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Dedication:

This edition is dedicated to the memory of Elaine Eccleston, our inaugural principal editor, without whose support and dedication the publication of this Journal would not have been possible.

Editorial



In the last edition of the Journal I focused on the interminable Brexit debate that is dominating UK politics. I was hoping to be able to comment on the outcome of those deliberations in the current issue, but here we are only two weeks away from the proclaimed date of the UK's departure from the EU with no resolution in sight.

The way in which this matter has been and continues to be managed at the political level is reprehensible given the international trading community's fundamental requirement for regulatory clarity and certainty. Regrettably, this basic prerequisite for prudent commercial decision-making is currently unavailable to UK traders and those with whom they do business.

The operating climate in which such traders currently find themselves is akin to opening the daily newspaper, not for the weather forecast, but to see what regulatory preconditions, duty rates and other non-tariff barriers they are likely to be facing in the coming days and weeks. At present, such predictions are purely speculative. Such a situation is untenable given that investment in international trade is a long-term proposition, and one which requires judicious forward planning. Knowledge of regulatory policy and procedure is fundamental to the success of such ventures, but unfortunately the continuing political impasse prevents this.

One could say that this situation is merely a reflection of the sorry state of UK politics, but it is much more than that. It is reflective of an underlying ignorance of the complexity of customs regulation. When Brexit was first mooted, the potential implications of customs rules and procedures were given little thought, and it was assumed that such matters could easily be dealt with. Similarly, the intricate warp and weft of the customs union and single market were never fully understood, and even today the practical implications of unpicking these arrangements are being downplayed.

It is the land border between the UK and the Republic of Ireland that has emerged as Brexit's most challenging conundrum and forced politicians to accept the fact that, if and when the UK and EU become separate customs territories, a border will be created. No doubt a Goldilocks solution will ultimately be found to the soft and hard border debate which has ensued, but the fact remains that enforcement of laws relating to trade between two customs territories cannot be achieved in the absence of effective border controls of some description.

In this edition's Special Report, we present an insightful article by Gareth Lewis in which he examines the extent to which technology may be used to achieve an effectively controlled 'soft' border.

The Editorial Board joins the rest of the trading community in following the Brexit drama with keen interest.

A handwritten signature in blue ink, appearing to read 'D. Widdowson', with a stylized flourish at the end.

David Widdowson
Editor-in-Chief



Section 1

Academic Contributions

Excise tax reforms across ASEAN since the start of its Economic Community

Rob Preece

Abstract

In the lead up to the commencement of the ASEAN Economic Community (AEC), Preece (2018) highlighted a number of significant differences in the excise tax policies of the 10 ASEAN member countries,¹ and the potential impacts of these as well as proposing mechanisms to better coordinate excise tax policies. With the AEC entering its fourth year, the author has reviewed all changes to excise tax policies across the region to determine what the priorities for member countries are, and how these priorities are addressed, and whether these reforms are better aligning excise policy across ASEAN.

Introduction

Since the formation of the AEC on 31 December 2015, all member countries have made changes to their excise tax systems, and whilst many of these have been simple rate rises to certain products, there have also been a number of significant reforms made by several member countries to their excise tax policies. Some members have also attempted excise tax changes, particularly for sweetened non-alcoholic beverages, which have been rejected by their parliaments, and it is also important to reflect on these policies. After the first three years of closer economic integration, it is timely to look at these changes to excise policy and consider issues such as whether there have been changes to priorities, and whether such reforms are moving excise tax policies of member countries closer together or further apart.

This paper will initially provide a summary of all changes to excise tax systems across ASEAN since the start of AEC, followed by some analysis of those reforms of significance, such as new products becoming subject to excise taxation, updating the tax base, and restructuring excisable items. This analysis will be conducted in the context of not only whether the excise tax policies of the 10 member countries are beginning to better align, but whether reforms are also aligning around what are considered appropriate excise tax policy principles.

The most recent ‘mapping’ of the excise taxation policies was Preece (2018, pp. 65–92) who captured the goods and services, tax bases and tax rates of all excisable items across ASEAN. The mapping is structured around categories of goods and services. These categories included alcohol, tobacco, automobiles, motorcycles, fuels and non-alcoholic beverages, which are subject to excise in all or most ASEAN countries. The remaining categories of goods and services were then categorised as luxury items, environmentally harmful, nightclubs, and gambling and communications. As part of this study, this mapping has been updated to include all changes to excise tax policy across ASEAN and reflects member countries’ excise tax systems as they stand on the 31 January 2019.

Following the remapping of excise taxation policy across ASEAN, Table 1 below was produced and contains a high level of the nature and extent of changes to excise tax policy by each member country. In the case of Brunei, Malaysia, the Philippines and Thailand, major excise reforms have been announced since the AEC commenced and, as such, a more detailed look at each of these has been included in Annexes A, B C and D to this paper.

Table 1: Summary of excise tax changes in ASEAN since the start of the AEC

Country	Changes	Notes
Brunei	<ul style="list-style-type: none"> • Addition of health-related goods to excise • Addition of environmental goods to excise • Adjustment for loss of customs tariff under AFTA • Increased rates for luxury goods (e.g. jewels, games, furs) • Doubling of rates on all alcohol and tobacco • Cars: reduced rate <2,000cc & increased rate >3,000cc 	See Annex A
Cambodia²	<ul style="list-style-type: none"> • Beer excise rate increase by 20% • Other alcohol excise rate increase by 75% • Cigarette excise rate increase by 33% 	From 1 April 2016
Indonesia³	<ul style="list-style-type: none"> • Two tobacco rates increases • New product: e-cigarette liquid 	In 2016 & 2017 Set at 57%
Laos PDR⁴	<ul style="list-style-type: none"> • Alcohol excise restructured to beer; other liquor <20%; and other liquor >20% a/v • Rate increase for all alcohol (60–80%), tobacco (50%), fuel (8–49%) and entertainment services (double) 	From 1 July 2018
Malaysia	<ul style="list-style-type: none"> • Alcohol excise rates increase and become full specific • New sweetened beverage excise MYR0.4/L in 2019 	From 1 April 2016 See Annex B
Myanmar	<ul style="list-style-type: none"> • Adjustment to price tiers to bring in specific rates to higher priced spirits • Introduce specific rates to cigars • Introduce price tier based specific rates for wine • Remove diamonds and emeralds from excise tax 	<i>Ad valorem</i> rate now starts for products >K26,000 per L K0.50 per stick Similar to spirits
Philippines	<ul style="list-style-type: none"> • 4% annual increases for alcohol and tobacco • Tax Reform for Acceleration and Inclusion (TRAIN): <ul style="list-style-type: none"> • New sweetened beverage excise • Restructure automobile excise • Road map of fuel excise increases 	Republic Act 10351 See Annex C
Singapore	<ul style="list-style-type: none"> • Tobacco increase by 10% 	2018 Budget
Thailand	<ul style="list-style-type: none"> • Consolidation of all excise law into single Act • <i>Ad valorem</i> tax base now suggested retail price • Simplification of alcohol excise tax system • Restructure of sweetened beverage excise 	See Annex D
Vietnam	<ul style="list-style-type: none"> • Rate increases: <ul style="list-style-type: none"> • 1 January 2016 – beer, liquor, tobacco and gambling; • 1 January 2017 – beer; • 1 January 2018 – beer, liquor and tobacco • 1 January 2016 – auto excise restructure, and tax base now manufacturer/importer selling price⁵ 	‘5-year plan’ 2016–2020 of rate increases Auto excise move to engine size

From Table 1, alcohol taxes rose in every country except Singapore, which has not increased alcohol excise since 2014. Likewise, all countries except Malaysia increased tobacco taxes, again the last tobacco tax increase in that country was 2014. It is also worth noting that Cambodia and Malaysia have not had any excise rate increases on either alcohol or tobacco since April 2016, and that excise rate rises in the Philippines and Vietnam were set out in legislation passed in 2012 and 2014, respectively, and so known well in advance of the AEC.

Another product category that was the subject of active excise reform was automobiles. There was a complete restructuring of those taxes in the Philippines, Thailand and Vietnam, while some tax rate adjustments were made in Brunei for both smaller and larger engine vehicles, leaving vehicles with an engine size between 2,000 and 3,000 cubic centimetres (cc) unchanged.

Also active across the region were policy changes around sugar-sweetened beverages. For these types of products, new excise taxes were introduced in Brunei, Malaysia and the Philippines, while a major restructure of sweetened-beverage taxes was made in Thailand. The extent of these various automobile and sweetened-beverage excise reforms warrants further analysis as they seem to indicate certain trend in excise taxation emerging in the region.

The remainder of this paper, therefore, will examine some of these emerging trends under the context of reforms based on addressing aspects of harm to ‘health’ and the ‘environment’ as policy objectives.

Health: Reforms to sugar-sweetened beverages

The reforms to the taxing of these types of drinks include the introduction of an excise in Brunei Darussalam, Malaysia and the Philippines, although the tax will not commence in Malaysia until 1 April 2019. This brings the number of ASEAN member countries taxing sugary drinks to seven (out of 10). However, it should be noted that Indonesia and Vietnam attempted to introduce a new excise tax on sweetened beverages without success (Preece, 2018, pp. 103–104), which would have come into effect in this period if the laws were passed. Also noteworthy is that the Ministries of Finance of both countries have kept pursuing the policy, with Vietnam announcing a new proposal in 2017 for at least a new 10 per cent excise tax starting in 2019 (Nguyen, 2017), and Indonesia introducing new customs tariffs in 2015 that apply to imports of beverages.⁷ The remaining member, Singapore, has now begun a review process on sugar intake with public consultations underway for options that include a tax on sugar-sweetened beverages (Ministry of Health, 2019), meaning these sweetened beverages have become a focus in the region.

In addition to new member countries introducing or discussing sugar-sweetened beverage taxes, Thailand has both expanded the range of sweetened beverages that will be subject to excise and restructured the tax, with a component of the rate being based on actual sugar content. This will see Brunei, Malaysia and Thailand taxing sweetened drinks based on sugar content, whilst the Philippines will apply excise based on the source of the sugar. Cambodia, Laos PDR and Myanmar continue to tax such drinks on their value. A summary of the taxation of sugar sweetened beverages is outlined in Table 2 below.

Table 2: Sweetened beverage excise policy across ASEAN members

Country	Sugar content	Tax per litre (USD) or ad valorem rate
Brunei	<ul style="list-style-type: none"> • 6 grams per 100 millilitres • > 7 grams per 100 millilitres (Soy milk based only) 	\$0.30 \$0.30
Cambodia	<ul style="list-style-type: none"> • Not based on sugar content 	10%
Indonesia	<ul style="list-style-type: none"> • <i>Attempted to add to Excise law in 2012 (rejected by Commission XI) and 2015 (rejected in 2016 Budget)</i> • <i>New customs tariffs: beverages 220210–220902</i> • <i>New customs tariffs: beverages 22029030–22029090</i> 	\$0.22 (Proposed) 10% 20%
Laos PDR¹⁴	<ul style="list-style-type: none"> • Not based on sugar content 	5%
Malaysia	<ul style="list-style-type: none"> • From 1 April 2019: <ul style="list-style-type: none"> • 5 grams per 100 millilitres • > 12 grams per 100 millilitres (fruit/vegetable juice) 	\$0.10 \$0.10
Myanmar	<ul style="list-style-type: none"> • Not based on sugar content 	5%
Philippines	<ul style="list-style-type: none"> • Use natural sugars or artificial sweeteners • Use high fructose corn syrup • Use coconut sap sugar or non-caloric sweetener 	\$0.12 \$0.24 \$0.00
Singapore	<ul style="list-style-type: none"> • <i>Review and public consultation by Ministry of Health</i> 	N/A
Thailand	<ul style="list-style-type: none"> • 6–8 grams per 100 millilitres • 8–10 grams per 100 millilitres • 10–14 grams per 100 millilitres • >14gm grams per 100 millilitres 	\$0.003 + 14% \$0.009 + 14% \$0.015 + 14% \$0.031 + 14%
Vietnam	<ul style="list-style-type: none"> • <i>National Assembly Economic Affairs Committee Resolution 56/NQ-CP 2014 rejects proposal</i> • <i>New proposed announced 15 August 2017</i> 	10% (Proposed)

An excise tax based on sugar content rather than value is also the recommended approach of the World Health Organisation (WHO). The WHO (2016, p. 19) provides two options, depending on the capabilities of the national tax agency concerned. It suggests an excise rate based on sugar content is best practice but this option requires that the tax agency has the capability to ensure compliance, whereas the other option could be a tax levied on the volume of product, such as an excise rate set at 'per litre' and could be adopted in developing economies where the tax agency may not have the skills and resources to administer a more complex rate. Where possible, a country should avoid *ad valorem* of value-based excises as they are more easily manipulated by manufacturers.

The principle is for the excise tax to increase the price of the sweetened beverage to reduce consumption of sugars to ranges that organisations such as the WHO believe reduce associated health risks. As at 2017, sugar intake from just sweetened beverages across ASEAN members was put between 10 per cent of all sugar intake in Indonesia, up to 25 per cent in the Philippines (Salleh, 2018). The WHO (2015, p. 16) now recommends a reduction in sugar intake in the entire population, not to a prescribed amount per day, but rather that intake of sugar be less than 10 per cent of total daily energy intake, and that 'free sugars', which are 'added sugars' such as sweetened beverages, be less than 5 per cent of total daily energy intake. This policy also means that, in addition to reduced levels of sugar, there is also a positive consequence of higher percentages of nutrition in a diet.

For this principle to work effectively, consumers also need to be sensitive to the price increases that are likely to occur as manufacturers 'pass through' the additional tax cost. This price sensitivity can be measured and is known as the 'price elasticity', where a fall in consumption at a rate greater than the price increase means the product is 'price elastic' and the effect of the excise tax on reducing consumption is therefore greatest. Alternatively, where consumption falls to a lower rate than the price rise itself, these products are known as 'price inelastic' and, while consumption may not fall to the extent desired, such products are seen as good tax revenue sources. In terms of price elasticity studies in ASEAN, there is little in the literature at present; however, Preece (2012, p. 66; 2013 pp. 29–31) found that, globally, price elasticities for sweetened sodas range markedly from -0.15 to -1.90 , with Thailand estimated by industry to be around -1.2 to -1.3 . This means that, for Thailand, a 10 per cent increase in prices results in a fall in consumption by 12–13 per cent.

With the growth in significance of sweetened beverage excises across ASEAN, the issue of whether the region needs to look at developing and implementing regionally based guidelines to members on such excises should be raised. In this case, ASEAN should be looking to the health of its community population. It should avoid loop holes and possible distortions in the non-alcohol beverage markets, where excise tax structures create opportunities for low cost/high sugar content drinks to circulate across the region. A starting principle could be that using sugar content as a basis for classification will mean that increased sugar content will result in higher consumer pricing.

Interestingly, Brunei Darussalam also introduced an excise on 'sugar and cocoa products' at a rate of 3 per cent (Ministry of Finance, 2017). While not based on sugar content, this new tax shows that there is recognition in this policy that beverages are not the only source of sugars in a diet. Of note (and a policy which may be worth noting), the same Duty Order introducing sugar-based excise taxes also introduced a new tax on monosodium glutamate (MSG) at a rate of 30 per cent.

Health: Reforms to tobacco excises

Since the start of the AEC, eight of the 10 member countries have increased excise tax for tobacco products, with only Cambodia and Malaysia not raising rates. The extent of these rates rises were found to be quite varied and are outlined in Table 3 below.

