

Final Report with Policy Recommendations for APEC Manufacturing-Related Services: Definitions, Contributions, Issues, & Challenges

APEC Group on Services

March 2024



**Asia-Pacific
Economic Cooperation**



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March 2024

APEC Project: GOS 03 2022

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The findings, interpretations, policy recommendations and conclusions expressed in this report are entirely those of the authors and do not necessarily represent the views of the APEC, its affiliated organizations, its executive directors, or the governments they represent. This report provides in-depth deliberation on APEC initiatives on MRS, MRS within trade and investment rules, challenges of MRS and lastly key policy recommendations.

Abbreviations

ASEAN Comprehensive Investment Agreement (ACIA)
ASEAN Framework Agreement on Services (AFAS)
ASEAN Investment Agreement (AIA)
ASEAN Investment Area Agreement (AIA).
ASEAN Trade in Goods Agreement (ATIGA)
ASEAN Trade in Services Agreement (ATISA)
Asia Pacific Economic Cooperation (APEC)
Association of Southeast Asian Nations (ASEAN)
Committee on Trade and Investment (CTI)
Comprehensive and Progressive Agreement for the Trans-Pacific Partnership (CPTPP)
European Union (EU)
Foreign Direct Investment (FDI)
Free Trade Agreement (FTA)
Free Trade Area of the Asia-Pacific (FTAAP)
General Agreement on Trade Services (GATS)
Global Value Chain (GVC)
Gross Domestic Product (GDP)
Group on Services (GOS)
International Investment Agreement (IIA)
International Standard Industrial Classification (ISIC)
Investment Expert Group (IEG)
Investment Guarantee Agreement (IGA)
Investor-State Dispute Settlement (ISDS)
Malaysian Standard Industrial Classification (MSIC)
Manufacturing-Related Services Action Plan (MSAP)
Manufacturing-Related Services (MRS)

Market Access Group (MAG)

Mutual Recognition Arrangement (MRA)

Non-Conforming Measures (NCM)

Organisation for Economic Co-operation & Development (OECD)

Policy Partnership on Science, Technology and Innovation (PPSTI)

Policy Support Unit (PSU)

Preferential Trade Agreement (PTA)

Public-Private Policy Dialogue (PPPD)

Regional Comprehensive Economic Partnership (RCEP)

Services Trade Restrictiveness Index (STRI)

Small and Medium Enterprise (SME)

Trade in Value Added (TiVA)

United Nations (UN)

United Nations Central Product Classification (UN CPC)

United Nations Conference on Trade and Development (UNCTAD)

World Trade Organization (WTO)

Executive Summary

The Manufacturing-Related Services (MRS) holds significance in the prospective economic advancement and expansion of the APEC region. Hence, it is crucial for the APEC economies to thoroughly grasp and execute initiatives related to MRS within the context of the Putrajaya Vision 2040, particularly emphasizing Pillar 1 concerning trade and investment.

Numerous outstanding concerns surround MRS, including the challenge of establishing a universally accepted definition or elements agreeable to a majority of APEC member economies. The Group on Services (GOS) and other forums within APEC can play a crucial role in further elucidating the understanding, impact, significance and contributions of MRS to the economic growth of the region.

To advance the MRS sector, APEC economies should strive for clarity in MRS definitions, harmonization, or recognition of policies, rules, and regulations related to MRS activities. This includes efforts to increase international trade and foreign direct investment (FDI) in MRS-related commercial activities, as well as providing guidance for the future of work and skills development in this field.

Policymakers may require data to formulate policies relating to MRS, considering the multilayered governance across multilateral, regional, bilateral, domestic, and sub-regional levels. Understanding the specific components of activities within MRS is essential for policymakers to establish commitments, whether in the form of a positive list or a negative list.

The link between MRS and the creation of new jobs. The digitalization trend may lead to discussions about a hybrid service mode, known as Mode 5, as professionals increasingly work in remote areas. With the emergence of new jobs and professions, APEC member economies should address the need to train and upskill service providers.

Support for SMEs involved in the delivery of MRS is crucial, whether through access to finance, training, re-skilling, or up-skilling of employees. Collaboration with higher education institutions is necessary for talent development, curriculum development, and training.

1. Introduction

The Report is a component of the APEC Project: GOS 03 2022 – Manufacturing-Related Services (MRS): Definition, Contribution, Issues & Challenges.

The objectives of the Project are:

- (i) to explore a common understanding on the definition of MRS;
- (ii) exchanges of practical experiences among economies and data gathering on the contribution of MRS to the value chain in the gross domestic product (GDP) in APEC economies, movement of natural persons offering services relating to MRA under Mode 4; and
- (iii) to explore how APEC economies can capitalize on opportunities and benefits in MRS.

The Project also identifies the policies related to establishment and operation of MRS in various APEC economies. The Project conducted two knowledge sharing events, namely Virtual Workshop and the Public-Private Policy Dialogue (PPPD) on MRS.

The first activity was the Workshop on MRS held virtually from 5 – 7 July 2023. The virtual format allowed for wide participation by speakers and other attendees from APEC economies. Second activity conducted by the project was a PPPD on MRS which was held in hybrid mode (physical and virtual) on 6 August 2023. The online format allowed wide participation by speakers and other attendees from APEC economies. The PPPD was a significant one-day event with a primary focus on enhancing the capacity of APEC economies in the field of MRS. The dialogue delved into crucial aspects such as MRS definitions, contributions, issues and challenges.

The PPPD provides a platform for knowledge exchange among experts, government officials, and stakeholders, fostering valuable discussions on the challenges and opportunities within the realm of MRS. One of the key objectives was to establish a common understanding of the definition of MRS, exchanges of practical experiences among economies, data gathering on the contribution of MRS to the value chain in GDP within APEC economies, the movement of natural persons offering services related to MRS under Mode 4, and to explore how APEC economies can effectively capitalize on the opportunities and benefits presented by MRS.

By fostering collaboration, sharing knowledge, and addressing challenges, the two events strove to pave the way for enhanced growth and prosperity in the field of MRS. The virtual workshop and the PPPD included several sessions with varying dynamics, which included expert presentations, case study discussions, as well as reviews of existing APEC initiatives on MRS to maximize learning and retention of the project outcomes.

Among others, the primary reason for this project was also to identify the policy frameworks and specific policies in various economies within the region that affected both the establishment and operation of MRS via sharing and learning practices.

2. Background

MRS have grown to be a significant part of the global economy, accounting for more than two-third of global GDP and attracting about three-quarters of Foreign Direct Investment (FDI) in advanced economies.¹

At the regional level, services represent more than half of the APEC economies' GDP, contributing to economic growth and employment opportunities in the region. Overtime, services are becoming a very important component for manufacturing. The increased importance of the MRS in relation to total services exports is shown in Table 1 below.

