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Editorial

This month we commemorate the twentieth anniversary of the terrorist attacks in the United States which killed almost 3,000 people and injured thousands more. The global impact of these abhorrent acts is still being felt today, including the way in which international trade and travel is conducted and regulated.

Following the attacks commercial international trade with the US came to a virtual standstill as the US authorities explored ways to ensure that the inbound supply chain was as secure as possible. With the assistance of members of the business community who were dependent on international trade, US Customs and Border Protection established the Customs-Trade Partnership Against Terrorism (C-TPAT) program which provided 'trusted trader' status to those businesses who could demonstrate that the risk of terrorist activity in their supply chains was being minimised by way of a variety of existing security standards.

This in turn led to the widespread adoption of the WCO SAFE Framework of Standards to Secure and Facilitate Global Trade (SAFE Framework), which has fundamentally changed the regulatory focus of customs administrations around the world. The architects of this progressive international instrument, with its central elements of Authorised Economic Operator and Mutual Recognition arrangements, clearly understood the need to establish mutually beneficial partnerships between Customs and business in order to effectively address supply chain security.

The WCO updates the SAFE Framework on a regular basis to build on its strengths, leverage lessons learned, incorporate best practices, and maintain its relevance in the face of new and emerging developments in the international supply chain.

As we commemorate the events of September 2001, we should also reflect on the efforts that continue to be made by Customs and other members of the international trading community who, through initiatives such as those embodied in the SAFE Framework, play their part in helping to make the world a safer place.

Professor David Widdowson AM
Editor-in-Chief

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Section 1

Academic
Contributions

The Establishment and Application of the DNA of Customs Law and Practice

Tom Walsh

Abstract

This article is a synthesis of the author's previously published books and theses (see Walsh, 1986; Walsh, 1996; Walsh, 2015, Walsh, 2020). Notwithstanding the findings of the Irish Commission on Taxation in 1985 (see Irish Government, 1985) (to the effect that they found customs law and administration to be "impenetrable" owing to its antiquity), the author takes the contrary view, which is that customs law, generally, has a perceptible pattern that can be traced and explained in a simple and straightforward manner to yield its raison d'être (its DNA). His particular premise is that identifiable and immutable principles of taxation and administration are at the heart of customs procedures and practices; that these principles of taxation and customs control determine the broad framework of customs legislation generally; and this has been the position from time immemorial, right up to the present day. To validate this premise, he has identified and distilled these formulating principles as they evolved over the centuries in Irish (and English) law. Having done so, he further goes on to house them within the framework of Adam Smith's so-called canons of taxation (see Smith, 1776)[1] to make them more meaningful in the overall scheme of taxation. It is worth noting that Smith was once a Commissioner of Customs in Scotland.

At the same time, the author demonstrates that these principles are enshrined in the customs law of the European Union (EU) and have been influential in the formulation of the original, overarching Kyoto Convention on the Simplification and Harmonisation of Customs Procedures, and its successor, the Revised Kyoto Convention. During its *Comparative Studies of Customs Procedures* undertaken in the 1950s and 1960s (see Customs Co-operation Council, n.d.), the then Customs Co-operation Council (CCC – now the World Customs Organization) independently came to the same broad conclusion – albeit without identifying or specifying the underpinning individual principles involved. The studies covered the entire spectrum of customs law and embraced the procedures and practices in force in all the then Council member countries. The studies covered the following customs procedures:

(a) Study No. 1 (1957) – Importation by Sea: Formalities on Arrival of Ships, prior to Unloading

(b) Study No. 2 (1957) – Importation by Sea: Unloading

(c) Study No. 3 (1958) – Importation by inland frontiers: Formalities on arrival up to presentation of goods declaration

(d) Study No. 4 (1959) – Importation by Air: Formalities on arrival of aircraft, up to presentation of goods declaration

(e) Study No. 5 – (Date Unknown) – Clearance of Goods for Home Use

(f) Study No. 6 (1964) – Customs transit of imported goods

(g) Study No. 7 (1965) – Customs warehousing procedure

(h) Study No. 8 (1966) – Temporary Admission

(i) Study No. 9 (1968) – Drawback

(j) Study No. 10 (1966) – The right of appeal in customs matters

(k) Study No. 11 (1968) – Rail traffic.

1. Introduction

Asakura (2003) is the best reference for a detailed understanding of the world history of customs and tariffs.

In an Irish/English context, customs duties are believed to be so-called because they were originally 'customary' duties of a common-law character, extracted by prerogative of the King (of England). One of the earliest references in Ireland to a specific customs duty dates to 1177, and consisted, in essence, of taking one-ninth of a cargo of wine for the King's use. Having been prised from imported cargo, the duty was called 'prisage' or 'prizage' (from medieval Latin, 'prisagium') (see Reamonn, 1981).

In earlier times, the collection of customs duties in both Ireland and England was 'farmed' out (collected) and appropriated by private individuals under royal licence. This concession was normally granted in return for an agreed sum of customs duties to be paid annually to the King, or advanced to him as a loan when he was in financial difficulties. McCoy (1938) defined "Farmers of the Revenue" as "Persons to whom the rights of levying Customs and Excise duties were let or sold for a term of years for a specified sum. The farming of Customs duties ceased in 1671 and Excise duties in 1683. Since then, the duties have been managed and collected by Commissioners."

Two particular points of interest present themselves. Firstly, the 'farmers' were often continentals (Italian). In 1275, the 'farmers' in Ireland were Luke of Lucca and his partners, Merchants of Lucca and Bonasius Bonacui, and his partners, Merchants of Florence (see Great Britain, 1875–86).[2] This, in turn, must have introduced some (unknown) continental customs control regimes into Ireland/England. Secondly, EU Member States are now, in effect, the 'farmers' of customs duties in the EU. They are legally empowered, and obliged, to collect, and return, a fixed percentage of all customs duties and like charges collected on foreign goods entering the EU.

As with the imposition of all customs duties, there were inevitable disputes and court cases. In 1305 there is a recorded case in Cork, Ireland, between Peter de Blayne, Merchant of the Duchy of Aquitaine, and the Mayor and Bailiffs (Customs) of Cork, concerning the taking of prises over and above the new customs (duty) of 2/ – per tun on wine (butlerage). The court found that de Blayne, 'being a merchant stranger', and having paid 2/ – per tun, should "be quit of prises", and that the illegal extraction should be restored to him without delay (Great Britain, 1905).It needs to be recalled that the sensitivities concerning customs duties in England and Ireland were so great that the first English Bill of Rights, *Magna Carta 1215*, prohibited illegal duty impositions:

> 41. All merchants may enter or leave England unharmed and without fear, and may stay or travel within it, by land or water, for purposes of trade, free from all illegal exactions, in accordance with ancient and lawful customs.

The provisions of *Magna Carta* were transposed into Ireland by the Great Charter of Ireland 1216. Its most important human rights provisions were subsequently enacted in Ireland on independence from England by the Constitution of the Irish Free State (Saorstat Eireann) Act, 1922. Article 35 of the Act, in line with *Magna Carta*, reserved the right of the imposition, repeal, remission, alteration or regulation of taxes (including customs duties) to the parliament – not to government, as sometimes mistakenly assumed in some countries with tripartite constitutions. The latter assumption can, and has, resulted in countries enacting unconstitutional customs tariffs.

2. Principles of taxation and customs administration

2.1 Introduction

Crombie (1962) posed, and answered, the following administrative question regarding customs duties:

> By what standards shall be judged in administration that which is worth preserving and that which should be changed? That the amount payable, the time and manner shall be known, that there shall be equitable assessment between different taxpayers according to the goods they import; that duties shall be as painlessly extracted as may be; and that thrift in collection is a good thing – these are propositions, commonsense, yet difficult to put into effect, that appear as certainty, equality, convenience and economy when elevated into canons [maxims] of taxation by Adam Smith or his supporters.

2.2 Adam Smith's principles were part of the DNA of customs law from ancient times

The author's overriding premise is that Smith did not invent the principles (maxims) of taxation that underpin customs law and control systems. Smith merely identified and labelled them in 1776 as being common to all taxes, including customs duties. For example, the first substantive Irish Customs Act in 1662 featured Smith's four 'maxims' (canons) in practice – 114 years before Smith formulated them, *inter alia,* in a customs duty context.

Section 1 of the Irish Customs Act 1662 Act provided:

- for a new book of rates (tariff) to make **certain** the uncertainty surrounding the duties lawfully payable
- that duties were to be applied **equally** to every Merchant, natural born subject, Denizens and Aliens, and **equally** to imports and exports
- for "the advancement of trade and the encouragement of merchants" (**trade facilitation**)

- for "the **just** payment of their Customs duties" (no unjust extortions)
- the duties were imposed by parliament (**constitutional requirement**)
- officers were to "faithfully manage (**economy**) their duties and **trusts**" (no discretion regarding the imposition or remission of customs duties).

Section 2 opened with a national **safety and security** measure, "for the better guarding and defending of the seas against all persons intending, or that may intend, the disturbance of the intercourse of the trade of this your Majesties realm.*"*

A sister act, the Customs Act 1662, dealing with import excise duty, consolidated the deferred payment "**convenience**" principle with the creation of duty-suspension/duty-free warehousing facilities.

If only to demonstrate how these historic principles of taxation and customs administration have survived throughout time, it is worth recording that particular provisions of the Irish Customs Act 1662 are still extant – 358 years later.

2.3 Smith's principles of taxation relating to customs duties

2.3.1 Certainty

Tridimas (2007) underlined the particular importance of the principle of legal certainty in a customs law context as follows:

> Legal certainty requires that the effect of Community legislation must be clear and predictable. The aim of the principle is to ensure that situations and legal relationships governed by Community law remain foreseeable. Obligations imposed on the individual must be clear and understandable…. The Court [ECJ] has held, in particular, that rules imposing charges on a taxpayer must be clear and precise so that he may be able to ascertain unequivocally his rights and obligations. The principle has found fruitful ground for its application in customs law. In relation to the Common Customs Tariff, for example, it has been consistently held that, in the interests of legal certainty and ease of verification, the decisive criterion for the classification of goods for customs purposes is to be sought in their objective characteristics and properties, as defined in the Common Customs Tariff.

The first formal Tariff in England, Book of Rates 1507, acknowledged the principle of legal certainty by declaring that duties may be charged only on those goods that are "authorised [by parliament] and notoriously known*"* (Crombie, 1962).

As for the need for taxation measures to be 'set in stone', the surviving Palmyrian Tariff dating from 137AD was literally inscribed in stone. It detailed the rates of duties on enumerated import and export goods. According to Matthews (1984), "The council of the city of Palmyra in Syria (then part of the Roman empire) agreed to revise and publish the tariff and regulations according to which dues were levied on goods brought into and exported from the city, and services provided within it. This was done in order to avert in future the disputes that had arisen between the tax collectors and the merchants, tradesmen and others from whom taxes were due, and to make the situation absolutely clear, the council ordered to be inscribed (in stone) and displayed in a public place both the new regulations and the old ones which preceded them."

The historical European context of tariff classification is best evidenced by the following case record:

> In 1364 you had a Court case dealing with yet another facet of the problems associated with the levying of customs duties. There were 'certain base wools that did not pay cocket duties by special charter'. Coarse wool, 'Cogwolle' and 'Refus', came within this exempt category. However, an exportation of such wool was seized in the Staple port of Calais for failure to pay the cocket duties. The French Court found that the 'Cogwolle' of Ireland fell into the exempt category. Consequently, it was 'customable but not cockettable'. As "the master has faithfully paid custom in Dublin (Ireland) for it", it was not liable to the cocket duties. (Great Britain, 1910).

2.3.2 Equality

According to Smith (1776), "taxation (including customs duties) should be equitable, that is, there should be equality of treatment for everyone." To that end, the European Court of Justice (ECJ)/Court of Justice of the European Union (CJEU) has repeatedly held in customs cases that the "principle of equal treatment" (non-discrimination) requires that comparable situations should not be treated differently, unless such a difference in treatment is objectively justified. The CJEU added the further requirement of *"the need for the uniform application of EU (customs) law."*

2.3.3 Convenience

Smith's maxim of taxation of convenience requires that: "Every tax ought to be levied at the time, or in the manner, in which it is most likely to be convenient for the contributor to pay it." Being indirect taxes that are borne by the ultimate consumer through the (duty inclusive) purchase price of the imported goods, 'convenience' has particular relevance in the case of customs duties. In recognition of this fact, the payment of customs duties on goods imported into the EU is deferred for an average period of 30 days following their release for free circulation. During this period, the importer has an opportunity to recoup the duties due through the sale of the goods.

This principle of deferred payment for a customs duty was first recognised in Ireland as far back as 1302, when payment of the duty due on imported wine was allowed to be deferred for 40 days (see Great Britain, 1875–86). In time (1660), the grant of the deferred payment of duty facility was extended in England to goods intended for re-exportation to facilitate the entrepôt trade – thereby anticipating warehousing (Crombie, 1962). This 'bonding' arrangement was, in turn (1662), converted, in Ireland, into a formal bonded warehousing regime thus making it "convenient for the storing and laying up of commodities … brought in with intent again for supply of foreign markets, by which much benefit and advantage may arise to His Majesty and people to be afterwards carried out(re-exported) without any payment of any duties (inwards or) outwards" (Excise Import Act 1662).The degree of 'convenience' provided by full warehousing facilities was best summarised by Crombie (1962):

> The warehouse system greatly assists the competitive position of the owner of the goods. By the deferment to the latest possible time of the duty point, duty is charged on what actually goes into home consumption, so allowing for natural losses, their scale depending on the methods employed, in storage and permitted operations. Capital is not locked up on duty payments for goods that are eventually exported, and both interest and insurance payments in respect of duty are reduced by the mark-time. So that a small trader may hold larger stocks. Moreover, traders can make large purchases at favourable prices and then await favourable selling markets: while sales are encouraged by the facility of exposing goods for sale and of drawing trade samples. The importer enjoys two great advantages of postponing payment of duty, and of retaining the option, to the very last moment, between entering the goods for home consumption and dispatching them for a foreign market.

Convenience should be viewed both in terms of Smith's maxim of taxation, and in the wider context of trade facilitation. While suspending the duty date, the introduction of the following customs regimes was also a response to proven trade needs:

- Temporary storage regime: no later than 1500, ships discharging foreign goods in Ireland could not 'break bulk' (land the goods) prior to making entry of the goods to customs. However, importers were unable to make entry on arrival of the ship as the documents required to support the entry (such as invoices, bill of lading and packing lists) accompanied the goods, and were carried in the 'ship's bag.' To circumvent the law, customs created the legal fiction in 1662 that a 'transit shed' (temporary storage building) was a part of the ship's hold – thus allowing the goods to be

discharged directly from the ship into temporary storage pending the preparation and presentation of the entry declaration and supporting documentation to the customs authorities. Some countries went as far as to enact the fiction of the temporary storage area being part of the ship's hold, for example Section 26 of the East African Customs Management Act 2004

- customs warehousing (long-term duty-free storage regime, 1662)

- inland clearance depots – referred to as dry ports in some countries – (designed to move goods away from congested borders, introduced in Ireland in 1967)

- inward processing (duty-free processing and manufacturing regimes,1558)

- free zones (duty-free storage primarily for entrepôt trade, from 12th century)

- removal of goods from the port of importation for clearance at the importers' own premises (1789) – forerunner of the approved consignee and Authorised Economic Operator concept

- transit (warehousing on wheels,1353)

- transhipment (1480)

- transire (allowed the duty-free movement of goods coastwise, 1346).

Each move to defer the duty point was driven by convenience and trade facilitation considerations. Specifically, minor operations on the goods (preservation and preparation of the goods for sale) were allowed in temporary storage and customs warehousing facilities. Further, customs warehousing facilities provided for the remission of duties on *bona fide* losses of goods in warehouse – whether due to approved operations, unavoidable accidental losses, or destructions and natural losses (wastage) due to the inherent nature of the goods (1602).

For their part, 'open' warehouses (not customs locked, and without a permanent customs presence) were created to give a warehouse keeper unrestricted access to his goods in the warehouse during normal working hours.

'Constructive warehousing' was established (no later than 1853) to obviate double handling of warehouse goods that were intended for direct delivery for home consumption. The system allowed goods imported for warehousing to be delivered for home consumption ex-ship, and the transaction to be processed through the warehouse records as if the goods were actually warehoused. In modern terminology the arrangement would be characterised as virtual warehousing, and probably seen as a business innovation.

Equally important from a trade facilitation standpoint, customs warehousing was a procedure (concept) that did not necessarily have to involve a structure of any kind –a warehouse could be delineated by a line drawn on a factory floor or an open space, if the circumstance warranted such an arrangement.

Inward processing relief provided for duty-free manufacturing/processing operations in operators' own premises.

On a larger economic scale, free zones provided for duty-free storage of goods in defined geographic areas – mainly to serve the entrepôt trade. From the late 1950s onwards manufacturing/ processing operations became an additional feature of free zone development. This in turn gave rise to a proliferation of new titles around the emerging zones, for example foreign trade zone, export-processing zone, special economic zone, enterprise zone, investment free zone and bonded zone. Although the different zone titles probably reflected differing objectives and activities, the nomenclature frequently reflected the implementing authorities' linguistic preferences rather than any functional differences between different kinds of zones.

2.3.4 Economy

The following abridged version of Smith's fourth maxim of taxation unmistakably refers to customs duties – the only reference to a particular tax in all his maxims:

IV. Every tax ought to be so contrived as both to take out and to keep out of the pockets of the people as little as possible over and above what it brings into the public treasury of the state. A tax may either take out or keep out of the pockets of the people a great deal more than it brings into the public treasury, in the four following ways.

First, the levying of it may require a great number of officers.

Thirdly, by the forfeitures and other penalties which those unfortunate individuals incur who attempt unsuccessfully to evade the tax, it may frequently ruin them, and thereby put an end to the benefit which the community might have received from the employment of their capitals. An injudicious tax offers a great temptation to smuggling. But the penalties of smuggling must rise in proportion to the temptation.

From the earliest times, customs controls were specifically designed to ensure the economical and efficient collection of customs duties. The nuclei of these controls were both simple and straightforward. In the main, they consisted of canalisation, concentration, prior notification and legally binding declarations. An Irish Act of 1611 encapsulated these administrative principles:

As by reason the King has not provided in any port of Ireland any certain quay, etc., or beam provided for weighing and trying the goods of the merchants resorting thither, nor for landing them as he has in England, so as every man discharges his goods when he likes without order, insomuch as the searcher cannot be present in more places than one, and is thereby sometimes enforced to take the merchant's word for the nature of the goods, which no doubt redounds oftentimes to the King's prejudice; it is fit that in the greatest and best ports there should be a convenient quay, crane, store house, and beam to weigh and try all merchants goods, whether imported or deported; to end no wrong may be done to the King in his custom.

When it came to the practice of 'economy', Ireland's judicious use of the principles of taxation and customs control managed to fuse the competing needs of maximum revenue collection, on the one hand, with the requirement of minimum interference with legitimate trade on the other. On accession to the European Economic Community (EEC) in 1973, Ireland, in common with other Member States, was allowed retain 10 per cent of the customs duties collected on behalf of the EU to cover their administrative costs. Their known actual cost per year during the period 1978 to 1983 were 2.593, 2.515, 2.198, 2.358, 2.463, and 2.612 per cent, respectively (Irish Government, 1984). The amount each Member State was allowed retain as the cost of collection was raised to 25 per cent in 2000, reduced to 20 per cent in 2001, and will revert to 25 per cent from 2021. It is worth noting that Smith recorded the annual cost of collecting the customs duties in England for 1755 to be 10 per cent of net revenue (exclusive of drawbacks).

3. Goal of the customs administration

Broadly speaking, the overarching goal of a traditional customs administration is to achieve the following, competing objectives:

i.   the collection of duties and like charges through effective and economic administration of the law

ii. minimum interference with legal trade

iii. equal treatment of traders and other persons affected by the controls.

It is worth noting that customs controls have always applied equally to prohibited and restricted goods, and terrorism. Customs were traditionally regarded as gatekeepers or defenders of the realm – hence the portcullis ('portcolys defensable') emblem in the crests of some national customs services symbolising their role and responsibility for the gates through which international trade must pass. As early as 1215 there are recorded payments of 'customs' duties for "the protection of the ship of Gerrard Mercer of Waterford (Ireland), his wife Eve, and all of their goods and chattels on board, and with the liberty of free traffic throughout the King's domain" (Great Britain, 1875−86) (goods in free circulation).

In 1299 there was a prohibition on the exportation of the "King's money or any other pure silver" and on the importation of "false money." The penalty for importing false money was "forfeiture of life and goods" (Customs Act 1299).[3]

It is also worth recording that the historical fiscal limits of ports (laid down in 1559) were associated with the defence of the realm, and threats from acts of piracy. The limits were set at three miles, which is said to have originated with the cannon-shot rule, "The rule by which a state has territorial sovereignty of that coastal sea within three miles of land. Its name derives from the fact that in the 17th century this limit roughly corresponded to the outer range of coastal artillery weapons, and therefore reflected the principle *terrae dominum finitur, ubi finitur armorium* (the dominion of the land ends where the range of weapons ends)" (Oxford University Press, 2021).

4. Principles and objectives of customs control

4.1 Principles of customs control

As stated previously, the then Customs Co-operation Council (CCC), in its *Comparative Studies of Customs Procedures* (CCC, n.d.) undertaken in the 1950s and 1960s, concluded that the principles of customs control were broadly consistent with the principles underpinning the Revised Kyoto Convention –without identifying or specifying the underpinning principles involved. The CCC study reports were based on responses to questionnaires completed by the 27 customs administrations of the founding members (including Ireland) on 11 specific aspects of customs practices and procedures. In the study report dealing with *Importation by Sea: Formalities on Arrival of Ships prior to Unloading*, the CCC concluded, *inter alia*, that the various practices and procedures in force throughout the then member countries were based on the same "basic underpinning principles of Customs control over ships and cargo":

> National legislation concerning importation by sea is generally very old, and overlaid with custom. Woven as it is into the pattern of maritime commerce, it reflects conditions – local, geographical and even historical – which may vary from country to country, and, at times, from port to port; procedures devised to meet conditions in the Baltic would not be suitable for use in the Aegean; and those applied to short sea journeys in the English Channel or the Mediterranean would be inappropriate in deep – sea Atlantic trade. Whilst uniformity, except on the broadest general lines, cannot therefore be looked for, this study nevertheless shows not only that the Customs and the countries concerned are generally in agreement on the basic principles of control of ships and cargo arriving from abroad, but, in many respects, their procedures, if different in detail, are comparable in purpose and method. (CCC, 1957)

4.2 Objectives of customs control

Customs control objectives are achieved using several basic principles of administration. For illustrative purposes, some of the more important ones are set out hereunder in the context of the importation of goods by ship.

4.2.1 Onus

There is an onus on the carrier to bring the goods without delay, by a specified route, to an approved customs area, and to report/declare the cargo within the prescribed hours at a designated customs office. The importer/declarant must make the requisite, legally binding declaration and, where appropriate, assess and declare the duties or levies properly payable; present the goods to customs, and, when called on, render all required assistance, including the provision of any special examination facilities. Failure to comply with any of the foregoing requirements can lead to penalties, and/or forfeiture of the goods.

There is also an onus on the carrier/importer/declarant to notify customs of any unavoidable accidents, or losses, to goods prior to their release for free circulation, and to satisfy customs that any goods deficient did not go into home consumption.

By the same token, the onus is invariably on the importer to prove that duty on imported goods has been paid. This requirement dates to 1303.

4.2.2 Concentration and canalisation

To concentrate foreign trade through prescribed channels, and thereby enable customs control to be applied effectively and economically, customs legislation provides that the authorities may appoint certain ports through which all foreign trade must pass (1222). They may also define the fiscal boundaries of such ports for customs purposes (1559), and they may further concentrate traffic within the port by appointing specified legal quays at which the goods must be unloaded (1559). They may also appoint sufferance wharves in lieu of legal quays (1695). Once ports, legal quays and sufferance wharves have been appointed, it follows that importation by vessels using routes and places not appointed is automatically illegal.

Further concentration is achieved by placing restrictions on the minimum size of vessels allowed to be used in the transport of import goods. In this way trade in high duty goods is concentrated into the bigger ports where the necessary staff and facilities are available to deal with the consignments (1464).

The principle of canalisation is centuries old. For example, in 1222 the King of England decreed that "no subject can erect a port or place of landing of merchandises, at least unless it be for his own ship or vessels, without the King's licence" (Hale, 1976).

The principle of canalisation is flexible and may also be adopted to meet official requirements in other directions. For example, the principle is very much in evidence at land borders where designated traffic lanes for different categories/types of vehicles are used for orderly traffic flows; at ferry terminals and airports where the use of red/green channels for processing travellers is a standard feature, and the way postal traffic is streamed through designated parcel post facilities.

4.2.3 Declaration

A declaration or 'entry' is a document containing the particulars of goods in a prescribed form which an importer, or his agent (1303), is required to pass through customs before foreign goods are landed or discharged from an importing ship. The document varies in form according to the nature of the goods,

and the purpose for which they have been imported. Nearly every facet of customs administration involves a legally binding declaration in some form or another. This applies to the carrier of the imported goods, the importer himself, his authorised representative, or a traveller arriving from foreign.

Notwithstanding changes in modes of transport and importation, this position is grounded in long-standing historical custom and practice. Carson (1972) neatly captured the facility of customs to cope with new situations in terms of old established principles, stating that on 25 July 1909, "Louis Bleriot, the French Airman made his historic flight across the English Channel and landed in a field near Dover. On the arrival of the monoplane from Calais, the preventive man in charge interviewed M. Bleriot and issued him with a Quarantine Certificate, thereby treating it as a yacht, and the aviator as master and owner. The Collector of Customs for the area reported to the Board of Commissioners that "a time might come when the Department would have to treat the arrival of aircraft seriously, and take steps to ensure that no opportunity be given for revenue interests to suffer through indiscriminative landings of airships in this country".

4.2.4 Differentiation

The selection of imported goods for physical examination is primarily based on risk analysis. A range of risk factors feed into the risk analysis system to better inform the selection process. The nature and extent of the physical examination of goods varies according to the duty risk involved. Accordingly, an examination may be either full or partial, depending on the customs risk rating of the goods. The EU does not prescribe the proportion of consignments to be examined, or the scales of internal examination to be carried out by customs administrations. Ideally such measures need to be prescribed if all the Member States are to operate as a uniform Customs Union.

4.2.5 Verification

In the past, physical checks were the primary method of customs control. The checks ranged from verification of the trader's self-assessment or declaration (whether written or otherwise) to counting or weighing the goods. The accuracy of a ship's report could be verified by the simple expedient of 'tallying' the goods on landing (now an outdated concept). Likewise, the veracity of the importer's entry declaration could be verified by the physical examination of the goods to ensure conformity with the legally binding entry declaration. The removal of goods from official storage places is challenged to verify that they have been properly cleared by customs and are covered by an official clearance docket (out of charge note).

Today's heightened challenges to customs administrations are, however, much more multifaceted and stem from many sources. Among these are the globalisation of trade, fraud and the threat from terrorism through the international supply chain; the increased volume of trade and just-in time delivery: the sophisticated nature of products and transport services; and the growth of electronic commerce. These new challenges necessarily required a change in the working methods of customs administrations, with the focus shifting from physical examinations to post-importation audits at the importer's own premises. Here again, however, this was not a new departure for customs. As far back as the Tobacco Act of 1789, Adam Smith's proposed new excise warehousing system for home-manufactured tobacco was both adopted and applied to tobacco imports. In effect, this gave customs what they characterised as a 'double hold' on the imported goods. The new hybrid control system applied the customs regime up to the point of importation. Following importation, the excise system of controls and checks were applied at the importer's premises, and on his records– in effect, post-importation checks and audits conducted at the importer's own premises (excise survey).

4.2.6 Rights

For obvious reasons, customs administrations always ensure they have the prescribed right to open, examine, sample and take account of goods. This right applies across the board and is not confined to any one aspect of customs control. Furthermore, most customs administrations have what can be loosely termed as 'police' powers that enable them to conduct post-importation verifications and checks at importers' premises. At the same time, they invariably have powers to obtain search warrants to look for (and seize) uncustomed goods, and/or any documents relating to illegal customs transactions.

As a corollary, the customs authorities invariably have powers to investigate and prosecute customs offences, including the power to detain (term of art for 'arrest') suspected offenders, and to seize all conveyances used to import or convey the uncustomed, prohibited or restricted goods.

4.2.7 Lien on uncustomed and prohibited goods

In Ireland and the UK, the rules relating to seizure, and subsequent forfeiture, of goods due to the non-payment of customs duties can be traced back to the 1200s. In his dissertation on the *'Question Concerning Impositions',* Sir John Davies (1569−1626; Attorney-General for Ireland) made the following distinction between customs duties and 'tolls'; "Lastly, if customs be not paid or agreed for before the merchandises be discharged and brought to land, the merchandises are ipso facto forfeited and may presently be seized to the use of the King, but if toll be not paid, the thing sold is not forfeited, only it may be distrained and detained till the toll be paid" (Davies, 1656).

An Ordinance of April 1645 gave "Power to Customs Commissioners and others to search for prohibited goods.; And seize them.; All such seizures made by Commissioners' servants, etc., to be certified to them.; Fraudulent Composition forbidden.; Customs Commissioners may appoint Messengers.; Security, how to be taken.; Assistance.; Indemnity.; This Ord. to be printed and sent to Ports of Kingdom."

4.2.8 Identification

In defined instances, the customs authorities will find it necessary to apply official marks or seals to goods. This can be necessary for both identification purposes, and to ensure the fiscal security of the goods. This practice is a particular feature of the movement of goods in transit, whether in a national or EU context. It generally follows that it is an offence to remove such official marks or seals. Such action normally indicates interference with the goods, with the result that any deficiency found in the goods is liable to be charged with duty. The thinking is that the goods deficient have found their way into home consumption and are, accordingly, liable to duty, unless the loss or deficiency is otherwise accounted for to the satisfaction of the customs authorities.

In Ireland, the origins of the use of marks or seals as a means of identification for customs control purposes can be traced to 1353. At that time, there was 'intra-community' trade between the staple ports in Ireland, England and continental Europe – Bruges and Calais in particular. Wool for export was weighed, inspected and sealed by the mayor of the staple town, and the outward 'custom' paid. The goods were then sent to the linked port of exportation, were examined on arrival there to ensure that the seals were intact, and reweighed as a precautionary check against illegal abstractions or substitutions. In effect, these measures were a sophisticated transit system that safeguarded against illegal extractions and the substitution or addition of undeclared or prohibited goods (Edward III, 1353).

4.2.9 Economic theory

Historically, customs administrations have operated on the premise that duty is not payable on goods that have not gone into home consumption. Consequently, duty is not payable on any goods short-shipped, or lost in transit. Also, where goods are lost prior to clearance for home use because of unavoidable accident or natural wastage due to their inherent nature, the duty is remitted subject to the importer providing satisfactory evidence to the customs authorities that the goods have not gone into home consumption. An Irish Customs Act of 1662 applied the principle in a very 'trader friendly' manner by providing that the duties would be remitted or repaid in the following circumstances:

i.   ten per cent allowance for the "leakidge" of wine in cask

ii. duty on "corrupt and unmerchantable" wine was abated, subject to the discretion of Customs – currently this relief measure is conditional on the destruction of the goods under official supervision

iii. the remission of export duties on the re-exportation of goods not sold within 12 months, and exported "without alteration of the property (in the "unaltered state")

iv. drawback of duties on re-exported goods.

The principle also plays an important role in customs valuation. The value of goods that have been damaged, or have deteriorated prior to customs clearance, may be reduced for duty charge purposes. Likewise, customs may, subject to production of supporting evidence (for example, a credit note from the seller, a statement from an independent expert such as a surveyor or loss assessor, or the reimbursement of the repair cost by the seller in accordance with the terms of the warranty) refund duties on goods found to have had latent defects that were not apparent at the time of importation, and only came to light through the course of normal use after clearance by customs. The amount of duty to be refunded may be either: (a) the full amount paid where the defective goods are irreparable, or (b) part of the amount paid where the defective goods are repaired, and the seller reimburses the importer under warranty for the cost of the warranty work carried out. Further, repayment or remission of duties may be allowed in cases where the imported goods are rejected by the importer on the grounds that they are not in accordance with the terms of contract. Further again, regarding tariff classification, if import goods deteriorate or change their characteristics while under customs control, duty is charged in accordance with the changed tariff heading, for example waste intermediate products and by-products resulting from approved customs operations.

Wolffgang and Harden (2016) have highlighted the cost and confusion surrounding the failure of the EU to legislate for this economic principle (theory) when it came to the construction of the Community Customs Code. What happened in practice was that the EU Commission, in the course of consolidating customs law into the Community Customs Code (1994), appears to have inadvertently omitted to carry forward the following fundamental economic principle into the 'consolidated' legislation, namely, "the reasons for the extinction of a customs debt must be based on the recorded fact that the goods have not been used for the economic purpose which justified the application of import or export duties." The net result was that, contrary to the 'economic theory', the ECJ ruled in a cluster of cases that duty liability turned on the question of whether there was a breach of a regulation that prevented customs exercising a proper (interim) control of the goods, rather than relying on the fact that the goods did not go into home use or consumption (the historical criterion). While the apparent legislative error (omission) was rectified in time, it took 22 years to do so. If nothing else, this experience highlights the advantage of using the fundamental principles of customs taxation and controls as a blueprint when reviewing, revising and drafting customs legislation.

The economic criterion (theory) was also used by the ECJ to determine if drugs were to be regarded as goods for customs tariff purpose. It found that "a customs debt cannot arise upon the importation of drugs which may not be marketed and integrated into the economy of the Community (EU)."

The wider, equitable principle of *force majeure* can be traced back to 1402. The Customs Act 1402 dealing with designated ports– the 'great ports' – decreed that; "Merchandises shall be laden and unladen in the great ports and not in creeks and small arrivals, upon pain of forfeiture of such merchandise to the King, except vessels and merchandise in such creeks by coercion of Tempest."

4.2.10 Minimum interference with legitimate trade

Customs administrations make every reasonable effort to accommodate and adapt their work practices to legitimate trade needs. Accordingly, legal and permitted places and hours of working are set to accommodate normal trade requirements, and working hours may be extended on 'request.' It is worth recording that in 1695, more than three hundred years ago, an English Customs Act 1695 provided that customs officers were to attend "... at times and places not required by law for the reasonable accommodation of trade."

The foregoing provisions are remarkably like those contained in the EU Customs Code Implementing Regulation (European Commission, 1993). According to Article 239 of the regulation:

> The goods shall be examined in the places designated and during the hours appointed for that purpose by the customs authorities. However, the customs authorities may, at the request of the declarant, authorise the examination of goods in places or during hours other than those referred to. (p. 1)

5. Principles underpinning the Kyoto Convention

5.1 Role of the Customs Co-operation Council Member States

The principles underpinning the Kyoto Convention on the Simplification and Harmonisation of Customs Procedures – which were extrapolated from the laws and procedures of the CCC (WCO) founding member countries, including Ireland – help explain the constituent elements of worldwide customs laws and procedures. Further, as far as Ireland and the other CCC (WCO) founding members are concerned, these principles of customs law and practice have merely travelled the full circle. They were conceived, nurtured and developed over the centuries at national level; assembled as best practice in the original and Revised Kyoto Conventions; used to mould, *inter alia*, EU Customs law; and then handed down to Member States, whose laws they originated from, as binding EU law.

The genesis of customs law is set out in Figure 1 below.

Figure 1: The Genesis of Customs law

IRELAND CUSTOMS PROCEDURES

WCO was established in 1952 (CCC) to harmonize customs procedures

27 original signatories to the WCO submit customs procedures based on questionnaires

Distillate of common principles and procedures by WCO

EU LAW

Kyoto Convention (KC) was developed in 1974 on the basis of distillate

Revised Kyoto Convention (RKC) in 1999 keeping same principles

EU Signatory to KC + RKC

Source: Walsh, 2020.

5.2 Principles used to formulate a regional customs code

The true test of all principles is to establish if they work in practice. To that end, the foregoing principles of taxation and customs control were used, *inter alia,* in the construction of the Customs Management Regulations (CMRs), 2009, for the Common Market for Eastern and Southern Africa (COMESA). At the same time, COMESA concluded that they should first establish the core mandatory measures required for a common market customs code. Rather than reinvent the wheel, they looked to see how the EU Customs Code was formulated and perfected over the years. Based on Walsh (1986) and seeing the results put into practice and fused into the EU Community Customs Code in 1994, COMESA designed their CMRs in accordance with the following formula:

The nucleus of the Community Customs Code (CCC) consists of the sections dealing with the duty elements – classification, valuation and preferential tariff treatment. These elements merge at the duty point i.e. the point at which the duty becomes chargeable on the imported or exported goods, and are of paramount importance in the scheme of the Code. The remaining policing provisions in the Code are largely procedural, and are designed to either, channel the goods to the duty point, to police the goods while they are marking time in a duty suspension regime, or to ensure that conditionally exempt goods are put to their declared end use. In the circumstances, the duty points for the determination of classification and valuation have to be set in stone for the various customs procedures involved. Otherwise import goods could be classified and valued differently throughout the EU, and cause deflections in trade. By the same token, duty refunds, remissions and exemptions have to apply equally throughout the EU. The same considerations apply to the determination of the dates governing the imposition and application of changes in tariff measures. In short, every measure with a bearing on the amount of duties payable, and when they are payable, has to be uniformly interpreted and applied without exception throughout the EU. By the same token, the person or persons liable for the customs debt has to be likewise set out in stone, along with the statutory period of liability, thus satisfying the twin principles of legal certainty and legitimate expectations.

One thing the EU has learned over the years is that customs taxation elements necessarily have to be backed by regulations that had general application, are binding in their entirety, and are directly applicable in all Member States. Legal measures short of regulations were either ignored by Member States, or interpreted and applied by them to their own advantage. Of necessity, these considerations led to the codification of EU customs law in binding legal form, leaving Member States with no measure of discretion on taxation issues and with little or no room in which to manoeuvre. (Walsh, 1986)

5.3 National and regional laws base

COMESA further concluded that the prerequisite national and regional duty elements, together with the supporting framework legislation, were all based on separate international agreements that the countries in question were either a party to, or were in the process of adopting. In furtherance of this premise, COMESA constructed their Common Market CMRs 2009 based on this blueprint. They also used the provisions of the then Community Customs Code to make good the gaps in the Revised Kyoto Convention (RKC) concerning the legal certainty of, *inter alia*, duty points and liabilities, while, at the same time, putting legal flesh on the adopted RKC skeleton provisions – thus aligning (*mutatis mutandis*) the substantive sections of the CMRs with the primary provisions of the Community Customs Code. The net result was that both COMESA and the EU shared the same substantive customs code provisions up to May 2016 when the Union Customs Code entered into force in the EU. The correspondence between the two Customs Unions was designed to ensure that imports and exports between the two regions would be subject to the same legal provisions and, in effect, to the same jurisprudence – thus facilitating the free flow of trade and, at the same time, providing legal certainty for all concerned.

When it came to sensitive sovereign and constitutional considerations, COMESA simply enacted the relevant RKC provisions verbatim on the understanding that they would be treated as 'directives', namely, "a directive shall be binding upon each Member State to which it is addressed as to the result to be achieved, but not as to the means of achieving it." (Treaty Establishing the Common Market for Eastern and Southern Africa, 1993, Art. 10).

The COMESA CMRs also provided the following framework for the use of information technology in promoting efficient administration:

> 55. The competent authorities shall, as far as is practicable, make use of information and communication technology in support of their prevailing customs procedures with a view to attaining: (a) more effective customs controls; (b) more effective customs clearance; (c) uniform application of these regulations; (d) more efficient revenue collection; (e) more effective data analysis; (f) efficient production of external trade statistics; and (g) improved quality of data. (COMESA, 2009)

The construction of the COMESA Common Market CMRs 2009 is illustrated in Figure 2.

Figure 2: The construction of the COMESA Common Market CMRs
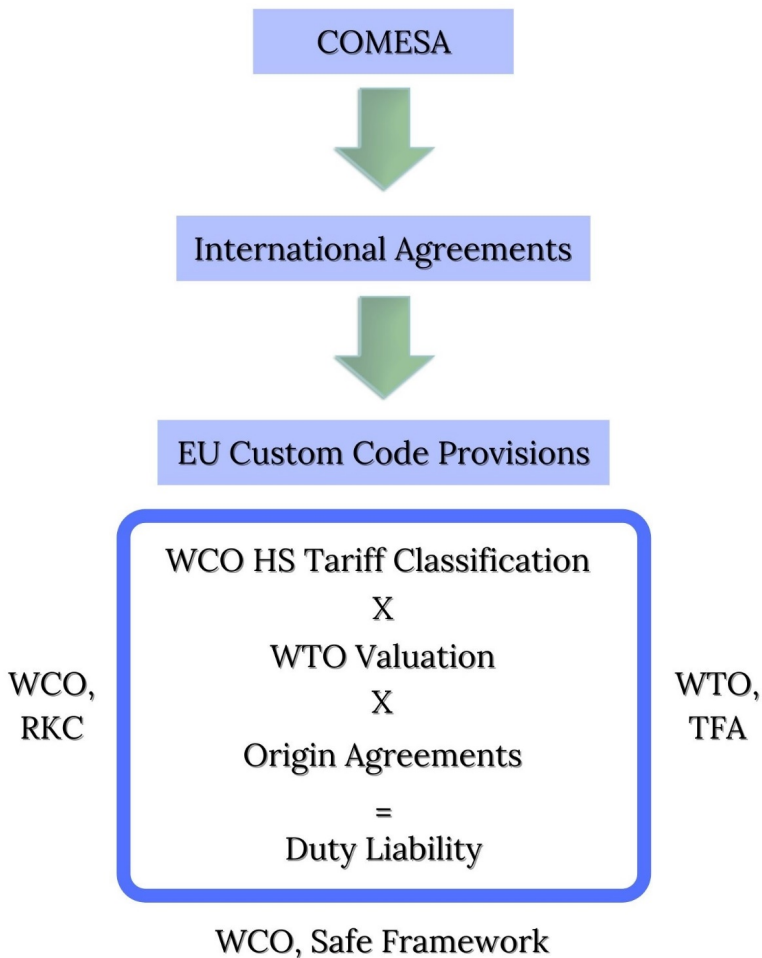
Source: Walsh, 2020.

6. Conclusion

When centuries-old customs law and practice are closely analysed, one is faced with the continuing task of devising a system of customs control that satisfies the competing needs of maximum revenue collection and minimum interference with evolving legitimate trade. In the first instance, the previously unidentified key to this dilemma has always been the availability of the necessary supporting documentation to prepare and lodge the requisite entry declaration to effect customs clearance of the goods. Up to the advent of fax machines the supporting documentation necessarily came in the 'ship's bag'. The restriction on the ship not being allowed 'break bulk' prior to entry of the goods resulted in long and costly delays to shipowners. Not later than 1500, it was enacted that, upon pain of forfeiture of the goods, "no maner of person or persons brings any maner of merchandizes or wares …. into this land, break bulk, or bring any wares out of any ship or ships till the same were entered in the customer's book by the merchant owner of the said wares" (Customs Act 1500). As previously recorded, this conundrum was resolved in an imaginative solution that created the legal fiction that a transit shed (temporary storage area) was an extension of the ship's hold. The sole purpose of the transit shed facility was to give the importer sufficient time to prepare his entry to clear the goods; and, if necessary, to inspect them under a Bill of Sight to make a perfect entry.

Undoubtedly the computerisation of the processes around the entry and clearance of goods has been the most significant development in customs work practice in the past 50 years. Computerisation saw the previously separate and time-consuming entry and processing stages of the physical 'lodgement';'acceptance'; 'passing' and 'screening' of the entry declaration rolled into one, omnibus, instantaneous processing procedure. Further, the entry declaration could be prepared and submitted by a declarant from a terminal anywhere in the country or region. Crucially, computerisation enabled the clearance of goods immediately on completion of the various processing stages.

The position now is that the requisite documentation may be sent electronically in order to be to hand before the goods are physically imported. In recognition of this fact, and to ensure that customs clearance keeps pace with international supply chain demands, it is incumbent on customs administrations to legally provide for such innovations. To that end, the use of electronic documents in lieu of paper documents; the acceptance of such documents as 'originals' for evidential purposes, and the recognition of electronic signatures must be enshrined in law. Further, history has taught us that the earlier duty liability and prohibition dates associated with pre-arrival clearance must be separately legislated for to safeguard against 'forestalling' – bringing the entry acceptance date (such as the date determining the rate of duty) forward to evade any pending new imposition of duties or prohibitions and restrictions.

The acceptance of electronic documents in lieu of paper documents facilitates the prior lodgement, processing and checking of entry declarations. Customs authorities are, in turn, then able to carry out risk assessment, and grant the pre-importation clearance of goods before the arrival of the import conveyance in the customs territory. With containerised sea traffic accounting for more than 70 per cent of global trade, the significance of pre-clearance in terms of the potential savings in time and money is clearly evident.

Of course, temporary storage (transit shed) facilities are not required for goods cleared prior to importation as temporary storage is limited, by law, to uncleared goods. This restriction is necessary to ensure that cleared goods are not used as a cover to remove uncustomed goods.

It is worth noting that these realities were recognised in the COMESA CMRs some ten years ago by providing that the sea (or air) journey time could be used to enter and declare the goods to customs, and where the goods were not selected for examination they could be cleared for delivery for home

use prior to physical importation. Aside from making the goods immediately available for delivery ex-ship, the savings in time (days), and proportionate double handling and storage costs associated with temporary storage, could be very substantial.

This contingency did not arise in cases of land or rail border crossings as customs clearance could be delayed– without impacting on the importer – up to the time of arrival of the conveyance at the border.

It is worth noting that Article 182 (3) of the Union Customs Code allows, subject to conditions, for the concept of pre-arrival clearance of goods by Authorised Economic Operators ('trusted traders') for the same reasons that underpinned the predating CMR provisions.

Regarding the potential danger of undeclared goods being added to goods 'pre-cleared' during the voyage, electronic seals and random spot-checks on selected 'pre-cleared' containers should mitigate this concern. Here again, it is simply a question of applying centuries-old solutions to seemingly new problems in providing adequate 'transit' safeguards against illegal abstractions and insertions during the voyage. Like preventive measures were in force no later than 1735 when an Act of Parliament of that year specifically prohibited the interference with goods – to facilitate smuggling – once the ship came within four leagues (12 miles) of the coast. Territorial waters and the limits of fiscal ports extended to 3 miles only.

Like the Roman god Janus who is portrayed with two faces, one looking to the past and the other to the future, customs law and practice has strong roots in the past, but is now moving rapidly to an electronic future with corresponding changes in work practices. Ultimately we should be looking to create a blueprint for a world customs code based on the shared centuries-old tried and tested principles of taxation and controls. If nothing else, people would know the "what "and the "why" of customs law, which is clearly not the position today throughout the world.

Arguably, you must look backward and forward at the same time to facilitate trade on the one hand, and to maintain the revenue stream on the other. Only the principles remain the same.

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Notes

1   Commonly referred to by the abbreviated title "The Wealth of Nations". All references throughout this article to Smith's principles, maxims or canons of taxation can be attributed to this publication.

2   The original documents are held in the library of University College Cork.

3   The act has an interesting history. It is titled "The Statute of Stepney on Bad Money (Statutum de Falsa Moneta (1299)". Although bearing the form of a statute, it was 'enacted' in the private house of the mayor of London. Accordingly, its official designation is that of a proclamation, and is cited as 27 Ed 1. "Importation and Exportation of Coins" is a modern a adaptation of the title.

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The Right to be Heard in EU Customs Law

Fabrizio Vismara

Abstract

This article analyses the origin and the main features of the right to be heard as a general principle of European Union (EU) law. It also analyses the EU customs rules regarding this principle, which are included in the regulation 952/2013 establishing the Union Customs Code and in the Commission Implementing Regulation (EU) 2015/2447. To this end, the analysis, also based on European Court of Justice (ECJ) case law, refers to possible restrictions to the right to be heard and the consequences arising from its violation. It highlights how the right to be heard protects not only the interests of individual customs operators, but also the interest of the EU in the proper conduct of relations between EU Member State authorities.