Table 3: Outline of tobacco excise tax changes since the AEC

Country	Tobacco Excise Rate Change	Notes
Brunei	<ul style="list-style-type: none"> Effective 100% increase in rates New product: e-cigarette liquid set at 100% 	Excise (Duty Order) 2017
Cambodia	<ul style="list-style-type: none"> Effective 33% increase in rates 	Anukret 92/ 2016
Indonesia	<ul style="list-style-type: none"> Effective 23% increase (from two increases) Effective 39% increase (from two increases) New product: e-cigarette liquid set at 57% Reduction to 18 classification tiers (from 1/1/16) 	Based on SKM I (highest retail cost) Based on SKM II (lowest retail cost) 146/PMK.010/2017 198/PMK.010/2015
Laos PDR	<ul style="list-style-type: none"> Effective 50% increase in rates 	0169/TD 2018
Malaysia	<ul style="list-style-type: none"> No increase 	Last increase in 2014
Myanmar	<ul style="list-style-type: none"> Effective 100% increase (bottom end) Effective 50% decrease (top end) Introduce specific rates to cigars 	Reflects a reduction in the number of price-based tiers Union Tax Law 2018/19
Philippines	<ul style="list-style-type: none"> Effective 67% increase (bottom end) Effective 20% increase (top end) Removal of price-based tiers and cessation of hand-made versus machine made tax rate differentials 	Act 10963 (in addition to previous increases under Act 10351)
Singapore	<ul style="list-style-type: none"> Effective 10% increase 	2018 Budget
Thailand	<ul style="list-style-type: none"> Restructure of tobacco excise into two-tier cigarette Above THB 60 per pack retail Up to THB 60 per pack retail Introduce mixed <i>ad valorem</i> + specific rate Effective 10–50% increase dependent on retail price of product (NB some high value products 16% decrease) 8 	Excise Tax Act BE 2560
Vietnam	<ul style="list-style-type: none"> Effective 7.1% increase (from two increases) 	Law 106/2016/QH13

Table 3 highlights not just the extent of tobacco excise rate rises, but also shows the results of important restructuring of tobacco taxes across the region designed to simplify and bring equity into the taxation of tobacco. Complex structures have been identified by Preece (2018, pp. 69–70) that were likely to have been designed to support certain local industry sectors and ensure a range of affordable cigarettes were available in the market.

Neither of these policy positions are sustainable and they have seen the tobacco tax systems of Indonesia, the Philippines, Myanmar and Thailand transitioning to more simplified systems where tobacco is taxed on its harm, irrespective of factors such as support of domestic production, traditional production, or regressivity from taxing a product the same irrespective of its value. However, as part of its restructuring, Thailand has included a ‘mixed’ specific tax rate and one based on an *ad valorem* rate, and further for a transition period, included two excise tax tiers for cigarettes based on retail pricing and rate differentials will apply for those cigarettes retailing up to, and to those above THB60 per pack.

Thus, these policy transitions away from *ad valorem* rate taxes to specific rate excises, in conjunction with various effective rate rises, can be seen as a positive trend across the region in terms of health-based outcomes.

Health: Developments in alcohol excise taxation

Also related to health is the taxation of alcoholic beverages. Since the start of the AEC, seven member countries have applied an excise rate increase to all categories of alcoholic beverage, while one (Malaysia) limited its excise rate increase to just beer. Indonesia and Singapore are the only members not to make any increases: Indonesia last raised excise rates in January 2014,⁹ while Singapore’s last rate rise was part of its 2014 Budget.

Beyond simple rate rises, there were also other restructures. Laos PDR has reclassified non-beer alcoholic beverages of a strength up to 15 per cent alcohol by volume (a/v) to now be of a strength up to 20 per cent a/v. This brings the structure into line with both Indonesia and Vietnam, where alcohol strength is used for product classification, with a 20 per cent a/v as a benchmark. In the Philippines, separate classifications for beer that are retailing up to and over Peso 50.60 per litre have been removed so that all beer irrespective of value pays the same excise tax rate.¹⁰

Use of specific rates, which is seen by the WHO (2010, p.16) as the most appropriate approach to alcohol taxation, has been expanded in the region with Myanmar now applying specific rates to distilled spirits and wine, albeit product classification for excise being based on its value.¹¹ Only beer remains taxed on an *ad valorem* basis, with the exception of wines valued in excess of K29,000 per litre or distilled spirits valued in excess of K26,000 per litre. This approach of increasing specific tax rates applying to higher pricing categories and with *ad valorem* rates used for high-end brands, seeking to retain a degree of progressivity in the alcohol tax system. With this reform in Myanmar, it is only Cambodia, Laos PDR and Vietnam with fully *ad valorem* alcohol excise tax systems.

However, the most comprehensive alcohol excise reform in the region was undertaken by Thailand. In summary, Thailand:

- introduced a simple ‘per litre of alcohol’ rate, which replaced a complex system that required taxpayers to undertake a calculation on a ‘per litre’ and ‘per litre of alcohol’ basis and then select the calculation that delivered the higher amount
- removed a ‘high alcohol content surcharge’ for each product category
- changed the tax base of the *ad valorem* component of the excise from ‘last wholesale price’ to ‘suggested retail price’.

- The effect of these changes is a greater simplicity and certainty being introduced once the taxpayer has agreed with the Excise Department on the cost structure up to the retail level that will be the basis of the *ad valorem* component calculation. It is also argued, as in the Philippines, where ‘retail price’ is the basis for distilled spirits excise, that a greater level of transparency exists, given that retail prices are highly visible to all parties.

Environment: Automotive excise addressing emissions

The most significant reform in this area is that of Thailand, as outlined above, in its restructure to classify automobiles for excise tax purposes by the level of CO₂ emissions, rather than the more common approach of classification by engine displacement. Figure 1 outlines this new approach, where the key aspects include the four tiers of emission levels (where excise tax rates increase with increasing emissions) and further discounted rates applied if the vehicle uses E85 fuel¹² or natural gas, or is a hybrid using an electric charge for power as well as petroleum fuel. The structure does, however, exclude those passenger vehicles with engine sizes exceeding 3,000 cubic centimetres (cc) and pickup trucks greater than 3,250 cc, although pickup trucks continues to enjoy substantial rate discounts over passenger cars.

Table 4: Excise rates for automobiles

Thailand excise tariff: Automobiles				
Passenger cars	Rate			
<100g/km CO ₂	10%	*50%		1. E10/E20/E85/NGV N/a
101–150g/km CO ₂	30%	*50%		2. E85/NGV <3,000cc 25%, Hybrid <3,000cc 20%
151–200g/km CO ₂	35%	*50%		3. E85/NGV <3,000cc 30%, Hybrid <3,000cc 25%
>200g/km CO ₂	40%	*50%		4. E85/NGV <3,000cc 35%, hybrid <3,000cc 30%
Pickup				
<200g/km CO ₂			3.18%	25% if pax pickup
>200 g/km CO ₂			5.18%	30% if pax pickup
>3,250cc			50.00%	

Source: Thai Excise Department and author.

The emissions-based structure of Table 4 is set to extend to motorcycles, possibly as early as 2019 (Chantanusornsiri, 2018), who also notes that the 2016 reforms to automobile excise have not had a marked impact on retail prices and expects the same for motorcycles.

In addition to Thailand, Vietnam also introduced a ‘road map’ of reforms to automobile excise tax that are clearly targeting environmental objectives. The following measures took effect on 1 January 2016:¹³

- Rate cuts were made to smaller engine vehicles where those vehicles with engine sizes below 1,000 cc fell from 45 per cent to 25 per cent; 1,000–1,500 cc fell from 45 per cent to 30 per cent; and those with engine sizes over 1,500 cc, but less than 2,000 cc rates were cut from 45 per cent to 40 per cent
- Rates increased for larger engine vehicles, with vehicles of an engine size 2,000–3,000 cc moving from 50 per cent to 60 per cent and others moving from 60 per cent to 75 per cent; however, these tax-rate increases were phased in over three years and came into full effect on 1 January 2018
- Where any of these vehicles above run on a clean burning alternate fuel (except bio fuels), then 70 per cent of the prescribed applies, and where a such a renewable is the fuel source, then 50 per cent of the prescribed rate applies
- Electric cars have an excise tax rate of 25 per cent (except for electric pickup trucks and busses that will pay 10% excise, and electric mini-busses that will pay at 15%).

Environment: Other reforms

Other environmental-based excise reforms were noted, namely Brunei Darussalam, which introduced an excise tax of 3 per cent on plastic products to ‘support the efforts of the Department of Environment, Parks and Recreation in reducing the amount of plastic waste (Ministry of Finance, 2017). Similarly, a new excise tax of 5 per cent was placed on ‘rubber products’. However, there have been what appears now to be two failed attempts by the Ministry of Finance in Indonesia for an IDR 200-per-bag excise on plastic bags (Gokken, 2018). The measure has been opposed by both plastic manufacturers and the Department of Industry on the grounds of economic impact, despite Finance Ministry studies believing the new excise would reduce plastic waste by 30 per cent by 2025 and generate annual additional excise revenue of IDR 500 billion (Jakarta Post, 2018).

Conclusion

It would appear that excise tax policies of the ASEAN member countries are moving closer together in terms of products subject to excise taxation and, in some cases, the tax base that is applied to those products. In addition, particularly in relation to alcoholic beverages, sweetened beverages and automobiles, there are signs of movement towards more appropriate tax bases in relation to the product being taxed. In these cases, the tax bases used are becoming more closely aligned with the behaviour or harm that is being addressed. There is still some way to go in terms of attaining a more comprehensive and more formalised coordination approach, but it must be highlighted that excise tax policies across the region can be more appropriately described as ‘converging’ rather than ‘diverging’, which must be seen as a positive for the region.

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Notes

- 1 ASEAN comprises Brunei Darussalam, Cambodia, Indonesia, Laos PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand & Vietnam.
- 2 Anukret 192 on Adjustment Customs Duty and Excise Tax (2016) & GDT Notification 4227
- 3 See Finance Minister Regulations 198/PMK.010/2015 & 146/PMK.010/2017 (which includes e-cigarettes)
- 4 Regulation No. 0169/TD 2018 which also includes rate rises for 2020
- 5 Law No 106/2016/QH13 includes changes to tax base to be manufacturer/import selling price provided it is not to an affiliated customer
- 6 Law No. 70/2014/QH13 Amendments to some articles of the Law on Special Excise Duty
- 7 See Regulation 132/PMK.010/2015 customs tariff of 10% for all non-alcoholic beverages except RTDs at 20%
- 8 TTM Report of 2017 see pages 13-15
- 9 See Finance Minister Regulation 207/PMK101/2013 of 31 December 2013
- 10 See Section 143, Title VI of the Tax Code of the Philippines.
- 11 See Union Tax Law 2018-19
- 12 E85 is a blend of fuel containing 85% ethanol
- 13 Law 108/2015/ND-CP
- 14 See Item 113, Schedule 3 of the Commercial Tax which the author considers akin to an excise tax

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Annex A

Brunei Darussalam

Effective from 1 April 2017, amendments to both customs and excise duty orders were made to reflect a number of government policies. In an accompanying press release, the new customs and excise duties were announced to give effect to the ASEAN Free Trade Agreement (AFTA) by removing import duties and, where needed, to then capture those goods on which duties were sought by inserting them into the excise tax system (Ministry of Finance, 2017). However, in some cases those goods identified as ‘encouraging the development of the private sector’ or ‘alleviating the cost of living for certain groups’, the duty rates when incorporated within the excise tax system were given lower duty rates, for example machinery or car parts, which were reduced from 20 per cent to 5 per cent. Other goods, such as electrical appliances, watches and tools, were given the same excise rate as had applied as a customs duty, whilst other more luxurious products, such as video games, mobile phones, jewellery and perfume, were given tax rate rises when transferred.

The other key policy announced in the press release relates to the ‘enhancing of safety of society’ through both the Ministry of Health’s *Towards a Healthy Society* initiative and the Department of Environment, Parks and Recreation program to ‘encourage recycling and reduce pollution’. In this regard, new excise items (sugar-based beverages, MSG, cocoa and vape juice for e-cigarettes) were introduced in the Excise orders to improve health while, at the same time, doubling the existing excise on alcohol and tobacco. In terms of the environment, new excise taxes were introduced on a range of plastic and rubber goods.

Annex B

Malaysia

Malaysia finished 2018 with a major tax reform, or ‘tax reform rewind’. The Goods Services Tax (GST) introduced in 2015 to replace Sales Tax and Service Tax, has been repealed and the former Sales Tax and Services Tax have been reintroduced and commenced 1 September 2018. The rates for excisable goods are 10 per cent, up from 6 per cent as levied under the former GST with no seeming resultant adjustment in excise to offset price changes. Interestingly, there continues to be no excise levied on fuel products; however, the newly reintroduced sales tax will levy that tax on fuels on a specific-rate basis, rather than an *ad valorem* basis, which is how excise taxes are generally applied.

Prior to the GST repeal, *Excise Duty Order 2017* came into effect on 1 April 2017, with a range of excise taxes on alcoholic beverages worthy of note. For beer and wine, the former tax base of ‘per litre’ was amended to align with distilled spirits as a ‘per litre of alcohol’ (LAL) basis, better reflecting the externalities of consumption (WHO, 2010, p. 16). Further, a potential loop hole has been closed in which bulk high-strength spirits, which paid excise at MYR 60 per LAL rather than the MYR 150 per LAL for packaged spirits.

However, a significant reform to excise will come into effect on 1 April 2019 with the implementation of a MYR 0.4 per litre ‘sugar tax’ on non-alcoholic beverages that contain more than five grams of sugar or sugar-based sweetener per 100 millilitres (ml), or fruit and vegetable juice containing more than 12 grams per 100 ml. The measure will be implemented by an addition of these new items to the existing Excise Duty Orders (Treasury, 2018, p. 22).

Annex C

The Philippines

In 2017, the Philippines Congress passed *Republic Act No. 10963*, known as the Tax Reform for Acceleration and Inclusion (TRAIN). TRAIN is a comprehensive reform covering many aspects of the National Internal Revenue Code (NIRC) of the Philippines, with significant reforms being made to Title VI ‘Excise Tax on Certain Goods’.

These reforms set out a road map, through to 2023, of excise tax rate increases for alcohol and tobacco products, with four per cent increases to the 2023 rates every year after commencing 1 January 2024. Streamlining of beer and cigarette excises structures continue from the 2012 reforms, with beer now having a single excise rate irrespective of value, and cigarettes having a single excise rate irrespective of whether they are made by hand or by machine. The main reforms, however, are to fuel, automobiles and non-alcoholic beverages.

The TRAIN reform will see the raising of tax rates on hydrocarbon fuels for the first time since 1997, which, due to these rates not rising, inflation has cost the Philippines budget some P140 billion (Department of Finance, 2017). The three main fuel types of diesel, gasoline and LPG will also be subject to a road map of rate increases through to 2020 and the new fuel excise regime under TRAIN is outlined in Table 1 below. The increased rates of fuel excise are to be accompanied in the law by compliance measures to address the increased risk of tax evasion and include the introduction of a ‘fuel marker’ scheme in which chemicals are added to duty paid fuel to distinguish it from non-duty paid fuels in the market, and this is expected to commence in 2019 (Padin, 2018).

