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The Productive, Sustainable and Inclusive Trade Channels Framework





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Executive Summary

The Productive, Sustainable and Inclusive Trade Channels (PSITC) framework is an analytical tool for thinking through the often complex channels through which trade impacts on productive, sustainable and inclusive outcomes.

Trade and other forms of international engagement often provide aggregate economic and other benefits. However, engaging with the world can have associated environmental, social and other costs. These costs, together with the benefits of trade, are unevenly distributed across society.

The Ministry of Foreign Affairs and Trade (MFAT) has a research program under way to better understand these benefits and costs, and their distribution. MFAT's research in this area is firmly focused on taking a wider view of the impacts of trade and, in doing so, provides the analytical underpinnings of the Trade for All agenda.

The development of the PSITC framework is one part of this research program. It builds on the MFAT working paper "Understanding the linkages between trade and productivity sustainability and inclusiveness", which discusses how trade can impact productivity, sustainability and inclusiveness in New Zealand and proposes metrics for measuring the effects. This paper supplements that discussion by providing a theoretical framework underpinning those impacts. Other parts of MFAT's program include working with firm-level data in Stats NZ's Longitudinal Business Database to develop a more accurate understanding of the current distribution of trading firms and their employees.

The PSITC framework is based on a standard economic model of a small, open economy. The main components of the small economy model are households, whānau and hapū; the environment; domestic firms; foreign firms and households; government and civil institutions; and the financial sector. All of these aspects are in turn linked to the four capitals (Natural, Financial/Physical, Social, Human) of the Treasury's Living Standards Framework (LSF). The framework also considers distributional dimensions, largely for households, whānau and hapū, and domestic firms. The full PSITC framework is shown on page 6.

The framework then identifies the main interlinkages that allow the impacts of trade to flow from one area to another. This allows us to identify the transmission channels from trade to productive, sustainable and inclusive outcomes. The framework also highlights the potential trade-offs, feedback loops, unintended consequences, and countervailing forces associated with trade.

Trade and trade liberalisation are an important mechanism for productivity improvements for firms. The PSITC Framework focuses on several mechanisms through which trade affects productivity: inter- and intra-industry reallocation effects, innovation responses from increased competition, foreign direct investment, learning-by-exporting, and diffusion of technology. These mechanisms are positively inter-related and often self-reinforcing.

The PSITC Framework adopts the OECD's Trade and Gender framework as a way of framing the **inclusive trade** channels. The OECD framework focuses on the different impacts of trade on men and women as

employers (business owners), employees (workers) and consumers. Whilst the OECD focusses on gender in this instance, we extend the framework to consider ethnicity and region as well. For example, this allows for the consideration of Māori as business owners, workers and consumers, and the different experiences they may have with trade. Similarly, the differences between firms, workers, and consumers in urban, semi-rural, and rural areas can also be framed this way. Finally, firm characteristics, including whether a firm is a Small or Medium Enterprise (SME), influence outcomes for both employer and employees.

The PSITC framework adopts the standard approach to breaking down the **sustainable** (environmental) impacts of trade into scale, composition and technique/income effects. Increased economic activity from trade typically increases environmental impacts (scale effect). Trade also changes the composition of production within an economy, which can have positive or negative impacts depending on the different environmental impacts of different industries or firms (composition effect). Finally, trade is an important channel for the transfer of innovation and technologies across borders, which can improve the spread and uptake of environmentally friendly and low emissions technologies and have a positive impact on the environment. Furthermore, rising incomes from trade can increase the demand for improved environmental quality. The framework is agnostic to the type of environmental effect, though we note that greenhouse gas emissions, and climate change more generally, are the most pressing issues globally.

A range of other important channels from trade to the environment are also included in the framework. International forces, notably agreements such as the Paris Agreement, but also trade agreements, drive changes to environmental standards. Firms may respond by investing in cleaner technologies and changes to business processes or practices. Alternatively, entire firms or parts of them may shift to countries with weaker regulations, the Pollution Haven Hypothesis and Pollution Haven Effect, respectively. Carbon leakage, when net emissions increase as a result of a shift from a more efficient to a less efficient producer, is a special case of the Pollution Haven Hypothesis. Trade may help facilitate the diffusion of green and low emissions technology, which in turn improves environmental quality or mitigates negative effects. This type of diffusion will play an important role in the transition to a low-emissions economy. Environmental attributes and credentials are an increasing feature of consumer preferences and an influence on international demand.

The small economy model itself tells us little about the **structural and distributional aspects** of an economy. A wide range of factors influence these different aspects. These factors determine an economy's areas of comparative advantage and comparative disadvantage, which play a critical role in determining international trade patterns and a country's propensity to trade. The framework attempts to capture the main drivers of comparative advantage.

The final part of the framework focuses on the **factors that influence the efficiency of international linkages**. These factors affect the scale, nature and distribution of the trade impacts in the small economy model. Importantly, these factors can be influenced to varying degrees by trade and domestic policy.

The PSITC framework has been primarily designed as **an analytical tool to better think through the impacts of trade, and in doing so improve trade outcomes**. There are three key ways it can do this.

Firstly, the framework can be used to **identify and evaluate the impacts that New Zealand's overall trade patterns have on productive, sustainable and inclusive outcomes**. These insights can inform the overall direction of trade policy and identify complementary domestic policies. New Zealand's Trade for All Agenda sets out a vision for sustainable and inclusive trade that delivers for all New Zealanders. Insights from the framework can be used to inform and sharpen specific policies within this overarching agenda.

Critically, trade policy rarely, if ever, operates in isolation. Particularly when it comes to inclusive and sustainable impacts, domestic policy settings and institutional factors tend to be more important than trade ones. By identifying these interlinkages, the framework can help inform what complementary policies could be used to maximise trade performance and the benefits of trade while minimising the costs. And in a similar fashion, there will be areas where trade and trade settings can be used to support domestic objectives. Trade policy needs friends.

Secondly, **the framework can be used to evaluate a specific trade policy instrument**, such as a trade agreement. In this case, evaluation could be before (*ex ante*) or after (*ex post*) the agreement comes into effect (or both). The results of such an evaluation can be used to improve the agreement during negotiation and implementation.

For *ex ante* evaluation, the framework can provide forward guidance on the likely impact of the agreement on productive, sustainable and inclusive outcomes. In this respect, it complements and builds on the economic analysis and modelling that is undertaken for each new agreement. Computable General Equilibrium (CGE) models are the work-horse quantitative tools when it comes to *ex ante* analysis of trade agreements. In principle, we think that the PSITC framework could be translated into a CGE model.

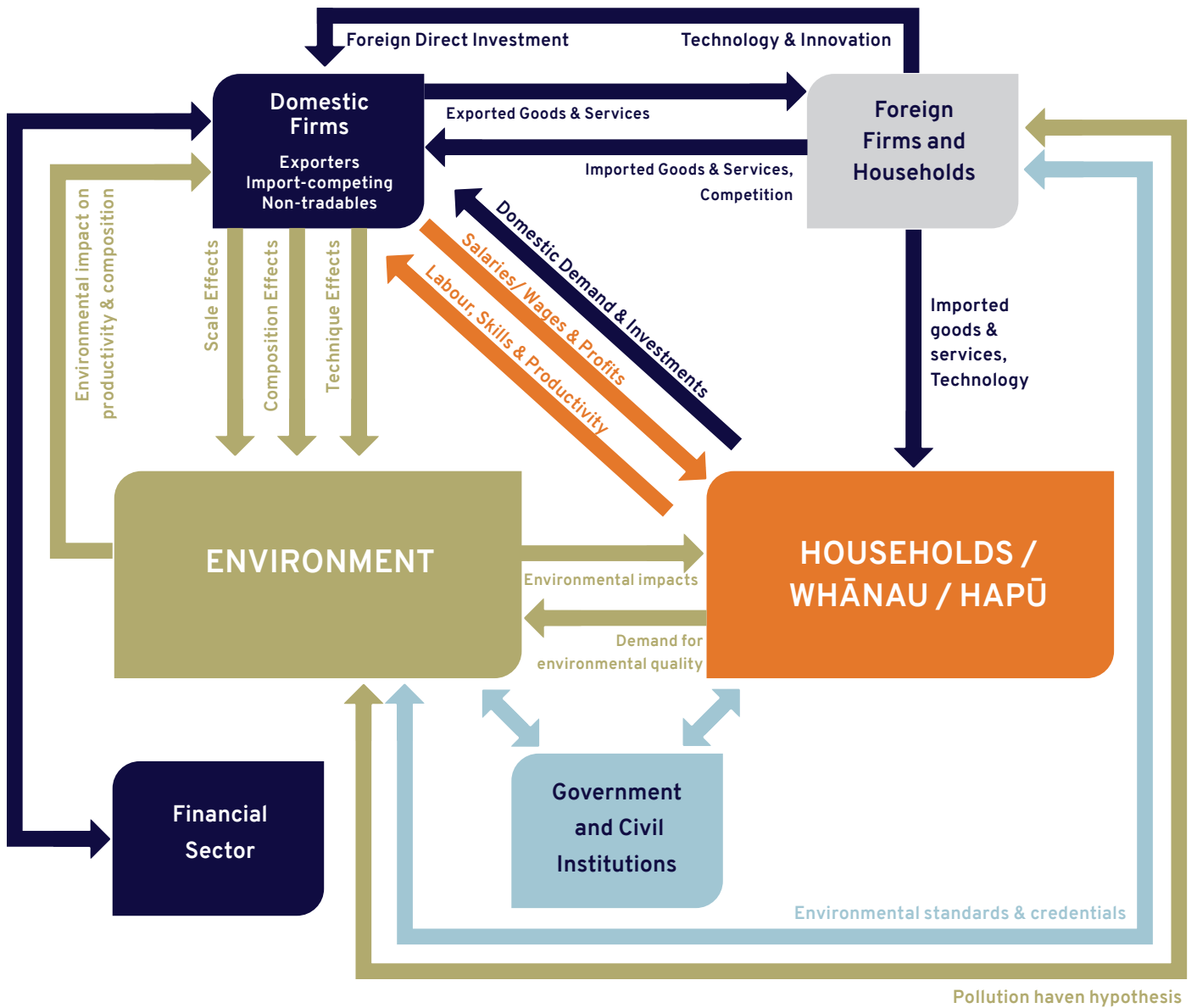
For *ex post* evaluation, the framework provides guidance on where to direct quantitative and qualitative analysis. Similarly to *ex ante* CGE modelling, we think that the sectoral results from traditional quantitative techniques, such as gravity models, tariff preference utilisation analysis, and firm level analysis, could be extended, at least partly, to distributional and environmental impacts. The framework can also be used to identify areas that have not been well covered by quantitative analysis. Understanding of the impacts of trade in these areas could be bolstered by qualitative methods, such as case studies and surveys.

Thirdly, **the framework can be used to assess the likely impacts of an economic event or shock** from a trade perspective. For example, MFAT economists used early versions of this framework to identify the likely impacts of COVID-19 policy responses on different parts of the tradables sector, and extrapolate from there the potential impacts on sustainable and inclusive outcomes. This analysis (replicated in Appendix Two) fed into advice to Ministers and senior officials engaged in the All of Government response to COVID-19.