1. The right to be heard and its origin in EU law

The right to be heard, as a fundamental principle, has general application in European Union law. Its origin dates to the beginning of European Union integration, at the time when the European Economic Community was building up, step by step, its peculiar and, to a certain extent, unique features (Dinan, 2014; Hoffman, Rowe, & Türk, 2011). Specifically, the right to be heard has been established by the European Court of Justice (ECJ) since 1963 in its judgement of 4 July 1963 rendered in case no. 32/62. The Court of Justice considered the right to be heard as a general principle of law and that the Community's bodies, before applying an unfavourable decision to any persons, must allow these persons to submit defences in relation to the charges that were moved against them. The Court also considered the right to be heard as a principle generally recognised by the administrative laws of all member States.

Subsequently, in the judgement dated 24 October 1996, in the case C-32/95, the Court of Justice reiterated that the respect of the right to submit defences, within any proceedings commenced against a person and that may result in a decision that is prejudicial to such person, constitutes a fundamental principle of Community law. The Court held that any person, in relation to which a prejudicial decision might be adopted, must be put in a condition to know and to express his/her point of view with respect to the elements that were taken into consideration against him/her and on which the prejudicial decision was based. The Court also noted that national authorities must respect the right of defence as established by its case law, as this is the expression of a general principle.

In further stressing the relevance of such a principle, the Court of Justice, in its judgement dated 13 September 2007, cases C-439/05 and C-454/05, specified that respect of the right of defence, and of the related principle of the right to be heard, is applicable in all proceedings instituted against a person and that may result in an act which is prejudicial for the latter, so much so that respect of this principle must always be guaranteed by all member States, even in the absence of a specific statutory provision to this effect. A further statement on the right to be heard is included in the EU Court decision dated 18 December 2008, in the case C-349/07. The Court reaffirmed that respect of the right of defence constitutes a general principle of EEC law and two consequences arise from this principle: the party interested by a prejudicial act must be granted an adequate term to be heard by the State authorities and

the national judges must verify whether the relevant administration has adequately taken into account the observations that were transmitted to it. The purpose of the right to be heard is, on the one hand, to enable the competent authority to effectively take into account all relevant information and, on the other hand, to enable the person concerned to correct an error or submit such information relating to his or her personal circumstances "as will argue in favour of the adoption or non-adoption of the decision, or in favour of its having a specific content" (C349/07).

As a general principle (Amalfitano, 2018; Groussot, 2006; Papadopoulou, 1996; Pescatore, 1980), the right to be heard is included in the Charter of Fundamental Rights of the European Union. [1] The provision to which reference is to be made is Article 41 of the Charter, according to which the right to a good administration, with respect to the activity of the institutions and bodies of the European Union, entails the right of each individual to be heard prior to the adoption of a prejudicial individual decision against him/her. This principle that guarantees the right to good administration is not retroactively applicable, as the European Court of Justice pointed out (C-129/13 and C-130/13), so it can be claimed since 1 December 2009, when the Charter of Fundamental Rights of the European Union entered into force. In addition, according to the Court of Justice such principle also includes, as a logical consequence, that "the addressees of decisions which significantly affect their interests must be placed in a position in which they can effectively make known their views as regards the information on which the authorities intend to base their decision" (C-349/07).

A further and coherent consequence of the abovementioned principle is that the authorities of Member States are subject to the obligation to recognise the right to be heard when they take decisions which come within the scope of EU law, even though their applicable legislation does not expressly provide for such a procedural requirement (C-349/07).

2. The right to be heard in EU customs law

As to the Customs Code perspective, recital no. 27 in Council regulation 952/2013 (hereinafter, the 'Customs Code') states, also in accordance with the Charter of Fundamental Rights of the European Union, [2] that "it is necessary, in addition to the right of appeal against any decision taken by the customs authorities, to provide any person with a right to be heard before any decision, which would adversely affect him or her, is taken. It is understood that the right to be heard is a fundamental principle in customs law" (UE 952/2013). [3]

According to Section 22, paragraph 6, first part of the Customs Code, which reproduces Section 16, paragraph 4, of regulation no. 450/2008, "before taking a decision which would adversely affect the applicant, the customs authorities must communicate the grounds on which they intend to base their decision to the applicant, who shall be given an opportunity to express his or her point of view within a period prescribed from the date on which he or she receives that communication or is deemed to have received it" (UE 952/2013). [4] Such a provision was not included in the Customs regulation of 1992 (EEC 2913/92). Section 6, par. 3, of this regulation stated that any decisions adopted by the customs authorities, which either reject requests or are detrimental to the persons to whom they are addressed, shall set out the grounds on which they are based and shall refer to the right of appeal. [5]

The provision included in Section 22, paragraph 6, first part of the Customs Code, concerns decisions taken by customs authorities [6] that may "adversely affect" the applicant or addressee: this means that these decisions are those which produce legal and unfavourable effects. [7] In addition, the fulfilment by customs authorities of the obligation of communicating to the applicant the grounds on which they intend to base their decision must be effective: this means that the reasons of the final provision must correspond to those communicated in advance to the applicant and cannot be substantially different.

The right to be heard is also contemplated in specific areas of customs law. According to Section 70, paragraph 3, of the Customs Code, the transaction value method, as a primary basis for the customs evaluation of goods, applies provided that several conditions are fulfilled. [8] Should these conditions not be met, instead of the transaction value method, the customs value of goods shall be determined by using the secondary methods set forth by Section 74 of the Customs Code. [9] The conditions mentioned by Section 70, paragraph 3, of the Customs Code include the fact that the buyer and seller are not related, or their relationship did not influence the price. Consequently, in the event of customs transactions between related persons, reference should be made to Section 134 of the Commission Implementing Regulation (EU) 2447/2015. According to this provision, where the buyer and the seller are related, and to determine whether such a relationship did not influence the price, the circumstances surrounding the sale shall be examined as may be necessary. In this case, the declarant shall be given an opportunity to supply further detailed information as may be necessary about those circumstances. [10]

In addition, with reference to the effectiveness of the right to be heard, Section 8 of the Commission Implementing Regulation (EU) 2015/2447 should be mentioned, which relates to the 'General procedure for the right to be heard'. This provision establishes that the communication of the grounds on which the customs authorities intend to base their decision, which would adversely affect the applicant, shall include a reference to the documents and information on which the customs authorities intend to base their decision. It shall indicate the period within which the person concerned may express his or her point of view from the date on which he or she receives that communication or is deemed to have received it. [11] It also establishes that said communication shall include a reference to the right of the person concerned to have access to the documents and information on which the customs authorities intend to base their decision in accordance with the applicable provisions. [12]

3. Possible restrictions to the right to be heard

A further point to examine is whether and to what extent the right to be heard, as a fundamental right, can be subject to restrictions. From a general perspective and according to the European Court of Justice, fundamental rights can be subject to restrictions to a certain extent. However, such restrictions are subject to specific requirements: they must reflect a general interest from the European Union perspective and they must be compliant with the principle of proportionality (ECJ, C-28/05; Ellis, 1999; Emiliou, 1996; Wouters et al., 2020; Varju, 2014; Alston, 1999). The Court also pointed out that the general principle of EU law of respect for the rights of the defence is not an unfettered prerogative but may be restricted, provided that the restrictions correspond to objectives of public interest and do not constitute, in the light of the objectives pursued, a disproportionate and intolerable interference which impairs the very substance of the rights guaranteed (C-298/16).

As mentioned in the previous paragraph, recital no. 27 of the Customs Code states that restrictions to the right to be heard may be justified if required by the nature or the level of the threat to the security and safety of the Union and its residents, to human, animal or plant health, to the environment or to consumers. Such provision reflects, more generally, the safeguard principle also expressed in Section 36 of the Treaty on the Functioning of the European Union, which concerns restrictions on import and export of goods between Member States. According to such provision, the freedom of movement of goods does not preclude prohibitions or restrictions on imports, exports or goods in transit justified on grounds of public morality, public policy or public security, the protection of health and life of humans, animals or plants, the protection of national treasures possessing artistic, historic or archaeological value or the protection of industrial and commercial property. [13]

Exceptions to the right to be heard are provided for by Section 22, paragraph 6, part two, of the Customs Code. A first exception concerns decisions relating to binding tariff information (BTI decisions), and decisions relating to binding origin information (BOI decisions). Such decisions are

taken upon application and they are binding on the customs authorities and on the addressee of the decision. [14] This provision reflects the specific nature of the proceedings aimed at the release of binding information, where the Member State Customs Authority is involved in assessing the requirements for the tariff classification or determination of the origin of goods, being such assessment binding both on the customs authorities and against the addressee of the decision. [15] However, the exception to the right to be heard is not applicable in the event the Customs Authority decides to reject the application for a binding information decision. As stated by the European Commission, [16] the right to be heard must be allowed when the customs authority refuses to issue a BTI decision, because the refusal of customs authorities to issue such a decision can be considered as potentially detrimental to the interests of an economic operator. Consequently, the customs authority, when notifying the applicant of its impending decision, must invite the applicant to express their point of view on the matter.

A second exception to the right to be heard regards the refusal of the benefit of a tariff quota where the specified tariff quota volume is reached. [17] This provision refers to Article 56(4) of the Customs Code, [18] which sets forth an automatic termination of preferential measures or exemptions because of reaching the allowed volume of imports or exports.

A further exception, which also reflects recital no. 27 of the Customs Code, concerns a safeguard clause which is applicable where the fundamental interests of the European Union are put in danger: this can occur where "the nature or the level of a threat to the security or safety of the Union and its residents, to human, animal or plant health, to the environment or to consumers so requires" (EU 952/2013). [19]

Also, no right to be heard is allowed in connection with decisions aiming at securing the implementation of another decision for which the same right has already been applied: in such a case, the ancillary or subordinate nature of the implementing decision exclude any violation of the right to be heard, as the affected party is allowed to enforce its rights with the first decision. [20]

The exercise of the right to be heard does not apply where its exercise could prejudice investigations initiated for the purpose of combating fraud: this may happen, for example, when the stated intention of the authority to issue a decision with the aim of countering customs fraud may induce potential addressees to adopt illicit measures and so frustrate the achievement of the antifraud purpose. [21]

4. Consequences arising from violations of the right to be heard

Under Article 243(1) of the Customs Code, any person has the right to appeal against decisions taken by the customs authorities which relate to the application of customs legislation, and which concern him or her directly and individually. [22] Any decision of the customs authority related to the application of customs law and rendered in violation of the right to be heard can be challenged by the addressee. In connection with such issues, the Court of Justice has analysed the consequences arising from the violation of the right of defence, of which the right to be heard on a pre-emptive basis constitutes a corollary. The Court has noted that violation of the right to be heard determines a defect of the issued decision only to the extent that, in the absence of such violation, the related proceeding might have had a different outcome. [23] This observation of the Court needs to be put into context to avoid its interpretation as restricting the right of defence. Such would be the case if the Court's reasoning was to be interpreted in the sense that the violation of the right to be heard on a pre-emptive basis would not entail the illegitimacy of the issued decision where the elements that might have been submitted during such a phase would be unfit to lead to a declaration of illegitimacy.

It is clear that if this were the case, the right to be heard on a pre-emptive basis would lose any autonomous relevance, as it would be absorbed by the merits of the dispute. This observation is confirmed by the fact that the Court of Justice observed that the reclamation proceeding would not

have had a different outcome if the interested persons had been heard before the decision of the dispute, as they were not challenging the merit of the tax claim (in particular, the customs classification rendered by the tax administration).

A similar confirmation is provided by examining the precedents cited in the judgement at issue: in particular, in the judgement dated 14 February 1990 (ECJ, C-301/87, Slot, 1991), the Court notes that in the context of the examination of an aid project by the Commission, the relevant Member State must be put in a position to express its opinion on observations submitted by interested third parties. Hence, if the Member State has not had a chance to comment upon such observations, the Commission cannot take them into consideration without violating the State's right of defence. This would render illegitimate the issued decision if, in the absence of this irregularity, the proceeding might have had a different outcome (in that case this possibility was excluded as the observations that had been submitted did not contain any additional information that had not already been acquired by the Commission and was not known to the State). [24]

The ECJ also stated that in the event of a breach of the right of the person concerned to be heard and to raise objections under Article 181a (2) of Regulation no. 2454/93, [25] it is for the national court to determine whether the decision, which was adopted in breach of the principle of respect for the rights of the defence, must be annulled on that ground. The national court may also give a ruling in the action brought against that decision or can consider referring the matter back to the competent administrative authority. To this end, the national court must have regard to the particular circumstances of the case before it and to the principles of equivalence and effectiveness. [26]

More recently, the Court decision rendered on 3 July 2014, cases C-129/13 and C-130/13, sets forth interesting remarks regarding the relevance of the right to be heard and the consequences arising from its violation. The Court confirmed that the right to be heard, before a decision that may affect the addressee's rights is taken, can be claimed before any courts of a Member State. According to the Court, where national legislation sets a time limit for collecting the observations of the parties concerned "it is for the national court to ensure, while duly taking into account the specific facts of the case, that that period corresponds with the particular situation of the person or undertaking in question and that it allows them to exercise their rights of defence in accordance with the principle of effectiveness." [27]

5. Conclusion

The analysis conducted in this article has highlighted some relevant aspects of the right to be heard. As a fundamental right, the right to be heard has general application in the law of the European Union and finds specific relevance in the field of customs law by virtue of a principle contained in the Customs Code and of the case law of the Court of Justice of the European Union and, more generally, because of the provisions included in the Charter of Fundamental Rights of the European Union. The right to be heard protects not only the interests of individual customs operators who are addressees of decisions which could adversely affect their rights, but also the interest of the European Union in the proper conduct of relations between EU Member State authorities, which apply customs rules, and customs operators. More generally, the right to be heard protects the correct enforcement of customs rules and procedures, ensuring that the same protection is uniformly given in all Member States of the European Union. The right to be heard is also linked to the right of defence, which is also a fundamental right in the EU law system, as it anticipates the possibility for the addressee of unfavourable decisions to assert its defences before the customs authorities of the relevant Member State and ultimately understand if its position deserves to be defended before national courts.

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Notes

1 The Charter became fully binding for Member States and European Union Institutions with the entry into force of the Lisbon Treaty on 1st December 2009.

2 The Charter of Fundamental Rights is binding, as set forth by Article 6.1 of the Treaty on European Union: "The Union recognizes the rights, freedoms and principles set out in the Charter of Fundamental Rights of the European Union of 7 December 2000, as adopted at Strasbourg, on 12 December 2007, which shall have the same legal value as the Treaties".

3 See European Commission, Commission Staff Working Document General Guidance on Customs Decisions, taxud.a.2(2016)3945564, 8 July 2016, available at https://ec.europa.eu/taxation_customs/system/files/2016-09/guidance_general_cust_dec_en.pdf

4 See also recital no. 27 of the Customs Code, where it is specified that limitations to the right to be heard may be justified if required by the nature or the level of a threat to the security of the Union and of its residents, or by the protection of human, animal or plant health, the environment or consumers.

5 According to the European Court of Justice "the obligation imposed by Article 6(3) of the Code to set out the grounds on which the decision is based concerns only adverse decisions taken in writing which are in response to a request or are addressed to a particular person". See judgment 7 December 2000, C-213/99, de Andrade, point 30, ECLI:EU:C:2000:678.

6 These authorities are defined as "the customs administrations of the Member States responsible for applying the customs legislation and any other authorities empowered under national law to apply certain customs legislation". See Section 5, n. 1 of the Customs Code.

7 Consequently, preliminary decisions, which do not have such nature, cannot be included in this provision. See for instance EU Civil service tribunal, 28 April 2009, Cases F-5/05 and F-7/05, point 2, ECLI:EU:F:2009:39, where it is underlined that "Acts preparatory to a decision do not adversely affect".

8 These conditions are the following: (a) there are no restrictions as to the disposal or use of the goods by the buyer, other than any of the following: (i) restrictions imposed or required by a law or by the public authorities in the Union; (ii) limitations of the geographical area in which the goods may be resold; (iii) restrictions which do not substantially affect the customs value of the goods; (b) the sale or price is not subject to some condition or consideration for which a value cannot be determined with respect to the goods being valued; (c) no part of the proceeds of any subsequent resale, disposal or use of the goods by the buyer will accrue directly or indirectly to the seller, unless an appropriate adjustment can be made; (d) the buyer and seller are not related or the relationship did not influence the price.

9 See also Sections 141 ff. of the Commission implementing regulation (EU) 2015/2447.

10 According to Section 134 the goods shall be valued in accordance with the transaction value method where the declarant demonstrates that the declared transaction value closely approximates to one of the following test values, determined at or about the same time: (a) the transaction value in sales, between buyers and sellers who are not related in any particular case, of identical or similar goods for export to the customs territory of the Union; (b) the customs value of identical or similar goods, determined in accordance with Article 74(2)(c) of the Customs Code; (c) the customs value of identical or similar goods, determined in accordance with Article 74(2)(d) of the Customs Code.

11 It should be noted that according to the last paragraph of Section 8 of Commission Implementing Regulation (EU) 2015/2447 "where the person concerned gives his point of view before the expiry of the period referred to in paragraph 1(b) the customs authorities may proceed with taking the decision unless the person concerned simultaneously expresses his intention to further express his point of view within the period prescribed".

12 As to access to documents, it should be noted that according to recital no. 58 of the Customs Code, "This Regulation should be without prejudice to existing and future Union rules on access to documents adopted in accordance with Article 15(3) of the Treaty on the Functioning of the European Union. It should also be without prejudice to national rules on access to documents". Under Article 15(3), first part of the Treaty on the Functioning of the European Union "Any citizen of the Union, and any natural or legal person residing or having its registered office in a Member State, shall have a right of access to documents of the Union's institutions, bodies, offices and agencies, whatever their medium, subject to the principles and the conditions to be defined in accordance with this paragraph".

13 As a matter of principle and according to Section 36 of the Treaty on the Functioning of the European Union such prohibitions or restrictions shall not constitute a means of arbitrary discrimination or a disguised restriction on trade between Member States.

14 According to Section 33(1) of the Customs Code "The customs authorities shall, upon application, take decisions relating to binding tariff information (BTI decisions), or decisions relating to binding origin information (BOI decisions)".

15 See Section 32(2) of the Customs Code.

16 See European Commission, Administrative Guidance on the Binding Tariff Information Process, Bruxelles, 2018, available athttps://ec.europa.eu/taxation_customs/system/files/2019-04/bti_guidance_en.pdf

17 See first subparagraph of Article 56(4) of the Customs Code.

18   Under this provision "where application of the measures referred to in points (d) to (g) of paragraph 2, or the exemption from measures referred to in point (h) thereof, is restricted to a certain volume of imports or exports, such application or exemption shall, in the case of tariff quotas, cease as soon as the specified volume of imports or exports is reached".

19   The protection of fundamental interests is paramount in the EU Customs Code. See Section 134 according to which "Goods brought into the customs territory of the Union shall, from the time of their entry, be subject to customs supervision and may be subject to customs controls. Where applicable, they shall be subject to such prohibitions and restrictions as are justified on grounds of, inter alia, public morality, public policy or public security, the protection of the health and life of humans, animals or plants, the protection of the environment, the protection of national treasures possessing artistic, historic or archaeological value and the protection of industrial or commercial property, including controls on drug precursors, goods infringing certain intellectual property rights and cash, as well as to the implementation of fishery conservation and management measures and of commercial policy measures".

20   Such an exclusion is provided for by section 6, letter d), of Article 22, without prejudice to the law of the Member State concerned.

21   A further exclusion of the right to be heard, according to Section 22, paragraph 6, second part, letter f of the Customs Code, concerns "other specific cases".

22   It should be noted that, in the absence of a hearing prior to the adoption of a demand for payment, the lodging of an objection or administrative appeal against that demand for payment should not necessarily have the effect of automatically suspending implementation of the demand for payment to ensure observance of the right to be heard in connection with that objection or appeal. See ECJ, judgment of 3rd July 2014, Kamino, C129/13 and C130/13, EU:C:2014:2041, paragraph 67. Moreover, the lodging of an appeal pursuant to Article 243 of the Customs Code does not, under the first paragraph of Article 244 of that code, in principle, cause implementation of the disputed decision to be suspended. As the appeal does not have a suspensory effect, it does not preclude the immediate implementation of that decision. The second paragraph of Article 244 of the Customs Code authorises the customs authorities to suspend, in whole or in part, implementation of a customs decision where they have good reason to believe that the disputed decision is inconsistent with customs legislation or that irreparable damage is to be feared for the person concerned.

23   See also Court of Justice, Judgment dated 14th February 1990, case 301/87.

24   Similarly, see Court of Justice, Judgment dated 5th October 2000, case C-288/96.

25   According to Article 181a(2) of the Regulation 2454/93, where the customs authorities have the doubts described in paragraph 1 they may ask for additional information in accordance with Article 178(4). If those doubts persist, the customs authorities must, before reaching a final decision, notify the person concerned, in writing if requested, of the grounds for those doubts and provide him with a reasonable opportunity to respond. A final decision and the grounds shall therefore be communicated in writing to the person concerned.

26   See judgment of the Court (First Chamber) of 13th March 2014, Joined cases C-29/13 and C-30/13, ECLI:EU:C:2014:140. In any event, it must be pointed out that the obligation of the national court to ensure the full effectiveness of EU law does not always result in the annulment of a contested decision, where the latter was adopted in infringement of the rights of the defence. According to settled case-law, an infringement of the rights of the defence, in particular the right to be heard, results in the annulment of the decision taken at the end of the administrative procedure at issue only if, had it not been for such an irregularity, the outcome of the procedure might have been different (judgments of 10th September 2013, G. and R., C383/13 PPU, EU:C:2013:533, paragraph 38, and of 3rd July 2014, Kamino International Logistics and Datema Hellmann Worldwide Logistics, C129/13 and C130/13, EU:C:2014:2041, paragraphs 78 and 79).

27   This remark reflects the Court's position in the Sopropé case, C-349/07, ECLI:EU:C:2008:746. See paragraph 44, where the Court maintains that where national legislation or regulations lay down within a specific time range the period for collecting the observations of the parties concerned, it is for the national court to satisfy itself that the period thus individually assigned by the authorities corresponds to the specific circumstances of the person or undertaking at issue and that it makes it possible for them to exercise their rights of defence in accordance with the principle of effectiveness.

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Development Model for Facilitating the Negotiation of AEO MRAs

Tuan Pham

Abstract

This paper presents a model for an effective Authorised Economic Operator (AEO) Mutual Recognition Agreement (MRA) development process, based on the author's doctoral thesis, which examined factors impacting the negotiation of AEO MRAs. The purpose of the model is to provide governments with a logical framework for facilitating the preparation, negotiation and implementation phases of MRA development at both the bilateral and multilateral level. First, an overview of methodology is presented to highlight the study's data collection, analysis and result integration within the convergent parallel mixed-methods design. Second, identified factors are categorised by way of their impact on the various phases of the MRA process including preparation, negotiation and implementation. Each of the three phases is then discussed, together with the steps involved in each phase.

1. Introduction

In the aftermath of the terrorist attacks on 11 September 2001 in the US, the World Customs Organization (WCO) developed a global initiative known as the SAFE Framework of Standards to Secure and Facilitate Global Trade (WCO SAFE Framework) to strengthen security while maintaining trade facilitation. The initiative (WCO, 2005, 2007, 2011b, 2012b, 2015, 2018d) contains two key concepts: the Authorised Economic Operator (AEO) and Mutual Recognition Agreement (MRA).

An AEO is defined as a business that meets specified customs compliance standards and shows a demonstrated commitment to supply chain security (WCO, 2005). In return, they receive greater levels of trade facilitation than other businesses. Meanwhile, MRAs are the means through which two customs administrations recognise each other's validation and authorisations of AEOs and agree to provide mutual trade facilitation benefits to their respective AEOs (WCO, 2005). The MRA concept broadens the scope of AEO programs beyond national borders through the conclusion of bilateral and multilateral MRA negotiations. While the WCO has developed several tools to facilitate such MRA negotiations (WCO, 2011a, 2018b, 2018c), the literature suggests that numerous challenges remain for countries who seek to negotiate MRAs (Pham, 2019).

AEO mutual recognition has become a common goal for many WCO member countries to pursue following the establishment of their AEO programs. The current global practice of mutually recognising AEO programs through the negotiation of MRAs has shown that, while some countries are doing this well, others are not and often struggle with the process. Furthermore, the literature highlights a wide range of issues and problems associated with the negotiation of MRAs. However, no empirical research has previously been undertaken to identify the factors that impact the negotiation of MRAs (Pham, 2019). The author's doctoral thesis sought to address these gaps in the literature (Pham, 2021).

The main aim of the research was to provide effective recommendations and solutions to governments for facilitating the MRA development process. In this regard, this study was designed to assist

regulators, negotiators and other relevant stakeholders at the national, regional and international level in identifying further ways to facilitate AEO MRA negotiations, which would support international trade and ensure global supply chain security. In the study, it was identified that mixed-methods research can enhance the quality of the research findings because both quantitative and qualitative results are combined in order to mutually support and strengthen each other in a single study (Bazeley, 2006; Kelle, 2006). The study identified 30 factors that impact the negotiation of MRAs and analysed the impact of such factors. It also examined the future trend of regional AEO programs and multilateral MRAs and assessed whether the WCO tools for the negotiation of MRAs are sufficient to promote the MRA development process at both the bilateral and multilateral levels. Therefore, an MRA Development Model, based on the research findings, was proposed to facilitate the MRA development process.

2. Overview of methodology

The research adopted the convergent parallel mixed-methods design, with three data sources, being documents, interviews and a survey. Quantitative data was collected using the survey, while qualitative data focused on all three sources of data including relevant documents, interviews and the survey's open-ended questions.

Data collection from documents was used for two purposes: supporting the interviews and survey; and verifying evidence from other sources (for example, interviews). The examination of relevant documents (Polner, 2010; WCO, 2012a, 2014, 2016, 2017, 2018a, 2019) assisted the development of research interviews and survey, the status of bilateral and multilateral MRAs and information about the trends and current situation of MRA negotiations and implementation. Documents were then analysed and combined with information from the literature review to develop interview protocols and survey questions. Figure 1 shows the development of interview protocols and survey questions based on the initial data analysis.

Figure 1. Development of interview protocols and survey questions
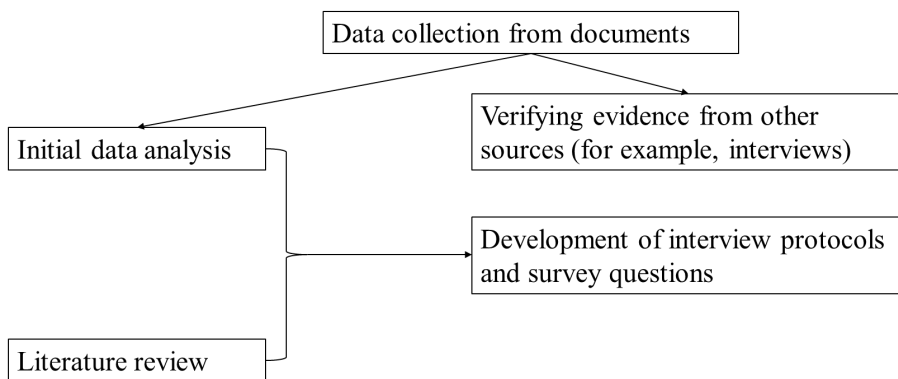
Source: Author

The interviews and survey shared the same study population, which included experts in the public sector, private sector, international organisations and academia. Public sector representatives were drawn from customs administrations, academics were identified via the International Network of Customs Universities (INCU) and participants from international organisations and the private sector were identified from lists of attendees from relevant international conferences or recruited from online social networks.

Interview participants were selected by quota and snowball sampling strategies, the sample size being 21. The use of quota sampling determined how many samples were drawn from each category to reflect the characteristics of the population (see Collins, 2010, p. 359). Snowball sampling is a technique where several recruited interviewees are encouraged to nominate other interviewees, which helps to increase the sample size (Visser et al., 2000, pp. 236–237).

In the survey, a purposive random sampling strategy (Collins, 2010, p. 358) was used to select 420 participants. From the list of interviewees, seven participants were randomly selected for inclusion in the survey. In the sampling frame of AEO conference attendees and academics who have at least one relevant publication, 96 participants were selected. By using LinkedIn to create a sampling frame, 317 participants were selected in this group. Table 1 highlights the dataset development of the study.

Table 1. Dataset development of the study

	Interviews	**Survey**
Defined study population	Experts in the public sector, the private sector, international organisations and academia	
Sampling	Quota and snowball sampling	Purposive random sampling from the created sampling frame
Sample size	21	420
Recruitment of participants	- The public sector: invitation letters - Academics: assistance from the INCU - International organisations and the private sector: conference attendees and online social network	- Seven participants from the list of interviewees 96 participants from the sampling frame of AEO conference attendees and academics who have at least one relevant publication 317 participants from the sampling frame created by using LinkedIn

Source: Author

Once interviews and survey data were collected and prepared for analysis, different techniques were employed to analyse the data. Descriptive statistics were used to analyse the quantitative data and the thematic technique was used to analyse the qualitative data.

In the integration of qualitative findings and quantitative results (Creswell, 2014; Guetterman et al., 2015), the joint display technique was employed. This technique, an effective tool to provide meaningful integration in mixed-methods research (Plano Clark, 2019), is highly recommended by Guetterman et al. (2015), who suggest that joint displays be used more often for the integration and interpretation of mixed-methods research.

Findings from this integration assisted in proposing an MRA Development Model to provide governments with a logical framework to facilitate the negotiation of MRAs at both the bilateral and multilateral level. In doing so, the model identifies the various steps involved in each phase of development, that is, the preparation, negotiation and implementation phase, together with a description of the elements which have an impact on each step.

3. MRA Development Model

The model identifies the various elements that have an impact on the MRA development process. These elements are grouped into two categories, MRA tools and factors. The impact of each element is also identified against the three phases of MRA preparation, negotiation and implementation.

The WCO MRA Guidelines, the WCO MRA Strategy Guide and the WCO Trader Identification Number (TIN) Guidelines were identified as the three most relevant MRA tools, which provide guidance to customs administrations throughout the MRA development process including the MRA preparation phase, the MRA negotiation phase and the MRA implementation phase. In addition to these three tools, a total of 30 factors were identified, which are considered to have an impact on the development of MRAs.

Eight factors including *free trade agreements*, *coordinated border management*, *customs cooperative agreements*, *internal commitment*, *resource allocation*, *MRA training*, *trader awareness* and *MRA benefits* have some impact in all three phases of the MRA development process.

Seven factors have an impact in the MRA preparation and negotiation phases only. These are *political ties*, *geopolitical considerations*, *economic size*, *trust*, *political will*, *form of selective agreements* and *MRA lobbying*.

The four factors *export volume/value*, *import volume/value*, *trade volume/value*, and *trade patterns* are identified as having an impact on the MRA preparation phase only and *national sovereignty* only has an impact on the MRA negotiation phase. Two factors, *import clearance time* and *non-tariff barriers*, have an impact on the two phases of MRA preparation and implementation.

The remaining factors consisting of *SAFE compliance*, *AEO program focus*, *AEO program scope*, *privacy and data protection*, *data integrity*, *number of AEO memberships*, *data exchange* and *dispute resolution procedures* have an impact on the two phases of MRA negotiation and MRA implementation.

In addition, the MRA Development Model identifies those elements which have an impact in each step of the three phases of MRA preparation, negotiation and implementation (see Section 4). The MRA Development Model created from the research findings is presented in Figure 2.

Figure 2. MRA Development Model

Source: Author

4. Phases of the MRA Development Model

Having provided a broad overview of the MRA Development Model (see Figure 2), this section further details the MRA Development Model in terms of its three phases of MRA preparation, negotiation and implementation.

4.1 Preparation phase

In the MRA preparation phase, a country should develop a holistic national MRA strategy, which provides a framework for competent authorities (for example, customs administrations) to negotiate and implement MRAs. The MRA strategy should include, but should not be limited to, the country's vision and mission in achieving both bilateral and multilateral MRAs, its long-term and short-term goals in relation to MRA negotiations, an analysis of the country's strengths, weaknesses, opportunities and threats in dealing with potential MRA negotiations, an analysis of information and intelligence obtained from relevant stakeholders and an appropriate resource allocation and operational plan.

The three critical steps in preparing for an MRA consist of organising a national MRA committee, devising an MRA project and accepting or sending invitations.

Step 1: Organising a national MRA committee

This step should be undertaken with guidance from the relevant tools, that is, the WCO MRA Guidelines, the WCO MRA Strategy Guide and the WCO TIN Guidelines. Key factors in achieving this include the need for a high level of political will, internal commitment, effective cooperation among border agencies and MRA lobbying. A customs administration needs to seek political support at government level for the establishment of a competent committee. In this stage, the factors of political will and internal commitment play an important role in encouraging relevant stakeholders, such as competent border agencies, trade associations, AEO associations and AEO companies, to join the committee and develop an MRA project. Lobbying by the private sector is a legal activity in many countries and these countries encourage trade associations, AEO associations and AEO companies to present their views to facilitate the MRA development process.

Step 2: Devising an MRA strategy

In this step, a proactive approach should be adopted to develop a national MRA strategy. This strategy should be devised with the participation of relevant stakeholders, such as border agencies, trade associations, AEO associations and AEO companies. All elements shown in Step 2 of Figure 2 for the MRA preparation phase are relevant, together with guidance from the MRA tools.

A high level of political will and internal commitment within the national MRA committee and each of the stakeholders' organisations is needed to support the development of the MRA strategy, which may be influenced by lobbying to help identify potential MRA partner countries. The factors of *coordinated border management* and *MRA training* are also relevant because the MRA strategy must have effective cooperation from governmental agencies at the borders, with MRA training providing relevant knowledge to negotiators, validators and auditors, as well as enhancing trader awareness.

In consulting with private sector stakeholders, the MRA committee should consider factors including *MRA training* to the private sector, *trader awareness* and *satisfaction with MRA benefits* to obtain the private sector's opinions, perceptions and suggestions. Meanwhile, it is essential to receive feedback on issues such as *import clearance time* and *non-tariff barrier*, common issues or problems arising in particular foreign markets. Consultation with the private sector regarding *import clearance time* and *non-tariff barri*er in several potential MRA partner countries could prove helpful in subsequently reviewing and evaluating actual MRA implementation.

When identifying a priority list of potential MRA partner countries, several factors need to be addressed, including *political ties*, *geopolitical considerations*, *economic size*, *trade volume/value*, *export volume/value*, *import volume/value*, *trade patterns*, *free trade agreements* and *customs cooperative agreements* to ensure appropriate countries are selected. Through careful examination of these factors, the MRA committee will also build an initial level of assurance of *trust* that MRAs with countries in the priority list would be appropriate. Furthermore, the national MRA committee should decide early in the process which form of selective agreements (binding or non-binding) it should pursue, based on a country's legislation or any other national requirements. Then, appropriate resources (human, time and finance) are allocated for successful progress of the national MRA strategy.

Based on information and intelligence collected from relevant stakeholders, an analysis should be conducted to examine the countries' and prospective partners' relative situations (for example, legal basis for MRAs, IT issues, resources, political relationships, geopolitical considerations, trade and the presence of free trade agreements and customs cooperative agreements).

Results from this analysis should provide a priority list of prospective MRA partner countries in which a country could have confidence in terms of the partner countries' regulatory environment and AEO program implementation. An MRA with these countries should also be considered achievable and bring mutual benefits to both parties. Prospective MRA partner countries should be listed in a priority sequence, on which decisions as to whether to accept or send MRA invitations would be based. In addition, the MRA committee could seek further political support from competent authorities to progress the national MRA strategy, to ensure appropriate MRA training to government officials and the wider business community, and to ensure sufficient resources for both the MRA negotiations and the implementation process. Additionally, lobbying should be encouraged as such activities will support and facilitate the MRA development process.

Step 3: Accepting or sending invitations

Based on the national MRA strategy, a customs administration should now have a clear road map and mandate to initiate MRAs with prospective MRA partner countries. There are two ways in which this may occur. First, the customs administration may be approached by a potential MRA partner, and second, the customs administration may approach a potential partner by sending an invitation to commence MRA negotiations.

There are also several ways to invite or accept invitations from prospective countries to initiate MRA negotiations. The director-general or customs commissioner may have personal contacts with their counterparts in other customs administrations and contact them informally. Also, through their interactions at international or bilateral conferences, they could exchange their interest in engaging in MRA negotiations. A formal Letter of Intent could follow at a later stage. When countries are key trading partners and free trade agreements or customs cooperative agreements are in place, this may further facilitate the initiation of MRA negotiations. Another way of sending or receiving invitations is through diplomatic channels, for example, embassies or overseas representative offices.

Note that a priority list of prospective MRA partners is very important for a country to compile, and if an inviting country is not on the invitation receiver's priority list, then the receiver is likely to decide not to proceed with MRA negotiations and therefore refuse the invitation. On the other hand, the invitation receiver will most likely accept the invitation if the inviter appears on their priority list of prospective MRA partner countries. Figure 3 provides a summary of the MRA preparation phase.

Figure 3. Three steps of the MRA preparation phase

Step 3: Accept and send invitations
- Informally, DG or customs commissioners could exchange their intentions for MRA negotiation. A formal letter of intent is sent at a later stage
- Another way for sending invitation is through diplomatic channels, e.g. Embassy
- A country could depend on its priority list of prospective MRA partners to decide appropriate partners to accept to negotiate or approach to send invitations

Step 2: Devise an MRA strategy
- An MRA strategy should be devised with the participation of relevant stakeholders
- A comprehensive analysis needs to be conducted
- One of the results from the comprehensive analysis is the priority list of prospective MRA partner countries

Step 1: Organise a national MRA committee
- To include representatives from relevant stakeholders
- The committee will be responsible for developing an MRA project

Source: Author

Common challenges in the MRA negotiation phase are that countries often lack the vision or motivation to develop a holistic national MRA strategy. This reduces these countries' ability to pursue and achieve MRAs. Therefore, the objective of the MRA preparation phase is to develop a national strategy that provides guidance and a mandate to achieve MRAs with other countries. An important part of the strategy is the priority list of prospective MRA partner countries.

To summarise, a customs administration may use the priority list in one of three ways. First, it may be invited by another customs administration to negotiate an AEO MRA and could either accept or reject the invitation based on the priority list. Second, the customs administration may proactively send an invitation to a customs administration on the priority list. Third, the customs administration may receive several invitations, and use the priority list to prioritise its MRA negotiation program.

4.2 Negotiation phase

Having decided to proceed with MRA negotiations, the study suggests that several relevant elements, including the three MRA tools and 24 of the 30 factors, may have some impact on the MRA negotiation phase. This phase is comprised of five essential steps and each step is impacted by different elements.

Step 1: Acceptance of MRA invitations

As indicated in Step 3 of the preparation phase, a customs administration checks the priority list to see if it has already been approached to engage in MRA negotiations. If the answer is yes, the customs administration will then rely on other factors to determine whether it accepts and proceeds with the MRA negotiations. Factors relevant to this step could include *political ties*, *geopolitical considerations*, *economic size*, *free trade agreements*, *coordinated border management*, *customs cooperative agreements*, *trust*, *political will*, *internal commitment*, *resource allocation*, *form of selective agreements*, *MRA training*, *trader awareness*, *MRA benefits* and *MRA lobbying* (see Figure 2).

A country might have a prerequisite for MRA negotiations in which it and its inviting country must have a *customs cooperative agreement* (*CMAA* or *free trade agreements* with provisions of customs cooperation) in place. In this case, an MRA may be negotiated according to provisions within the customs cooperative agreements. Therefore, this prerequisite should be checked to ensure an invitation will not be declined. While *MRA lobbying* may facilitate the MRA development process, accepting MRA invitations requires a customs administration to have *political will*, *internal commitment* and *coordinated border management* where the customs administration must cooperate with other border agencies and have trust in the inviting country before proceeding with MRA negotiations. The customs administration might rely on its country's *political ties* and *geopolitical considerations* with the inviting country to build its initial *trust*. The customs administration should consider the *economic size* of the inviting country because MRA negotiations with a large economy could also be challenging. Together with accepting an invitation, the customs administration must also allocate appropriate resources for the negotiation phase.

Once the Letter of Intent (or Letter of Invitation) for MRA negotiations has been accepted by the prospective MRA partner country, the two parties will exchange initial information regarding their first point of contacts, AEO programs and the status of AEO implementation, objectives and expectations. This step is very important for the two parties because it shows their commitment in pursuing a successful outcome. If both parties have already researched and prepared their priority lists carefully, as discussed in the MRA preparation phase, they will be able to identify each other as prospective partners. It would then be appropriate for the parties to progress to the next step of MRA negotiations.

Step 2: Agreement on the action plan

An action plan (sometimes called a work plan, joint work plan or road map) will provide a way forward and a schedule of activities for both parties to fulfil, follow up and review their work throughout the MRA negotiation phase or even through further stages of MRA implementation. In this step, both parties should refer to the three MRA tools for instruction as well as all relevant factors (as specified in Step 2 of Figure 2) to develop, and then agree on, the action plan. For example, based on possible factors of *MRA lobbying*, *political ties*, *geopolitical considerations*, *free trade agreements*, *customs cooperative agreements*, *national sovereignty* and *trust*, a party could gain further *political will* and *internal commitment* for its MRA negotiations.

It will be essential for the action plan to demonstrate the scope of the negotiations, timeframes, designated roles of each party, evaluation mechanisms, types of communication, MRA training and the legal basis for MRA texts (for example, the form of selective agreements and types of MRA benefits). Once the parties agree on the details of the proposed road map, the action plan can be signed by competent representatives from both parties.

Step 3: Program comparison

This step is one of the activities that should be specified in the action plan. In it, each party requests their counterpart to provide the relevant documents for initial program comparison. These documents will include the relevant legal framework for data protection and the current implementation of AEO programs, such as eligibility criteria, minimum security requirements, authorisation, validation procedures, benefits, how many AEOs and what types of AEOs are involved in the program. Therefore, key relevant factors involved in this step include *SAFE compliance*, *AEO programs focus*, *AEO program scope*, *privacy and data protection*, *data integrity* and *AEO memberships* as both parties will compare the equivalence and actual implementation of their AEO programs, while the remaining factors will help to facilitate such a comparison.

Based on available documents, both parties should conduct a detailed side-by-side program comparison of each party's legislation, procedures and guidelines regarding AEO programs, their implementation and relevant legal framework for data protection and exchange. The comparison may

identify possible gaps, including in relation to SAFE compliance of their AEO programs. In addition, the comparison will indicate whether their AEO programs are equivalent in terms of security standards, mutual interests and reciprocated benefits.

This step often identifies several issues. First, a party's AEO implementation may differ from their prospective MRA partners (for example, in the AEO validation process and methods, MRA benefits in AEO programs, or in the number of AEO memberships). Second, lack of a legal framework for privacy and data protection or data exchange may be identified in one or more of the negotiating parties. It is critical that once issues are identified they are addressed promptly by each party so that such gaps are closed to allow matching of the AEO programs' compatibility and equivalence requirements. If further issues arise, each party should clarify and address them via ongoing communication. Alternatively, these issues could also be addressed in Step 4, joint validation audits.

Step 4: Joint validation audits

Joint site validation audits (or country joint visits) occur either at the customs headquarters or the AEOs' premises. Visits to customs offices will provide both parties' negotiators, validators and auditors the opportunity to observe the partners' program's implementation. Additionally, such visits allow both parties to benchmark best practices and exchange training materials. The negotiators, validators and auditors may also validate any on-site certification practices, such as application, validation and authorisation, which would supplement their program comparison to determine whether they are compatible and equivalent. In Step 4, key relevant factors involve *resource allocation*, *national sovereignty*, *trust*, *SAFE compliance*, *AEO program focus*, *AEO program scope*, *privacy and data protection*, *data integrity* and *AEO memberships* while other remaining factors should also be considered to foster the audit process.

Joint validation audits are also generally organised at the AEOs' premises for observation and validation purposes. The audits provide data about on-site practices which are used to support and validate the side-by-side program comparison in Step 3. On completion of joint validation audits, some key issues (for example, privacy and data protection, and data exchange) need to be identified and addressed. Both parties rely on the data collected from the program comparison and joint validation audits to determine the compatibility and equivalence of both AEO programs. If the respective programs are compatible and equivalent, both parties may proceed to prepare and sign an MRA.

Step 5: Preparing and signing an MRA

Step 5 involves the establishment of MRA texts at both legal and operational levels. Firstly, both sides' MRA negotiators focus on setting a legal framework for the proposed MRA. If the parties already have a CMAA, it could form part of the future MRA's legal framework. Also, both parties should address other aspects of the proposed MRA, such as type of benefits and type of selective agreements (binding or non-binding). Therefore, the key relevant factors in this step include *coordinated border management*, *customs cooperative agreements*, *free trade agreements*, *form of selective agreements*, *trader awareness* and *MRA benefits*, among others. It is also essential that a legal framework is established for governance, operation and maintenance of an MRA to facilitate the MRA implementation phase, which further involves the factors of *data exchange* and *dispute resolution procedures*. At the operational level, MRA texts involve the exchange of data, pilot testing and communication channels. The two parties' MRA negotiators then discuss selection of suitable timing and the location for the official signing of the MRA. Figure 4 presents a summary of the MRA negotiation phase.

Figure 4. Five steps of the MRA negotiation phase

Step 1 Accept MRA invitations	Step 2 Agreement on the Action Plan	Step 3 Program comparison	Step 4 Joint validation audits	Step 5 Preparing and signing an MRA
• Accept MRA negotiations • Exchange of contacts, legal documents of AEO programs, current status of AEO implementation • Express expectations for an MRA	• Meetings to develop an Action Plan • Demonstrate the scope for the MRA negotiations, timeframes, legal ground for MRA texts (e.g., binding or non-binding, types of MRA benefits) • Sign the Action Plan	• Request extra documents (if required) • Conduct a detailed side-by-side program comparison of each side's legislation, procedures to identify gaps and determine the compatibility and equivalence • Any issues identified will be addressed through ongoing communications and also verified in Step 4	• Observe and verify the implementation of the respective partners' AEO program • Validate on-site certification practices, e.g. application, validation and authorisation • Determine the compatibility and equivalence of AEO programs.	• Establish MRA texts at legal and operational levels • At the legal level, a legal framework for the proposed MRA is prepared together with mechanisms for governance, operation and maintenance • The operational level involves the exchange of data, a pilot testing phase, communication channels.

Source: Author

Three outcomes are identified within the MRA negotiation phase. First, a customs administration could accept an invitation from another, but the invitation does not proceed further because there is a change in its priorities, lack of political will or insufficient resource allocation.

Second, an invitation is accepted and both parties would like the MRA negotiations to proceed. Subsequently, an action plan is agreed upon and signed by both parties. However, several common issues identified in either Step 3 or Step 4 need to be addressed before negotiations proceed further. For example, one party may not have legislation regarding data protection and data exchange, or the countries cannot agree on the form of selective agreements because one party requires it to be binding while the other insists on a non-binding arrangement. Thus, it is recommended that countries consider the form of selective agreements early in Step 2 of the MRA preparation phase to facilitate subsequent MRA negotiations.

The third outcome is that both parties negotiate through Step 1 to Step 5 of the MRA negotiation phase, addressing all inherent issues and an agreement is reached and signed by both sides' competent representatives. Pilot testing may be conducted before or after the conclusion of the MRA to facilitate subsequent MRA implementation (see below).

4.3 Implementation phase

The MRA implementation phase involves effective governance, operation and maintenance of the concluded MRA. The relevant MRA elements involved in the implementation phase are the WCO MRA Guidelines, the WCO MRA Strategy Guide, the WCO TIN Guidelines and 18 factors (see Section 3). This phase is undertaken in two steps and each step is impacted by different elements.

Step 1 Pilot testing

Pilot testing may be conducted before the conclusion of an MRA. In this case, the pilot test would be at the operational level of the MRA negotiation phase and involve IT experts from each party designated in the MRA negotiation team. Hence, an action plan should clearly outline pilot testing steps before the MRA is concluded.

