

Packaging Framework System Under International Trade Rules*

Xue-fei Du^a, Hyun-sook Cho^b

^a School of Materials Science and Engineering, Jiujiang University, China

^b School of Business, Wonkwang University, South Korea

Received 30 August 2022, Revised 25 September 2022, Accepted 28 September 2022

Abstract

Purpose - The purpose of this study was to expound the packaging framework system(PFS) under international trade rules.

Design/methodology/approach - This study analyzed packaging framework system and packaging regulations and technical standards in international regulations and major countries and classified these in some standards

Findings - First, the study provides packaging provisions associated with packaging regulations and technical standards (PRTS). Then, the basis of PFS in international trade rules was proposed; it is believed that the PFS was composed of packaging legal system in WTO institutional framework (WTO-PLS), international organization packaging standard system (IO-PSS) and major countries or regions packaging regulatory system (MCR-PRS). Secondly, this paper expounded relations and legal characteristics of the three packaging systems. Finally, This study investigated PRTS coverage under technical barriers to trade (TBT) and Sanitary and Phytosanitary measures (SPS).

Research implications or Originality - The regulations associated with PRTS have played a key role in challenges to merchandise trade in international trade. This study has significance in classifying packaging related reticulations into several criteria unlike previous studies. Therefore it is hope that this study can provide a supplementary document for the existing research of PRTS.

Keywords: Pakcaing Frame System, Standardized Packaging, WTO, TBT, SPS

JEL Classifications: F13, F53, K29

I. Introduction

After General Agreement on Tariffs and Trade (GATT)/ World Trade Organization (WTO) abolished tariff barriers, the restrictive effect of traditional trade barriers is weakening gradually. New technical measures to trade (such as technical regulations, technical standards, conformity assessment procedures, etc.) are widely adopted by various countries, and being used with increasing frequency. In a world with increasing distance in space and time, packaging systems are a necessity to facilitate the protection, transport, and storage of products (Wikström, et al., 2019).

Many scholars have studied the special packaging standard measures associated with PRTS

* This work was supported by Wonkwang University in 2022

^a First Author, E-mail: dxlawl@163.com

^b Corresponding Author, E-mail: chs1669@wku.ac.kr

© 2022 The Institute of Management and Economy Research, All rights reserved.

from different perspectives. The previous works presented specialized issues related to packaging provisions of wood packaging materials (WPMs), tobacco standardised packaging (TSP), food packaging labelling, sustainability packaging, and so on. However, the framework system of PRTS is rarely mentioned in the field of international trade. Therefore, this study proposes a framework system of PRTS based on international trade rules. This work focuses on proposing PFS under international trade rules, and aims to provide a new idea for the study of PRTS, and exert the application of PRTS in the development of foreign trade.

Strutt et al., (2013) mentioned that the treatments of WPMs are likely to have an effect on exports and economic welfare for most countries. WPM is integral to global trade and used to contain and package a large proportion and variety of goods that are moved internationally. Some researches (Eyre, et al., 2018; Wu et al., 2017; Strutt et al., 2013) believed that WPMs is a significant pathway for the movement of insect pests between countries. Eyre et al., (2018) surveyed certain categories of imported products packaged with WPM from China to European Union (EU) based on the international harmonized system. Harmful organisms were detected in the consignments, and the imports did not have markings compliant with the ISPM 15 for treating WPM. Wu et al., (2017) inspected beetle pests in WPM associated with imported products that may cross country borders at six U.S. ports, and provided the identification of wood-boring insects for pest risk analysis and management.

Policy packaging binds different policy measures together in a systematic way; there exist trade-offs between political feasibility (Fesenfeld, et al., 2020) and the integration of sustainability and the strategic of packaging development (De Koeijer, et al., 2017). The related actions of the European Strategy for plastics in a circular economy have worked to regulate production on plastic carrier bags and packaging (Foschi & Bonoli, 2019). Fiscal measures (such as environmental taxes on certain packaging) (de Sadeleer, 2016) are likely to being the potential market restrictions (such as cost, time-to-market and technical challenges, etc.) to inter-state trade. Henna & Maria (2021) shed the contestations between different sustainability goals and interests that relate to food packaging. Food imitating products that associated with packaging label may merit being recalled for the safety of consumers (Basso, et al., 2016). Packaging contributed considerably to the energy and resources for some products (Pålsson, et al., 2017). Hakovirta & Hakovirta (2020) assessed packaging's role in the transmission of SARS-CoV-2 virus on the global trade. Koen, et al., (2016) investigated the specifically declared information in food and nutrition labelling on packaging in developed countries. The packaging labelling is mandatory in Australia, Canada, China, EU member states, Korea, United States, etc., and voluntary in Japan, Singapore, South Africa, Turkey, etc. Buzard and Voon (2020) analyzed the trade restrictions bring by standardized packaging. It is widely believed that packaging measures are being challenged not primarily to maintain access to the market, but in an attempt to discourage future adoption of similar measures. They will cause weighing and balancing under the TBT, TRIPS and other WTO agreements.

II. PFS under International Trade Rules

1. Basis of PFS

The connection of PRTS and international trade is mainly due to the establishment and operation of GATT/WTO, which led to a larger scale reduction or even abolition of traditional

trade barriers (such as tariffs and quotas) and appeared a variety of technical standards and regulations (issued by some major countries or regions). Countries have turned to some new types of trade measures that are more obscure and concealed; the PRTS is one of the main forms.

The WTO has established an international trade system framework. GATT is an agreement on goods trade and applies to all products. In principle, the packaging of export products is included in the agreements. In other words, the packaging rules are based and originate from the relevant trade rules of GATT/WTO. The substantive components of this international system framework are the TBT and agreement on the application of Sanitary and Phytosanitary measures (SPS). The principles and norms of technical trade measures are embodied in the two agreements, and the settlement of international trade disputes mainly follows this institutional framework. TBT agreement mainly includes technical regulations, technical standards, certification systems, conformity assessment procedures; SPS agreement mainly includes inspection and quarantine systems, commodity packaging and labeling requirements, green measures and information technology measures.