Table 1: Manufacturing services on physical inputs owned by others -World and the APEC Region 2016-2021

(Million dollars)

| Product/Sector | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|-----------|-----------|-----------|-----------|-----------|-----------|
| Total Services: World | 5,090,595 | 5,539,028 | 6,104,846 | 6,290,557 | 5,179,459 | 6,071,633 |
| Total Services: APEC | 1,974,022 | 2,122,577 | 2,308,761 | 2,381,382 | 1,914,617 | 2,185,650 |
| Manufacturing Services on Physical Inputs owned by Others – World | 92,638 | 101,821 | 119,226 | 115,621 | 107,026 | 126,778 |

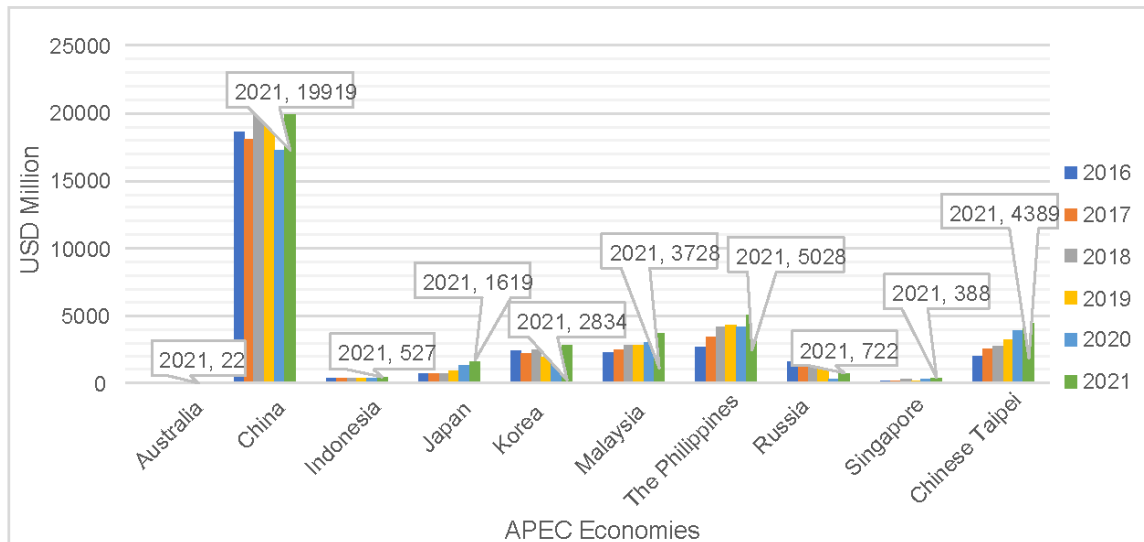
¹ OECD (2023), OECD Services Trade Restrictiveness Index: Policy Trends up to 2023 (Paris, OECD).

| | | | | | | |
|--|--------|--------|--------|--------|--------|--------|
| Manufacturing Services on Physical Inputs owned by Others – APEC | 31,033 | 31,650 | 37,414 | 34,579 | 32,783 | 39,176 |
|--|--------|--------|--------|--------|--------|--------|

Source: World Trade Statistics, 2022

Table 1 shows that manufacturing services on physical inputs owned by others has increased from USD 92 billion or 1.82 percent of the total World’s services exports in 2016, to USD 126.8 billion in 2021 or 2.08 percent of the total world’s services exports. The same upward trend also happens in the APEC region, where the manufacturing services on physical inputs owned by others has increased from USD 31 billion or 1.57 percent of the total APEC services exports in 2016 to USD 39.2 billion or 1.78 percent of the total APEC services export in 2021. Manufacturing services on physical inputs owned by others have also seen an increasing trend on the selected APEC economies, whose data are captured by the World Trade Statistics (Figure 1).

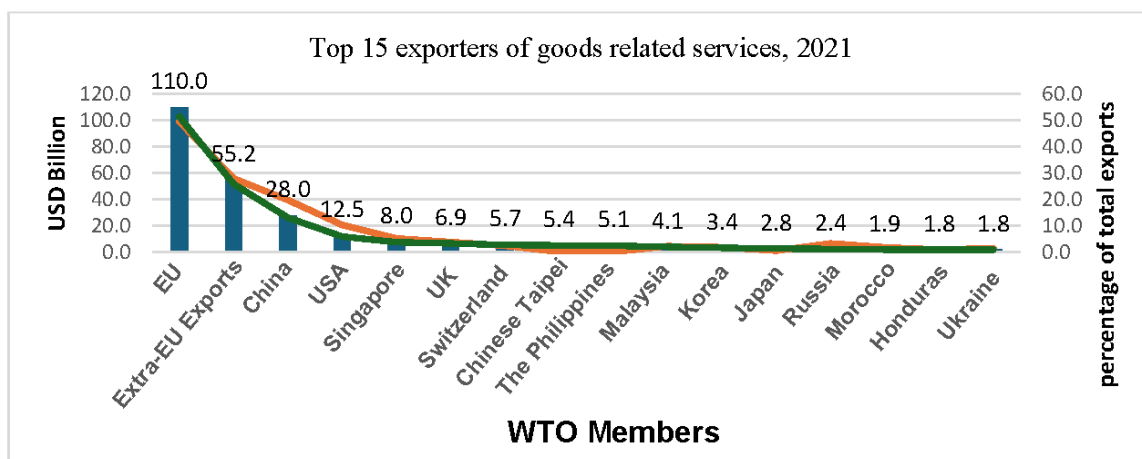
Figure 1: Exporters of manufacturing services on physical inputs in selected APEC economies, 2016-2021



Source: World Trade Statistics.

Figure 2 shows that China is the main exporter of manufacturing services on physical input owned by others in the APEC region, with a total export of USD 19.9 billion in 2021, a 7 percent increase over the total export of USD 18.6 in 2016. Other top exporters of the manufacturing services in physical input owned by others include the Philippines, Chinese Taipei, Malaysia, Republic of Korea and Japan. APEC economies are major exporters of a wider defined “goods related services” which the UN statistics defined as to include manufacturing services input owned by others, maintenance and repair services, and freight transport and insurance² (see Figure 2).

Figure 2: Top 15 exporters of goods related services



Source: World Trade Statistics.

Figure 2 shows that the European Union (EU) is the leading exporters of goods related services, with a total export (including intra-EU trade) at USD 110 billion in 2021. Figure 2 also shows that 9 out of 15 exporters of goods related services in 2021 are APEC member economies, with a total combined export of USD 71.5 billion in 2021. The figure exceeds the extra-EU exports of USD 55.2 billion.

According to the APEC Policy Support Unit (PSU), the APEC region accounted for 48 percent of global trade in goods and commercial services in 2021. However, partly due to the COVID-19 pandemic, APEC overall exports of commercial services have

² <https://unstats.un.org/wiki/display/M2CG/B.1.++Goods-related+services> (last accessed 19.07.2023).

seen some decline, from 38 percent of the total of world trade in 2010 to 36 percent of the total of world trade in commercial services in 2021.