Alternatively, the pilot testing step could be conducted after the conclusion of an MRA, before the MRA comes into effect. Again, the two parties should cooperate in the pilot test which will involve the exchange of data, the identification of AEOs in each counterpart's IT systems and the granting of benefits to AEOs.

Each party should review implementation timelines, manage expectations, provide necessary MRA training to frontline officers, engage relevant stakeholders (for example, other border agencies) and disseminate the concluded MRA to the public. Frontline officers should be aware of the respective parties' IT and legal systems. It is critical that the IT systems update the latest types of AEO identifiers, AEO recognition procedures and facilitate the granting of MRA benefits to eligible AEO companies. Therefore, key relevant factors in this step are *MRA training*, *privacy and data protection*, *data integrity* and *data exchange*.

Step 2 MRA governance, operation and maintenance

The provisions for MRA governance, operation and maintenance, negotiated during the MRA negotiation rounds, will have been agreed upon and concluded in the MRA texts. Each party establishes their points of contact for communication with their counterpart in the MRA implementation phase. Effective communication channels foster the exchange of information, for example, program updates and supply chain security policies, which are required to improve both parties' risk management. In this step of the MRA implementation phase, all relevant factors specified in Step 2 of Figure 2 are involved.

Everyday MRA operation involves data exchange with members of both AEO programs. This information needs to include their name, address, AEO status, the validation or authorisation date, suspensions and revocations and especially, the TINs. Significantly, such information is required to accurately communicate any changes or amendments to the counterpart on time, for example, if suspensions and revocations are updated.

Subject to each party's privacy and data protection regulations, the data exchanged with the MRA counterpart is to be used exclusively for the purposes of the implementation of the MRA. Both parties should have legal procedures in place to handle data, such as data deletion procedures, notifications and archiving. Such procedures are enacted solely for MRA implementation. Also, MRA texts may include compliance provisions developed to allow monitoring of the exercise of MRA provisions, for example, privacy and data protection.

Furthermore, the MRA texts should include provisions regulating review and consultation procedures. These provisions enable parties to conduct periodic meetings to review (partly or comprehensively) the MRA implementation to identify strengths, shortcomings and future benefits.

The MRA should also contain provisions to regulate the conditions of commencement, suspension and termination. Also, if an MRA is concluded as part of an existing CMAA, then this MRA is subject to the CMAA and does not constitute a new international agreement. Figure 5 below summarises the MRA implementation phase.

Figure 5. Two steps of the MRA implementation phase

Step 1 Pilot testing

-Review timelines
-Manage expectations
-MRA training
-Disseminate MRA information

-Test operational procedures (data exchange, AEO identification, benefit grants)

Step 2 MRA governance, operation and maintenance

Governance

Maintenance

Operation

-MRA legal and operational grounds (e.g. compliance monitoring, program updates)
-Review procedures

-Points of contact
-Data exchange (AEO details)
-Ensure privacy and data protection

Source: Author

5. Conclusion

Based on the identified factors that impact the MRA development process and the inherent challenges and issues associated with such factors, this paper provides a comprehensive understanding of MRA negotiations in the context of the WCO SAFE Framework. In this regard, it presents a proposed MRA Development Model to facilitate MRA negotiations to assist regulators, negotiators and other relevant stakeholders at the national, regional and international level to support trade facilitation and secure global supply chains.

Acknowledgments

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The Jurisdictional Conflict Between Regional Trade Agreements and the World Trade Organization

Abdulmohsen Alajmi

Abstract

The number of regional trade agreements (RTAs) between countries has significantly increased over the past few decades. RTAs may include rights and obligations that are parallel to those of the Agreement Establishing the World Trade Organization 1994 (Marrakesh Agreement). They may also provide for their own dispute settlement mechanism that is different from the WTO Understanding on Rules and Procedures Governing the Settlement of Disputes (DSU). This forum clause allows parties to both RTAs and the WTO to litigate their dispute outside the DSU. This article addresses the issue of jurisdictional conflict between the RTAs and the WTO dispute mechanism over a claim that is violative of both the WTO's and RTA's obligations.

The main question this article answers is whether it is possible for the forum clause incorporated in RTAs to divest the jurisdiction of the WTO if invoked during the proceeding. This article analyses several cases and RTAs involving a choice of forum clause before the WTO panel. This paper examines different legal principles to find a legal justification to reconcile the jurisdictional scope of both RTAs and the WTO agreements. As current international legal principles do not offer an effective solution, this paper suggests that the DSU should be amended to provide a set of rules governing the conflict between the RTAs and WTO jurisdictions.

1. Introduction

It is not unique for states to be bound by many treaties that provide for a specific dispute settlement mechanism. The General Agreement on Tariffs and Trade 1947 (GATT 1947) allows WTO members to engage in regional trade agreements to enhance the international trade system. The WTO covers certain types of agreements, like trade of goods, services, and intellectual property. RTAs mostly reframe these aspects of trade. In this case, the rights and obligations of RTAs may be like those of the WTO. Alternatively, the parties of RTAs may go further and agree to incorporate an exclusive dispute settlement clause to their agreement to settle their dispute during the implementation of the treaty. However, the DSU in Article 23 claims to be the exclusive and compulsory jurisdiction over claims concerning violation of WTO obligations. The issue of jurisdictional conflict, then, arises when a violation occurs involving a common obligation between the RTA and the WTO. The question becomes which adjudicative body should settle the matter. The conflict between the WTO jurisdiction and the dispute mechanism of RTAs is foreseeable as the number of RTAs is growing, since many WTO members are also members of multiple RTAs (DSU, Article 23) Therefore, these states have commitments to perform their obligations under both agreements.

The DSU would also be competent to review the RTA's claims if the rights infringed under the RTA are identical to those of the WTO. How would the DSU or RTA's Dispute Settlement Body react if the forum selection clause were invoked during the proceeding? Could international and national legal principles offer a solution to resolve this problem?

To avoid WTO jurisdiction over overlapping disputes, some RTA agreements intentionally deprive the parties of the right to resort to the DSU either entirely or partially. This raises the issue of the legal effect of these types of clauses, and whether they divest the jurisdiction of the WTO. This instance has materialised in many international cases.

Jurisdictional conflict between the WTO and the RTA will result in many negative impacts to the growth of commerce internationally. It is understandable that RTA agreements represent the interests of the parties, therefore, the disputing parties have a legitimate right to choose the dispute settlement forum to resolve their disputes. However, if both WTO and RTA tribunals decide the same matter, the parties would encounter difficulties enforcing the rulings in the case where the outcomes of each award are different.

Section 2 of this article articulates the current dispute settlement mechanisms under both the WTO and RTAs and how they operate. It explains the legal framework of these entities and the scope of their jurisdiction. Section 3 is an analysis of the issue of jurisdictional conflict between the WTO and RTAs. It introduces the problem and explains the potential conflict based on the current legal text and the language of forum selection clauses used by many RTAs. It then attempts to assess the problem to identify the issue. Section 4 discusses several cases where an overlap of jurisdiction between the WTO and RTAs has materialised. Section 5 evaluates many solutions that have been suggested. This section also explores different arguments that either strive to rectify the shortcomings of the DSU rules by applying international legal principles or insist on the validity of the DSU rules to resolve the issue. Section 6 presents a recommendation to help overcome the potential obstacle of overlapping jurisdiction.

2. Background

2.1 WTO dispute settlement mechanism

The jurisdiction of WTO dispute settlement is restricted to claims arising under agreements covered by the WTO (Pauwelyn, 2001, pp. 535−554). Article 23 of the DSU states, "When Members seek the redress of a violation of obligations or other nullification or impairment of benefits under the covered agreements or an impediment to the attainment of any objective of the covered agreements, they shall have recourse to, and abide by, the rules and procedures of this Understanding."

The dispute mechanism under the WTO involves three phases. First, the offending party makes a request for consultation with the other party, and the other party must reply to the request within 10 days. Both parties must enter, in good faith, into consultation within thirty days after the other party replies to the request.

The second phase assumes, within 60 days (DSU, Article 4.7, 4.8), the disputing parties did not reach a solution. In that instance, parties proceed to the panel, which is composed of three panelists, unless parties agreed otherwise (DSU, Article 8.4, 8.5). Finally, the panel issues the conclusion and its report. The decision of the panel will be adopted by the WTO Dispute Settlement Body (DSB) unless a party to the dispute notifies the DSB of its intention to appeal (DSU, Article 16.4). The recommendations and conclusions of the Appellate Body, which generally must be issued within 60 days starting from the notification to appeal by a party (DSU, Article 17.5), should be unconditionally adopted by the parties unless the Appellate Body, by consensus, decides not to adopt them (DSU, Article 17.14).

An RTA dispute cannot be brought before the WTO unless some requirements related to the formation of the RTA are satisfied. The RTA must meet many requirements, some of which are the "substantially all trade" (GATT 1947, Article XXIV.8.b), or the "substantial sectoral coverage" requirement (GATT 1947, Article V), whether certain trade policy instruments are considered "other restrictive regulations of commerce" (GATT 1947, Article XXIV.8.a.i), and whether the interim agreements contain a schedule of the free trade area in a reasonable time (GATT, 1947, Article XXIV 5.c). Most of these requirements are pre-conditions that an RTA must fulfill for the RTA's members to invoke the WTO jurisdiction over disputes arising from the free trade agreement, and to justify their deviation from Most Favoured Nation (MFN) obligations (Gao & Lim, 2008).

2.2 Dispute settlement mechanisms in RTAs

A total of 711 RTAs have been signed between 1948 and 2020 (WTO, 2021). Most address the same issues as WTO agreements, such as trade in goods and services, intellectual property, customs and valuation provisions, sanitary and phytosanitary provisions.

Almost all these agreements contain dispute settlement clauses to ensure effective implementation of the parties' obligations. Dispute settlement mechanism provisions incorporated in the RTAs vary in terms of the language and forum selection clause. Some might be a choice of forum agreement, which adds another forum in addition to the DSU where disputes arising under RTAs can be resolved through many fora. For instance, this method is adopted in Article 56 (2) of the European Free Trade Association-Singapore Free Trade Agreement (EFTA-Singapore FTA). Most of the RTAs notified to GATT can be classified under this category as they contain a provision permitting the complaining party to bring its claim either under the dispute settlement mechanism specified in the RTA agreement or under the WTO's dispute settlement (EFTA-Singapore FTA, 2002). For example, the North American Free Trade Agreement (NAFTA) Article 2005 (1) states: "Subject to paragraphs 2, 3 and 4, disputes regarding any matter arising under both this Agreement and the *General Agreement on Tariffs and Trade*, any agreement negotiated thereunder, or any successor agreement (GATT), may be settled in either forum at the discretion of the complaining Party."

The second category is the exclusive jurisdiction clause, under which only one tribunal or panel will be competent to adjudicate the matter resulting from RTA agreement. Thus, parties must bring their claims under the specified dispute settlement mechanism agreed on. For instance, NAFTA restricts the parties to litigate their disputes under NAFTA dispute settlement mechanisms when the claim involves measures taken to protect human, animal, plant life, or health or environment protection and the defendant requests the claim be adjudicated under NAFTA (NAFTA, Article 2005 (4) a).

Last, the preferred forum states that any dispute should be brought within the RTA's dispute settlement procedure as an exclusive method if the dispute is first submitted under that procedure. Similarly, if the dispute is filed before the WTO settlement, this would prevent the dispute from being brought under the RTA. An example of that would be Article 2005 (6) of the NAFTA, which provides that:

> Once dispute settlement procedures have been initiated under Article 2007 or dispute settlement proceedings have been initiated under the GATT, the forum selected shall be used to the exclusion of the other, unless a Party makes a request pursuant to paragraph 3 or 4.

In this type, the parties agree on more than one forum in advance. However, it can be changed if the parties collectively agree so (Hillman, 2009, pp. 195–196).

3. Analysis

3.1 Overview

The jurisdictional conflict stems from the clashes between the forum clauses incorporated in relevant international treaties that provide for additional jurisdictions. This conflict occurs in the situation where one claim can be brought to different dispute settlement systems for various reasons. Under some circumstances, the possibility of having two distinct competent jurisdictions to decide the claim may lead to difficulties if they are invoked in parallel or in sequence. These two or more adjudicative bodies may claim final jurisdiction, which prevents the parties from seeking redress through another tribunal. It is also possible that these jurisdictions will reach a different conclusion which can lead to different outcomes (Marceau & Kwak, 2003, pp. 84−86).

Even though settlement provisions in many RTAs may be compatible with the WTO rules, the forum clauses in these agreements may give rise to a conflict with respect to the applicable law over the matter as well. Particularly, the overlap can be expected when the RTA has substantive obligations that are parallel to the WTO's obligations and the forum clause in the RTA obliges or gives the opportunity to the parties to recourse to the RTA's dispute settlement mechanism agreed on, exclusively or in addition to DSU. The immediate question here is that is it possible for the DSU to seize its jurisdiction in favour of RTA dispute settlement if the forum clause is invoked during the proceeding? DSU mandates the Panel to "address the relevant provisions in any covered agreement or agreements cited by the parties to the dispute" and conduct "an objective assessment of . . . the applicability of and conformity with the relevant covered agreements" (DSU, Article 11). It seems that the Panel could be in breach of its obligations under the DSU if it fails to address the consistency of the forum selection clause of the RTA if it is invoked and cited by the defendant, with the requirements of GATT Article XXIV.

Moreover, the Marrakesh Agreement states that multilateral trade agreements are "binding on all Members" (Marrakesh Agreement, Articles I; II 2) and "each Member shall ensure the conformity of its laws, regulations and administrative procedures with its obligations as provided in the annexed Agreements" (Marrakesh Agreement, Article XVI 4). Therefore, if the parties of the RTA-containing forum clause are also parties of the WTO, they should be committed to the RTA agreement signed.

3.2 DSU versus RTA

A number of scholars hold the view that the DSU will have exclusive jurisdiction over WTO violations claims relying on Article 23, which states that "When Members seek the redress of a violation of obligations or other nullification or impairment of benefits under the covered agreements or an impediment to the attainment of any objective of the covered agreements, they shall have recourse to, and abide by, the rules and procedures of this Understanding" (Steger, 2004, pp. 142−147).

They claim that Article 23 cannot be read in a vacuum, and the meaning of this article is that the DSU has "not only compulsory jurisdiction over matters arising under the covered agreements, but that it also has exclusive jurisdiction over such matters" (Steger, 2004, pp. 142−147). By interpreting that Article, they insist that it imposes on the WTO member seeking redress for violations under covered agreements an obligation to use DSU procedures. Therefore, once the complaining party submits a request for a panel, the panel is automatically established. (Steger, 2004, pp. 142−147). This opinion moves on to confirm that final decision of that panel or the Appellate Body is binding on all parties (Steger, 2004, pp. 142−147).

From a different angle, some scholars tend to believe that it is possible for a DSU panel to apply the RTA rules. Article 7.1 of the DSU articulates the relevant rules to be applied by the WTO's panel, and the mission of the panel, which is "to examine, in the light of the relevant provisions in (name of the

covered agreement(s) cited by the parties to the dispute), the matter referred to the DSB by (name of party) in document ... and to make such findings will assist the DSB in making the recommendations or in giving the rulings provided for in that/those agreement(s)." Also, the panel has an obligation to further "address the relevant provisions in any covered agreement or agreements cited by the parties to the dispute" (DSU, Article 7.2). Therefore, according to this opinion, RTA rules should be applied through Article 7 of the DSU when these rules are cited by either party to the dispute during the proceeding before the WTO's panel.

3.3 Assessment

The reliance on the language of Article 23 raises the question of the possibility of the RTA to prevail if it has similar provisions as the WTO and requires the parties to bring any dispute arising under this agreement to the RTA's dispute settlement. Would that language deprive parties of their right to access the WTO dispute settlement mechanism since the RTA imposes the same obligations? (Hillman, 2009, p. 197).

The boundary between the RTA and the DSU dispute settlement is vague. Even though GATT recognizes the validity of a RTA as part of the GATT and the WTO legal system, the distinction between these dispute settlement mechanisms needs to be drawn as this ambiguity might hamper the effectiveness of the WTO dispute mechanism.

The overlap between the substantive obligations and multiple dispute fora requires clarification of the relationship between these international agreements if the WTO members are allowed to initiate WTO proceedings seeking redress of a violation of RTA obligations (Hillman, 2009, p. 197). There are several cases that have triggered the problem.

The exclusivity of the WTO in respect of violation of WTO obligations may be called into question when the RTA provides for a forum selection clause in addition to the WTO. In this situation, we should distinguish between two examples. First, if the forum selection clause elects the RTA as an alternative dispute mechanism, in this situation, the WTO can adjudicate the matter as the RTA does not deny the WTO's competency. Note that allowing the WTO to hear the claim, in the presence of an alternative forum clause, does not preclude the RTA's jurisdiction. The question then becomes: what if the rulings of these two different mechanisms are contradictory? In fact, there is an example of these conflicting rulings between the WTO and the RTA. Canada brought actions against the US over softwood lumber countervailing and antidumping measures, initiating three NAFTA proceedings in addition to four claims in the DSU. The WTO panel ruled in favour of the US[1] while the NAFTA panel rejected the US claim on the ground that the injury determination was not supported by sufficient evidence. Now, each party has a ruling from a binding and competent panel (Lan, 2007).

Indeed, this is not the only problem that occurs; DSU has been precluded in many RTA agreements, as we will see. Some RTAs stipulate that parties cannot invoke their right of the WTO dispute settlement. When issue comes up while performing their obligations, the complaining party should only submit their claim to the forum listed in the RTA. The question here is: what if the party initiates a DSU proceeding? Will this provision divest the DSU's jurisdiction?

4. Paradigms of jurisdictional conflict between the WTO and the RTA

4.1 Treaties providing for another forum in addition to the WTO

In this method, the approach of some RTAs provides a lenient interaction with parties' obligations under another international agreement in terms of a competent forum. As an example, the EU-Japan Economic Partnership Agreement (EPA) was signed between the EU and Japan on 1 February 2019. Article 2.15 of this agreement allows parties to adopt restrictions on exportation or sale for export of any good listed in Annex 2-B in accordance with GATT Article XI.2 (exceptions to quantitative restrictions). However, parties should "seek to limit that prohibition or restriction to the extent necessary, giving due consideration to its possible negative effects on the other Party" (EPA, Article 2.15 (2) [b]). This provision expands the party's ability to impose restrictions if these measures are necessary. There is nothing in the treaty defining the term 'necessar' in relation to these restrictions, which means parties have the discretion to assess necessity. In contrast, GATT Article XI.2 opines that the necessary circumstances, where a party may impose restriction on exportation, must be narrowly tailored to certain situations. Article 21.7 of the EPA agreement provides: "Where a dispute arises with regard to the alleged inconsistency of a particular measure with an obligation under this Agreement and a substantially equivalent obligation under any other international agreement to which both Parties are party, including the Marrakesh Agreement, the complaining Party may select the forum in which to settle the dispute."

Let's assume that Japan, as it is party to both the EPA agreement and the WTO, arbitrarily imposes restrictions on exportation to the EU and these measures are inconsistent with Article XI.2 of GATT. Japan can justify these measures as necessary; it cannot be held liable since there is no definition on what is necessary under Article 2.15 (2) (b) of the EPA. Assume further that the EU resorted to dispute settlement under that agreement and the claim was denied. The EU is still able to bring the same matter to the WTO despite the forum clause incorporated in the EPA agreement as there is an obligation imposed on the WTO DSB that its ruling "cannot add to or diminish the rights and obligations provided in the covered agreements" (DSU, Article 3.2).

This provision prohibits the DSB from declining to exercise jurisdiction if the matter falls under THE WTO obligations.

The panel will encounter difficult questions. One is whether the ruling issued by the EPA tribunal is binding; second is whether the DSU has jurisdiction, if the clause is invoked by Japan; third is whether the assessment will be based on the EPA treaty or the GATT; and finally, if the DSU ruled in favour of the EU there will be two different rulings.

Another example is the United States-Mexico-Canada Agreement (USMCA), which came into effect on 1 July 2020. That agreement contains a dispute settlement section, Chapter 30. Article 31.3 of that Chapter provides:

1. If a dispute regarding a matter arises under this Agreement and under another international trade agreement to which the disputing Parties are party, including the WTO Agreement, the complaining Party may select the forum in which to settle the dispute.

2. Once a complaining Party has requested the establishment of, or referred a matter to, a panel under this Chapter or a panel or tribunal under an agreement referred to in paragraph 1, the forum selected shall be used to the exclusion of other fora.

Based on this language, the party has the right to recourse to either forum only when a dispute arises under the USMCA agreement and another international agreement. Once the proceeding is initiated, the tribunal will be exclusively competent.

In the same vein, in 2002 party States of MERCOSUR[2], the Republic of Argentina, the Federative Republic of Brazil, the Republic of Paraguay and the Eastern Republic of Uruguay, agreed to sign the Olivos Protocol for the Settlement of Disputes in MERCOSUR (Olivos Protocol). This protocol provides for a permanent dispute settlement mechanism, which aims to establish a unifying jurisprudence on matters derived from the MERCOSUR.

Article 1.2 of the 2002 Olivos Protocol, which is the most recent dispute settlement mechanism set up within MERCOSUR, contains a choice of forum clause regarding disputes that fall within both the WTO and MERCOSUR's jurisdiction:

> Disputes falling within the scope of application of this Protocol that may also be referred to the dispute settlement system of the World Trade Organisation or other preferential trade systems that the Mercosur State Parties may have entered, may be referred to one forum or the other, as decided by the requesting party. Provided, however, that the parties to the dispute may jointly agree on a forum.

However, once the complaint has been submitted to one tribunal, that will prevent the parties resorting to any other tribunal, as Article 1.2 provides:

> Once a dispute settlement procedure pursuant to the preceding paragraph has begun, none of the parties may request the use of the mechanisms established in the other fora…

The question here is what would the WTO do if one party, in violation of USMCA or MERCOSUR obligations that are like those of the WTO, resorts to the DSU after submitting its claim to the RTA tribunal? Would the WTO respect the exclusion provision and decline to decide the case?

This situation has previously materialised before the WTO panel on Argentina-Definitive Anti-Dumping Duties on Poultry from Brazil. Brazil complained and lost its claim to MERCOSUR. Then, it decided to resort to the WTO dispute settlement. The panel, notably, found that the old Brasilia Protocol was still applicable and had no prohibition with respect to bringing subsequent cases before the WTO. The panel, in its reasoning, stated that:

> We note that Brazil signed the Protocol of Olivos in February 2002. Article 1 of the Protocol of Olivos provides that once a party decides to bring a case under either the MERCOSUR or WTO dispute settlement forums, that party may not bring a subsequent case regarding the same subject-matter in the other forum. The Protocol of Olivos, however, does not change our assessment, since that Protocol has not yet entered into force, and in any event it does not apply in respect of disputes already decided in accordance with the MERCOSUR Protocol of Brasilia. Indeed, the fact that parties to MERCOSUR saw the need to introduce the Protocol of Olivos suggests to us that they recognised that (in the absence of such Protocol) a MERCOSUR dispute settlement proceeding could be followed by a WTO dispute settlement proceeding in respect of the same measure. (WTO, 2003, 7.38)

It can be concluded from the panel explanation that the exclusion clause had a legal effect before the panel and if the Protocol was effective the panel would have been willing to enforce it, otherwise the panel would not have addressed this defense (Pauwelyn, 2003, p. 1013).

4.2 Treaties precluding WTO jurisdiction

In this paradigm the situation is more complicated. The RTA sometimes includes an explicit provision to preclude the DSU from hearing future disputes. India, for example, signed a bilateral agreement

with the European Commission (EC) on 12 November 1997 to reach a solution and not to invoke the WTO dispute settlement. The agreement was notified to the DSB in accordance with Article 3.6 of the DSB, containing the following provision:

> . . . the European Communities will refrain from action under GATT Article XXII or Article XXIII as regards those restrictions [maintained by India on import of industrial, agricultural and textile products] during the phasing-out period as defined below, if India complies with its obligations under this exchange of letters. (WTO, 1998)

After the agreement, the EC brought action before the DSU related to India-Auto. India argued that the DSU lacked jurisdiction over the dispute as the parties had agreed not to invoke the WTO dispute settlement, also contending that the bilateral agreement removed the EC's right to resort to the DSB (WTO, 2002, para. 4.30). The panel did not address the question of whether the bilateral agreement divests the jurisdiction from the WTO dispute settlement and whether the forum selection clause was binding by finding that the matter was not covered by the settlement provision (WTO, 2002, para. 4.30).

This paradigm might come in different wording. For instance, Article 19.5 of the Closer Economic Partnership Arrangement (CEPA), which was signed by Mainland China and Hong Kong, stipulates that "any problems arising from the interpretation or implementation of the CEPA" shall be settled "through consultation in the spirit of friendship and cooperation" (CEPA, 2003, Article 19.5).

It has been argued that if the dispute results under an agreement containing a clause that denies the jurisdiction of the WTO over the dispute, the DSU's panel has an obligation to decline to decide the matter by virtue of the agreement (Pauwelyn, 2004, p. 998−1008). However, this opinion contradicts with Article 23 of the DSU, which, as a general principle, subjects all WTO matters to be resolved under the DSU.

4.3 Treaties providing for an exclusive jurisdiction

NAFTA, in Chapter 20, adopted the exclusive forum regime. If the dispute relates to environmental or health protection, the adverse party can insist that the dispute be adjudicated under NAFTA. In an international context, the idea of exclusive jurisdiction also poses a risk to other tribunals' jurisdiction. Article 292 of the Treaty on the Functioning of the European Union (TFEU), for instance, states that:

> Member States undertake not to submit a dispute concerning the interpretation or application of this Treaties to any method of settlement other than those provided for therein. (Consolidated version of the Treaty on the Functioning of the European Union, 1957)

Does this text prevent EU members from recourse at any EU international tribunal other than the European Court of Justice? Based on the plain language of the text, the answer seems to be no, EU members can resort to any other international tribunals unless the dispute concerns interpretation of the TFEU. The difficult question is what happens when one party raises an issue involving the TFEU and WTO obligations during the proceeding?

This conflict between the TFEU and another international tribunal, in fact, occurred recently in *Ireland v. United Kingdom.* In that case, Ireland filed claims regarding violations under the United Nations Convention for the Law of the Sea (UNCLOS). Ireland accused a MOX (mixed oxide fuel) plant of discharging radioactive waste into the Irish Sea. This plant was managed by the United Kingdom. The International Tribunal for the Law of the Sea (ITLOS) found that there was *prima facie* jurisdiction according to Article 288.1 of the UNCLOS, which states: "A court or tribunal referred to in Article 287 shall have jurisdiction over any dispute concerning the interpretation or application of this Convention which is submitted to it in accordance with this Part" (ITLOS, Order of 3 December 2001). The tribunal constituted to decide the case. In contrast, the panel decided to suspend the proceeding

in response to UK arguments that the dispute fell, exclusively, within the scope of TFEU jurisdiction in pursuance of Article 292 of the TFEU. The arbitration panel refused to answer the question as to whether the dispute fell, partially, under the TFEU's exclusive jurisdiction and decided that the question is "to be decided within the institutions of the European Communities, and particularly by the European Court of Justice" (Permanent Court of Arbitration, Order No. 3 of 24 June 2003). Therefore, the tribunal refrained from continuing the proceeding upon the existence of the exclusive jurisdiction provision. The immediate question is what would be the decision of the WTO's panel if a case submitted to it involved overlapping substantive obligations between the WTO and TFEU?

Some scholars tend to follow the UNCLOS's rules and call for them to be applied even by the DSB. In justifying that, they list a number of reasons: the first, according to Article 133 of the TFEU, states that the TFEU's common commercial policy falls within the exclusive competence of the EC. EU members have no legal capacity to exercise their right to resort to the WTO dispute settlement, because they relinquished that right (Pauwelyn, 2004, p. 1010), at least not when the matter involves multiple issues concerning both the WTO and TFEU obligations. Furthermore, the dispute between EU members and non-EU members should also be adjudicated by the EC. Therefore, the lack of competence resulting from the TFEU Treaty applies beyond the EU.

There are two observations from this opinion. First, it weighs on the side of the TFEU, and not the WTO, without reasonable justification. Why should the WTO rules not apply since the language of Article 23 DSU has the same legal strength? We can assume EU members relinquished their right to bring their claims under the TFEU in favour of the WTO as this opinion alludes to the autonomy of the states.

5. Solutions suggested to resolve the jurisdictional conflict

5.1 Res judicata

Bin Cheng states that "recognition of an award as res judicata means nothing else more than recognition of the fact that the terms of that award are definitive and obligatory." (Cheng, 1987, pp. 336−7) In the same vein, Barnett has described res judicata as:

> [a]… judicial decision of special character because, being pronounced by a court or tribunal having jurisdiction over the subject-matter and the parties, it disposes finally and conclusively of the matters in controversy, such that – other than on appeal – that subject-matter cannot be relitigated between the same parties or their privities. Instead, the subject-matter becomes – as the Latin reveals – 'a thing adjudicated', with res judicata thereafter standing as the final and conclusive resolution of the parties' dispute. (Barnett, 2001, pp. 92−98)

> The concept of res judicata has been recognised by international courts and tribunals such as the International Court of Justice (ICJ), the European Court of Justice (ECJ), and arbitration tribunals, as a legally binding principle. (Barnett, 2001, p. 143)

The applicability of res judicata is one of the most controversial issues in the WTO law. The principle of res judicata is a non-WTO norm and not included in any WTO covered agreement in the DSU. The DSU tribunal relies on Articles 1.1, 3.2, 7, 11 and 19.2 to decide any case.[3] To determine whether a WTO member has violated the rights of another member, the DSU would use the agreement signed by these members as substantive law to determine the rights and obligations of each party.

Even though the DSU is bound by the articles set forth above as applicable law, once the jurisdiction of the DSU is properly established, it is not clear what the applicable law panels and the Appellate Body would apply (Pauwelyn, 2003, p. 1001). Scholars claim that award rendered by the RTA's

dispute settlement mechanism has a res judicata effect, therefore, the DSU should decline to exercise jurisdiction (Hillman, 2009, p. 203). The motive behind this view may be based on the characterisation of the RTA rules as general international law. However, most laws of international agreements, such as those related to the environment and human rights, have not been applied by the DSU tribunal. Rather, they are taken into consideration to determine rights and obligations of the WTO covered agreement (Son, 2008, p. 130).

The basis of applying res judicata to the DSU is debatable. It has been suggested that this doctrine be applied through the inherent power of the WTO tribunal. Inherent power can be defined as "powers that the judge enjoys by the mere fact of his or her status as a judge. They are functional powers, only to be exercised when necessary for the purpose of fulfilling the judicial function" (Nguyen, 2013, p. 154).

It is undisputed that because the WTO tribunal acts in many regards as a court, it can be classified as a judicial body. Hence, it should recognise the concept of inherent power since this concept is adopted by all international judicial bodies and there is no prohibition for the WTO to do so (Son, 2008, p. 131). Particularly, as there is no treaty or explicit language that specifies whether the non-WTO rules or norms of international law can be extended to the WTO disputes, inherent power can be the only basis for res judicata (Son, 2008, p. 131).

In the author's view, the applicability of res judicata in the WTO's disputes, based on inherent power doctrine, might face an obstacle of the lack of state consent. Simply put, the WTO members should agree explicitly to the application of res judicata in the WTO's disputes. Such consensus is nonetheless unlikely to happen as this might be inconsistent with the WTO's obligations to designate the DSU as a dispute settlement mechanism to adjudicate the WTO's disputes. Otherwise, that means the WTO encourages its members to settle their disputes in an outside forum. This would be incompatible with the fundamental principle of Article 23 of the DSU. The only way to accept res judicata is for the concept to be recognised explicitly in the DSU.

However, adopting res judicata by the panel does not settle the problem. Assuming res judicata can be applied by the DSU somehow to avoid subsequent proceeding on the same matter before the WTO's panel, it does not offer a decisive solution for the concurrent proceedings before both DSU and RTA panels.

5.2 RTA rules are the substantive applicable law

There is no doubt that WTO panels have jurisdiction over disputes arising from the WTO's obligations. Under Article 1.1 of the DSU, Article 23 only applies to "disputes brought pursuant to the consultation and dispute settlement provisions of the agreements listed in Appendix 1 to this Understanding referred to in this Understanding as the "covered agreements". The question is whether this Article gives the parties the ability to use the RTA's obligation as a defense before the WTO's panel if it is similar to that of the WTO. To put it differently, Article XX of the GATT prohibits any "arbitrary or unjustifiable discrimination" between parties. According to these three Articles, as they are integrated, can a party to the RTA justify that the violation is justifiable discrimination?

In fact, the problem here is related to the applicable law, which differs from jurisdiction. Articles 7.1 and 7.2 of the DSU establish an obligation of the panel, "in the light of the relevant provisions" (DSU, Article 7.1) to "address the relevant provisions in any covered agreement or agreements cited by the parties to the dispute" (DSU, Article 7.2). It can be deduced that the applicable law in the DSU encompasses the rules of the RTA if they are cited by the disputing parties, and the RTA agreement contains the WTO obligations. Therefore, for the RTA to be the applicable law, as non-WTO rules, in the WTO dispute, there are two conditions to be met; first there must be an RTA involved in the

dispute; second the RTA should be cited to the panel by at least one party to the dispute. Then the RTA becomes non-WTO rules and can be applied by the DSB. The problem, therefore, occurs when the RTA, which becomes applicable, contains a provision precluding the jurisdiction of the DSU, how the panel would deal with it.?

Some scholars have emphasised that these provisions in the DSU should be read to allow the WTO's panel to apply non-WTO law to the dispute even if that precludes the WTO's rules, and their reasons are as follows.

First, the WTO panels have not limited themselves to the four corners of the WTO covered agreements. They have referred, multiple times, to the general public international law principles, namely customary international law (Pauwelyn, 2004, pp. 1002−4). Second, the DSU, in Article 3.2, clearly states that WTO covered agreements must be clarified "in accordance with customary rules of interpretation of public international law". Based on that, the Vienna Convention on the Law of Treaties 1969 (Vienna Convention) stipulates in Article 31(3) that a treaty must be interpreted in light of "any subsequent agreement between the parties regarding the interpretation of the treaty or the application of its provisions" (Vienna Convention, Article 31.3 'a'). Therefore, the WTO treaty "explicitly frames itself in the wider context of public international law, including other non-WTO treaties" (Pauwelyn, 2004, p. 1001).

The author agrees with part of this opinion, as it is undisputable that the DSU may use other international agreements and bilateral treaties as a tool to clarify parties' obligations under the Marrakesh Agreement, such as the Vienna Convention, for example. However, neither Article 3(2) of the DSU nor Articles 31 and 32 of the Vienna Convention provide that all relevant treaties between the disputing parties must be applied by the WTO's panel while determining whether a defendant has performed their obligation under the WTO covered agreement (Steger, 2004, pp. 8−9).

Another argument is that the Marrakesh Agreement is, in fact, a treaty, which means it is part of public international law, and the Marrakesh Agreement cannot be applied in a vacuum from other international law rules. In other words, Article 7 of the DSU does not need to set out all other rules of international law to be applied by the WTO's panels (Pauwelyn, 2004, p. 1001).

The crux of this analysis is that based on the characterisation of the WTO as an international agreement, there is no justification to isolate non-WTO rules. This is because non-WTO agreements create international law obligations, and these treaties serve as an applicable law, therefore, they cannot be ignored by the panel (Pauwelyn, 2003, p. 1001).

The Marrakesh Agreement has no provision that imposes an obligation on the panel to examine the covered treaties between the disputing parties and assess their satisfaction of their obligation. The function of the DSU is to control the trade between the WTO members. Thus, the attempt to give the RTA legal value to be applied by the WTO panel as part of public international law is baseless. Further, the WTO's members did not grant a jurisdiction to the DSB panel to hear any issue arising from other agreements (Steger, 2004, p. 5).

5.3 WTO jurisdiction prevails

Article 23 of the DSU may prevail and preclude other jurisdictions from deciding the WTO law matters as Vienna Convention Article 30.2 states: "When a treaty specifies that it is subject to, or that it is not to be considered as incompatible with, an earlier or later treaty, the provisions of that other treaty prevail". Evidently, forum selection in the RTA cannot divest the jurisdiction of other tribunals established by other agreements: such bodies may still adjudicate claims arising under their agreements having provisions that operate in parallel to, or overlap with, the WTO provisions. Therefore, there is a need for WTO's members to address the issue of conflicting jurisdiction of both the WTO-RTA dispute settlement mechanisms.

Based on the Vienna Convention Article 30.2, it is possible that either the RTA or the WTO jurisdiction be seized, at the same time or in sequence, from adjudicating a very similar issue since the obligations under the RTA and the WTO are similar. In the absence of a treaty that addresses this issue, the principles of treaty interpretation appear to be the only reliable rules to resolve the issue of overlap or conflict of dispute settlement mechanisms. The issue is whether these conflicting rules can exclude the WTO dispute settlement mechanism or nullify its access; it is unlikely.

5.4 Abuse of process

It may be argued that in public international law, a State, by bringing the same claim to a second tribunal, is abusing its process or procedural rights. A tribunal may decline to exercise jurisdiction if it believes that the motive behind this proceeding is to harass the defendant, or the allegations are frivolous or baseless. Realistically, it is rare that any judicial body, including the DSU, would find the allegations frivolous (Kwak & Marceau, 2002, p. 7).

6. Solution

It would be difficult to deny the WTO members' access to the DSU if the dispute is subject to the RTA dispute settlement mechanism, as Article 23 of the DSU imposes on members to resort only to the DSU if they seek redress of a violation of the WTO obligations. The risk of having parallel proceedings does negate the fact that Article 23 of the DSU would prevail over the RTA rules, and the WTO's panel would not hesitate to adjudicate any violation of the WTO's obligations submitted to it. The only solution, in the author's view, would be for the WTO's members to negotiate an amendment to the DSU rules and incorporate a set of rules governing the allocation of jurisdiction between the WTO and the RTA. The amendment of DSU rules should consider the recognition of the dispute settlement mechanism provision contained in the RTA, whether this provision is formulated to designate the WTO as an additional forum or to exclude its capacity to decide the issue.

Suggesting that RTA members draft the forum clause in the RTA consistently with DSU jurisdictional scope is unlikely to happen for two reasons. First, for this suggestion to be binding it must be incorporated in DSU rules which would require an amendment to the DSU rules. Second, some countries intend to preclude the jurisdiction of the WTO when drafting their free trade agreement. In addition, all states have the right to bind themselves with any obligation and their freedom in this regard cannot be seized.

In conclusion, this article has provided an analysis on the viability of the forum selection clause incorporated in the RTA when: 1) all parties are WTO members, and 2) the dispute concerns the WTO obligations. Given the significant growth of RTAs, particularly when most of these agreements contain forum selection clause, it seems the conflict of jurisdiction between the DSU and RTA dispute settlement mechanism is inevitable. This article, therefore, argues that this problem should be resolved for a consistent relationship between these two regimes. As discussed above, in light of the clear language of Article 23 of the DSU, all of the solutions suggested seem to be impractical. Negotiation between WTO members is urgently needed in the absence of any international rules that might govern this issue. Also, there should be a set of interpretation rules to help avoid any potential conflict in the future between the RTAs and the WTO in terms of obligations or jurisdiction.

Acknowledgements

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Notes

1   The appellate body overturned the DSU decision; however, that does not negate the fact there is a potential jurisdictional conflict. See WTO (2006).

2   MERCOSUR is a union of States obtaining legal personality under International Law, whose origin is the Asuncion Treaty of March 26, 1991. The treaty was executed by the Republic of Argentina, the Federative Republic of Brazil, the Republic of Paraguay, and the Eastern Republic of Uruguay.

3   DSU, Articles 1.1, 3.2, 7, 11, 19.2 are substantially procedural and instruct the panel to apply the rules of covered agreement underlying the dispute as substantive law.

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Big Data Analytics for Supply Chain Sustainability: Amid the Outbreak of the COVID-19 Pandemic

Tariq Al-Shbail, Asma Maghayreh and Mohammed Awad

Abstract

Sustainability of supply chains are current buzzwords globally and are now more important than ever. Big data analytics holds many promises to address supply chain issues. However, the potential of big data analytics to address COVID-19 pandemic issues, particularly supply chain sustainability, remains vague and understudied. This study highlights the challenges facing supply chains resulting from the COVID-19 outbreak and investigates the role of big data analytics in promoting supply chain sustainability. Our findings revealed that big data analytics can play a vital role in overcoming supply chain disruptions and enhancing the sustainability of supply chains during the COVID-19 pandemic.

1. Introduction

At the start of 2020, COVID-19 emerged and led to an unprecedented situation that affected every aspect of human life more than any before it. The World Health Organization (WHO) announced the outbreak of COVID-19 as a pandemic and 'a public health emergency of international concern' threatening health care systems worldwide (WHO, 2020). Despite rigorous containment and preventive measures, COVID-19 continues to rise exponentially posing full or temporary closures of businesses, factories, markets, borders and government agencies in many countries facing high levels of infection (Bartik et al., 2020). As a result, this pandemic has significantly affected the global economy, which has fallen to record lows (Ozili & Arun, 2020), sparking fears of an impending economic crisis (Nicola et al., 2020).

The toll that the global economy has taken is mostly related to the curfews and the consequent travel restrictions and unprecedented lockdown in several trade sectors. The global economic consequences have been devastating. There has been a huge dip in international trade, declining between 13 per cent and 32 per cent compared to 2019 (World Trade Organization [WTO], 2020). Millions of people lost their jobs across all economic sectors, and many stock markets suffered record losses (Laing, 2020). Some industries such as food, pharmaceutical, retail, logistics and freight strive to meet global demand, while other sectors, especially hospitality and aviation, have failed to survive due to a lockdown in trade, and have begun to suffer unimagined losses (Nicola et al., 2020).

Moreover, COVID-19 has caused drastic destabilisation and disruptions to supply chains globally by creating a misbalance between supply and demand of many crucial facilities and activities (Ivanov & Dolgui, 2020). Araz et al. (2020) mention that COVID-19 is breaking many international supply chains. As an example of supply chain disruptions, the sudden and huge increase in demand for food and safety personal protective equipment (PPE), offset by an acute shortage of raw materials for these items, has caused chaos in the markets because of an imbalance between demand and supply.

Conversely, in other industries (specifically the hotel, aviation and automotive industries), there has been a dramatic drop in demand making them vulnerable to bankruptcy. Therefore, COVID-19 has caused destabilisation of supply chains globally, making them unable to meet the population's needs.

Given its lean and globalised nature, the supply chains of numerous organisations worldwide have experienced a wave of disorders. For example, 94 per cent of the 1,000 largest American companies listed in Fortune magazine have been significantly influenced by COVID-19 pandemic-driven supply chain disruptions (Fortune, 2020). The World Economic Forum's Global Risks Report indicated that COVID-19 is among the significant risks that cause supply chain disruptions (World Economic Forum, 2020). Worse yet, the activities and facilities of global supply chains are prone to outbreaks of COVID-19 (Ivanov & Dolgui, 2020). According to Linton and Vakil (2020), the biggest 1,000 supply chains in the world have more than 12,000 facilities including warehouses, factories, logistics and other operations that are located in quarantine and lockdown areas of COVID-19.

As a result, the COVID-19 pandemic has shed light on supply chains as an important aspect and vital artery of the global economy, and put the value of sustainability into greater focus (Ivanov & Dolgui, 2020). While there have been some calls and efforts to make supply chains more sustainable and resilient in the past few years, most supply chains' parties did not consider the possibility of a pandemic in their strategies. Thus, most supply chains are labelled as not sufficiently resilient. The COVID-19 pandemic has also presented challenges beyond the capability of businesses and governments in supply chain sustainability and uncovered some coordination vulnerabilities between supply chain parties (Hakovirta & Denuwara, 2020). Nevertheless, one of the key questions looming today is how to ensure supply chain sustainability with the spread of COVID-19. According to Ivanov and Dolgui (2020), the answer to this question goes beyond the current capabilities of supply chain parties as it cannot be resolved from a narrow perspective, instead, it requires more sophisticated data analytics tools.

In the fight against the outbreak of COVID-19, big data analytics have played a prominent role in many disciplines (Zhou et al., 2020). This mainly included the health care sector in terms of the rapid collection of health data from multiple sources, spatial tracking of infected cases, visualisation and prediction of the pandemic and assessment of the prevention level and control (Wang et al., 2020). In the supply chain context, big data analytics has contributed to making supply chains more resilient in balancing the demand and supply of commodities. It also effectively supports the capabilities of supply chain actors in identifying potential risks, making more informed and smarter decisions, and finding alternative solutions (de Sousa Jabbour et al., 2020). However, the potential of big data analytics to face COVID-19 pandemic issues, particularly supply chain sustainability, remains vague and understudied (Zhou et al., 2020).

As a key actor positioned at borders, customs administrations worldwide play a pivotal role in global supply chains and ensuring their sustainability (Aman et al., 2017). Realising this importance, the World Customs Organization (WCO) devoted the year 2020 to promoting the sustainability concept among its members, and launched the slogan 'Sustainability for people, prosperity and the planet' with the aim of 'focusing on the contribution of Customs towards a sustainable future where social, economic, health and environmental needs are at the heart of its actions' (WCO, 2020, p. 1). In addition, the WCO has issued several tools and instruments to assist the customs community in fostering supply chain management and ensuring sustainability, and recently published guidelines to fight the COVID-19 pandemic. In response to that, many customs administrations around the world are listing supply chain sustainability as a top priority in their strategies. However, COVID-19 has created more burdens and pressures for both customs administrations and businesses (Weerth, 2020). Trade facilitation, supply chain security and sustainability are among key issues for customs administrations under this confused global health situation. Businesses are now facing many challenges regarding scarcity and increased costs of materials and shipping, workforce, logistics, as well as consumer

demand, marketing issues and cash flow. All this indicates unprecedented disruption of international trade and impedes its facilitation.

The COVID-19 outbreak has caused deliberation among academia and practitioners on the concept of sustainability as an interesting research topic. While the supply chain has gained considerable attention in recent literature, big data research on supply chain sustainability during the COVID-19 pandemic remains quite scarce and rather limited. Therefore, this study investigates how big data analytics can help address supply chain challenges and support their sustainability during the COVID-19 outbreak. The findings of this study will assist decision-makers and supply chain stakeholders, who are still struggling with the spread of the pandemic, to leverage big data analytics to promote sustainability of supply chains.

2. Literature review

2.1 Sustainability and supply chains

The term 'sustainability' is commonly defined as economic practices that meet the present needs without compromising the needs of future generations (World Commission on Environment and Development [WCED], 1987). Sustainability has been used to balance and take responsibility for development and economic activities (Hakovirta & Denuwara, 2020). Sustainability focuses mainly on three key pillars: social, environmental and economic development (Govindan et al., 2014). These pillars have been widely considered as the basis to develop many sustainability standards. Most recently, some researchers emphasised the importance of adding a fourth pillar of sustainability to include human health as a new sustainability goal as a result of the COVID-19 pandemic (Hakovirta & Denuwara, 2020).

During the last decade, many organisations from both public and private sectors have identified sustainability as a top priority in their supply chains and have adopted, or are in the process of adopting, programs to make their supply chains more sustainable (Govindan et al., 2014; Govindan et al., 2016; Luthra & Mangla, 2018). A supply chain can be defined as a network that links diverse entities, activities, systems, resources and information to produce and distribute a particular product or service to the final customer (Charkha & Jaju, 2014). Supply chain sustainability is a holistic view of supply chain processes, logistics networks and technologies that affects the environmental, social, economic and legal aspects of a supply chain's components (Giannakis & Papadopoulos, 2016). Most recently, global interest in supply chain sustainability has been raised by the increasing risks and level of uncertainty imposed by the outbreak of the COVID-19 pandemic on the global economy, business trends and social environment, which have induced disruptions in supply chains worldwide (Bartik et al., 2020; de Sousa Jabbour et al., 2020; Hakovirta & Denuwara, 2020).