Table 1: Philippines ‘road map’ for fuel excise increases – Pesos per litre

Fuel Type	2018	2019	2020
Diesel	2.5	4.6	6
Gasoline	7	9	10
LPG	1	2	3
Other:			
Avgas	4		
Kerosene	3		
Naptha	7		
Lubricant oil	8		
Ashphalt	8 (per kg)		
Parafin wax	8		
Petcoke	2.5		

Source: Author, Department of Finance.

In relation to automobile excise, TRAIN somewhat restructures the tax regime from a ‘marginal rate’ system based on a vehicles value, to a ‘flatter’ or more simplified banded structure, again based on a vehicles value rates with increasing *ad valorem* rates. The changes are summarised in Table 2 below. In addition, the highest excise rate of 50 per cent will apply to vehicles valued over four million pesos, up from two million pesos, where value will continue to be the Net Manufacturer’s or Importers Selling Price (NMISP).

The restructure is expected to raise additional revenue from lesser valued vehicles, and likely reduces excise taxes on more luxury cars (Adrian, 2018). However, the government has argued that, overall, the TRAIN package with its cuts to personal income tax, any rises to prices in the lower of the car market have been off-set (Department of Finance, 2017).

From an environmental perspective, hybrid vehicles, defined as being powered by electric energy in combination with gasoline or diesel, will have their effective excise rate halved and those purely electric powered vehicles will be exempt from excise tax.

Table 2: Philippines reform of automobile excise from 2018

NMISP	Old Rate	NMISP	New Rate
< P600,000	2%	< P600,000	4%
P600,000–1,100,000	2%	P1,000,000–2,000,000	10%
P1,100,000–2,100,000	P112,000 + 40% of that > P1,100,000	P2,000,000–4,000,000	20%
> P2,100,000	P512,000 + 60% of that > P2,100,000	> P4,000,000	50%

Source: Author, Department of Finance.

The final TRAIN reform of significance in terms of excise taxation is that of a new tax that is applied to ‘sweetened beverages’. From 1 January 1 2018 there have been three categories of sweetened beverages subject to excise for the first time as follows:

- Using purely caloric sweeteners (natural sugars) and purely non-caloric sweeteners (artificial sweeteners) or a mix of caloric and non-caloric sweeteners – P6 per litre
- Using purely high fructose corn syrup or in combination with any caloric or non-caloric sweetener – P12 per litre
- Using purely coconut sap sugar and purely steviol glycosides (non-caloric sweetener) – Exempt

The basis for this reform is explained as being a move to address the ‘worsening numbers of cases of diabetes and obesity’ by ‘curbing consumption of sugar-sweetened beverages’ (Department of Finance, 2017). In terms of structuring the new excise, the department has based the term ‘beverage’ on the definitions as set out by the Food and Drug Administration (FDA) so as to capture ‘liquids, powders, and concentrates’ and adopted for the law and regulations, the following foods categories as set out in the *Codex Alimentarius Food Category Descriptors*, also used by the FDA:

- sweetened juice drinks
- sweetened tea
- all carbonated beverages
- flavoured water
- energy and sports drinks
- other powdered drinks not classified as milk, juice, tea and coffee
- cereal and grain beverages
- other non-alcoholic beverages that contain added sugar.

Similarly, coconut sap sugar is required to meet the specifications of the Bureau of Agricultural and Fisheries Standard 76:2010 ICS 67.180 to be eligible for tax exemption.

Thus, the Philippines now joins Malaysia and Brunei Darussalam in introducing a new excise on sugar sweetened non-alcoholic beverages in the past two years.

Annex D

Thailand

Thailand has perhaps undertaken the most comprehensive reform of excise taxation with the passage of the *Excise Act BE 2560 (2017)*, which has codified all of Thailand's former seven excise-related Acts into a single piece of law. This provides consistency across the taxation of those excisable goods and services, as well as simplifying the oversight of excise law.

A key reform of note was that of transforming the tax base for all *ad valorem* excise goods, and the *ad valorem* component of those 'mixed' rates, changing from an ex-factory sales value (or cost insurance freight + Import tariffs for like imports), to one of a suggested retail price (SRP). The exception to this is alcoholic beverages which have had the *ad valorem* component of their excise rate based upon the last wholesale selling price since 2012.

The SRP is calculated by reference to the regulations and requires excise payers to self-assess a value based on a 'production cost' plus an 'administration cost' plus a 'standard profit', all net of the VAT, and must not be below the selling price to customers. Such valuations can be approved by the Excise Department with rules providing for methods to confirm valuation.

The new Excise Act has also restructured alcohol taxes. Whilst a mixed *ad valorem* and specific-rate approach remains, the former specific rate was an option of a 'per litre' or 'per LAL' tax base, whichever delivered the higher amount, has been replaced with a simple 'per LAL' rate. An additional 'high strength levy' applying to beers greater than seven per cent alcohol by volume (ABV), wine greater than 15 per cent ABV and spirits greater than 45 per cent ABV has been scrapped, becoming redundant with a pure 'per LAL' rate in place. Thus, certain complexities have been removed from the taxation of alcohol.

Also restructured was the excise applying to non-alcoholic beverages. From the start of the new law, such beverages began paying excise on a mixed *ad valorem* and specific-rate basis, with the specific-rate component aligning with sugar content. Mineral and soda waters without added sugar will continue to be subject to excise at a rate of 14 per cent of SRP; however, other beverage categories (sweetened sodas and sweetened juices and drinks) have been split into bands based on content measured per 100 ml. Products with less than six grams per 100ml will only pay an *ad valorem* rate, but those above will then incur an additional specific rate that increases as the sugar content increases. The industry and consumers have been given until 2023 until the full policy is implemented, with a road map created in the regulations that sees rates rising every two years, while at the same time the maximum sugar content that attracts the highest tax rate is lessened (Chantanusornsiri, 2017).

However, it also needs to be noted that the passage of the *Excise Act BE 2560* followed only 15 months from the significant restructure of the automobile excise taxes, which essentially had commenced on the first day of the AEC. These automobiles excise reforms, approved by the Cabinet in 2012, move classification for excise tax purposes to be based on CO₂ emissions rather than engine size, and providing further discounted excise tax rates when clean burning energy sources are used as fuel (FIA, 2015). Thus, the objective of the reforms is to both promote the development of technology within vehicles that reduce emissions without impacting performance, and encourage further development of cleaner alternate fuel sources.

The concept of European export controls on technology transfers: Risks and strategies for international companies

Philip Haellmigk

Abstract

As foreign economies, especially China, seek to acquire European technology, and digital communication has become an integral part of the business world, technology transfers by European companies are becoming increasingly popular. However, technology transfers to third countries are subject to a rather complex European export control law regime. This article provides an overview of how, and to what extent, European export laws control technology transfers, and shows which risk points European companies should consider in their daily export business.

Introduction

Technology transfer is increasingly coming under close observation in the context of European export controls. There are three reasons for this: first, foreign economies, in particular China, purchase know-how in Europe for manufacturing the product instead of the product itself. Newly industrialised and emerging countries have a strategic interest in acquiring technology to reduce their dependence of traditional industrialised countries. Second, business is becoming more and more digital: every company uses digital media for its internal communication or communication with its clients via emails or the installation of servers for electronic access from abroad. Further, in international projects, electronic exchange of information between business partners is a key factor of business cooperation. Third, certain sensitive countries and organisations continue to seek to obtain weapons of mass destruction. For example, Iran, North Korea, Syria or Pakistan are seeking to obtain sensitive information to develop such programs or to maintain their weapon arsenal. It goes without saying that European companies are rarely approached by direct means, as this approach would be unsuccessful. Instead, these countries undertake their proliferation efforts more covertly: they enter into technology transfer agreements that may appear to have no association with weapon acquisition.

Against this background, companies based in Europe should know the content and scope of European export control laws on technology transfers to identify potential risk points of their export business. Understanding how export controls regulate technology transfer is crucial for addressing this issue in the companies' internal export control compliance programs and thus avoiding, or at least minimising, the risk of export control violations.

This article provides an overview of how European export controls define technology transfer and illustrates when and how business transactions involving technology must be considered technology transfers that are subject to European export control laws. Further, it shows the risk points companies should consider with respect to the exchange of technology.

Concept of technology transfer under European export controls

From the European export control point of view, technology transfer (i.e. the transfer of technical know-how), can occur in two ways. First, it takes place by the export of the technology instead of the good based on the technology (category 1). Here, the question arises, whether this kind of export—as opposed to the export of a good—includes any particularities that must be considered. Second, a technology transfer is carried out via technical assistance (category 2). Under European export controls, technical assistance is an export control concept that is different from the export of technology. Therefore, how and when technical assistance, including the transfer of technology, and which export control restrictions apply to this specific kind of technology transfer, must be analysed.

One must also examine the relationship between these two categories. Which category must be checked first? Is there any order of review? Or is it necessary to check both categories? The companies' internal export control program must provide clear answers to these questions.

Category 1: Technology transfer by export of technology

Which technology is subject to export controls?

European export controls define technology as specific information necessary for the development, production or use of goods. If such information is to be transferred abroad, either in a printed manner or by electronic means (email, fax, phone) this transfer is an export that is subject to export control laws. This applies irrespective of whether goods have previously been exported where their production was based on this technology. The fact that the technology is contained in the goods and thus has been already exported through the goods is irrelevant. The export of technology is a separate export activity; the question of export control restrictions apply to this activity must be reviewed.

This means that a technology export—similar to the export of a good—is regulated by four control criteria: the technology itself, the intended end use, the destination country and the customer.

Therefore, the main control steps are as follows:

- *Does the technology to be exchanged have a European export control classification number?* In the EU, goods and technology with classification numbers are listed in the EU dual-use list (Annex 1 of the Council Regulation (EC) No 428/2009 of 5 May 2009 setting up a Community regime for the control of exports, transfer, brokering and transit of dual-use items and the national military list of the EU member states).¹
- *Does the exporter have knowledge of a sensitive end-use of the technology by the customer?* According to European export controls, sensitive end-use includes mass destruction weapons use and military end-use in an embargoed country. National export control laws can include further sensitive end-use. For example, in Germany, an end-use is also sensitive if used with respect to civil nuclear facilities in certain sensitive countries.²
- *Do specific export control law restrictions apply due to embargo regulations against the destination country?* To date, there are 32 country embargoes, including Iran, Russia, North Korea and Syria.
- *Is the customer (or their business partners) listed on EU sanctions lists that prohibit making available any economic resources to the sanctioned parties?* The EU has established various sanction lists either relating to an embargoed country (such as Iran, Russia, Syria) or relating to terrorist organisations (such as Al Qaeda, Hamas, Tigers of Tamil).

Licence exceptions

These control steps correlate with the control steps for the export of goods. However, with respect to the classification of technology as sensitive technology (dual-use or military), there are various particularities.

As a general rule, technology with an export control classification number is subject to an export licence. However, there are certain exceptions to this principle: technology, even with an export control classification number, is exempt from licence requirements if it is:

- Technology that is not required for the development, production or use of goods under control (this exception does not apply to nuclear technology). Required technology refers to only that portion of technology that is peculiarly responsible for achieving or extending the controlled performance levels, characteristics or functions.³
- Technology that is the minimum necessary for the installation, operation, maintenance, checking or repair of those goods that are not controlled or whose export has been authorised. This means that the export licence issued for the good's export covers the following technology export. However, this exception applies only if the technology export is made shortly after the export of the good (Haellmigk, 2017, p. 429). Further, the end user must be identical.
- Technology that is in the public domain. This is the case if the technology has been made available without restrictions upon its further dissemination; copyright restrictions do not remove technology from being in the public domain. Technology has been made available if it has been published already and thus is available to the public, irrespective whether the acquisition is subject to charges. This applies both to printed or electronic publications (Wolfgang, Simonsen & Rogmann, 2017, para. 26; Haellmigk, 2017, p. 430).
- Technology that results from basic scientific research. Basic scientific research means experimental or theoretical work undertaken principally to acquire new knowledge of the fundamental principles of phenomena or observable facts, not primarily directed towards a specific practical aim or objective.⁴
- Technology that is the minimum necessary information for patent applications (this exception does not apply to nuclear technology).

However, it must be noted, that these exceptions apply only to a limited number of technology exports. When acquiring technology, foreign companies are interested in obtaining that part of the technology that enables the development or manufacture of the goods controlled. Further, companies will not pay for technology that is already in the public domain. As regards the exception for technology that is basic scientific research, this mainly applies to universities and research institutes. If private business carries out research activities they are usually directed towards a specific practical aim, such as developing new or better goods for sale. Therefore, companies are well advised to apply these exceptions restrictively.

Transfer modalities

Technology export can take place by two ways. First, it can be carried out by the export of know-how in a physical manner. This is the export of tangible technology. If technology is printed and then sent to a customer abroad by post, this export is similar to the export of goods. It is irrelevant in which form written technology is exported; this can be descriptions, formula or charts. Due to the digitalisation of business technology, export can also take place via electronic means. This is the export of intangible technology. European export controls do not limit this kind of export to existing electronic media; rather, it intends to comprise all possible and future means of electronic transactions. Therefore, European export controls define export of intangible technology as every immaterial transfer of technology via data transmission from the EU to a third country. It does not matter which kind of data transmission

model is used (Krenzler, Herrmann, Niestedt, 2017, para. 12). European export controls, without being limited to them, explicitly state the current and most popular electronic communication tools as emails, fax or phone (Art. 2 no. 2 iii, Dual-Use Regulation).

The common ground for these types of technology export is that the exporter actively takes part in the exchange of technology: They write and send the email with sensitive data; dial the fax number and send the sensitive document; or pick up the phone and explain the sensitive technology to their customer.

However, even if the exporter does not actively take part in the technology export, European export controls must be considered. This is the situation where information is made electronically available for access from abroad. For example, if a company sets up a server with sensitive technology to allow access from abroad, this is deemed to be technology export. European export controls already consider the fact of allowing such access to be a technology export. It is not required that the technology is actually accessed. The reason for this is that by granting access to the sensitive technology the authorities cannot control who acquires the technology (Dorsch, 2018, para. 26)

With respect to technology export, either physically or electronically, European export controls seek to avoid situations where technology is exchanged without any control before the exchange takes place. Against this background it is clear that intra-company technology transfer is subject to European export controls too (Haellmigk, 2016, p. 31). It is irrelevant whether technology is transferred to a customer or an employee of the same company working in a third country. In both cases, technology is transferred abroad, regardless of who the recipient of the technology may be. Therefore, European companies should carefully analyse their internal and external digital communication in the light of European export controls. This review should not be limited to standard email exchanges. It should also be applied to the use of new electronic media, such as cloud computing.

Category 2: Technology transfer by technical assistance

To understand the concept of European export controls on technology transfer that takes place by technical assistance, technical assistance must firstly be defined.

Definition

Technical assistance is defined as a technical support with respect to a good. Based on this wide definition, technical assistance comprises every kind of support relating to the development, production, repair, maintenance or operation of a good. Similar to the first category of technology export, it does not matter how technical assistance takes place. Technical assistance can be provided by a conversation, a phone call or a presentation of technical documents, either in a written, oral or electronic form (German Federal Office of Economics and Export Control, 2016, p. 24).

Relationship to technology export

When compared, both categories overlap as the scope of application of technical assistance corresponds with the scope of technology export. For example, a phone call with a customer abroad discussing the maintenance of a sensitive facility meets the definition of a technology export as well as that of technical assistance. The same applies if technical documents are provided to a customer abroad. This kind of technology exchange can be considered both a technology export and technical assistance.

