions globally (IEA, 2020).

The International Energy Agency sees untapped energy-efficiency potential in the sector, because "global building energy code evolution is not keeping pace with rapid floor area expansion in emerging economies, while renovation rates in developed countries remain low". In the light of this, CO2 emissions are effectively being locked in over the lifetime of buildings; this is largely occurring in new constructions in emerging economies and because of low rates of energy-efficient retrofitting in developed countries (Jachnik and Dobrinevski, 2021).

Notwithstanding the challenges, 2022 could be a defining year for renewable energy investment. Indeed, renewable energy infrastructure will be the best-performing asset class of 2022, according to a survey of investment company managers.[131] An increase in infrastructure spending in the renewable energy sector will have two main drivers:

- Governments, through spending and innovation policy.

- Corporates, through investments in decentralised energy as a hedge against spiralling gas prices.

10gt
CO^2 emissions from the **building sector** in 2019

Investment relating to expanding energy production has fallen short over the past few years. In the absence of a scaling up, there will be a prolonged period of shortages and elevated energy prices (IEA, 2020a; OECD, 2020). The results of climate-change mitigation policies across OECD and G20 countries show that renewables investment from 2000 until 2014 was primarily driven by investment incentives (feed-in tariffs, renewable certificates, and public tenders) (OECD, 2017).

Feedback loops, spillover effects, and interactions between different climate-change mitigation policies show that such policies can enhance each other when combined (Baranzini et al., 2016). Investment flows in renewable power also depend on a broader investment environment (Ang et al., 2017). This can be seen, for example, in emerging economies where explicit carbon pricing is combined with public research, development, and deployment spending (Vieira, 2017). It is particularly relevant for investment in solar and wind energy (in advanced economies as well).

[131] https://sebgroup.com/press/press-releases/2022/sebs-the-green-bond-energy-investments-to-surge-in-2022 html

SECTION THREE

BRIDGING THE GAPS THROUGH BLENDED FINANCE

Trade finance shapes export opportunities

The networks that define cross-border commerce all entail some form of finance. Ultimately, it enables firms (some of which might otherwise have been designated as risky) to link into expanding global value chains.

But trade finance is not equal. The Asian Development Bank puts the global trade finance gap at US$1.7 trillion dollars. What is more, it is not evenly distributed across financial institutions that evaluate applications for trade finance reporting; in some instances, there have been rejection rates as high as nearly 60 per cent for small and medium-sized enterprises in the past.[132] This poses a policy conundrum, given that trade finance is one of the safest forms of finance, with less than 1 per cent of transactions defaulting (Auboin and Di Caprio, 2017).

Structural difficulties in lower-income, emerging, and developing economies attempting to access affordable trade finance persist, and the difficulties are particularly acute for countries that are in sovereign default or distress (IMF, 2021). Recovery from financial crises lags in weaker economies (Freund, 2009), and this has significant impacts on the availability of trade finance, credit rationing, and trade flows (Ahn et al., 2011). All this underscores how financial deepening in developing countries needs to be accompanied by advances in financial inclusion – a link that has been lacking (Dabla-Norris et al., 2015).

Providing blended finance – government and/or philanthropic funding leading to corporate investment – is important:

- Financial-sector development and access to finance are crucial for long-run growth prospects. Various paths to reach financial-sector development have different long- run growth impacts at the country level (Bordo and Meissner, 2015). In addition to this, trade finance impacts trade flows and underlying economic development.
- There is an opportunity for lower-cost economies to capture market share in certain sectors, depending on the associated access to trade finance. Countries in developing Asia and Africa are poised to take advantage of the relocation of apparel and garments manufacturing from China (Zhang et al., 2015), for example. But such new players require trade finance; 80 to 90 per cent of global exports are supported by financing or credit insurance.[132]
- Rationing of finance does not always reverse after an economic or financial shock has ended.[134] In this sense, trade finance gaps reflect a structural market failure (Auboin and Di Caprio, 2017). There are disconnects between the more liquid end of the trade finance market (where borrowing costs are cheaper) and the other end of the market (in which liquidity is scarce and borrowing costs are high).