The COVID-19 crisis has exposed vulnerabilities and risks across supply chain parties and their operations. The recent supply chain literature has identified a number of risks arising from COVID-19, which include disruptions and delays caused by the wide shutdowns of borders, manufacturers, suppliers and markets (Hakovirta & Denuwara, 2020; Ivanov & Das, 2020), supplier dependency, supply capacity constraints, demand and supply volatilities, stock accumulation or stockouts, logistics and transportation problems, supplier liquidity and money transfer, exchange rate volatility, breakdowns and machine malfunctions, information distortion and inaccurate forecasts (Ivanov, 2020; Queiroz et al., 2020). From these scenarios, the political and social consciousness has awakened to the negative economic and social impacts of COVID-19. Supply chain disruptions and risks along with global human health problems may lead to a point of no return. Therefore, the pursuit of sustainability is widely perceived as an effective strategy to address the contemporary challenges facing supply chains and mitigate the consequences resulting from the drastic events of the COVID-19 outbreak.

Sustainability has emerged as a key research topic in the recent supply chain literature. Environmental sustainability has gained much attention in supply chain research driven by growing concern arising from scarcity of natural resources, climate change and global warming (Caniato et al., 2012; Fransoo, Günther, & Jammernegg, 2014). Recently, there have been some research attempts to address sustainability issues in the context of supply chain management (Giannakis & Papadopoulos, 2016; Govindan et al., 2014; Govindan et al., 2016; Luthra & Mangla, 2018; Mota et al., 2015). However, although there have been calls among academics and practitioners to further investigate supply chain sustainability, studies that address this issue in relation to recent COVID-19 events are scarce (Hakovirta & Denuwara, 2020; Ivanov & Das, 2020).

2.2 Big data and supply chain sustainability

The increasing risks and uncertainty imposed by the outbreak of the COVID-19 pandemic on the global economy, health care and social environment, along with the high infectivity of the virus, data distortion and inaccurate forecasts, have led to an urgent need for more sophisticated data analytics tools and technological support to fight the spread of the pandemic (Hakovirta & Denuwara, 2020). The response to COVID-19 has created a bigger volume of data than ever before, and has seen a paradigm shift in the way that data is gathered, managed and analysed across different disciplines (Zhou et al., 2020). Data are no longer generated and collected from government entities, rather, they are gathered from multiple diverse sources (Jeble et al., 2018). As a result, globally, we are witnessing an unprecedented increase in the sheer volume of heterogeneous data in terms of diversity and complexity. As practitioners and academics look for every possible way to prevent and control the epidemic, big data analytics emerges as a plausible solution with the promise to mitigate the consequences resulting from the COVID-19 pandemic. Big data can be defined as an enormous amount of unstructured, diverse and complex data that cannot be processed using traditional analytical tools, which requires more sophisticated technology to analyse and extract meaningful insights and make informed decisions (Appelbaum, 2016).

Zhou et al. (2020) highlight the role of big data in addressing challenges facing geographic information systems in the fight against COVID-19. They summarise 10 potential responses of big data in mitigating the influence of the COVID-19 epidemic, namely, '1) rapid construction of a big data information system for the epidemic; 2) rapid problem-oriented big data acquisition and integration; 3) convenient multiscale dynamic mapping for epidemics; 4) comparison between spatial tracking and the spatiotemporal trajectory of big data; 5) spatiotemporal prediction of the transmission speed and scale of the epidemic; 6) spatial segmentation of the epidemic risk and prevention level; 7) spatial dynamic balancing of supply and demand for medical resources; 8) assessment of the supply of materials and transportation risk; 9) rapid estimation of the population flow and distribution; and 10) monitoring the spatial spread of social sentiment and detection' (p. 78).

Big data analytics is 'a field that consists of big data, analytical tools and techniques to derive actionable insights from the big data for delivering sustainable value, improving business performance and providing a competitive advantage' (Wamba et al., 2017, p. 357). In the last decade, big data analytics has earned considerable interest in several domains. However, big data in the context of supply chain sustainability has a very limited legacy in the existing literature. There has been some research on big data and sustainability in the automotive industry (Bughin, Chui, & Manyika, 2010), whereas other studies either provide a rhetorical and anecdotal perspective or offer a very limited depth of analysis. Some studies addressed the impact of big data analytics on environmental sustainability (Koo, Piratla, & Matthews, 2015; Koseleva & Ropaite, 2017; Lokers et al., 2016). Other research investigates the relationship between big data analytics and financial performance of organisations (Gunasekaran et al., 2017; Wamba et al., 2017). Only very limited studies examine the impact of big data on supply chain sustainability (Hazen et al., 2016; Jeble et al., 2018).

During the COVID-19 crisis, there has been a growing push to take advantage of big data analytics capabilities to promote sustainability in supply chains. However, practitioners are still unaware of how big data can enhance sustainability measures in supply chains, and there is a lack of empirical evidence as of yet to do so (Jeble et al., 2018). Moreover, this domain has yet to earn significant interest in academia. According to Hazen et al. (2016), studies that address the relationship between big data analytics and sustainability in the context of supply chains are contemporarily relevant and quite scant which requires further attention from practitioners and academia. This is particularly true considering the COVID-19 outbreak. Therefore, this study highlights how big data analytics can promote sustainability in the supply chain.

3. Methodology

This research adopts a qualitative interview approach as a data collection method. Considering the novelty of both big data analytics and sustainability in the context of supply chains, particularly under the complex and uncertain situation of the COVID-19 pandemic, qualitative interviews are the most appropriate approach to address such new, unexplained and complex phenomena (Creswell & Poth, 2016). This is consistent with Walsham (2006) who affirmed that qualitative interviews are an apt technique to gain insights into the nuances and difficulties of complicated social phenomena. Moreover, this study aims to provide an understanding of how big data analytics can promote supply chain sustainability. Thus, qualitative interviews are well placed to answer this research question (Merriam, 2015). Qualitative interviews provide an in-depth investigation of participants' perceptions and can grasp the meaning of their opinions and experiences regarding big data analytics capabilities to promote sustainability in supply chains. Hence, this interview technique offers an opportunity to understand the subtleties of participants' perceptions and experiences, and thereafter proceed to a comprehensive and complete understanding of the phenomena under investigation (Daymon & Holloway, 2011).

Beside qualitative interviews, this study relies on a triangulation approach of data collection using semistructured interviews as the prime data collection technique, along with observations and documents. The triangulation approach allows the development of detail-rich data, maintaining the improvement of converging lines of research and enhancing the research validity (Al-Shbail & Aman, 2018).

Interviews were conducted with 12 individuals, including supply chain and logistics experts (3), trade facilitation experts (2), customs managers (3), big data vendors (1), epidemiology experts (1) and academic experts in supply chain and data science (2). The interviewees were questioned on their opinion, experience and perception regarding the implication and consequence of COVID-19 on supply chain sustainability, the current challenges facing global supply chains and the role of big data analytics on supply chain sustainability during the COVID-19 outbreak. The following interview questions were used:

- Can you tell me please what are the current challenges facing global supply chains during the COVID-19 pandemic?

- In your opinion, what are the implications and consequences of COVID-19 on supply chain sustainability?

- Do you think that big data analytics assists in promoting supply chain sustainability (Please explain how)?

- Can you explain how big data analytics enhances supply chain sustainability during the COVID-19 outbreak?

- What are the key success elements of big data analytics that enhance supply chain sustainability during the COVID-19 outbreak?

Documents reviewed included many related international reports, by-laws, regulations, daily press reports, standard operating procedures (SOPs), press reports, guidelines and instructions. Observations included some photos including systems and the work processes in several ports and factories.

Data analysis was performed using a coding technique (Strauss & Corbin, 1998) of all transcripts of interviews and documents to identify relevant elements and themes. The process of coding involved three levels of coding, open coding, axial coding and selective coding (Strauss & Corbin, 1998). The coding process was repeatedly rechecked to identify final themes. Subsequently, the literature was reviewed to explain the themes. Thus, our findings are not *a priori*.

4. Findings

This section presents the findings of this study on how big data analytics promote sustainability in the supply chain amid the outbreak of the COVID-19 pandemic. Our findings revealed that the pandemic has transformed the way in which supply chains operate, which will have global economic, social and environmental ramifications. Sustainability became the major concern of politicians, decision-makers and supply chain stakeholders, as they are committed to a more sustainable future, and are currently looking closely at this issue for supply chains to be far more resilient and sustainable against global disruptions. Amid COVID-19, supply chains have become more complicated and generate a huge amount of complex trade data that only sophisticated technology can deal with. The interviewees believe that to ease the burden, supply chains need to leverage big data analytics, which will have a significant impact on making more informed and strategic decisions to promote supply chain sustainability.

The findings of this study indicate that big data analytics contributes to promoting social and environmental sustainability in supply chains. With the uncontrolled spread of COVID-19, restrictions and lockdowns may increase further and thousands of people will likely lose their jobs, which would destroy economic activity and supply chains. In response to these threats, many organisations worldwide have sought to transform the way in which they operate from traditional work towards fostering flexible working hours, teleworking and harnessing information and communication technology (such as e-commerce, online platforms and social media) to make earning a living easier for employees. This transformation in economic practices and supply chain activities has created a massive amount of unstructured data. From an experts' point of view, big data analytics, particularly data extracted from social media, improves the level of awareness among supply chain stakeholders about the work conditions, wages, health and living conditions of employees, and challenges faced by them. This may lead to an acknowledgment and realisation by organisations of the importance of social and environmental sustainability and its relevance for their activities. Thus, socially sustainable supply chain practices must be improved. Moreover, findings showed that big data analytics enables organisations to better-allocate resources, improve workplace conditions, reduce waste and raise living standards for both employees and society. For example, one interviewee said that big data analytics assists organisations on how to maintain customers, which may lead to enhanced job opportunities and reduced unemployment, which will lead to the survival of sustainable supply chains during the COVID-19 pandemic.

Moreover, our findings showed that the COVID-19 pandemic has affected the resiliency and sustainability of global supply chains relentlessly and caused wide demand-supply disruptions across all industries. The pandemic has caused a long-lasting struggle for all supply chain entities to survive during these challenging conditions, which poses challenges to the enhancement of sustainability

outcomes during and after the current COVID-19 situation. Demand-supply activities have been extensively disrupted because of an upsurge in demand for some products, such as personal protective equipment, pharmaceutical and agrifood products, and disinfectant. With wide-ranging shutdown policies, an increased demand for equipment and supplies by hospitals and mall shelves empty of essential goods have become distinctive features of the pandemic around the world. Other industries, however, such as clothing, furniture, jewellery and electronics have been substantially affected by COVID-19 directly, making them vulnerable to bankruptcy. Most interviewees stressed that big data analytics enhances supply chain resiliency and mitigates demand-supply disruptions caused by the COVID-19 crisis. Big data analytics helps to assess the environment, predict consumers' demands and the actual needs of people during lockdowns, and improve service delivery, which would enable supply chain stakeholders to manage and balance the demand and supply of essential goods and material resources. While the spatial spread of the pandemic is the key threat to supply chains, big data analytics provides meaningful information in a timely manner to better understand the endemic areas. For example, big data analytics provides near real-time prevention of COVID-19 outbreak at the borders, ports, manufacturing and warehouse areas (Zhou et al., 2020). Moreover, the rapid collection of diverse data from multiple sources and real-time analysis offers unique opportunities to develop flexible logistics systems, predict an epidemic outbreak and spatial segmentation of areas at epidemic risk, and draw appropriate dynamic maps for the spread of COVID-19. This enables decision-makers to set out a more sustainable and resilient strategy for supply chains. In addition, big data analytics provides smart and innovative solutions for sectors facing recession by offering meaningful insights into a more agile approach for sectors open to learning from their mistakes.

Another form of disruption revealed by our empirical investigation is that, amid the panic, many businesses are mistakenly or intentionally making multiple orders for the same goods without realising whether they will simply incur the additional costs or will be able to actually sell them. In addition, some suppliers intend to monopolise some essential materials in their warehouses. hoping to drive up prices in the near future. Some customers, on the other hand, sought to 'panic buy' items they feared would run out. These disruptions make it difficult for supply chain stakeholders, including manufacturers and governments, who are struggling to achieve for supply chain sustainability, to determine whether the quantity ordered by vendors and suppliers is consistent with the actual needs of consumers or indeed whether these goods are actually sold. Such practices may waste resources and threaten food security. The findings of this study showed that big data analytics provides more disciplined approaches to maintaining environmental sustainability, the elimination of resource waste and mitigating panic. For example, the interviewees stated that the sophisticated analysis techniques of big data could provide more predictive insights into the exact number of orders made by a particular supplier for a particular service or good, the exact quantity of the goods to be manufactured and shipped, and the extent to which the amount of goods being ordered fits with the population size in a certain area. Additionally, big data analytics helps in avoiding 'out of stock' situations, precisely identifying reorder points and effectively addresses dumping issues.

Furthermore, the interviewed experts affirmed that the COVID-19 outbreak has dramatically changed consumption patterns and customer behaviours because of isolation and changes in habits caused by the growing use of online shopping and social media. This result is confirmed in a survey by Ernst and Young in which '42% of respondents believe that the way they shop will fundamentally change because of the COVID-19 outbreak. When it comes to brands and products, 34% of consumers indicate that they would pay more for local products, 25% for trusted brands and 23% for ethical products' (Ernst and Young, 2020). As not all supply chain entities are able to readily manage and control all such disruptions using traditional methods, big data analytics arises as an effective tool to deal with this dilemma, which plagues global supply chains. Our findings revealed that big data analytics has a variety of advanced techniques such as artificial intelligence, machine learning and sentiment analysis.

These provide deeper business insights into social-emotional orientation and can be used to develop new interactive and integrated services models. They can also be used to develop an optimal approach based on accurate segmentation of customers according to 'what, who, when and where' for numerous services and products. These analytical techniques also offer new innovative methods to predict consumption patterns and identify consumer preferences.

Indeed, the COVID-19 pandemic has highlighted the imperative need to make supply chain operations more visible and agile than before. Our findings indicate that big data analytics is a powerful tool for real-time monitoring and tracking of materials and information throughout supply chain activities, which makes all the processes more visible. In addition, experts strongly believe that real-time analysis of big data shared with other supply chain stakeholders (for example, suppliers, logistics, distributors and government bodies) promotes collaboration and provides clear and common insights into the opportunities and challenges facing supply chains. This in turn leads to increased visibility, makes supply chains more adaptable and flexible, and creates a common understanding to assess the environmental, social and economic impacts of supply chain risks resulting from the COVID-19 crisis. Furthermore, we found that big data analytics enable supply chain entities to identify processes and activities that may be reduced or removed to ensure the flow of materials efficiently, which supports resilience and quick transformations in production in case disruptions occur.

Amid the uncertainty and disruptions caused by the COVID-19 pandemic, risks to the supply chain are more complicated than ever before. Currently, the most prominent risks undermining supply chains are operational risks, simultaneous and long-term disruption and epidemic outbreak propagation. These risks are distinguished by unpredictability and have a very hard and immediate effect on supply chain activities, causing a ripple effect on the sustainability of global supply chains. Thus, more sophisticated risk analysis is now urgently needed for promoting sustainability in supply chains. Experts claimed that organisations with high powered big data analytics in place can make better decisions and adjust their strategies to mitigate supply chain risks in real-time. Our findings indicate that big data analytics delivers enormous benefits to identify and assess supply chain risks during the disruptive events of the COVID-19 outbreak. For example, predictive analysis helps decision-makers better anticipate and respond to disruptions, forecast the potential risk areas and customers' behaviour, reveal new risk patterns in complex environments, understand disruptive conditions early on and prevent them from occurring. Big data analytics also has huge capabilities to gain valuable insights into the lessons learned and identify key areas for optimisation across the entire supply chain, which assists in planning for sustainability and immediate adaptation to changing conditions.

In the customs context, the increase in the epidemic outbreaks has set a great challenge for customs administrations worldwide to fulfil their responsibilities. This study shows that big data analytics can assist customs administrations to develop risk management systems that are able to balance the control of trade and trade facilitation, ensure survivability and sustainability of the supply chain and that can achieve better results with fewer resources. In addition, big data analytics delivers opportunities to handle the complex and huge amount of trade data effectively, to track and trace trade movement in affected areas, identify and to detect new emerging risk patterns such as strategic goods, and counterfeit and substandard commodities that harm the health and safety of society. Thus, this analytical approach enables customs administrations to set out proactive measures to mitigate risks in advance, instead of responding once they have occurred.

5. Conclusion

Amid the ongoing COVID-19 pandemic, supply chain sustainability has become a major concern for both politicians and decision-makers to ensure a more sustainable future for our continued existence and for that of the planet. This study addressed the challenges facing global supply chains caused by the outbreak of COVID-19 and highlighted the role of big data analytics in promoting the sustainability of supply chains. Our findings revealed that big data analytics plays a vital role in overcoming supply chain disruptions and enhancing the sustainability of supply chains during such situations. As a relatively new and innovative phenomenon, many organisations worldwide seek to benefit from big data analytics capabilities in their supply chains with the highly visible aim of surviving supply chains becoming more sustainable and providing high value and outstanding services to society. However, many have yet to leverage big data analytics to promote sustainability in their supply chain, while others are unaware of how to utilise big data analytics to achieve such sustainability.

The times we live in are filled with challenges, uncertainty and disruptions. Big data analytics is no longer perceived as a trendy optional practice that will soon fade, nor a new phenomenon requiring validation. It will continue to survive during the unpredictable future. Thus, big data analytics should be considered an imperative strategic option throughout supply chain activities as they face a rapidly changing reality, and be seen as a valuable asset to develop measures of supply chain sustainability. Therefore, we suggest that it is time to go beyond investigating the role of big data analytics in enhancing the financial and operational performance of supply chains, and that future research should focus on the use of big data analytics to address supply chain sustainability issues, which are becoming significantly important worldwide.

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Manifest Monitoring Model as Support for Customs Risk Management: Evidence from Taiwan

Yen-Hui Kuo and Shu-Ching Chou

Abstract

This study constructs a feature prediction model in border smuggling inspection using the Artificial Neural Networks technique. We extracted six input variables relevant to smuggling through an iterated learning process on 176,869 import manifests. By adopting logistic regression, we also revealed that the six identified factors are significantly related to the occurrence of smuggling. We further used the six seizure factors to predict smuggling in 2019 and obtained an average accuracy rate of nearly 83 per cent. The accuracy rate was much higher around Fridays and holidays. The results will help provide cost-effective screening during customs clearance inspection and effectively manage border risks.

1. Introduction

Efficient enforcement of border inspection has become a necessary response to the increasingly diverse modes of international trade and flows of travellers, goods and money. As global economic interactions intensify, smugglers have increasingly utilised cross-national information and modern technologies to smuggle goods and money. Traditional manual screening of manifests, which depends heavily on the inspectors' experience, might not detect illicit activities of importers during the brief inspection process. Developing an efficient prediction model to curtail smuggling in a timely manner is crucial in border security control.

Traditional border inspection uses arduous and time-consuming processes that involve routine investigation and strategic inspections on specific targets such as seasonal routine adjustments or policy requests. Facing increasing international trading and complex smuggling behaviour, Customs therefore could consider technology-based inspection to promote trading security at borders. With rapid advances in artificial intelligence (AI) technology, AI-based prediction models have been widely applied in different fields given their considerable potential in logic deduction and massive data processing. A technology-based border inspection and administrative approach is expected to trigger an 'alarm' to potentially high-risk consignments, thus enhancing inspection accuracy and curbing smuggling.

This study utilises artificial neural networks (ANNs) optimisation methodology to build a smuggling prediction model. Using 16 input variables and training these variables with 176,869 import manifests at Taichung Port in 2018, the ANNs identified the following six input variables as seizure factors: firm age, firm capital, firm risk level, container ship deadweight, cargo volume and loading port. We used the six identified factors as independent variables to predict the occurrence of smuggling cases using logistic regression. The results showed that all six factors are significantly related to smuggling. We further used the six seizure factors on manifests at Taichung Port in 2019 to predict the smuggling

cases and obtained an average accuracy rate of nearly 83 per cent. An interesting finding was that the accuracy rate of prediction was substantially higher around Fridays and holidays, days which often have more declared cargo and usually have a higher probability of smuggling.

The existing literature discusses general policies regarding cross-border crime and border security management (Tertereanu et al., 2020; Tjiptabudi et al., 2018). The contribution of the study described here is the construction of a smuggling-detection model using real manifest data through the ANNs technique. As reported by Tan et al. (2016), the amount of noise in high-dimensional datasets makes it difficult to understand the information therein and to construct prediction models through data mining. Selecting a subset of relevant factors could reduce the dimensionality and help construct the prediction model (Zhou, 2019). The results show that ANNs could be applicable in screening large amounts of manifest information and determining relevant seizure factors on smuggling. The smugglers in modern society tend to adopt flexible smuggling methods. Our study confirms that a real-time AI-based border inspection system provides Customs with timely assistance on border risk management.

2. Literature review

2.1 Decision-making in global border risk management

Governments worldwide have adopted various border control strategies and implemented strict investigations on goods and people for clearance. Recent practice indicates that the patterns of traditional criminal activities such as drug smuggling and trafficking in migrants have gradually changed. For example, the possibility of international terrorist organisations infiltrating multinational enterprises and financial institutions through trade fraud and money laundering has greatly increased with increasing seemingly legitimate activities (Tessa, 2020). In 2020, the spread of the coronavirus COVID-19 restricted the area of activities and profitability of international criminal groups. To consolidate their power and interests, the criminal groups might increase their activities through illegal but seemingly legal transactions. Experts on Italian mafiahave urged governments to act quickly to fight the rising activities of these groups during the COVID-19 crisis (Savio, 2020).

In particular, in cooperation with high-performance cross-border logistics, border management authorities must enhance the inspection and monitoring of the data pertaining to cargo flow such as using big data analysis to establish regional monitoring models (Lee et al., 2009).When customs clearance data are mined, the data must be highly uniform and strictly adhere to international law and agreements (Garrie & Gelb, 2012). Therefore, the conversion of trade information into applicable data is necessary for administrative decision-making, which allows for economically related evaluations to improve current deployment strategies (Burinskienė & Burinskas, 2011). For example, administrative and legislative agencies must establish measures to verify the authenticity of online user accounts involved in e-commerce trade (such as using two-step authentication) and continually ensure that users of the data adhere to and are protected by regulations and the law (Raymond, 2011).

2.2 Administrative measures to reinforce customs border enforcement in Taiwan

Globalisation and the rapid evolution of information technology have resulted in goods, services and technology flowing quickly and freely across borders, which has, in turn, made customs monitoring more difficult. The duties and concurrent matters of Customs have become increasingly complicated in Taiwan over the years. On the one hand, multinational companies and participants in the global supply chain desperately require the government to establish a new operating model in border management in addition to requiring Customs to simplify procedures and speed up the release of goods from customs clearance procedures. On the other hand, the Executive Yuan of Taiwan requires the Ministry of Legal

Affairs, the Ministry of Finance, and the Financial Supervision and Administration Departments to fight against speculative international finance companies without hindering the free flow of international trade funds, aiming to establish a fair international business environment.

In response to the ever-changing economic tendencies and diverse modes of international transactions, apart from the changing administrative systems of customs operators, Customs has actively optimised technology-based enforcement devices, strengthened border inspection capabilities, and applied the Internet of Things (IOT) technology to monitoring to enhance cargo transportation safety and administration plans, which make customs management more innovative and customs clearance more efficient (Ministry of Finance, 2020).

3. Methodology

3.1 Sample used in this study

This study uses the import manifest data of Taichung Port in Taiwan for the period 1 January 2018 to 31 December 2018. Taichung Port is located in central Taiwan, and is administrated by Taichung Customs, which is governed by the Customs Administration of the Ministry of Finance. Being the largest port for international trading in the central area, Taichung Port receives data on cargo manifests of 500–600 consignments daily and 1200–1500 consignments on weekends and holidays. We collected the information of 176,869 import manifests through the PORTAL system of the Ministry of Finance. The PORTAL system contains information on cargo content, shipping terms, the importer's background, customs clearance status and smuggling-detection record, and is utilised as an important databank by the customs administration. Because smugglers often deliberately conceal their activities and related information, this large and real data sample is suitable for both manifest screening and the extraction of factors significantly related to smuggling (Khunkitti & Chongsujjatham, 2019).

3.2 Artificial neural networks (ANNs)

ANNs are machine learning techniques and have been frequently utilised recently to build prediction models. ANNs not only calculate and recognise patterns of data but also learn and generate optimised estimation through cognitive functions (Chen et al., 2009). Because ANNs develop models in a manner like the human nervous system with deep learning and the ability to adapt, ANNs are well suited for an environment with free constraints in which the data investigated does not require the assumption of a normal distribution, interactive factors and nonlinear relations (Warner & Misra, 1996). Due to these advantages, many studies have suggested that ANNs outperform conventional statistical or other classification methods in classification and prediction.

For example, Wray et al. (1994) compared ANNs to regression with respect to predictive performance (specifically, accuracy), and found ANNs to perform better. Tam and Kiang (1992) compared several prediction methods, namely ANNs, discriminated analysis, k-nearest neighbour algorithms and decision tree algorithms, with respect to how well they predicted a company's bankruptcy, and ANNs were found to be the best. Dutta and Shekhar (1988) applied ANNs to bond evaluation, where their ANNs outperformed multiple regression models in predictions. Refenes et al. (1997) suggest that ANNs are suitable for time-series prediction because ANNs can process interactive data and evolve with trends through the input of various types of data. In addition, ANNs have been found to be suitable for determining the best combinations of input variables that affect output variables, as mentioned by Niazian et al. (2018).

This study adopts the ANNs technique to construct a smuggling-detection model. We utilise the simple feed forward neural network model, with one input layer, three hidden layers and one output layer (multilayer perception, MLP). The data are partitioned as 60 per cent for training, 20 per cent for validation and the remaining 20 per cent for testing. There are 13 input variables used to train the algorithms iteratively. The cargo manifests contained these 13 input elements: firm age, loading port, firm log capital, firm risk level, transportation method, cargo volume, container ship deadweight, tariff number, container transportation time, container slot, mode of container transport services and manifest submission time. The output variable is the seizure case record. The training and deep learning procedure by ANNs helps to screen for the major factors that relate to smuggling at the Port of Taichung.

3.3 Binary selection analysis

After the screening process and identification of influential factors by ANNs, which strongly relate to smuggling, we then used a logistic regression model to inspect the relation between the identified input variables and the output variable (seizure record of smuggling). Logistic models have been commonly used for prediction, particularly for the binary choice as the dependent variable. This study adopts a binary selection model, as follows:

$$Smuggling = \alpha_0 + \sum_{i=1}^{i=n} X_i + \varepsilon \qquad (1)$$

In model 1, α_0 is the intercept. *Smuggling* is the binary dependent variable. It is coded as 1 when firms have a smuggling record; otherwise it is coded as zero. The independent variables, *X*, are the influential factors identified by the ANNs described above. The number of identified input variables ($i = 1 - n$) is determined based on the results of the ANNs, with a maximum of 13. ε is the residual of this regression.

4. Results and discussion

4.1 ANNs results

The ANNs iterated learning process extracted six input variables which feature smuggling at Taichung Port. The six input variables are firm age, firm capital, firm risk level, container ship deadweight, cargo volume and loading port. The prediction performance in the 35,373 tested manifests (20 per cent of the total sample) reached an accuracy of nearly 70 per cent. Table 1 lists the results of feature screening on test manifests by ANNs.

Table 1: ANNs results

Tested sample size: 35,373 manifests Output variable: seizure case record Selected input variables:	
Firm age	Container ship deadweight
Firm capital	Cargo volume
Firm risk level	Loading port

To understand how they relate to smuggling, descriptions of the six input variables are listed below:

(1) Firm age: The age of the importing business is calculated based on the tax registration database of the Finance Centre of the Ministry of Finance and the company registration database of the Department of Commerce of the Ministry of Economic Affairs, starting from the time the importer is registered.

(2) Firm capital: The amount of capital of the importer is based on the company registration database of the Department of Commerce of the Ministry of Economic Affairs. Larger capital presents larger firm size.

(3) Firm risk level: Customs evaluate the importer's risk based on (a) their record of violation of regulations; or (b) the customs clearance records of the importer; or (c) governmental policy requirements; or (d) seasonal or other adjustments for specific inspections. Based on these evaluations, importers bearing higher risk will be evaluated with a higher firm risk level.

(4) Container ship deadweight: The container ship deadweight is the container weight declared by the importer based on the loading plan for container ships (Bay Plan).

(5) Cargo volume: The cargo volume is based on the declaration by the importer, calculated by using cargo length multiplied by width and height.

(6) Loading port: Based on investigation experience, Taichung Customs has listed some export ports and trans-shipment ports as high-risk routes for smuggling.[1]

4.2 Binary selection regression analysis

We use these six input variables as independent variables to predict smuggling at Taichung Port using logistic regression with the 2018 manifests. We took the log value of capital and created a dummy variable equal to one for the loading port being recorded as the target for reinforced investigation. As shown in Table 2, all six independent variables are significantly related with seizure cases. The negative coefficients of *firm age* and *firm capital* show that older and larger firms are less likely to engage in smuggling.

*Table 2: Logistic regression (LR) results*

	Coefficient	z-Statistic	Prob.
Firm age	-0.027***	-4.148	0.000
Firm capital	-0.045***	-5.400	0.000
Firm risk level	0.046***	4.207	0.000
Container ship deadweight	0.005***	3.284	0.001
Cargo volume	0.010***	3.598	0.000
Loading port	0.012**	2.474	0.013
Intercept	0.356***	4.226	0.000
LR statistic = 145.019 Prob. (LR statistic) = 0.000			
*, ** and *** denote significance at 0.1, 0.05 and 0.01 level or better, respectively.			

In contrast, the coefficients of *firm risk level*, *container ship deadweight*, *cargo volume* and *loading port* are all significantly positive. The positive coefficient of *firm risk level* indicates that an importer's risk record is valuable in port investigation. For shipments, larger and heavier containers are more likely to be involved in smuggling. This may be because prohibited items are more likely to be carried in containers with more cargo. In addition, one of the routine investigations of Customs is to identify tax evasion where importers declare less cargo than is actually shifted. Therefore, larger containers are more likely to be linked to tax-evasion cases. Finally, the regression results reveal that some loading ports and trans-shipment ports have higher risks relating to smuggling (see Note 1).

4.3 Additional tests and findings − Friday events

To verify the accuracy of our smuggling prediction model, we further utilised the six input variables to conduct testing on 2019 smuggling events at Taichung Port. Figure 1 shows the average prediction accuracy rate was nearly 83 per cent. Furthermore, we found that there were seven dates with an accuracy rate close to 99 per cent: January 18 (Friday), March 6 (Wednesday), April 26 (Friday), June 21 (Friday), August 19 (Monday), October 11 (Friday) and December 6 (Friday). For example, on 18 January 2019 (see Figure 1), Taichung Customs seized a total of 962 packs of ketamine, classified as the third category of illegal narcotic, which were hidden in a batch of curtains rods imported from South-East Asia. The gross weight was 305.118 kg. In another case on 19 August 2019 (see Figure 1), 79 packs of ketamine were found in stainless steel moulds, imported from the Middle East. These empirical cases of seizure correspond to predictions by our ANNs and logistic model.

Figure 1: Screening of import manifests of the Port of Taichung in 2019
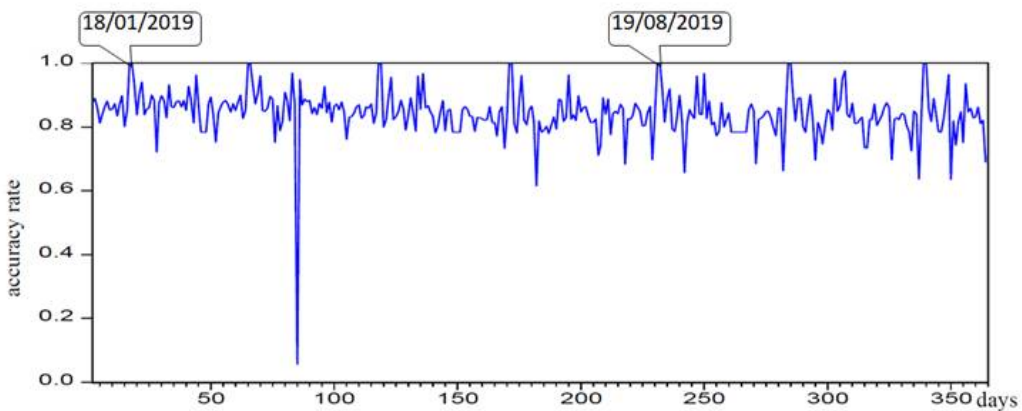
Notably, among the seven dates which had high instances of smuggling, five dates were Fridays and one was a Monday. Some of these dates were close to consecutive holidays, such as January 18 (close to Lunar new year), October 11 (close to Double Tenth Day, a Taiwanese national holiday,) and December 6 (close to Christmas and New Year holidays). The results show that, in addition to the overall accuracy rate of approximately 83 per cent, the six input variables are suitable to help identify smuggling around weekends and holidays when there is usually a higher rate of smuggling.

5. Conclusion and suggestions

This study utilises ANNs techniques and manifest data from Taichung Port to build a smuggling prediction model. The iterated data training process determined six input variables as relevant to smuggling seizure records: firm age, firm capital, firm risk level, container ship deadweight, cargo volume and loading port. The logistic regression further shows that larger, older import firms are less likely to smuggle, while importers with a higher rated risk, with higher weight and volume cargo, and consignments shipped from specific ports more likely to involved in smuggling. We used the six seizure factors to predict the occurrence of smuggling at Taichung Port in 2019. We found that the prediction accuracy nears 83 per cent and is even higher for manifest declared around Fridays and holidays.

Customs today faces multiple challenges requiring a great deal of adaptability. This is visible in all modes of transport. Offenders attempt to abuse vulnerable supply chains to smuggle numerous commodities and money, which pose threats to the safety and security of citizens (World Customs Organization [WCO], 2018). The findings presented herein will appeal to customs enforcers through providing critical factors in predicting smuggling among large quantities of manifest information. For future research and practice, depending on the region and time, and even changes in the method of smuggling, the prediction techniques and the six input variables may need adjustments before application.

Disclaimer

The findings and the views in this paper are those of the authors and do not necessarily present the views and policies of Taichung Customs or the WCO.

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Notes

1   Based on the confidentiality of customs investigations, variable descriptions are expressed in general terms. For example, the standards for the classification on import's risk level and the name of loading ports are not suitable for detailed descriptions.

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Research Results Enhancing the Employer Branding Efforts of the Hungarian Tax and Customs Administration

Adrienn Magasvári, Péter Olexa and Andrea Szabó

Abstract

This paper presents the findings of a study carried out among a specific group of tax inspectors serving at the Hungarian Tax and Customs Administration (graduates of the Customs and Excise Administration Program, cohort 2012–2017 from the Faculty of Law Enforcement of the University of Public Service). The study reveals the opinions and viewpoints of young, freshly graduated tax inspectors about the employer's potential to retain employees, particularly concerning the reasons for choosing or switching workplaces. The research findings will also enable the organisation to commence the development of its employer brand, relying on the strengths and weaknesses identified.

1. Introduction

The Faculty of Law Enforcement of the University of Public Service is the only higher educational institution which conducts law enforcement training in Hungary. The faculty organises and performs high-level and top-quality professional training programs primarily for civilians, commissioned officers, public servants and other officials who serve in various law enforcement agencies, particularly the Hungarian Police Force, the Hungarian Prison Service, the National Tax and Customs Administration, the National Directorate-General for Disaster Management, the Immigration and Asylum Office as well as in the private security sector. When students enrol in any program at the University of Public Service's Department of Customs and Tax Administration at the Faculty of Law Enforcement, they undertake a serious obligation, as they are choosing not only a job, but also a profession, as well as a unique way of life. By signing their scholarship contracts, students who have been admitted pledge to serve the Hungarian revenue authority as tax inspectors after their studies for a period equivalent to the duration of their undergraduate studies. Furthermore, they also accept that, following their graduation from the university, they will be appointed and relocated to a service location within Hungary's administrative boundaries in accordance with the authority's needs. The organisation also pledges to support the students' law enforcement studies and accept and hire the graduates in financial inspector positions related to their degrees upon graduation. Therefore, these students must be aware of the organisation's operations, best practices and how they can serve their future employer's key interests. On the other hand, the revenue authority must pay special attention to integrating fresh graduates into the organisation and effectively fostering their job loyalty and motivation.

Since most new staff of all ranks at the Hungarian Tax and Customs Administration are graduates of the two programs mentioned above, we concluded that preserving and maintaining their presence would constitute a crucially important matter for the organisation in the future. Our research thus focused on the opinions and viewpoints that underlie their decision to remain with their employer.

Moreover, we also present the organisational operations, human resource factors and functions which may need development or engagement to promote employee loyalty. Based on all these findings, an attractive employer brand could be developed.

2. Employer branding

Employer branding constitutes a new and fresh perspective even today in human resource management cooperation and various marketing segments. The term itself is linked to Ambler & Barrow (1996) and was coined in 1990 but was first published in their 1996 study. The lack of skills and low economic growth in the 1990s made corporations face the problem of not only 'branding' their commodities, but also of improving their qualities as employers to make themselves attractive organisations and employers. However, Ambler & Barrow's theory required about ten years to become successfully embedded into practice in 2006 (von Roeder, 2014, p. 140). Another factor calling for the emergence of this theory proved to be related to the changes taking place within the labour market in the 2010s. At that time, a new generation emerged, already born into the digital world and having utterly new and different attitudes towards work (Schuman & Sartain, 2010, pp. 15–18). While previously employers could freely select and choose from applicants, by 2018–2019, the scale had shifted to the opposite direction: potential employees could choose from among the job offers available to them. Consequently, hiring corporations had to win over the brightest applicants. In other words, employers were essentially competing on the labour market for the most suitable, skilful and most competent employees.

First, we must start from the concept of 'brand' itself to grasp the concept of branding. We would like to emphasise two assumptions: one is the officially accepted definition by the American Marketing Association, that "a brand is a name, term, design, symbol or the combination of any other feature that identifies or differentiates one seller's goods or service as distinct from those of other sellers, competitors" (Kotler, 1998, p. 396). Another definition by Hungarian experts is that "a brand is the collection of symbols that aim to identify certain goods or services with a specific producer as well as to differentiate those from other goods or services" (Bauer & Berács, 1998, p. 194).

While a brand is a status, branding or brand construction, is a process that involves filling a brand with value, advertising and popularising it (Levine, 2003; Svéhlik, 2007, p. 90). The purpose of the process is to differentiate from other products available on the market.

When talking about employer brand, we think of a value that is unique and distinct from other competitors and reflects upon the organisation's values and features as an employer. What feelings does it elicit in employees, what expectations do they have from the employer and vice versa? What might the employee expect from the employer in return for the skills and work that they contribute to the organisation? In Kant, Jaiswal & Mishra's (2017) definition, the employer brand is the primary source of reputation and corporate branding, making it a powerful differentiating feature from the competing partners. According to Swystun (2007, p. 14), "it is a mixture of symbolic, practical and ethereal features, which can produce values and influence through its appropriate application."

For the sake of preserving and attracting key workers, organisations must define the corporate brand in a way that current and targeted future employees perceive it as an "excellent workplace" (Ewing et al., 2002, p. 21; Lloyd, 2002; Backhaus & Tikoo, 2004, p. 9; Jiang & Iles, 2011, p. 6). The process of elaborating, planning and popularising it constitutes employer branding. If it is well done, the employer brand generates something that can be seen as valuable, unique and hard-to-imitate. Thus, it can become the source of a fundamental and lasting competitive market advantage (Cascio & Boudreau, 2012, p. 6).

One of the most complex definitions of employer branding was provided by Chovan (2019, p. 63): "Employer branding includes all human resources activities in general, it enables companies to create value through obtaining highly skilled employees, preserving and motivating top-performing workers, and by its humane attitude towards colleagues who leave the company, which, taken together, contribute to creating a welcoming and attractive workplace […] its objective is to contribute to the development of the company's productivity and efficiency, to achieve the corporate goals through satisfying the continuous professional development needs and awareness of suitable employees."

The fundamentals of corporate employer branding are provided by the employer value proposition, which fits into the organisational culture and ordinary business activities. A well-defined and elaborated value proposition would make an effective difference compared with competitors. Thus, a company has the opportunity to select from a more extensive and better-skilled potential workforce pool (Kajos & Bálint, 2014). The value proposition is a strategic tool for attracting and retaining a workforce. The employer value proposition constitutes a vital message of employer branding (Eisenberg et al., 2001). Therefore, this value must be offered to be compelling on both the domestic and international markets.

Several advantages of brand building have already been listed, such as the rising number of applicants, growing employee motivation, as well as attracting the attention and interest of potential employees from Generations Z and Y[1] and contributing to a drop in employee fluctuation. It is also noteworthy that employer brand building is a dynamic process which can also react to a changing social, economic and labour landscape; thus, it can be continuously tweaked and updated (Kajos & Bálint, 2014).

Given all the foregoing, it may seem that employer branding would primarily be an issue in the private sector, however, according to Biba (2015), well-founded and elaborated employer branding can function perfectly in the public sector as well, since the shortage of employees, along with the need to attract and retain top-performing workers, is also relevant in the public sector (including the National Tax and Customs Administration).

3. International examples of successful branding efforts by revenue authorities

The job application results of the Swiss and German tax and customs authority directorates demonstrate spectacularly how efficient employer branding implementation can be in the public sphere. In 2018, the Swiss tax agency hired about 50 per cent of its new personnel through social media platforms. Following their employer rebranding, the German customs authority achieved a 20 per cent increase in new applicants (Abgottspon, 2019; Graf, 2019).

The key to these successes lay in recognising the new, altered employee trends and adapting flexibly to them. Surveys also reflect that members of Generation Z and Y wish to work for a greater purpose as well. It is essential for them that their organisation also have a clearly defined corporate social responsibility policy. In public service, by its very definition, public servants work for the benefit of society and the common good of citizens. In addition, there are many challenges one must face when working for the Tax and Customs Administration. Another important factor that is prevalent nowadays is that young people prefer working under experienced professional leaders, though they do not wish to become one. Thus, another element can be integrated into employer branding: fostering leadership roles for members of the younger generations (Hallberg, 2019). When choosing a career path, the options of flexitime or telework (which includes, but is not limited to, working from home) have also become an important feature. Thus, companies that adopt a flexitime scheme versus rigid office hours tend to become more successful (Abgottspon, 2019). This proves to be of utmost importance in a time of a global pandemic and lockdown, with regards to those employers who could most flexibly switch to telework or a home office. In the future, this kind of flexibility will prevail among organisations

and employees as well. Related to this issue, the importance of work/life balance among employees of the younger generation also tends to be quite significant (Hallberg, 2019). In accordance with these demands, 32 per cent of employees at the Swiss tax authority work remotely one or two days a week (Abgottspon, 2019). Other influential factors for Generation Z workers are proven job security, a pleasant work environment and opportunities for career advancement. The tax and customs authorities meet all these demands and wishes, giving them an effective edge in the assessment of potential applicants (Randstad, 2019; Saatkorn, 2018).

In building an employer brand and becoming an excellent workplace, it is of utmost importance for an employer to share authentic value proposition-based communication (Saatkorn, 2018). The obstacle, which can hinder this goal in tax and customs authorities, is that people share little information about this profession. The German federal customs authority's research findings reinforced this misconception when people surveyed tended typically to regard customs officers as working at airports and border crossing stations, checking travellers' luggage and vehicles, which is an extremely simplified view, as their job is in fact much broader. For this reason, they initiated an awareness raising and recruiting campaign and built the review of their employer brand on that. They primarily targeted the members of Generation Z ('Your talent in action!', Karriereseite des Zolls, www.talent-im-einsatz. de). They reached out to them through an active social media presence (for example, Instagram and Snapchat) and short films about the profession of tax and customs officers, including involving certain 'influencers' who were popular among students aged 14 to 19.

These video clips were posted on YouTube and became trendy and successful materials. In addition, the conventional advertisement platforms were also preserved. The career site was reshaped and simplified, adding new, valuable tips for parents (Saatkorn, 2018). Following their ad campaign in 2018, the tax agency became the ninth most popular workplace among graduating high school students (compared with their ranking at twelfth or thirteenth position in previous years). They won third position within the public sector as the most sought-after workplace (Weerth, 2019).

It is worth remembering that employer branding is directed not only outward but inward as well. It is helpful to define and build it to become attractive, authentic and popular among the present employees. As well as drawing new employees into the organisation, it is also crucial to keep the current ones. In other words, the content must be elaborated with the active involvement of employees. The objective is to become an appreciated employer and create a workplace where employees feel at home and enjoy their work time. To achieve this, and based on the ideas mentioned above, we recommend the following best practices:

- Examining the employer's identity: identification of what the organisation can offer right now and what it can develop further.

- The first step to obtaining growth and renewal is to conduct surveys and research on present conditions. Results obtained from the surveys are then used as the starting point for the employer branding process (Theurer et al., 2016).

- Definition of target groups: what factors can help retain present employees and also attract new applicants into the organisation? What is the target audience? If it is future recruits, perhaps the target group of promotional content should be those aged 14–19. The organisation should review its value proposition and consider how it could become even more attractive.

- Elaboration of the employer value: the summary of all those values and offers may attract new members from the target group and encourage them to join the organisation. This may be regarded as the heart of employer branding: an authentic message about what the organisation promises. All this must be presented realistically, consciously and authentically, which should include admitting the organisation's difficulties and possible shortcomings.

- Organisations should be present on the platforms where their target group is generally active. Nowadays, this is shifting towards online media platforms, but various job fairs, university and high school profession career planning recruitment events should not be neglected either (Hallberg, 2019; Abgottspon, 2019). The more the organisation succeeds in establishing a direct relationship with members of the new generation, the better and more positive an impression it will make. An excellent example of this practice was the German example, in which the customs agency invited young 'influencers' who represented their generation authentically by raising issues and asking questions that were relevant for young people.

- It is important to create a wide range of content that is attractive to the target group. The younger generation prefer and demand video content. They like watching and listening to credible, authentic stories about real people whom they may find trustworthy and relatable. These video clips can convey a realistic image of the actual work conditions and dispel unwanted misconceptions (Hallberg, 2019; Abgottspon, 2019).

- Organisations should see their staff as ambassadors of their brand. Workers who love their jobs tend to share their experiences with others, projecting positive feedback about their employer (Hallberg, 2019). This kind of informal communication emphasises that hearsay is gaining more and more momentum in how career paths are chosen (Theurer et al., 2016). Nowadays, 45 per cent of potential employees tend to check an organisation's reputation and reliability via their friends and relatives, which affects their judgement significantly (Randstad, 2019). Thus, cooperating and working together with employees is crucial for the employer branding process.

What is the present position of the Hungarian revenue authority in this process? What are those factors that may become the cornerstones of building the 'Tax and Customs Administration brand?' To what extent is the Hungarian National Tax and Customs Administration popular and attractive among young people, and how can the agency maintain this position? The research findings presented below may help us to comprehend young people's career-choice preferences, as well as to identify factors that can contribute to their long-term job loyalty and the elaboration of branding.

4. Research methodology

Our research sought to identify the attitudes and viewpoints of fresh graduates on their workplace expectations and long-term career motivational and inspirational factors (in general). They majored either in Customs and Tax Administration or were from the Financial Investigation program. Furthermore, we were curious about their presumptions concerning their present workplace's job-retention potential and manner (the revenue authority in 68 instances). On the other hand, we also expected to get answers about the number of employees who planned to swap jobs and positions in the future and the motives involved in these decisions.

To achieve our research objectives, we examined the following four areas using a questionnaire-based methodology:

1. ranking of the factors that promote workplace loyalty among employees

2. the rating and level of job security and workplace preservation potential

3. assessment of the critical factors contributing to employees remaining at or leaving a workplace

4. examination of the reasons that drive employees to leave the organisation.

Given the examination methods and criteria presented above, we drafted the following hypotheses:

Hypothesis 1. We presumed that the young people of Generations Y and Z taking part in our survey differ from the previous generations, and the results of our survey will be similar to the results of surveys carried out within the private sector (PwC, 2013; Ernst and Young Global, 2015; Fodor, 2015, p. 114; Csehné, 2016; Ranstad, 2020) regarding factors which facilitate the long-term workplace loyalty of the target group (Hypothesis 1A). The primary factors influencing young people in choosing the tax and customs authority as a long-term workplace tend to be new motivators (such as work/life balance, personal and physical work environment), with the classic factors, such as job security, reliability, social prestige or the expectation of a guaranteed retirement, having a lesser influence (Hypothesis 1B).