Therefore, it is necessary to define the relationship between technology export and technical assistance. When exchanging technology, is a company required to review both categories of technology transfer? Or does a technology export exclude technical assistance? The answer is that both categories of technology

transfer are alternative models of a technology exchange. A technology transfer is either a technology export or a technical assistance; it cannot be both at the same time.

Hence, the order for reviewing exports controls for a technology transfer is as follows: first it must be assessed whether the intended technology transfer meets the definition of a technology export. If so, one must further review whether the technology export is subject to any export restrictions. In this case, the export control concept of technical assistance and its export restrictions do not apply.

If the intended technology transfer does not meet the definition of a technology export, the export control regime for this kind of export does not apply. Instead, one must analyse whether the technology transfer meets the definition of technical assistance. If so, one must further check whether export restrictions for this kind of technology transfer apply (German Federal Office of Economics and Export Control, 2016, p. 24; Haellmigk, 2017, p. 431).

However, the abovementioned overlapping of technology export and technical assistance in terms of scope of application should not be misinterpreted to imply that the concept of technical assistance never or only rarely applies. The concept of technical assistance includes two situations that are not covered by the concept of a technology export.

Scope of application

Transfer of technology in the domestic territory

The concept of technical assistance applies when technology is transferred in the domestic territory.

This is illustrated by the following example. The technical department of an aviation company invites foreign customers at its German site for an advertising presentation that includes sensitive technology for the development of an aircraft engine. Is this technology exchange a technology export or a technical assistance?

According to the order of review established above, it first must be assessed whether this technology transfer meets the definition of a technology export. Conceptually, an export requires that the technology be transferred to a third country. In this case, however, there is no transfer to a third country. The sensitive technology is transferred within Germany only. Therefore, it must be determined whether this technology exchange is technical assistance. As noted above, technical assistance includes every technical support relating, among other things, to the development of a good. It is irrelevant where technical assistance is provided; it can take place at home or abroad.

Therefore, as opposed to technology export, technical assistance applies if technology is transferred in the domestic territory. This is the first separate scope of application of technical assistance (Haellmigk, 2017, p. 431).

Technology transfer involving cross-border movement of a person

Further, the scope of technical assistance applies if technology is transferred abroad through a cross-border movement of a person. Let's assume the technical personnel of the German aviation company from the example above visits a customer in a third country and provides details about how to develop of an aircraft engine. During the meeting, sensitive technology is orally released to the customer. Is this technology exchange a technology export or a technical assistance?

According to the review order established above, one must first check whether this is a technology export. As opposed to the first example, the technology is transferred to a third country. However, the technology transfer takes place only through the cross-border movement of the personnel. European

export controls are not able to control what is in the mind of a travelling person and whether they possess technical know-how. Therefore, if a person who crosses the border does not carry technology with them in a visible form (printed documents, computer, USB stick), this is not a technology export (German Federal Office of Economics and Export Control, 2016, p. 24). In other words, transmission of technology is not a technology export if that transmission involves cross-border movement of persons (Art. 7 Dual-Use Regulation). Hence, the second category of technology transfer applies: releasing sensitive technology in a third country is considered to be technical assistance.

This is the second separate scope of application of technical assistance: technology is transferred to a third country by the cross-border movement of a person, who later provides technology to a third party (Haellmigk, 2017, p. 431).

Export control restrictions

Export control restrictions for technical assistance are based on the following criteria: the use of the goods for which technical assistance is provided; the country in which technical assistance is provided; and the customer for whom technical assistance is provided. Therefore, technical assistance is subject to an export licence if it is carried out in connection with a sensitive use of the good. Further, country embargo regulations may further restrict technical assistance (e.g. the Russia embargo). Finally, it is prohibited to provide technical assistance to sanctioned parties.

European export laws control three sensitive uses. Technical assistance is sensitive if carried out in connection with:

- weapons of mass destruction and missiles capable of delivering such weapons
- military use in a weapon embargoed country
- goods of surveillance communication
- civil nuclear facilities in sensitive countries, such as Algeria, Iraq, Iran, Israel, Libya, North Korea, Pakistan or Syria (German Federal Office of Economics and Export Control, 2016, p. 26–27).

Licence exceptions

However, in some cases, technical assistance, although in connection with a critical use of the product, is exempt from export licensing. These exceptions apply if technical assistance includes information that:

- is the minimum necessary for the installation, operation, maintenance, checking or repair of controlled goods whose export has been authorised
- is in the public domain
- results from basic scientific research
- is provided in non-sensitive countries or to persons from non-sensitive countries. Non-sensitive countries are the EU member states as well as Australia, Japan, Canada, New Zealand, Norway, Switzerland and the USA
- does not include controlled technology (German Federal Office of Economics and Export Control, 2016, p. 27–28).

The rules regarding when these exceptions apply are complex and subject to further requirements that need to be analysed thoroughly. In some cases, these exceptions are further subject to the place where technical assistance is provided (domestic territory or abroad) or apply to some critical uses only. Against this background, European companies exchanging technology should carefully review whether their customers intend a critical use of the products the technical support is provided for. If so, companies should review in a second step whether a licence exception for technical assistance might apply.

Risk points for companies

Due to European export control laws' wide scope of application of a technology transfer, there are many situations where a company's business may be affected by export restrictions. The following checklist provides an overview of the possible risk scenarios when exchanging sensitive technology. Depending on the company's business—product range, sensitivity of goods and technology, foreign markets—the checklist set out in Table 1 needs to be adjusted or amended.

Table 1: Risk points checklist

Enquiry	Reason
Does the company's export business involve EU embargoed countries?	EU country embargos include separate regulations restricting technology export and technical assistance
Does company's business involve technical services such as repair, maintenance or training?	These services can include technology exports and/or technical assistance.
Does company's business involve participation in international research and development projects?	These projects usually include sharing and exchanging technology that can be considered technology exports and/or technical assistance.
Does company's business involve electronic communication with affiliates and employees abroad?	Intra-company technology transfer is subject to export control restrictions.
Does company's business involve business trips abroad?	Transmitting information to an employee who is on a business trip abroad, is subject to export controls. Providing information in a third country by an employee can be technical assistance.
Does company's business involve electronic data transfer models for its employees being abroad?	Using data transfer models can include technology exports and/or technical assistance.
Does company's business involve national site visits by foreign customers including trainings or factory visits?	Training and factory visits in the EU can include technical assistance.
Does company's business involve participation at conferences or symposiums at home and abroad?	Presentations and panel discussions can include a technical assistance.
Does company's business involve seconding its employees abroad?	Working on secondment can include providing information that can be considered technical assistance.
Does company's business involve recruiting foreign employees at national sites?	If a foreign employee is granted access to technology this can be technical assistance.

Conclusions

According to European export controls, technology transfers are divided into two categories: technology export and technical assistance.

Technology export is subject to the same export control restrictions as is the export of a good. Exceptions apply with respect to controlled technology. In certain cases, technology, although controlled, is not subject to export licences. Technology export also includes electronic data transmission abroad and making data available for access from abroad.

European export controls have established a separate concept for controlling technical assistance. Although the concept of technical assistance includes the same activities as technology export, there are two additional situations where technical assistance applies: technical support at home and providing technical support in third countries. Technical assistance is subject to export control restrictions if the technical support is intended for a sensitive use of a good, if specific embargo regulations apply or if the customer is a sanctioned party.

When conducting export business in Europe, companies will be subject to European export controls on technology transfer. The risk points for companies are diverse and include many business activities. Therefore, companies should carefully review whether their businesses involve technology transfers and include such considerations in their internal compliance programs.

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Notes

- 1 See, for example, Germany Annex of the Foreign Trade and Payments Regulation.
- 2 Algeria, Iraq, Iran, Israel, North Korea, Pakistan, Syria, see Sec. 9 of German Foreign Trade and Payment Regulation.
- 3 German Federal Office of Economics and Export Control, 2016, p. 11.
- 4 German Federal Office of Economics and Export Control, 2016, p. 11.

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Designing a new methodology for customs risk models

Alwyn Hoffman, Sonja Grater, Willem C Venter, Juanita Maree and David Liebenberg

Abstract

Effective risk management is a prerequisite to find an acceptable balance between the objectives of a customs operation and the streamlined flow of goods. The customs operations in many developing countries are characterised by high levels of physical inspections, with resulting disruption of trade flows, but with little positive impact for the regional economy. Most developed economies have moved towards customs risk management models based on the analysis of rich datasets that can be used to accurately determine the risk represented by a cargo consignment without physically stopping it. The use of such models can result in reduced physical inspections without increasing the risk to Customs of either losing income or allowing the influx of illegal contraband. It, therefore, represents a more optimal compromise between the interests of customs and those of trade, reducing the economic cost to the region and making the region more attractive to global economic partners. In this paper we develop a rigorous methodology that utilises electronic data transacted between Customs and trade to characterise the risk attributes of cargo consignments and then extract a model that can be applied in real time to minimise disruption of trade flows while reducing Customs risks to levels that are below set thresholds. This paper builds on previous work of Laporte (2011) and others but extends their results by developing a more detailed methodology to quantify the impact of a variety of input factors and demonstrating how an optimal set of inputs can be selected to arrive at an effective risk management model.

1. Background and introduction

In recent years many security problems, such as the 9/11 terrorist attack in America, have resulted in some customs administrations changing their priorities to include higher levels of risk profiling of importers to increase security and safeguard citizens (Manners-Bell, 2017, p. 34). Two common themes in cargo security programs have been to (1) gather more detailed information on which to gauge transaction risks, and (2) move the point of compliance further upstream along the supply chain and away from the point of entry (Prokop, 2017, p. 16). The success of supply chain movements globally depends greatly on the ability of customs to achieve an effective balance between trade facilitation and regulatory intervention, and not to place more restrictions in place (Creskoff, 2016, p. 319). Customs risk management, the screening of data for risk profiling, and the protection of the society must not increase disruptions to the flow of cargo in a supply chain through repetitive stops and inspections (Manners-Bell, 2016, p. 128).

Against this background, there exists very little empirical evidence that customs authorities are using well-designed statistical systems to identify possible high-risk or illegal transactions. Many of the existing systems only combine simple criteria, such as the importer code, the origin of the goods and the applicable tax regime. However, very few empirical or statistical models can be found in the literature.

Therefore, there is a need for more studies to develop statistical techniques that can be used by customs authorities to more efficiently target declarations that should be inspected.

A few studies, such as Laporte (2011), Davaa and Namsrai (2015) and Komarov (2016), designed possible methodologies to manage Customs risk. They explain the use of input factors, such as importer, freight agent, HS classification, country of origin, customs broker, transport mode, provenance and customs regime, in regression-type analysis to distinguish between high – and low-risk transactions. However, no alternative methodologies exist in the literature.

The limited number of historical studies motivates further exploration of a non-intrusive analytics-based approach to customs risk management. No systematic method has been designed to determine which input factors to consider and which should be selected for inclusion in a customs risk management model. The cited references, furthermore, provided no quantified indication of the relationships between the various input factors (e.g. customs office) and the operational customs performance (such as time delays). Such an analysis will indicate which areas of the overall customs operation suffers the most from inefficiencies, and if specific types of cargo or specific entities seem to be unfairly targeted.

In a previous paper (Hoffman et al., 2018), we characterised the effectiveness of an existing customs operation in terms of the contribution of specific input factors on outcomes, like time duration and the probability of finding an infraction, as well as the efficiency of current procedures used to select cargo consignments for inspections. Our finding was that the level of accuracy of the current risk engine appears to be quite low, with the result that most inspections do not produce infractions and do not lead to amendments of rejections, while adding substantial time delays to the operation. This paper aims to continue our previous work by utilising input–outcome relationships for customs processes currently applied in South Africa in order to quantify the capability of each input factor to contribute towards a more effective risk model. We furthermore extract risk models using a variety of empirical modelling techniques, including decision trees, linear regression and neural networks, and compare the capabilities of these techniques to accurately capture input–output relationships. The paper uses transaction-level trade data that was obtained from South African freight forwarders for the period September 2014 to September 2016.

The primary focus of this paper is the development of a rigorous methodology that provides more insight into the underlying relationships between inputs and outcomes than the approaches that were previously reported on (Laporte, 2011; Davaa & Namsrai, 2015; Komarov, 2016). The following specific research questions will be addressed:

1. What is the quantified capability of each identified input factor to predict customs outcomes before these have occurred?
2. Which combination of input factors and outcomes will provide the best risk-prediction capability?
3. Which empirical modelling technique can capture input–output relationships the most effectively?
4. To what extent could the current South African Customs decision-making process be improved?
5. What methodology, in general, should be followed for customs risk management?

This paper aims to contribute towards the creation of new knowledge about the use of empirical modelling techniques to improve customs risk management, in the process providing more accurate solutions to address the challenge an optimal balance between customs risk versus efficient trade flows.

The paper is structured as follows: section 2 describes the available data set, while section 3 describes the set of statistical modelling techniques that were used. Section 4 provides an overview of the methodology used to extract input–output models. Section 5 provides results and findings, while section 6 discusses the results. In section 7 we conclude with recommendations for customs operations and suggest future research work.

2. Description of the data

The authors of this study obtained trade transaction data from several freight forwarders in South Africa, in accordance with an agreement between the North-West University (NWU) and the South African Association of Freight Forwarders (SAAFF). The data that was used in this study represents EDI transactions exchanged between South African Revenue Services customs division (hereafter referred to as SARS Customs) and consignors of goods imported into South Africa from September 2014 to September 2016. The available dataset includes approximately 3.5 million transactions over the given time period.

For each transaction the following information was obtained:

- times and dates when electronic declarations were submitted by consignors and received by SARS
- name of the customs office where declarations were submitted
- HS chapter describing the nature of the cargo
- customs value of the cargo
- mode of transport through which goods entered into South Africa
- Customs Procedure Codes (CPC) reflecting the reason why goods were imported into South Africa
- countries of origin, export and import (some goods may be in transit via South Africa en route to a final destination elsewhere)
- codified identity of the entity submitting the customs declaration (preserving the anonymity of the declarants)
- detailed set of customs response codes communicated to the declarant for each transaction, together with the time and date for each code.

The customs response codes represent the customs outcomes that we would like to be able to predict (e.g. a decision to stop and inspect a consignment or finding an infraction). The corresponding date/time information indicates what the impact was on the flow of cargo in terms of time delays. The remaining data represents input factors that could reasonably be expected to impact the outcomes.

Table 1 provides a summary of the input factors and the level of detail that was included in the data. For the purpose of this study we decided to only focus on the use of categorical input factors; for this reason, customs value (that represents a continuous input value factor) was excluded from the set. Due to the large number of HS classifications we decided to narrow it down to a smaller number of cargo categories, based on HS chapter (i.e. the first 2 digits of the HS code). The naming convention used for this reduced number of HS categories is described in Table 2.

Table 1: Input factors reflecting customs declaration processes

Input factor	Number of categories	Examples
Import/Export	7	Imports, Ex-bond, In transit
Customs Office	36	Durban, Cape Town, etc.
CPC Code	31	10, 11, 12, etc.
Previous CPC Code	23	00, 14, 20, etc.
Country of Origin	237	GB, CN, GE, etc.
Country of Export	222	GB, CN, GE, etc.
Country of Import	197	ZA, ZM, ZW, etc.
Transport Code	9	Ocean, Road, Rail, etc.
Consignors	310	#0, #1, #7, etc.
HS chapter	18	Animal, Chemical, etc.