[132] https://iccwbo.org/global-issues-trends/banking-finance/access-trade-finance/

[133] https://www.wto.org/english/thewto_e/coher_e/tr_finance_e.htm

[134] See, for example, Guttentag and Herring (1984).

[135] https://www.un.org/en/chronicle/article/womenin-shadow-climate-change

[136] https://www.convergence.finance/news-and-events/news/0qkaeG2OlenTfKkYEZokz/view

CHAPTER V: Structural gaps in trade and infrastructural finance

80-90%

Share of global exports **supported by financing** or credit insurance

Closing the trade gap: the intersection between gender and climate finance

Addressing gender equality, including through access to trade finance, is one of the most effective, yet overlooked, means to mitigate the impacts of climate change. Increasingly, blended climate finance will need to address the growing gap in gender equality when it comes to financial access. Trade policies and access to finance impact women and men differently, because of differences in their economic and social conditions. Women overwhelmingly contend with the consequences of climate change.[135] Additionally, over-representation in the informal sector limits income stability and leaves women more exposed to the economic impact of extreme weather (Zelenczuk, 2022).[136]

Trade lowers prices for consumers; this, in turn, increases and typically supports the purchasing power of more vulnerable groups (where women are disproportionately

represented). Conversely, higher trade costs impede access to international markets for smaller businesses more than they do for large firms (which also disproportionately impacts women, who tend to own and lead smaller businesses) (Korinek et al., 2021).

Blended finance constitutes both a promising investment approach and a tool to tackle the gender funding gap:

- Increased trade is associated with lower levels of gender discrimination (ibid.). The increased competition resulting from trade liberalisation in goods and services leads to cost reductions. This, in turn, erodes the ability of firms to exploit cost disparities that can lead to discriminating between men and women (Black & Brainerd, 2004). Export subsidies have been found to coincide with firms discriminating against women workers, because they provide additional financial resources that firms can use to hire relatively more expensive men (ILO, 2016; Lopez 2016).

- Gender-framed climate finance will drive new (higher-return) investment. Adopting a gender lens when designing and financing climate solutions addresses the unique way in which climate change impacts women. Since 2015, only 18 per cent of blended climate-finance transactions have been aligned with the UN's Sustainable Development Goals relating to gender equality. They account for just 7 per cent of all blended capital directed towards climate outcomes (Convergence, 2021; UN Women, 2016). Approximately a quarter of blended climate-finance deals had incorporated some gender component into the overall transaction structure (ibid.). Gender-smart investment can foster financial deepening in a way that promotes sustainable trade. An example of this is climate insurance for women to improve their ability to adapt.

The opportunity to bridge the climate-gender financing gap is rapidly closing. On 28 February 2022, the Intergovernmental Panel on Climate Change, in its latest report, found that approximately half of the measures previously believed to be critical to limiting climate risks are "no longer an option" and that climate-change risks are highest and will be experienced more immediately in low-income and least-developed countries, where women form the majority of the population living in multidimensional poverty.[137]