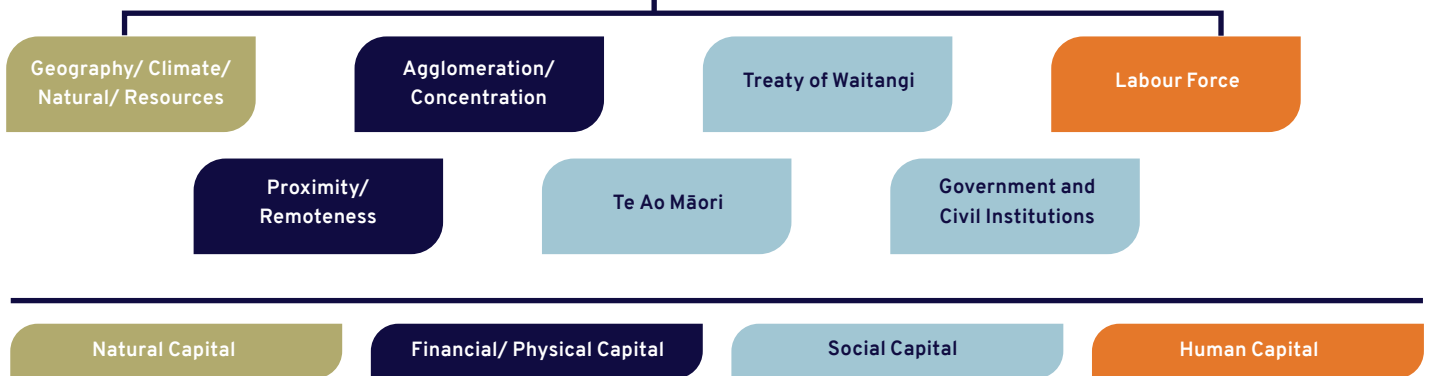
The PSITC framework will continue to evolve over time. The version presented here reflects our best efforts to date to articulate the economic and trade channels, leveraging off the economic literature and cross-government engagement. But we know there will be gaps in our understanding and there will be areas for improvement. To that end, we welcome all feedback on the framework and its application.



PRODUCTIVE, SUSTAINABLE AND INCLUSIVE TRADE CHANNELS



Influence industry composition/ comparative advantage



PRODUCTIVE TRADE

1. Domestic and foreign households demand goods and services from domestic firms. Domestic firms provide employment and wages to domestic households in return for labour, productivity and skills. Domestic firms also provide profits to households that have an ownership stake in them. A range of factors determine industry composition.
2. Increased trade / trade liberalisation changes the composition of industry / firms in tradables sector (some industry/firms better off / some worse off) through improved access to overseas markets, increased international competition in domestic markets, foreign investment, and technology diffusion. Increased quality and variety of imports is also a benefit to households and firms.
3. Returns and productivity and therefore wages and employment rise in tradables industry's that are better off and vice versa. This is an intra- and/or inter-industry reallocation effect.
4. Net effect of (3) creates an income effect (that is positive at an aggregate level) that further influences industry composition (including for non-tradables) through domestic demand and investment. Cheaper imported goods and services may also contribute to improving household budgets.

INCLUSIVE TRADE

5. The distribution of workers and business owners by region / gender / ethnicity across industries determines if they are net beneficiaries of trade. This distribution is largely determined by non-trade factors, although trade will have small impacts.
6. Trade-driven changes in relative prices might be equalising (reduce consumption inequality) if price declines are more concentrated in the bundle of goods and services consumed by lower-income households and vice versa (dis-equalising).
7. The overall impact on household inequality from trade will be a mix of the income-related effects (5) and the consumption-related effects (6).

SUSTAINABLE TRADE

8. Increased economic activity increases environmental impacts (scale effect).
9. Change in composition of economy (2 and 4 above) can have positive or negative environmental impacts (composition effect).
10. Demand for environmental quality (and ability to pay) increases with income (4 above) translating into more stringent environmental regulations/standards (although might not occur until beyond a particularly income threshold).
11. The environment and environmental regulation impact on productivity (positive or negative) e.g. through changing business practices or processes (technique effects), climatic effects.
12. Changes to environmental standards are also driven by international forces (including trade). This is usually a harmonisation with higher standards to meet export requirements, although a "race to the bottom" is possible.
13. Environmental attributes contribute to demand for exports. These may be linked to environmental standards or may reflect features of the product / service itself (e.g. credence attributes).
14. Pollution haven hypothesis: Pollution intensive industry shift to countries with weaker regulations. Carbon leakage is a special case of the pollution haven hypothesis. Pollution haven effect: Environment regulation has an effect on trade flows, at the margin e.g. firms offshore some "dirty" production.
15. Diffusion of green and low emissions technologies improves environmental quality or mitigates negative effects (technique effects). This diffusion may occur through environmental goods and services.

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1

Introduction

Trade and other forms of international engagement often provide aggregate economic and other benefits, such as increased economic activity and employment, access to better quality and cheaper goods and services, and access to better technology and knowledge. This is particularly true for smaller economies. However, engaging with the world can have associated environmental, social and other costs. These costs, together with the benefits of trade, are unevenly distributed across society.

The Ministry of Foreign Affairs and Trade (MFAT) has a research program under way to better understand these benefits and costs, and their distribution. MFAT's research in this area is firmly focused on taking a wider view of the impacts of trade and, in doing so, provides the analytical underpinnings of the Trade for All agenda.

The development of the Productive, Sustainable and Inclusive Trade Channels framework is one part of this research program. It builds on the MFAT working paper "[Understanding the linkages between trade and productivity sustainability and inclusiveness](#)", which discusses how trade has influenced productivity, sustainability and inclusiveness in New Zealand and proposes metrics for measuring the effects. This paper supplements that discussion by providing a theoretical framework underpinning those impacts. Other parts of MFAT's program include working with firm-level data in Stats NZ's Longitudinal Business Database to develop a more accurate understanding of the current distribution of trading firms and their employees.

WHAT IS THE PRODUCTIVE, SUSTAINABLE AND INCLUSIVE TRADE CHANNELS FRAMEWORK?

The Productive, Sustainable and Inclusive Trade Channels (PSITC) framework is an analytical tool for thinking through the often complex channels through which trade impacts on productive, sustainable and inclusive outcomes.

The framework is based on a standard economic model of a small, open economy. The main components of the small economy model are households, whānau and hapū; the environment; domestic firms; foreign firms and households; government and civil institutions; and the financial sector. All of these aspects are in turn linked to the four capitals (Natural, Financial/Physical, Social, Human) of the Treasury's Living Standards Framework (LSF).¹ The model also considers distributional dimensions, largely with households, whānau and hapū, and domestic firms.

The framework then identifies the main interlinkages that allow the impacts of trade to flow from one area to another. This allows us to identify the transmission channels from trade to productive, sustainable and inclusive outcomes. The framework also highlights the potential trade-offs, feedback loops, unintended consequences, and countervailing forces associated with trade.

The small economy model itself tells us little about the structural and distributional aspects of an economy. A wide range of factors influence these different aspects. These factors determine an economy's areas of comparative advantage and comparative disadvantage, which play a critical role in determining international trade patterns and a country's propensity to trade. The framework attempts to capture the main drivers of comparative advantage.

¹ For a summary of the Treasury LSF see appendix 1. Further details can also be found here: <https://www.treasury.govt.nz/information-and-services/nz-economy/higher-living-standards>.

The final part of the framework focuses on the factors that influence the efficiency of international linkages. These factors affect the scale, nature and distribution of the trade impacts in the small economy model. Importantly, these factors can be influenced to varying degrees by trade and domestic policy.

To sum up, the PSITC framework consists of:

- A small open economy model that identifies the channels from trade to productive, sustainable and inclusive outcomes;
- The drivers of comparative advantage that determine the underlying structure of the economy; and
- The factors that influence the efficiency of international linkages, which can be influenced by policy settings.

The full framework is set out on page 6, along with text summarising the key elements. The remainder of this paper goes through the framework in more detail. Section two describes the foundation of the framework – a basic model of a small open economy – while section three looks at some of the factors that drive the structural features of an economy and areas of comparative advantage. Section four looks at country-, industry-, and firm-level factors that influence the efficiency of international trade linkages. Section five brings all this together to describe at a high level what happens in the economy when trade increases.

Section six then looks at the main channels through which trade increases productivity in the economy. The channels from trade to inclusive (distributional) outcomes are examined in section seven. Section eight looks at the channels from trade to sustainable (environmental) outcomes. We conclude in section nine by looking at how the framework will be used as an evaluation tool.

HOW WILL THE FRAMEWORK BE USED?

The PSITC framework has been primarily designed as an analytical tool to better think through the impacts of trade, and in doing so improve trade outcomes. There are three key ways it can do this.

Firstly, the framework can be used to identify and evaluate the impacts that New Zealand's overall trade patterns have on productive, sustainable and inclusive outcomes. These insights can inform the overall direction of trade policy and identify complementary domestic policies. New Zealand's Trade for All Agenda sets out a vision for sustainable and inclusive trade that delivers for all New Zealanders. Insights from the framework can be used to inform and sharpen specific policies within this overarching agenda.

Critically, trade policy rarely, if ever, operates in isolation. Particularly when it comes to inclusive and sustainable impacts, domestic policy settings and institutional factors tend to be more important than trade ones. By identifying these interlinkages, the framework can help inform what complementary policies could be used to maximise trade performance and the benefits of trade while minimising the costs. And in a similar fashion, there will be areas where trade and trade settings can be used to support domestic objectives. Trade policy needs friends.

Secondly, the framework can be used to evaluate a specific trade policy instrument, such as a trade agreement. In this case, evaluation could be before (*ex ante*) or after (*ex post*) the agreement comes into effect (or both). The results of such an evaluation can be used to improve the agreement during negotiation and implementation.

For *ex ante* evaluation, the framework can provide forward guidance on the likely impact of the agreement on productive, sustainable and inclusive outcomes. In this respect, it complements and builds on the economic analysis and modelling that is undertaken for each new agreement. Computable General Equilibrium (CGE) models are the work-horse quantitative tools when it comes to *ex ante* analysis of trade agreements. CGE models typically focus on the economic and trade impacts of a trade agreement. Historically, they have not delved deeply into distributional or environmental impacts. However, this is changing and new approaches in Canada and other countries have shown that it can be done. In principle, we think that the PSITC framework could be translated into a CGE model.

For *ex post* evaluation, the framework provides guidance on where to direct quantitative and qualitative analysis. Similarly to *ex ante* CGE modelling, we think that the sectoral results from traditional quantitative techniques, such as gravity models, tariff preference utilisation analysis, and firm level analysis, could be extended, at least partly, to distributional and environmental impacts. Meanwhile, firm level analysis is a promising avenue for more explicitly linking changes from a trade agreement to distributional impacts, particularly those relating to firm size and employment. The framework can also be used to identify areas that have not been well covered by quantitative analysis. Understanding of the impacts of trade in these areas could be bolstered by other methods, such as case studies, surveys, and stakeholder engagement.

Thirdly, the framework can be used to assess the likely impacts of an economic event or shock from a trade perspective. For example, MFAT economists used early versions of this framework to identify the likely impacts of COVID-19 policy responses on different parts of the tradables sector, and extrapolate from there the potential impacts on sustainable and inclusive outcomes. This analysis fed into advice to Ministers and senior officials engaged in the All of Government response to COVID-19. We have reproduced this analysis in Appendix Two as an example of the framework being applied to a real situation.

WHERE TO NEXT?

The PSITC framework will continue to evolve over time. The version presented here reflects our best efforts to date to articulate the economic and trade channels, leveraging off the economic literature and cross-government engagement. But we know there will be gaps in our understanding and there will be areas for improvement. To that end, we welcome all feedback on the framework and its application. Please contact the Economic Division of MFAT with your written feedback or to arrange a discussion with us:

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We also think that the framework could be translated into a Computable General Equilibrium (CGE) model. Feedback on the practicality of doing so would be greatly appreciated from academics, economic consultants, and other CGE practitioners. A CGE model of the framework would significantly enhance its usefulness as a tool for *ex ante* analysis. A preliminary analysis suggests the CGE models developed for the Climate Change Commission, notably the Distributional Impacts Employment Module (DIM-E), are doing similar analysis in a different context, and could potentially be adapted to modelling the sustainable and distributional impacts of trade.



2

A basic model of a small open economy

The foundation of the PSITC framework is a standard economic model for a small, open economy (Figure 1). In this context, “small” means the economy is a price-taker in international trade. And “open” means that the economy’s institutions and policy settings allow international trade to take place. New Zealand is commonly classified as a small, open economy on this basis.²

For the basic model, we separate the economy into six main areas, all of which are interlinked through a variety of channels:

- Households, whānau and hapū,
- The environment,
- Domestic firms (further split into direct and indirect exporters, import competing firms, and non-tradables firms),
- Foreign firms and households,
- Government and civil institutions, and
- The financial sector.