In 2021, commercial services exports in APEC amounted to USD 2.2 trillion (14.4 percent higher than in 2020), while imports into the region totaled USD 2.1 trillion (14.7 percent higher than in 2020). The APEC region accounted for more than a third of the world's commercial services exports of USD 6.07 trillion.³

There are two main factors contributing to the increase in the servicification of manufacturing. Firstly, the manufacturing sector is increasingly relying on services input as activities within firms, and secondly, the manufacturing sector is increasing services output sold bundled with goods.⁴ The servicification of MRS often requires specialized skills, knowledge, and expertise, creating employment opportunities and contributing to human capital development. Nevertheless, with the advancement of technology, some jobs will be lost to machines. Hence, policymakers will have to consider issues relating to the future of work.

In relation to the first factor, modern manufacturing is a heavy user of services inputs, and its competitiveness relies on access to state-of-the-art suppliers at the best price. The OECD Trade in Value Added (TiVA) database shows that services represent more than 50% of the value added in gross exports, and over 30% of the value added in exports of manufacturing goods involve services that are deeply imbedded in manufactured goods and being traded all over the world today.⁵

Services in the first type of servicification is “services” as if they were outsourced from other service providers. These types of services are hard to quantify mainly because they used to be produced in-house or treated as direct input to the manufactured products. One way of quantifying this type of services is to analyze labor force surveys and occupations related to services activities in manufacturing industries. Miroudot and Cadestin suggests that using this methodology, some recent work at OECD

³ APEC (2022), APEC in Chart 2022; see also World Trade Statistics, Commercial Services Exports by Sector and Partner, at the WTO Statistics website, last accessed 19.07.2023.

⁴ Sebastian Miroudot (2017), The Servicification of Global Value Chain: Evidence and Policy Implications, UNCTAD Multiyear Expert Meeting on Trade Services and Development, Geneva, 18-20 July 2017.

⁵ OECD (2023), OECD Services Trade Restrictiveness Index: Policy Trends up to 2023 (Paris, OECD).

suggests that on average 18% of the value-added in exports comes from the in-house provision of services, and as a result, instead of one third of the value-added originating in services, they find that services now have on average half of the manufacturing value-added corresponding to services activities, either outsourced or insourced.⁶

The servification trend is now moving towards the utilization of the supply-chain as part of the Global Value Chain (GVC) where firms' separate services. Firms may separate in-house services from those from external suppliers, which include spin-off service providers. There is also increasing trend to hire external services providers for new and modern services. With the advancement of technology, manufacturing is becoming more reliant to technologies related to industrial revolution 4.0 (IR4.0). integration of digital technologies, automation, data analytics, leading to smart manufacturing, use of artificial intelligence, and Industrial Internet of Things (IIoT). Firms may also outsource professional services like legal, professional engineering and other professional services.⁷

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MRS affects the economy in three ways. Firstly, the servification of manufacturing encourages manufacturers to export their goods together with services, a term known as 'bundles.' In the bundling process, manufacturers add value and offer integrated solutions to customers. In the EU, for example, in 2020, research and development (R&D), professional management, consulting, and technical trade-related services amounted to 40.5 percent of service imports and 27.3 percent of service exports, while manufacturing services on physical inputs owned by others amounted to 2 percent of service imports and 2.7 percent of service exports. Total

⁶ Miroudot, S. and C. Cadestin (2017), "Services in Global Value Chains: From Inputs to Value-Creating Activities", OECD Trade Policy Papers, No. 197, OECD Publishing.

⁷ OECD (2023), OECD Services Trade Restrictiveness Index: Policy Trends up to 2023 (Paris, OECD).

EU service exports were EUR910 billion in 2020, down from EUR1 trillion in 2019.⁸

Secondly, MRS also contributed to the diversification of employment. Miroudot discovered that across economies, between 25 percent and 60 percent of employment in manufacturing firms is found in service support functions such as R&D, engineering, transport, logistics, distribution, marketing, sales, after-sale services, IT, management, and back-office support.⁹ Some services are needed at the early stage of the value chain, such as R&D; some are needed at the intermediate part of the value chain, such as maintenance and repair; and some at every stage of the value chain, such as telecommunication services.

Thirdly, MRS also contributes to increased competitiveness. Firms view services as value-creating activities that allow them to be competitive. Low and Pasadilla investigated 22 case studies around the APEC region to understand how services and manufacturing interact to produce manufacturing goods.¹⁰ In this study, the authors divided the value chain into six separate categories according to its production stage. The categories include Establishment, Pre-Manufacturing, Manufacturing, Post-Manufacturing, Post-Sales Services and Back-Office Services. The study found a range of 37 to 74 services entering the value chain in each case study, with the lowest being Automotive Component Manufacturing and the highest being Mining and Construction Manufacturing, as well as Power Generation Equipment. The total value of services was estimated at around 30 to 90 percent.

There are potentially three modes of sourcing MRS: supplied in-house, fully outsourced, and partially outsourced.¹¹ Manufacturing firms cited various reasons when it comes to the decision to consider outsourcing their service activities. Manufacturing firms said that some of the outsourcing is the result of mandatory requirements, typically from regulatory bodies. They would also consider outsourcing to seek cost competitiveness, taking advantage of the expertise of external economies and network supply. In contrast, manufacturing preferred for their

⁸ EUROStat, 2022.

⁹ Sébastien Miroudot (2017). The Servicification of Global Value Chains: Evidence and Policy Implications UNCTAD Multi-year Expert Meeting on Trade, Services, and Development.

¹⁰ Low, P., & Pasadilla, G. O. (2015). Services in Global Value Chains: Manufacturing-Related Services, APEC, Singapore, 2015.

¹¹ Ibid.

services to stay in-house if they involved proprietary information, where the activities in the value chain are too sensitive to outsource.

In addition, access to qualified suppliers is an important determinant of whether the firm will outsource its activities. Some suppliers could not meet the qualified standard or fail to offer competitive pricing. Other concerns raised by manufacturing firms are transaction costs, which are the costs of finding third-party suppliers, and the costs of supervision. Finally, manufacturing firms have to take the cost-benefit analysis into account before making the decision to outsource some of the activities, with the risk that giving full control to outsiders could harm the company in terms of quality, timeline, and reputation.

This in itself poses a challenge for policymakers in analyzing and formulating appropriate and suitable policies. Furthermore, there is a need to explore the treatment of the movement of natural persons for experts involved in MRS. Due to the need for investment and service liberalization in the various manufacturing sectors, the development and policy intervention for MRS require a different approach. The project would benefit all APEC economies, especially by sharing experiences in finding the common definition of MRS, the development and tracking of data on MRS contributions to member economies, and how to design and develop effective policies for MRS. The project not only focused on services, but also on investment in MRS-related activities.

3. Definitions of Manufacturing-Related Services

The definitions and boundaries of manufacturing and services have been increasingly blurred as the trade and investment world is moving towards total fusion, instead of relying on the separate pillars of economic activities. There are no standard definitions of MRS. In general, MRS refer to a broad set of services that are closely connected to or facilitate the manufacturing process. This is because, services are used throughout the manufacturing process and the manufacturing value chain, where some services are needed early in the chain (e.g., R&D); some are needed at the end (retailing, maintenance and repair); and some are needed at every stage (telecommunications

and financial services).¹² These include services purchased by manufacturers from other firms, as well as services tasks performed within the firm.