Table 2: Description of reduced HS chapter codes

Cargo category	HS chapter value range
Animal	HS chapter ≤ 5
Vegetable	$5 < \text{HS chapter} \leq 15$
Food	$15 < \text{HS chapter} \leq 24$
Mineral	$24 < \text{HS chapter} \leq 27$
Chemical	$27 < \text{HS chapter} \leq 38$
Plastic	$38 < \text{HS chapter} \leq 40$
Hide	$40 < \text{HS chapter} \leq 43$
Wood	$43 < \text{HS chapter} \leq 49$
Textile	$49 < \text{HS chapter} \leq 63$
Footwear	$63 < \text{HS chapter} \leq 67$
Stone & Glass	$67 < \text{HS chapter} \leq 71$
Metal	$71 < \text{HS chapter} \leq 83$
Machinery	$83 < \text{HS chapter} \leq 85$
Transport	$85 < \text{HS chapter} \leq 89$
Miscellaneous	$89 < \text{HS chapter} \leq 97$
Service	$97 < \text{HS chapter} \leq 99$
Other	$99 < \text{HS chapter}$

Table 3 provides a summary of the customs response codes that can be received for any given transaction, and that indicate the actions by customs for that specific transaction.

Table 3: Customs response codes

Customs response code	Description
1	Release
2	Stop for physical inspection at unpack depot or X-ray scanning
4	Refer to other governmental agency (OGA)
6	Reject declaration
13	Supporting documents required
26	Request adjustment to declaration
27	Accept
31	Request additional supporting documents
33	Supporting documents received
36	Booked for physical inspection

3. Statistical techniques used to characterise input–output relationships

To develop a model that can predict customs outcomes from data that is available before any intrusive action has occurred, it is necessary to evaluate the usefulness of the available input factors that can help explain various characteristics of the expected outcomes, such as the level of risk attached to a consignment. We shall use the term ‘explanatory variables’ for these input factors. The quality of an empirical model derived from a set of available data (normally called the training set) depends on a number of factors; most important of these is whether the desired outputs can in fact be derived or inferred from the available inputs. In a case like the development of a customs risk model one would expect the outcomes to depend on a variety of input factors; some of these will hopefully be contained in the available set of explanatory variables.

The usefulness of such an empirical model is not reflected by how well it can fit input–output relationships present in a given training set, but whether it can learn the ability to generalise: once trained on a given set of data it must also be able to provide useful responses when fed with previously unseen data that was not used during the training process. The reason for this requirement is obvious: if a customs risk model has already been trained on historical data, its practical application will involve feeding it with new data for which the outcomes are still unknown. Such new data was not yet available when the model was trained; the real test for the model is thus how well it generalises out of the training sample.

The capability of an empirical model to explain input–output relationships inside the training set tends to increase with increasing model complexity; however, it tends to lose its ability to generalise if it is allowed to become too complex (Bishop, 1995). Model complexity largely depends on the number of free parameters (also called degrees of freedom) present in the model and of which the values are optimised during the training process; as the number of inputs increase the number of free parameters and model complexity will also tend to increase. The best models are normally those that achieve an acceptable

modelling accuracy over the training set using the smallest number of inputs factors and degrees of freedom. It is, therefore, important to reduce the set of candidate input factors as far as possible before the model is trained to help prevent overtraining and subsequent bad generalisation capability. For this purpose, each potential explanatory variable should be assessed separately and in combination with others for its ability to correctly predict the desired outputs before it is considered for inclusion into a model. We will use analysis of variation (ANOVA) as well as linear correlation analysis to evaluate the respective explanatory variables before we proceed to extract empirical models.

3.1 Analysis of variation

In Table 4 we show the results of an ANOVA applied to the different explanatory variables. We investigated the extent to which these variables can explain the following customs outcomes:

- the duration of the customs process
- the likelihood
 - of a request for additional documentation
 - of being stopped
 - of being stopped and inspected
 - of an infraction to be found.

The F-statistic measures the ratio of between-class-variations (e.g. variation of infraction probability between different customs offices) and within-class-variations (e.g. variations of infraction probability over time for the same customs office). A high F-value indicates, on average, larger differences between categories than within categories, implying that the respective category variable does have the ability to help explain the respective outcome values.

Table 4 shows that, for all of the outcomes, at least some of the explanatory variables have significance. Duration and request for additional documents produce, on average, larger F-statistics, indicating that they may be easier to predict using the available explanatory variables. For all of the outcomes, the F-values are sufficiently large to justify proceeding with the development of prediction models based on the available set of explanatory variables.

Table 4: F-statistics extracted through one-way ANOVA

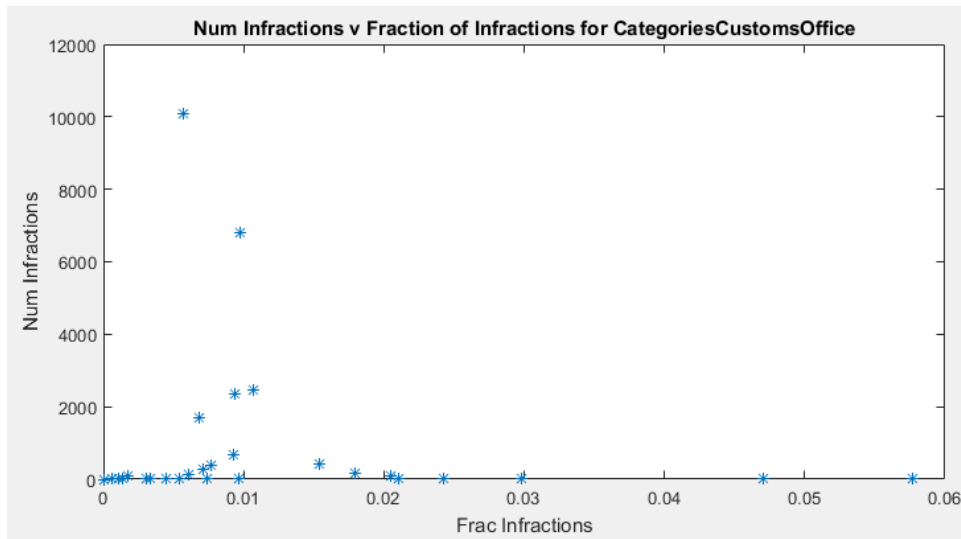
Input Factor	Duration	Req_Add_Docs	Stopped	Stopped_Inspected	Infraction
CustomsOffice	1150.8	1356.2	43.6	168.8	82.2
HSChapter	892.1	8934.3	32.6	114.1	105.8
TransportCode	2105.4	4533.6	204.1	731.9	499.1
SPSource	206.7	809.5	84.2	234.2	126.5
CpcCode	423.4	352.7	2.6	10.6	93.2
PreviousCpc	118.4	834.1	4.2	22.6	75.8
CountryOfOrigin	50.1	329.2	4.9	13.3	17.8
CountryExport	59.9	352.0	4.8	18.1	17.7
CountryImport	25.4	29.7	1.8	2.0	3.7

3.2 Investigating the classification ability of individual explanatory variables

In this article our primary focus is on the prediction of infraction probability for cargo consignments. In order to determine the difference in the incidence level of infractions within different input categories, we calculated the fraction of infractions present within each category, using each of the selected explanatory variables as the basis for categorisation. Should a specific category be characterised by a high historical infraction rate, membership of that category can be used by a customs risk engine as the basis for selecting future consignments falling within the same category. Should historical behaviour continue into the future, this should allow the risk engine to achieve higher than random success rates.

The degree of success that can be achieved with such an approach will, however, also depend on the number of infractions present within each category. If some categories can easily be identified as being associated with high infraction rates, but these categories only represent a small fraction of the overall number on infractions, the degree of success that can be achieved by selecting such categories will be limited. This is illustrated in Figure 1 for customs offices, which shows the number of infractions against fraction of infractions for each of the 36 customs offices. It can be seen that some customs offices display a much higher than average incidence of infractions, in some cases more than 5 per cent compared to a population average of about 0.6 per cent. It is, however, also clear that all of the customs offices with much higher than average infraction rates also contain only a very small fraction of the total number of infractions present in the entire population. The two largest customs offices, Durban and ORT International Airport, display by far the largest number of infractions, but their averages are not very different from the population average (largely because between them they dominate population averages). Using the customs offices with high infraction rates as predictors will, therefore, make some contribution but will only allow a limited fraction of all infractions to be correctly selected.

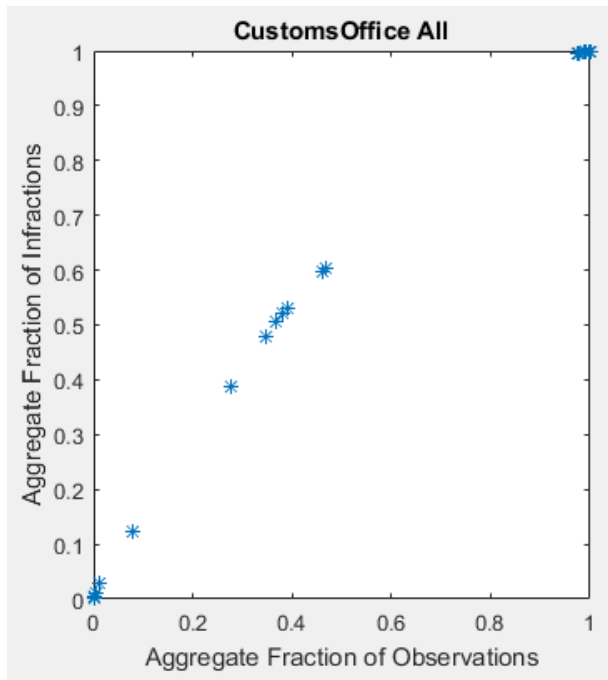
Figure 1: Number of infractions vs fraction of infractions for different customs offices



The accumulative effect of what was described above is shown below in Figure 2. This graph was constructed by selecting consignments for inspection, starting with consignments falling into those categories that historically displayed the largest infraction levels, and gradually adding more categories until all have been selected. If all categories contained the same infraction rates, the resulting graph of aggregate fraction of infractions selected versus aggregate fraction of all observations selected would be

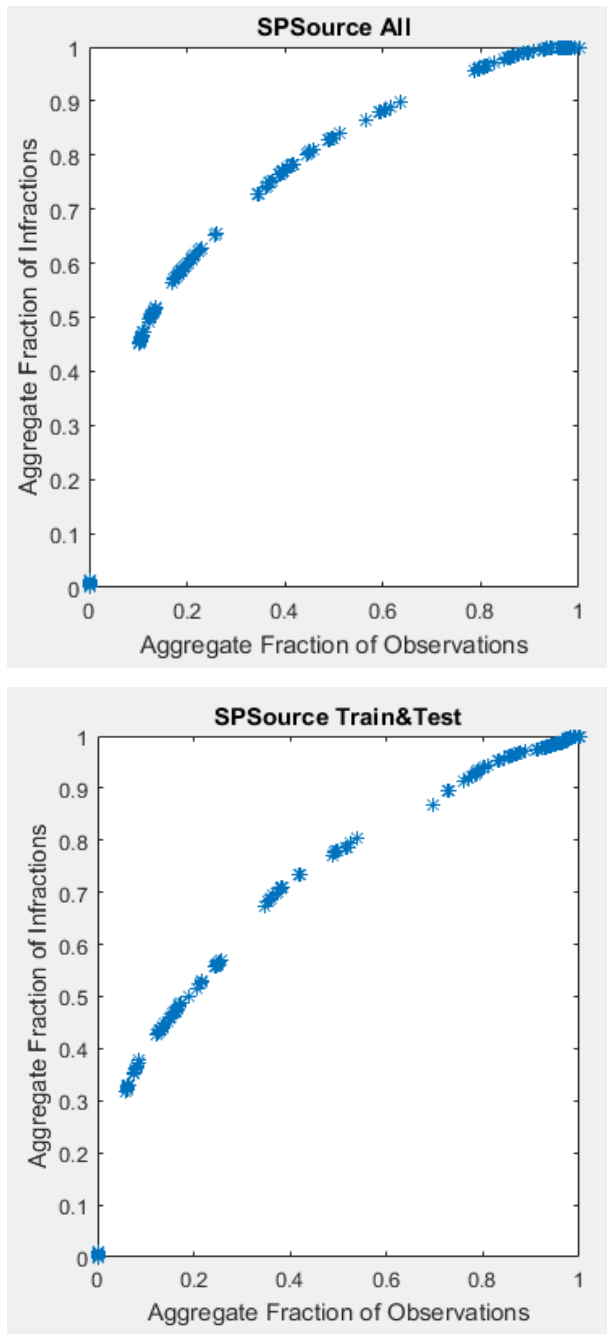
a straight line with gradient 1 from (0,0) to (1,1). In this case the gradient of the graph is initially steeper than 1, as the categories with the higher incidence rates are selected first. As categories with lower incidence rates are added, the graph becomes less steep. The effect of the large fraction of infractions present in the two largest customs offices is clearly illustrated in the graph: when these customs offices are added to those already selected, big jumps occur in the graph. If these two large customs offices are omitted from the criteria for inspections, then only a relatively small fraction of infractions are present in the selected group; once these two categories are added, most infractions are included but then the selected group contains almost all observations. This clearly illustrates why using only one explanatory variable in a risk classifier will lead to minimal success.

Figure 2: Aggregate fraction of infractions found vs aggregate fraction of observations selected based on customs offices



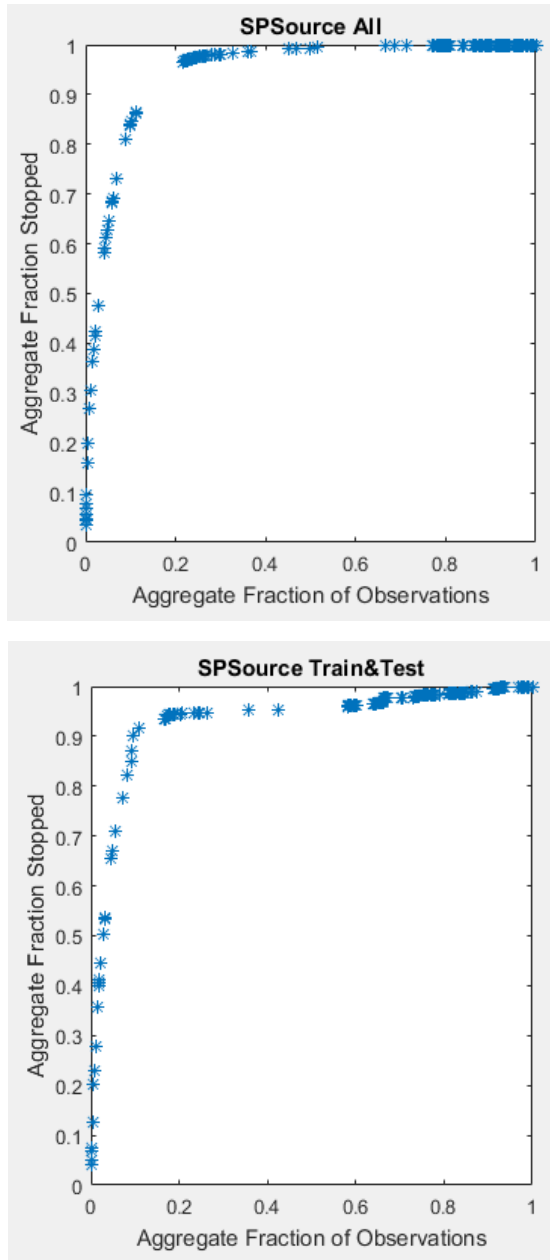
In Figure 3 we show similar results but using consignor identity as category variable. It is clear that this variable has a superior ability compared to customs office to separate consignments with a high infraction incidence from the rest of the population, as the graphs start off with steeper slopes. We also illustrate the importance of evaluating selection criteria out-of-sample to obtain a realistic indication of its ability to generalise outside of a training set. The graph on the left-hand side shows the aggregate fractions when categories are selected after the category averages were determined using all available samples. This is obviously not a realistic approach, as in practice the categories must be characterised based on historical samples only before a rule is applied to new samples. We applied the correct approach in the graph on the right-hand side, where the available data was first divided into a training and test set of equal size, and where the testing data follows after the training data in calendar time, which will always be the case in practice. It can be seen that the selection ability of this variable was slightly reduced when applying training set averages as selection criteria to test set data.