Shifts in China's catalytic role in global infrastructural finance

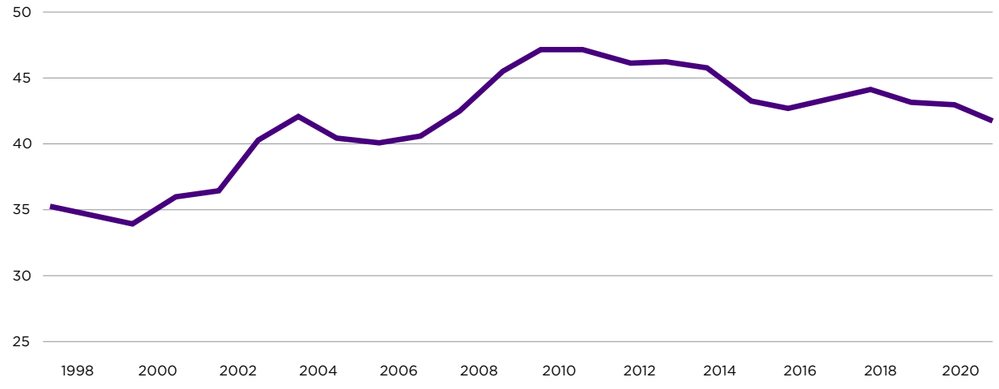
China is the main financer of much of the infrastructure transformation in several regions and economies, including, notably, Africa.[138] China's development banks (China Exim Bank and China Development Bank) accounted for more than twice the amount lent by the United States, Germany, Japan, and France combined over 13 years: US$23 billion versus US$9.1 billion. This was to 535 public-private infrastructure deals funded in sub-Saharan Africa.[139] This is consistent with China's growth in outbound investment. Its domestic investment as a share of its own economy has remained resilient compared to several developed economies but has trended lower of late (***Figure 23***).

[137] https://www.ipcc.ch/report/ar6/wg2/resources/press/press-release/
[138] https://eastafricamonitor.com/chinese-infrastructural-funding-in-africa-continues-to-build-momentum/
[139] https://www.cgdev.org/article/new-study-china-lends-25x-us-uk-japan-germany-combined-infrastructure-sub-saharan-africa

FIGURE 23

China's total investment

PER CENT OF GDP



Crucially, China's administration has become increasingly active in the functioning of multinational development banks. Chinese contractors have also accounted for an increasing proportion of World Bank contracts, backed both by recipient governments and the Bank. An estimated 31 per cent of all construction projects in Africa valued at US$50 million or more in 2020 were Chinese funded (Kenny, 2022). A core reason for this is the cheap labour costs in the country's construction sector (ibid.). Owing to the state-owned status of China Exim Bank, the low interest rate is unbeatable by other multinational organisations, such as the IMF (Morris et al., 2020).

Despite this impressive funding, a gap between public-private investment and infrastructure finance needs in sub-Saharan Africa persists. From 2007 to 2020, the total domestic and external finance for financially closed infrastructure projects (including private participation) remained stagnant, despite announced commitments to increase the total financing volume, and particularly the World Bank's "billions to trillions" challenge to itself (Eyraud et al., 2021; Hoque, 2017).

Looking ahead, there could be structural shifts in the provision of infrastructure finance. The United States recently announced the Build Back Better World Initiative (B3W) to help meet this challenge and address infrastructure needs in the developing world. B3W will be led by the G7 in partnership with multilateral institutions and private-sector companies – with China also announcing its intention to contribute to the initiative.[140] B3W will focus on mobilising "hundreds of billions" in investments in climate, health, digital technology, and gender equality. It will focus on two tracks of investment – one on private-sector finance, the other on grants and concessional loans through US development agencies.[141] B3W could also provide a unified platform for America and its allies to offer an alternative model to China's Belt and Road Initiative.

[140] https://www.reuters.com/world/china/china-willing-work-with-us-build-back-better-world-initiative-2022-02-28/
[141] Deputy National Security Advisor for International Economics Daleep Singh recently emphasised that the initiative's success will rely heavily on US development personnel serving abroad, who "understand the binding constraints to the development impact we're looking for" and can help create a "repeatable process for developing a pipeline of bankable projects".

SECTION FOUR

KEY DEVELOP-MENTS IN THE DE-RISKING OF INVESTMENT

Trade has rebounded strongly following the COVID-19 crisis, coinciding in large part with a bounce-back in global growth (***Figure 24***). However, the positive upturn masks wide divergences between countries, sectors, and products.[142] The gaps in trade finance and the risks in accessing finance have accounted for these differences.