Hypothesis 2. We presumed that when an employee changes jobs, the primary factor for leaving the organisation would be higher wages and that it would typically result in repositioning within the private sector.

The target group involved in the survey comprised current employees at the tax authority or those recently departed, who graduated between 2012−2017 from the Customs and Tax Administration and Financial Investigation programs of the Faculty of Law Enforcement of the University of Public Service. We applied a complete study method along with the survey to check the total study population (n = 158).

We opted for a questionnaire-based data collection method in conducting the survey, since the sample size proved to be too large to adopt other research methods. Furthermore, this way, we could also ensure anonymity and voluntariness, trusting in the target group's increased willingness to answer our questions. This survey method also provided the necessary flexibility whereby each respondent could freely choose the most suitable time and place to complete the questionnaire. The questionnaire was answered by 79 volunteer respondents, of which 51 were men and 28 were women. The total study population consisted of 109 men and 49 women, showing a correlation with the gender ratio of the respondents. Of the respondents, 11 had already left the revenue authority, while the majority (68) still worked for the agency.

5. Research results

Along with our research, we were curious about the most important workplace-related expectations of young employees and the key factors that influenced their job loyalty. Respondents could rank the degree of their commitment towards the employer on a nine-point scale (1, not important at all; 9, the most important) of organisational loyalty. A summary of the results is illustrated in Figure 1.

*Figure 1. The most critical aspects determining job loyalty (in general)*
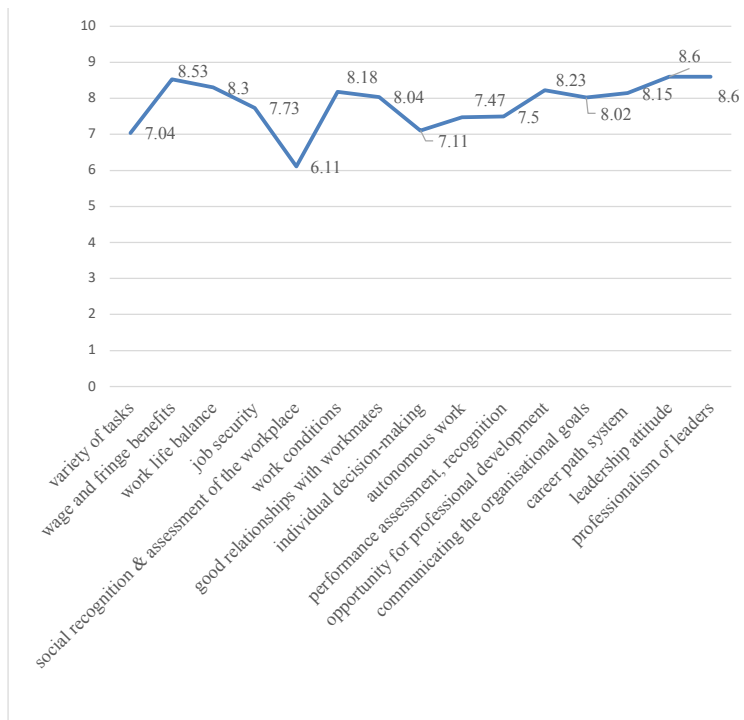
Respondents tended to assess all the factors as being somewhat important (7−8 on the nine-point scale). In their opinion, the three most important factors that positively affect an organisation's employee-loyalty potential are the following: the professional qualifications of the leaders, the leaders' attitude, support and care and wages, as well as fringe benefits.

In their view, in an ideal and attractive workplace, the employer cares about work/life balance, career advancement, a pleasant work environment (including infrastructural features and work schedule), plannable promotions and well-functioning work relations. Like versatile tasks and autonomous decision-making and work processes, the social prestige and status of the workplace were considered the least important factors. Similarly, the respondents tended to undervalue the workplace's reliability, job security and the professional, appropriate communication of the organisational objectives. Previous research results (Meier & Crocker, 2010, pp. 70−72) have also revealed the outstanding importance of wages, professional career development, work environment, work/life balance, and work relationships between colleagues.

Beyond the economic factors, we also sought to determine whether these factors (Figure 2; each aspect was expressed in a characteristic statement in a corresponding question) were valid for that specific organisation, or in what manner they were implemented at the given workplace of the respondents. In this set of questions, respondents also had to rate on a nine-point scale, how true the statements are about their employers' organisations (1, not true at all; 9, completely true). Since the Tax and Customs Administration employed about 86 per cent of the respondents, we assume that the results shown in Figure 2 illustrate reflect the features of that organisation as well.

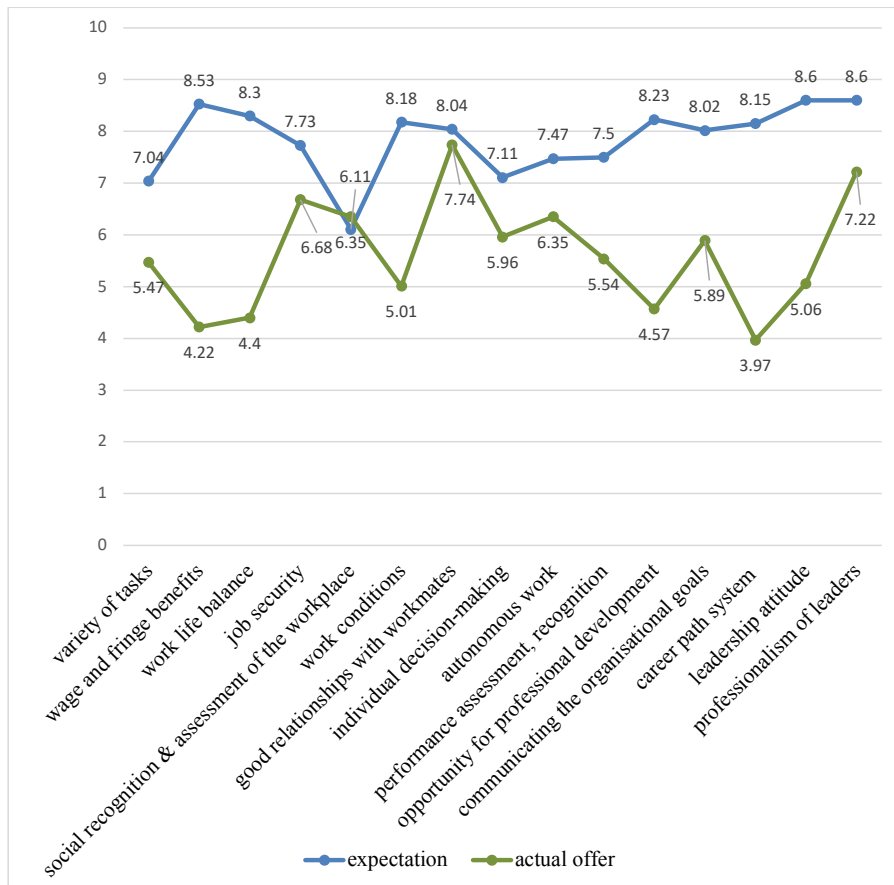*Figure 2. Opportunities provided by the present workplace*
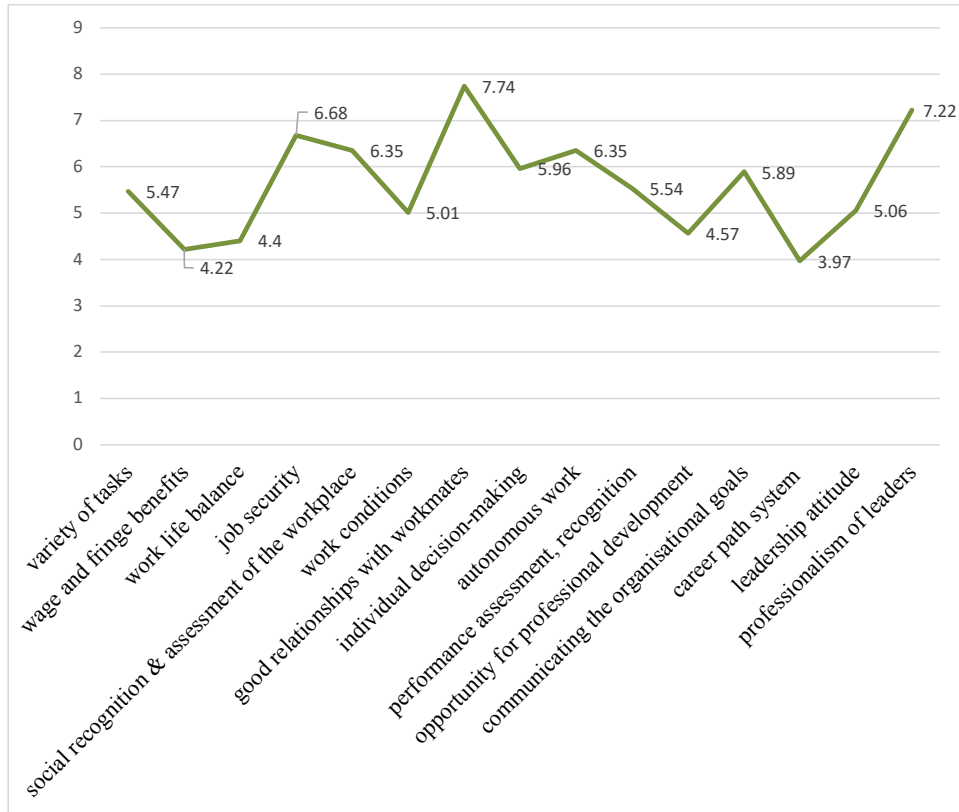
As Figure 2 illustrates, according to the responses of Generation Y and Z employees, most of the factors that respondents expected from an employer were not met to the degree that respondents valued such factors. Aspects such as the leaders' professionalism, a good work relationship with colleagues, job security and workplace reliability were rated as the most prominent of their employer, receiving above average scores in their assessment. Factors that had the least impact on young employees' loyalty and commitment to the organisation proved to be wages and fringe benefits, lack of work/life balance and chances for career advancement. These factors seem to share relatively low scores on the survey list.

These are substantial findings that reveal the differences between employers and employees' advantages in employer branding and recruiting and preserving valuable employees. This discrepancy is illustrated in Figure 3.

Figure 3. Comparing the preferences of young entry-level professionals with the opportunities provided by the employer

One positive feature is that harmonious work relationships between colleagues is an expectation of young employees, and it was met in practice at their jobs, as illustrated in Figure 3. Issues like job security, being able to work autonomously and decision-making were also factors where there was a correlation between expectations and workplace reality. 'Social recognition and assessment of the workplace' was the only factor respondents experienced to a degree greater than that which they considered essential. The other factors do not meet respondents' expectations. Nevertheless, it is noteworthy that six factors (wages and fringe benefits, career path system, work/life balance, opportunities for professional development, leaders' attitudes and work environment) are among the most important areas where the greatest differences can be identified between the young employees' expectations and their experiences of the employer's organisational practices. The differences seem to be rather striking concerning the issue of wages and fringe benefits, career path system, work/life balance, opportunities for professional development, leaders' attitudes and work environment (with a more than three-point difference).

Any organisation that is working on its employer branding should communicate with those leaving the organisation and identify their motives for doing so. This is illustrated in Figure 4.

Figure 4. Reasons for workplace change

The numbers on the right of the bars show how many respondents indicated that the given factor was a reason for the change of workplace.
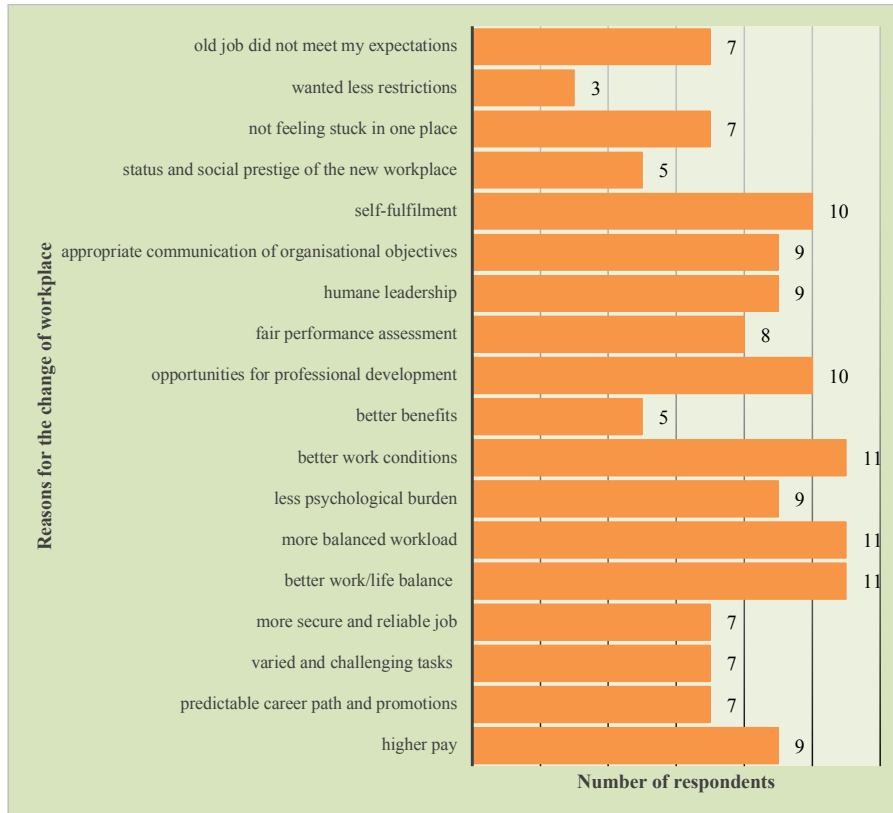
Source: Authors' compilation based on the research survey results

The respondents did not cite financial reasons as being among the most typical reasons for leaving the organisation. Instead, a better work environment, a more balanced workload and a better work/life balance were revealed as deciding aspects. These factors were followed in the list by the issue of professional development and self-fulfilment. Issues like fringe benefits, status and prestige of the new job or a restrictive organisational structure proved to be the least influential factors underlying a change in workplace.

6. Summary

Our research results partly corroborated our hypotheses, but in other respects did not support our initial assumptions.

According to Hypothesis 1A, Generation Y and Z employees have new needs and expectations from their employers. An organisation must adapt and adjust to these new demands even if its resources are limited. According to our findings, it also appears probable that the recruits of the NAV (the Hungarian Tax and Customs Administration) do not choose this organisation for the job security or predictable advancement opportunities (Hypothesis 1B) that it offers. Besides wages, what young employees want

from their employers are initiatives and measures which ensure their personal development, work/life balance, career choices, a pleasant work environment, irregular working hours (including flexitime) and infrastructural improvements. Moreover, young workers tend to enjoy and appreciate it when their relationship and cooperation with their superiors at work are smooth and harmonious, and when their leaders show professionalism and provide authentic, reliable feedback on their performance.

Furthermore, we assumed (Hypothesis 2) that changes in jobs are usually motivated by financial reasons, and that the promise of a higher salary regularly lures employees into the private sector. This presumption was partly justified since most of the job leavers switched to the private sector. Still, their motives primarily did not involve the desire for higher wages, but rather for a more balanced workload, thus leading to a better distribution of work and leisure time.

The research findings support the importance of financial incentives, as well as the changes which are necessary for issues like improving work/life balance and the working environment, providing increased options for training and career development, improved sensitivity in the leaders' attitudes and mental habits, and for reforming career paths and the promotion system.

Many respondents were willing to take the time and effort to answer the only non-multiple-choice question in the survey and express their personal opinions. All in all, their views show that the Tax and Customs Administration provided them with very little motivation; they expressed this is also the case in other law enforcement and administrative agencies. They also expressed that if the tax authority fails to change its organisational structure and operation, especially in its career path and advancement system, there will be 'more and more dismissals/people leaving, and no one will apply for jobs there' (according to a respondent).

The primary aim of our study was to raise awareness of the fact that the Tax and Customs Administration, as part of the Hungarian public sector, is also part of the global labour market and must compete for skilled workers who are also sought after by the private sector (Domokos, Jakovác & Németh, 2016; Poór et al., 2019). However, in this competition, it is faced with quite a difficult task, since its present organisational values are not sufficiently attractive and are not commensurate with opportunities in the private sector or with the expectations of the younger generation. All the same, identifying strengths and revealing deficiencies may guide development and the development of an appropriate employer brand.

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Notes

1   Generation Z are people born between 1980–1994, while Generation Y refers to those born between 1995–2009 (Tari, 2011, pp. 8–9).

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Methodology for Determining Optimal Import Tariffs

Batnasan Namsrai, Munkhbayasgalan Ganbold and Narandalai Davaatsedev

Abstract

The concept of 'comparative advantage' has always been at the heart of national economic development policy. It refers to the export goods that one country produces better than other countries and the trading of such goods for products that other countries produce best. Mongolia is a small, landlocked country, situated at great distances from the world's major transport channels and seaports. It mainly exports agricultural and mining products to world markets and depends on imported goods for its domestic consumption. Landlocked countries are primarily affected not only by high transportation costs but also by low competitiveness in the global market.

Historically, Mongolia has benefited from the export of its raw agricultural materials, such as cashmere, wool and meat. However, rapid urbanisation, growing population needs and high import prices in recent years, especially during the COVID-19 pandemic, means the country must shift from its static comparative advantage of an economy to a dynamic one. Mongolia must pursue a trade policy aimed at creating value-added end products capable of meeting the demands of its domestic consumption and competing in the international arena based on development potentials and comparative advantages of the country. The objective of this paper is to illustrate how tariff optimisation could potentially be used to protect domestic industry, specifically focussing on the dairy production industry.

1. Background to the Mongolian domestic dairy market

Potential members of the World Trade Organization (WTO) are invited to join other members in a roundtable discussion to negotiate commitments regarding the bound tariff to be imposed on goods imported from member countries upon their accession. This commitment before the members is called the schedules of concessions, and encourages the importing member country to set customs duties at lower rates than its commitment to the bound tariff.

In acceding to the WTO in 1997, Mongolia has committed not to exceed 20 per cent for its customs duties on all imported goods, except for alcohol and tobacco products. The current applied rate is, however, in most cases, a uniform five per cent across all trading sectors.

Since the beginning of its transition to a market economy, Mongolia has pursued strategies to support economic growth through a fairly open trade and investment regime. Trade policy was aimed at adapting promptly to the changing environment, as well as at mitigating difficulties resulting from transition and integration with the world economy. Mongolia liberalised its trade by removing its self-imposed barriers to trade and services, by expanding bilateral trade and economic cooperation and by participating in regional and multilateral trade negotiations.

After three decades of continued economic liberalisation, the economy has undergone some significant changes that have important implications for the sustainability of future growth. The Mongolian economy has successfully reoriented its external sector and trade has become much more embedded in the fundamental strengths of the economy (Namsrai, 2017). Trade turnover has grown nearly 10 times that of its pretransition level. More importantly, the country has achieved this trade expansion by diversifying the destinations of its exports far beyond its former partners. According to World Bank statistics, Mongolia's per capita GDP has increased 7.45 times from 2000 to 2020, 1.53 times in real terms (The World Bank, 2020a).

Mongolia's trade and economy, however, has grown quickly during the last two decades. The country's economic growth has not always been steady and has exhibited a dramatic boom-bust cycle. The economy is concentrated in a few sectors − mining and livestock raw materials and textile products − that account for most of Mongolian exports. In 2020 the percentage share of those products accounted for 93 per cent of the country's total exports (Customs General Administration of Mongolia [CGA], 2000−2021). Because of its narrow economic base, the country remains largely dependent on external factors, including the price and demand of raw materials, especially from the economic situation of its main trading partners.

Diversification could be a useful strategy to manage this unstable economic situation, however, it cannot be achieved quickly − it is a long-term process requiring decades of carefully designed and planned policies. Mongolia is trying to diversify its economy, but in an increasingly globalised world, small countries have few opportunities compared with their much larger and stronger competitors.

Of course, any strategies aimed at diversification of the national economy should be rooted in the industries in which the country has a comparative advantage. In Mongolia, the comparative advantage lies in natural resource-intensive industries, of which there are two major types including livestock-based processing industries such as textiles, leather and dairy, and the mining industry.

The livelihoods and wellbeing of most nomadic herders in Mongolia still depend largely on livestock in general and on meat and milk in particular. Milk production is the third largest sector of the livestock industry in rural Mongolia, ranking behind meat and cashmere, and has a gross value of US$300−400 million.

Due to increased soil degradation, ongoing climate change, population growth and rapid urbanisation, some countries are now facing a severe scarcity of land for pasture and agriculture, food supply shortages and significant rises in food prices. Persisting global food vulnerability and lack of food supply call for revision of existing policies and regulations on food products, including milk and agricultural products in Mongolia, and their distribution.

Mongolia is one of the few countries of the world that has kept its old nomadic production practices, including milk, for thousands of years. Over centuries, the nomadic herders of Mongolia have developed vast experience and knowledge in dairy production. Traditional milk products remain an important part of the nomadic culture and for the livelihoods of nomadic herders, especially during the long harsh winters. Even so, Mongolia is wasting the export potential of its dairy industry and people in urban areas mostly consume imported milk, especially in winter. Figure 1 illustrates graphically the domestic market supply of the dairy industry.

Milk and dairy products play an essential role in the food consumption of our population. Dry and liquid milk is processed industrially or manually to produce over 150 types of dairy products such as yoghurt, cheese, curd, sour cream, butter and ice cream (Oktyabri, 2012).

Figure 1: Domestic market supply of the Mongolian dairy industry
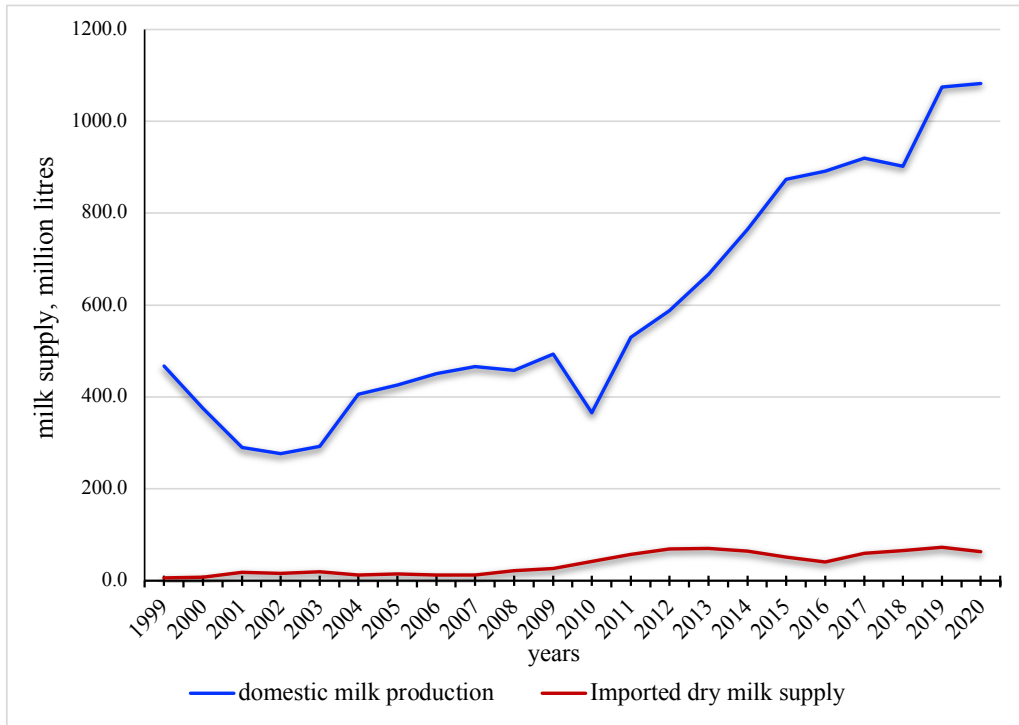
However, there are huge opportunities to produce and export dairy products. Strong seasonality and low production volumes per herding family, as well as the long distances between milk production areas and markets, lead to high transportation costs, which in turn often becomes the cause of the under-utilisation of the milk produced.

Recent measures, and discussions, to protect domestic production from import competition by imposing high customs duties and providing subsidies, implemented by politicians, economists and scientists, are unrealistic. Because milk is an excellent source of calcium, it is an especially important product for target groups requiring a high calcium intake, such as older adults and the young.

The imposition of high import tariffs poses a significant risk of trade sanctions and restrictions from other member countries if high tariffs are set arbitrarily. On the other hand, high tariffs may cause domestic prices to rise, potentially harming the health of the two target groups mentioned above who are most vulnerable in terms of income.

However, it is important to emphasise that there are opportunities to support domestic production by setting differentiated tariffs on imported goods without violating our commitments to the international community.

Customs tariffs and tax rates are not a subjective issue that can be decided by the will of one person or another but must be set at an optimal level based on specific scientific methods and techniques. In our customs practice, a methodology for setting optimal customs duties is yet to be used, and this article is written to address this theoretical and practical issue, based on a methodology used approximately 10 years ago.

Although it is in theory possible to apply customs tariffs on all types of goods, only imports of price-sensitive goods will be reduced by increasing customs tariffs. Logically, this raises the question of how to calculate the price elasticity of imported goods, and how to use price elasticity to calculate customs tariffs to protect domestic production.

2. Methodology

The concept of the optimal tariff rate was first proposed by Johnson (1951) in his seminal work about trade war. There has subsequently been a phenomenal growth of analytical literature on this subject. Several independent works of economists, including Corden (1966), Johnson (1965), Balassa (1965), Naya and Anderson (1969), Leith (1968) have contributed to the context of empirical work on tariff measurement. Chief among the contributors in this area have been Corden (1969), Ruffin (1969), Tan (1970) and Ramaswami and Srinivasan (1971).

The elasticity of substitution between domestic and foreign goods is commonly called the Armington elasticity. Following Armington (1969), trade models often assume that products are differentiated by their country of origin. In this section, we illustrate methodology to be employed for estimating and updating Armington elasticities.

Let us assume that consumers meet their demands through the purchase of two types of goods, imported and domestic. The quantity of imported goods is denoted by Q_m and the quantity of domestically produced goods is denoted by Q_d.

Assuming that the product has a utility function with a constant elasticity of demand, the utility function is given as follows:

$$U = [\beta Q_d^\alpha + (1-\beta)Q_m^\alpha]^{-\frac{1}{\alpha}} \quad\quad\quad [1]$$

Here, β represents the share of domestic goods in total consumption, 1-β represents the share of imported goods and α is the parameter for the supply function. If the price elasticity were represented by σ, it would be calculated as follows:

$$\sigma = \frac{1}{\alpha - 1} \quad\quad\quad [2]$$

Assuming that consumers spend their income on only two types of goods – imported and domestically produced – the budget constraints are:

$$I = P_d Q_d + P_m Q_m \quad\quad\quad [3]$$

To maximise the supply, the Lagrangian (Arrow, Hurwiz & Uzawa, 1961) function is applied:

$$L = [\beta Q_d^\alpha + (1-\beta)Q_m^\alpha]^{-\frac{1}{\alpha}} - \lambda(I - P_d Q_d - P_m Q_m) \quad\quad\quad [4]$$

Using the Lagrange function, the first-order condition is represented to determine the quantity and price for which the supply function reaches its maximum value. The first-order condition of the Lagrangian function by Q_d is:

$$L'_{Q_d} = -\frac{1}{\alpha}\,\alpha\beta Q_d[\beta Q_d^\alpha + (1-\beta)Q_m^\alpha]^{-\frac{1}{\alpha}-1} - \lambda P_d \quad\quad\quad [5]$$

Whereas the first-order condition by is Q_m:

$$L'_{Q_m} = -\frac{1}{\alpha}\,\alpha(1-\beta)Q_m[\beta Q_d^\alpha + (1-\beta)Q_m^\alpha]^{-\frac{1}{\alpha}-1} - \lambda P_m \tag{6}$$

Also, if we take the first-order condition of the function [4] by λ:

$$I = P_d Q_d + P_m Q_m \tag{7}$$

To find the values of P_d and P_m, which are the values for maximising supply, the first-order condition of the Lagrangian function is set to zero. Here, the domestic price to maximise supply is calculated as:

$$P_d = \frac{-\frac{1}{\alpha}\,\alpha\beta Q_d^{\alpha-1}[\beta Q_d^\alpha + (1-\beta)Q_m^\alpha]^{-\frac{1}{\alpha}-1}}{\lambda} \tag{8}$$

Whereas the import price to maximise supply is:

$$P_m = \frac{-\frac{1}{\alpha}\,\alpha(1-\beta)Q_m^{\alpha-1}[\beta Q_d^\alpha + (1-\beta)Q_m^\alpha]^{-\frac{1}{\alpha}-1}}{\lambda} \tag{9}$$

From the formula above, the ratio of imported goods to domestic production to maximise supply is calculated as:

$$\frac{Q_d}{Q_m} = \left(\frac{\beta}{1-\beta}\right)^{\frac{1}{\alpha-1}} \left(\frac{P_d}{P_m}\right)^{-\frac{1}{\alpha-1}} \tag{10}$$

If the following substitution of $\sigma = \dfrac{1}{\alpha-1}$ $\qquad$ [11]

is applied, the ratio will shift to:

$$\frac{Q_d}{Q_m} = \left(\frac{\beta}{1-\beta}\right)^{\sigma} \left(\frac{P_d}{P_m}\right)^{-\sigma} \tag{12}$$

Formula 12 can be logarithmised on both sides:

$$Log_{10}\left(\frac{Q_d}{Q_m}\right) = \sigma Log_{10}\left(\frac{\beta}{1-\beta}\right) + \sigma Log_{10}\left(\frac{P_m}{P_d}\right) \tag{13}$$

Equation 13 determines that the ratio of the quantity of domestically produced and imported goods sold in the domestic market is directly proportional to the ratio of the price at which they are retailed, whereas the previous parameter of the price ratio represents the elasticity of substitution of domestic and imported goods. In other words, it is possible to create a timeline using these ratios, and to calculate the elasticity of substitution.

Assuming:

$$\varepsilon = Log_{10}\left(\frac{\beta}{1-\beta}\right)^{\sigma} \tag{14}$$

$$Y = Log_{10}\left(\frac{Q_d}{Q_m}\right)$$

[15]

$$X = Log_{10}\left(\frac{P_m}{P_d}\right)$$

[16]

We have:

$$Y = \varepsilon + \sigma X + u_t$$

[17]

where u_t represents the difference between the actual and theoretical values of the equation. When the customs duty is altered, the customs value changes from P_m to P'_m. However, let us assume that when the customs value is altered, the import volume changes by ΔQ_m, and becomes Q'_m. Then, by finding Q'_m and Q_m from Equation 12, the import volumes after the customs tariffs have been changed can be determined using these ratios:

$$Q'_m = \left(\frac{P'_m}{P_m}\right)^\sigma Q_m$$

[18]

The price of imported goods is represented by P_m, assuming that the purchase price of the product on the world market is equal to P_w multiplied by the current exchange rate (*ER*) and converted into the national currency, with the value-added tax v deducted from the t_0 value added by customs duty. This can be demonstrated as follows:

$$P_m = P_w * ER * (1 + t_0)(1 + v)$$

[19]

If the customs duty rate is changed from t_0 to t_1, the import price of P_m becomes P_m':

$$P'_m = P_w * ER * (1 + t_1)(1 + v)$$

[20]

If the substitution above is introduced into Equation 18, we achieve the following form:

$$Q'_m = \left(\frac{1 + t_1}{1 + t_0}\right)^\sigma Q_m$$

[21]

When the customs tariff rate for a particular good is changed from t_0 to t_1, the import volume changes by ΔQ_m units. This can be calculated by Equation 22, where Q_m represents the import volume of the product when the tariff level is present and Q'_m after the tariff rate is altered to t_1:

$$Q'_m = Q_m + \Delta Q_m$$

[22]

Hence, if we change the import tariff rate, considering the change in the quantity to be imported, it can be expressed by the following formula:

$$\Delta Q_m = Q_m\left(\left(\frac{1 + t_1}{1 + t_0}\right)^\sigma - 1\right)$$

[23]

According to the formula above, provided that the elasticity of substitution of domestic and imported goods have been determined, it is possible to predict how the volume of its imports will change based on the percentage of imposed customs tariffs.

Assuming from Equation 23 that the tariff rate required to protect domestic production from imports is t_1, this means:

$$t_1 = \left(1 + \frac{\Delta Q_m}{Q_m}\right)^{1/\sigma} (1 + t_0) - 1 \qquad [24]$$

The most challenging problem in common practice is that although increasing import tariffs to support the domestic production of certain goods reduces the import of these goods, it causes increased import of components used for their production or other goods produced using these products. On the one hand, a tariff increase of imported inputs would raise the costs for domestic producers and may lower their output. On the other hand, increasing tariffs on imported inputs is likely to result in the increased import of finished products produced using such inputs.

Therefore, when changing import tariffs for certain products, it is important to change the tariffs for other related products accordingly. Thus, effective protection measures need to consider the whole tariff structure on domestic producers in a particular sector. The following formula (Bhagwati & Srinivasan, 1971) of the Effective Rate of Protection (ERP) is used to coordinate changes in tariffs under such circumstances:

$$t_e = \frac{P_{wi}(1 + t_{mi}) - \sum_j P_{wi}(1 + t_j) * a_j}{P_{wi} - \sum_j P_{wi} * a_j} = \frac{t_i - \sum_j a_{ij} * t_{ij}}{1 - \sum_j a_{ij}} \qquad [25]$$

where:

P_{wi}: world price of ith final good

t_e: effective tariff rate for imported i^{th} final good

t_{mi}: nominal customs tariff rate on imported i^{th} final good

t_{ij}: customs tariff rate for j^{th} imported material used in the production of the final good i.

a_{ij}: percentage share of jth imported material in the value of final good i.

The ERP is a commonly used measure of the net effect of trade policies on the incentives facing domestic producers. It is used to measure the percentage change in the value added in industry because of the imposition of a tariff structure by the country rather than the existence of free trade. The ERP formula (Equation 25) raises several important general points, as follows:

• the ERP will be greater if the nominal rate of protection on the final good is larger, and if the nominal protection on its inputs and the share of its imported inputs is smaller.

• the higher the value of a_{ij}, the greater the effective protection rate for any given nominal tariff rate on the final product. A tariff on imported inputs to be used in the production process reduces the level of effective protection.

• if the nominal rate of protection is the same both on imported inputs and final product, the ERP will be identical to this common rate for the final good and its inputs. If the nominal tariff on the final good is larger than on its inputs, the ERP will be larger than the nominal protection on the final good.

3. Setting optimal customs tariffs for the import of liquid and dry (powdered) milk products

Customs tariffs are an internationally recognised, traditional tool for regulating foreign trade. By imposing customs tariffs, it is possible to increase the retail prices of low-cost imported goods. This allows countries to protect domestic production from foreign competition. Historically, governments have used customs tariffs for various purposes, such as improving the balance of payments by reducing imports, determining the optimal supply and demand ratio in the domestic market, correctly defining nontariff regulation scope and generating state budget revenues.

Following the eight rounds of the General Agreement on Tariffs and Trade (GATT), countries around the world have significantly reduced customs tariffs from previous levels as part of its trade liberalisation policy (WTO, 2020). Today, customs tariffs are no longer a powerful tool for regulating foreign trade.

Currently, there are very few countries that arbitrarily set their own tariffs. Most countries around the world have joined the WTO and set customs tariffs in accordance with the commitments undertaken within this international community. Currently, 164 countries have joined the WTO (WTO, 2021). According to the latest estimates, WTO members account for 98 per cent of all world trade (WTO, 2021) and 96.6 per cent of total world GDP (The World Bank, 2020b).[1]

The sustainable supply of imported milk and dairy products is essential to the development of the domestic production of dry milk and other milk and dairy products for a country such as Mongolia. This is because of its high volatility in export revenues, recurrent deficiency in payment balances, and high transportation costs while geographically distanced from key international road transport networks. On the other hand, developing domestic production is paramount for addressing major development issues such as providing thousands of rural herders with access to markets, reducing rural unemployment and poverty, and closing the gap between urban and rural development by creating favourable conditions for mobilising local production resources.

The question of whether to source the milk and dairy products domestically or via import depends on the rate of import tariffs. Granted, the direct increase in import tariff rates without the development of milk production is likely to have a negative impact on the supply of this type of product. It may be necessary to apply seasonal tariffs on milk and dairy products, especially during the winter, when domestic milk supply is disrupted.

If high, nonseasonal tariffs must be levied, these tariffs will need to be raised once domestic dry milk factories and plants are constructed. Otherwise, high milk tariffs could have adverse effects on the livelihoods of the most vulnerable.

To determine the optimal level of milk import tariffs, the substitution elasticity of domestic and imported milk was estimated using Equation 16. For model parameter estimation, we have used 1999−2019 foreign trade customs statistics and national statistical data. According to regression analysis results, the estimated substitution elasticity of substitution between domestic and imported milk is 1.049 (Table 1).

Table 1: The regression model coefficients for estimating the long-run Armington elasticity for milk.

	$Y = \text{Log}_{10}\left(\frac{Q_d}{Q_m}\right)$
$X = \text{Log}_{10}\left(\frac{P_m}{P_d}\right)$	1.049
	*0.404
$\varepsilon = \text{Log}_{10}\left(\frac{\beta}{1-\beta}\right)^{\sigma}$	0.800
	*0.191
Number of observations	**21**

*These values are the standard errors of the corresponding coefficient estimates.

From the Table 1, we could rewrite Equation 12 as follows:

$$Y = 0.80 + 1.049 * X + u_t \qquad\qquad [26]$$

A tariff increase imposed on imported milk increases its price in the domestic market, and thereby may lead to a decrease in demand for imported milk. The decrease in import demand reduces competition in the domestic market; the reduced competition then allows prices to rise. A rise in milk price in the domestic market affects supply and promotes domestic production. The sales of domestic producers should increase, all else being equal.

The above calculation of long-run Armington elasticity for milk indicates that a 1.0 per cent increase in the price of imported milk would cause a 1.049 per cent decrease in the quantity of imported milk. Conversely, a 1.0 per cent decrease in the price of imported milk could increase demand for imported milk by 1.049 per cent.

In other words, any tariff measures for the protection of the domestic dairy industry will be effective, and a 1.0 per cent increase in the customs tariff rate for milk would lead to a 1.049 per cent decrease in the imported milk supply. Thus, it is possible to protect domestic production from import competition by imposing a high customs tariff on imported powdered milk.

Using the above estimation of elasticity of substitution between domestic and imported milk, we determined using Equation 24 that the optimal tariff rate for the complete protection of the domestic import-substituting milk industry is 122.7 per cent.

Considering Mongolia's 20.0 per cent bound rate for milk products under the WTO agreement, there is probably little room to increase the present tariff rate for milk powder. The country could raise its current rate to 20.0 per cent from the current 15.0 per cent. This 5.0 per cent increase in the current tariff would reduce milk powder import by 4.57 per cent.

In addition, in the case of customs tariff changes for powdered milk, tariffs on other dairy products,

such as ice cream, yoghurt and cheese, should be changed in line with the revised customs rates.

If such measures are not taken, the importation of the dairy products above will likely increase in place of powdered milk. The effective import tariff for these products can be calculated using Equation 23.

In practice it is important to control the ERP for finished goods in harmony with the tariff change in its imported inputs. Figure 2 displays the tariff rates for ice cream made from imported milk powder.

Figure 2. Graphical illustration of nominal and effective tariff rate for ice cream in Mongolia
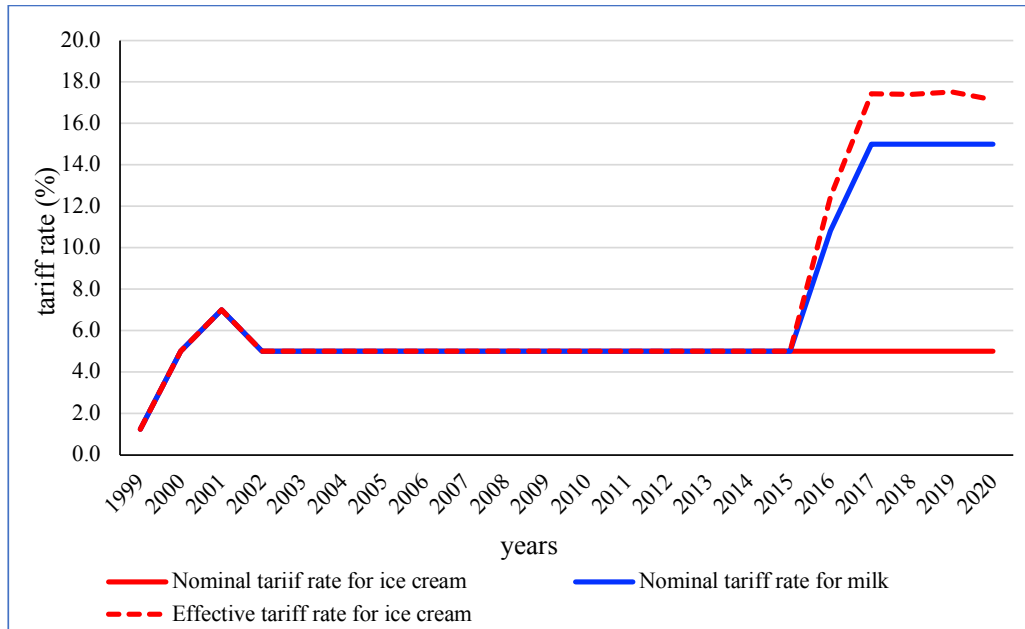
Source: Authors' calculation based on "Foreign trade commodity statistics" of the CGA of Mongolia (1999−2020).

Milk powder is an essential ingredient of ice cream. After conversion to liquid milk, it accounts for roughly one-half of the ice cream content. Depending on the market price fluctuations of milk powder and ice cream, the percentage share of milk powder in the value of ice cream changes over time. For this calculation, we have used foreign trade statistics from the International Trade Centre (ITC) (ITC, 2020) and the Customs General Administration of Mongolia between 1999 and 2020 (CGA Mongolia, 2000−2021) and data related to a nominal import tariff rate of milk powder and ice cream for the corresponding years.

From Equation 25, the current ERP for ice cream is $t_e = 0.044$ or 4.40 per cent when the nominal tariff rate for milk powder is $t_{ij} = 0.155$, and the nominal tariff rate for ice cream is $t_{mi} = 0.05$, as for 2020. This means the ERP for ice cream is at a level a little lower than the current 5.0 per cent tariff rate on ice cream.

The above calculation shows that an increase in the tariff rate on milk powder decreases the net effect of the tariff in its final product, ice cream.

Let us say that milk is the only ingredient used in the production of ice cream, and the customs tariff rate for imported ice cream is set higher than 4.4 per cent. In this case, it would be more profitable for producers to use domestically produced milk than to use imported milk powder. However, if the customs tariff rate for ice cream is lower than 4.4 per cent, it will be more profitable to use imported milk powder to produce ice cream.

Therefore, we need to consider such interdependence of products when setting customs tariffs, determining options for importing goods and opportunities to develop domestic production. Consequently, it is crucial to calculate and apply optimal customs tariff rates based on a solid foundation of accurate research.

4. Conclusion

In today's world of global competition, customs tariffs play an important role in protecting and developing domestic production. In the past, customs tariffs played a vital role in the accretion of the government budget in developing countries, but as tariffs decline, this role is likely to subside. On the contrary, its role in protecting national production and ensuring its security has become more significant.

Countries with small economies have limited opportunities to develop all production sectors simultaneously, resulting from the economic potential of the whole country. However, there is a need to protect and develop infant industries through trade policy instruments. Setting optimal customs tariffs is critical for this to occur.

Mongolia has not yet used clear scientific methodology for setting its customs tariffs. Here, we present the methodological issues of determining the optimal rate of customs tariffs, and a method for calculating the optimal tariff.

Our empirical study using the Mongolian dairy industry example shows that an increase in customs tariff rates could be an effective way to protect the domestic industry. Tariffs could protect the domestic milk industry and increase production costs for certain import-substituting final products made from imported milk powder. Hence, calculation of the 'net effect' of tariffs on the domestic value added is crucial.

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Notes

1   Authors' calculation based on the World Bank and International Trade Centre (ITC) data base 2020.

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Customs Revenues Prediction Using Ensemble Methods (Statistical Modelling vs Machine Learning)

Jordan Simonov and Zoran Gligorov

"There are two kinds of forecasters: those who don't know, and those who don't know they don't know." John Kenneth Galbraith

Abstract

This paper considers the problems associated with prediction of customs revenues by ministries of finance and customs administrations. Accurate predictions of customs revenues result in better liquidity of the central budget, and for that reason, they are extremely important for successful management of public finances. The orthodox approach to forecasting revenues is usually based on forecasting revenues based on tax buoyancy and tax elasticity, with respect of some economic proxy. However, this approach has some shortcomings which can negatively affect accuracy, and for that reason we examine different approaches (machine learning and ensembling). Namely, nowadays in the era of Big Data and digitisation in customs, new approaches based on computer algorithms can give us better results as compared to classic modelling. The paper concludes that using ensemble methods that combine different types of heterogeneous models such as statistical modelling and machine learning can improve forecast accuracy when predicting customs revenues.

1. Introduction

Even though customs revenues are collected by customs administrations within customs procedures, forecasting the collection of such revenues is ordinarily performed by ministries of finance. Nevertheless, ministries also need predictions performed by customs administrations themselves. In this regard, we shall review the most frequently used approaches when planning the revenues.

The orthodox approach to forecasting tax revenues (including customs revenues) is usually based on forecasting revenues based on tax buoyancy and tax elasticity. Tax buoyancy measures the gross elasticity of tax revenues in relation to the respective macroeconomic variable (for instance, import or consumption). The main characteristic of this approach is that it measures the overall elasticity of taxes in relation to their base. In the tax elasticity approach, the time series needs to be first excluded from the discretionary measures of the fiscal policy to calculate the coefficient of the net tax elasticity in relation to the respective macroeconomic variable. Tax elasticity, according to Jenkins et al. (2000, p. 39), is a relevant factor for forecasting and is most often used by ministries of finance when forecasting tax revenues. Furthermore, to obtain more robust forecasts when estimating the elasticities, it is necessary to harmonise them with the business cycle in the economy, which has significant effects on revenue collection. The advantage of such forecasting is that the forecasted revenues are fully correlated with the macroeconomic indicators so that, should they increase, the revenues are expected to correlate with such an increase. However, this forecasting approach also has its shortcomings.

Macroeconomic indicators (which are usually forecasted twice a year) are used when forecasting the revenues, but from the moment of their forecasting to the moment of realisation, a certain period passes which can have negative effects on the forecast accuracy. In fact, Buettner & Kauder (2009, p.7) point out that the circumstances that the forecasters face can significantly affect the accuracy of the forecasts, and this needs to be taken into consideration when evaluating accuracy. Also, timing of the frequency of forecasts can vary (for instance, in Austria the time is 3.5 months; in Italy the time is six months; and in the Netherlands the time is 9.5 months).

To overcome the problems that occur when applying the previous approach, and with the aim of achieving more accurate forecasts, we look at some more flexible approaches that are based primarily on data-driven methods. The use of data-driven methods can be exceptionally useful, since such models provide for forecasting by using high-frequency data and are of particular benefit for cash management and early warning. The main objective of such models is making short-term inflow forecasts (daily, weekly or monthly) for a period not longer than two years (Haughton, 2008, p. 1).

2. Statistical modelling vs machine learning

Nowadays, to increase the accuracy of forecasting models, forecasters apply various approaches based on statistical modelling and machine learning. Modelling assisted by these approaches is usually done in one of the programming languages (for example, R or Python), whereby automated algorithms are used to perform the complex mathematical operations. However, before moving on to practical modelling, we shall first review the basic differences between these two approaches. The basic characteristics of and major differences between statistical modelling and machine learning are outlined in Table 1.