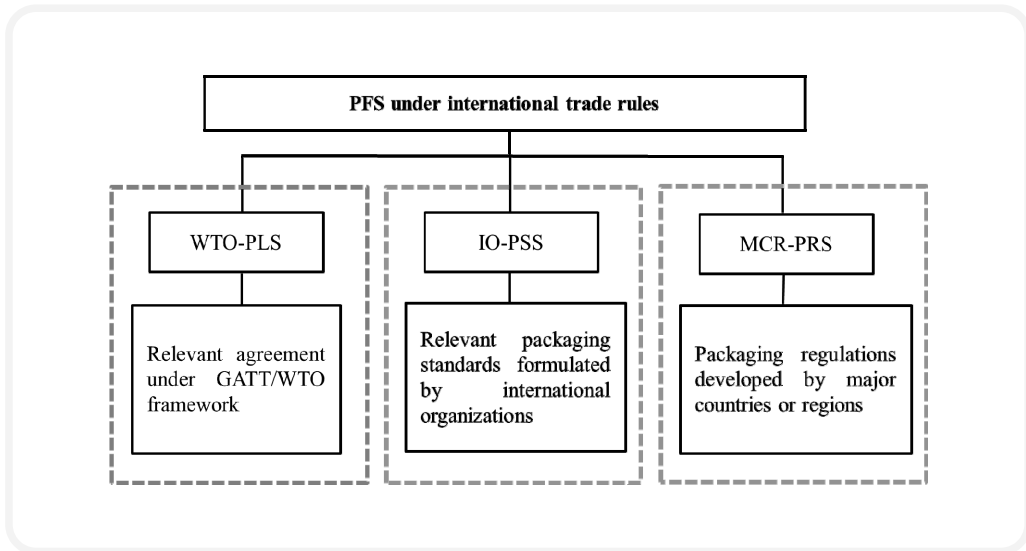
The TBT agreement stipulated that “mandatory product characteristics or related processes and production methods, including applicable management regulations”; these documents may also include or specifically refer to “specific terms such as symbols, packaging, marking or labeling requirements, which applies to products, processes or production methods”; “no state should be prevented from taking necessary measures to the extent that it believes appropriate to ensure the quality of its exported products, or to protect the life or health of humans, animals or plants, and to protect the environment”. To this end, the restrictions on trade imposed by national measures should be limited to realizing the necessary legal objectives. The SPS agreement applies to government measures that have direct or indirect effects on trade. SPS refers to some compulsory or voluntary technical measures. The provisions of SPS cover a wide range of aspects, including product standards, production processing, inspection and certification procedures, quarantine treatment, statistical sampling and risk assessment methods, and packaging labelling. The objects involve animal health, plant protection, food safety, additives, packaging containers used for transporting goods, and packaging vehicles from epidemic areas. Its forms include all relevant laws, decrees, regulations, requirements and procedures, especially including the requirements that are directly related to health and safety.

2. Classifications of PFS

The packaging systems are composed of three major systems in international trade. They are packaging legal system in WTO institutional framework (WTO-PLS), international organization packaging standard system (IO-PSS), and major countries or regions packaging regulatory system (MCR-PRS). The WTO-PLS is composed of the rules and clauses of GATT/WTO relevant agreements. The IO-PSS is composed of standards formulated by relevant international organizations. The MCR-PRS is composed of packaging laws and regulations and packaging standards developed by various countries (regions). These numerous agreements, international standards, national regulations constitute technical barriers to packaging in the field of trade. The PFS is shown in Figure 1.

2.1. WTO-PLS

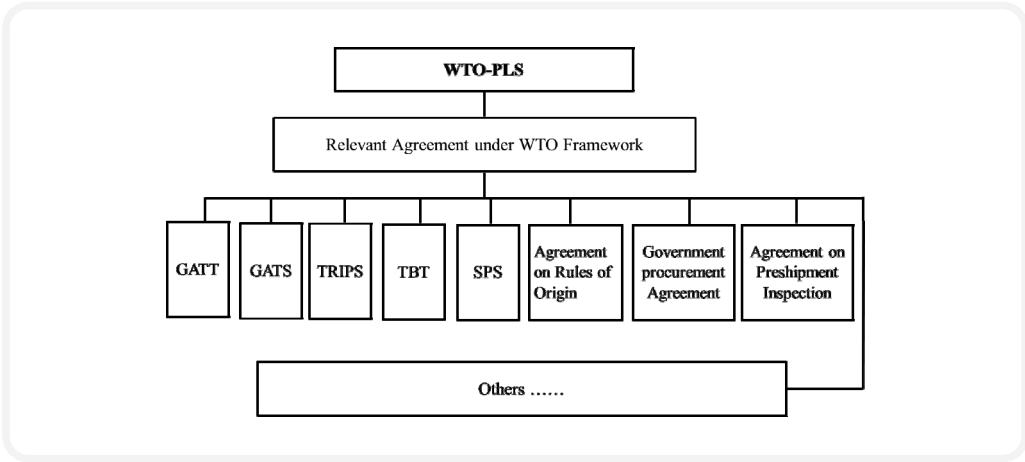
Fig. 1. PFS under International Trade Rules



In the new round of WTO negotiations, topics are all involved technical standards such as trade and environment, trade facilitation, trade-in services. In the WTO, regulatory measures are categorized into the product standards, product regulations, production process, or methods standards. The packaging-related regulations are formulated and implemented related to regulations, technical standards, packaging labels, health and quarantine, environmental requirements under the WTO relevant rules. The PRTS system is based on the technical regulations and technical standards system under WTO/TBT-SPS rules. The most important measures are also the TBT and SPS Agreements for import and export. The legal framework of international trade consists of several block international treaty groups extended from the WTO agreement, including trade in goods, trade in services, trade in intellectual property rights, and multilateral treaties, etc. These treaties constitute a large and complex legal system that regulates multilateral trade. This paper believed that the packaging legal system of WTO institutional framework (WTO-PLS) consists of the above-mentioned legal system. The WTO-PLS is shown in Figure 2.

Under the WTO relevant rules, the main regulatory documents related to PTRS are “agreement on establishing the WTO”, “general agreement on tariffs and trade (GATT)”, “agreement on technical barriers to trade (TBT)”, “agreement on the application of Sanitary and Phytosanitary measures (SPS)”, “general agreement on trade in services (GATS)”, “import and export license procedure agreement”, “agreement on pre-shipment inspection”, “government procurement agreement (GPA)”, “agreement on trade-related aspects of intellectual property rights (TRIPS)”, “agreement on rules of origin”, “agreement on safeguards”, etc.