[142] https://www.oecd.org/coronavirus/policy-responses/international-trade-during-the-covid-19-pandemic-big-shifts-and-uncertainty-d1131663/

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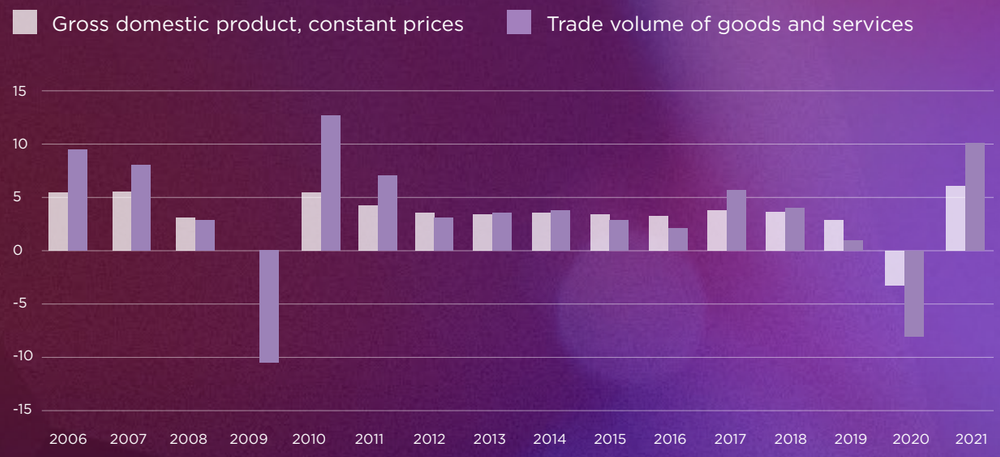
FIGURE 24

Export and import growth in services trade

ANNUAL PERCENTAGE CHANGE



Blended finance has been used to support trade finance to ensure that market access channels remain open. The economic impacts of the pandemic, and the resultant global supply-chain disruptions, pose intermittent risks to trade in the form of falling export revenues, limited access to foreign exchange liquidity, and a risk of decreased supply of bank-intermediated trade finance (Nyantakyi and Drammeh, 2020).

Organisations linked to the World Bank are stepping up. The International Finance Corporation's global trade finance programme (GTFP) offers local banks partial or full guarantees covering payment risk for trade-related transactions. Through the GTFP bank network, local financial institutions work with international banks that can broaden access to finance and reduce cash collateral requirements (IFC, 2018). Similarly, responding to COVID-19, up to US$400 million of concessional resources have been made available through the International Development Association's Private Sector Window to low-income countries and fragile states, to ensure continued availability of trade finance.[143]

Key to de-risking of investment is wider use of blended finance. The blending of investment funds on commercial (private sector-led) and concessional (public sector-led) terms can catalyse investments that would have otherwise not been made. This will, in turn, lead to the creation and development of deeper, varied, competitive, and sustainable markets (Lankes, 2021). This stems from pioneering new investments, building market platforms, adopting new technologies and business models – often amid pronounced uncertainty.

[143] https://www.ifc.org/wps/wcm/connect/industry_ext_content/ifc_external_corporate_site/financial+institutions/priorities/global+trade/gtfp

Blended finance should only be used in specific contexts.[144] Financing on commercial terms is typically best as the first option, though it's often not a realistic one.[145] Blended finance is also not the solution to long-term structural issues where permanent subsidies are called for, or the solution for problems where reforms would be preferable. Blended finance should be used in the presence of market failures, affordability constraints, or information deficiencies that prevent private-sector investment (Mutambatsere and Schellekens, 2020). Even when blended finance is needed, its use should be limited, and concessionary rates minimised as much as possible to help develop and encourage future sustainable commercial markets (ibid.).