THE MAIN COMPONENTS OF THE SMALL OPEN ECONOMY MODEL

Households, whānau and hapū are the basic building blocks for the model, with all individuals in the economy belonging to one (or more). Some may consist of a single individual, whilst others will consist of many individuals. *Together with the environment, households, whānau and hapū are the core focus of the PSITC framework.*

Firms demand labour and skills from households, whānau and hapū. In return for that labour firms provide salaries or wages. In many cases, households, whānau and hapū will wholly or partially own firms and receive profits from their investment of capital in those firms. The combined returns from labour and capital provide income for households, whānau and hapū. That income is then used to demand goods and services from domestic and foreign firms, used to invest in firms, or goes to financial institutions as debt servicing or savings.

The **environment** covers all aspects of the natural environmental including land, soil, water, air, the atmosphere, plants and animals, minerals and natural resources. We’ll come back to the environment in more detail in section 8. But for now, we note that the state of the environment has both positive and negative impacts on households, whānau, and hapū, and domestic firms.

Domestic firms are split into exporters (direct and indirect) and import-competing firms, who collectively make up the tradables sector, and non-tradables firms. The tradables sector can be broadly thought of as that part of the economy that is directly impacted by international conditions. Some firms, particularly larger ones with multiple operations, may fit into more than one of these categories. Furthermore, firms can and will shift categories over time. Firms produce goods and services for intermediate and final consumption in both the domestic and international market. Domestic firms are also a source of technology development and innovation.

² In certain narrow areas (e.g. some dairy products, some niche high technology manufactured products), an argument can be made that New Zealand is at least partly a price-setter in international markets. Overall, however, New Zealand fits the “small” definition.

Foreign firms and households also demand goods and services from domestic exporting firms, while foreign firms compete with domestic firms to supply the domestic market. Foreign firms and households invest in domestic firms (Foreign Direct Investment, or FDI) and vice versa (Outward Direct Investment, or ODI).

FDI and ODI facilitate technology and innovation transfers. Technology transfer is also embedded or embodied in traded goods and services, particularly capital goods.

The **government** plays a number of roles in the economy including:

- Redistribution i.e. taxes and transfers (e.g. benefits, government grants)
- Setting regulations e.g. labour markets, human rights, environment, competition
- Procuring and providing goods e.g. infrastructure, vaccines
- Procuring and providing services e.g. health, education, research and development, exporter helplines
- Employment e.g. nurses, teachers, diplomats and trade negotiators
- Businesses e.g. State Owned Enterprises

Government decisions and actions across all of these areas influence, often quite heavily, the decisions made by households, whānau, and hapū, and firms.

Civil institutions captures broader aspects such as:

- Quality of governance
- Corruption and rule of law
- Ease of doing business
- Human rights

Finally, the **financial sector** (banks, non-bank financial institutions, insurance companies) play a number of key roles in the economy including:

- Creating and allocating credit for use by firms and households, whānau and hapū
- Funding working capital for firms
- Providing trade finance and export credit
- Facilitating transfers and transactions (including internationally)
- Hedging exchange rate and interest rate risk
- Insuring against other risk
- Providing instruments for saving and inter-temporal consumption smoothing
- Financial and other advice

The decisions made by financial sector institutions have a large influence on firm expansion/contraction and industry composition.

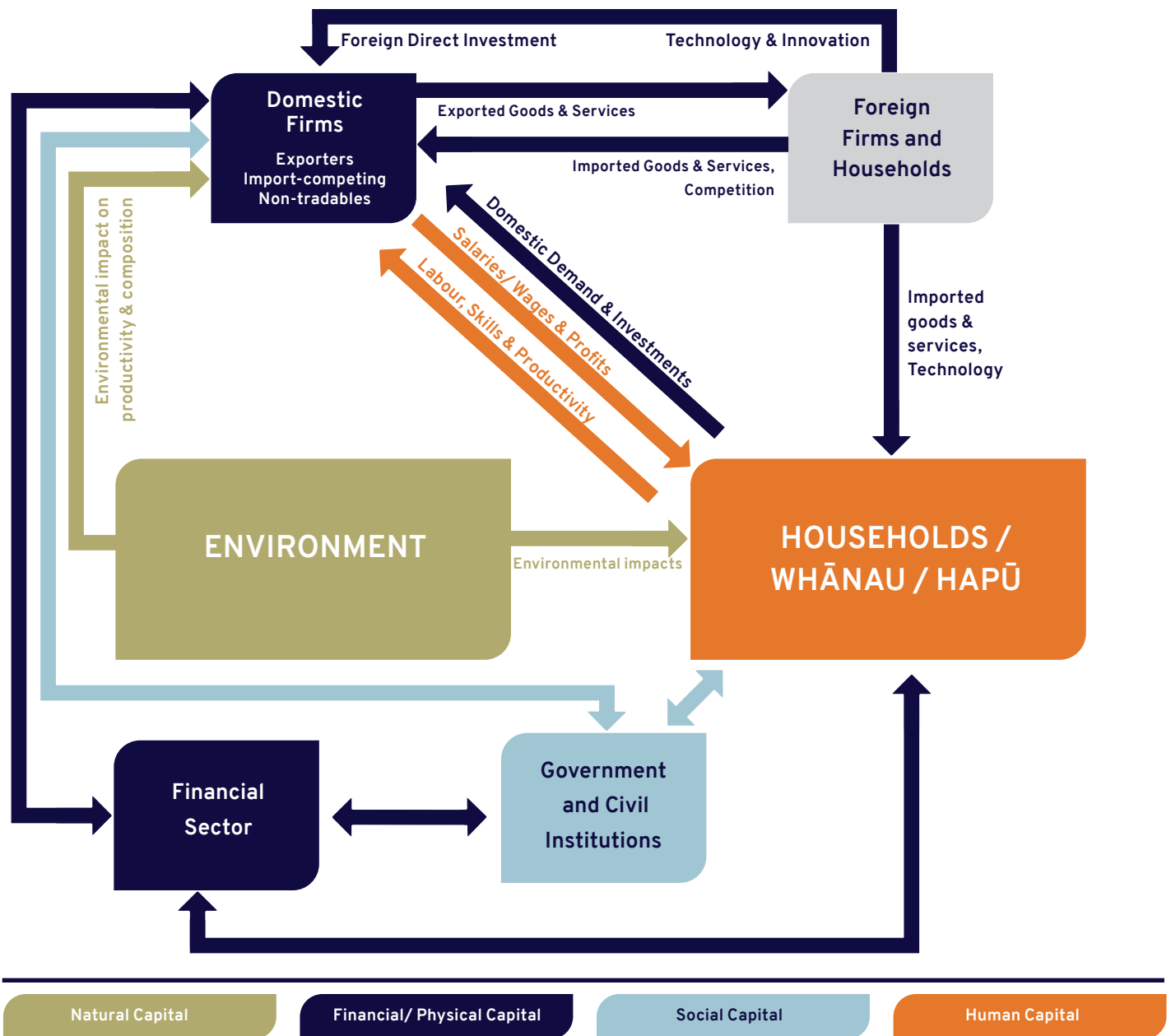
THE FOUR CAPITALS – STOCKS AND FLOWS

Each of the main parts of the model links to at least one, and sometimes several, of the four capitals outlined in the LSF. The LSF provides a useful high-level framing for thinking about long-term outcomes across a range of economic, social, and environmental areas. Firms, including those in the financial sector, are largely a mechanism for grouping financial and physical capital. Households, whānau and hapū are where human capital resides, as well as much of a country's social capital. Government and civil institutions account for much of the social capital that sits outside of households, whānau and hapū. The environment is natural capital.

In the PSITC framework, each of the main parts of the model is linked to the most relevant capital (from a trade impacts perspective). These then reflect the stock of different capitals at any point in time. The channels from which trade then impacts on these different areas then reflect different flows of services from those stocks that change the capital stocks over time.

Similarly, the underlying drivers of comparative advantage have been linked to the capitals (see section three). Throughout the PSITC framework diagrams these stocks and flows have been colour coded to reflect the different capitals involved.

Figure 1 - A Small Open Economy



3

Underlying drivers of comparative advantage

The small, open economy model illustrated in section two sets out the basic interactions between different parts of the economy. However, it tells us little about the distribution of firms and industries, the size and skill levels of the labour force, the geographic and demographic dispersion of households, whānau, and hapū, and so on. A wide range of factors influence these different aspects. And in turn, these factors determine an economy's areas of comparative advantage and comparative disadvantage, which play a critical role in determining international trade patterns.

The PSITC framework focuses on some of the most important of these factors in determining areas of comparative advantage:

- Geography / climate / natural resources
- Proximity / remoteness
- Agglomeration / concentration
- Māori culture and world view
- Treaty of Waitangi
- Population and labour force
- Government and civil institutions

Whilst these factors have an important influence on trade, trade and trade policy typically have only a limited influence on these factors.

The following sections set out the factors in further detail, grouped by the four capitals of the LSF.

NATURAL CAPITAL

Geography, climate and natural resources will often be a key source of comparative advantage and play a critical role in determining the industrial structure and capital stock for that country. This in turn will influence the degree to which that region can engage with and benefit from international trade. For example, New Zealand's relatively benign climate and plentiful water resources favour agriculture, horticulture, and forestry.

Within a country, geography, climate and natural resource endowments play a much more significant role for rural economies than they do in urban ones (OECD 2014).

FINANCIAL AND PHYSICAL CAPITAL

Closely linked to geography, **proximity** to trading partners provides access to larger markets, can help facilitate knowledge and technology transfer, and can reduce transportation costs. Proximity need not be geographic; efficient infrastructure links can mitigate the effects of distance, particularly an increasingly digital world.

Within a country, proximity to urban areas can play a key role in rural regions' economies. The OECD note "Rural communities close to cities generally have a greater capacity to diversify in the tradeable sector, for example, leveraging linkages with cities through manufacturing activity and the demand for rural amenities from urban residents." (OECD 2019a). Similarly, proximity to critical trade infrastructure such as ports and airports also influences trading patterns.

When complementary firms locate in close proximity to each other, this boosts firm productivity through

allowing greater specialisation, as well as the transfer of technology and knowledge. This typically occurs in cities in the form of **agglomeration** effects. Manufacturing tends to be more regionally **concentrated** than services, a lesser form of agglomeration.

One key challenge in unlocking the full potential of regions in international trade is the difficulty of accessing agglomeration benefits. Agglomeration forces can also attract people and resources away from the regions, with more export-intensive, larger, and higher paying firms typically clustering into hubs in large city centres.

SOCIAL CAPITAL

Te ao Māori “stands alone as the unique part of our country’s offering to the world” (Trade for All Advisory Board 2019, p 80). Te ao Māori can be thought of as the Māori world view, but the concept is much richer and deeper than this simple definition conveys. Te ao Māori captures the language, values and cultural practice of tangata whenua. Values such as manaakitanga (respect for others), whānaunga (connectedness), kotahitanga (shared aspirations or togetherness), and kaitiakitanga (stewardship) can have a strong bearing on the nature of trade and trading relationships, as well as business practices more generally.

The **Treaty of Waitangi** is similarly unique to New Zealand and fundamental to the country’s history, culture, and institutional arrangements. A small number of Māori-owned trading companies are the direct result of Treaty of Waitangi settlements.

Government and Civil Institutions pertain to all those elements constituting the ‘rule of law’, such as a country’s legal, social, economic and political systems. Aspects such as the quality of governance, degree of corruption, and ease of doing business heavily influence how firms and industries operate and are structured, as well as influencing how markets work more generally. Broadly speaking, government and civil institutions set the operating environment in which businesses and individuals function.

HUMAN CAPITAL

The size and skill level of the **labour force** will influence the type of industry that can be sustained in a country and its level of productivity. And industry composition will in turn influence labour force composition, particularly over the long run as the demand for skills shapes education and training programs and the acquisition of human capital more generally.