From the academic perspective, the servicification of manufacturing can be defined as “the innovation of an organization’s capabilities and processes to shift from selling products to selling integrated products and services that deliver value in use.”¹³ In the EU, it is found that manufacturing firms are increasingly adopting service business model, leading to creation of well qualified jobs and shift towards “servinomics.” This is because firms find that services are more resilient to business cycle fluctuations.¹⁴

In another perspective, Baldwin and Forslid propose that services development path, and not manufacturing development path, is becoming a norm.¹⁵ Baldwin and Forslid assertion is based on the increase in digitalization, where they argue that digitech is shifting the ground when it comes to automation of goods production, in which machines are replacing workers. Richard Baldwin in his latest presentation argues that services in trade are gaining over manufacturing, where intermediate inputs are more important in services imports than manufacturing imports.¹⁶ Baldwin further argues that service intermediaries are three times more important than manufacturing intermediaries in overall economy.

The United Nations Central Product Classification (UN CPC) Version 2 contains a division 88 entitled ‘manufacturing services on physical inputs owned by others.’¹⁷ These classifications refer to services bought from other service providers and not from within the firms. These are defined to include “services performed on physical

¹² USITC, Services’ Contribution to Manufacturing,

<https://www.usitc.gov/publications/332/pub4440c.pdf> (last accessed 1 July 2023).

¹³ Baines, T. S., Lightfoot, H. W., Benedettini, O., & Kay, J. M. (2009). The servitization of manufacturing. *Journal of Manufacturing Technology Management*, 20(5), 547–567.

¹⁴ Andrea Ariu, (2016), Crisis-proof services: Why trade in services did not suffer during the 2008–2009 collapse, *Journal of International Economics*, Volume 98, 2016, Pages 138-149,

¹⁵ Richard Baldwin and Rikard Forslid (2020) *Globotics and Development: When Manufacturing is Jobless and Services are Tradable* NBER Working Paper, No. 26731, February 2020.

¹⁶ See Richard Baldwin, (2023), *Service-export-led development & the future of trade*, World Bank Washington, 1 February 2023,

<https://thedocs.worldbank.org/en/doc/ca24d55f8afc0550523b6921216a883e-0350012023/related/Slides-Baldwin.pdf> (last accessed 1 July 2023).

¹⁷ See further discussion below.

inputs owned by units other than units providing the service” and are characterized as “outsourced portions of a manufacturing process or a complete outsourced manufacturing process”. It is further clarified that since this division covers manufacturing services, “the output is not owned by the unit providing this service”.

The UN Statistics treat ‘manufacturing services on physical inputs owned by others’ as a subset to ‘goods-related services’. The UN Statistics define goods-related services as to include manufacturing services on physical inputs owned by others; maintenance and repair services; and freight transport and insurance.¹⁸ Manufacturing services on physical inputs owned by others, on the other hand is defined as to include processing, assembly, labelling and packaging that are undertaken by enterprises that do not own the goods. This is a narrow definition as it refers to processing by a third party who obtains a processing fee, where the third-party processor transforms the goods using its own labor and capital, while the economic ownership of the goods remains with the principal. The definition does not include a more modern services input into a manufactured product such as digital technology aided services, designs, and engineering services.

On the other hand, the OECD, Malaysia’s Central Bank and Zhu and Pasadilla offer a wider definitions of manufacturing related services. The OECD focusses on trade in value-added (TiVA). This is based on the assumption that goods and services composed of inputs from various economies around the world and the flow of goods and services within the global production chains are not captured in the conventional computation of international trade. TiVA captures data in domestic and foreign value-added content of gross exports by exporting industry, services content of gross exports by exporting industry, by type of service and value-added origin, participation in GVC via intermediate imports embodied in exports (backward linkages) and domestic value added in partner’s exports and final demand (forward linkages); global orientation of industrial activity; economy and industry origins of value-added in final demand; bilateral trade relationships based on flows and valued added embodied in domestic

¹⁸ <https://unstats.un.org/wiki/display/M2CG/B.1.++Goods-related+services> (last access 19.07.2023).

final demand and inter-regional and intra-regional relationships and domestic value-added content of imports.¹⁹

In Malaysia, MRS activities are classified under the Malaysian Standard Industrial Classification (MSIC) (2008). MSIC 2008 is adopted from International Standard Industrial Classification (ISIC) Revision 4. MSIC is a classification of type of economic activity and not a classification of goods and services or a classification of occupations. The Central Bank of Malaysia defines MRS as activities or services, other than manufacturing activities, that are performed to support or complement the manufacturing activities with a view to the use, sell, transport, delivery or disposal of the manufactured products. This include all the upstream and downstream activities in the manufacturing value chain.²⁰

These services can include product design, engineering, prototyping, production, quality control, packaging, logistics, distribution, after-sales services, and maintenance, among others. The focus is on services that add value to the manufacturing sector and contribute to its overall performance and competitiveness.²¹

These services are often provided by specialized companies or service providers that have expertise and experience in supporting the manufacturing industry. Their role is to help manufacturers optimize their production processes, improve efficiency, ensure quality standards, manage their supply chain effectively, and enhance overall productivity.

While the exact scope may vary, MRS typically include:

- a. Design and engineering services including conceptualizing, designing, and developing products, components, or manufacturing processes. They may include computer-aided design (CAD), prototyping, and engineering analysis.

¹⁹ Martins Guilhoto, J., C. Webb and N. Yamano (2022), "Guide to OECD TiVA Indicators, 2021 edition", *OECD Science, Technology and Industry Working Papers*, No. 2022/02, OECD Publishing, Paris.

²⁰ Bank Negara Malaysia, Conclusion of the Second National SME Development Council Meeting - Bank Negara Malaysia, 2004. www.bnm.gov.my. Retrieved April 5, 2022, from <https://www.bnm.gov.my/-/conclusion-of-the-second-national-sme-development-council-meeting>

²¹ Huani Zhu and Gloria O. Pasadilla (2016), "Manufacturing of Telecommunications Equipment", in Patrick Low and Gloria O Pasadilla (eds), *Services in Global Value Chains Manufacturing Related Services*, Ch. 15, 491-531, World Scientific Publishing.

- b. Supply Chain Management including managing the flow of materials, components, and finished products throughout the manufacturing process. This can involve procurement, inventory management, logistics, and distribution.
- c. Quality assurance and control including activities focused on ensuring that products meet the required quality standards especially inspection, testing, quality management systems, and certifications.
- d. Maintenance and repair services, including services aimed at maintaining and repairing manufacturing equipment and machinery to ensure their optimal performance and minimize downtime.
- e. Tooling and Machining Services including the design, fabrication, and maintenance of tools, dies, molds, and fixtures used in the manufacturing process. This can include CNC machining, tool and die making, and precision engineering.
- f. Packaging and Labeling Services including services related to the packaging, labeling, and branding of products for shipment, storage, and marketing purposes.
- g. R&D Services including services focused on developing new technologies, processes, or products to enhance manufacturing capabilities and competitiveness.
- h. Consulting and Training including services provided by experts in the manufacturing field who offer guidance, advice, and training to improve operational efficiency, productivity, and overall performance.