Blended finance will support sustainable and resilient trade

Blended finance can particularly contribute to the following two areas for continued medium-term recovery and risk mitigation:

- **The reduction of basic-goods and medical-goods prices**. Governments are rethinking their industrial policies to improve resilience and achieve self-sufficiency for essential domestic goods.[146] Given this, they are likely to pursue Public-Private Partnerships to alleviate fiscal pressure. Blended finance can help lower the prices of critical goods, such as medicine or medical diagnostic equipment,[147] to improve the accessibility of essential commodities, especially for low-income countries.
- **The channelling of blended finance into digital infrastructure**. The digitalisation of global trade finance will continue to take centre stage. When it comes to attracting blended finance investment, particularly from the private sector, the expected productivity and efficiency gains from digitalisation are likely to result in strong profit and revenue projections. This, in turn, will make digital-infrastructure investments financially attractive. The principles for digital development[148] – highlighting the guidelines for best practices in technology-enabled development programmes and regulatory frameworks – will be important facilitators of investment.

Blended finance can **drive recovery** and risk mitigation

[144] Private Sector Development Roundtable (2013), "DFI Guidance for Using Investment Concessional Finance in Private Sector Operations", which defined five core principles for engagement: (i) ensuring additionality; (ii) crowding-in private investments; (iii) promoting commercial sustainability; (iv) reinforcing markets; and (v) reinforcing high standards.
[145] https://openknowledge.worldbank.org/bitstream/handle/10986/30377/125904-BRI-EMCompass-Note-51-BlendedFinance-April-13-PUBLIC.pdf?sequence=1&isAllowed=y
[146] https://www.oecd.org/coronavirus/policy-responses/building-back-better-a-sustainable-resilient-recovery-after-covid-19-52b869f5/
[147] https://www.cdcgroup.com/en/news-insight/news/cdc-group-invests-in-medical-credit-fund-to-support-health-entrepreneurs-in-sub-saharan-africa/
[148] https://digitalprinciples.org/

Looking ahead, key catalysts for blended finance will include

Thinking more strategically. Meeting the significant sustainable investment needs in the least-developed countries post-COVID-19 will require thinking about how to scale blended finance. The small size of individual investment projects in such countries is one acute barrier that prevents the mobilisation of private finance. Early-stage risk capital will continue to be a critical support.[149] Such capital, combined with technical assistance, helps demonstrate commercial viability and address constraints, such as a lack of collateral or credit history.

Supporting transactions at the portfolio level. Pooled funds or facilities, for example, are a principal strategy for managing credit risk (Boffo and Patalano, 2020). A portfolio approach helps create larger deals to increase diversification to reduce risks; it also makes assessment and approval processes more cost-effective. This can include a greater use of structured funds, which pool capital with different risk and return expectations. These have already mobilised more commercial finance than flat funds and are more likely to reach a size of US$100 million or more (Convergence, 2021).

Standardisation in the blended-finance field. This will lead to less complexity, lower transaction costs, and greater transparency. However, a tailored country-specific approach is needed: it is absent in least-developed countries (Attridge and Engen, 2019), preventing many mainstream investors from placing capital in blended-finance vehicles.[150] Greater transparency is needed to improve the understanding of what works and where the effectiveness of blended-finance mechanisms can be improved.

Strengthening capacity and ecosystems in local capital markets. Transaction, advisory, and business-development services constitute the supportive ecosystem to help generate specific blended-finance transactions. Local capital markets need the capacity to assess and price the credit (repayment) risk of infrastructure projects. Donor-funded guarantees can attract local investors and foster local-currency guarantors to support local capital markets.