Similar factors play out at the regional level too. Economic theory suggests that people are mobile and will locate where employment vacancies exist. However, often people will not shift for a much wider range of factors than just employment opportunity (MBIE, 2017).

Finally, the size and affluence of the overall population will determine domestic demand.

4

Factors influencing the efficiency of international linkages

A wide range of factors influence the efficiency of international trade and investment linkages. These can be broken into country-, industry- and firm-level factors. Small and Medium Enterprises (SMEs) can be particularly vulnerable to the negative effects of these factors, or be less able to benefit from the positive effects, due to their more limited internal resources.

COUNTRY-LEVEL FACTORS

As highlighted in section 3, **home country institutions** play an influential role in shaping a country's economy and, in turn, its international trade and investment links. Formal institutions pertain to all those elements constituting the 'rule of law', such as a country's legal, social, economic and political systems. Informal institutions include factors such as culture, relationships, networks and family (Lindsay, Rod and Ashill, 2017; Chen, Yang, Hsu and Wang, 2009). These can be thought of in broad terms as the business operating environment. All of these factors influence areas of comparative advantage and disadvantage as well as the productivity and efficiency of firms themselves.

Physical distance (proximity) influences access to overseas markets and supply chains, the ability to transfer knowledge and technology, transportation costs, and competition. Physical distance cannot be changed, though efficient transportation and digital links and other infrastructure can help reduce the effects of distance.

Distance is not just physical. **Institutional distance** refers to the difference in the institutional environment between two countries. The greater the institutional distance, the greater the challenges faced by firms trading internationally. Conversely, firms tend to have higher success rates internationalising into institutionally close countries. Home country institutions can play an important role in reducing institutional distance through acting as "boundary spanners" – helping firms to navigate the challenges posed by institutional distance (Lindsay, Rod and Ashill, 2018).

The existence of **trade barriers**, to-the-border, at-the-border, and beyond-the-border, makes international trade and investment more costly, and in some cases prevents it from taking place altogether. Two key components of these barriers are tariffs and non-tariff barriers (NTBs). Much of trade policy is focused on reducing these barriers, through institutions such as the World Trade Organization (WTO), or instruments such as Free Trade Agreements (FTAs), customs agreements, or Mutual Recognition Agreements (MRAs).

The size and competitiveness of a country's **domestic market** also shapes trade flows. A large domestic market provides more opportunity for firms to achieve economies of scale before they move into exporting. Similarly, a highly competitive domestic market can drive innovation and improve productivity, which makes exporting firms more competitive on international markets.

INDUSTRY-LEVEL FACTORS

Firms are different to one another. To use some jargon, firms are **heterogeneous**. They range in scale from coffee shops to high-tech engineering companies, with their performance in productivity, wages and international competitiveness varying across sectors, regions and firms (OECD 2019b). Engaging in trade thus depends on the specific activities being undertaken by the firm, and particularly, whether or not it engages in, or desires to engage in, the tradable sector (WTO, 2016). Heterogeneity can mean that firms cannot readily benefit from knowledge sharing when they are spread across different industries and are geographically distant (Lindsay, 2005).

Gaining information about export opportunities in a destination market and, indeed, the process of trade itself, is expensive, especially for SMEs. Having access to business and distribution **networks** are important mechanisms for overcoming such challenges (OECD, 2018). Business networks may be of disproportional benefit to SMEs. However, engagement with networks is not costless and monitoring the performance of partners can be particularly burdensome (Brouthers, 2013).

FIRM-LEVEL FACTORS

The **size and internal capacity** of a firm matters a great deal when it comes to trade. Operating in the international market is expensive and only the most productive firms can afford to do so (Melitz, 2003). Furthermore, many of the costs of operating internationally are not scaled to business size. Engaging in trade through exporting requires developing new marketing channels, adapting products and packaging to fit destination market preferences, and learning to navigate new bureaucratic procedures, all of which require intense resource allocation (Leonidou, 1995). These large fixed costs to trade are more easily born by larger firms than SMEs. Large firms are also more likely to employ the skilled staff and have the access to finance needed to overcome these challenges. Finally, the chosen entry mode into a new international market can influence the degree of resource intensity.

Closely linked to size and capacity is the **management capability and motivation** of a firm. Management capability and practices have a strong influence on productivity, which in turn has a strong impact on the ability to engage in trade (Productivity Hub 2018). Larger firms are more likely to employ better management practices than SMEs, in part because they have more resources to invest in improving these practices. Finally, the motivations of managers can matter a great deal for whether a firm enters international markets. This is particularly the case for SMEs where the manager (who is also likely the owner) may be largely motivated by non-business reasons (Bennett and Chatterji 2019).



5

How an increase in trade affects the economy in our framework

AN INCREASE IN THE VOLUME OF TRADE

Increased trade changes the composition of industries and firms in the tradables sector through improved access to overseas markets, increased international competition in domestic markets, foreign investment, and technology diffusion (Figure 2). Some industries and firms will be better off and some worse off as a result of the increase in trade. Some firms, particularly those in the non-tradables sector, will be largely indifferent to the first round effects of an increase in trade, though second round effects may affect them (see below)

Industries and firms that benefit from the increase in trade experience higher profits and an improvement in productivity through some combination of economies of scale, access to better and/or cheaper intermediate inputs, and innovation and technology diffusion. In order to expand production to meet overseas demand, labour, capital and other factors of production will need to be reallocated from other parts of the economy. This reallocation process, coupled with improvements in productivity, puts upward pressure on wages and prices of other factors of production.³ Households, whānau, and hapū employed or with an ownership stake in these industries and firms receive higher income.

The converse is true for industries and firms exposed to greater domestic competition from overseas firms and imported goods and services. These industries and firms may experience a fall in demand and consequently reduce production, with a flow on effect to demand for factors of production, including labour. Households, whānau, and hapū employed by or with an ownership stake in these industries and firms may face lower incomes and potentially loss of employment altogether.

The net effect of changing wages and reallocating employment creates a net income effect (that will be positive at a national aggregate level but could be positive or negative for different population sub-groups) that further influences industry composition (including for non-tradables) through domestic demand and investment. The more efficient an economy is at reallocating labour, capital and land from contracting to expanding sectors, the greater the net income effect is likely to be. There is a critical role for the government in this process in supporting training programmes and other mechanisms to smooth the adjustment process and reduce adjustment costs.

Cheaper imported goods and services may also contribute to improving household budgets. Increased quality and variety of imports is also a benefit to households (and firms).

AN INCREASE IN THE TERMS OF TRADE

The terms of trade is the ratio of a country's export prices to its import prices. In macroeconomic terms, it broadly measures the purchasing power of a country's exports. An increase in the terms of trade means a greater volume of imports can be purchased for a given volume of exports. An increase in the terms of trade can be the result of an increase in export prices or a decrease in import prices (or both).

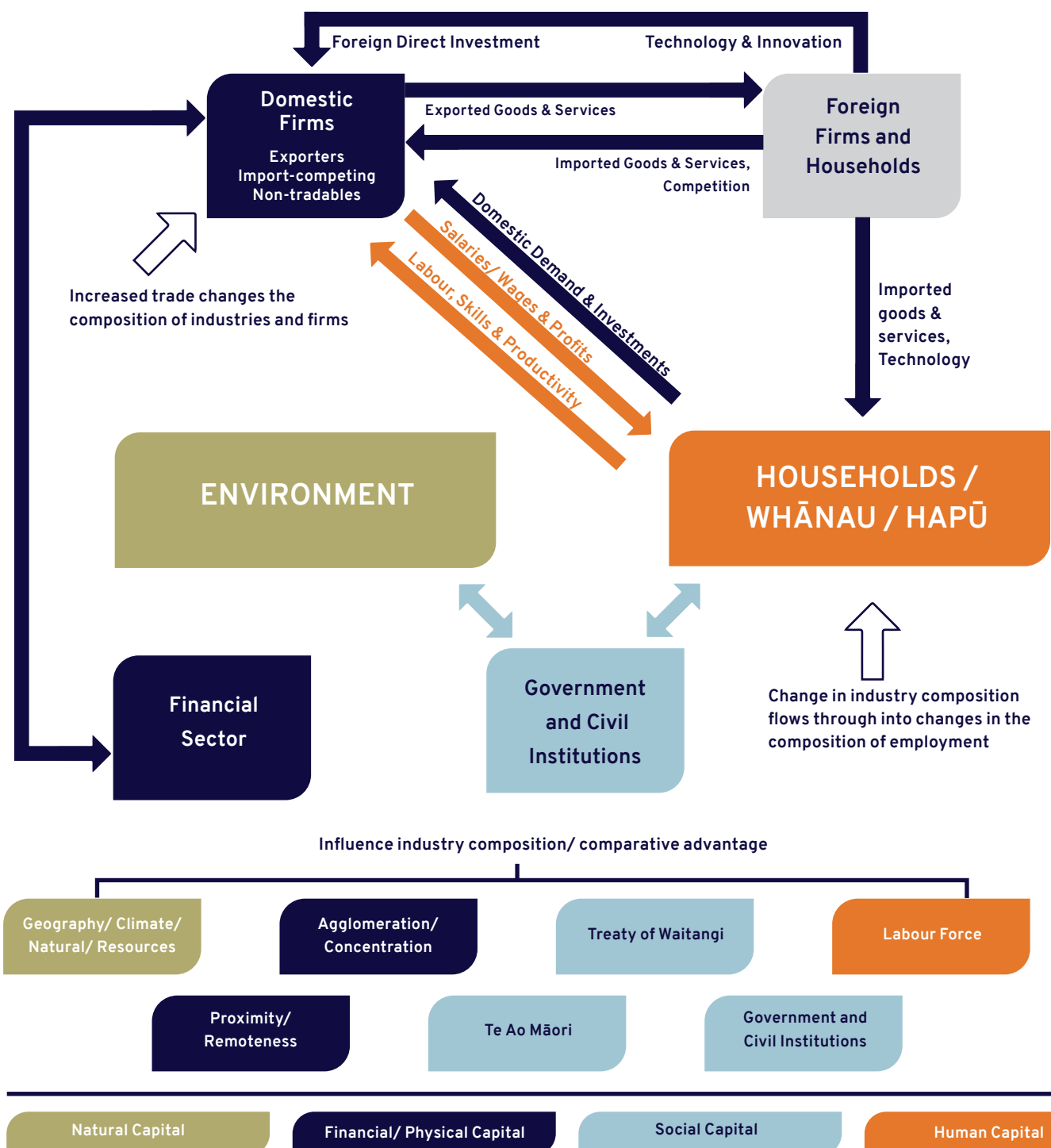
A change in trading conditions will frequently manifest, at least initially, as a change in the terms of trade rather than a change in the volume of trade. The change may be driven by factors largely external to an economy. For example, global commodity prices move over time in response to changing supply and demand patterns, and can be quite volatile in the short term. A trade agreement could also change prices. For example, reductions in trade barrier costs such as tariffs in the partner country would increase the export price received by domestic exporters.

³ This assumes that the economy is at or close to full employment. If there is underemployed or surplus resources this may dilute the wage effects.

A permanent increase in export prices will have much the same effects as those described above. Exporters will respond to the price signal by increasing output over the longer term, drawing in labour and other resources from elsewhere in the economy to do so. Similarly, a permanent decrease in import prices would place greater pressure on import-competing firms. At the same time, a decrease in import prices lowers the cost of inputs into production and benefits consumers. Crucially, a high terms of trade helps distribute the gains from trade across the whole community.

A temporary increase in export prices will have a smaller effect. It may not be feasible or prudent to permanently increase output in response. Instead a temporary price increase is likely to act as a windfall gain. How this gain is used will depend on the nature of the firm but the four main options are: a boost to firm profits that accrues to the firms owners; distributing some or all of the gains to employees through bonuses or other temporary income increases; reinvesting the boost to profits in the firm; or repaying debt. A temporary decrease in import prices will act in a similar way as a temporary boost to households, whānau and hapū disposable income.