While the specific definitions and categorizations may vary slightly depending on the context and industry, the core concept of MRS remains consistent: they are services that assist and support manufacturers in their operational activities to drive success in the manufacturing sector.²²

²² Mohd Javaid, Abid Halee, Ravi Pratap Singh, Rajiv Suman (2021), Significance of Quality 4.0 Towards Comprehensive Enhancement in Manufacturing Sector, Sensors International, 2, 100109.

4. APEC Initiatives, Guiding Principles and Manufacturing-Related Services

a. Putrajaya Vision 2040 and the Aotearoa Plans of Action

The advancement MRS within the APEC region is guided by the Putrajaya Vision 2040 and the Aotearoa Plan of Action. Activities relating to MRS falls within Pillar 1 and Pillar 2 of the Putrajaya Vision 2040. Pillar 1 of the Putrajaya Vision 2040 emphasizes the need to ensure that the Asia-Pacific remains the world's most dynamic and interconnected regional economy, which include promoting seamless connectivity and resilient supply chain. Pillar 1 of the Putrajaya Vision 2040 also reiterates APEC's ambition to further advance the Bogor Goals and economic integration in the region in a manner that is market-driven, including through the work on the Free Trade Area of the Asia-Pacific (FTAAP) agenda which contributes to high standard and comprehensive regional undertakings.

Through the Aotearoa Plan of Action, APEC member economies are committed to take actions to liberalise trade and investment in a manner that is free, open, fair, non-discriminatory, transparent and predictable. This includes trade in services liberalization, facilitation and cooperation, including by implementing the APEC Services Competitiveness Roadmap, promote the flow of quality investment through steps such as work on investment facilitation and liberalization, and increase trade predictability and openness by improving economies' transparency through trade measures and policies.

APEC member economies will also need to take into account Pillar 2 of the Putrajaya Vision 2040 by taking steps to foster enabling environment for manufacturing related services through policies in innovation and digitalization. To implement Pillar 2, under the Aotearoa Plan of Action, APEC member economies agree to, among others, identify ways to support resilience and recovery by using science, technology and innovation systems; adopt new and emerging technologies to stimulate growth, connectivity and digital transformation; and share best practices and promote approaches for a digital economy that fosters competition and promotes innovation.

b. APEC Initiatives on Manufacturing-Related Services

Recognizing the increase importance of the MRS, in 2014, the APEC Policy Support Unit (PSU) conducted an extensive analysis²³ of the aforementioned international databases, along with OECD's Services Trade Restrictiveness Index (STRI). The PSU found several services, such as R&D and business services, that add significant value to the manufacturing sector. The research team also concluded that multi-faceted efforts are needed to mitigate the negative effects of the complex and often cross-sectoral restrictions on such MRS, in order to support this "servicification" of the manufacturing sector.

Following the guidance from APEC leadership, APEC PSU continued its work to further understand the roles that services play in the manufacturing sector in the APEC region,²⁴ conducting sector-specific case studies in various APEC member economies that identified related services as well as regulatory measures that may be hindering their trade. In 2015, the APEC Committee on Trade and Investment (CTI) endorsed the Manufacturing Related Services Action Plan (MSAP).²⁵ The report was endorsed by CTI in 2018, identified the current progress on six categories of regulatory regimes and policy environments in the APEC region.²⁶

In assisting the APEC region with the post-COVID-19 pandemic recovery, MRS are particularly crucial for economic recovery, as they are a key component of many multi-economy supply chains. Therefore, it is critical to support capacity building and efficiency in international trade in order to facilitate swift economic recoveries, as promoted in the statement issued on 5 May 2020 by APEC Minister Responsible for Trade (MRT).²⁷ MRS play an important role in industries that are directly involved in combating the pandemic, such as the manufacturing of personal protective equipment (PPE), critical healthcare equipment such as respirators and ventilators, and eventually vaccines for the virus.

²³ APEC, "Services and Manufacturing: Patterns of Linkages", APEC, Singapore, 2014. See also APEC, "Services, Manufacturing and Productivity", APEC, Singapore, 2015.

²⁴ APEC, "Services in Global Value Chains: Manufacturing-Related Services", APEC, 2015.

²⁵ APEC, "2015 CTI Report to Ministers. Appendix 3", APEC, 2015.

²⁶ APEC, "2018 CTI Report to Ministers. Appendix 6", APEC, 2018.

²⁷ APEC, "Statement on COVID-19 by APEC Ministers Responsible for Trade", APEC, 2020.

5. Manufacturing-Related Services and Trade and Investment Rules

a. Manufacturing-Related Services and the WTO Rules

In dealing with policies and domestic regulations relating to MRS, APEC member economies who are members of the World Trade Organization (WTO) are bound by the General Agreement on Trade in Services (GATS).

Article 1(3) (b) of GATS defines "services" to include any service in any sector except services supplied in the exercise of governmental authority, which in itself a very general and broad definition. GATS Article I(2) specifies four modes of supply of services which consist of Mode 1: Cross border trade where services supplied from the territory of one member to the territory of another, Mode 2: Consumption abroad in which services supplied in the territory of one member to the customers of another, Mode 3: Commercial presence which represents services supplied through any type of business or professional establishment of one member in the territory of another, and Mode 4: Presence of natural persons; services supplied by citizen of one member in the territory of another.

A WTO member is obliged to implement measures in compliance with market access and national treatment²⁸ on sectors in manufacturing related services where specific commitments are made through the positive lists approach. Article VI.1 of GATS requires each Member to ensure all measures of general application affecting trade in services are administered in a reasonable, objective and impartial manner.

The WTO does not offer any specific definitions or classifications of MRS. The sectors where specific commitments are made are listed in the Services Sectoral Classification

²⁸ National treatment means treating foreigners and locals equally. Imported and locally-produced goods should be treated equally at least after the foreign goods have entered the market. The same should apply to foreign and domestic services, and to foreign and local trademarks, copyrights and patents. This principle of "national treatment" (giving others the same treatment as one's own nationals) is also found in all the three main WTO agreements (Article 3 of [GATT](#), Article 17 of [GATS](#) and Article 3 of [TRIPS](#)), although once again the principle is handled slightly differently in each of these. National treatment only applies once a product, service or item of intellectual property has entered the market. Therefore, charging customs duty on an import is not a violation of national treatment even if locally-produced products are not charged an equivalent tax.

List or otherwise referred to as WTO 120 list.²⁹ Services Sectoral Classification List MTN.GNS/W/120 or W/120 was developed during 1994 Uruguay Round. The W/120 list provides scope of services and has since been used for scheduling services commitments. The W/120 list consists of eleven large sectors from business services to transport services, which are composed of 160 sub-sectors including the residual category of ‘other services not included elsewhere.’