Investment-ready sustainability projects in key sectors for crisis-recovery financing. Even before the COVID-19 crisis, there was wide recognition of the shortage of investment-ready projects in the least-developed countries. The crisis then triggered a precipitous drop in global foreign direct investment, which has not recovered in a substantive way. This macroeconomic backdrop for cross-border investment will be a barometer for investments that are perceived to be riskier. The United Nations SDG Investor Platform could fill market intelligence gaps and connect investors to investment opportunities.[151]

[149] UNCDF's LDC Investment Platform aims to address the "missing middle" challenge; UNCDF manages a portfolio of risk-tolerant catalytic loans and guarantees, which aim to de-risk early-stage projects in least-developed countries (Berlin and Lediju, 2021).
[150] https://www.convergence.finance/news-and-events/news/7Cwi1FknKtfqd2vVmgcKlW/view
[151] https://www.undp.org/press-releases/undp-and-gisd-alliance-launch-sdg-investor-platform-unlock-trillions-sdg-aligned

The central role of development institutions

***DFIs**: Crucial to small and medium-sized business financing following COVID-19*

Development finance institutions' (DFI) guarantees are critical for SMEs. These guaranteed portfolios yield low, single-digit, market-based returns, with typically zero losses and very low delinquencies over extended periods of time. Their fixed income-like risk-return profile (similar to longer-dated commercial paper) has proved to be attractive. Insurance companies have been willing to share in some of the guaranteed exposure with DFIs (Kingombe et al., 2011).

DFIs[153] also hold a central role in blended finance. No single financing instrument can provide a sustainable long-term solution in isolation. During the current recovery from the COVID-19 crisis, DFIs are focused on countering short-term liquidity shortages, restructuring loans, or simplifying procedures to implement fast-track processes to get money disbursed. While many DFIs appear to have announced financial commitments urgently, it has not been clear whether they are coming up with new or reallocating existing financing.

DFIs are important actors in offering risk mitigation and should use their role to attract further investment in the medium term to build more resilient markets, including through the promotion and facilitation of digitalisation (Runde et al., 2019). DFIs have been at the centre of the discussions in the multi-stakeholder THK Roadmap[154] for Blended Finance platform.

Taking on, and underwriting, more risk will mean a greater focus from DFIs on more fragile countries and sectors that have been severely hit by the COVID-19 crisis and geopolitical uncertainty (Collier et al., 2021). This has been demonstrated by the global development finance coalition – comprising 20 international development financial institutions – committing more than US$5.55 billion for micro-to-medium-sized business financing in Africa.[155]

***MDBs**: A source of resilience for trade promotion and inclusion*

The blended-finance programmes of multilateral development banks (MDB) strengthen trade inclusion in low-income countries. In effect, they provide risk mitigation through guarantees to both issuing and confirming banks, allowing for rapid endorsement of letters of credit, the main instrument used to finance trade transactions between developing countries, and between developed and developing countries.[157]

- New initiatives include the three-year, US$3 billion Fight COVID-19 Social Bond issued by the African Development Bank, the largest dollar-denominated social bond launched in the international capital markets to date.[158] Additionally, there has been funding from the International Finance Corporation for low-income and least-developed countries.

- The Asia Development Bank has worked with the Inter-American Development Bank and the Africa Development Bank (AfDB) to include member banks in each other's trade finance programmes. The goal is to encourage direct cross-continental relationships between banks and to alleviate part of the financing gap in trade between developing countries. AfDB risk-mitigation instruments run on a private-sector demand basis, with a focus on clients in the poorest developing countries. All institutions operating such programmes facilitate trade in countries where private markets do not operate. Notably, the AfDB continues to launch new transaction guarantees to support SMEs' trading activity in Africa.[159]

- The World Bank's International Finance Corporation (IFC) has deployed more than US$321 billion in emerging and developing economies.[160] IFC actively works with the private sector to drive co-financing and has announced its priority to target climate financing in emerging economies (Jessop, 2021). Illustrative of this was the announcement to mobilise US$2 billion with the Rockefeller Foundation for investment in distributed renewable energy (generated near its users, rather than for a main grid) in emerging economies. The investment has the underlying aim of unlocking further private capital to fund the IFC's renewable energy projects.[161]

As financial markets grow and access to diverse forms of finance improves, a strategy needs to be implemented to account for a phasing out of the concessional finance component of any blended-finance arrangement. As markets mature, business models are ideally scaled up and extended, new standards and market norms are established, and new financing is mobilised (IFC, 2018). In such a scenario, bespoke de-risking structures can be implemented (ibid.).