Figure 2 – An Increase in Trade in the Small Open Economy Model



6

Productive trade – the effects of trade on productivity

Trade and trade liberalisation are an important mechanism for productivity improvements for firms and countries. The PSITC Framework focuses on several mechanisms through which trade affects productivity: reallocation effects, innovation responses from increased competition, foreign direct investment, learning-by-exporting, and diffusion of technology. These mechanisms are positively inter-related and often self-reinforcing.

REALLOCATION EFFECTS

Trade allows countries to specialise in areas of comparative advantage. Countries tend to gain from trade if they specialise in producing and exporting what they are relatively more efficient at producing, and import goods and services they are less efficient at producing. Reallocating resources (labour, capital, and land) from less efficient/productive industries to more efficient/productive industries lifts aggregate productivity. This is an *inter industry* reallocation effect.

Similar effects take place within an industry. Freer trade opens up and expands markets, enabling firms to exploit economies of scale and forcing firms that operate with higher costs to either adapt to the new competition, which operate on lower cost structures, or to exit. Over time, resources shift from the least productive firms within an industry to the most productive firms (Melitz, 2003; Melitz and Ottaviano, 2008; Melitz and Trefler, 2012). This is an *intra-industry* reallocation effect.

INNOVATION RESPONSES FROM INCREASED COMPETITION

Trade liberalisation opens up new markets to exporters while increasing competition within domestic markets. Firstly, this results in an expansion of export market size and/or improved returns from exporting, which increases firm profit in the market. This in turn affects firms' incentives and ability to invest in new technology and innovating activities (Constantini and Melitz, 2008). Secondly, domestically focused firms' innovative activities are affected through increased competition (Rivera-Batiz and Romer 1991a, 1991b). This could be a negative effect, where a more competitive market reduces firm profit margins, resulting in lower investments and innovative activity. Alternatively, increased competition may incentivise firms to innovate in order to remain in the market.

FOREIGN DIRECT INVESTMENT

Foreign direct investment (FDI) can help facilitate the transfer of productivity enhancing technical or managerial knowledge and expertise to domestic firms. This may include intellectual property that would not otherwise be available to domestic firms. FDI will also typically gravitate towards the more productive firms in an industry, helping to drive intra-industry resource reallocation. Some FDI, however, is focused on securing factors of production or raw materials for global supply chains; this type of FDI is likely to be less productivity enhancing.

LEARNING BY EXPORTING

Learning by exporting is the idea that firms who move into export markets learn from foreign companies and markets, and become more productive by bringing that knowledge to bear on domestic production (Grossman and Helpman 1991). That knowledge could be technical expertise or relate to managerial techniques and practices.

Empirical evidence tends to favour causality running from productivity to exporting (firms with higher productivity “self-select” into exporting) rather than from exporting to productivity (the learning by exporting hypothesis). Nonetheless, learning by exporting remains a potential channel for productivity improvements. Nor is learning by exporting mutually exclusive with self-selection; indeed it may reinforce a higher productivity starting point.

DIFFUSION OF TECHNOLOGY

Technology may be embedded or embodied in physical goods (notably capital and intermediate goods), as well as in a range of traded services. Domestic firms can access better technology via trade to improve their own productivity. Similarly, domestic households can access better technology to improve their own productivity.



7

Inclusive trade – the distributional effects of trade

The PSITC Framework adopts the OECD’s Trade and Gender framework as a way of framing the inclusive channels.⁴ The OECD framework focuses on the different impacts of trade on men and women as employers (business owners), employees (workers) and consumers. Whilst the OECD focusses on gender in this instance, we extend the framework to consider ethnicity and region as well. For example, this allows for the consideration of Māori as business owners, workers and consumers, and the different experiences they may have with trade. Similarly, the differences between firms, workers and consumers in urban, semi-rural, and rural areas can also be framed this way. Finally, firm characteristics, including whether a firm is a Small or Medium Enterprise (SME), influence outcomes for both employer and employees.

The distribution of firms and workers by region, gender, and ethnicity across industries determines if they are net beneficiaries of an increase in trade. This distribution is largely determined by non-trade factors, such as those outlined in section 3, although trade may have small impacts.

FIRMS AND BUSINESS OWNERS

Some firms will benefit from an increase in trade as a result of improved market access, access to better quality and/or cheaper inputs, and knowledge and innovation diffusion through embodied or embedded technology and foreign investment. Other firms, faced with greater competition, may experience weaker demand or be forced out of business altogether. These effects will have flow on impacts to the firms owners, be they a hands-on sole proprietor or partnership, or a more distant shareholder. Some of the distributional dimensions on which firms and business owners may face different impacts include:

- Size (e.g. number of employees)
- Industry (potentially multiple)
- Region (potentially multiple)
- Exporting, import competing and non-tradable
- Ownership structure and/or owner’s characteristics (including gender, ethnicity, age)

WORKERS

Workers in firms that benefit from trade should receive higher incomes as productivity increases or as wages are bid upwards to attract workers from other parts of the economy. Workers in firms that are disadvantaged by trade may experience stagnant wages, reduced hours or even loss of employment. The net of these two effects is an income effect, which can be positive or negative for different groups of workers, and will be influenced by the ease with which labour can shift from one sector to another. Labour market and education/training settings in particular will have a strong influence on how well (or not) workers are able to shift from contracting sectors to expanding sectors. Some of the distributional dimensions on which workers may face different impacts include:

- Industry
- Region
- Gender
- Ethnicity
- Skill or education level

⁴ For further information, see <https://www.oecd.org/trade/topics/trade-and-gender/>. A forthcoming OECD Trade Policy Paper covers the framework in depth (OECD forthcoming).

CONSUMERS

One of the main reasons economies trade is to source cheaper and/or higher quality goods and services for households, whānau, and hapū (and firms) to consume. Another potential benefit to households, whānau, and hapū is greater choice or variety of products and services to consume. However, consumers may face higher domestic prices for exported goods and services, with domestic consumption in these areas having to compete with foreign consumption for its share of domestic production.

As with other aspects of trade, the benefits to consumers from trade-related price changes are unevenly distributed. That unevenness is driven by the different consumption patterns of different households, whānau and hapū, which in turn are a factor of, amongst other things, incomes, household composition, and urban/rural location. Trade-driven changes in relative prices might reduce consumption inequality if price declines are more concentrated in the bundle of goods and services consumed by lower-income households, whānau or hapū (OECD 2020b). Equally, trade could increase consumption inequality if price declines are concentrated in the bundle of goods and services consumed by higher-income households, whānau or hapū.

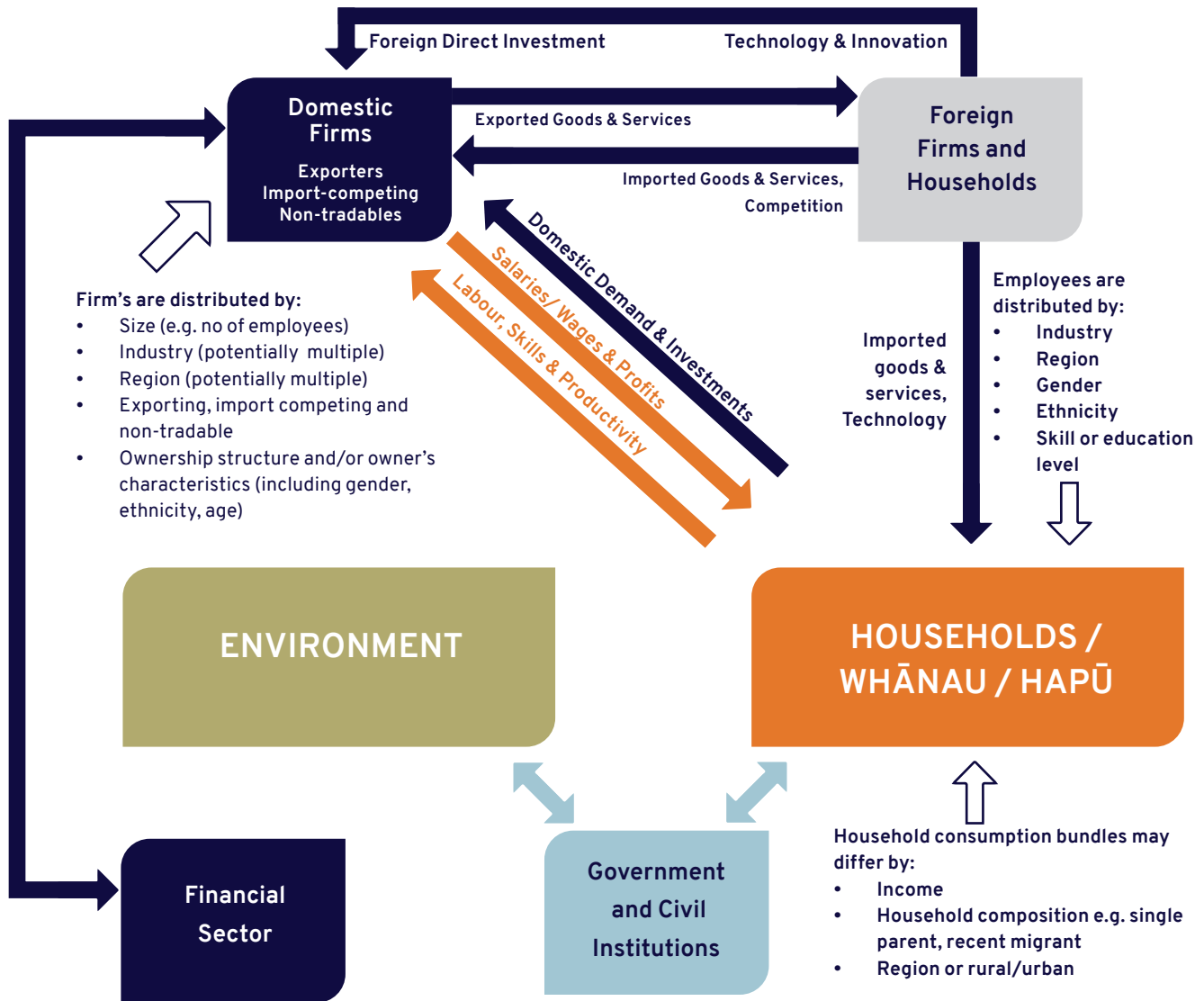
Whilst income is the most common distributional breakdown of households, other household types, such as sole parent households, recent or temporary migrant households, extended family households, and super annuitant households, may face different impacts from trade (OECD 2020b).

INEQUALITY

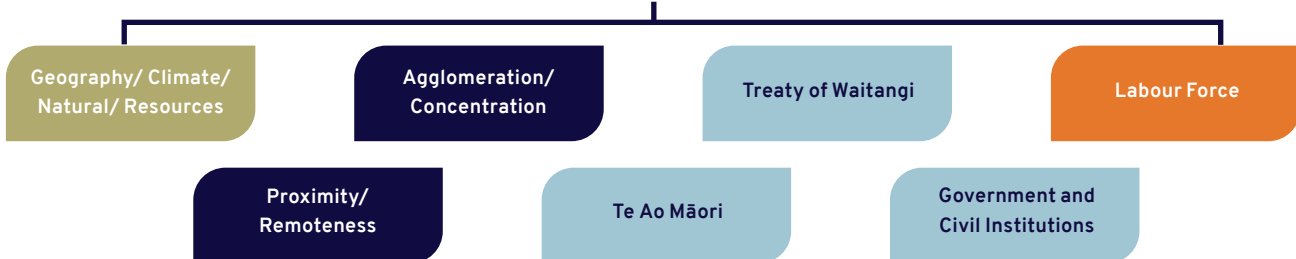
The overall impact on household inequality from trade will be a mix of the income-related effects and the consumption-related effects. In some cases the two effects may work in the same direction; in other cases they may be partially offsetting. Income-related effects are likely to be the dominant factor for households, whānau and hapū employed in or with an ownership stake in industries or firms that are directly impacted by trade effects.



Figure 3 – Inclusive trade



Influence industry composition/ comparative advantage



8

Sustainable trade – the effects of trade on the environment

Sustainable trade can take different forms: environmental, fiscal, economic, social to name a few. This part of the PSITC framework focuses on the link between trade and the environment. Economic and social sustainability are largely covered by the productive and inclusive trade channels respectively.