The W/120 makes reference to the United Nations Central Product Classification (UN CPC) equivalent. Within business services, W/120 lists five distinct categories that are services incidental to, respectively, agriculture, hunting and forestry (CPC 881), fishing (CPC 882), mining (CPC 883 and 5115), manufacturing (CPC 884 and 885, except for 88842) and energy distribution (CPC 887). In the case of MRS, their main activities mainly fall under CPC 884 and 885. CPC 884 is services incidental to manufacturing, except to the manufacture of metal products, machinery and equipment consists of nine sub-categories including food products, textiles and apparel and wood, to name a few. CPC 885, which is Services incidental to the manufacture of metal products, machinery and equipment also consists of nine sub-categories including equipment and machinery and electrical machinery.

Further, the World Trade Statistics compiled by the WTO and UNCTAD refers to the classifications in the UN Statistics, namely goods-related services as to include manufacturing services on physical inputs owned by others; maintenance and repair services; and freight transport and insurance.³⁰

b. United Nations Central Product Classification

The UN CPC provides detailed breakdown of services, including specific categories related to MRS. It can be useful for statistical purposes, data collection, and in-depth analysis of various types of services within the manufacturing sector. The latest version of the UN CPC is Version 2.1 published in 2015.³¹ The list of sectors and

²⁹ WTO, MTN.GNS/WTO/120, 10 July 1991.

³⁰ <https://unstats.un.org/wiki/display/M2CG/B.1.++Goods-related+services> (last access 19.07.2023).

³¹ United Nations (2015), Central Product Classification (CPC) Version 2.1, ST/ESA/STAT/SER.M/77/Ver.2.1

activities has since been expanded beyond what has originally been referred to by the W/120 in 1991, and not restricted to UN CPC 884 and 885 only.

Table 2: UN CPC Division 88

| Group | Class | Subclass | Description | Corresp. CPC 2 | ISIC 4 |
|--------------|---------------|-----------------|---|---------------------------|---------------|
| 881 | 8811- 8819 | 88110- 88190 | Food, beverage and tobacco manufacturing services, including meat processing services, fish processing services, fruit and vegetable processing services, vegetable and animal oil and fat manufacturing services, dairy product manufacturing services, other food product manufacturing services (grain mill, starch, bakery, sugar, cocoa etc, macaroni etc, prepared meals), prepared animal feeds, beverage (including wine and beer), tobacco | 88110- 88190 | 1010- 1200 |
| 882 | 8821- 8823 | 88211- 88233 | Textile, wearing apparel and leather manufacturing services including textiles manufacturing, carpet and rug, cordage, rope, twine and netting, other textiles, wearing apparel, leather and leather products | 88211- 88233 | 1311- 1520 |
| 883 | 8831- 8832 | 88311- 88329 | Wood and paper manufacturing services including wood and wood products, paper and paper products | 88311- 88329 | 1610- 1709 |

| Group | Class | Subclass | Description | Corresp. CPC 2 | ISIC 4 |
|--------------|---------------|-----------------|--|---------------------------|---------------|
| 884 | 8841- 8843 | 88411- 88430 | Petroleum, chemical and pharmaceutical product manufacturing services including coke and refined petroleum product, chemical product, pharmaceutical | 88411- 88430 | 1910- 2100 |
| 885 | 8851 | 88511- 88539 | Rubber, plastic and other non-metallic mineral product manufacturing services including rubber product, plastic product, other non-metallic mineral product | 88511- 88539 | 2211- 2399 |
| 886 | 8860 | 88601- 88602 | Basic metal manufacturing services | 88601- 88602 | 2410- 2420 |
| 887 | 8871- 8877 | 88711- 88799 | Fabricated metal product, machinery and equipment manufacturing services including Structural metal product, tank, reservoir and steam generator manufacturing services, Weapon and ammunition manufacturing services, Other fabricated metal product manufacturing and metal treatment services, Computer, electronic and optical product manufacturing services, Electrical equipment manufacturing services, General-purpose machinery manufacturing services, Special-purpose machinery manufacturing services | 88711- 88799 | 2511- 2829 |

| Group | Class | Subclass | Description | Corresp. CPC 2 | ISIC 4 |
|--------------|---------------|------------------|--|---------------------------|---------------|
| 888 | 8881- 8882 | 88811 - 88829 | Transport equipment manufacturing services including Motor vehicle and trailer manufacturing services, other transport equipment manufacturing services (ship building, railway, air and space craft, military vehicles, motorcycle, bicycles) | 88811- 88829 | 2910- 3099 |
| | | 88827 | Bicycles and invalid carriage manufacturing services | 88827 | 3092 |
| | | 88829 | Other transport equipment manufacturing services not elsewhere classified | 88829 | 3099 |
| 889 | 8890 | 88901- 88909 | Other manufacturing services (furniture, jewellery, imitation jewellery, musical instrument, sports good, game and toy, medical and dental, other manufacturing services not elsewhere classified) | 88901- 88909 | 3100- 3290 |

Source: United Nations (2015), Central Product Classification (CPC) Version 2.1, ST/ESA/STAT/SER.M/77/Ver.2.1

c. Regional Rules: ASEAN Trade in Service and Investment

i. ASEAN Trade in Service Agreement

The main agreement governing trade in services in ASEAN is the ASEAN Trade in Services Agreement (ATISA), signed on 7 October 2020, and came into force on 5 April 2021. ATISA establishes a new framework for implementing liberalization

commitments in ASEAN, succeeding the ASEAN Framework Agreement on Services (AFAS) signed on 15 December 1995, which is based on the GATS model.

ATISA's main objective is to enhance ASEAN's trade and production networks, as well as to establish a more unified market for its firms and consumers, and to enhance ASEAN's integration into the global supply chains in services, and ASEAN Member States (AMS) competitiveness in services. It sets out to review existing flexibilities, limitations, thresholds and carve-outs; enhance mechanisms to attract FDI in the services sectors to support Global Value Chain (GVC) activities; have further liberalization; establish possible disciplines on domestic regulations to ensure competitiveness of the services sector, taking into consideration other non-economic or development or regulatory objectives; consider the development of sectoral annexes; and enhance technical cooperation in the services sector for human resource development, joint promotion activities to attract FDI in the services sector, and the exchange of best practices. There are three annexes namely the Annex on Financial Services, Annex on Telecommunication Services, and Annex on Air Transport Ancillary Services.

Pending the submission of the Non-Conforming Measures (NCM), the positive list Schedules of Commitments made under AFAS still stand, the latest the being the Tenth Package, seventh package under the financial services and ninth package under the Packages of Commitments on Air Transport Services.

ATISA deviates from AFAS by requiring AMS to adopt a negative list approach. AMS are required to submit their Schedule of NCM by 5 April 2026, within five years of ATISA coming into force, with the exception of Viet Nam (7 years) and Cambodia, Lao PDR and Myanmar (13 years).

AMS seven of which are APEC member economies may decide on the liberalization approach to MRS through the NCM. APEC member economies not wanting to fully liberalize the MRS may list services in the NCM, leaving those not covered under the NCM as fully liberalized. This is the opposite of the WTO positive list approach where liberalization takes place only to those sectors specified in the Schedules of Commitments.