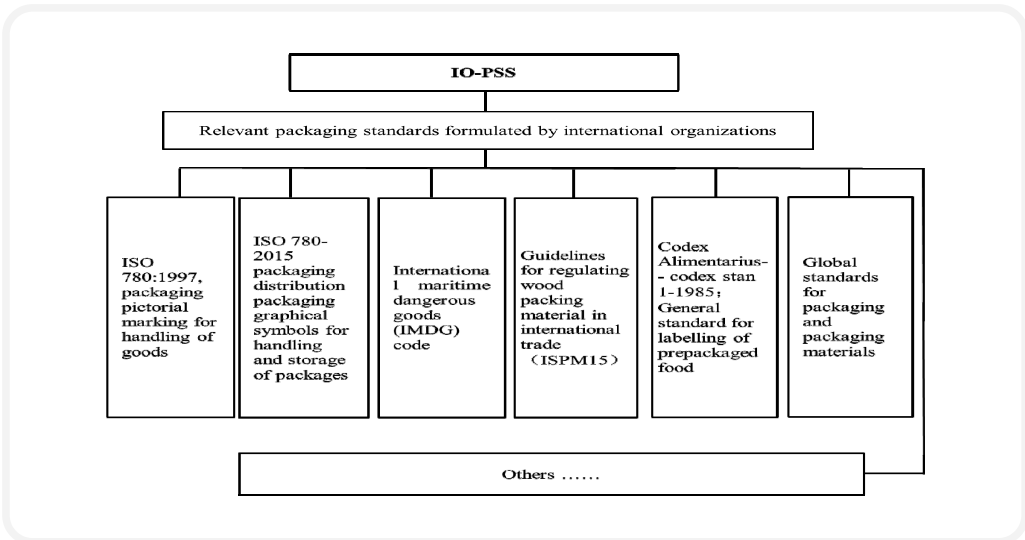
Fig. 2. Packaging System in WTO



2.2. IO-PSS

Packaging standards are formulated by international organizations and they play an important role in the trade. The packaging standards system of international organizations (IO-PSS) mainly consists of standards formulated by ISO, IEC, CAC, IPPC, OIE (World Organization for Animal Health), British Retail Consortium (BRC), World Packaging Organization (WPO) and other international organizations. These standards have strong industry professionalism and universal applicability and they are the basis for other countries to develop relevant PRTS. The IO-PSS is shown in Figure 3. Here raise some standards related to packaging that formulated by some international organizations.

Fig. 3. Packaging System in International Organizations



The “ISO 780-1997 Packaging-pictorial marking for handling of goods (PPMHG)” specified the name, figure, size, color, pictorial marks, method, storage and transportation of packaging, which apply to the transportation and packaging of all kinds of goods. The “Packaging-distribution packaging-graphical symbols for handling and storage of packages (ISO 780-2015)” specified a set of graphical symbols conventionally used for marking distribution packages in their physical distribution chain to convey handling instructions. This international standard applies to packaging containing any kind of goods except dangerous goods. The “Food safety management systems—requirements for any organization in the food chain (ISO 22000:2018)” was a voluntary international standard. It was a new standard for food safety management system; it defined the common requirements in food safety management and covers the whole process of the food chain. The standard applies to all organizations in the food chain that want to establish a food safety system, regardless of their size, type, and products.

The International Maritime Organization (IMO) issued the International Maritime Dangerous Goods (IMDG) Code. The IMDG Code set out detailed provisions on the use of packaging containers, packaging markings and labels about dangerous goods that transport by ship. The packaging of dangerous goods exported by sea all over the world must be designed, produced and inspected in accordance with the requirements of the IMDG Code. Only those who meet the requirements will be allowed to export. The Code required that clear and durable symbols must be marked on every packaging container of dangerous goods that has been inspected (refers to “Symbols of the United Nations Committee for the Transport of Dangerous Goods”).

The International Plant Protection Convention (IPPC) issued the International Standards for Phytosanitary Measures No. 15 (ISPM15 standard). The ISPM15 mainly stipulated the detoxification and labeling of wooden packaging, which is international standards of wood packaging quarantine measures, namely, “Guidelines for Regulating Wood Packing Material in International Trade (GRWPMIT)”. It stipulated that all imported wooden packaging must be quarantined; the wooden packaging should be free of tree bark and do not carry pests and diseases; the wooden packaging should be in line with ISPM15 standard and should be marked with fumigation and IPPC symbols.

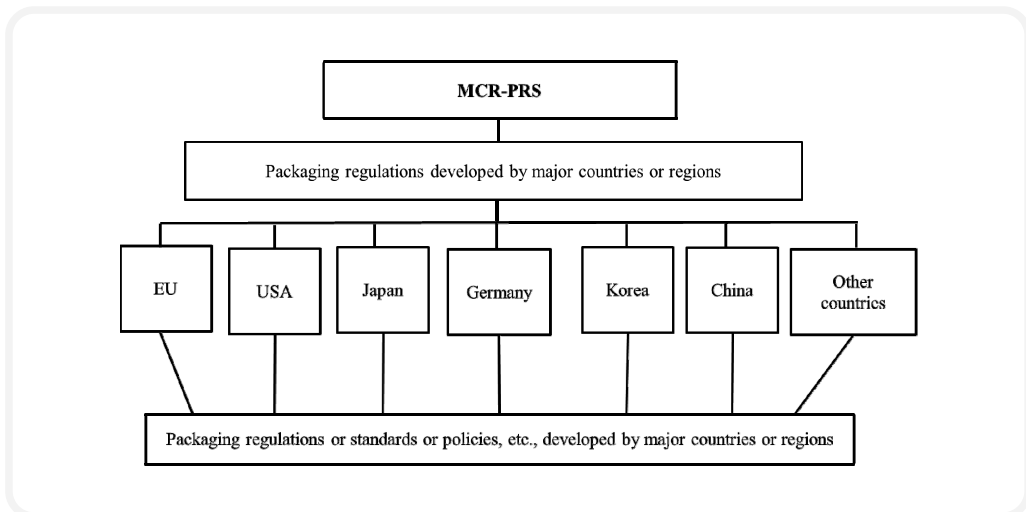
Food and Agriculture Organization of the United Nations (FAO)/World Health Organization (WHO) issued the “Codex Alimentarius - codex stan 1-1985, General standard for the labeling of prepackaged food”. It regulated the words, graphics, symbols and all instruction items on the food packaging. The application scope of the standard covers all aspects of prepackaged foods such as how they should be presented. Prepackaged foods shall not be described in a false, misleading or deceptive manner in the label or logo, and shall not be mentioned association with another product through words, graphics or other means.