SCALE, COMPOSITION AND INCOME/TECHNIQUE EFFECTS

The PSITC framework adopts the standard approach to breaking down the environmental impacts of trade into scale, composition and technique/income effects (Grossman and Krueger 1991). These are:

- **Scale effect:** an increase in economic activity and income as a result of trade raises the total amount of pollution and emissions and creates environmental damage. Scale effects are typically negative in terms of environmental impact.
- **Composition effect:** trade changes the composition of production within an economy. The impact on the environment will depend on the production structure of an economy and its areas of specialisation or comparative advantage (and therefore, the type of production that is scaled up or down as a result of trade). Composition effects can therefore be either positive or negative.
- **Technique/income effects:** trade is an important channel for the transfer of innovation and technologies across borders, which can improve the spread and uptake of environmentally friendly and low emissions technologies and have a positive impact on the environment. Furthermore, rising incomes could have positive effects for the environment since increasing per-capita incomes may lead to greater demand for (and ability to pay for) improved environmental quality.

Environmental regulations (and their enforcement) play a significant role in determining the size of all of these effects.

INTERNATIONAL REGULATORY RESPONSES

International forces also drive changes to environmental standards. International environmental agreements, such as the Paris Agreement on climate change and emissions reductions, are gradually driving change in domestic environmental policy settings and regulation. Meanwhile, international trade agreements increasingly include environment chapters. Increased trade may elicit different regulatory responses:

- “Harmonisation” or improvement of environmental standards in order to meet requirements in export markets and/or trade agreements. This is increasingly extending into different emissions standards in different countries. Over time, the ability to meet emissions and other standards may become a pre-requisite for trade. Conversely, the inability to meet emissions standards may become a trade barrier in the future e.g. Carbon Border Adjustment mechanisms.
- A “Race to the Bottom”, as struggling exporters or import-competing firms lobby for weaker environmental standards or less tightening in regulation (the distressed and dirty industry hypothesis).

FIRM RESPONSES TO REGULATORY CHANGES

Changes to environmental regulations may elicit different firm responses (Copeland and Taylor 2003, Cherniwchan et al 2017):

- Investment in cleaner technologies and changes to business processes or practices to comply with regulations and/or meet emissions targets⁵

⁵ Firms may also do this to benefit from the premiums associated with environmental attributes.

- Pollution intensive industry shifts to countries with weaker regulations (the Pollution Haven Hypothesis)
- Environmental regulation has an effect on trade flows at the margin e.g. firms offshore some “dirty” production (the Pollution Haven Effect)

Carbon leakage is a special case of the pollution haven hypothesis, where tighter emissions regulations in one country displace activity to less regulated countries with less efficient producers, increasing global emissions.

GREEN AND LOW EMISSIONS TECHNOLOGY DIFFUSION

Trade may help facilitate the diffusion of green and low emissions technology, which in turn improves environmental quality or mitigates negative effects. These are another form of technique effects. This diffusion may occur through environmental goods and services, via foreign direct investment, or through the movement of people. Green and low emissions technology diffusion will be a key enabler for countries managing the transition to a low-emissions economy.

ENVIRONMENTAL ATTRIBUTES AND CREDENTIALS

Environmental attributes and credentials are an increasing feature of consumer preferences and an influence on international demand (Dalziel, Saunders and Saunders 2018). Some attributes may be reflected in environmental standards e.g. trust that products from a country meet a minimum acceptable standard. More generally, the actual or perceived adequacy of a country’s overall climate change response may become a feature of a country’s comparative advantage.

Other attributes, called credence attributes, relate to the state of the environment itself and the influence this has on the quality and other attributes of the product or service. Consumers, both domestic and foreign, are often willing to pay a premium for products or services that have specific credence attributes that match their preferences.⁶

THE FEEDBACK LOOP – ENVIRONMENTAL IMPACTS ON HOUSEHOLDS, WHĀNAU AND HAPŪ, AND DOMESTIC FIRMS

Most of the discussion above has highlighted how firms and, indirectly through their consumption preferences, households, whānau and hapū, impact on the environment through trade. Of course, the relationship is not one way, with both firms and households, whānau and hapū impacted by the environment.

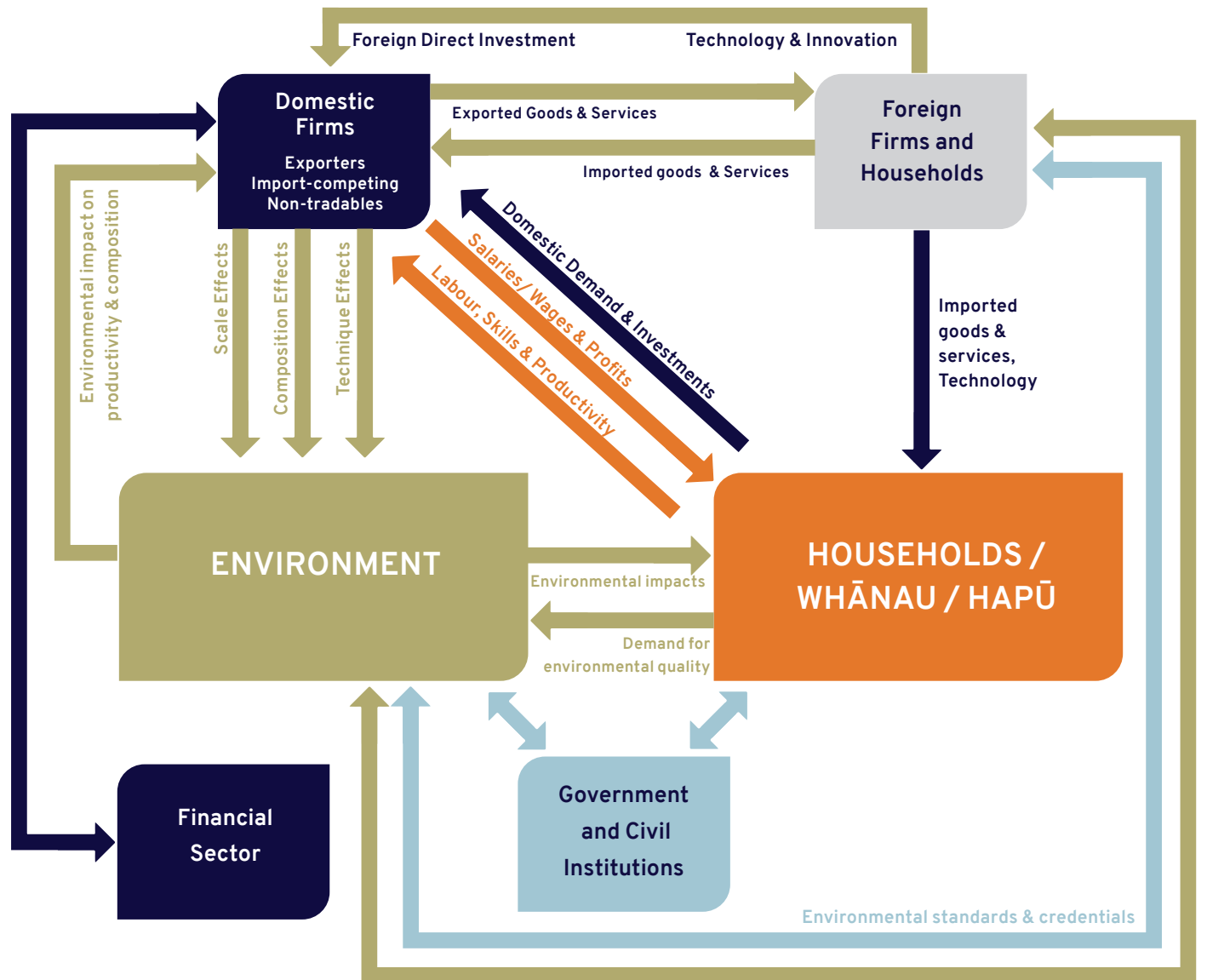
Many firms and industries rely heavily on the environment in the production process of their goods or services. Specific elements of the environment, such as fertile agricultural land or mineral resources, will often form part of a country’s comparative advantage. This is perhaps most noticeable in the primary sector where the state of air, land, and water quality, and climate patterns have immediate and large impacts on production and productivity, and therefore trade. Over time, these conditions are likely to shift both slowly and quickly in response to climate change. Slowly, through the steady change in climate patterns such as rainfall and temperatures from global warming. Quickly, through the increase in frequency and severity of adverse events such as drought and flooding.

For firms and industries less directly reliant on the environment as, crudely, an input into production, changes to environmental regulations and policy settings will affect firms’ productivity and the composition of industry. For example, new regulations may result in changes to business practices or processes, while carbon pricing and the transition to a low emissions economy will influence the cost and profitability of a wide range of economic activities.

⁶ The Agribusiness and Economics Research Unit (AERU) of Lincoln University has a range of examples of New Zealand credence attributes and the premiums attached to them.
<https://www.sustainablewellbeing.nz/aeru-data-portal>

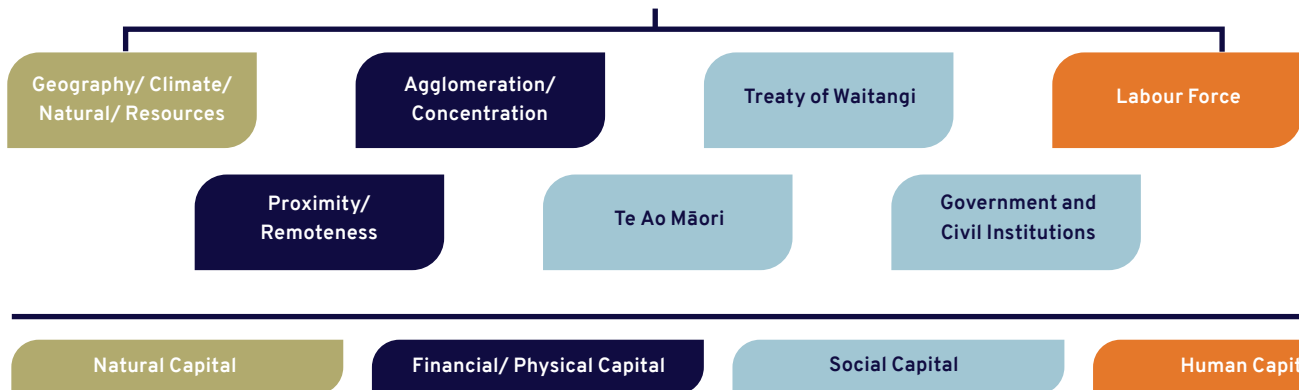
For households, whānau and hapū, the state of the environment is a fundamental source of well-being. The state of the environment, and changes in the state of the environment, have both direct and indirect impacts on households, whānau and hapū. Some of these changes, both positive and negative, may be created by trade.

Figure 4 – Sustainable trade



Pollution haven hypothesis

Influence industry composition/ comparative advantage



9

The framework as a tool for evaluating the impact of trade and trade related policy

The PSITC framework has been primarily designed as an analytical tool to better think through the impacts of trade, and in doing so improve trade outcomes. There are three key ways it can do this. Firstly, the framework can be used to identify and evaluate the impacts that New Zealand's overall trade patterns have on productive, sustainable and inclusive outcomes. These insights can inform the overall direction of trade policy and identify complementary domestic policies. Secondly, the framework can be used to evaluate a specific trade policy instrument, such as a trade agreement. In this case, evaluation could be before or after the agreement comes into effect (or both). The results of such an evaluation can be used to improve the agreement during negotiation and implementation. Thirdly, the framework can be used to assess the likely impacts of an economic event or shock from a trade perspective.