Nevertheless, AMS should be mindful that MRS liberalization may not be placed under ATISA, but rather under ASEAN Comprehensive Investment Agreement (ACIA), for reasons discussed below.

ii. ASEAN Comprehensive Investment Agreement

In the quest of creating a freer and more open investment regime based on international best practices, the ASEAN Economic Ministers have signed the ASEAN Comprehensive Investment Agreement (ACIA) on 26 February 2009, which consolidated two earlier agreements: the ASEAN Investment Guarantee Agreement (IGA) and the ASEAN Investment Area Agreement (AIA). ACIA encompasses four pillars: liberalization, facilitation, protection, and promotion. ACIA's liberalization covers ten sectors including manufacturing and services incidental to manufacturing.

It is important to note that, liberalization of investment in services incidental to manufacturing is covered in the ACIA, and therefore is not subject to liberalization and market access provisions in the ATISA. ATISA, Article 3.1 specifically states that "the ACIA signed on 26 February 2009 in Cha-am, Thailand, and its subsequent amendments, does not apply to measures adopted or maintained by a Member State covered by this Agreement." Therefore, market liberalization of MRS in ASEAN must be undertaken through the investment agreement and not through the services agreement.

On the other hand, AMS, seven of which are APEC member economies, must go through the services channel through WTO GATS to liberalize MRS at the multilateral level.

ASEAN Investors³² investing in MRS in ASEAN are also covered by the ACIA's investment protections including the principles of National Treatment and Most-Favored-Nation treatment, selection of senior management, irrespective of their citizenship, to manage their investment, prohibition of performance requirement, fair

³² ASEAN Investors include an ASEAN juridical person of a third-party citizen which will then make an investment in another ASEAN Member State. The third-party citizen or legal entity must own or control (have power to name a majority of its directors or legally direct the actions of) the ASEAN Juridical Person, which must carry out substantive business operations in the ASEAN Member State where it was established (ACIA, Art. 4 (d) and (e)).

and equitable treatment, no unlawful direct and indirect expropriation, free transfer of funds, and access to investor-state dispute settlement (ISDS).

d. Free Trade Agreements: CPTPP and RCEP

Trade in services in the Comprehensive and Progressive Agreement for the Trans-Pacific Partnership (CPTPP) and the Regional Comprehensive Economic Partnership Agreement (RCEP) are covered by the respective Trade in Services (Chapter 10 in CPTPP and Chapter 8 in RCEP), CPTPP Temporary Entry for Business Persons (Chapter 12), RCEP Temporary Movement of Natural Persons (Chapter 9 in RCEP) and Investment Chapters (Chapter 9 in CPTPP, Chapter 10 in RCEP).

CPTPP adopts the negative list approach for both services and investment chapters, whereas RCEP allows adoption of positive list approach for services and negative list approach for investment. RCEP Chapter 8 (Trade in Services) includes provisions on market access, national treatment, most-favoured-nation treatment, and local presence. These are all subject to Parties' Schedules of Specific Commitments or Schedules of Reservations and NCM. Importantly, several parties scheduled their services commitments through a "negative list" approach while the parties that have used a "positive list" for services commitments are required to transition to a negative list within six years of entry into force of the agreement.

Like in the ATISA, parties not undertaking full MRS liberalization will have to provide specific measures restricting the liberalization in the NCM. Otherwise, such sectors will be considered as fully liberalized. Unlike ATISA, parties to both CPTPP and RCEP will only deal with MRS liberalization through the services chapters.

6. Manufacturing-Related Services and Challenges to Trade and Investment Policies

a. Implications for Trade Policies

Based on the above discussion, the treatment of MRS will affect the trade and investment policy design, in the following manners:

1. MRS is a creature of cross-discipline, covering both services and investment liberalization. The definitions used for MRS can have implications for trade agreements, market access, and international negotiations. Harmonizing definitions across APEC economies can facilitate mutual recognition, standardization, and the removal of trade barriers for manufacturing-related services. Consistent definitions help establish a level playing field and promote fair competition, enabling businesses to access larger markets and expand their operations. Further, like any other investments, investments involving MRS are subject to the same International Investment Agreements (IIAs) treatments, like liberalization, facilitation and investment protection.
2. The potentially higher level of services imports and exports will put a challenge to domestic trade and investment policies. APEC member economies may have to carry out domestic services reforms including addressing domestic regulations acting as “non-tariff measures” relating to services; addressing non-tariff measures in relation to goods especially when most of manufactured goods have high services components; and re-strategizing offensive and defensive interests in Preferential Trade Agreements (PTAs) and IIAs especially in relation to investment liberalization (which is reflected in either the positive list or the NCM or the negative lists).
3. Liberalization of MRS requires specific technical expertise in scheduling in the services and investment chapters of a free trade agreement. The latest generation of IIAs allow parties to undertake exclusion from the commitment through the Annex of NCM or negative list. This requires a thorough regulatory audit. In the ACIA, Malaysia for example included MRS in the NCM. For example, in relation to services incidental to manufacturing, Malaysia restricts foreign equity up to 30% in activities relating to fabrics and apparels of Batik (ISIC 1711, ISIC 1712, ISIC 1810); and integrated portland cement (ISIC 2694). Among others, Malaysia also reserves the right to adopt or maintain any measures relating to the conditions imposed on Pineapple canning (ISIC 1513), Palm oil milling and refining (ISIC 1514), Wood-based products utilizing local logs (ISIC 2010, ISIC 2021, ISIC 2022), Arms, weapons, ammunitions, explosive, pyrotechnic products, propellant powders, detonating or safety fuses, and the like (ISIC 2429, ISIC 2927), Petroleum refining (ISIC 2320),

Manufacture/Assembly of motor vehicles, passenger cars and commercial vehicles (ISIC 3410), Sugar refining (ISIC 1542).

4. Further to investment and services liberalization, MRS may also require different approach towards treatment of subsidies and trade remedies (including anti-dumping), especially where one economy provides subsidies to the services component of a manufactured product where subsidies is yet to be properly addressed in the GATS.
5. This also calls into question on how an economy treats movement of natural persons especially experts involved in the MRS. Those MRS falling under GATS or GATS like commitments would generally treat the experts under Mode 4, whereas non-service MRS may fall under investments, providing a potentially larger and liberalized movement of persons falling within the category of “employment.” On the other hand, in many regional trade agreements, like CPTPP, RCEP and ASEAN, movement of natural persons are dealt by a separate chapter or agreement on temporary movement of natural persons or business persons, separating Mode 4 from Services Chapter altogether.
6. The individual expertise owned by individual MRS providers may have not been captured by the more traditional classification of professional business services under the Movement of Natural Persons chapter or agreement or even in the traditional mode 4. As discussed, individual expertise moves with the advancement in technologies, creating new types of professionalism and job types. This development may require trade policy makers to consider issues like creation of new professional services and mutual recognition agreement of qualifications (MRA) in future. This move may also affect institutions of higher education in providing accredited training and university degrees.
7. Several of the new MRS activities such as those resulting from new industrial revolution including IR4.0 could fall within the category of services “pending the entry into force of discipline” (Art. VI). Hence, this calls for a discussion at the multilateral level within the framework of GATS Article VI.4 where “the Council for Trade in Services shall, through appropriate bodies it may establish, develop any necessary disciplines.”

b. Implications on other domestic policies

1. The servicification of manufacturing means there will be a higher level of internationalization of services, which provides opportunities for firms from APEC member economies to export their services abroad, whilst there could be a higher use of foreign services as inputs in exports, creating competition to domestic services input, potentially putting a strain to local small and medium services firms.
2. Apart from trade and investment policies APEC member economies may have to revisit other policies like education and training policies, where there is a need to consider trainings in the required skills.
3. APEC member economies may have to also address other related policies such as competition, intellectual property, innovation, R&D, data localization and movement of natural persons.

c. Data and Statistics

Definitions play a crucial role in data collection and analysis. Statistical agencies and research institutions rely on consistent definitions to gather data and measure the contribution of manufacturing-related services to the economy. Different definitions can result in variations in data interpretation, making it challenging to compare and benchmark the performance of APEC economies. Consistency in definitions enables better data comparability and enhances the accuracy of policy decision-making.