The British Retail Consortium (BRC) issued global standards for packaging materials (GSPM). The GSPM offered standards for safe and applicable packaging materials for the production of food and consumer products, and it provided specific guidance for packaging materials with high hygiene requirements that directly contact food or other health-sensitive products. The standard covers all areas of the packaging industry, including quality, hygiene, and product safety. It involves food, health-sensitive consumer products (including cosmetics), raw materials, and other consumer products. The standard also clearly lists requirements for traded products that involve product approval, supervision, specification, inspection, testing, product brand identity, label information, product legality, traceability, product nature and related risks, legal requirements where the product is sold or imported, and so on.

2.3. MCR-PRS

The Uruguay round negotiations developed a special TBT to provide more comprehensive and effective coordination and protection for global trade under the multilateral trade system. In this framework, countries promulgated relevant trade measures, such as the EU, USA, Germany, Korea, Japan and China have established package-related regulations or technical standard measures, and formulated relatively rich packaging laws or policies. These measures constitute the packaging regulatory system in the major countries (or regions) (MCR-PRS). The MCR-PRS is shown in Figure 4. Here, we list some representative packaging regulations issued by some major countries or regions.

Fig. 4. Packaging Regulations of Regions



In EU, there are some regulations related to packaging such as “European parliament and council directive on packaging and packaging waste (94/62/EC)”, “packaging-requirements on specific to manufacturing and composition-prevention by source reduction (EN 13428:2004)”, “on the approximation of the laws of the member states relating to the making-up by weight or by volume of certain prepackaged products (76/211/EEC)”, “packaging-requirements for the use of European standards in the field of packaging and packaging waste (EN 13427:2004)”, *Conformite Europeenne (CE)*.

In the USA, we can find some regulations such as “Code of Federal Regulations (CFR 2018)”, “fair packaging and labeling act (FPLA)”, “toxics in packaging”, “United States quarantine requirements for imported wooden packaging and bedding materials”, “the toxins in packaging clearing house (TPCH)”, “hygienic standards for container packaging of food utensils”, “ASTMD6198-2001, transport packaging design guide”.

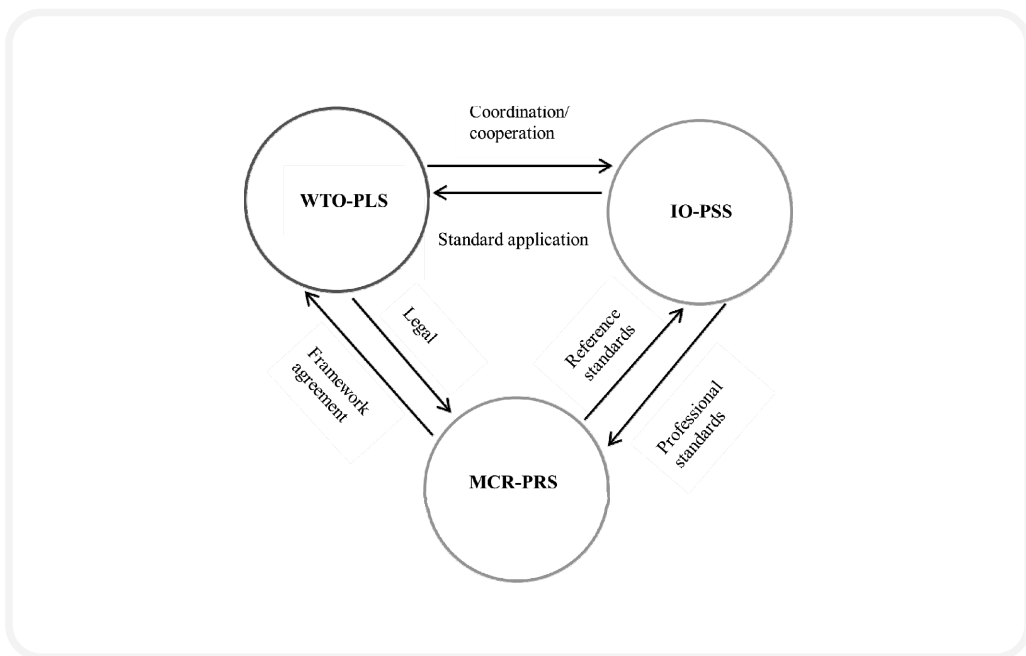
South Korea also regulates packaging under “Korea standards and specifications for utensils, containers and packaging for food products”, “draft partial amendment of the enforcement rule of the act on standards for packing materials and packing methods of products”, “quality inspection of imported wood packaging materials” and “plastic film for packaging”.

III. Relations and Legal Characteristics of the Three Packaging Systems

1. Coordination and Inheritance of the Three Packaging Systems

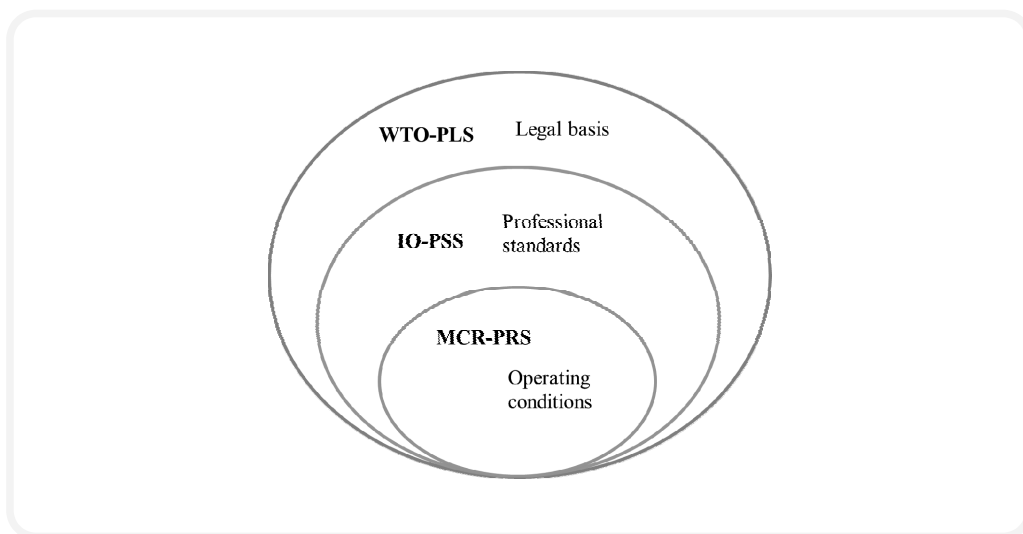
The packaging system is introduced under the framework of the international trade system, which is composed of three parts, namely, WTO-PLS, IO-PSS, and MCR-PRS. The three parts have interactive and interdependent coordination relations, as shown in Figure 5.