Table 1: Major differences between statistical modelling and machine learning

Statistical modelling	Machine learning
Formalisation of relationships between variables in the form of mathematical equations	Algorithm that can learn from the data without rule-based programming
Required to assume shape of the model curve prior to performing model fitting to the data (e.g. linear, polynomial)	Does not need to assume underlying shape, as machine learning algorithms can learn complex patterns automatically, based on the provided data
Predicts the output with 85% accuracy at a 90% confidence level	Predicts the output with 85% accuracy
Various diagnostics of parameters are performed, such as p-value	Does not perform statistical diagnostic significance tests
Data will be split into 70%/30% to create training and testing data. Model developed on training data and tested on testing data	Data will be split into 50%, 25%/25% to create training, validation and testing data. Models developed on training and hyperparameters are trained on validation data and are evaluated against test data
Models can be developed on a single dataset (training data), as diagnostics are performed at both overall accuracy and individual variable level	Need to be trained on two datasets (training and validation data), to ensure two-point validation
Mostly used for research purposes	Apt for implementation in a production environment
From the school of statistics and mathematics	From the school of computer science

Source: Adopted according to Pratap (2017, p. 43).

Statistical modelling. This type of modelling comprises a wide range of models that could be used for modelling time series. Exponential smoothing (ETS) and autoregressive integrated moving average (ARIMA) (Hyndman & Athanasopoulos, 2016, p. 290) could be considered as two of the most frequently used models in time series forecasting that allow for a complementary approach to the problem. The ETS forecasting model starts from the assumption that a certain legality of the change in observations and their random fluctuations is present in the series, whereby the alignment method gives rise to the so-called 'smoothed series', showing the basic tendency of the time series that is further used for modelling. The predictions of ARIMA forecasting models assume that future circumstances in the time series will be similar to past circumstances. Due to this feature, these models are widely used when modelling a great number of economic series that entail periodic variations.

Machine learning. The term 'machine learning' was first used in 1959 by Arthur Samuel, who was at the time working at IBM, and described it as the field of study that gives computers the ability to learn without being explicitly programmed (Gutierrez, 2015, p. 17). In the era of Big Data and digitisation in customs administrations, machine learning algorithms can be advantageous, especially in predictive analytics. In general, these algorithms can be divided into two major types: supervised and unsupervised. Supervised learning algorithms are those in which a machine learning model is scored and tuned against some smart of known quantity, while unsupervised learning algorithms are those in which machine learning derives patterns and information from data while determining the known quantity tuning parameter itself (Burger, 2018, p. 40). In this regard, we shall look at the application of the Artificial Neural Network (ANN), frequently used for modelling time series. In general terms, ANN algorithms are based on simple mathematical models of the brain and they allow complex nonlinear relationships between the response variable and its predictors (Hyndman & Athanasopoulos, 2016, p. 443). To illustrate, the human brain consists of approximately 85 billion neurons, which creates a network capable of absorbing huge quantities of knowledge, whereas the number of neurons in animals is far lower – for instance, cats have 1 billion neurons and mice have 75 million neurons (Lantz, 2015, p. 220).

Ensembles. Bates and Granger (1969, p. 451–468), in their famous paper 'The Combination of Forecasts', point out that combining forecasts often leads to better forecast accuracy. Even though this approach is more than half a century old, the point of ensembling is not very far from this idea. Namely, this is the reason for using ensembles, whereby it is always considered better if they consist of heterogeneous types of models to better cover different aspects of the time series. The output of these models is most commonly based on the average projections given by models upon the voting, weighting or other type of selection. This method is more often applied in machine learning, whereby special algorithms automatically create ensembles. A specialised type of supervised learning algorithm is ensemble learning, which is a set of algorithms that is built by combining results from multiple machine learning algorithms. These methods have become popular due to their ability to provide superior results and the possibility of breaking them into independent models to train on distributed networks. Some of the most popular ensemble machine learning methods are boosting, bagging, gradient boosting machines and random forest. It is worth mentioning Kaggle, a subsidiary of Google, and the largest online community of data scientists, frequently organises machine learning competitions involving the use of forecasting methods. Often the winning solutions are based on variations of the ensemble methods strategy (Gutierrez, 2015, p. 239). As the discussion above shows, these data-driven approaches provide a solid basis for revenue modelling. However, the question that inevitably arises is, 'which of these approaches can provide us with better projections?'.

3. Data

For the purposes of this research, a dataset with customs duties from the Republic of North Macedonia was used. This dataset consists of a univariate time series with monthly frequency from January 2014 to January 2020. Taking into consideration that the Republic of North Macedonia still applies the 1986 government finance statistic (GFS), this is on a cash basis according to their payment. To better elaborate revenue collection related to customs duties, we shall look at several basic facts related to the customs protection of the Republic of North Macedonia. Customs duties account for three per cent of the total budget revenue or 0.9 per cent of GDP. According to the report *The World Tariff Profiles* (World Trade Organization [WTO], International Trade Centre [ITC] and the United Nations Conference on Trade and Development [UNCTAD], 2018), by using the same methodology a comparison of trade weighted average was made, which in the European Union (EU) is three per cent, while in Republic of North Macedonia it is calculated at 6.3 per cent. The Republic of North Macedonia has concluded Free Trade Agreements (FTA) with the following parties: the EU, the European Free Trade Association (EFTA), Turkey (TR), Ukraine (UA) and the Central European Free Trade Agreement (CEFTA). Considering that trade with CEFTA is fully liberalised, that is zero tariff rates, it is not going to be subject to analysis in the study below. One of the most important FTAs for the Republic of North Macedonia is the Stabilization and Association Agreement (SAA) regulating foreign trade with the EU, in line with which around 70 per cent of the total foreign trade is realised. Figure 1 shows the distribution of most favoured nation (MFN) tariff rates, as well as the range of customs protection of agricultural products and non-agricultural products. The dotted lines present the simple mean for each of these product groups, respectively.

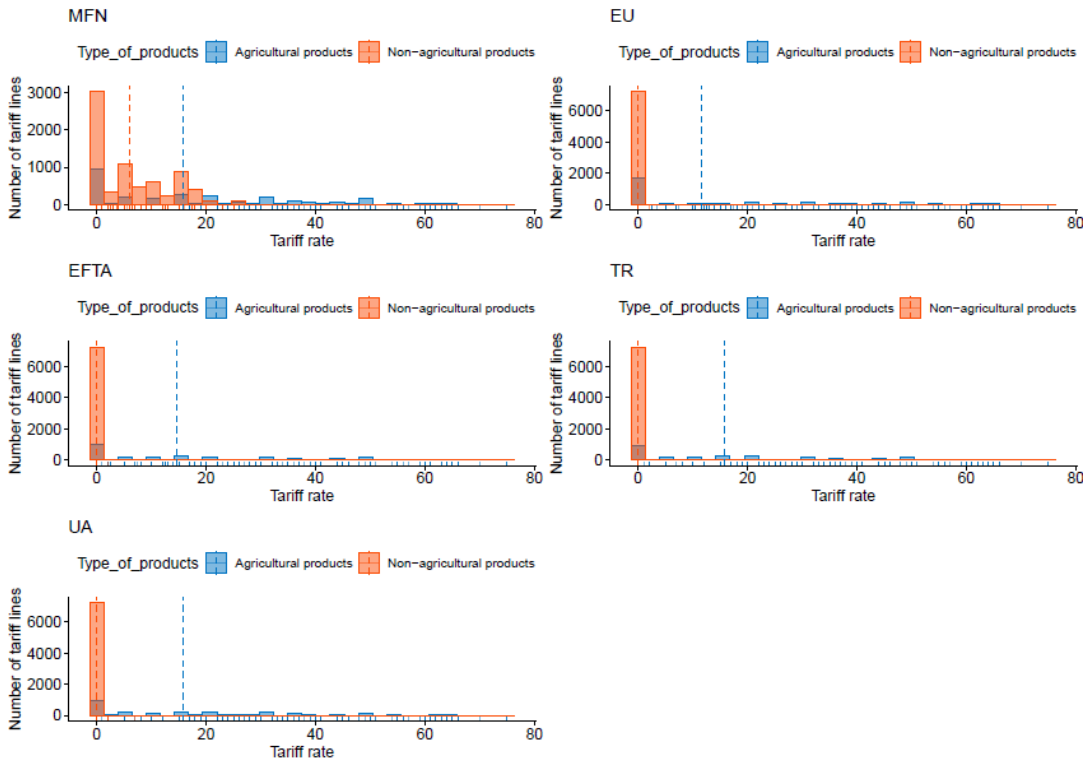*Figure 1: Distribution of MFN and FTA tariff rates by type of products*

Figure 2 shows a boxplot of the descriptive statistics of tariff rates based on a five number summary (minimum, first quartile, median, third quartile, and maximum plus outliers) for the indicated 22 groups of products shown in a rectangular form. The horizontal line in the middle of the rectangles displays the median of the data, or in this case, the amount of the tariff rates. The horizontal line under the median displays the first quartile of the customs duties, while the line above the median displays the third quartile of the tariff rates for the respective group of products. The box itself shows where 50 per cent of the central data in the variation series (interquartile range) is located, and the length of each vertical line (whisker) corresponds to one and a half length of the interquartile range, while all data above these lines that are outliers are marked as dots.

Figure 2: Boxplot (MFN and preferential tariff rates)
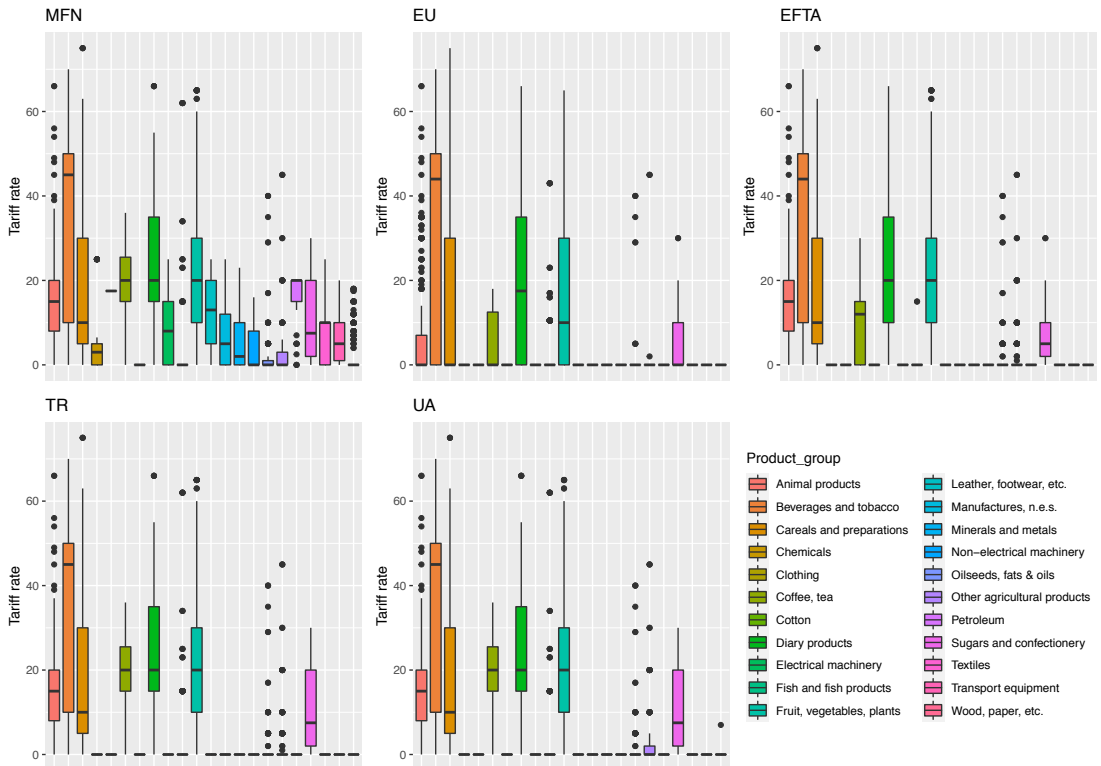
n.e.s.: not elsewhere specified

4. Exploratory data analysis

Explanatory data analysis (EDA) is an approach to analysing data sets to summarise their main characteristics by using visual methods and statistical tests. Performing such an analysis is a mandatory precondition for successful modelling and is it highly recommended to conduct it before any forecasting of customs revenues.

To better understand data properties, find patterns and suggest a modelling strategy, we began with EDA. The descriptive statistics of monthly collection of customs duties in Table 2, with main central tendency measures, show that customs duties collection measured through simple averages account for 416.6. Standard deviation, which measures the distance from the median value ranges, is 68.6.

Although the average of customs duties collection (expressing the central tendency of the data) amounts to 416.6, the median value is lower and accounts for 411.9. This is also confirmed by the trimmed mean (which at the level of 10 per cent excludes the lowest and highest values at the daily collection and then calculates the average), thereby accounting for 413.1. The median absolute deviation is a robust measure of statistical dispersion and is more resilient to outliers in a dataset than a standard deviation. It indicates a deviation of 59.4. Monthly collection of customs duties is in the range of 249.9 to 591. The asymmetry coefficient is positive, amounting up to 0.04, thus indicating a positive skew (that is, the right tail is longer and the mass of the distribution is concentrated on the left side). In addition, the coefficient kurtosis records low values that are lower than three, thus confirming non-normal data distribution, which is 0.1 and value of the standard error is 8.0.

Table 2: Descriptive statistics of monthly collection of customs duties in MKD (Macedonian Denar)

Mean	**416.6**
Standard deviation	68.6
Median	411.9
Trimmed mean	413.1
Median absolute deviation	59.4
Min	249.9
Max	591.0
Range	341.1
Skew	0.4
Kurtosis	0.1
Standard error	8.0

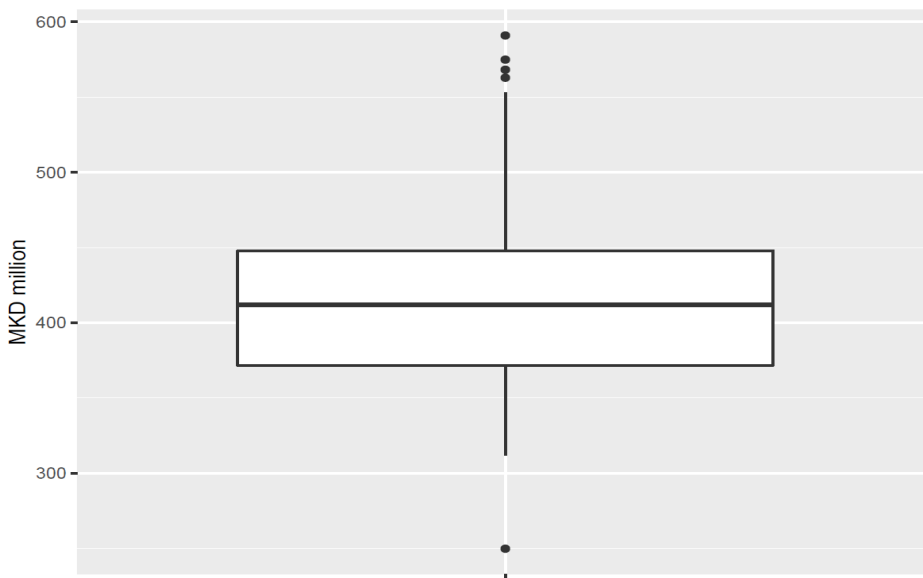*Figure 3: Boxplot of customs duties of monthly collection in MKD*

Figure 3 represents a boxplot with a graphic display of the descriptive statistics based on a five number summary (minimum, first quartile, median, third quartile, and maximum plus outliers) of the monthly collection of customs duties. The horizontal line in the middle of the rectangle displays the median of the data, or in this case, the amount of collected duties in national currency. The horizontal line under the rectangle displays the first quartile of the customs duties, while the line above displays the third quartile of the collection of customs duties. The box itself shows where 50 per cent of the central data in the variation series (interquartile range) is located, and the length of each vertical line (whisker) corresponds to one and a half length of the interquartile range, while all data above these lines that are non-standard observations (outliers) are marked as dots.

Upon visual inspection of the boxplot in Figure 3, a crucial characteristic of the time series is evident: the existence of outliers which should be adequately treated in the data preprocessing procedure, since they usually lead to non-stationarity, and may also affect the accuracy of the projections.

Figure 4 shows four charts, the first of which refers to the original time series, whereas for the rest of the three charts the STL method (Seasonal and Trend decomposition using Loess) for decomposition was applied, whereby the time series has been divided into three parts: trend, seasonal and residual component. Upon visual inspection of the lineplot showing the original time series, a trend in the data is evident, which usually leads to non-stationarity of the time series. This assertion was checked through the KPPS-test (Kwiatkowski at al., 1992, p. 159–178) whereby the result for the test statistic for critical value for a significance level of 5 per cent is 0.463. As the test-statistic is 1.79, we can see that it fails the KPSS unit root test for stationarity. The detailed results from this KPSS test are provided in Table 1A in Annex A. A characteristic of the trend component is that it is constantly increasing, and this is due to several factors such as an increase in economic activity and thus an increase in imports, which on the other hand affects the increase of revenue collection at a nominal value. The seasonal component describes the seasonal character of the data in the form of fluctuations in the time series, related to calendar cycles. The seasonal type of data may have a significant effect on the projections, and thus they should be adequately treated – that is, the data needs to be deseasonalised. The remaining component refers to the residuals from the seasonal plus trend fit.
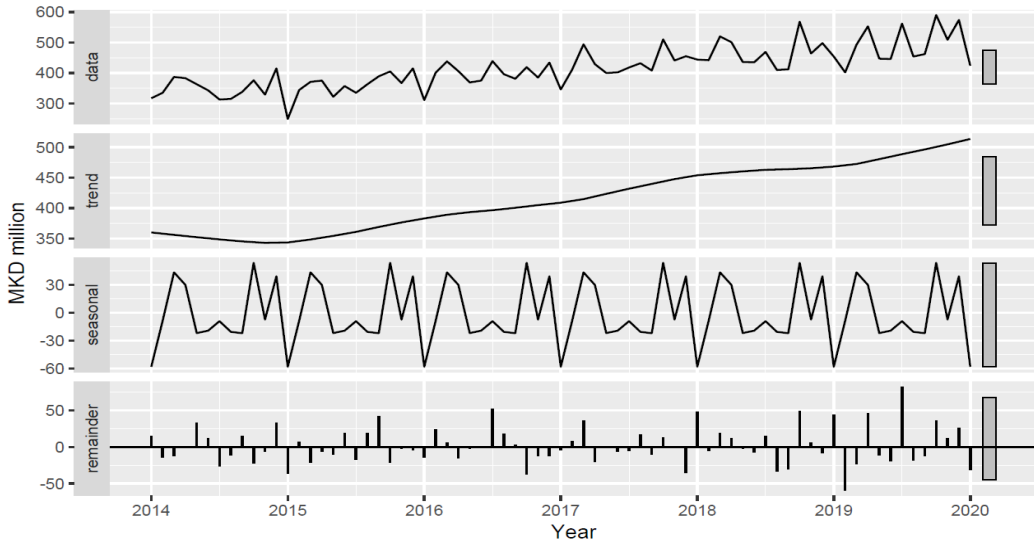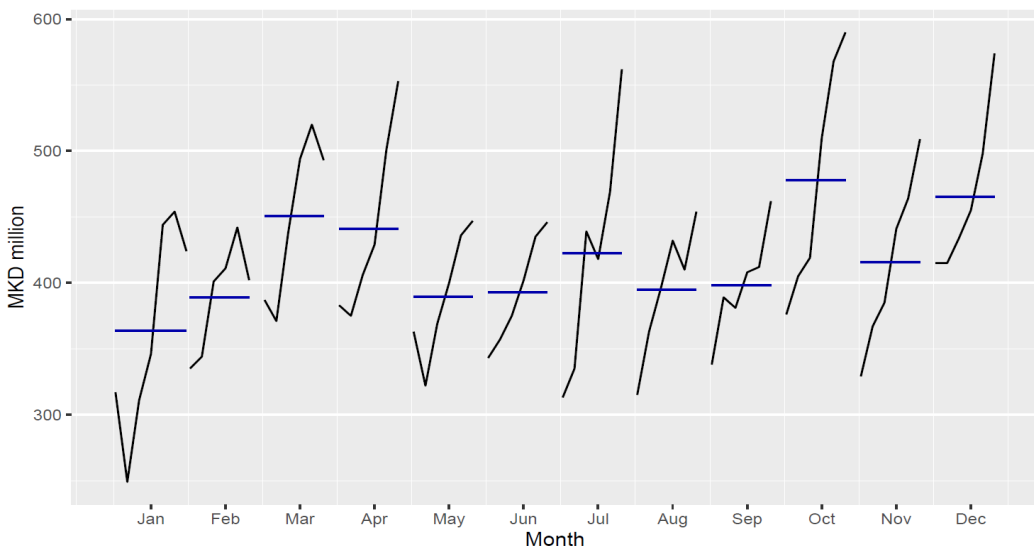
Figure 4: STL decomposition

*Figure 5: Seasonal plot of monthly collection of customs duties in the period of 2014−2020*

To better familiarise ourselves with the seasonal patterns of time series, a seasonal plot, shown in Figure 5, was used. The horizontal blue lines indicate the means for each month and show the changes in seasonality over time. From this plot, we can conclude that the last quarter is usually strongly affected by season, and collection of customs duties is higher as compared to other quarters. This can also be confirmed by averages shown on this plot.

Finally, it can be concluded that EDA has revealed many important features of this time series by providing mathematical and statistical proof related to seasonal patterns, non-standard observations (outliers) and non-stationarity that must not be neglected during modelling. Such volatility of the time series may be explained by the influence of seasonality as well as with the measures of

the discretionary fiscal policy, which, in the analysed period appears in the form of adoption of autonomous measures for reducing certain tariff rates. Considering that the series has a seasonal component, its seasonal adjustment was performed with the assistance of an automated procedure that uses the decomposition method developed by the US Census Bureau and Statistics Canada, also known as X11 (Hyndman & Athanasopoulos, 2016, p. 216). Additionally, we used the automated function that performs outlier replacements on the linear interpolation principle. The seasonally adjusted series is shown in Figure 6.

Figure 6: Original series and seasonally adjusted series
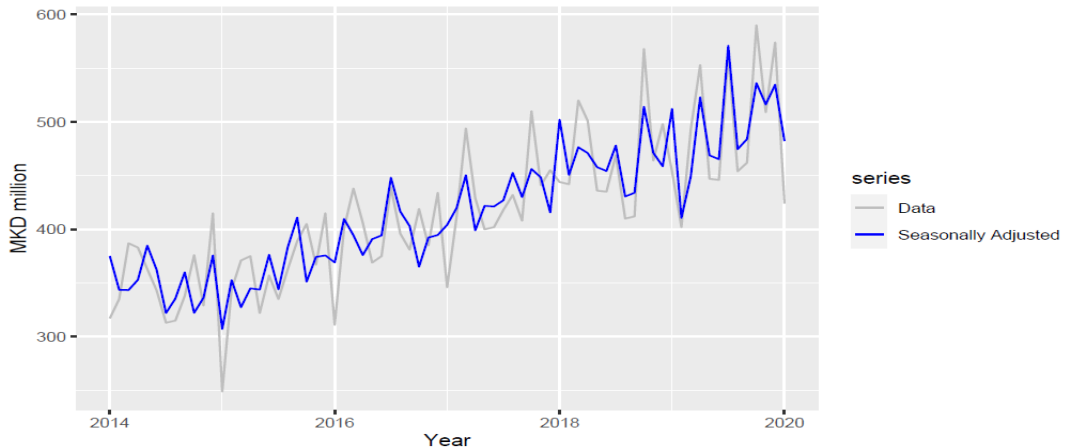
5. Predictive modelling

In this part we focus on the most likely scenario of income planning, or, in other words, it is a scenario in which the data source is limited and data of only one time series are at our disposal. We chose this scenario because forecasters in the real word of data often face situations when at the time of income projection they do not have the remainder of the data at their disposal because the data publication frequency may be different. For modelling purposes, we divided the data into a training set (80 per cent of the observations) with 58 observations relating to the period from January 2014 until October 2018, and a test set (20 per cent of the observations) with 14 observations relating to the period from November 2018 to January 2020. This approach is also known as hold-out and is used for training the models, based on the training set, as well as for testing the predictive performance of the test set. We applied this approach to avoid overfitting, which often occurs during such modelling when the models have good results when it comes to the training set, but when it comes to the test set they are far more dissatisfactory.

For the evaluation of the forecast accuracy, we used different types of metrics, where we calculated the errors separately for each model with: Mean Error (ME), Mean Absolute Percentage Error (MAPE), Mean Absolute Scaled Error (MASE), Root Mean Squared Error (RMSE), Mean Absolute Error (MAE) and first-order autocorrelation (ACF1). When making the main comparison between the errors we used MAPE and RMSE. We chose these accuracy metrics as MAPE and RMSE are commonly used when mutually comparing the errors made by different models because these metrics are more pessimistic measures since they give more weight to larger errors.

For the purposes of this predictive modelling, we chose the R ecosystem with different packages as it is one of most user-friendly languages, which operates with automated algorithm functions.

5.1 Statistical modelling

For the purpose of this kind of modelling we used the auto.arima function from the forecast package in the R ecosystem. This function enables modelling with ARIMA. Determining the order of the ARIMA model is usually a complex task and this becomes even more complicated if it concerns a model with seasonal data. Therefore, for the purposes of this modelling, the automatic ARIMA algorithm (Hyndman & Khandakar, 2008, p. 1–22) was used. This algorithm automatically selects the best model for the specified time series, combining single-root tests to convert the series from non-stationary to stationary (on an off-seasonal and seasonal basis) and to determine the order of the ARIMA model on a non-seasonal and seasonal level through the Akaike information criterion (AIC) .

By using this automated approach with the auto.arima function, the model for the time series customs duties is specified as $ARIMA(0,1,1)(0,1,0)_{[12]}$. The detailed results from this modelling are provided in Table 2A and Table 3A in Annex A.

Before deciding whether the selected model is adequate for further use and forecasting, we needed to perform some additional tests related to the residuals. It is always a good idea to check if there is any autocorrelation between the residuals or whether they are normally distributed. For that reason, we performed additional residual diagnostics. Results from this diagnostic are shown in Annex A, Figure 11. The forecast accuracy can only be determined by considering how well a model performs on the test set that was not used when fitting the model within the training set. In the training set, this model has a RMSE of 28.8, a MAPE of 5.05 and a MASE of 0.568, while on the test set the RMSE is 40.5, the MAPE is 6.61 and the MASE is 0.870. MASE metrics compares the model predictive performance (MAE) to the naive forecast on the training and the test set and has a value below one, which indicates that the model has a lower average error than the naive forecasts. Considering that the residual diagnostics showed good results, we considered this model to be adequate for forecasting and we used it to make a forecast with a horizon of 14 + 1 observations. The results are shown in Figure 7.

*Figure 7: Forecast from ARIMA $(0,1,1)(0,1,0)_{[12]}$*
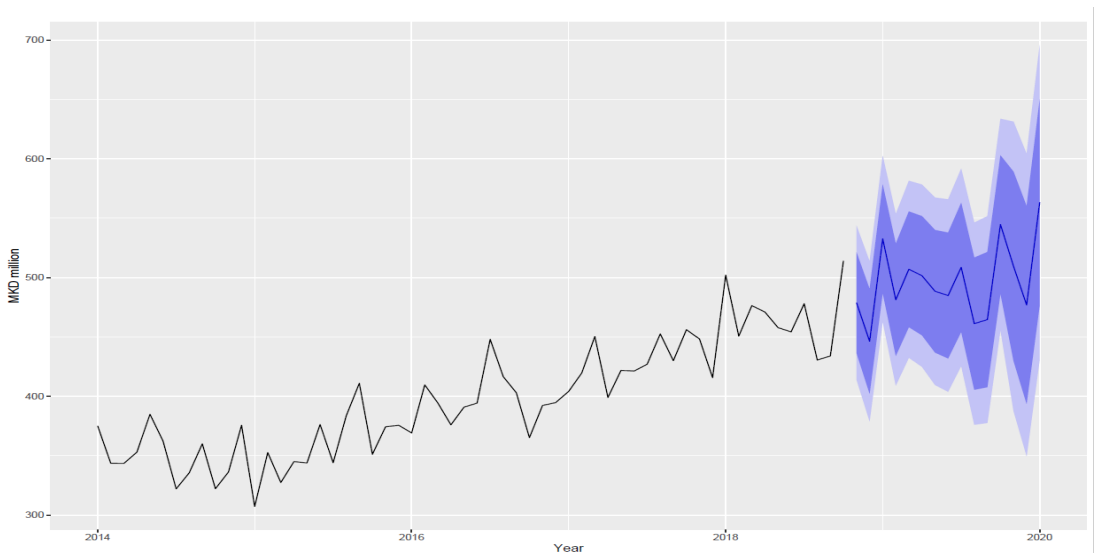
5.2 Machine learning

Given that the time series differs from other types of data series, is subject to modelling, we modelled it with a neural network that supports solving regression problems such us customs revenue forecasting.

In this case we used an automatic procedure which we performed with the assistance of the nnetar function from the forecast package in the R ecosystem, which can operate with neural network autoregression (NNAR). Here, the feature selection is automatic and lag-based features are selected. This function has four main arguments: repetitions, p, P and size. The first argument in this function repeats the number of neural networks fitted. By default, this argument is 20 unless otherwise specified. For the seasonal series argument, p is chosen from the optimal linear model fitted to the seasonally adjusted data while P = 1 by default. These functions only fit neural networks with a single hidden layer, where the last argument – size – refers to the number of nodes in the hidden layer. By default, this argument is estimated in this way: size = (p + P + 1)/2 (and rounded to the nearest integer). If the values for the arguments in the function are not specified, then they are automatically selected. When it comes to forecasting, the network is applied iteratively. For forecasting one step ahead, the nnetar function simply uses the available historical inputs and this process will continue consequently, two steps ahead (the one-step forecast as an input, along with the historical data) and so on (Hyndman & Athanasopoulos, 2016, p. 446). By using this automated approach with the nnetar function, the model for the time series customs duties is specified as NNAR (3,1,2)[12]. The detailed results from this modelling are provided in Table 4A and Table 5A in Annex A. Results from this diagnostic are shown in Annex A, Figure 12. Considering that we already performed residual diagnostics, our next step was to evaluate the forecast accuracy. The forecast accuracy can only be determined by considering how well a model performs on the test set that was not used when fitting the model within the training set. On the training set this model has a RMSE of 21.8 and a MAPE of 4.19 and on the test set the RMSE is 49.7 and the MAPE is 7.7. Considering that the residual tests showed good results, we considered this model adequate for forecasting and we used it to make a forecast with a horizon of 14 + 1 observations. The results are shown in Figure 8.

Figure 8: Forecast from NNAR (3,1,2) [12]
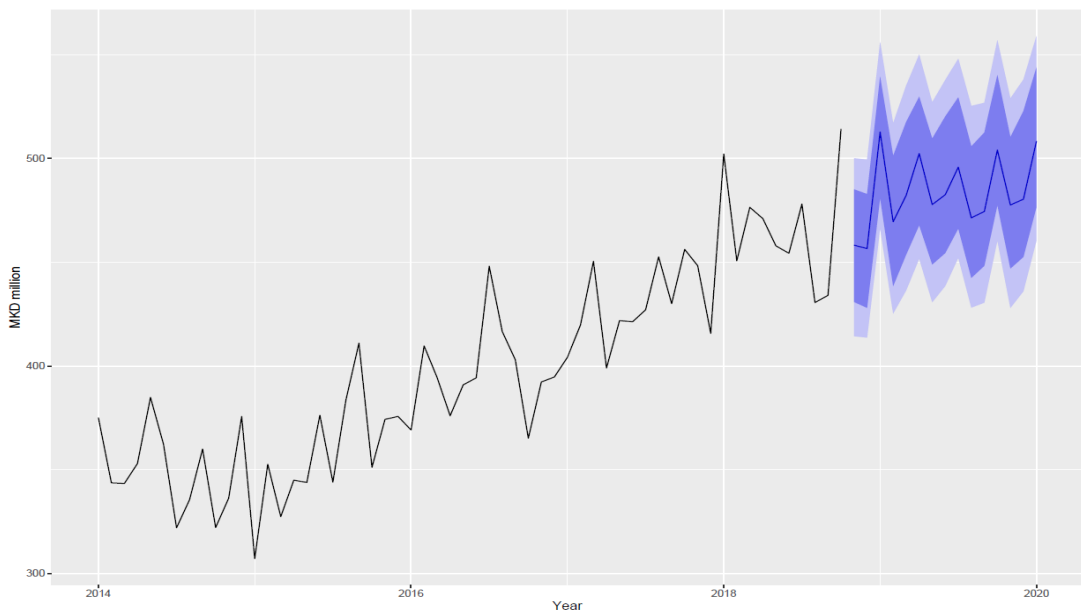
5.3 Ensemble modelling

Our idea here was to combine the results of the previous models and for that purpose we used the hybridModel function from the forecastHybrid package in the R ecosystem. This function gives modelling a platform to ensemble heterogeneous time series models. In this modelling framework we used ARIMA and NNAR. We already saw the predictive performance in the separate models and now we ensembled this model. By using this automated approach, the model for the time series customs duties was comprised of the ARIMA and NNETAR models, with weights 0.452 for ARIMA and 0.548 for NNETAR. The detailed results from this modelling are provided in Table 6A and Table 7A in Annex A. Results from this diagnostic are shown in Annex A, Figure 13. In the training set this model has a RMSE of 21.8 and a MAPE of 4.00 and on the test set the RMSE is 31.2 and MAPE is 5.0. As shown in the results, the ensemble method gave the best results compared to all previously tested models. In fact, compared to the RMSE of the test set, this model has a value of 31.2. This error was larger in all the other models, ARIMA was 40.55 and NNETAR was 49.7. The MAPE of this model has a value of 5.0 while in all other models, this error was bigger, ARIMA 6.61 and NNETAR 7.7. This example shows that we can consider the models separately as weak learners because, individually, they can have poor predictive performance, while the ensemble technique of combining different models provided better performance of the models, so that the individual error in the models for RMSE has been reduced from 49.7 to 31.2 and for MAPE it was reduced from 7.7 to 5.0. These results are shown in Figure 9.

Figure 9: Forecast from ensemble
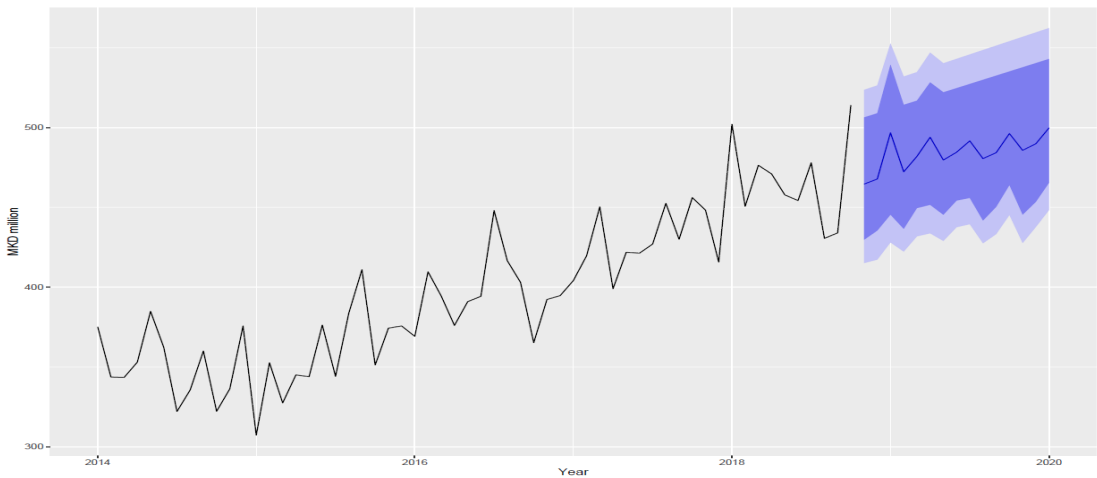
6. Conclusion

For the objectives of this research, we have modelled a univariate time series by using three different approaches within the R ecosystem.

By using statistical modelling we specified the ARIMA $(0,1,1)(0,1,0)_{[12]}$ model as the most adequate one to forecast time series. This model has a RMSE of 28.8 and a MAPE of 5.05 while on the test set the RMSE is 40.5 and the MAPE is 6.61. Statistical modelling combined with some classical models can give good results but, generally, all these models have problems when it comes to handling Big Data (for example, a sample of around one thousand rows). For this reason, it may be better to use all these models with data that have monthly, quarterly and yearly frequency or smaller samples.

Although machine learning, as part of artificial intelligence, is widely used in many other areas of classification problems (for example, customs fraud detection and detection of underpricing evasion), this research has shown how we can use this kind of modelling for forecasting time series and projecting customs duties. By using machine learning we specified the NNAR $(3, 1, 2)_{[12]}$ model as the most adequate one to forecast time series. This model has a RMSE of 21.8 and a MAPE of 4.19 and on the test set the RMSE is 49.7 and the MAPE is 7.7. As a relatively new area of time series analysis, compared to the classical statistical methods, machine learning has shown solid results on a relatively small sample and its use deserves more attention especially in more complex data. Point forecasts from ARIMA, NNAR and Ensemble are show in Figure 10.

Figure 10: Point forecasts from ARIMA, NNAR and Ensemble applied to customs duties collections
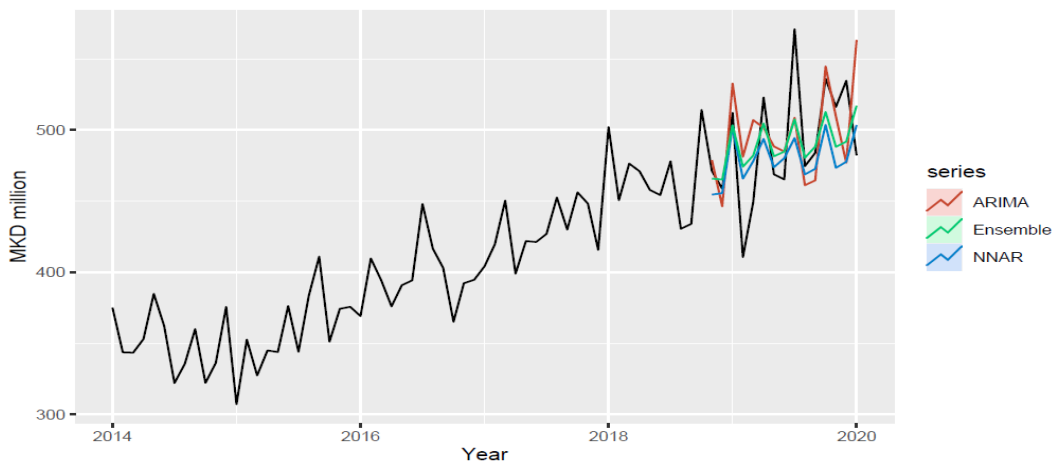
As for the two approaches,[1] the ensemble technique has shown that it can improve prediction accuracy compared to the individual models. This example shows that we can consider the models separately as weak learners because individually they can have poor predictive performance, while the ensemble technique of combining different models provided better performances of the models, so that the individual error in the models for RMSE was reduced from 49.7 to 31.2 and for MAPE it has been reduced from 7.7 to 5.0. They can reduce the forecasting error and, finally, we can conclude that the ensemble technique is certainly a game changer and must be an important addition to every forecaster's toolbox. For this reason, we strongly recommend using this technique for forecasting purposes with statistical modelling or machine learning.

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Notes

1   Code is available on GitHub https://github.com/jordans78/Ensemble-Methods

Annex A

Table 1A: KPSS Unit Root Test

Value of test-statistic is: 1.7909				
Critical value for a significance level of:				

	10pct	5pct	2.5pct	1pct
Critical values	0.347	0.463	0.574	0.739

Table 2A: ARIMA(0,1,1)(0,1,0)[12]

Call:

ARIMA(0,1,1)(0,1,0)[12]

Coefficients:

ma1

-0.7164

s.e.   0.1148

sigma^2 estimated as 1094: log likelihood=-221.16

AIC=446.32   AICc=446.61   BIC=449.94

	ME	RMSE	MAE	MPE	MAPE	MASE	ACF1	Theil's U
Training set	4.416098	28.81491	20.82767	1.062319	5.051560	0.5679152	-0.02734069	NA
Test set	6.142640	40.55658	31.93333	-1.724624	6.611157	0.8707370	-0.03343311	0.7099668

Table 3A: Ljung-Box test

data: Residuals from ARIMA(0,1,1)(0,1,0)[12]
Q* = 5.654, df = 11, p-value = 0.8954
Model df: 1. Total lags used: 12

Figure 11: Residual diagnostics
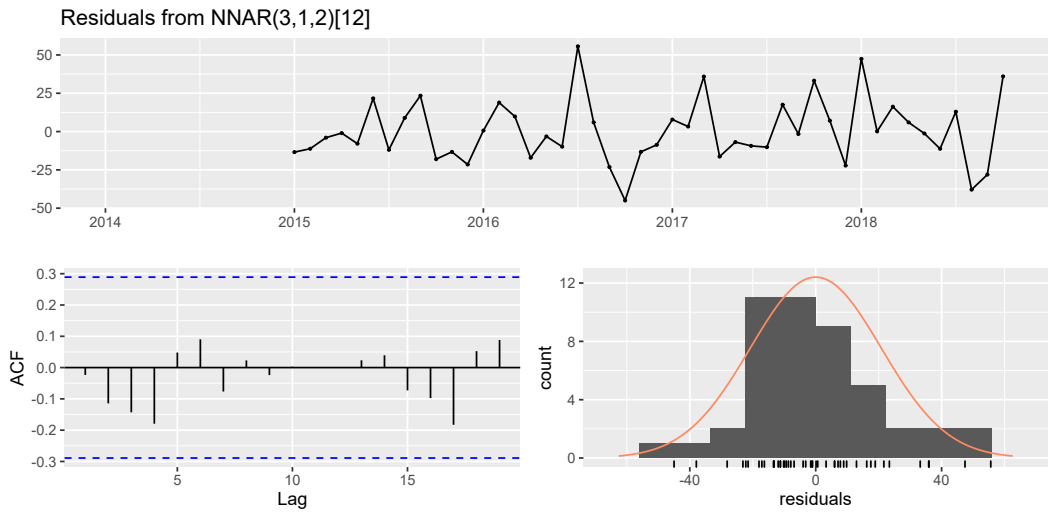

Residuals from NNAR(3,1,2)[12]

Table 4A: NNAR(3,1,2)[12]

Call:

Series: MONTLY_TS_TRAINING_SET

Model: NNAR(3,1,2)[12]

Call: nnetar(y = MONTLY_TS_TRAINING_SET, lambda = "auto")

Average of 20 networks, each of which is

a 4-2-1 network with 13 weights

options were - linear output units

sigma^2 estimated as 263.5

	ME	RMSE	MAE	MPE	MAPE	MASE	ACF1	Theil's U
Training set	0.4175588	21.67883	16.63400	-0.2456791	4.043607	0.4535650	-0.05721551	NA
Test set	5.8703121	34.37212	26.86929	0.6581365	5.419174	0.7326541	-0.06010674	0.6110487

Table 5A: Box-Ljung test

data: test_res

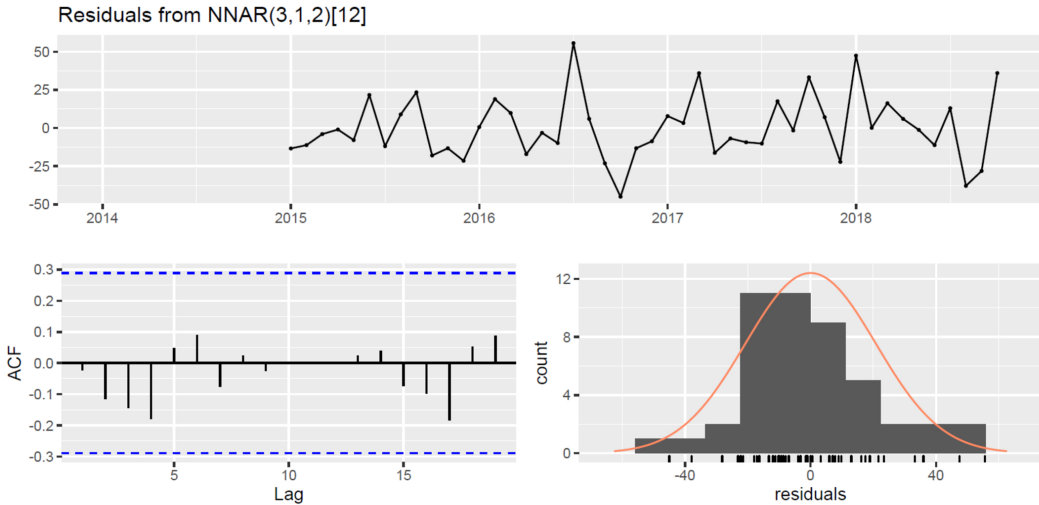X-squared = 7.6537, df = 11, p-value = 0.7439

*Figure 12: Residual diagnostics*

Table 6A: Ensemble model

Forecast method: auto.arima with weight 0.444

Forecast method: nnetar with weight 0.556

	ME	RMSE	MAE	MPE	MAPE	MASE	ACF1	Theil's U
Training set	0.3780783	21.29728	16.40109	-0.2507778	4.002343	0.4472140	-0.03853283	NA
Test set	0.6781094	31.22528	24.72169	-0.3442233	5.055429	0.6740947	-0.03640456	0.5478217

Table 7A: Ensemble model

data: test_res2

X-squared = 2.9966, df = 11, p-value = 0.9908

Figure 13: Residual diagnostics
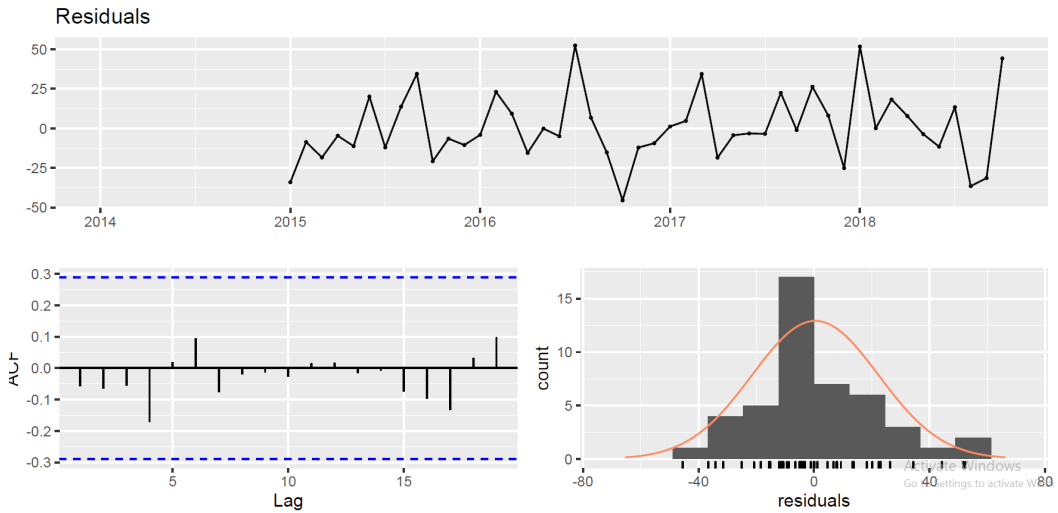
Jordan Simonov

Jordan Simonov has worked at the North Macedonian Ministry of Finance since 2002. Mr Simonov completed a bachelor degree in customs and freight forwarding and a master degree in European Studies during which he defended his master thesis, *Harmonising Customs legislation of the Republic of Macedonia with acquis Communautaire and future challenges of full membership in the European Union*. Currently Mr Simonov is Head of the Forecasting and Analysis Unit, where he analyses and forecasts tax and Customs revenue.

Zoran Gligorov

Zoran Gligorov has worked at the North Macedonian Ministry of Finance since 2000. Mr Gligorov completed a bachelor degree in financial management and has a master degree in economics entitled *Customs strategy of EU in accordance with customs system of the Republic of Macedonia and further excise system policy*. Currently Mr Gligorov is the Assistant Head of Department where he works on tax and customs legislation.