Figure 3: Aggregate fraction of infractions found vs aggregate fraction of observations selected based on consignors



In Figure 4 we show similar results to demonstrate the ability of Consignor identity to correctly predict the incidence of consignments being stopped by customs. It can be seen that a much higher selection accuracy for stopped consignments will be achieved when selecting a given fraction of total observations, compared to the selection accuracy for infractions, as the graph has a much steeper gradient initially and a much lower gradient once the ‘elbow’ has been passed. This indicates that when customs select consignments for stops, the identity of the consignor seems to play a very important role. The success of this strategy to actually find infractions is not quite as high, as indicated by the results in Figure 3.

Figure 4: Aggregate fraction of stopped consignments found vs aggregate fraction of observations selected based on consignors



3.3 Correlation analysis between input factors and outcomes

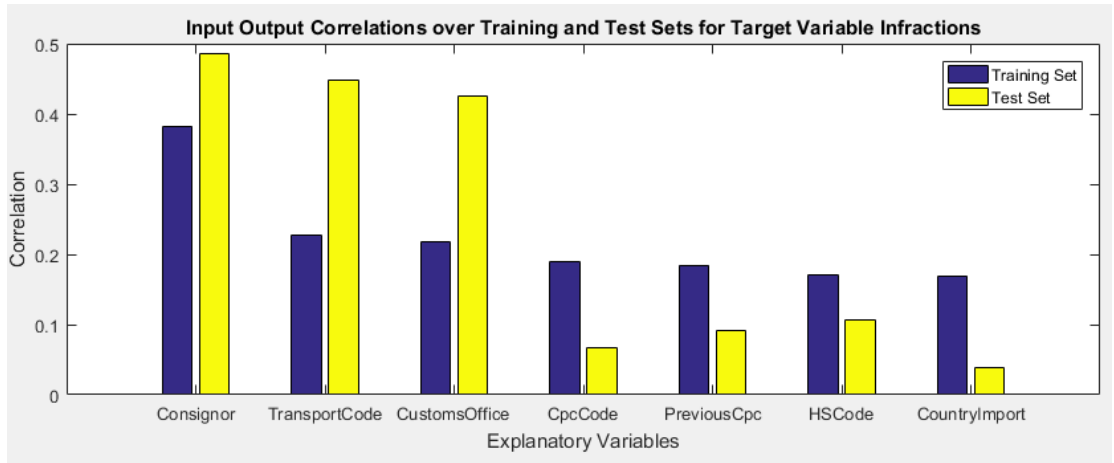
The previous section described the ability of different input factors to predict whether consignments will be associated with specific eventualities. In order to perform a direct comparison between the impacts of different input factors on the various outcomes we implemented a linear correlation analysis. This was done in the following manner:

1. For each category of each input factor (e.g. Durban or Cape Town for category customs office) the accumulated average value of each outcome (e.g. fraction of infractions) was calculated as function of time as from the start of the observation period up to the end of each specific month. These averages represent the behavioural characteristics of the respective categories up to that point in time.
2. For each new observation falling in a subsequent month its category memberships were determined (e.g. customs office: Durban; HS chapter: textiles; transport mode: maritime). That observation was then allocated the accumulated averages for the categories to which it belongs as determined at the end of the previous month. Each observation thus inherits the attributes of the categories that it belongs to; as these attributes are continuous variables, it can be used as basis for a correlation analysis with the observed outcomes.

For each new observation and each input factor (e.g. customs office) the Pearson correlation was calculated between the incidence of a specific eventuality for that specific consignment (e.g. whether it contains an infraction) and the historical average for the same eventuality within that specific category (e.g. Durban). Should historical behaviour within that category continue, a positive correlation value would be obtained; if the respective categorisation has no impact on that eventuality then a close to zero correlation will be obtained.

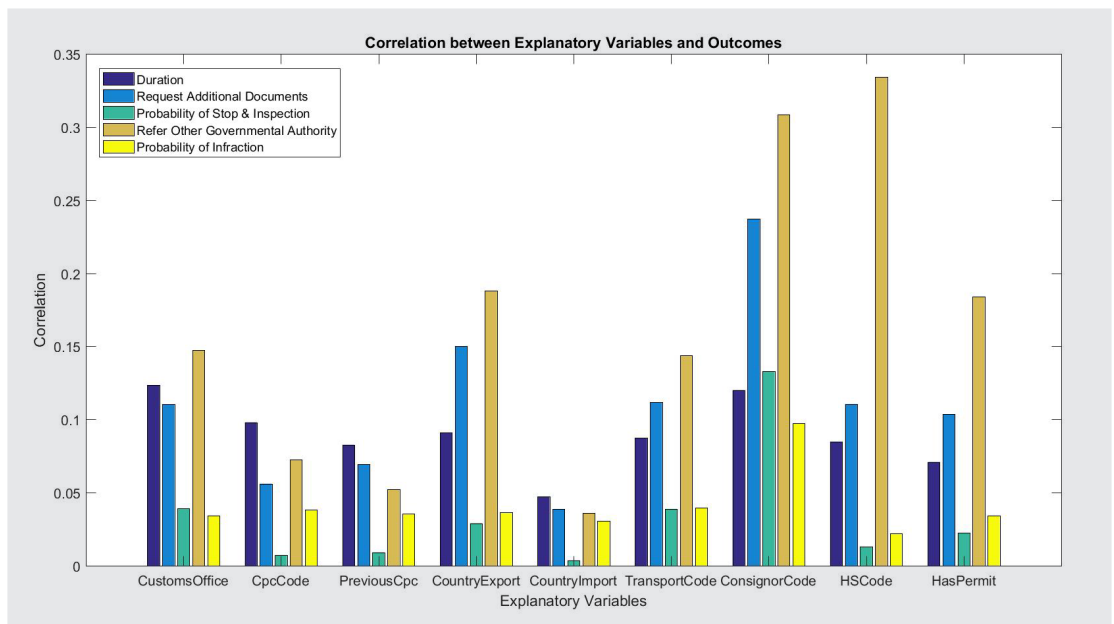
In a previous article (Hoffman et al., 2018) we performed correlation analysis on the same training set and found relatively weak relationships (correlation coefficients of below 5%) between explanatory variables and outcomes. This was partly caused by the fact that we are dealing with a very unbalanced dataset: only about 0.6 per cent of all infraction outcomes are true, resulting in the relationship between this small fraction of infractions and category membership to be obscured by the noise levels in the 99.2 per cent data with false outcomes. We can overcome this limitation by using a weighted dataset where the observations with true outcomes are multiplied to obtain a balanced set with an equal number of true and false outcomes. These results are displayed in Figure 5. The difference is apparent as several correlation coefficients are above 20 per cent. We performed the correlation calculations separately for a training set (first 50% of all weighted observations) and test set (last 50% of all weighted observations), to investigate the degree to which the relationships between inputs and outcomes remain constant over time. The explanatory variables are ranked based on size of correlation coefficient in the training set. While the ranking of explanatory variables based on correlation coefficient is more or less retained in the test set, there are considerable differences with respect to some categories, for example, CPC code and country of import. This emphasises the fact that a model extracted from the training set will not always perform as well over the test set.

Figure 5: Weighted correlation between probability for infraction and 7 explanatory variables



When similar correlations are calculated with respect to other customs outcomes, the same input factors tend to dominate but correlations are significantly larger, as can be seen in Figure 6. This indicates that, while consignor identity is used by Customs as a primary determinant for stops, inspections and requests for additional documents, this strategy meets only with limited success in terms of infractions that are found. It is, therefore, possible that some consignors are unjustifiably discriminated against, with significant implications in terms of overall time delays experienced. The results based on correlation analysis also support the results obtained in the previous section using average historical incidence of eventualities, as consignor is once again clearly the most useful explanatory variable.

Figure 6: Correlation between explanatory variables and different outcomes



4. Methodology for extracting input–output models from the data

In order to allow a direct comparison between our results and those that were previously published, we firstly implement methods based on individual inputs or simple combinations of inputs, similar to the approach as published by Laporte (2011). Secondly, we implement both linear regression and logistic regression models, also similar to the approach of Laporte. We then proceed to implement a neural network-based model as well as a decision-tree model to verify if these more sophisticated techniques can improve upon the performance of simpler techniques.

Each model produces an output, called a risk score, which is compared against a risk threshold; should the score exceed the threshold it is assumed that the event being predicted has occurred—such an observation will typically be selected for inspection. By applying the same threshold to all risk scores generated by a particular model it can be determined what fraction of all observations will be selected for inspection by that model; by comparing the predicted outcomes with true outcomes it can also be determined what the success rate was (i.e. the fraction of total events, e.g. infractions, that were present in the selected set). The Laporte study arbitrarily selected a number of threshold values ranging from 0.01 to 0.5 to create a range of score intervals. We decided to identify the specific threshold values to obtain specific success rates; the required success rates were set at 50 per cent, 80 per cent, 90 per cent and 95 per cent. Different models can then be directly compared in terms of the fraction of observations that must be selected to achieve a desired ‘hit rate’.

The description of model extraction as reported by Laporte creates the impression that models were extracted from the entire population after which the models were applied to the same data to determine model performance, as no separate training and test set results were reported in that reference. Such an approach can, of course, not be used in a practical customs risk engine, as a model derived from historical data can thereafter only be applied to new data. We, therefore, extracted models both from the entire datasets (to allow comparison against the results of Laporte) as well as from a training set that represented the 50 per cent of data that occurred first, with model evaluation done on the remainder of the data. It can then be observed to what extent the performance of a model deteriorates or is maintained out of the training sample.

4.1 Simplistic models

We followed Laporte’s definition of simplistic models as closely as possible. First each of the explanatory variables as extracted in section 3.3 are evaluated separately, using its value (historical infraction incidence rate) as risk score. Then three combined models are implemented, using the country of origin, HS chapter and consignor as inputs:

- using a simple average over the three inputs as risk score
- using a weighted average (with weights 0.5, 0.3 and 0.2) over the three inputs as risk score
- using the maximum of the three inputs as risk score.

4.2 Econometric models

The same explanatory variables that were used for the correlation analysis in 3.3 above were also used as inputs for econometric models. We experimented with different numbers of input factors, selecting inputs based on their linear correlations with the outcome being modelled. In addition to linear regression and logistic regression we also extracted a neural network model. Neural network models will have benefits over linear regression models should there be significant nonlinear aspects in the input–output relationships (Bishop, 1995). A typical example would be where the incidence of an eventuality starts to increase more rapidly once a specific threshold value in some input factor is exceeded.

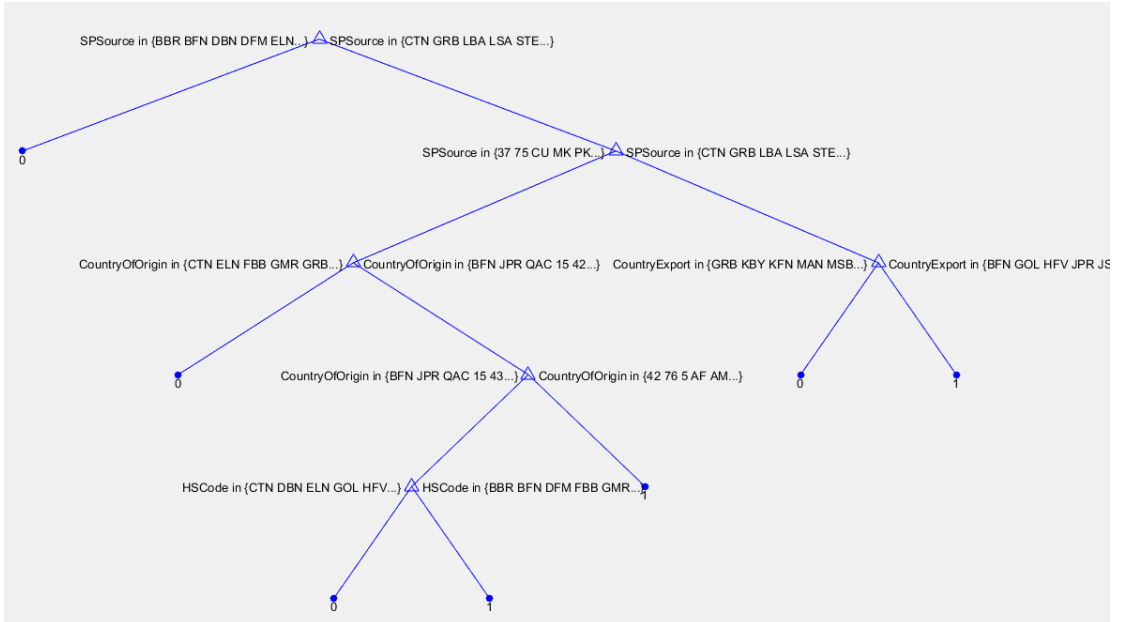
To investigate the presence of such behaviour we extracted feed-forward multilayer perception networks that use the same sets of inputs as the regression models. We used a single hidden layer of which the size is adjusted based on the number of inputs, with sigmoidal transfer functions in the hidden layer and linear transfer functions in the output layer. As neural networks have a tendency to overtrain, we added the use of a validation set that made up 10 per cent of the training set values; training was terminated at the point where the modelling error on the validation set started to increase. Both the input and hidden layers were restricted to not more than ten nodes each; the overall number of degrees of freedom in the models would therefore be less than 120. Given the size of the population (about 3.5 million observations), it was not necessary to apply specific regularisation techniques as the large training set combined with the use of the validation set would help prevent the model from being over fitted to specific training samples.

As mentioned earlier, the target data is highly unbalanced—for our dataset only about 0.6 per cent of cases contained infractions and only a small percentage was selected for scrutiny. If such an unbalanced dataset is directly used for training a regression or neural model, the optimisation technique that determine optimal values for the model parameters will tend to be dominated by the large number of samples with outcome ‘0’ (e.g. no infraction); this may result in the optimisation process getting stuck in a trivial solution where all observations produce an outcome of ‘0’, providing a high accuracy measured over all outcomes (as e.g. 99.2% of all outcomes contain no infraction) but of no practical value. In order to overcome this problem, we used weighted training sets, by multiplying each of the true outcomes with a factor that equals the ratio between the initial number of true and false outcomes. As a result, both the training and test sets contained about 3.5 million observations, with approximately 50 per cent false and true outcomes in each set.

4.3 Classification trees using original inputs

For our selected problem domain, most of the available input data is inherently categorical in nature (e.g. a cargo consignment can only come from one specific country of origin and belong to a specific HS chapter). For the previous set of modelling techniques, we translated these categorical values into continuous ones as these types of models perform best when fed with continuous input data. It is, however, also possible to directly use the categorical input values in their original format; the obvious model type would then be decision trees. A decision tree consists of many branches, and at each branch point one or more categorical variables are used to make a decision regarding which way to branch. Once the probability of a specific outcome is high enough the branch terminates in an outcome (e.g. an infraction occurred or did not occur). If the outcomes are also categorical then the technique is called classification trees. An example of a simple classification tree is shown in Figure 7.