Fig. 5. Coordination of Three Packaging Systems



In the field of trade, the packaging regulations and standards formulated by various countries cover all industries, and cover import and export commodities of all types of goods trade, so the PRTS covers a wide range. PRTS are the physical manifestation of the implementation of trade treatment under the WTO rules system. In terms of cooperation, WTO-PLS is a framework clause and treatment that WTO member states need to abide by, and all trades should be conducted under this rule; IO-PSS is a guiding reference standard, which standardizes product quality and industrial production safety; MCR-PRS is a detailed standard that puts forward specific requirements for specific product standards and carries out regulations on products compliance.

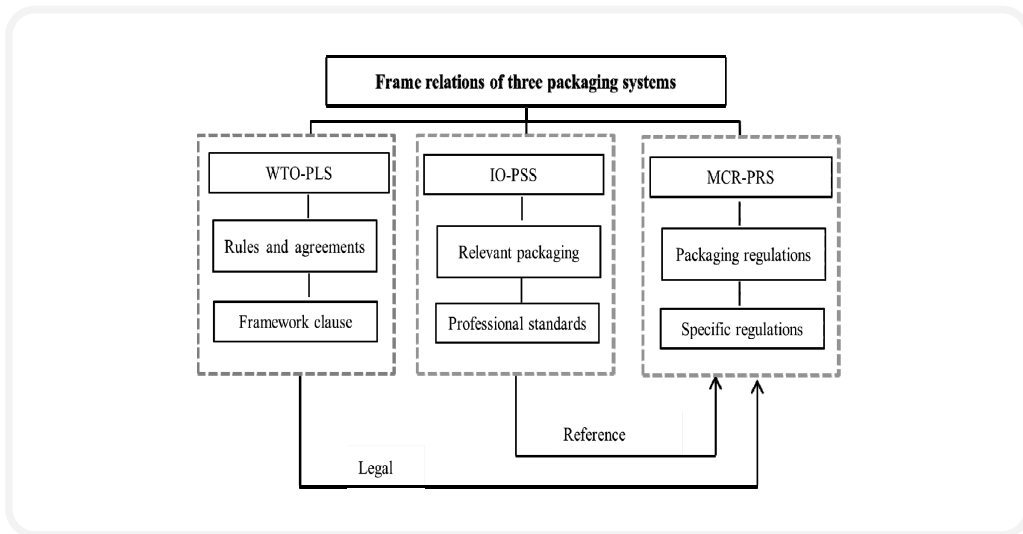
Therefore, in terms of the coverage of packaging-related contents, it can be considered that WTO-PLS covers the largest coverage, IO-PSS has the second, and MCR-PRS has the smallest coverage of packaging connotations. The coverage relations of them are shown in Figure 6.

Fig. 6. Coordination of Three Packaging System

The relevant agreement clauses of the WTO are the legal source for the implementation of laws and regulations in various countries. The international standards are the technical standards for the various countries to refer to, and the laws and regulations of various countries are the assessment rules for import and export commodities. That is to say, under the international trade framework, for PRTS, the WTO/TBT-SPS related agreements are the legal basis, the packaging standards formulated by international organizations are reference standards, and the packaging laws, regulations and technical standards of major countries are the measuring scales. To sum up, WTO-PLS is a framework clause, IO-PSS is a guiding standard, and MCR-PRS is a specific regulation. The frame relation of them is shown in Figure 7.

First of all, there have cooperation and coordination between the WTO framework agreement and the standards of international organizations. WTO has always attached the important role of international standards. The International Trade Center (ITC) (SPS committee, TBT committee, Committee on Trade and Environment (CTE)) has close cooperative relations with some international organizations. The standards formulated by international organizations have had a positive effect on the global market and trade field, and have been recognized by the WTO.

Secondly, the standards of international organizations are the reference standards and basis for the formulation of PRTS in major countries. The widespread development of international trade makes the competition of products in the international market is becoming more and more fierce, which require that the products should be of high quality and good performance. In these situations, the standards should have universality and interchangeability, and be unified among countries; otherwise, the obstacles will bring into international trade. So, all countries are actively adopting international standards and taking participate in the formulation of international standards to strive for a voice as an important goal in the field of international standardization. Therefore, international standards are the scientific support for countries to formulate technical standards. When developing PRTS, countries make use of the standards formulated by international organizations as reference guidelines to develop technical standards and regulations on commodity import and export and market access.

Fig. 7. Frame Relations of Packaging Systems

Finally, the WTO framework agreement is the legal basis for the formulation of packaging laws and regulations in various countries. WTO/TBT-SPS requires that all member countries make domestic regulations should base on international standards, that is to say, the international standards have a strong force effect on all countries in international trade. Countries have established a relatively complete management system and regulations system in terms of trade which are based on the WTO international trade system framework. Therefore, the relevant packaging technical laws, regulations and standards formulated by major developed countries and regions have basis and rationality.

2. Legal Characteristics of the Three Major Packaging Systems

The relevant clauses of the WTO/TBT-SPS agreement are framework clauses. Although there is no detailed description of packaging standards, it is allowed that countries can adopt relevant packaging provisions, which is the legal theoretical basis for countries to formulate trade packaging laws and regulations. Therefore, in the matter of trade dispute, countries may appeal to the WTO, and apply DSU (Understanding on Rules and Procedures Governing the Settlement of Disputes) and DSB (Dispute Settlement Body) to resolve the related trade dispute. From this point, WTO-PLS provides a theoretical solution for packaging disputes in trade and it is the "backer" for countries to resolving trade disputes.