Enabling Supply Chain Visibility and Compliance Through Voluntary Information Sharing with Customs: a Case Study of the Global Quality Traceability System in China Customs

Xin Zhou, Yao-Hua Tan and Boriana Rukanova

Abstract

The promotion of digital customs and data analytics have led customs administrations to seek to improve their analytics capabilities and exploit data from the trade community. Despite the increased data analysis capabilities of Customs, the data available to them are still limited to the current mandated declaration. If businesses are willing to share additional commercial information with Customs, it will enable them to make a more accurate risk assessment and ensure compliance. As a new form of Customs and business partnership, voluntary information sharing can be a supplementary data source to the mandated declaration and enable Customs to exploit additional commercial information. This study analysed an exploratory case study on the Global Quality Traceability System (GQTS) initiated by China Customs to investigate how voluntary information sharing can be achieved, and to explore the benefits for the participants. This study demonstrated that voluntary information sharing with Customs implemented through a data pipeline enhanced supply chain visibility and ensured compliance. The private companies who shared information contributed to the supply chain visibility and in return benefited from it.

1. Introduction

The development of digital technology and its implementation in international trade has led customs administrations to seek to improve their analytics capabilities with additional data and advance commercial information. Currently, the primary data sources are supply chain actors. Supply chain actors (that is, exporters, importers and carriers) are obligated by law to submit data to customs administrations regarding exports, transits and imports as part of advance cargo information schemes and actual customs declarations. The data held by Customs should be complete, reliable, accurate, detailed, timely and "fit for the use" (Wang & Strong, 1996). However, in reality, because of the fragmentation of supply chain information, Customs only receives partial information regarding the transactions and international movements instead of complete trade data. The main data source available to customs officers is limited to the current mandated customs import and export declaration. If more data were available for customs administrations, different categories of data could be combined and correlated, allowing the identification of trends and patterns in the subjects of control

(that is, cargo, conveyances and people), and the accuracy of data in question could be ascertained and verified (Okazaki, 2017). However, if Customs increases the fields and documents that must be mandatorily submitted, it will inevitably add to the administrative burden of traders, which is contrary to the minimum information necessary principle stated in the Revised Kyoto Convention.[1] Instead of having merely declaration data available, another possible approach is that Customs collaborates with business and encourage companies to share more commercial data voluntarily as a complementary information source to the traditional mandatory declaration. As a new area of Customs to business collaboration, voluntary information sharing underscores the changing role of Customs to align with business partners in information sharing via digital trade infrastructures (Rukanova et al., 2018), such as data pipelines (Hesketh, 2010), to create public value. A data pipeline can be seen as a web-based, seamless digital infrastructure, which links the systems of multiple parties in the international supply chain (Hesketh, 2009; 2010).

Voluntary information sharing differs from the mandated declaration in various aspects, such as the scope, the transmission, the point of time and the provider of information. In the mandated declaration, the law stipulates what should be submitted (the documents required, the field to be filled), how to submit (the interface between business and customs, such as Single Window), when to submit, and who is obliged to submit (the declarant). In comparison, voluntary information sharing has the nature of a public-private data partnership. The business can share data beyond the scope of the mandated declaration, or transfer data via IT means other than the legally required business and Customs interface, or provide the information in advance of the mandated declaration, or add more parties to the supply chain as information providers, such as the exporter.

This collaborative voluntary information sharing emphasises the 'value proposition', which focuses on both profit maximisation for businesses and public policy goal attainment for governments (Koliba et al., 2017). Despite all the perceived benefits for Customs, however, it is challenging to achieve successful voluntary information sharing considering the willingness of the business, the complexity of governance (Rukanova et al., 2020), and more importantly, the commercial interest. Businesses will cooperate with Customs only when voluntary information sharing can bring commercial interest and trade facilitation, like expedited customs clearance of goods at the border. It has been demonstrated that businesses can benefit from information sharing with their commercial supply chain partners (business-to-business, B2B) to achieve supply chain coordination (Lee et al., 1997). However, the commercial interest in launching business-to-government (B2G) voluntary information sharing is not apparent. This is challenging because businesses and Customs may have conflicting goals despite their common interest in supply chain visibility and security. The primary goal of businesses is to increase profits, following laws and regulations, whereas customs play the dual role of a business partner and police officer (Prokop, 2017). Furthermore, the initial setup and transaction costs with authorities should also be considered (Grainger, 2014).

Despite all the challenges, with the growing evidence showing the value of public-private data collaboration, the purpose of this paper is to investigate how voluntary information sharing with Customs is achieved and what the benefits are for all stakeholders. The first part of the question involves two sub-questions: (1) what to share, or the types of data that are shared voluntarily beyond the scope of the mandatory declaration, and (2) how to share, or what are different approaches through which customs platforms connect to the business IT system. To answer the second part of the research question, we will focus on identifying the benefits of the stakeholders involved. With relatively few examples of voluntary information sharing with Customs at a global scale, our analysis is based on an in-depth case study of the Global Quality Traceability System (GQTS) in China, which is mainly used in trade via cross-border e-commerce channels. As a data pipeline, GQTS enables different parties in the global supply chain such as suppliers, retailers, logistics providers, and third-party quality inspection institutions that join the system voluntarily to share information to prove the quality of their product.

The remainder of the paper is structured as follows: in Section 2, the related literature and theoretical background are reviewed. In Section 3, the research methodology is explained. The background of GQTS is described in Section 4. The research questions are answered in Sections 5 and 6. The findings of voluntary information sharing to customs from the case study are discussed in Section 7. We end this paper with conclusions in Section 8.

2. Literature review

2.1 Cross-boundary information sharing

Cross-boundary information sharing with IT is defined as the collaboration or interconnection of different information systems or telecommunication technologies to share data between entities by using a common conceptual schema (Barki & Pinsonnault, 2005). Yang, Zheng, and Pardo (2012) identified boundaries as being hierarchical, departmental, personal, geographical, developmental, procedural or sectorial. Studies have investigated the determinant factors in cross-boundary information sharing. The factors include organisational and managerial, technological, political, and policy (Yang & Maxwell, 2011; Yang & Wu, 2014; Chen & Lee, 2017). Meanwhile, difficulties in information crossing boundaries are also observed, such as different data formats and system incompatibilities (Comfort, 2007), as well as the cost and complexity of implementation (Fawcett et al., 2007). To overcome these difficulties, studies have emphasised the importance of trust and trust-building for cross-boundary information sharing initiatives (Gil-Garcia et al., 2010) as trust can influence the possibility of information sharing and information quality (Li & Lin, 2006).

From a technical perspective, cross-boundary information sharing is supported by various types of inter-organisational systems (IOS), such as B2B, government-to-government (G2G), or G2B. Studies on cross-boundary information sharing are mostly related to public sectors, such as e-Government (Lee et al., 2011; Navarrete et al., 2010). Although studies have shown that transforming B2G information exchange is the next frontier in reducing government spending while improving performance (Bharosa et al., 2013), little attention has been paid to the voluntary interaction between businesses and the government (Susha et al., 2019; Rukanova et al., 2020). One of the main obstacles is that businesses are often reluctant to share information. The willingness of the business is a determinant factor if they are not obligated to share (Fawcett et al., 2007). Therefore, adopting a partnership–data process perspective is suggested to increase partners' willingness to share information (Du et al., 2012).

2.2 Supply chain visibility

Information sharing between supply chain members can coordinate orders and reduce the bullwhip effect (Lee et al., 1997). In the literature, the topic of supply chain visibility has received increasing attention (Ouyang, 2007; Caridi et al., 2014). Supply chain visibility is considered essential to the performance and competitiveness of the supply network (Bartlett et al., 2007; Pradhan & Routroy, 2018). Increased visibility could increase responsiveness (Williams et al., 2013) and benefit logistics operators (Zhang et al., 2011) especially in the context of the global supply chain. However, the challenge of sharing information in the global supply chain increases when customers and suppliers are spread throughout the world (Shore, 2001). Problems with information transparency remain severe in the extended supply chain (Steinfield et al., 2014). It is often the case that one member of a supply chain may not have detailed knowledge of processes in other parts of the chain (Christopher & Lee, 2004). This lack of visibility increases the vulnerability of supply chains to disturbance or disruption. In particular, governments, especially border control agencies, also require supply chain visibility to improve decision-making and enhance supply chain security for governments

involved in policymaking, monitoring, and control of international trade (Kothmann, 2007; Marcel et al., 2007). Researchers have recommended several approaches to increase supply chain visibility with the support of IT infrastructures, such as inter-organisational information systems (IOIS) (Humphreys et al., 2001) and tracking and tracing systems with radio frequency identification (RFID) (Zhou, 2009; Musa et al., 2014).

2.3 Customs–business partnership

Customs–business partnerships are an implementation of cross-sector collaboration (Bryson et al., 2006). As one of the three pillars in the SAFE Framework of Standards to Secure and Facilitate Global Trade (World Customs Organization [WCO], 2021), it is suggested that each customs administration should establish a partnership with the private sector to promote involvement in ensuring the safety and security of the international trade supply chain. To build successful Customs–business partnerships, voluntary engagement is a key desirable factor, which is based on shared interests and goals, mutual trust and respect (WCO, 2015). In current customs and business partnership programs, such as Authorized Economic Operator (AEO) or Customs-Trade Partnership Against Terrorism (C-TPAT), which are the most influential worldwide, a collaborative relationship is established between government and private sectors. For AEO companies, Customs changes from a transaction-based auditing to a system-based auditing approach because the application of advanced IT serves as signalling for the business that they have good internal controls (den Butter et al., 2012).

Data collaboration for the common good has now been recognised as a good opportunity to enable trust and innovation through public-private partnerships (World Economic Forum [WEF], 2019). However, there are relatively few examples of business-Customs information sharing initiatives in the customs domain and limited research on this topic. Voluntary business-Customs information sharing is not currently necessary for AEO or C-TPAT status worldwide. Using observations of an example of business-Customs information sharing based on a pilot project – FloraHolland − Rukanova et al. (2020) built a theoretical framework to understand the governance process, context, factors and benefits related to voluntary information sharing. As data analysis is increasingly used in border management, the Customs and business partnership is expected to expand to data collaboration. Voluntary information sharing with Customs, although promising, has relatively few successful examples reported on a global scale so far. More studies need to be done to investigate how voluntary information sharing with Customs can be achieved and the incentives for all the parties involved.

2.4 Data pipelines and voluntary information sharing

Real-time, accurate data captured upstream and updated as the goods move in the data pipeline (Hesketh, 2009; 2010), which enhances supply chain visibility and reduces the information fragmentation in global trade. Based on the integrated commercial data from the data pipeline, Customs will make a more accurate risk assessment of the shipments. This approach, in which Customs reuses business data from the existing IT infrastructure of businesses for government control purposes, is described as "piggybacking" (Tan et al., 2011). There are various advantages of piggybacking, including access to better quality of business data from the source.

Piggybacking on the existing IT infrastructure of businesses implies that such a data pipeline is driven by business. Therefore, developing and operating a data pipeline on a global scale must be done by the private sector since government have no jurisdictions outside their countries (Klievink et al., 2012). In current data pipeline research, the initiatives for data pipeline development are mostly business-driven, such as the FloraHolland initiative (Rukanova et al., 2017), the OneTouch case (Hu et al., 2016) and the TradeLens platform (Jensen et al., 2019). The scope of information exchange covered by the data pipelines above are from the seller/consignor to the buyer/consignee and the interactions in between include B2B, B2G and G2G (Rukanova et al.,2018).

The interaction with the government system via a data pipeline means that businesses are willing to share more commercial information with the government voluntarily. Therefore, it is critical to identify the economic drivers for the business (Klievink et al., 2012). In the current research, the benefits from such voluntary sharing are mostly identified as enhanced visibility across supply chains (Jensen et al., 2019) and improved efficiency as well as effectiveness (Rukanova et al., 2020). In addition to the voluntary information sharing with Customs, the current research also shows that combining data pipeline capability with Coordinated Border Management (CBM) can bring more benefits for stakeholders. As shown in the FloraHolland initiative, the collaboration of Customs and plant protection organisations was fostered by parallel procedures based on the data pipeline (Rukanova et al., 2017). This indicates the government may play a bigger role in voluntary information sharing in the context of a data pipeline especially in the case of multiple border agencies. If the government leads a data pipeline, will the objectives, the participants and the benefits for the stakeholders differ from these business-driven initiatives? In this study, we will further discuss the role of government and explore the potential public value that could be created with more parties involved besides business and Customs.

3. Research methods

Case study methodology was employed to conduct this exploratory research. This methodology is appropriate when the research goals are to understand 'whys' or 'hows' (Yin, 2003). Accordingly, the present methodology was designed to understand how and why Customs-business collaboration should be implemented because the importance of such collaboration is most recognised in the literature, but the studies on voluntary information sharing with Customs are limited. The present study focused on the GQTS case from Chinese Customs.

Data were collected from interviews, documents and reports. There were a total of 12 interviewees in the study. The interviewees belong to two major groups, customs officers and participants from the private sector. Among the interviewees from China Customs, some customs experts were from the former China Inspection and Quarantine Bureau (CIQ), who had a background in commodity quality inspection. The interviewees from the private sector included importers, a logistics service provider in a bonded warehouse, a trader and the IT provider of GQTS. In this study, data were collected from interviews with customs officers and from documents provided by two regional customs offices, Fuzhou and Guangzhou, where the GQTS was launched. These interviews provided detailed information regarding the background of GQTS, the motivation of Customs, the key business players in the supply chain and the perceived benefits for each party. Second, data were collected from interviews with the companies who participated in the project. These interviewees explained why and how businesses would join these initiatives, which confirmed what the benefits for the business were. Third, a field investigation was conducted in Pingtan Port, a subordinated customs office of Fuzhou, where many cross-border e-commerce companies participating in GQTS are located. This field investigation allowed researchers to witness the whole customs control process of GQTS.

For data analysis, we focused on what data were voluntarily shared, how they were shared and what were the benefits for the stakeholders. First, we analysed the scope of data voluntarily shared and identified what data were beyond the mandated declaration. Second, we investigated the business-government interface and the process of voluntary sharing. Finally, we analysed whether each party had realised the expected benefits after engaging in voluntary data sharing, including the improvement of business in terms of sales growth and customs clearance time, as well as the value for Customs and customers.

4. Case background

The flow of consignments through cross-border e-commerce channels has rapidly grown in the past few years. These consignments are small parcels that together carry various goods from various sources and consignees, and their shipment represents a considerable challenge for border control agencies. Specifically, Customs requires decisive measures to cope with fiscal, safety and security risks that are entailed by goods of, for example, an illicit, restricted, counterfeit or pirated nature. It is crucial for Customs to access timely and accurate information, ideally from the source company.

The GQTS is an IT platform that makes it possible to integrate information from upstream factories, traders, e-commerce platforms, border control agencies and downstream domestic consumers along the cross-border e-commerce supply chain.[2] It was primarily initiated by the China Inspection and Quarantine Bureau (former CIQ) in 2015 in the Nansha area of the Port of Guangzhou,[3] with the aims of (1) ensuring the quality of imported products and (2) combating piracy and counterfeiting through cross-border e-commerce channels. This platform resulted in a significant increase in trade volume in the Nansha area. In 2015, it was awarded 'Best Practical Case of a Free Trade Zone in the Country' by China's Ministry of Commerce. In 2017, the initiative expanded its scope to the parallel import of vehicles[4] and to export purchases in the market[5] because these two types of trade share common features with business-to-consumer (B2C) e-commerce, such as the small trade volume per order and the presence of multiple sources. These features make it difficult for authorities to identify a product's source and verify the product's quality.

In 2018, the jurisdiction of China Customs was expanded to cover entry-exit inspection and quarantine, enabling Customs to make full use of the data in this platform to prevent a wider range of risks. At present, the GQTS is being piloted in many ports under the authority of China Customs − such as the Fuzhou regional customs office.[6] The GQTS went online in Fuzhou through the China (Fujian) International Trade single-window platform in March 2019 and has been in operation since September 2019. By 2019, 413 companies had access to the system and 1,800,000 commodities had been traced in the Fuzhou region.[7] China's leading cross-border e-commerce B2C platforms, such as Tmall,[8] have since joined the system.

At present, Customs uses GQTS to reduce the following risks: (1) infringement of intellectual property rights, which arises from the import and sale of counterfeit goods (especially luxury goods) without the permission of the brand owner; (2) quality, which arises from the unwanted entry of unsafe or substandard products (because China Customs is also responsible for inspection and quarantine, Customs must ensure that imported goods conform to national regulations governing health, safety, and environmental protection); (3) logistics, which arises from fabricated import logistics data − such as those pertaining to the place of origin − or from the mislabelling of domestic goods as imported goods; and (4) fiscal, which arises from understatement of the real price for tax and duty evasion.
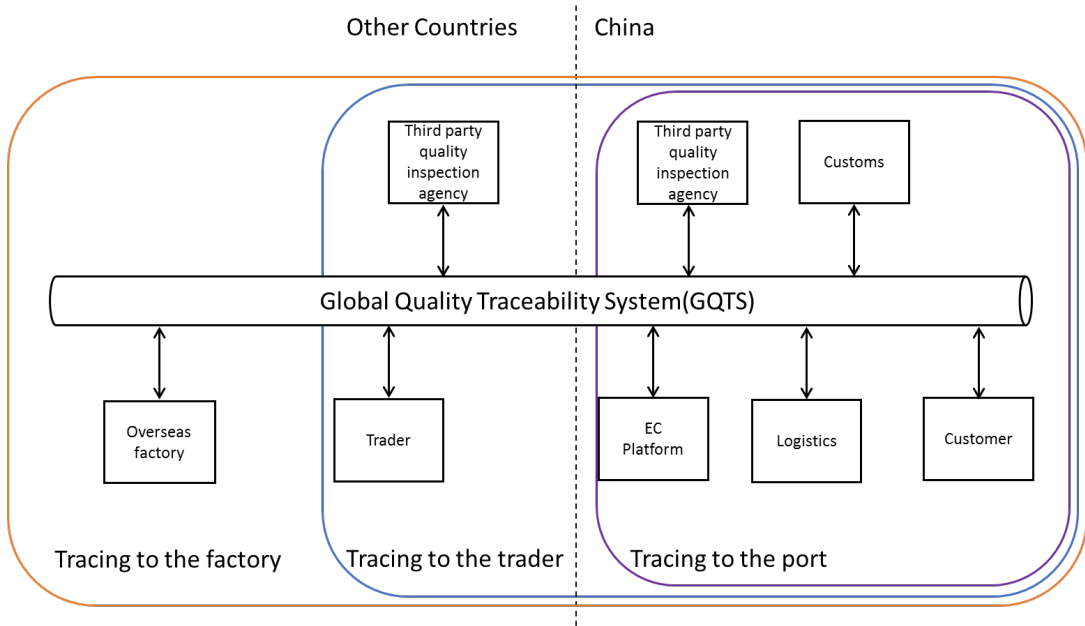
GQTS integrates the data from upstream manufacturers and third-party quality-inspection institutions abroad as well as from traders, e-commerce platforms, domestic logistics providers, border control agencies and consumers. The trader is the one who purchases the goods from multiple sources and exports them to China. For commodity inspection, the importer must submit the inspection certificate, which states that the goods have met the national standards of the importing country. Typically, third-party quality-inspection institutions, which can be domestic or overseas, issue these inspection certificates. The GQTS connects to the corresponding major domestic third-party inspection agency and to some of the third-party inspection agencies abroad who have dual accreditation by the host country and the China National Accreditation Service for Conformity Assessment (CNAS).

GQTS is a typical data pipeline, intending to ensure supply chain visibility for all parties, including the final consumer. The inclusion of the final consumer highlights a special feature of this case, since most of the data pipeline pilots reported in literature focus primarily on providing extra control data for border inspection agencies. In this case, citizens also receive direct benefits from this data in the data pipeline. The system acquires the original information relating to commodity quality from multiple sources − including the manufacturer, trader (distributor), third-party inspection agency, e-commerce platform, logistics provider, border control agencies and the final consumer. All information is shared through the GQTS with all related parties. The GQTS itself does not judge whether the products satisfy the requisite standards but rather ensures supply chain visibility and traceability to guard against counterfeits or substandard products. Specifically, when an offending product is identified, the information in the GQTS can be used to easily identify the parties related to the product. Its traceability can be divided into three levels by the stage the supply chain data source is at:

1. Tracing to the factory. When an upstream factory or brand owner agrees to connect its enterprise resource planning (ERP) system to the GQTS, this connection allows downstream actors to trace the source of production.

2. Tracing to the overseas trader (distributor). If the trader agrees to connect its system to the GQTS, this connection initiates the process of distribution. Therefore, information can be traced to the trader through the GQTS.

3. Tracing to the port. This refers to trade that can be traced at the port level after export or import in China. The information includes the declaration, clearance and local logistics.

Therefore, in the three levels above, details of the content of the traceable information degrades at each level. The data chain of tracing to the factory is the longest and provides complete information, in contrast to the other two. The GQTS can provide different levels of traceability for a given set of participants from various stages in the supply chain. Such a multilevel design provides flexibility for the private sector to join the platform and makes it possible to start small from the port-level information sharing and gradually expand to the upstream supply chain. GQTS architecture is illustrated in Figure 1.

Figure 1: GQTS architecture

Other Countries | China

Third party quality inspection agency

Third party quality inspection agency

Customs

Global Quality Traceability System (GQTS)

Overseas factory

Trader

EC Platform

Logistics

Customer

Tracing to the factory | Tracing to the trader | Tracing to the port

Notably, the GQTS extends the data pipeline to the end of the supply chain (that is, the customer) through QR code functionality. Specifically, each product has a unique QR code that can be used to access the information in the data pipeline. After the products enter free circulation, the final customer can access information on the product pertaining to, for example, origin, quality, logistics and clearance through scanning the QR code label on the product with the GQTS app. Every item has its unique QR code. For example, the Japanese-made diapers of Kao Corporation are very popular in China and there are counterfeited products. Thus, Kao Corporation joined the GQTS in Nansha at the factory level. When their diapers are imported into Nansha Port, customers can scan the QR code of the product or the parcel with their smartphones to access product information. All the information is provided by the different parties in the supply chain and integrated into the GQTS.[9] Another example is Red Seal brown sugar, which originated in New Zealand and was imported from Sydney in Australia to Nansha Port in China. The traceable information pertains to the dates and ports of departure and arrival as well as the commodity quality inspection certificate notarised by GIQCI[10] in Australia, an agency that is also recognised by the Port of Nansha.[11] As a government-driven project, customs authorities and local governments in China made the initial investment in GQTS and maintained it. All actors in the supply chain, including consumers, contribute to information sharing and use the platform free of charge. Business users only bear the cost of connecting their in-house IT systems to the GQTS.

5. How is voluntary information sharing with Customs achieved

5.1 What to share

In China, the mandated declaration submitted to Customs in the case of cross-border e-commerce trade includes order data (from transactions on the e-commerce platform), payment data (from consumer payment records) and logistics data (from domestic delivery to consumers), in addition to declarations and the requisite certificates. Typically, traders abroad gather quality-related information from the

manufacturer or the inspection institutions and provide it to the border control agencies. However, such information is second-hand and may be insufficiently reliable for control purposes. With the information voluntarily shared by all parties to the GQTS, especially from factories and institutions overseas, Customs can integrate the fragmented pieces of information in the supply chain to obtain more detailed and original information that goes beyond the scope of the declaration, which is typically submitted by an intermediate trader in the supply chain. The manufacturer or brand owner voluntarily shares production information, and third-party quality-inspection institutions voluntarily share their inspection information. The voluntarily shared information comes directly from upstream parties and is thus more detailed, complete and accurate. A customs officer from the project group with a background in commodity inspection stated the following:

> If the data were not within the scope of the declaration, we used to have no access to them. With the GQTS, data that are scattered across various stages in the supply chain can be collected… Take factory-level traceability as an example. Actors from the whole supply chain − including the manufacturer, trader, warehouse and overseas inspection agencies − will upload product-related data; the content of such data depends on the actor's function in the supply chain. For example, manufacturers upload data on the production date, production line arrangement, raw materials, as well as the date of packaging and delivery, and inspection agencies upload data on the date and results of the inspection.

To ensure the quality of the information imported into the system, the border control agencies will sample and inspect product quality randomly to confirm the information in the GQTS. If the product quality does not conform to the information provided in the GQTS, the businesses concerned will be penalised accordingly. The third-party inspection institution may be disqualified if it has committed fraud.[9] In addition to being used for border control by Customs, the voluntarily shared information on the product is also accessible to other actors in the supply chain for them to manage the supply chain and ensure compliance.

5.2 How to share

As exemplified in factory-level traceability, the data transfer process in the GQTS is illustrated in Figure 2. Before the goods arrive at port, the relevant parties push the information to the GQTS. Specifically, the manufacturer pushes production information, the trader and logistics providers push logistics information and third-party quality-inspection institutions push inspection information. With such information sent in advance, China Customs performs cross-validation and a preliminary risk assessment in advance. When the products arrive at the port, customs conduct risk profiling. If physical inspection is necessary, the Customs officer can scan a QR code to access information about the product in the GQTS, thus speeding up inspection and release. The clearance notice will then be displayed in the GQTS. After the products are released and enter free circulation, customers and local authorities can use the GQTS apps or WeChat applet[12] to scan the QR code on the product to access tracking information. Should the product be of substandard quality, the customer can lodge a complaint or make an inquiry on the GQTS app or WeChat applets. All customer feedback is sent to government authorities and to supply chain partners. Therefore, the flow of information takes the form of a closed-loop information chain, with two-way information flow from the source to the customers and from the customers to the source. Hence the customer knows that their feedback information will have a negative impact on fraudulent parties, and this will provide an extra incentive for the companies to act compliantly.

Figure 2: Information shared on the GQTS
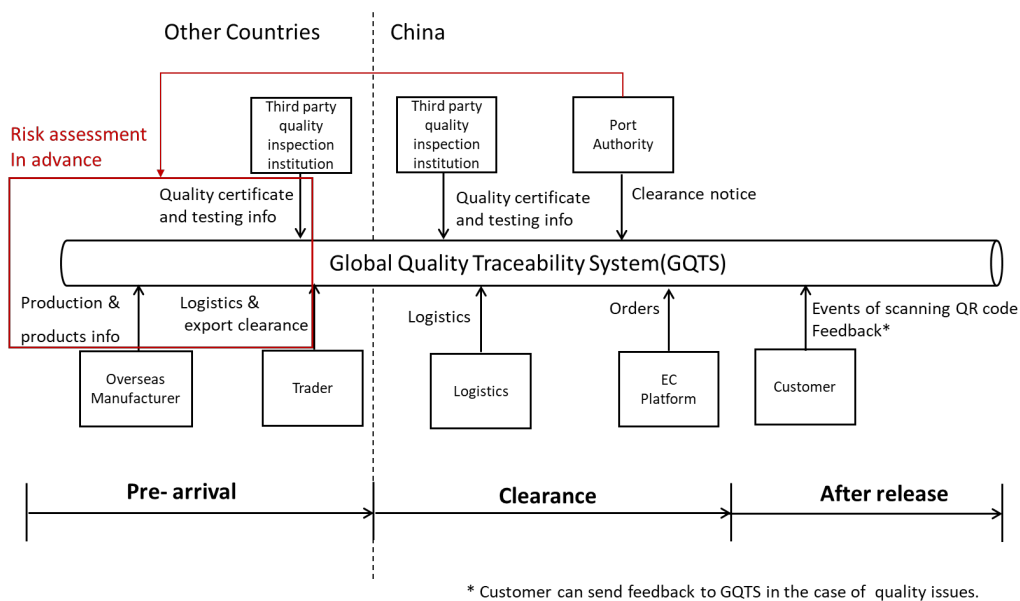
Regarding the interface between business and government, the GQTS is integrated with the in-house ERP systems of users through application program interfaces (API) that are designed for ease of setup and use. A customs officer from the project group with a background in commodities inspection stated the following:

> They connect [to the GQTS] through APIs. It is more convenient. They don't need to fill [the data] in manually. We have prepared several standard interfaces because the IT systems of each company may vary. They may make some slight technical changes to their system…Because many of them have ready-made data and those large enterprises have strong technical teams, it is very convenient for them to connect with us.
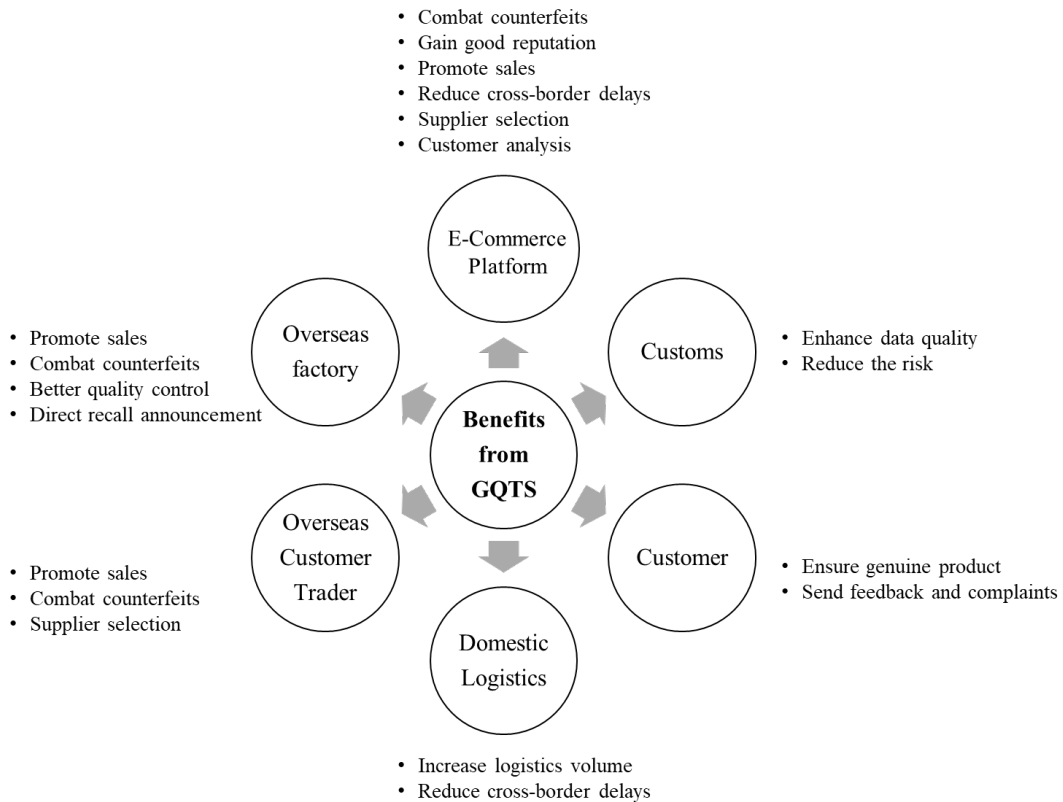
The general manager of Sizhou (a food trading company) recognised this open characteristic, and stated[9] "this system is very open. All qualified notarial, as well as inspection and testing institutions, can connect [to the GQTS] regardless of which country these institutions are located in."

A general manager of a logistics service provider in a bonded warehouse also confirmed that API connection was "affordable and not very complicated."

6. Benefits for all stakeholders

Voluntary information sharing by businesses with Customs in the GQTS reduces information asymmetry and increases supply chain visibility. This benefits government, businesses and consumers yielding a win-win situation that creates public and private value. All participants can benefit from voluntary information sharing, as illustrated in Figure 3.

Figure 3: Benefits for all stakeholders from GQTS

- Combat counterfeits
- Gain good reputation
- Promote sales
- Reduce cross-border delays
- Supplier selection
- Customer analysis

E-Commerce Platform

Overseas factory

- Promote sales
- Combat counterfeits
- Better quality control
- Direct recall announcement

Benefits from GQTS

Customs

- Enhance data quality
- Reduce the risk

Overseas Customer Trader

- Promote sales
- Combat counterfeits
- Supplier selection

Customer

- Ensure genuine product
- Send feedback and complaints

Domestic Logistics

- Increase logistics volume
- Reduce cross-border delays

6.1 Benefits for business

6.1.1 Reducing counterfeits and promoting sales

After goods are released, the quality information, which the business voluntarily shares with Customs, as well as the declaration and clearance information, are all available to the final customers by the GQTS. Therefore, the business can prove their products are genuine, gain the trust of customers and promote sales. All the supply chain parties, directly or indirectly, will benefit from this. For the manufacturer and brand owner, they are burdened by the heavy cost of combating counterfeiting and copyright infringement, so they are willing to use the GQTS to reduce such costs. A customs officer from the project group stated that "a famous brand told us that they spend several hundred million renminbi[13] annually on combating counterfeiting. Joining this [the GQTS] is akin to us being able to furnish a certificate of identification: customers can easily distinguish between genuine and counterfeit goods."

In weeding out counterfeits, e-commerce platforms ensure that only genuine goods are sold, which increases consumer trust. A representative of Funsens, a cross-border e-commerce platform, said that the GQTS has not only protected consumer interests but also helped cross-border e-commerce enterprises gain consumer trust. As the logistics manager of an e-commerce platform stated,[14] "this system builds a channel of trust between e-commerce enterprises and customers. From a consumer's perspective, this system better assures them of the product's safety and quality."

This is also confirmed by a manager of an alcoholic beverage importer. He said, "the most important benefit is that we can transfer the quality information to consumers…In the future, the sales volume of trustworthy companies is sure to rise."

Logistics service providers play an important role in the GQTS and they indirectly benefit from sales increases. Their systems in the bonded warehouse are connected to the GQTS and upload information such as storage information and customs release time. They are also in charge of printing and pasting the QR tags on express packages of the products ordered. The increase in sales of e-commerce platforms will also promote the logistics business, so they are willing to share information and provide such extra services for their client.

6.1.2 Reducing cross-border delays

The participants of GQTS noted the benefits of fewer delays when their goods cross the border after voluntarily sharing more information with Customs due to the improved supply chain visibility. Customs can access the quality-inspection reports of overseas inspection agencies, which simplifies business procedures and reduces the need to wait for quality-inspection results upon the arrival of goods. The information shared voluntarily on the GQTS − pertaining to the product name, manufacturer, country of origin and the quality-inspection certificate issued by third-party inspection institutions − prior to the arrival of goods helps Customs at the port of entry to conduct a risk assessment in advance. This greatly reduces customs clearance time when the goods arrive in the port. According to a customs manager of an alcoholic beverage importer, the customs clearance time was significantly reduced after joining the GQTS, "the customs release time used to be 2–3 days. Most of the time, it was two days. Now, the products will be released on the day of arrival except for when the cargo is randomly sampled for inspection."

Since logistics parties can operate more efficiently with the GQTS, their clients, such as e-commerce platforms, can reduce their inventory costs due to fewer inspections and faster customs clearance.

6.1.3 Improving supply chain management

Information sharing is essential to achieve supply chain coordination and reduce the bullwhip effect, in which the fluctuations of orders increase as one moves upstream in the supply chain. For the GQTS, in return for voluntarily sharing the commercial data, businesses gain access to more supply chain data on the respective platforms; these data come from customs authorities and other businesses, allowing the supply chain to be better coordinated and optimised. Firstly, the traceability of the GQTS can help manufacturers and the brand owner improve their quality control using the information on the production line and production batch. For example, a representative of Lesso Group stated that their supply chain includes overseas factories and distributors. Before joining the platforms, quality control of delivered products was difficult for the headquarters of Lesso Group. With direct global traceability from the platforms, they can now trace a product's origin down to the exact factory and even machine, and they can also identify the materials used for every product sold in the overseas market. Another example is Johnson & Johnson (China). Their e-commerce director stated that the GQTS has helped the company solve its reputation problem among Chinese consumers:[15]

> We want to have regular products enter China. Johnson & Johnson has many factories around the world, so the products in China are sourced from all over the world. With this system, we can trace the origin of imported shipments to ensure that products are highly compliant.

Secondly, manufacturers can use the recall module in the GQTS to contact the end users of a product to be recalled. Manufacturers used to find it difficult to notify customers of a recall of some specific batch of products from the global market. The recall notification module in the GQTS was thus designed to remedy this by sending a recall message to the customer that bought the product. Thirdly, the statistics of scanning events can be reused by the business for commercial purposes. After the products enter

free circulation, the QR code scan events will be recorded by the GQTS if customers scan the code on the products. If the e-commerce platforms can access the aggregated data of scanning events in certain regions, they can perform market analysis and plan sales promotion according to the customer regional distribution data indicated by the scanning events. In sum, the GQTS provides end-to-end traceability across the supply chain with the information channel extending to the final customer. All private-sector entities − including upstream manufacturers, traders or downstream cross-border e-commerce platforms − can use the platform's data to improve their supply chain decision-making, such as that pertaining to quality control, supplier selection or consumer analysis.

6.2 Benefits for the government

The GQTS was driven by border control agencies in China, including Customs and the former CIQ. As a government authority, Customs has aligned goals with business on promoting the growth of trade volume, facilitating trade and ensuring product quality. In addition, voluntary information sharing through the GQTS helps Customs to enhance their data quality and reduce their risk.

6.2.1 Enhancing data quality

With integrated information, the GQTS remedies the problem of information fragmentation in the case of goods that are imported in small quantities − such as those from cross-border e-commerce. These pieces of information constitute proof of the product's authenticity; thus, Customs can better ensure the quality of these goods. The GQTS − in establishing a global data pipeline for cross-border e-commerce throughout the entire supply chain − has successfully integrated data on production, logistics and consumer feedback as well as from quality-inspection reports. Furthermore, customer feedback provides the best verification of a product's quality. The detailed information comes from a wide range of sources along the entire global supply chain. The GQTS has expanded the scope and depth of data at Customs' disposal.

It is important to point out that significant improvement of customs data quality relies on the broad coverage of the tracing system for companies and commodities. Although more and more companies have joined the GQTS, currently the proportion of participants in total is still relatively small due to voluntary sharing rather than compulsory engagement. In addition, more domestic and foreign notarisation institutions and testing institutions still need to be included in the system. The more data providers that join the system, the more significant the improvement of customs data quality, and thus more trade facilitation can be provided to trade.

6.2.2 Reducing the risk

With more information voluntarily shared, Customs makes risk assessment more accurate and reduce the risks of counterfeiting. The QR code-accessible information provided by manufacturers and brand owners indicates a product's quality, which allows non-compliant actors to be expelled from the market, thereby reducing counterfeiting risks. Businesses that voluntarily share their data exhibit a willingness and capacity for compliance, which allows Customs to categorise these businesses as being low risk. These businesses should also have access to incentives and simplified customs clearance procedures, which would allow Customs to concentrate its compliance resources on high-risk entities. Voluntary information sharing is decisive in helping Customs not only reduce but also detect counterfeiting risks. Using the original information in the traceability system, Customs can optimise the establishment of risk indicators and generate rules for risk profiling. Besides counterfeiting risks, Customs can also identify the risk of understating the price by cross-validating a declaration against data in the GQTS, which reflects the product's real transaction price. Also, Customs greatly benefits

from receiving risk-relevant data in advance, so they can also do the risk assessment before the goods arrive in the destination port, Guangzhou. Hence for these goods, customs clearance times in Guangzhou can be significantly reduced, and Customs can offer more trade facilitation to trade.

6.3 Benefits for customers

The GQTS provides a public service to customers. Customers can access detailed information on a product − such as those pertaining to its manufacture, quality-inspection results and import history − by scanning the product's QR code through mobile apps or a WeChat applet. In recent years, it is popular for the retailer to provide a traceability function to the customers. Many companies also provide QR code functionality and tracking information to customers. However, the information comes from company databases, and there is a risk that companies tamper with such data deliberately. In contrast, the GQTS data are validated by Customs and are thus perceived by consumers to be more authentic and reliable. This was confirmed by the manager of an alcoholic beverage importer, who stated "the most important benefit is that we can transfer the quality information to consumers, and it is accurate and reliable since it is from customs."

Moreover, by lodging a complaint via the GQTS apps or WeChat applet, customers can seek redress from government agencies against being sold a defective product. In the case of products recalled by the manufacturer, customers receive timely recall announcements, allowing them to cease using a defective, and potentially dangerous, product.

7. Discussion

7.1 Creating supply chain visibility with data pipelines

The GQTS is a government-driven initiative aimed at encouraging businesses to voluntarily share additional information with Customs. However, information flow is not limited to one-way transfers from B2G. Instead, B2B, G2B, customer-to-business (C2B), and customer-to-government (C2G) information-sharing play indispensable roles in these initiatives. In this case study, the government provided the platform and enabled information exchange among private-sector entities. In doing so, the government achieved its objective of improving risk management by integrating fragmented pieces of information provided by various public-sector entities. In return, these private-sector entities enjoyed the benefits of increased sales, fewer cross-border delays and other supply chain optimisation opportunities. Thus, supply chain visibility served the interests of both the public and private sectors.

As a data pipeline, the GQTS has made visible end-to-end quality-related information pertaining to the global supply chain and highlights the two-way flow of information. In previous studies, the data pipeline has (1) a scope extending from the seller in the country of origin to the buyer in the destination country and (2) the objective of 'getting data from the source' (Hesketh, 2010), both of which imply that information flows from the upstream to downstream of the supply chain. However, the data pipeline in the GQTS is featured by information flow in two directions. Consumer feedback on poor quality products sent to the government (C2G) and businesses (C2B) plays an indispensable role in a closed-loop information chain and thus contributes to public value. Consumer feedback is visible to the supply chain partners as well as to Customs. The transparency of feedback puts pressure on the business to take measures to prevent poor quality goods in the future. This makes it then more attractive for consumers to add feedback information because they know Customs is aware of faulty products.

Traditionally, the relationship that businesses have had with Customs has revolved around compliance, avoiding penalties, and reducing the risk of supply chain disruptions, and business-Customs cooperation has centred on supply chain security and trade facilitation. If Customs has already done its utmost to facilitate trade, further improvements must therefore come from businesses. In the voluntary information sharing initiatives, the sharing of more data with Customs does not simply entail more simplified customs procedures for the participant, and legal requirements limit how far Customs can simplify their procedures. Therefore, as shown in this case study, with the information shared by the supply chain members, Customs has encouraged business participation through underscoring the commercial incentives afforded by improved supply chain visibility − a measure that goes beyond the streamlining of customs clearance, such as the reduction of inspection rates or giving priority to inspection.

7.2 Piggybacking and data reuse

The concept of piggybacking initially referred to Customs piggybacking on the existing IT infrastructure of businesses, doing so to reuse business data for policing compliance. Such piggybacking allows Customs to get access to better quality data from the source (Tan et al., 2011). As indicated in the case study, like the piggybacking and reuse of commercial data by the government for regulatory purposes in business-driven projects, businesses can also piggyback on government platforms to reuse data for commercial use. In the case of the GQTS, Customs uses the data for quality control, risk management and customs clearance of imported products. Businesses also reuse such data to conduct their own customer analytics and quality control, and consumers use such data to protect their interests. The declarations, which are submitted by the business to the government (B2G), are now shared with customers (G2C) for the products they bought, and reused as proof of product quality. Such reuse of data resulted in the formation of data collaboration partnerships among business, government and customers in the GQTS.

7.3 The role of government in voluntary information sharing

The GQTS in this case study is driven by the government and has yielded good results. This finding contrasts with those in the literature stating that data pipelines must be business-driven because of limitations in funding and in IT expertise and the government's inability to reach beyond jurisdictional limits (Klievink et al., 2012). Our analysis showed that the data pipeline can be government driven. Information sharing could be achieved on a voluntary basis instead of a mandated manner. If the government provides the incentive for the actors involved, there is no need for the jurisdiction outside the hosting country.

One advantage of a government-driven platform is to benefit a wider range of private sectors. In the FloraHolland initiative, the government was actively involved in working with the business to identify win-win scenarios. However, the business participants, who were also the main beneficiaries, were limited to a specific supply chain in this business-driven project. As a government-driven initiative, the GQTS was an open platform to meet the common needs of multiple stakeholders. According to interviews, some companies intended to provide traceability to consumers themselves, but the threshold for building a cross-border information communication platform was relatively high, especially for small cross-border e-commerce platforms. The GQTS met the common needs of these companies.

Another advantage of a government-driven platform is to engender trust. The GQTS transfers the information voluntarily shared and declared by business to customers. Its information flows from business-to-government-to-customers (B2G2C). In the view of customers, the data from the

government is more reliable than from business. Therefore, in the GQTS case, the government played a dominant role in coordinating stakeholders and ensuring the reliability of data in G2B and G2C data sharing.

7.4 Coordinated Border Management in the data pipeline

The case study also illustrated the critical role of the Coordinated Border Management (CBM) approach in the data pipeline. The GQTS was initiated by departments of the former CIQ and was further developed after the integration of the former CIQ duties and work force into China Customs in 2018. The GQTS facilitates intra-agency cooperation, which became the priority for China Customs after inspection, and the quarantine bureau was absorbed into China Customs.

The concept of a data pipeline was proposed for the customs field and was highlighted in the WCO's integrated supply chain management (ISCM) guidelines (WCO, 2018). In addition to customs authorities, other border control agencies have also called for seamless information exchange along the supply chain. The combination of data pipeline capabilities with the CBM approach was also exemplified in the FloraHolland case (Rukanova et al., 2017). In that case, the agencies cooperating with customs were the plant protection organisations. In the GQTS, intra-agency cooperation is involved in the commodity quality inspection department. Generally, the risk management of commodity quality inspection is obliged to extend to the upstream factories, which is consistent with the idea of obtaining data from the source in the concept of the data pipeline in the customs domain. Therefore, this example illustrates the value of building a data pipeline through cooperation between Customs and those agencies.

8. Conclusion

This study explored a type of business-government data partnership where businesses voluntarily share information with Customs using a new IT platform provided by the government. The main research question of this paper is *how voluntary information sharing with Customs is achieved* and *what the benefits are for all stakeholders*. This paper conducted a case study on the GQTS, a pilot project that has been recently adopted by several regional customs authorities in China. The first part of the main research question was answered by answering the sub-questions of *what to share and how to share*. We found that the data sources were expanded to include more parties upstream and downstream in the supply chain, and the shared data were more granular than those in the mandated declaration. The three-level traceability made the platform more flexible and scalable for the private sectors to join in. To answer the second part of the main research question, the benefits for all the stakeholders were explored. With these voluntary information sharing initiatives, customs enhanced data quality and improved risk management. Businesses gain consumer trust regarding the quality of their products, which increases sales. Furthermore, businesses benefit from the reduction of the flow of counterfeit goods masquerading as theirs, reduced cross-border clearance time and more optimal supply chain operations. In particular, the GQTS exemplified the extension of the current data pipeline to the final consumer to ensure data integrity throughout the supply chain. This active role of the final consumer is a novel feature that has not yet been described in the previous data pipeline literature. It provides an extra control function to companies in the data pipeline, in addition to the customs and third-party inspection controls. Thus, one could argue that in the GQTS the final consumer enhances the customs control function in the data pipeline. At the same time, this consumer feedback also supports the seller of goods, because it provides valuable marketing information which enables the seller to develop more attractive sales offerings, and hence increase its sales volumes to the consumers. Therefore, data

interaction in data pipelines should not be limited to its B2G and G2G. B2B, G2B, C2B and C2G information sharing also contributed to improving supply chain visibility, thereby generating public value.

As noted in the literature review, to solve the problem of poor data quality in the global supply chain, Hesketh (2010) proposed the concept of a data pipeline. Klievink et al. (2012) investigated this concept with respect to its potential benefits for businesses and government, noting that a data pipeline must be business-driven; however, that study found it challenging to identify the economic drivers for businesses. By contrast, in this study, the government led the data pipeline project. Customs can still obtain data from overseas sources that are outside its jurisdiction through voluntary information sharing mechanisms. This analysis indicated that with the right incentives, upstream companies abroad can be motivated to share their commercial data. Furthermore, the data pipeline concept implemented in the quality control of cross-border e-commerce in the GQTS enriches research on aligning data pipelines with CBM innovation.