INFORMING TRADE AND TRADE-RELATED POLICY

The framework can be used to identify and evaluate the impacts that New Zealand's overall trade patterns have on productive, sustainable and inclusive outcomes. In this context, it provides the theoretical underpinnings for the suite of productive, sustainable and inclusive trade metrics that were proposed in the MFAT working paper "[Understanding the linkages between trade and productivity sustainability and inclusiveness](#)". The metrics largely focus on key outcomes, with causality and attribution to trade difficult to establish quantitatively. The framework helps bridge this gap by identifying the key channels and the likely causality.

Evaluating trade impacts at this level provides insights that can inform the overall direction of trade policy. New Zealand's Trade for All Agenda sets out a vision for sustainable and inclusive trade that delivers for all New Zealanders. Insights from the framework can be used to inform and sharpen specific policies within this overarching agenda. In particular, we believe the framework helps improve the transparency of trade impacts. When approaching new trade agreements and looking to improve existing ones, a better understanding of the productive, sustainable and inclusive impacts of trade can help trade negotiators better target their efforts to improve outcomes across different areas. The framework could potentially help inform the negotiating mandate set by Ministers.

Critically, trade policy rarely, if ever, operates in isolation. Particularly when it comes to inclusive and sustainable impacts, domestic policy settings and institutional factors tend to be more important than trade ones. By identifying these interlinkages, the framework can help inform what complementary policies could be used to maximise trade performance and the benefits of trade while minimising the costs. And in a similar fashion, there will be areas where trade and trade settings can be used to support domestic objectives. Trade policy needs friends, and the best friendships go both ways.

EVALUATING TRADE AGREEMENTS

The framework explains how a trade agreement may affect productive, sustainable and inclusive outcomes...

An FTA is expected to reduce the barriers that impair efficiency of international trade, notably tariff and non-tariff barriers and institutional distance (section 4). This leads to trade diversion or trade creation effects. The mix of creation and diversion effects will drive changes in the composition of firms / industries (section 5). Even a pure trade diversion result may be welfare enhancing if returns to exporting firms increase. The change in firm / industry composition drives changes in inclusive outcomes (section 7). The same compositional change also drives scale, composition and technique/income effects on environmental outcomes (section 8).

Depending on its nature, the FTA may also drive changes in green and low emissions technology diffusion.

...but attributing those impacts quantitatively is extremely challenging

The critical challenge is distinguishing the specific impacts of a given FTA from everything else going on. Quantitative techniques such as gravity models can shed some light on the *ex post* trade creation and diversion effects. Computable General Equilibrium (CGE) models are commonly used for *ex ante* evaluation, with the impact of changes to tariffs and non-tariff barriers estimated as deviations from a baseline projection of the economy.

When it comes to sustainable and inclusive outcomes, some impacts may be inferred (directionally at least) from the combination of quantitative techniques noted above and observation of changes in the trends of key metrics in these areas. Empirical causation is likely to remain elusive, leaving qualitative techniques such as surveys and case studies as a way to bridge the gap.

Ex ante evaluation could leverage CGE modelling techniques to analyse inclusive and sustainable impacts

For *ex ante* evaluation, the framework can provide forward guidance on the likely impact of the agreement on productive, sustainable and inclusive outcomes. In this respect, it compliments and builds on the economic analysis and modelling that is undertaken for each new agreement. MFAT officials used the framework in this way for chapter seven of the [National Interest Analysis](#) of the Regional Comprehensive Economic Partnership trade agreement.

As noted above, CGE models are the work-horse quantitative tools when it comes to *ex ante* analysis of trade agreements. CGE models typically focus on the economic and trade impacts of a trade agreement, usually with some sectoral breakdowns and impacts on different factor markets (including labour). Historically, they have not delved deeply into distributional or environmental impacts. However, this is changing and new approaches in Canada and other countries have shown that it can be done.

In a nutshell, the sectoral economic impacts are translated into distributional labour market outcomes (different employment impacts for men and women for example) and on environmental outcomes (typically greenhouse gas emissions). Promisingly in New Zealand, the Climate Change Commission's CGE modelling has a Distributional Impacts Employment Module (DIM-E), as well as the emissions and economic impacts that are core to its analysis. In principle, we think that the PSITC framework could be translated into a CGE model. Feedback on the practicality of doing so would be greatly appreciated from academics, economic consultants, and other CGE practitioners.

Ex post evaluation could extend on traditional analysis

For *ex post* evaluation, the framework provides guidance on where to direct quantitative and qualitative analysis. As at the national level, the theoretical framework can also help to infer causality of impacts. The first cab off the ranks for this type of evaluation will be the Comprehensive and Progressive Trans Pacific Partnership (CPTPP). New Zealand signed a [joint declaration](#) with Canada and Chile to review the effectiveness of the progressive elements of CPTPP three years after entry into force. That review is currently under way and the PSITC framework will be used to guide the "Impact Analysis" component of the review.

In a similar fashion to *ex ante* analysis, there are some work-horse tools for *ex post* evaluation of trade agreements. Econometric gravity models are used to estimate the impacts of trade agreements whilst controlling for a range of structural and other factors, which helps narrow in on attribution of impacts. Tariff preference utilisation analysis measures how well a trade agreements tariff provisions have been used in a given time period. And firm level analysis can help identify trade creation versus trade diversion effects.

Similarly to *ex ante* CGE modelling, we think that the sectoral results from traditional techniques could be extended to distributional and environmental impacts. Meanwhile, firm level analysis is a promising avenue for more explicitly linking changes from a trade agreement to distributional impacts, particularly those relating to firm size and employment.

Finally, quantitative analysis will typically only tell part of the story of a trade agreement. The framework can be used to identify areas that have not been well covered by quantitative analysis. Understanding of the impacts of trade in these areas could be bolstered by other methods, such as case studies, surveys and stakeholder engagement.

ASSESSING THE POTENTIAL IMPACTS OF A TRADE-RELATED SHOCK

The framework can be used for more than evaluation. For example, MFAT economists used early versions of this framework to identify the likely impacts of COVID-19 policy responses on different parts of the tradables sector, and extrapolate from there the potential impacts on sustainable and inclusive outcomes. This analysis fed into advice to Ministers and senior officials engaged in the All of Government response to COVID-19. We have reproduced this analysis in Appendix Two as an example of the framework being applied to a real situation.

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Appendix One – *The Treasury Living Standards Framework*

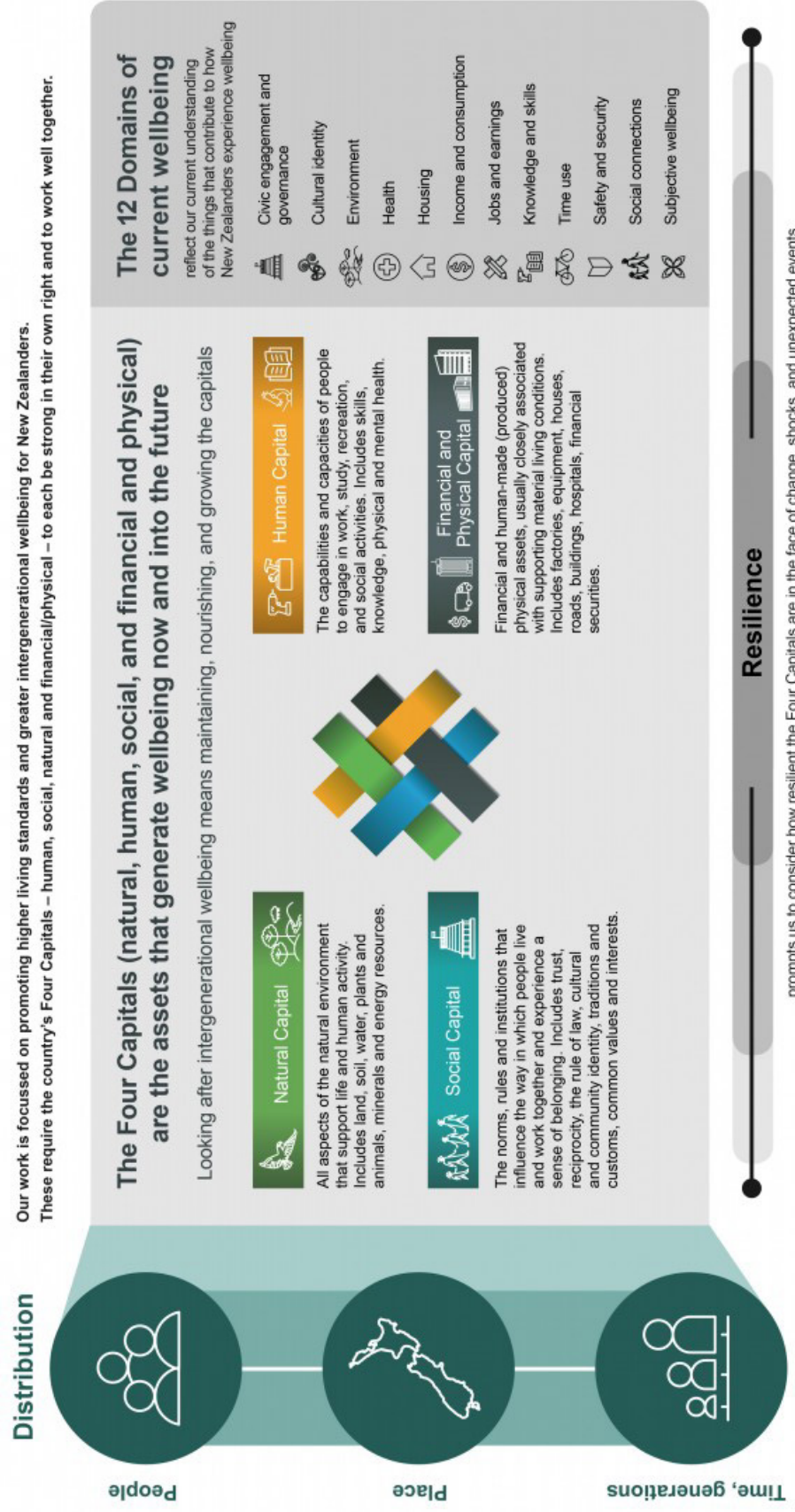


TE TAI ŌHANGA
THE TREASURY

The Treasury's Living Standards Framework

To help us achieve our vision of working towards higher living standards for New Zealanders, we developed the Living Standards Framework. Our Living Standards Framework provides us with a shared understanding of what helps achieve higher living standards to support intergenerational wellbeing.

Source: The Treasury



Appendix Two –

Applying the Framework to the Economic Shock from COVID-19

MFAT economists used early versions of this framework to identify the likely impacts of COVID-19 policy responses on different parts of the tradables sector. This analysis feed into advice to Ministers and senior officials engaged in the All of Government response to COVID-19 in June 2020. The analysis is reproduced below as an example of the how framework can be applied to a policy issue.

Initial Insights on the Trade Related Impact of COVID-19 on Productive, Sustainable and Inclusive Outcomes

PRODUCTIVITY

Key points:

- COVID-19 will exacerbate New Zealand’s productivity challenge, by reducing our international connectivity, global market opportunities, dampening knowledge and technology diffusion, and reducing global FDI flows.
- To boost aggregate productivity, economic recovery policy should aim to materially increase the share of the more productive tradables sector relative to the rest of the economy over time.

The channels from trade to improved productivity are fairly well established in economic theory and the empirical literature. Key transmission mechanisms include international connectivity, economies of scale from access to larger markets, increased international competition in domestic markets, improved quality and pricing of imported inputs, foreign investment (a potential source of improved management capability), and technology/innovation/knowledge diffusion. The OECD estimates about half of our weak productivity performance in recent decades can be attributed to relatively weak international connections – a situation that is exacerbated by the current situation at our borders.

COVID-19 will worsen New Zealand’s productivity challenge. Global demand has weakened, which coupled with a trend of rising protectionism, will likely reduce market opportunities for New Zealand exporters. If this continues for some time it will reduce opportunities to drive productivity gains through increased economies of scale, including in “global niche” areas where some of New Zealand’s leading exporters operate.

Restrictions on international travel will hamper the ability of businesses to connect with overseas customers as well as reduce technology and knowledge diffusion. Global foreign investment flows are expected to diminish, which will likely reduce FDI into New Zealand. The supply of higher quality and/or lower cost imported inputs, including capital goods, may be reduced by global value chain disruptions.