IO-PSS is a guiding standard that it is equivalent to industry standards. It provides professional guidelines and instructions for packaging technical standards in relevant industries. It has an important reference value for the formulation of related standards in the trade field. IO-PSS has the nature of international universality, but it does not have mandatory legal nature.

MCR-PRS is a specific packaging standard and compulsory regulation. It has highly targeted and has detailed requirements on the packaging with compulsory legal nature. MCR-PRS has a direct conformity assessment effect on the products of trade partners. It determines that whether the product can enter the market and be completed in exchange.

IV. PRTS Coverage and TBT/SPS Jurisdiction over Packaging

1. Main Coverage of PRTS

A series of packaging-related laws and regulations formulated and implemented by major countries (especially, formulated with higher technical level by developed countries and regions such as Europe and America). These packaging regulations and standards set specific provisions and requirements for packaging materials, safety and health, sanitation and epidemic prevention, environmental protection, they involve product packaging materials, packaging container structure, packaging marks, packaging labels, packaging waste, etc. The packaging must comply with the relevant provisions of laws or regulations, and must provide technical documents or third-party certification for conformity declarations in accordance with the market access system (Waldman, et al., 2014). These measures constitute the packaging regulatory system for import and export products as a trade control tool.

1.1. Health and Safety Prevention

There are parasitic or hidden harmful organisms, germs, and viruses in some packaging and raw materials, they can spread in product circulation and cause some harm. To prevent this kind of harm, countries adopt health protection measures in legal form from the perspective of epidemic prevention. Hygiene, safety, and epidemic prevention restrictions are imposed on packaging containers, packaging materials, and packaging auxiliary materials used for commodities. In the laws and regulations of Europe and America, sanitary inspection and quarantine requirements are put forward for imported commodities or packaging to prevent the introduction and spread of pests and diseases. The export products of wooden packaging materials are often condemned and restricted by importing countries because they contain pests and diseases.

1.2. Packaging Toxicity

Many packaging materials are inherently toxic, and their toxicity may transfer into products and cause pollution to products, thereby, they may affect human health or life safety. Countries stipulate packaging laws and technical regulations to restrict the harmful substances and contents of commodities and packaging materials. These laws and regulations mainly include food hygiene law, drug administration law, consumer protection law, anti-virus packaging law, and so on.

1.3. Environment

Product packaging may have a negative impact on the ecological environment during production, transportation, storage, and consumption; especially the packaging wastes pollute the environment after the packaging losing function. Countries have formulated and promulgated waste recycling laws and regulations, and adopt measures to restrict or prohibit the use of plastic as packaging materials. At the same time, they are actively looking for substitute or using degradable and renewable materials as packaging materials.

1.4. Packaging Materials

Packaging materials (paper, metal, plastic, glass, bamboo and wood) are the main carriers that constitute product packaging. Improper use of packaging materials can cause harm. In order to ensure the safety of goods and users, packaging materials are required to save resources, be recyclable, be able to decompose naturally, be non-toxic when incinerated, occupy less land when landfilled, do not pollute the environment, and do not endanger the health of consumers. Most countries have put forward regulations and requirements on product packaging materials to ease the environmental pressure brought by packaged products.

1.5. Packaging Container Structure

Countries have made detailed regulations on packaging specifications of product containers and set a series of standards for product container structure, and required that packaging should comply with the effective use of resources. The US FDA stipulated that all imported medical, fitness and beauty drugs must be packaged with anti-pollution functions (such as preventing adulteration and poisoning). According to Korea's pharmaceutical law, containers should be designed to be difficult to open for children under 5 years old. Australia stipulated that the empty volume of all kinds of packaging should not exceed 25% of the packaging capacity. EU required that any packaging must not contain more than 0.01% of heavy metal; otherwise, it cannot be sold. Japan has stipulated that the empty volume of packaging should not exceed 20% of packaging capacity.

1.6. Packaging Labels

As an important element of packaging, labels can provide accurate and comprehensive product information and can provide important decision-making for consumers to select products too. In order to reflect the quality attributes of products as faithfully as possible, various countries have made detailed regulations on product labels (such as nutritional information, labeling specifications, language types, etc.). In particular, label regulations are more specific and strict on agricultural and food products. Packaging and labels are distinctive and complex. Some countries have made detailed requirements on labels of imported goods. In the use of labels and packaging, imported products must comply with the relevant regulations on packaging, labels and transportation.

1.7. Language and Pattern

It is generally stipulated that the words on packaged products should use importing country language to facilitate the use of products by domestic consumers. Some countries are very taboo to some patterns, colour and numbers due to religious customs and cultural background. Therefore, it is necessary to pay attention to factors such as local cultural background, religious customs, favor and taboos, and avoid unnecessary information appearing on the packaging of export products.

1.8. Marks Certification

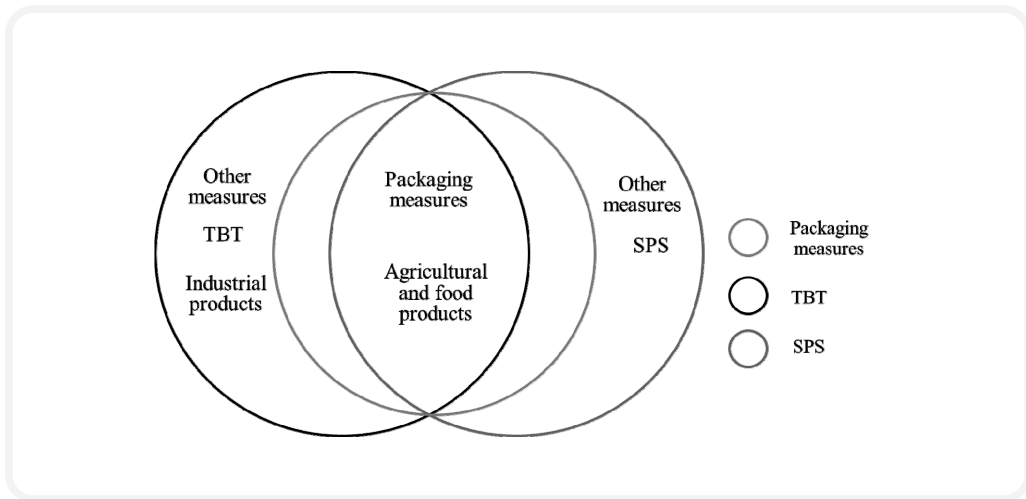
In order to protect the environment, health and safety, and ensure product quality, WTO member states make relevant certification requirements for import and export products. Only

certified products can enter the market. There should be corresponding green environmental logo or market access mark on the package, such as: IPPC logo, ISO certification, EU CE certification, U.S. FCC certification, China CCC certification, Canadian CSA certification, etc.