Figure 7: Example of a classification tree



To investigate if classification trees can resemble the customs decision-making and infraction incidence process more accurately than models using continuous inputs, we trained classification trees that take any number of the original categorical variables as inputs. In the training of decision trees, care must be taken not to overtrain, as a sufficiently large number of branching points will allow any number of unique inputs observations to be correctly classified. Overtraining is prevented by limiting the maximum number of levels in the tree: a tree with only one level will classify all observations as either ones or zeros; with two levels at least one rule will be applied to separate the two classes; as the number of levels are increased more conditions can be defined to use as basis for more refined classification.

To determine at which level the tree must be terminated, we used a validation set defined similarly as in the case of neural network training sets. An initial tree was extracted using no limit on tree level, and the performance of the tree was tested on the validation set. The number of tree levels was then gradually reduced until the classification performance for the validation set reached its maximum value. All of these trees were then also applied to the test set to determine how well the selected tree performs on the test set.

5. Results and findings

Each of the modelling techniques described above were applied to the available data to predict both the probability of specific customs decisions (e.g. to stop and inspect) and the probability of finding an infraction. It must be appreciated that the process that generated the available dataset was not the actual process that generated the incidence of infractions, but only the process as applied by the respective customs authority. It is known that the relevant customs authority in this case applied a set of rules and procedures to generate decisions to stop, inspect, etc.; once such a decision was implemented an infraction that was potentially present in the respective consignment may or may not have been found. Any deficiency in this process, both to correctly stop or scrutinise risky consignments and to find infractions that are present, will be directly reflected in the data. No empirical modelling technique will be able to correct such a customs deficiency, as an empirical model can at best be as good as the data from which it is derived.

It must, therefore, be stated that the models that were extracted mimic the customs process rather than the true incidence of infractions and should therefore be evaluated primarily on that basis. This is supported by the results in section 3, where it could be seen that there are stronger correlations between input factors and the incidence of specific customs decisions than between the same input factors and the incidence of infractions.

5.1 Simplistic models

When applying simplistic models as described in 4.1, the results as displayed in Table 5 were obtained. For direct comparison purposes we limited the use of these models to prediction of infractions, as Laporte only applied these techniques to finding infractions and not to predict customs decisions. For each required selection accuracy (50%, 80%, 90%, 95%) it was determined what fraction of observations would have to be inspected to achieve the corresponding selection accuracy. We repeated this process for two cases:

- by extracting the threshold values from the entire set and then applying the thresholds to the entire set
- by extracting the thresholds from a training set only and then applying them separately to the training and test sets—this would be the more correct approach.

Table 5: Classification results for infraction using simplistic models

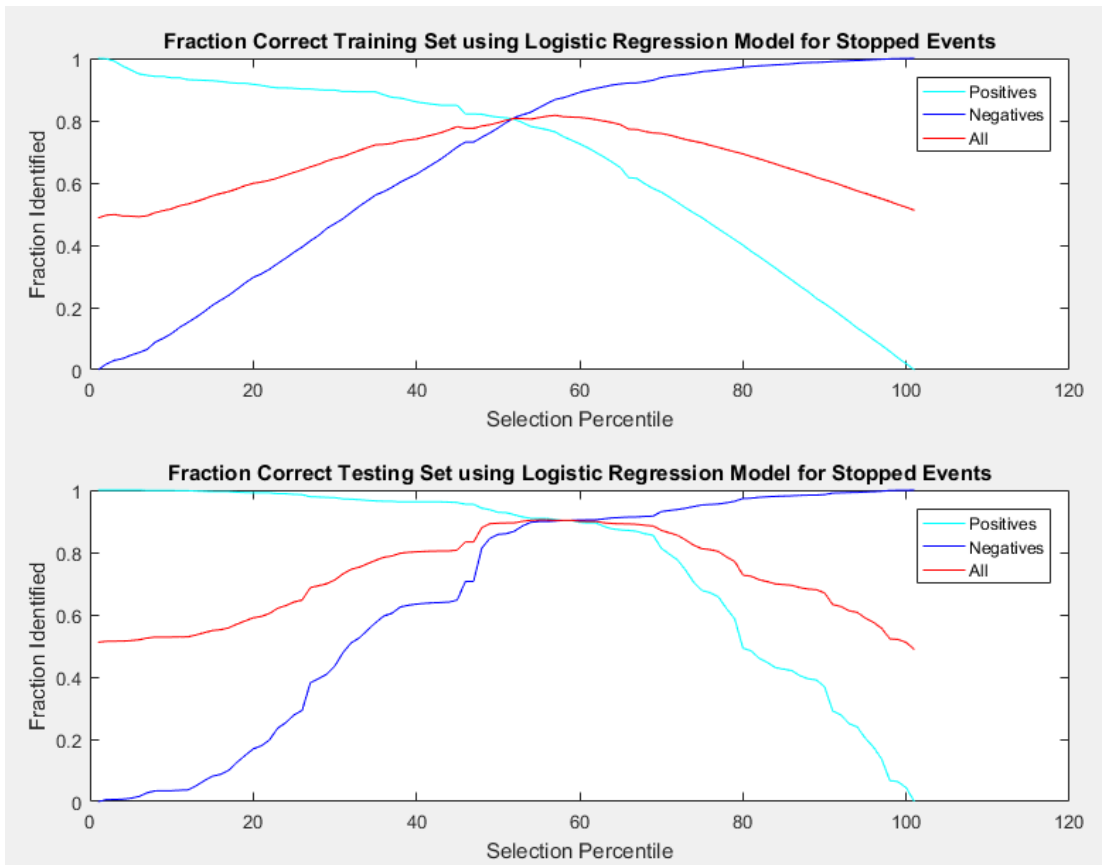
Fraction Infractions Found	Customs Office	CPC Code	Country Export	Country Import	Consignor	HS chapter	Country Origin	Simple Average	Weighted Average	Maximum
All										
0.50	0.37	0.94	0.41	0.97	0.17	0.72	0.43	0.14	0.13	0.22
0.80	0.98	0.94	0.82	0.97	0.49	0.85	0.72	0.67	0.58	0.58
0.90	0.98	0.94	0.82	0.97	0.87	1.00	0.87	0.86	0.78	0.90
0.95	0.98	0.94	0.97	0.97	0.87	1.00	1.00	0.92	0.90	0.90
Train										
0.50	0.39	0.97	0.43	0.97	0.14	0.74	0.43	0.17	0.18	0.15
0.80	0.98	0.97	0.79	0.97	0.41	0.85	0.72	0.58	0.46	0.56
0.90	0.98	0.97	0.97	0.97	0.77	1.00	0.86	0.77	0.66	0.79
0.95	0.98	0.97	0.97	0.97	0.77	1.00	1.00	0.88	0.84	0.92
Test										
0.50	0.97	0.97	0.42	0.97	0.25	0.75	0.42	0.20	0.27	0.23
0.80	0.97	0.97	0.78	0.97	0.76	0.86	0.85	0.75	0.63	0.62
0.90	0.97	0.97	0.96	0.97	0.76	1.00	0.90	0.87	0.83	0.78
0.95	0.97	0.97	0.96	0.97	0.84	1.00	1.00	0.93	0.92	0.91

The quality of the selection measures is reflected by how small a fraction of observations needs to be inspected in order to achieve a specified selection accuracy. As could be expected based on the results of section 3, consignors performed the best amongst the individual inputs. Consignor on its own is only marginally outperformed by the combination techniques, and only for some selection accuracies. It can also be observed that when the model extraction technique is correctly applied, using separate training and test sets, the performance is significantly worse compared to the approach where the model is applied to the same dataset from which it was derived.

5.2 Econometric models

The econometric models accept up to 9 input variables. Outcome accuracies are calculated for both the training and test sets and for both positive and negative outcomes. The impact of gradually changing the threshold level to separate positive and negative outcomes is illustrated in Figure 8, with separate graphics displaying the results for training and test sets, and a separate graph provided for positive, negative and all outcomes. Starting off with a zero-threshold level, all observations are classified as positive, with a resulting 50 per cent accuracy: all positive target values are classified correctly, and all negative target values are classified incorrectly. As this threshold is increased more observations will fall into the negative category; if the model possesses any ability to correctly classify observations then the classification accuracy for the category ‘all’ should increase, reaching a maximum value before decreasing again as the threshold value approaches 1.

Figure 8: Fraction stopped consignments correctly identified by logistic regression model as function of fraction selected



The results based on regression and neural network models are shown in Table 6. The coefficients of determination (or R^2) are somewhat lower than the figures reported by Laporte; this indicates that for our dataset the input–output relationships could be somewhat weaker. This coefficient is also lower for the test set compared to the training set, indicating that the models extracted from the training data do not fit the test data quite as well, also in line with expectations.

Apart from some marginal cases, the regression models could not significantly improve on the performance of the simplistic models. This indicates that the additional input variables, over and above the three variables used in the simplistic models, do not significantly contribute towards model performance. It can also be seen that the neural networks perform slightly better compared to the regression models, indicating that its nonlinear modelling capability is of some benefit in capturing the input–output relationships.

Table 6: Classification results for predicting infraction using different model types

Model Type	Linear regression		Logistic regression		Neural network	
	Train	Test	Train	Test	Train	Test
R^2	0.18	0.15	0.20	0.16	0.20	0.16
Fraction infractions found	Fraction of observations inspected					
50	0.32	0.48	0.32	0.48	0.32	0.46
80	0.64	0.74	0.63	0.73	0.65	0.66
90	0.81	0.85	0.81	0.83	0.83	0.75
95	0.90	0.90	0.89	0.90	0.91	0.81

In Table 7 we show similar results to predict the incidence of customs stops. It can be seen that all techniques perform much better compared to the case of predicting infractions. This confirms that the modelling techniques used do have the ability to capture the underlying behaviour present in the customs decision-making process with reasonable accuracy.

Table 7: Classification results for predicting stops using different model types

Model	Linear regression		Logistic regression		Neural network	
	Train	Test	Train	Test	Train	Test
R^2	0.16	0.26	0.39	0.61	0.43	0.66
Fraction infractions found	Fraction of observations inspected					
50	0.27	0.22	0.30	0.21	0.26	0.20
80	0.49	0.34	0.65	0.30	0.49	0.29
90	0.68	0.42	0.81	0.83	0.68	0.39
95	0.74	0.65	0.99	0.53	0.77	0.57

5.3 Classification trees

A different approach had to be followed in the case of classification trees, as this technique does not allow a threshold to be adjusted in order to achieve the desired selection accuracy. Instead of changing a threshold, the model performance can be moderated by limiting the allowed tree level. As shown in Table 7, the maximum tree level when extracting the model from the training set was 1371. The case with tree level equal to 1 represents the trivial case where all observations are classified as true. As the tree level increases, fewer observations from the training set are classified as true. At the same time, the fraction of events that are correctly selected also goes up as more branches are added to the tree; this behaviour is displayed in Figure 9. As is evident from Table 7 and Figure 10, the fraction correctly selected infractions from the test set reaches a maximum value for an optimal tree level of about 20. For this level of tree complexity, 23 per cent of test set observations are selected to produce a selection accuracy of 58 per cent of infractions. This is slightly superior compared to the best results for the simplistic or econometric models.

We can also compare our results with those of Davaa and Namsrai (2015). Their risk engine increased the incidence of infractions from 0.05 per cent in the lowest risk categories to 0.22 per cent (i.e. by approximately a factor of 4) in the highest risk categories. Our classification tree increases the average incidence of infractions from 0.6 per cent (when all observations are selected) to 1.7 per cent in the test set when the optimal tree level is used (i.e. by approximately a factor of 3). We can, therefore, state that, for our dataset, the performance is comparable to the results achieved by Davaa and Namsrai.

Table 8: Classification results for infraction using classification trees

Tree Levels	1	2	3	15	20	101	536	1371
Training								
Fraction selected	1.00	0.20	0.26	0.27	0.28	0.27	0.25	0.22
Hit rate	0.008	0.026	0.023	0.022	0.022	0.024	0.028	0.032
Fraction correct	0.52	0.72	0.73	0.74	0.74	0.77	0.81	0.83
Fraction correct no event	0.00	0.80	0.75	0.73	0.72	0.74	0.76	0.78
Fraction correct event	1.00	0.65	0.72	0.75	0.77	0.79	0.86	0.88
Validation								
Fraction correct	0.52	0.72	0.73	0.74	0.74	0.76	0.80	0.83
Fraction correct no event	0.00	0.80	0.75	0.73	0.72	0.74	0.75	0.78
Fraction correct event	1.00	0.65	0.71	0.75	0.76	0.78	0.85	0.87
Testing								
Fraction selected	1.00	0.14	0.20	0.22	0.23	0.21	0.19	0.16
Hit rate	0.006	0.021	0.017	0.017	0.016	0.017	0.016	0.016
Fraction correct	0.47	0.67	0.67	0.68	0.68	0.68	0.66	0.63
Fraction correct no event	0.00	0.87	0.80	0.79	0.77	0.79	0.81	0.84
Fraction correct event	1.00	0.44	0.53	0.56	0.58	0.54	0.48	0.39

We display similar results for the case of customs stops prediction in Table 9. It can be seen that classification trees display a high level of accuracy to correctly model the decision-making processes used by Customs to decide which consignments to stop: by selecting only 13 per cent of cases 86 per cent of those that will be stopped by customs will be identified.