In terms of initial policy insights, the Government’s Trade Recovery Strategy will help address some of the challenges highlighted above. It directly tackles (to the extent that New Zealand can) rising protectionism and reducing market access, provides a limited substitute for restricted international business travel (through increased economic diplomacy and NZTE support), and keeps open supply chains for imported inputs. However trade policy can only do so much on its own. Trade policy needs domestic policy friends.

In particular, COVID-19 economic recovery policy should strongly emphasise the importance of the more productive tradables sector and aim to materially increase the size of that sector, principally the most productive industries within the tradables sector (such as food and beverage manufacturing and digital services), relative to the rest of the economy over time. This would lift productivity (and in turn incomes and well-being) at a faster rate than a more inward-looking economy⁷. A significantly lower real exchange rate would assist this, although the trade-off for improving exporters’ competitiveness would be relatively more expensive imports. In this regard we consider that Skilling’s 2-3 deep clusters and supporting innovation policy has merit. (This policy suggestion is contained in a research paper prepared for the Productive Commission’s frontier firms inquiry). Policies and processes which increase New Zealand’s relative attractiveness as an investment destination could be useful in securing a greater share of the diminished global FDI pool.

⁷ A related risk, however, is the potential for the crowding out of smaller firms by larger ones with the resources to ride out the initial and potentially ongoing lock-down-driven pressures.

SUSTAINABILITY

Key points:

- In the short to medium term, COVID-19 trade impacts may have positive environmental effects, chiefly lower emissions from the sharp reduction in tourism.
- However, over the longer term a poorer New Zealand will have fewer resources for investing in environmental initiatives including climate change mitigation and adaptation. Fiscal expenditure may bridge this gap and policy prioritisation will remain a key factor in making judgements on relative trade efforts.

Sustainability can cover different angles; this framework focusses on environmental sustainability. For New Zealand, the main areas of interest are emissions and soil and water quality.

The link from trade to the environment can be split into three main effects: scale effects, where increased economic activity increases environmental impacts; composition effects, where changes in the composition of economic activity creates environmental impacts (positive or negative); and income and technique effects, where consumer preferences, tighter regulation and innovation reduce environmental impacts. The main drivers of environmental performance will be domestic regulation and policy settings and consumer and producer preferences, rather than trade or trade policy.

In the short term at least, COVID-19 may have positive environmental effects. Emissions in New Zealand and elsewhere have fallen in line with the sharp decline in economic activity (scale effect). In New Zealand, this reduction may be smaller than elsewhere, as about half of our emissions are from the agriculture sector where emissions are unlikely to have changed much, nor did we have much heavy industry to shut down. Similarly, water and soil quality issues are unlikely to have been materially impacted by COVID-19 economic and trade impacts. (The drought may have had some environmental impacts through greater than usual de-stocking).

Set against this, emissions and other environmental effects from international tourism will have effectively ceased and volumes of emissions-intensive airfreighted goods have also declined. On balance, this suggests a decline in emissions from trade.

Lower emissions may extend into the medium term, with international aviation activity likely to be depressed for some time (composition effect). The net impact of this medium term effect will be dependent on what consumers replace long haul travel with e.g. a switch to more frequent short-haul travel may negate any overall emissions reductions.

In the longer term, a smaller economy and poorer New Zealand (particularly if it becomes more inward looking) may constrain the ability of businesses, households and government to invest in environmentally enhancing initiatives and technologies (income effect). Fiscal measures in this area may be one approach to bridge the funding gap. More generally, forthcoming regulatory changes from the Zero Carbon Act and freshwater regulations will have a much larger impact on trade-related environmental impacts than trade policy.

Conceivably, the composition of the export sector in the wake of COVID-19 could lead to a downward trend in environmental impacts, particularly emissions. This could be due to a combination of the following:

- A stable primary and related manufacturing sector that is becoming steadily more environmentally efficient (in response to the tightening regulatory settings already in progress, consumer preferences and general efficiency gains);
- A structurally smaller tourism and international education sector (perhaps with a focus on high-value tourists and students);
- A growing share of exports in the “weightless” services sector.

Such a compositional change would likely boost aggregate tradables sector productivity as well, by shifting the composition of the sector to more productive tradables industries and ideally lifting productivity in the remaining tourism sector. However, this change is unlikely to reverse the long run decline in the tradables share of the economy and may accelerate it, given the scale of the gap left by lost international tourism and education.

INCLUSIVENESS

Key points:

- The trade impacts of COVID-19 may worsen inclusive outcomes for regions, women and Māori, chiefly through the impact on tourism, as well as making exporting even more challenging for SMEs.
- Domestic policy interventions, such as active labour market policy and industry plans, will be more effective in this space than trade policy in isolation. However, consideration of how these domestic policies could increase the share of the most productive industries in the economy (both tradable and non-tradable) could enhance their long term effectiveness.

The distribution of workers and businesses (including SMEs) by region / gender / ethnicity across industries determines if they are net beneficiaries of trade. This distribution is largely determined by non-trade factors, although trade will have small impacts. Trade-driven changes in relative prices might reduce consumption inequality if price declines are more concentrated in the bundle of goods and services consumed by lower-income households. The overall impact on household inequality from trade will be a mix of the income-related effects and the consumption-related effects.

Our information on the distribution of workers and businesses across the tradables sector is patchy at best. Some high level generalisations only can be inferred.

Regional economies tend to have a higher share of tradables sector activity than the more urban economies (Auckland, Wellington, Christchurch). This is due to their greater relative exposure to the primary industry and tourism. Despite a greater weighting towards the more productive tradables sector, the regions tend to have lower per capita incomes (with the exception of Taranaki).

COVID-19 impacts on regional economies via trade are likely to be very mixed. Regions more reliant on agriculture, horticulture, and related manufacturing and support industries may weather the COVID-19 shock relatively better in the shorter term, although labour availability could become an issue. Over the longer term, a prolonged global recession would challenge this resilience. Those with a greater reliance on tourism and forestry are already suffering and will likely remain hard hit. This may manifest in sharp differences across neighbouring regions e.g. Waikato vs Rotorua, Southland and Central Otago vs Queenstown-Lakes. JobSeeker data is starting to reveal this regional divergence already.

Māori workers, businesses and Iwi have relatively high exposure to primary industries and tourism and are likely to be impacted in similar ways to regional economies, with sharp differences in outcomes for those involved in different sectors. Māori have historically fared worse and for a longer period of time in global recessions; this is likely to be the case again.

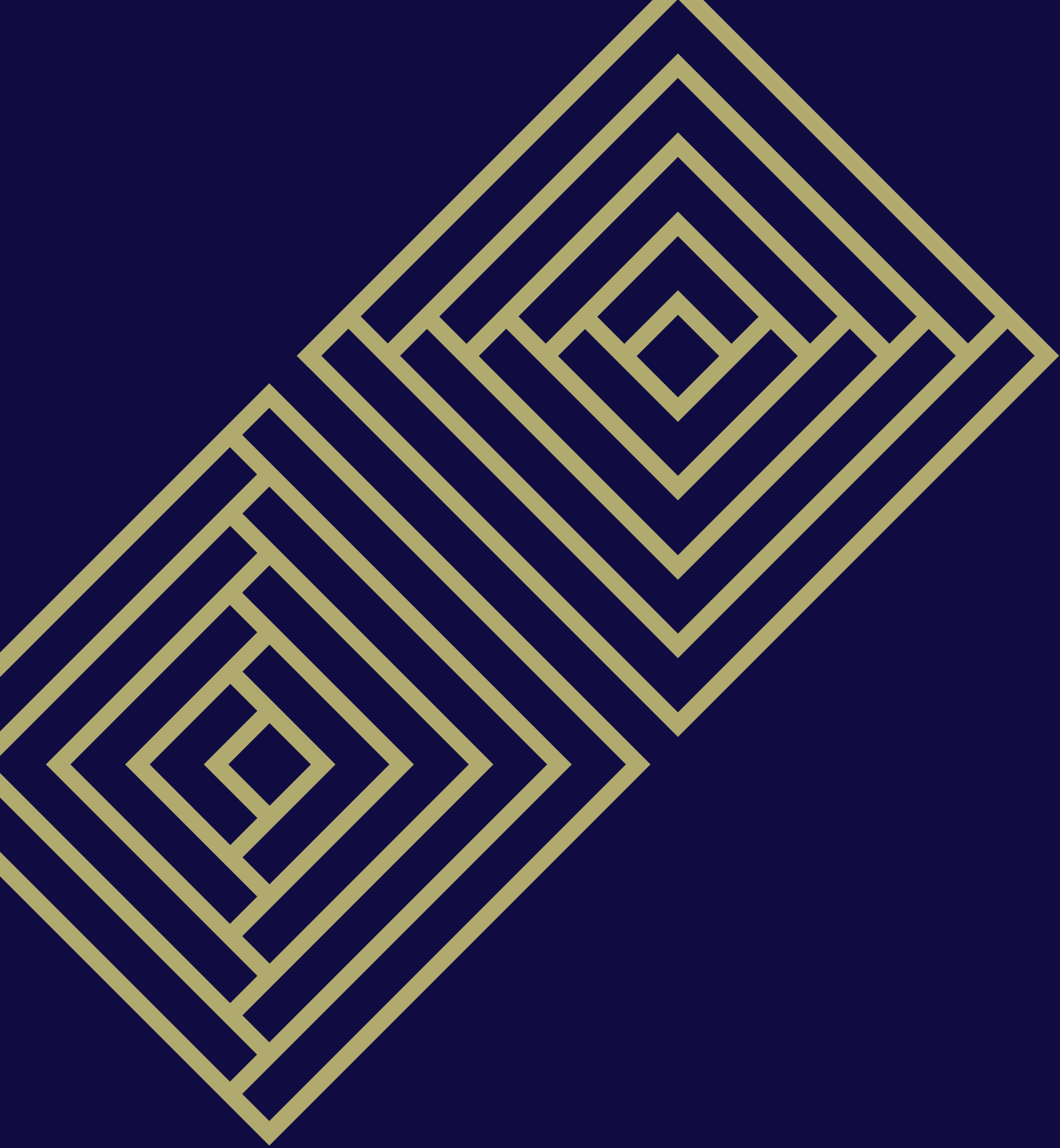
In terms of female employment, two different impacts will partly offset one another. On the one hand, female employment in the tradables sector is low relative to men – about 40 percent of women work in the tradables sector but make up just under half the total workforce. This would leave women less vulnerable to COVID-19 trade impacts. On the other hand, women make up a low share of the workforce in export-oriented industries that are likely to weather COVID-19 relatively well (e.g. agriculture – 29 percent) but a relatively larger share of the workforce in tourism-related industries (roughly 50 percent). This suggests that trade-related impacts of COVID-19 could hit women harder than men.

Exporting SMEs are likely to face similar impacts to those above based on their industrial distribution.

Typically, the barriers to exporting are felt disproportionately by SMEs, who have fewer resources to overcome them. Looking ahead, these barriers are likely to be greater given the uptick in protectionism. Furthermore, border/travel restrictions are likely to severely constrain SMEs ability to access overseas markets; SMEs will be less likely to have offices or staff in market than larger firms and will be less able to spare staff to spend time in quarantine if they are required to travel. The Trade Recovery Strategy will be critical for alleviating some of these challenges and MFAT and NZTE are working on how to mitigate these as far as possible.

In terms of trade-related household inequality, the negative income effect is likely to be the critical factor. There is likely to be little if any offset from import price effects. Higher transport costs and a potentially weaker exchange rate will put upwards pressure on imported prices, though lower oil prices will provide some offset.

Domestic policy interventions, such as active labour market policy and industry plans, will be more effective in addressing these inclusivity challenges than trade policy. However, consideration of how these domestic policies could increase the share of the most productive industries in the economy (both tradable and non-tradable) could enhance their long term effectiveness.



MFAT

MINISTRY OF FOREIGN AFFAIRS AND TRADE
MANATŪ AORERE