2. TBT/SPS Jurisdiction over Packaging

From a general view, the packaging regulations cover all import and export commodities in goods trade. For import and export commodities in goods trade, all product packaging are subject to the jurisdiction of TBT or SPS. The jurisdiction of the two is different; TBT applies to all industrial products and agricultural products; while SPS applies only to agricultural and food products. SPS covers the three areas of food safety, plant health and animal health. Due to the existence of the SPS Agreement, the TBT Agreement does not involve SPS measures. For the scope of TBT, except for the jurisdiction of SPS, all PRTS of products are governed by the TBT agreement. That is to say, TBT covers all the technical requirements and standards that are not covered by SPS. The relations of packaging measures and TBT/SPS are shown in Figure 8.

Fig. 8. Relations of Packaging Measures and TBT/SPS



TBT and SPS agreement apply to all goods in the scope of application. If the measures do not apply to SPS, the TBT agreement may be used. It was further stated that requirements unrelated to health and safety involve the TBT agreement, mainly including labeling, quality, specifications, packaging, and conformity assessment requirements. The requirements related to health and safety involve the SPS agreement, mainly including drug residues, toxic and harmful residues, and animal and plant quarantine requirements. For example, for a certain import and export food, the outer packaging, accessories, and bottles belong to TBT. That is to say that the regulations on structure, size, and volume of outer packaging containers are fall in the jurisdiction of the TBT agreement. However, the internal product-food belongs to SPS, namely, whether the content of food ingredients and additives exceeds the standard, whether it poses a threat to animal and plant safety, and whether packaging materials pollute

the environment; they are fall in the jurisdiction of the SPS agreement. For example, the COVID-19 outbreak in 2019 continues to now. In the recent cross-border trade, the COVID-19 virus has been found in agricultural products. The reason is that the virus is accompanied by packaging. The goods in cross-border trade whether containing COVID-19 subject to SPS measures.

V. Conclusion

In international trade, packaging industry has made great contribution to the development of economy and trade, and plays an important role. This is because commodity packaging is a necessary prerequisite for export commodities to enter international trade market, which is one of the main terms of trade. As an integral part of commodities, packaging provides protection for commodities, and ensures the goods be transported to all parts of the world intact and smoothly; the rapidly identification function of packaging improves the circulation efficiency of goods and shortens the circulation cycle of trade. In the field of trade, the packaging regulations and standards formulated by various countries cover all industries, and cover import and export commodities of all types of goods trade. Measures such as packaging laws, regulations, and technical standards are no longer purely appendages in today's international trade; they gradually become the mainstream of technical trade means, and they need to conform to international, regional, legal, environmental protection, safety, etc. The regulations associated with PRTS have played a key role in challenges to merchandise trade and PFS in international trade. To some extent, these packaging rules would implicit trade restrictiveness, which affect the ability to export manufactured goods and hinder the smooth progress of trade, challenge international trade relations nationally, bilaterally and multilaterally.

This study considered that the PFS is based on the relevant WTO agreements, professional packaging standards established by international organizations, and a series of packaging provisions or policy measures implemented by major countries or regions. We expounded that the organizational structure of the PFS was constituted by three levels, namely, WTO-PLS is composed of the rules and clauses of GATT/WTO relevant agreements; IO-PSS is composed of standards formulated by relevant international organizations; and MCR-PRS is composed of packaging laws and regulations and packaging standards developed by various countries (regions). The three levels have interactive and interdependent coordination relations. The relevant agreement clauses of the WTO are the legal source for the implementation of laws and regulations in various countries. The international standards are the technical standards for the various countries to refer to, and the laws and regulations of various countries are the assessment rules for import and export commodities. That is to say, under the international trade rules, for PRTS, WTO-PLS is the legal basis, IO-PSS is a guiding reference standard, and MCR-PRS is the measuring scale that puts forward specific requirements for specific product and carries out regulations on products compliance. WTO-PLS covers the largest coverage, IO-PSS has the second, and MCR-PRS has the smallest coverage of packaging connotations. The PRTS provisions involved in safety and health, sanitation and epidemic prevention, and environmental protection, they implicate product packaging materials, packaging container structure, packaging marks, packaging labels, packaging waste, etc. In the trade practice, the applicable inspection procedures are mainly all fall into the TBT/SPS measures that jurisdiction over PRTS.