Study by the OECD (2019) indicates that there is a gap between the classification of businesses used in current trade regime and statistics with the actual practice by manufacturing firms. This is not only due to bundling activities by manufacturing firms where products and services are bundled together and sold as a bundle but also firms are identified as belonging to the manufacturing sector or service sector depending on their main activities. When a manufacturing firm produces a significant number of services, the classification can be arbitrary. Thus, it is hard to know the actual percentage of services offered by manufacturing firms.

In addition, the servicification of manufacturing firms has caused firms to deal with two separate trade regimes, both trade and services, where the trade regime for services is generally more restrictive. In the case of manufacturing firms providing additional

complementary services together with their products such as complementary installation services, the firms have to regard the services as separate service exports.

An initial review by researchers at the Institute of Malaysian and International Studies (IKMAS UKM) also shows that the UN CPC Division 88 mainly deals with manufacturing services on physical input owned by others and this makes it difficult to capture data for in-house services. This is because, as discussed above, the UN Statistics refer goods-related services as to include manufacturing services on physical inputs owned by others; maintenance and repair services; and freight transport and insurance.³³ Such definitions do not include other services input into manufacturing. Hence, researchers are still attempting to find the best methodology to calculate the MRS input data on manufactured products.

7. Conclusions and Key Policy Recommendations

Based on the above discussion, MRS is an important component of the future economic development and growth of the APEC region. Hence, it is very important for the APEC economies to fully understand and implement activities relating to MRS within the framework of the Putrajaya Vision 2040, especially in Pillar 1 on trade and investment, as explained and as extended by the Aotearoa Plan of Action.

This is especially when there are many unresolved issues relating to MRS, such as finding a common definition or elements acceptable to all or most of the APEC member economies; addressing MRS liberalization and market access, investment, facilitation, promotion and protection within either the investment or services policy framework; and capturing the right statistical data for the purposes of policy design in trade, investment, business support, and skills and human resource development.

Further, MRS is a cross-discipline and cross-economic issue for APEC Group on Services (GOS) and other fora. Such for a include, but not limited to the Investment Expert Group (IEG), the Market Access Group (MAG), the Policy Partnership on Science, Technology and Innovation (PPSTI) (which relates to agriculture, biotech, the high-level task force for biotech).

³³ <https://unstats.un.org/wiki/display/M2CG/B.1.++Goods-related+services> (last access 19.07.2023).

This is because MRS is closely linked with new technologies such as the digital technology and technologies related to Industrial Revolution 4.0. MRS and digital are also closely linked with data capture. The new technologies contribute to the growth in automation for modern technologies. The employment of new technologies also provides opportunities for research and development and innovation, leading to the need of robust intellectual property protection.

It is also recognized that SMEs are key players in delivering the MRS, especially in providing the forward and backward linkages to the much bigger businesses and the multi-national corporations. With the advancement of technologies, MRS provides opportunities for the creation of jobs, especially in the new technology related employment, affecting the future of works.

Yet, there is no single definition of what MRS is and what are the main components of MRS. MRS does not necessarily fit into the current trade and investment classifications. They may come in the form of business services or professional services, depending on the types of activities involved.

The multilateral, regional and domestic policy frameworks are far from ready to address the potential major role of MRS in the services sector and to create sustainable MRS-based businesses and attract more investments into the sector. The policy design in the MRS field is still blurry. Moving with time, some of the MRS activities are new and unregulated services, which may require a new outlook by policy makers and service providers alike.

Therefore, the Report makes the following recommendations:

1. It is crucial to having a general understanding of the accuracy of MRS contributions in the APEC region and beyond. The GOS and other fora may continue to elaborate on the importance and contribution of MRS to the economic growth of the APEC region.
2. APEC economies may work towards achieving a clarity in MRS definitions, harmonization or recognition of policies and rules and regulations in MRS related activities as and when necessary, increasing international trade and FDI in MRS related commercial activities, and providing guidance for the future of work and skills development in the field.

3. To promote the MRS sector, APEC economies must consider trade, investment, and industrial policy design at both the domestic and international levels. APEC economies may need data to establish trade, investment, and industrial policies. These policies involve multilayered governance across multilateral, regional, bilateral, domestic and sub-regional. For example, APEC economies in the ASEAN region are bound by the ASEAN Comprehensive Investment Agreement, which provides liberalization for services related to manufacturing. On the other hand, other services, like the business services and professional services, which also contribute to MRS, are liberalized through the ASEAN Framework Agreement on Service, to be replaced by the (ATISA.
4. There is a need to understand the components of activities within MRS for policy makers to work on schedule commitments either in the form of positive list or negative list.
5. As MRS is closely linked with the digital technology, it is very important for APEC economies to provide policy guidance on data capture, storage and governance, and cross border data transfer and utilization. Data also provide guidance to policy makers and businesses when dealing with MRS related activities.
6. As MRS is linked to the creation of new types of jobs, APEC member economies will have to look into the issues relating to the movement of persons and recognition of qualifications. The emergence of new professionals may mean the need to reconsider the existing commitments on Mode 4 service providers. With the digitalization, some professionals may work in remote areas, necessitating the discussion of a hybrid service mode, known as Mode 5.
7. The creation of new jobs and professions may also lead to the necessity to train and upskill individual service providers, such as through specialized micro-credentials on specialized technical skills. APEC member economies may consider the development of new mutual recognition of qualification arrangements for these emerging professions.
8. APEC member economies may consider whether the existing intellectual property protection system is adequate for the emerging technologies related

to MRS. This is because MRS service providers could increase the use of proprietary knowledge as inputs to the manufactured products.

9. APEC member economies will have to consider supporting SMEs involved in the delivery of MRS, either through access to finance or training, re-skilling or up-skilling of employees. Cooperation with higher education institutions is needed for talent development and to provide the required curriculum and training.
10. SMEs should be encouraged to embrace technologies and digital tools to enhance their competitiveness in MRS. As specified in the Malaysian New Industrial Master Plan 2030, assistance may be provided to SMEs to implement productivity-enhancing software, exploring automation opportunities and embracing technologies related to the Industrial Revolution 4.0. New technologies may assist SMEs to improve their business practices, improve operational efficiency, promote and support innovation and become technology front-runners.

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