[153] According to the OECD, bilateral, multilateral, national, and international development finance institutions (DFIs) are "specialised development banks or subsidiaries set up to support private sector development in developing countries. They are usually majority-owned by national governments and source their capital from national or international development funds or benefit from government guarantees. This ensures their creditworthiness, which enables them to raise large amounts of money on international capital markets and provide financing on very competitive terms." See: https://www.oecd.org/development/development-finance-institutions-private-sector-development.htm

[154] https://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/tri-hita-karana-roadmap-for-blended-finance.htm

[155] https://www.edfi.eu/news/global-development-finance-coalition-commits-over-usd-5-5-billion-for-msme-financing-in-africa/

[156] Multinational development banks are supranational institutions formed by multiple sovereign states for the purpose of financing economic and social development. Multilateral DFIs are typically the private-sector arms of regional and multilateral development banks (Ravenscroft, 2020).

[157] https://www.oecd.org/dac/financing-sustainable-development/blended-finance-principles/documents/Principle_4_Guidance_Note_and_Background.pdf

[158] https://www.afdb.org/en/news-and-events/press-releases/african-development-bank-launches-record-breaking-3-billion-fight-covid-19-social-bond-34982

[159] https://www.afdb.org/en/news-and-events/press-releases/african-development-bank-launches-new-transaction-guarantee-support-smes-and-trade-africa-44851

[160] https://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/home

[161] https://renewablesnow.com/news/ifc-rockefeller-foundation-aim-to-unleash-usd-2bn-of-private-capital-for-distributed-renewables-744636/

CHAPTER V: Structural gaps in trade and infrastructural finance

Innovative blended finance as a form of risk management

Innovative blended finance that creates new markets (ibid.) could be part of the solution to providing the financing support needed by SMEs. This is especially true for small and growing businesses, the so-called missing middle. MDBs and DFIs, as well as local banks, tend not to serve this segment because of the perception of high (or unquantifiable) risks and technical obstacles inherent in a particular investment or project.

Managing risk will be essential, given the likelihood of pronounced and multiple further shocks in the years ahead. Against such a backdrop, blended finance is an effective approach for risk mitigation.

There are sectors that would be effective for blended finance:

- **Innovative blended finance to offset SME scarring from COVID-19**. SMEs based in least-developed countries have been severely affected by the pandemic. Preliminary findings from a survey on the state of SMEs in such countries – conducted by a consortium of organisations, including the UN Capital Development Fund – indicate that because of COVID-19, nearly 88 per cent of SMEs operate at less than 75 per cent capacity, 35 per cent have laid off staff, and more than a third indicate that they are at risk of shutting down within three months.[162]

35%

Estimated share of SMEs that have **laid off staff** due to the pandemic

- More specifically, the survey found that the textile, personal-care, hospitality, and energy sectors are more impacted than businesses in the financial and digital services sectors. Women-led businesses report higher rates of lay-offs (37 per cent) and risks of closure (40 per cent). As noted above, MDBs and DFIs, as well as local banks, tend not to serve this segment because of high risks (real and perceived) and high transaction costs. Providing support – through loans or guarantees, for example – to local financial institutions that lend on to local SMEs can help ensure access to finance.

[162] https://www.uncdf.org/sme-survey

- **Increased blended-finance funds to fill the energy gap**. Larger, utility-scale, transformative investments are needed to drive low-carbon development and jobs. One example is Climate Investor One,[163] which is focused on financing projects in low- and lower middle-income countries in the wind, solar, and hydro sectors. It focuses on 11 countries, of which five are least-developed (Burundi, Djibouti, Madagascar, Malawi, and Uganda).[164] Following a notable investment by the Green Climate Fund, along with the Netherlands, the European Union, the Nordic Development Fund, and USAID, the Climate Investor One facility closed at US$850 million in June 2019, with some US$620 million in commercial equity mobilised from investors in Africa and Europe (Choi and Seiger, 2020).