References

- Basso, F., J. Bouillé, K. L. Goff, P. Robert-Demontrond and O. Oullier (2016), "Assessing the Role of Shape and Label in the Misleading Packaging of Food Imitating Products: from Empirical Evidence to Policy Recommendation", *Frontiers in Psychology*, 7, 1-13, <https://doi.org/10.3389/fpsyg.2016.00450>
- Buzard, K. and T. Voon. (2020). "How Trade-Restrictive Is Standardized Packaging? Economic and Legal Implications of the WTO Panel Reports in Australia–Tobacco Plain Packaging", *World Trade Review*, 19(2),267-281, doi:10.1017/S1474745620000051
- Crosbie, E., G. Thomson, , B. Freeman and S. Bialous (2018), "Advancing Progressive Health Policy to Reduce NCDs Amidst International Commercial Opposition: Tobacco Standardised Packaging in Australia", *Global Public Health*, 12(12), 1753-1766, <https://doi.org/10.1080/17441692.2018.1443485>
- De Koeijer, B., J. De Lange, and R. Wever (2017). "Desired, Perceived, and Achieved Sustainability: Trade-offs in Strategic and Operational Packaging Development. Sustainability", 9(10), 1923, <https://doi.org/10.3390/su9101923>
- De Sadeleer, N. (2016). "Case Note Court of Justice of the European Union Preliminary Ruling–Excise Duty on Certain Beverage Packaging: Case C-198/14 (Valev Visnapuu). *Review of European, Comparative & International Environmental Law*, 25(2), 261-267, <https://doi.org/10.1111/reel.12167>
- Eyre, D., R. Macarthur, R. A. Haack, Y. Lu and H. Krehan (2018), "Variation in Inspection Efficacy by Member States of Wood Packaging Material Entering the European Union", *Journal of Economic Entomology*, 111(2), 707-715,<https://doi.org/10.1093/jee/tox357>
- Fesenfeld, L. P., M. Wicki, Y. Sun, and T. Bernauer (2020), "Policy Packaging can Make Food System Transformation Feasible", *Nature Food*, 1(3), 173-182, <https://doi.org/10.1038/s43016-020-0047-4>
- Fooks, G. and A. B. Gilmore (2014), "International Trade Law, Plain Packaging and Tobacco Industry Political Activity: the Trans-Pacific Partnership", *Tobacco control*, 23(1), e1, :10.1136/tobaccocontrol-2012-050869
- Foschi, E. and A. Bonoli, (2019), "The Commitment of Packaging Industry in the Framework of the European Strategy for Plastics in a Circular Economy", *Administrative Sciences*, 9(1), 18, <https://doi.org/10.3390/admsci9010018>
- Fraś, J., I. Olsztyńska and S. Scholz (2018), "Standardization and Certification of the Wooden Packaging in International Trade", *Research in Logistics & Production*, 8(1), 25-37, DOI: 10.21008/j.2083-4950.2018.8.1.2
- Gruszczynski, L. and M. Melillo (2018), "The FCTC and Its Role in WTO Law: Some Remarks on the WTO Plain Packaging Report", *European Journal of Risk Regulation*, 9(3), 564-574, <https://ssrn.com/abstract=3450174>
- Hakovirta, M. and J. Hakovirta (2020), "Transmittance and Survival of SARS-CoV-2 in Global Trade: The Role of Supply Chain and Packaging", *Journal of Packaging Technology and Research*, 4, 261–265, <https://doi.org/10.1007/s41783-020-00101-0>
- Hawkins, B., C. Holden and S. Mackinder (2019), "A Multi-level, Multi-jurisdictional Strategy: Transnational Tobacco Companies' Attempts to Obstruct Tobacco Packaging Restrictions", *Global Public Health*, 14(4), 570-583, <https://doi.org/10.1080/17441692.2018.1446997>
- Henna Sundqvist-Andberg and M. Åkerman. (2021), "Sustainability Governance and Contested Plastic Food Packaging–An Integrative Review", *Journal of Cleaner Production*, 306, 1-13. <https://doi.org/10.1016/j.jclepro.2021.127111>,

- Koen, N., R. Blaauw and E. Wentzel-Viljoen (2016), "Food and Nutrition Labelling: the Past, Present and the Way Forward", *South African Journal of Clinical Nutrition*, 29(1), 13-21, doi: 10.1080/16070658.2016.1215876
- Laverty, A. A., C. Millett, N. S. Hopkinson and F. T. Filippidis (2021), "Introduction of Standardised Packaging and Availability of Illicit Cigarettes: A Difference-in-Difference Analysis of European Union Survey Data 2015–2018", *Thorax*, 76(1), 89-91, <http://dx.doi.org/10.1136/thoraxjnl-2020-215708>
- Lencucha, R. and J. Drope (2015), "Plain Packaging: an Opportunity for Improved International Policy Coherence?", *Health Promotion International*, 30(2), 281-290, <https://doi.org/10.1093/heapro/dat038>
- MacKenzie, R., A. Mathers, B. Hawkins, J. Eckhardt, J. and J. Smith (2018), "The Tobacco Industry's Challenges to Standardised Packaging: A Comparative Analysis of Issue Framing in Public Relations Campaigns in Four Countries", *Health Policy*, 122(9), 1001-1011, <https://doi.org/10.1016/j.healthpol.2018.08.001>
- Mackey, T. K., B. A. Liang and T. E. Novotny (2013), "Evolution of Tobacco Labeling and Packaging: International Legal Considerations and Health Governance", *American Journal of Public Health*, 103(4), e39-e43, <https://doi.org/10.2105/AJPH.2012.301029>
- Moodie, C., J. Hoek, J. Sheffels, K. Gallopel-Morvan et al (2019), "Plain Packaging: Legislative Differences in Australia, France, the UK, New Zealand and Norway and Options for Strengthening Regulations", *Tobacco control*, 28(5), 485-492, <http://dx.doi.org/10.1136/tobaccocontrol-2018-054483>
- Pålsson, H., F. Pettersson, and L. W. Hiselius (2017), "Energy Consumption in E-commerce Versus Conventional Trade Channels-Insights into Packaging, the Last Mile, Unsold Products and Product Returns", *Journal of Cleaner Production*, 164, 765-778, <https://doi.org/10.1016/j.jclepro.2017.06.242>
- Strutt, A., J. A. Turner, R. A. Haack and L. Olson (2013), "Evaluating the Impacts of An International Phytosanitary Standard for Wood Packaging Material Global and United States Trade Implications", *Forest policy and economics*, 27, 54-64, <https://doi.org/10.1016/j.forpol.2012.11.003>
- Waldman, K. B. and J. M. Kerr (2014), "Limitations of Certification and Supply Chain Standards for Environmental Protection in Commodity Crop Production", *Annual Review of Resource Economics*, 6, 429-449, <https://doi.org/10.1146/annurev-resource-100913-012432>
- Wikström, F., K. Verghese, R. Auras and A. Olsson et al. (2019), "Packaging Strategies That Save Aood: A Research Agenda for 2030", *Journal of Industrial Ecology*, 23(3), 532-540, <https://doi.org/10.1111/jiec.12769>
- Wu, Y., N. F. Trepanowski, J. J. Molongoski and P. F. Reagel (2017), "Identification of Wood-boring Beetles (Cerambycidae and Buprestidae) Intercepted in Trade-associated Solid Wood Packaging Material Using DNA Barcoding and Morphology", *Scientific Reports*, 7(1), 1-12, <https://doi.org/10.1038/srep40316>