Because research on data pipeline innovations has been centred on western countries, this study's investigation of a data pipeline in the Chinese context provides a fresh perspective into voluntary B2G information sharing. Now the system has been extended from one port to several ports in China. However, the initiatives are still regional pilots rather than general nationwide practices, which leads to the limited generalisation of this case study. How these initiatives perform over the long term and whether they can be implemented at a national level require further research. Furthermore, the benefits of voluntary information sharing enjoyed by businesses depend on local customs policies, which vary between countries. Such variability also affects how a program is designed and what the economic drivers are. Thus, follow-up research is needed to study the projects of different types of platforms (driven by business or government) in different countries to obtain a more overall understanding of the incentives for stakeholders.

Acknowledgements

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Notes

1   It is stated that "the customs shall limit the data required in the goods declaration to only such particulars as are deemed necessary for the assessment and collection of duties and taxes, the compilation of statistics, and the application of customs laws" (General Annex Standard 3.12, Revised Kyoto Convention).

2   Guangzhou Nansha New Area Innovation Work Bureau, China (Guangdong) pilot free trade zone. Introduction of global traceability center, November 11, 2019, accessed June 6, 2020. http://ftz.gzns.gov.cn/zwgk/tzgg/201911/W020191111534983840175.docx (in Chinese).

3   Guangzhou Daily. The first cross-border e-commerce commodity quality tracing platform in China for the pilot free trade zone was officially launched in Nansha, June 3, 2015, accessed June 6, 2020. http://ftz.gzns.gov.cn/zwgk/qydt/content/post_3859192.html (in Chinese).

4   The parallel import of vehicles refers to vehicles imported by traders from overseas markets for sale without authorisation of the brand's manufacturer.

5   Market purchase trade pertains to how the trader purchases commodities in the approved market agglomeration area and handles export clearance formalities at the place of purchase. This trade mode is created for 'multi-variety, multi-batch and small batch' foreign trade transactions in the professional market. The maximum value of goods is US$150,000 within one customs declaration.

6   General Administration of China Customs. Fuzhou Customs global quality traceability system has been running for half a year; 207,000 commodities have been traced, October 18, 2019, accessed June 6, 2020. http://www.customs.gov.cn//customs/xwfb34/302425/2647110/index.html (in Chinese).

7   Statistics provided by Fuzhou Customs, China.

8   Tmall is a subsidiary of Alibaba Group.

9   China Business. Scanning a code to check the source of Kao's diapers in the Guangdong Nansha free trade zone, October 25, 2016, accessed June 6, 2020. https://www.yicai.com/news/5142574.html (in Chinese).

10 GIQCI is an independent and nongovernmental third-party notary institution recognised by the ILAC-MRA/CNAS (International Laboratory Accreditation Cooperation-Mutual Recognition Arrangement/China National Accreditation Board for Laboratories).

11 The Port of Nansha extends commodity quality traceability to overseas. November 23, 2015, accessed June 14, 2020. http://ftz.gzns.gov.cn/zwgk/qydt/content/post_3858832.html (in Chinese).

12 WeChat applets, or typically called WeChat Mini Programs, are a kind of app that can be used on WeChat without needing to be downloaded or installed.

13 Nearly a million US dollars.

14 Wang, Pingtan Times, Global Quality Traceability System helps Pingtan build an internationally renowned shopping island without counterfeit goods, October 14, 2019, accessed June 6, 2020, http://www.china-fjftz.gov.cn/article/index/aid/13145.html (in Chinese).

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Section 2

Practitioner Contributions

Humanitarian Customs: Lessons Learned Regarding Customs Response and Role in Supply Chain Continuity During the COVID-19 Pandemic

Shri. T. Samaya Murali, S. Vandana Raj and G. Kanaga Subramanian

Abstract

This paper, presented at the World Customs Organization (WCO) PICARD Web Conference 2020, analyses the challenges faced by Customs and the key stakeholders in the cross-border supply chain due to the onset of the COVID-19 pandemic. It documents the role of Customs in supply chain continuity by recording policy responses, innovative practices and technological solutions to highlight the initiatives taken for faster release of cargo including emergency relief cargo, hassle-free movement of international passengers and reduction in time and cost for the stakeholders in cross-border supply chains. For disseminating the lessons learned as a way of sharing best practices, the paper discusses how Indian Customs has facilitated the movement of goods while applying appropriate risk management; how Customs has enhanced communication, collaboration and cooperation with their Participating Government Agencies and the private sector; and what measures are being taken by Customs to protect their frontline officers. An analysis by the authors of dwell time data across major customs formations in India proved that the policy responses by the Central Board of Indirect Taxes and Customs (CBIC) yielded positive results through reduction in dwell time from May 2020 onwards. The authors have also analysed in detail the importance and effective role of the WCO in supply chain continuity across the globe during the COVID-19 pandemic.

1. Introduction

Historical evidence suggests that Indian Customs, in its best tradition, has always been adept in balancing the twin objectives of trade facilitation and enforcement (Ramdass & Subramanian, 2018). The outbreak of COVID-19 posed twin challenges to the global customs fraternity − facilitating supply chain continuity and ensuring public health precautions. Starting from the readiness of Customs in the event of a humanitarian crisis to concerns over the impact of trade and movement of people across borders during the crisis, there have been numerous lessons learned in the journey of Customs during the pandemic where policy responses, innovative practices and technological solutions have been utilised to reduce the vulnerability of supply chains to external shocks. This paper analyses the lead role played by Indian Customs in maintaining the continuity of supply chains and discusses the lessons learned as a way of sharing best practices.

2. Background

On 30 January 2020, the World Health Organization (WHO) Director-General declared the novel coronavirus outbreak a public health emergency of international concern (PHEIC), WHO's highest level of alarm. On 11 March 2020 the WHO characterised the novel coronavirus disease (COVID-19) as a pandemic. Subsequently, there were several lockdown announcements across the world leading to wide-scale disruption in movement of goods and services.

3. Challenges faced by Customs at the onset of COVID-19

Before analysing the policy responses and strategy to ensure supply chain continuity, it is appropriate to provide an overview of the challenges faced by Customs at the onset of COVID-19 as identifying the problem is a first step in solving it. Accordingly, the authors enumerated the challenges as follows:

1. Health concerns of frontline customs officers working at borders, airports, seaports, Container Freight Stations (CFS) and Inland Container Depots (ICD) during the onset of COVID-19.[1]

2. Due to labour and transport unavailability, loading/unloading and transport of cargo was affected, which led to congestion inside the ports, CFS and ICD.

3. Logistics problems due to lockdown. Due to non-availability of public transport and restriction imposed on the movement of vehicles, free movement of people and goods were affected.

4. Lesser availability of staff due to staffing rationalisation from Customs and stakeholders for effective clearance of cargo.

5. Clearance of critical medical supplies and relief material on time.

6. Due to courier issues, there were delays in getting crucial EXIM (export and import) documents from other countries for clearance purposes. Delays made trade file the bills of entry very late which could attract a heavy late fee from Customs.

7. Heavy detention demurrage was incurred by trade due to non-clearance of the goods from ports. This created additional financial burdens for trade and pressure for the port and customs authorities in reducing congestion.

8. Crowding at customs offices, since much of the work required the physical presence of trade to get hard copies signed by the officers and physical submission of documents like bonds, bank guarantee and licences to Customs as per the rules and regulations prescribed in the act. This created concerns for the spread of COVID-19 among the staff.

9. A lot of time-sensitive legal work such as issuance of adjudication orders and show-cause notices were affected due to lockdown and restrictions.

10. Unscrupulous elements attempting to take advantage of the COVID-19 situation to illegally import/ export restricted goods that are high in demand like gold, medical supplies and medical equipment. Numerous attempts to smuggle contraband like narcotic drugs and psychotropic substances. With minimum staff, controlling smuggling activities also posed a major challenge.

4. Role of Customs in supply chain continuity

Supply chain continuity is very important for businesses to plan and execute work and day-to-day operations in a timely and cost-effective manner. Getting the right product, in the right quantities, in the right condition, delivered to the right place, at the right time and at the right cost (Swamidass, 2000) is essential for business to thrive successfully. Hence, responsive stakeholders in the supply chain and coordination are necessary for supply chain continuity.

Stakeholders in cross-border supply chains include exporters, importers, shipping lines/airlines, terminals, ports, transporters, couriers, Customs and other participating government agencies (PGAs), steamer agents, custom brokers, CFS, ICD and warehouses (United Nations [UN], 2012). Due to the onset of COVID-19, the continuity of supply chains has been affected and the various challenges faced by stakeholders in cross-border supply chains are:

- **Exporters and importers:** The challenge of getting the product delivered due to logistics problems and labour availability; late filing of bills due to late receipt of documents, and consequently late fees for late filing; additional ground rent, detention and demurrage from ports and CFS, reduced cash flow.

- **Shipping lines/airlines:** Higher detention charges; unable to move the containers due to labour and transport. Delay in issuing delivery orders due to staff availability; and increased charges due to flight and ship availability.

- **Ports/terminals/CFS/ICD**: Congestion due to non-removal of containers due to shortage of labour and transport; increase in port charges on containers because of overstay; shipping lines skipping ports due to lack of yard space. Delay in movement of sensitive cargo like temperature-sensitive cargo, explosives stored in high-risk areas, perishable goods with the potential to put public safety and food safety at risk.

- **Transporters:** Non-availability of labour/drivers; travel restrictions imposed by governments; increased procedural issues like getting an e-PASS for movement; non-availability of, for example, shops for food on the road discourages drivers to go ahead with long journeys.

- **Couriers:** Delivery by international couriers affected due to fewer staff, less cargo flights and local transport; domestic courier movement also affected.

- **Warehouses:** Labour, transport, congestion; certain warehouses fall under the containment zone classification.

- **PGAs:** Legal requirements of timely submission of documents delayed due to COVID-19; fewer staff due to non-availability of transport; less frequent application of ICT technologies in some agencies and the consequent requirement for manual intervention; protecting officers from COVID-19.

- **Custom brokers:** Labour, transport, increased procedural issues like getting e-PASSes for movement of their staff, reduced business opportunities due to less import/export.

In this backdrop, various facilitation measures have been taken by Indian Customs to ensure uninterrupted supply of both essential commodities and other commodities while balancing security and public health concerns by applying the risk management principles as advocated by the WCO instruments and standards such as the SAFE Framework of Standards to Secure and Facilitate Global Trade (World Customs Organization [WCO], n.d.-a) and Chapter 5 Annex J of the Revised Kyoto Convention (WCO, 2011). The following analysis on the role of Indian Customs in supply chain continuity is based on the summary of measures taken to combat COVID-19 and to ensure smooth customs clearances by the CBIC.

4.1 Application of ICT technologies

The CBIC has leveraged ICT technologies to serve trade better during these testing times. Indian Customs is a forerunner in the application of ICT technologies (Mishra et al., 2007) and the necessary framework and capability in the case of any contingency already existed. To ensure the smooth supply of essential goods and emergency medical consignments during the lockdown, 24/7 customs clearance was made effective (Central Board of Indirect Taxes and Customs [CBIC], 2020a; CBIC, 2020q). The ICT technologies played an enabling role in this regard and provided the platform for Customs to communicate, collaborate and cooperate with their PGAs and the private sector on a real-time basis.

Connectivity for online clearance is supported by pertinent WCO instruments such as the WCO Single Window Compendium (WCO, n.d.-c) and exists in the Indian Customs Single Window Interface for Facilitating Trade (SWIFT) involving 44 departments/agencies associated with clearances of import and export goods. To ameliorate the problems faced by trade and industry, a new avatar of a single window concept 'a dedicated online single window COVID-19 helpdesk' for EXIM trade was unveiled by the Government of India recognising the urgent need for proactive measures to mitigate the anticipated adverse impact at the onset of the outbreak of the novel coronavirus. Importers/exporters are empowered to intimate a brief description of issues hampering trade or issues affecting speedy clearance by specifying the commodity involved, port of import/export and the relevant ministry/department/agency involved. The issue is then referred to the relevant ministry/department/agency through the single window mechanism for quicker resolution.

To incorporate innovative practices to minimise human interface and maximise social distancing, the CBIC introduced e-delivery of the PDF-based GatePass and Out of Charge copy of the Bill of Entries to custom brokers/importers across India (CBIC, 2020h; CBIC, 2020b).

Further, personal hearings with respect to any proceeding under the Customs Act 1962 were allowed to be conducted by video conferencing mechanisms (CBIC, 2020k); requests and documents from importers/exporters were accepted via email to avoid physical visits and contact between trade and customs officers; and CBIC and zonal Chief Commissioners promptly monitored the situation through video conferences with customs stations and trade to resolve any emerging issues.

4.2 Paperless documentation

Increased focus has been given to electronic documents and deferring submission of physical documents. The fact that the National Portal of Indian Customs, the Indian Customs Electronic Gateway (ICEGATE), on a daily average received 5,800,000 hits with around 50,000 documents submitted online and 12,461 e-payment transactions made, is testimony to the use of the electronic platform during the pandemic. Further 1,647 user grievances were also redressed through the portal.[2]

In addition, the CBIC rolled out Pan-India faceless assessment.[3] Envisioned to be a game-changer, 'Turant Customs', a flagship program of Indian Customs, is an innovative step to tackle the daunting task of processing 12.5 million customs-related documents by balancing facilitation and enforcement, national security and revenue generation. This is a next-generation reform aimed at improving the ease of doing business. Customs has implemented the first two phases of faceless assessment across Chennai, Bengaluru, Mumbai and New Delhi. In addition, the CBIC launched the e-Office, a paperless initiative with a view to ensure efficiency and transparency in tax administration.

4.3 Measures to ease the financial burden to stakeholders

Shipping lines have been asked not to levy detention charges on containers held up for reasons attributable to lockdown measures.[4] All major ports have been directed not to levy penalties, demurrage, charges, fees or rental on any port user (such as traders, shipping lines, concessionaries and licensees) for any delay in berthing, loading/unloading operations or evacuation/arrival of cargo caused due to reasons attributable to lockdown measures.[5,6]

Likewise, customs airports have been asked to waive demurrage charges by 50 per cent by airport operator/cargo terminal operators for the lockdown period.[7] Zonal Customs Chiefs have asked local custodians (ICD and CFS) to exempt demurrage charges during the lockdown period. In addition, to tackle pending refund claims to provide immediate relief and liquidity to business entities and especially Micro, Small and Medium Enterprises (MSMEs) for Brand Rate fixation and consequent disbursal of the claim, a special drive was undertaken by the Customs Zones to dispose of the pendency so that no application received up to 31 May 2020 was pending at the end of the drive on 30 June 2020 (CBIC, 2020f).

4.4 Extension of time limits relating to compliance

The time limit for filing of appeals, furnishing of returns or any other compliance under the Customs Act or Customs Tariff Act, expiring from 20 March 2020 to 29 June 2020, was extended to 30 June 2020.[8] Exemption from the Integrated Goods and Services Tax (IGST)/compensation cess on goods imported against Advance Authorization/Export Promotion Capital Goods Scheme (EPCG) was extended to 30 March 2021 (CBIC, 2020c). To allow duty free import against the existing Export Performance Certificates for the financial year 2019−20, their period of validity was extended to 30 September 2020 (CBIC, 2020m). Time limits for the last date of re-export in Drawback were extended by six months to provide relief from COVID-19 (CBIC, 2020n).

Letters of Intent (LOIs) issued by the CBIC to various promoters for setting up ICDs/CFSs expired during the lockdown period. As a facilitation measure, with the approval of the Inter-Ministerial Committee, the validity of such LOIs were extended to 31 August 2020. To ease the burden of compliance on Authorized Economic Operators (AEOs), the AEO certificates that were expiring between 1 March 2020 and 31 May 2020 were extended to 30 June 2020.

4.5 Relaxation of procedures

To address the difficulties faced due to non-availability of stamp papers during the lockdown period, the requirement of different types of customs bonds was dispensed with. Traders can submit undertakings on plain paper in lieu of bond (CBIC, 2020d). With the subsequent extension of the lockdown period in the wake of the pandemic, and to continue the relief against the difficulties faced due to non-availability of stamp papers during this period, the facility of submitting undertakings on plain paper in lieu of bond was extended to 30 June 2020 (CBIC, 2020i; CBIC, 2020l; CBIC, 2020p). Goods imported under free trade agreements were allowed to be cleared without producing original certificates of origin (CBIC, 2020g). This step goes a long way towards ensuring a trust-based compliance system.

4.6 Emergency clearance of relief cargo and essential commodities

As a relief measure, queue prioritisation of relief consignments used for fighting COVID-19, such as medical equipment, drugs and pharmaceuticals, testing kits and personal protective equipment (PPE), was ensured. Basic customs duty and health cess was exempted from goods such as ventilators, masks, PPE and testing kits, as well as the inputs used in manufacturing these items (CBIC, 2020f). Import clearance of edible oils and food grains was facilitated based on visual examination to avoid delay caused by the analysis report (Food Safety and Standards Authority of India [FSSAI], 2020). However, the risk was balanced by the issue of a final 'No Objection Certificate' on receipt of the analysis report.

The gestures by the Government of India in providing relief measures to other countries battling the pandemic through specific export shipments of critical drugs, pharmaceuticals, testing kits and PPE is well recognised and actively facilitated by Customs at the borders. Some of these shipments are donations from the Government of India. A special mention is made here of the quick facilitation of shipments of essential drugs like hydroxycholoroquine and paracetamol to multiple countries, including on a grant basis.

4.7 On-ground facility for seamless clearance of passengers

Customs contributed to the success of the Vande Bharat Mission[9] by ensuring seamless clearance of thousands of passengers. Customs also facilitated repatriation of stranded nationals of other countries through various ports and airports, helping them with procedures and swift clearances. Meerut Customs Zone and Delhi Customs Zone of Indian Customs set up on-ground facilities at designated places for the smooth processing of Indian citizens who returned from affected countries. Special arrangements were made for clearance of passengers coming from affected countries. Separate channels were created at the airports, port terminals and land customs stations for such passengers.

4.8 Customs-led coordination

Customs operations are declared as an essential service to facilitate seamless cross-border movement of consignments during the lockdown period and nodal officers actively collaborated with concerned ministries/departments/agencies through an online single window COVID-19 helpdesk for ensuring the continuity of supply chains. Mention must be made of the customs-led coordination leading to permission for movement of customs brokers and transporters, and allowing functioning of warehouses across the country during the lockdown period.

Concerns expressed by trade were given top priority and EXIM trade-related responses requiring inter-ministerial coordination were taken up by the CBIC at high level forums such as the Empowered Group of Secretaries looking into COVID-19 related issues. This has resulted in positive outcomes on the concerns expressed by Indian Customs such as quicker availability of labour in ports, issue of passes to customs brokers, and movement and storage of consignments and conveyances. Within the department, the Indian Customs Ease of Doing Business Dashboard (ICEDASH) provided real-time visibility into clearance times helping to analyse the functioning of various customs formations relating to supply chain continuity.

Regarding movement of goods and conveyances, innovative practices were adopted through interdepartmental coordination with police and municipal administrations, especially at the Custom House level. For instance, the Chennai Custom House at the beginning of the lockdown period in March 2020 decided to issue passes mentioning details of vehicles and containers carrying EXIM cargo. They made arrangements with police authorities to permit the movement of customs-cleared cargo and vehicles based on the customs pass.[10] To facilitate trade on the internal taxes front, the CBIC

quickly rolled out remote and secure access to the CBIC-GST application over the internet through Directorate General of Systems and Data Management (DG Systems), which enabled the central GST officers working from home during the lockdown to disburse GST refunds expeditiously to address the important issue of cash flow to the industry, especially to MSMEs.

Further, importers and their agents were better coordinated to clear goods from customs areas to reduce congestion. Special teams were formed to oversee the reduction of congestion in customs-notified areas.

4.9 Ensuring health and safety of frontline officers

Customs offices were assigned a contingency fund to take care of the health and safety of frontline officers; to provide a safe work environment through, for example, PPE and maintenance of hygiene; to render financial assistance to lower-paid officers and to provide community outreach in and around the workplace.

Staggering of office hours and a roster system was introduced to rationalise staffing. A dedicated COVID-19 Task Force was formed to cater for the health and safety of officers.

The government sanctioned an ex gratia financial assistance amounting to INR500,000 for immediate assistance to families of customs officers in case of death of officials/staff attributable to infection by COVID-19 contracted while on duty.

4.10 Additions to existing infrastructure

The CBIC coordinated with the port and airport authorities and other custodians to aid in ensuring that ample space was available for storing EXIM cargo in the customs area. New additions were made to reduce congestion within customs limits. For instance, Gopalpur port was made a notified port for exports to benefit under the Advance Authorization/EPCG Scheme and other export promotion schemes (CBIC, 2020n).

4.11 Local best practices for handling congestion

Innovative practices according to local requirements were taken up at the Custom House level to facilitate trade by faster clearance using the available resources. For example, the efforts to reduce congestion at Chennai port by the swift on-ground action of Indian Customs involved permitting evacuation of import containers to CONCOR ICD, Tondiarpet, by rail, an ad hoc arrangement to handle congestion during the lockdown period. M/s Container Corporation of India Ltd (CONCOR) acted as a service provider in handling containers and supply of rakes for the carriage of containers – with the objective of evacuating containers en masse by rail and facilitating trade and reduced transit time at an economical tariff. Chennai port also coordinated with the terminal operators inside the port in effectively utilising the Extended Gate Common User Facility.[11]

4.12 Contributions to the underprivileged members of the community

Customs offices across India generously contributed to the distribution of food and relief material to the underprivileged members of the community in the lockdown period. Masks and sanitisers were provided to local residents. Food materials and cooked food were distributed daily by custom houses. Preventive medicines suggested by the government were purchased and distributed for the health and safety of the underprivileged members of the community.

5. Lessons learned regarding the response of Customs

Customs all over the word is responsible for controlling and facilitating the import and export of goods and passenger movements and its role is linked to nation building and security. In the contemporary era, the role of Customs has shifted from revenue collection to trade facilitation, apart from enforcing various trade laws and government regulations at the border. Movement of goods and persons necessitates its active involvement at seaports, land ports, airports and land borders.

The first act initiated by many countries as a response to COVID-19 was border control to contain its international spread. Passengers were subjected to screening, quarantine and isolation. The customs officers' response to any new outbreak is significant in controlling its spread. During the severe acute respiratory syndrome (SARS) pandemic of 2003, the A/H1N1 influenza pandemic of 2009 and other major disease outbreaks, customs officers played a significant role in assisting the nation to control the spread of disease.

Due to their frontline role at the border, customs officers are a high-risk occupational group in a pandemic like COVID-19 and are vulnerable to infection. To reduce their vulnerability and in response to the risk all customs officers were provided with safety materials like face masks, sanitisers and PPE kits from December 2019 (the start of the pandemic) to the present. Apart from insisting on maintaining general preventive measures, specific office-related preventive measures continue to be provided for maintaining the proper health of customs officers. Employees aged over 50, pregnant employees and employees who have underlying medical conditions are not given any frontline work requiring direct contact with the public. Office hours, lunch hours and breaks are staggered to rationalise staffing.

For organisational support, a COVID Task force headed by a Joint Commissioner-level officer was formed to assist and counsel staff including officers, contingent staff, security officers and their family members. Arrangements were made with hospitals for treatment of customs staff in case of illness due to COVID-19. Preventive medicines suggested by the government were distributed to all staff as an emergency precaution. All emergency helplines related to COVID-19, details of COVID-19 testing centres, laboratories and the designated hospitals treating COVID-19 patients were compiled and handed to all staff so that in case of urgency they have all the information available to enable them to help and also to guide other citizens.

A roster system is followed. Officers attend the office on alternative days and those remaining are encouraged to work from home. Seating is arranged in such a way that there is sufficient distance between members of staff. Online communication from trade is encouraged and physical meetings and physical handling of files are mostly avoided through the application of ICT technologies and related measures.

While trade facilitation and faster clearances with minimum interference is the immediate need in times of crisis like the COVID-19 pandemic, a holistic system that can identify potential threats like smuggling of prohibited/restricted goods is also necessary. Some unscrupulous elements always try to exploit humanitarian crisis situations and supply chain vulnerabilities to smuggle prohibited/restricted goods, which could have a potential impact on the social and economic condition of the country.

Effective risk management strategies have evolved throughout the years after the implementation of the Indian Customs Electronic Data Interchange (EDI) System (ICES) and has really helped Indian Customs to respond to the challenges and to rise to the occasion to deliver positive results. Non-intrusive methods like scanning of goods and risk profiling based on various risk parameters identified

by the National Risk Management Division, as well as local risk management at an individual port level through Local Risk Manager, have helped in focusing risk-based consignments and in the faster facilitation of other consignments. Contraband goods such as narcotic drugs and psychotropic substances have been seized at seaports, airports and international courier terminals. Goods violating intellectual property rights (IPRs), counterfeit goods, various restricted and prohibited goods were also seized under the Customs Act, 1962 during the COVID-19 period.

At the same time, an Emergency Standard Operating Procedure (SOP) to facilitate faster clearance of essential commodities through ensuring a Right Queue mechanism was urgently required. Lifesaving goods in the event of crisis could be assessed by a separate queuing system as a priority. The EDI System can be suitably modified to capture the Harmonized System of Nomenclature (HSN) details of the relief goods (medicines and medical equipment).

The CBIC sensed the gravity of the pandemic and its likely impact on the global supply chain very early and took several proactive measures to ensure the smooth operation of all customs locations in India, that is, seaports, airports, land customs stations, foreign postoffices and courier terminals, while following social distancing and other health-related guidelines of the government, issued from time to time. With IT framework such as ICEGATE, ICEDASH and e-Sanchit, Customs could respond early to reduce the vulnerability of supply chains and it leveraged technologies to serve the taxpayers during these challenging times.

To promote trade facilitation and the seamless flow of legitimate consignments, monthly meetings of the Customs Clearance Facilitation Committee (CCFC) and the Permanent Trade Facilitation Committee (PTFC) were held online by customs formations for quicker resolution of issues concerning trade. Frequent video conferences were held with MSMEs and various trade organisations like the Federation of Indian Export Organisations (FIEO) to address the problems faced by trade. The meetings were attended by all stakeholders and their suggestions and issues were discussed and resolved in the meeting which resulted in better coordination for cargo movement. Guidelines/ Circulars were issued for clarity in coordination with all the PGAs and private sector participants to fast-track cargo clearance. The Indian Customs Single Window Project that has evolved overtime has contributed immensely to communication, cooperation, collaboration and coordination with PGAs and private sector participants for facilitating the speedy movement of goods while applying appropriate risk management.

Movement of cargo will ensure the continuity of business and will reduce the strain on the national economy. Movement of relief cargo and essential goods, especially food and the medical supply chain, are of paramount importance during a pandemic. The data analysis depicted in Figures 1 and 2 illustrates the reduction in dwell time across the country from May 2020[12] in response to the policy initiatives of Indian Customs that started in March 2020[13] to ensure supply chain continuity. After the initial negative impact due to COVID-19, one can see the signs of improvement in dwell time.

Figure 1: Comparison of dwell time in March, April and May 2020 in six major customs stations in India. (Green channel) (Y axis, dwell time, measured in hours).
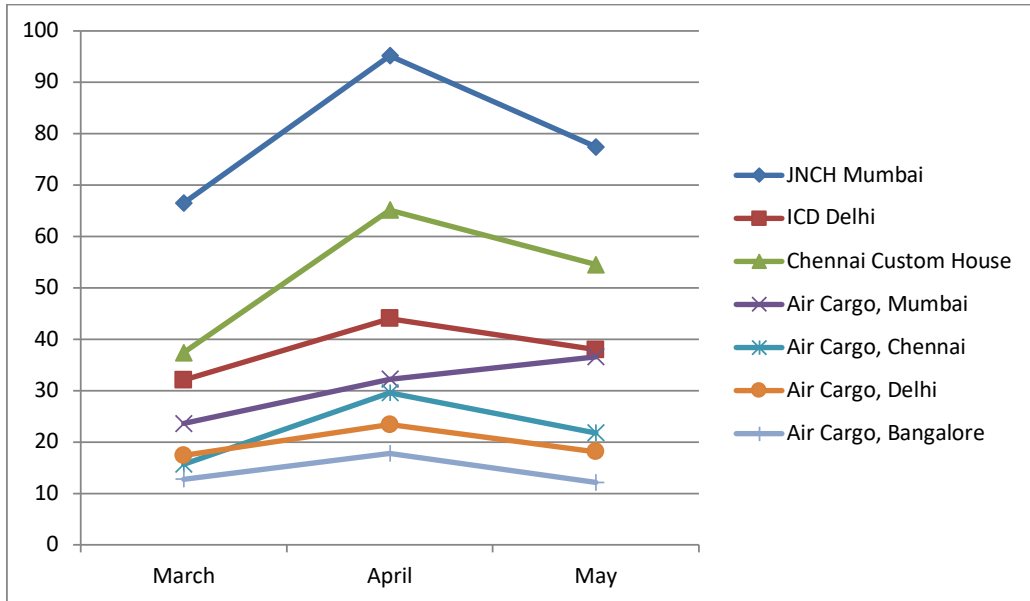
Source: Central Board of Indirect Taxes and Customs (CBIC), Government of India, 2020, Archived Reports. https://www.cbic.gov.in/htdocs-cbec/dwell-time/archived_dwell_time

Figure 2: Comparison of dwell time in March, April and May 2020 in six major customs stations in India. (Red channel) (Y-axis, dwell time, measured in hours).
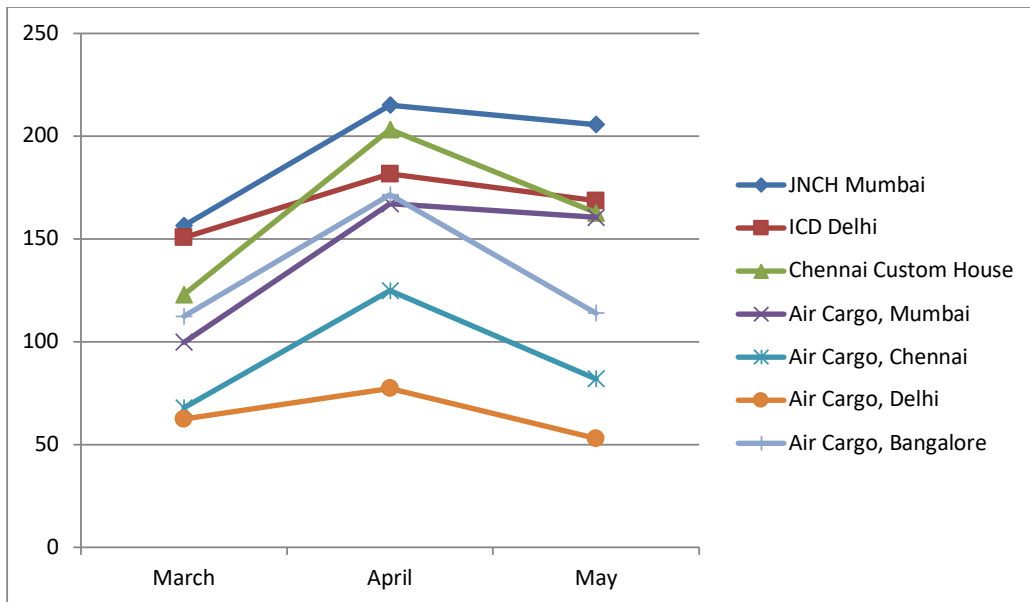
Source: Central Board of Indirect Taxes and Customs (CBIC), Government of India, 2020, Archived Reports. https://www.cbic.gov.in/htdocs-cbec/dwell-time/archived_dwell_time

It is heartening to note that the dwell time in May 2020 reduced drastically from the peak in April 2020[14] and is trending towards pre-COVID levels. It could be concluded that the reduction in time taken by Customs for clearance of goods, *ceteris paribus*, has resulted in the overall reduction of clearance time.

6. The international perspective: efforts taken by the WCO towards global supply chain continuity

The WCO is the sole intergovernmental organisation on customs matters. With 183 member customs administrations, representing 98 per cent of world trade, the role of the WCO is significant in ensuring global trade facilitation (WCO, n.d.-d). During the COVID-19 pandemic, the WCO has undertaken numerous efforts to safeguard the global supply chain by partnering with international organisations (WCO, n.d.-b). These steps have helped to mitigate the overall impact of the pandemic on the socioeconomic conditions of people.

In this regard, the partnership of the WCO with WHO for faster clearance of essential medical supplies and critical response products on priority is significant. The Harmonized System (HS) Classification of those medical supplies deemed critical by WHO was updated. To give this widespread publicity, this updated list of HS classifications was uploaded to the WCO website as well (WCO, 2020e; 2020h).

Further, the WCO partnered with the World Trade Organization (WTO) to facilitate seamless border trade in goods and ensure that there is minimal disruption. Member countries were urged to take targeted, proportional, transparent and non-discriminatory border action, if any (WCO, 2020d). This aided faster global recovery and eased cross-border trade flow substantially.

To enable MSMEs to take advantage of opportunities in the global market and adapt to new post-COVID commercial realities, the WCO contributed to the improved and expanded Global Trade Helpdesk rolled out by the WTO, the International Trade Centre (ITC) and the United Nations Conference on Trade and Development (UNCTAD) (WCO, 2020o).

As the voice of the international customs community, the WCO, in association with the International Maritime Organization (IMO), facilitated smooth cargo movement in a coordinated manner.[15]

In addition, the WCO teamed up with the Universal Postal Union (UPU) owing to the rerouting of postal traffic from the air to surface transportation (road and rail) (WCO, 2020j). The coordination between customs administrations and Designated Postal Operators (DPOs) was of critical importance in safeguarding the global postal supply chain.

Since much of the traffic was routed through roads during the pandemic, the coordination of the WCO and the International Road Transport Union (IRU) gained significance. Various international standards were implemented, like the Convention on the International Transport of Goods under cover of TIR Carnets (UN, 1975). The TIR Convention was implemented to ensure movement of essential goods and personnel with minimum checks and less contact (WCO, 2020f). This helped balance public health concerns with smooth cargo movement.

To facilitate railway transport, the WCO partnered with the Organisation for International Carriage by Rail (OTIF) and the Organisation for Cooperation between Railways (OSJD) to temporarily accept electronic documents and defer submission of paper-based documents to a later date (WCO, 2020l). This was in congruence with the WCO Revised Kyoto Convention (RKC) (WCO, 1999).

Another major role of the WCO is in the field of prevention of cross-border movement of illicit goods during the pandemic. The WCO launched an Intellectual Property Rights (IPR) Customs Enforcement Network Communication Platform (IPR CENcomm Group) for data sharing aimed at prevention

of trafficking of counterfeit medical supplies and fake medicines (WCO, 2020c). Further, in March 2020, the WCO participated in a collaborative enforcement effort named Operation Pangea XIII along with Interpol, Europol, customs administrations, police forces and other law enforcement agencies, which led to the seizure of 37,258 counterfeit medical devices (WCO, 2020a). The Global Regional Intelligence Liaison Office (RILO) Network continued to provide intelligence and operational support to WCO members during the COVID-19 crisis (WCO, 2020b).

The frameworks created in member customs administrations with the help of the WCO helped them in discharging their duties during COVID-19. Detection of a shipment containing around 100 falsely declared COVID-19 test kits by Cambodia's Air Cargo Control Unit in Phnom Penh (WCO, 2020g), established under the framework of the United Nations Office on Drugs & Crime (UNODC)-WCO Container Control Programme (CCP), is a case in point. Further, the UNODC-WCO CCP ensured capacity building to member administrations to ensure supply chain security (WCO, 2020m).

Further, to ensure the urgent and immediate response to cross-border movement of goods, the WCO collaborated with the International Chamber of Commerce (ICC) (WCO, 2020k). This partnership along with other governmental agencies ensured continuity of global supply chains and facilitated trade.

In addition, to deal with disruptive scenarios, the WCO initiated the COVID Project with the support of Japan (WCO, 2020n). A collection of best practices in dealing with such emergency situations along with ensuring business continuity was highlighted.

Finally, various tools and instruments have been promoted by the WCO through its COVID-19-dedicated webpage (WCO, n.d.-b) to strengthen supply chain continuity along with ensuring integrity. These tools include:

• Resolution of the Customs Cooperation Council on the Role of Customs in Natural Disaster Relief (WCO, n.d.-b)

• Guidelines to Chapter 5 of Specific Annex J to the International Convention on the Simplification and Harmonization of Customs Procedures, as amended (WCO RKC) (WCO, n.d.-b)

• Annex B.9 to the Convention on Temporary Admission (Istanbul Convention)

• Istanbul Convention Handbook (WCO, n.d.-b)

• HS Classification reference for COVID-19 medical supplies (WCO, n.d.-b)

• List of national legislation of countries that have adopted temporary export restrictions on certain categories of critical medical supplies in response to COVID-19 (WCO, n.d.-b)

• List of WCO Members' practices in response to the COVID-19 pandemic (WCO, n.d.-b).

7. Conclusion

Due to its inherent interconnected nature, the effective functioning of all the stakeholders in the supply chain is imperative for its continuity and efficiency. Customs is a key stakeholder in the cross-border supply chain; "Borders divide, Customs connects" (WCO Vision Statement). COVID-19 saw the Indian Customs take a sovereign lead role in facilitating the smooth movement of relief consignments, personnel and their possessions and in strengthening supply chains for sustainability of people and prosperity at the same time as applying appropriate risk management.

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Notes

1   The necessity of maintaining motivation levels to keep the pace of ease of doing business is paramount in this time of crisis as the fear factor started affecting the attendance and performance of the Customs staff.

2   Data from CBIC's ICEGATE website, August 2020. https://icegate.gov.in/

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Section 3

Special Report

The Changing Nature of the Harmonized System – One Perspective

Brian Thomas

The Harmonized System (HS) Nomenclature is an international descriptive listing of products and their numerical codes, that has been developed by the Harmonized System Committee (HSC), itself a body that forms part of the World Customs Organization (WCO). The HS Nomenclature forms the basis of customs tariffs for about 95 per cent of the world's countries.

Unlike its predecessor, the Customs Co-operation Council Nomenclature (CCCN), which was largely a static document, the authors of the HS have built into it a system of continual amendment or review. The review process is an essential requirement, as the HS needs to remain up to date with the constant change to world trade patterns, which are the result of either varying product demand or the advancement of product technology. The HS is a product classification nomenclature, therefore it is imperative that its structure – the headings, subheadings and legal notes – keep pace with and reflect international trade and production. Its classification system is of use only if it keeps in step with technological progress.

The authors of the HS envisaged this document as a nomenclature for the overall movement of goods. This contrasted with the CCCN, which was essentially a customs document, largely written by customs officers, for customs purposes – that being to form the basis for national tariff documents. Obviously, the creation of national tariffs has been the prime use of the HS, but other uses were to include it being a document for the collection of statistics, and also as a means of identification of goods for the private/commercial sectors, as goods are transported from origin to destination.

The HS contains six classification rules, referred to in this document as the Interpretative Rules. Rules 1 and 6 relate to classifying goods by their descriptions within the headings and subheadings, together with any relevant legal notes. There are obvious advantages in being able to classify goods as they are so described within headings and subheadings as opposed to having to have recourse to some of the remaining classification rules. Interpretative Rules 2 and 3, in particular, which concern the treatment of goods that are imported in a condition that is not immediately recognisable within the structure of the Nomenclature, can prove difficult as they are open to subjective interpretation.

As such, it is a continual aim of the authors of the HS that as many goods as possible be classified under the directives of Interpretative Rules 1 and 6. It is estimated that over 95 per cent of the HS classifications are so classified.

In an effort to keep pace with change, the HS has a five-year review cycle. The review cycles may look at the Nomenclature as a whole, or they may address certain sectors, or particular areas – for example, a review period may focus on heavy machinery classifications or on computer related equipment.

The review cycle is a very intensive process. It involves detailed submissions and consultations between the HSC, its sub-committees and interested parties outside the WCO, both government and private. Amendments also need to be approved by at least a two-thirds majority of the HSC. At present the HSC has a membership of 159 countries and the European Union (EU). All these members may vote on a particular issue if they so wish. In addition, a further complication may lie with the EU, as it has a membership of some 27 countries. It therefore needs to determine its position between its members before it casts its vote. It all adds up to a time-consuming procedure.

Despite these perceived shortcomings the review process is a major feature of the success of the HS. Since the advent of the Harmonized System, there have been five major reviews to the document.

The initial review in 1996 almost solely related to goods of economic concern, being those that reflected either varying product demand or the advancement of product technology. National tariffs and their duty rates were amended accordingly.

It is suggested that a variance to this attitude occurred with the second review in 2002, when the Third Edition of the HS included changes to specifically include products of an environmental concern. These changes included goods that were endangered species of flora and fauna subject to the Convention on International Trade in Endangered Species. In addition, the changes also included specific categories of waste controlled by the Basel Convention, which gave rise to classifications for industrial waste (heading 38.25) and waste pharmaceuticals (subheading 3006.92) together with several legal notes that defined these terms.

Although changes that reflect either varying product demand or the advancement of product technology still account for most changes, recent reviews have also included changes relating to environmental concerns. The fourth review (Fifth Edition of the HS), which was implemented in 2012, included the provision of separate identification of certain hazardous chemicals and pesticides, and the separate identification of certain ozone-depleting substances that are covered by the Rotterdam Convention and Montreal Protocol, respectively. Further identification of these products, the majority of which are classified within the headings and subheadings of Chapters 28 and 29, was continued in the Sixth Edition of the HS (2017), together with certain products covered by the Chemical Weapons Convention. The Sixth Edition also included separately identifying certain antimalarial products.

Allocating goods of environmental concern their own specific classifications has a number of benefits for the global community. It provides a means of tracking their movement and it provides a platform for subsequent profiling purposes.

The current review, which will result in the Seventh Edition of the HS, will enter into force on and from 1 January 2022. It is anticipated that many customs administrations, and indeed all those of the major trading nations, will have incorporated the amendments into their tariffs, and these documents will also be operative on and from that date.

The HS contains about 5,300 product description codes constituting some 1,240 headings, and subheadings, a number which is not all that different to the first HS document. The latest review contains about 350 sets of amendments. As with previous reviews, not all the amendments will result in additional codes − some will replace current codes, while others relate to the deletions of codes.

As with previous reviews the Seventh Edition of the Nomenclature continues to recognise products that are of environmental and social concern, as well as those that reflect trading patterns and product technology.

Amendments to the Seventh Edition of the Nomenclature include dedicated classification codes for:

- new forms of nicotine-based products

- mixtures containing halogenated derivatives of methane, ethane or propane listed under the Kigali Amendment of the Montreal Protocol

- certain chemicals listed under the Chemical Weapons Convention

- certain hazardous chemicals listed under the Rotterdam Convention

- certain persistent organic pollutants listed under the Stockholm Convention

- placebos and clinical trial kits for medical research

- machines for additive manufacturing

- smartphones

- flat panel display modules

- electrical and electronic waste and scrap

- drones.

Many of these products have accompanying definitions that are set out in the form of legal notes, which will be located within their respective areas.

The above products are examples of the changes that will be introduced on 1 January 2022. Those wishing additional information are urged to visit the Nomenclature and Classification of Goods section, located within the WCO website.

The next review is scheduled for implementation on 1 January 2027. The review period for the Eighth Edition began as soon as WCO Council approved the Seventh Edition, which was in June 2019.

What changes may we see in the near future? One that immediately springs to my mind stems from a tariff course that I tutor. One of the discussion exercises involves possible changes to the HS. A student indicated that in view of the current global crisis, perhaps face masks should be given their own separate identity. At present the student considers the goods are classified within heading 63.07, which is the residual classification for articles of textile fabric. The HSC agrees with this classification. The HSC also considers that if made of paper or cellulose, the masks are classified within heading 48.18. This means that similar goods are classified in different headings if they are made of different materials – not an ideal situation.

Should this be an issue for future HSC consideration, perhaps a satisfactory solution would be to follow the example that it has done with sanitary products and create a separate heading within Chapter 96. This chapter covers an array of largely unrelated miscellaneous manufactured articles including pens, smoking pipes, brushes, combs, stamp pads and tailors' mannequins, and it was considered by the HSC as an appropriate location to insert a heading for these goods. The classification of sanitary products had long been an issue, in that they were classified according to their constituent material, which meant that essentially the same product was classified in different headings. In providing a single heading for these goods, regardless of composition, the HSC created a situation whereby the goods were classified under the directives of Interpretative Rule 1, that is, how they are so described, thereby obviating the need to consider recourse to reliance on material and/or essential character. This may be a solution for face masks, or indeed for PPE generally.

Brian Thomas

Brian Thomas is a consultant with the Centre for Customs and Excise Studies, having joined the Centre in 2004, after a career with Australian Customs spanning 36 years. He has been involved with the Australian Harmonized Tariff since 1983 and his range of experience extends across all fields of tariff development, including policy, drafting, legislation, administration, classification, industry promotion and training. Brian Thomas has designed and delivered both national and international tariff training packages for the Centre at both post and undergraduate level.

Section 4

*Reference
Material*

Guidelines for Contributors

The *World Customs Journal* invites authors to submit papers that relate to all aspects of customs activity, for example, law, policy, economics, administration, information and communications technologies. The Journal has a multi-dimensional focus on customs issues and the following broad categories should be used as a guide.

Research and theory

The suggested length for articles about research and theory is approximately 5,000 words per article. Longer items will be accepted, however, publication of items of 10,000 or more words may be spread over more than one issue of the Journal.

Original research and theoretical papers submitted will be reviewed using a 'double blind' or 'masked' process, that is, the identity of author/s and reviewer/s will not be made known to each other. This process may result in delays in publication, especially where modifications to papers are suggested to the author/s by the reviewer/s. Authors submitting original items that relate to research and theory are asked to include the following details separately from the body of the article:

- title of the paper
- names, positions, organisations, and contact details of each author
- bionotes (no more than 100 words for each author) together with a recent, high resolution, colour photograph for possible publication in the Journal. Please ensure the image is a jpeg with a resolution of 300 dpi.
- an abstract of no more than 100 words for papers up to 5,000 words, or for longer papers, a summary of up to 600 words depending on the length and complexity of the paper.

Please note that previously refereed papers will not be refereed by the *World Customs Journal*.

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These items are generally between 2,000 and 5,000 words per article. Authors of these items are asked to include bionotes (no more than 100 words for each author) together with a recent, high resolution, colour photograph (jpeg with a resolution of 300 dpi) for possible publication in the Journal. The Editorial Board will review articles that relate to practical applications.

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The suggested length is between 350 and 800 words per review. The Editorial Board will review these items submitted for publication.

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Authors of papers previously published should provide full citations of the publication/s in which their paper/s appeared. Where appropriate, authors are asked to obtain permission from the previous publishers to re-publish these items in the *World Customs Journal*, which will acknowledge the source/s. Copies of permissions obtained should accompany the article submitted for publication in the *World Customs Journal*.

Authors intending to offer their papers for publication elsewhere—in English and/or another language—are asked to advise the Editor-in-Chief of the names of those publications.

Where necessary and appropriate, and to ensure consistency in style, the editors will make any necessary changes in items submitted and accepted for publication, except where those items have been refereed and published elsewhere. Guidance on the editors' approach to style and referencing is available on the Journal's website.

Letters to the Editor

We invite Letters to the Editor that address items previously published in the Journal as well as topics related to all aspects of customs activity. Authors of letters are asked to include their name and address (or a pseudonym) for publication in the Journal. As well, authors are asked to provide full contact details so that, should the need arise, the Editor-in-Chief can contact them.

All items should be submitted in Microsoft Word or RTF, as email attachments, to the Editor-in-Chief:
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Editorial Board

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Professor Aydin Aliyev is a Colonel General of Customs Service (Rtd) and former Chairman of the State Customs Committee of the Republic of Azerbaijan. He is a graduate in Law from Azerbaijan State University, and author of educational and scientific articles and books on customs matters which have been published in several countries. His contributions to the development of customs administrations and for strengthening customs cooperation have been recognised by the World Customs Organization, the Federal Customs Service of the Russian Federation, the Republic of Hungary and by customs administrations of several other countries. In 2010, Prof. Aliyev was awarded the title of 'Honoured Lawyer of the Republic of Azerbaijan' by Presidential Decree. In 2014, he was admitted as an Honorary Fellow of the International Network of Customs Universities for his contribution to raising the academic standing of the customs profession.

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