88%

Share of SMEs operating at **75% capacity or less** due to the pandemic

Investments in digital infrastructure and solutions are imperative for the future of trade and are needed to build more resilient economies in the face of shocks. The financing of shortfalls in infrastructure and trade finance will continue to be of primary importance in the future. Tackling both in a way that is sustainable and consistent with the energy transition will be crucial.

As part of this, closing the digital divide will help mediate and mitigate the socio-economic consequences of the pandemic and the uneven economic recovery in several countries.

Blended finance can play an important role in reaching segments of the population and portions of the private sector that lack affordable access to trade finance, or access to finance altogether. Collaborations, such as those between government, schools, and the health sector, boost broadband connectivity.[165]

[163] CI1 comprises three funds tailored to finance each stage in a project's life cycle: the development fund for the development stage (including pipeline development), a construction equity fund for construction, and the refinancing fund for operations. See: https://www.researchgate.net/figure/CI1-Financing-Structure-Source-Author-compilation-based-on-Climate-Fund-Managers_fig1_342183454

[164] https://www.greenclimate.fund/publications?f[]=field_date_content:2018#

Blended finance will play an essential role in the future of trade. It can improve both financial and economic resilience for future crises, including those related to climate. The mobilisation of finance remains central, particularly for least-developed countries and segments of emerging economies that lack access to finance.

Crucially, trade finance can contribute to accelerating economic recovery through improving market access. Industrial policy measures and affordable access to finance will help build greener digital economies.

At the core of these endeavours will be increased partnerships between the public and private sectors. As with most crises, the COVID-19 pandemic underscored the importance of public-sector involvement in responding to multiple shocks.

With private-sector capacity retrenched (as demonstrated by trade finance rejection rates), coordination between the public and private sectors is key. In particular, the co-financing of investments will decisively support a sustainable outlook for trade.

Key takeaways

1. Infrastructure – and renewed investment in infrastructure – will lower costs in transportation. But the spike in oil and commodity prices will exacerbate the trade financing gap for resource-constrained SMEs and constitutes a negative growth shock (of anywhere between 0.25 and 1 per cent depending on the economy).

2. Fintech continues to help close the global trade finance gap, now likely to be over the US$1.7 trillion estimate; An illustration of this is the use of blockchain for payment systems, or machine learning for underwriting. These mechanism help connect micro enterprises and SMEs to investors.

3. The mobilisation and further scaling of blended finance remains an important pathway to help close both the substantial trade finance gap and infrastructure financing gaps that have been, in part, exacerbated globally by the COVID-19 crisis.

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Recommendations for businesses:

1. Increase co-investment initiatives with development finance institutions and multinational development banks in order to build a larger market for blended finance that would channel more financing into sustainable initiatives.

2. Financial institutions and firms should start to pivot away from traditional models of bilateral investment transactions towards greater use of blended-finance funds and facilities in order to build sustainable investment initiatives.

3. To close financing gaps, portfolio investments managed by financial institutions and non-bank financial institutions could be utilised to create larger deals (through structured funds), to increase diversification and scale up private finance.

Recommendations for governments:

1. Policymakers need to strengthen the investment ecosystem and align it with climate-change mitigation policies to mobilise greater green investment, particularly in the renewable energy sector.

2. Prioritise automation of trade facilitation, which has proven crucial for the cost efficiency of SMEs. For women-led businesses, automation also helps eliminate formalities that subject women entrepreneurs to discrimination.

3. Greater standardisation in blended finance would simplify and lower transaction costs, as well as promote transparency. Closer coordination between pension funds and sovereign wealth funds would mobilise more blended finance.

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