Table 9: Classification results for stops using classification trees

Tree Levels	1	2	3	15	20	104	456
Training							
Fraction selected	0.00	0.25	0.23	0.17	0.16	0.10	0.08
Fraction correct	0.51	0.86	0.87	0.89	0.90	0.94	0.96
Fraction correct no event	1.00	0.75	0.77	0.83	0.84	0.90	0.92
Fraction correct event	0.00	0.97	0.97	0.96	0.96	0.99	0.99
Validation							
Fraction correct	0.51	0.86	0.84	0.82	0.83	0.79	0.68
Fraction correct no event	1.00	0.75	0.77	0.83	0.84	0.90	0.92
Fraction correct event	0.00	0.98	0.91	0.81	0.82	0.68	0.43
Testing							
Fraction selected	0.00	0.17	0.16	0.14	0.13	0.09	0.06
Fraction correct	0.49	0.89	0.88	0.86	0.86	0.77	0.63
Fraction correct no event	1.00	0.83	0.84	0.87	0.87	0.91	0.94
Fraction correct event	0.00	0.94	0.93	0.86	0.86	0.63	0.34

Figure 9: Fraction training infractions correctly selected as function of classification tree level

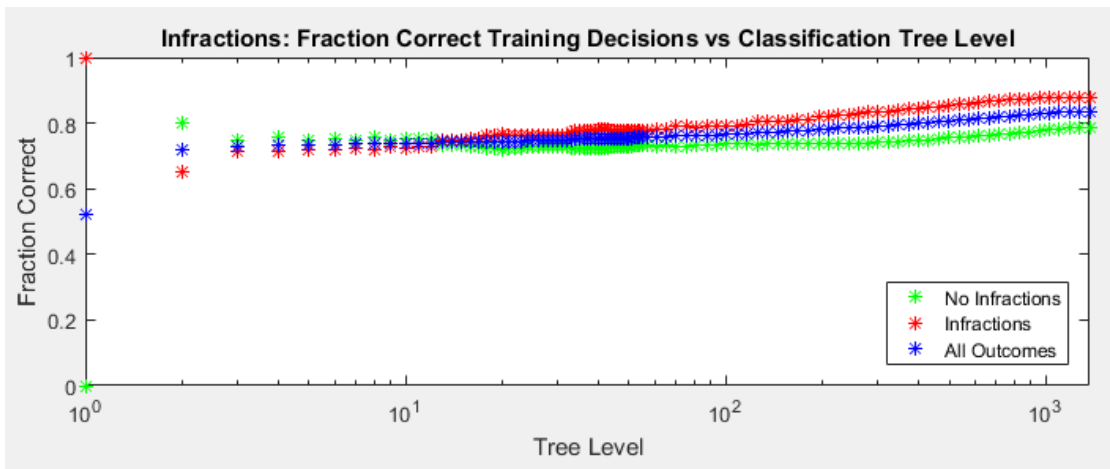
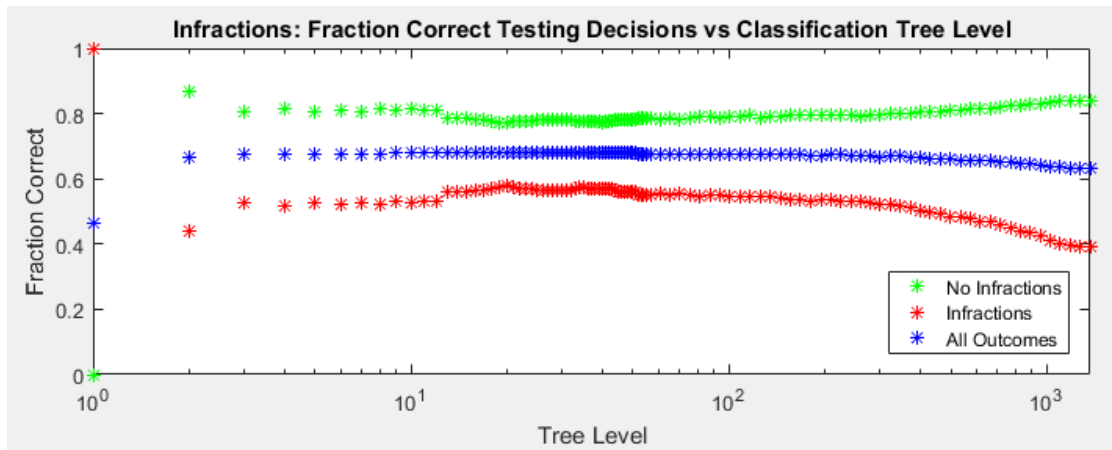


Figure 10: Fraction testing infractions correctly selected as function of classification tree level



6. Discussion

When comparing these results against the figures reported by Laporte (2011), significant differences are observed. This could have been expected as the models were extracted from very different datasets: Laporte used just over 100,000 observations generated by Senegalese Customs, whereas we used about 3.5 million observations generated by SARS Customs. It is quite possible that totally different behaviour would be present both in terms of the real incidence of infractions (resulting from the behaviour of consignors and their service providers) and in terms of the efficiency of the respective customs authority. We specifically note that, while the demonstrated approaches to risk assessment do improve the accuracy of selection compared to a random process, the accuracies of selection achieved on our dataset are not as high as those reported by Laporte. While Laporte claimed the ability to reach accuracies of 90–96 per cent by inspecting only 20–26 per cent of consignments, in our case the inspection rate had to be pushed up to 75–83 per cent to achieve the same. For lower accuracies the difference in performance is also prominent: while Laporte achieved accuracies of more than 50 per cent by selecting only 2–3 per cent of consignments, with our data the same techniques must select about 20 per cent of observations to exceed a 50 per cent accuracy.

It can be observed that other researchers applying similar techniques also did not achieve nearly the same level of selection accuracy as was reported by Laporte (2011). Selection accuracy in this case refers to the ability to correctly select only cargo consignments that include infractions for inspections. The difference in results may be partially explained by the fact that Laporte may have extracted his selection model from the entire data set, and that his selection accuracy results were then extracted from the same data used to produce the models. As can be seen from our results, empirical models will produce more accurate results for the datasets from which they were extracted than when the model is applied to previously unseen data.

Differences in effectiveness of the same techniques applied to two different datasets can also be explained by the nature of the input dataset as well as by the approach followed by the respective customs authority. To achieve the level of accuracies reported by Laporte the infractions present in the total population must be restricted to a relatively small number of the categories amongst which the observations are distributed. Our analyses of category behaviour as displayed in section 3.2 clearly shows that for our dataset, and for all category variables, the incidence of infractions is distributed across too many different

categories to allow 95 per cent of infractions to be found within as little as 20 per cent of the population. Even combining the different category variables as inputs into a neural network or classification tree cannot reach the same level of accuracy as was possible for the Laporte dataset.

Another factor that will influence the results is the fraction of consignments that were subjected to physical inspections before infractions were declared. In the case of SARS Customs, who already employs a relatively sophisticated risk management system, only a small fraction of consignments (about 2%) are physically inspected. In the case of Senegal, as with most other African countries, no systematic risk management approach was used at the time when Laporte performed his experiments. It is quite likely that they employed a much higher inspection rate, as it is common in many African countries to inspect virtually 100 per cent of all import consumer goods. If the current system used by SARS Customs was not effective in selecting those consignments for inspections that did include infractions, then the available data set will not include the majority of infractions actually present in the cargo processed. In such a case it will be impossible for an empirical model, extracted from data with such obvious limitations, to perform as well as in a case where almost all consignments were physically inspected and as a result more of the infractions that were present were found and thus represented in the data.

While the available data set may not necessarily accurately reflect the true presence of infractions, it does accurately reflect the decisions made by customs. A more realistic test for the techniques that we employed is therefore to determine how accurately they can predict customs decisions based on prior data. Table 9 shows that by selecting 16–17 per cent of consignments, 93–94 per cent of customs decisions to stop can be predicted out-of-training-sample. This provides evidence that the techniques that we applied work well on datasets that contain the required level of consistency in input–output relationships.

7. Conclusions and recommendations

Against the background of the previous sections, we can reach the following set of conclusions and recommendation, by addressing each of the stated research questions:

1. *Capability of identified input factors to predict Customs outcomes:* The results displayed in Table 5 provide a quantified answer to this question. Consignor identify was clearly the individual explanatory variable that contains the most prediction ability; in all likelihood it plays an important role in decisions taken by this customs authority.
2. *Combination of input factors that provide the best risk-prediction capability:* Apart from consignor, the other inputs that made a significant contribution include country of origin, transport mode (which in the case of our dataset is closely related to customs office as the two largest customs offices are served by primarily one transport mode each) and CPC code. Increasing the number of explanatory variables to a maximum of 9 did not appreciably improve prediction ability.
3. *Most effective empirical modelling technique:* Regression models performed slightly better than the simplistic techniques, with neural networks slightly outperforming regression models and classification trees providing the most satisfactory performance within the set of techniques that were investigated. As expected, the ability to correctly predict the outcome of the customs process was much superior to the ability to predict the incidence of infractions.

4. *Potential to improve the current South African Customs decision-making process:* From the results in sections 3 and 5, it is clear that the risk models can improve current processes as they all produced infraction incidence rates in the highest risk categories that are significantly higher than the incidence rates in the lowest risk categories. The level of improvement will depend on the minimum accuracy that is required for finding infractions. Based on our results, it is suspected that the primary limitation to extract accurate empirical models to be used in a risk engine is not the quality of the modelling techniques but the quality of the infraction incidence data that was generated by historical customs processes.
5. *Methodology to be followed:* The processes as described in section 4 are all applicable. If a technique is required that allows accurate control over the fraction consignments selected for inspections, then neural networks combined with setting an optimal risk score threshold value will be the most suitable; if a technique is required that allows the selection of the smallest fraction of consignments for a reasonably high selection accuracy then classification trees may be the best choice. In order to ensure that the models that are extracted remain current, the proposed methods of model extraction should be repeated on a regular basis, as the evidence shows that some of the underlying relationships change significantly over time.

Future work will focus on specific vertical markets that are severely impacted by customs operations. This work will involve extending the set of data fields extracted and measuring time delays in the process across the entire value chain, rather than focussing on the customs process only. This should indicate in which part of the value chain the most improvements can be achieved based on the ability to predict and detect eventualities at an early stage.

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Impact of rules of origin on market access in Japan for developing countries under Generalized System of Preferences (GSP)

Yuki Mizuo

Abstract

This paper analyses the impact of rules of origin (ROO) of Japan's Generalized System of Preferences (GSP) on Japan's import value using data for 97 countries and territories. Under the GSP scheme, Japan unilaterally provides preferential tariff treatment for goods originating in developing countries to promote their exportation and economic growth. Aiming to capture the restrictiveness of ROO, I construct a synthetic index based on earlier research by Cadot et al. (2006). Regression results show that when the tariff rate under ROO is raised by one point, import value using GSP decreases by 19.2 per cent. This result is statistically significant and robust. An additional finding is that the GSP import value increases by approximately 3 per cent when the tariff rate is reduced by one percentage point. Furthermore, EPA eligibility reduces the GSP import value significantly because when both Economic Partnership Agreements (EPAs) and GSP preferential tariffs are provided to the same product, and if the EPA rate is less or equal to the GSP rate, importers cannot claim GSP. On the other hand, exemption from documentary submission requirements does not affect the GSP import value. These findings have the potential to enable Japan to make trade rules more strategic in response to changes in the global trade environment.

1. Introduction

The Generalized System of Preferences (GSP) has been playing an important role in promoting the economic growth of developing countries, with reduced or zero tariff rates provided by developed countries since its introduction was agreed in United Nations Conference on Trade and Development (UNCTAD) in 1968. Nearly 50 years have passed since the launch of GSP in Japan and the world trade environment has changed dramatically. Trade volume has grown enormously due to economic growth of the third world and expansion of information technology. When GSP started, China was almost absent from world economy because it was in the middle of the Great Proletarian Cultural Revolution (Anderson, 1998). Since China adopted its opening-up policy, it has become the second biggest economic superpower. During that time, Japan experienced both rapid growth and a sequential long-lasting slump after the collapse of the bubble economy.

Furthermore, the World Trade Organization's (WTO) negotiations have shifted to bilateral and multilateral free trade agreements (FTA) or economic partnership agreements (EPA), because the WTO Doha round, which started in 2001, was suspended and member countries needed to find other ways to realise the liberalisation of trade. Global supply chains now cover trans-national networks to minimise the cost of production, which makes it more complicated to understand many factors influencing trade activities and to adopt appropriate policies. Among these rapidly changing circumstances, Japan's GSP scheme should

now be reassessed. It is vital to re-examine its role in the future so that it can balance effective aid for economic development in emerging partners and adequate protection for sensitive domestic industries by using tariff measures and other trade policies.

For each of the preferential schemes, including GSP, the crucial factor that may affect a trader's decision is rules of origin (ROO). ROO is the criteria for importing goods to qualify for preferential tariff treatment. Not only GSP, but each FTA/EPA requires its own ROO. Recently, managing ROO has become a serious issue for both private traders and customs administrations. To manage this technical matter accurately, it is necessary to examine the effect of ROO on trade quantitatively. It is a relatively new academic field to study the impact of ROO using econometric methods.

Related studies can be categorised into three groups. The first group of studies analyses the effect of ROO under FTA/EPAs. The second group examines the ROO effect under GSP. The third group focuses on the effect of Japan's ROO under EPAs. Studies in the first group show a significantly negative impact of restrictive ROO on trade value or utilisation rate of each FTA. For example, Estevadeordal (2000) first creates a synthetic index that captures the restrictive level of ROO under NAFTA as level 1 to 7 at HS¹ 6-digit level. Based on this index, Estevadeordal and Suominen (2004) introduce ROO levels into a standard gravity model using data from 155 countries, aiming to uncover the effect of ROO on trade. Their estimated results show that restrictive ROO undermines the total trade value between FTA partners. This is leading research in the field, nevertheless they do not incorporate the level of tariff reduction and separate import data, which is purely claiming FTA in their model. Therefore, the result might not be adequately precise.

Taking into account these factors, Cadot, Carrere, Melo and Tumurchudur (2006) compare the effect of ROO on the utilisation rate under NAFTA and the PANEURO system by further constructing the ROO index to capture more detailed features. They conclude that restrictive ROO discourages the utilisation of FTAs. Following these works, Kim and Cho (2010) and Hayakawa, Kim and Lee (2014) examine the impact of ROO on the utilisation rate of Korea–ASEAN FTA (KAFTA), while controlling the effect of tariff reduction and average import volume. In their study, ROO indices are basically the same in the works by Estevadeordal et al. (2004) and Cadot et al. (2006), but slightly modified to fit the specific rules of KAFTA. Bombarda and Gamberoni (2013) use the ROO index developed by Cadot et al. (2006) and find the evidence that diagonal cumulation relaxes ROO's negative effect on trade. In addition, Hayakawa and Laksanapanyakul (2017) use an interesting approach to measure the impact of common ROO on FTA utilisation, using export data from Thailand. They create a ROO dummy with more general criteria compared to previous literature to classify 'common ROO' among six ASEAN+1 FTAs. They show that harmonisation of ROO within ASEAN+1 FTAs has different effects, depending on the types of rules, whether the rule is based on classification or value-added (details of these ROO types are explained in 2.2). Yi (2015) provides a comprehensive summary of literature regarding the ROO of FTAs and concludes that ROO create a higher cost and compliance burden for traders using FTAs.

Compared to the studies on FTAs reviewed above, the second group of literature, which uses an econometric approach to GSP, is rather limited. Most of the previous studies have focused on the EU's GSP. Francois, Hoekman and Manchin (2006) research the determinants of the EU's GSP utilisation, applying gravity model analysis. The gravity model was invented to explain the bilateral trade volume, but they assume that the GSP utilisation rate can be estimated by the model. Though they mention that the ROO is one of main costs of utilising GSP, they do not incorporate a detailed ROO effect in their regression. The European Commission (2015) assesses the impact of GSP on export performance of developing countries, using tariff reduction data and differences in methodologies. However, again it does not assess the specific ROO effect in detail.

On the other hand, Hakobyan (2016) analyses the US's GSP. The ROO of US's GSP is simple: the sum of the local input value and local processing cost needs to be at least 35 per cent of the final product. Even though the ROO is common for all eligible products, Hakobyan assumes that the administrative burden is higher if the commodity is a processed product rather than primary product, as more documentation is required. Hakobyan also calculates the local content using OECD data. Her regression results indicate that the degree of processing causes a decrease of GSP utilisation, while the greater the local content share, the greater the utilisation rate. Her method of ROO assessment is unique due to the simplicity of US's GSP rule.²

In the third group, there are very few empirical studies regarding Japan's ROO, all of which have examined FTA/EPAs. Cheong and Cho (2007) compare features of ROO under several Asian FTAs, including Japan–Singapore and Japan–Mexico EPAs. They use the index developed by Estevadeordal et al. (2004) and find that Japan's FTA rule is rather more stringent than that of Korea, and less stringent than that of NAFTA. They compare and categorise ROOs by a number of aspects; nevertheless, there is no econometric assessment on trade value or utilisation rate. Bando, Shirayama, Sawauchi and Yamamoto (2008) compare ROO under Japan's four EPAs³ and conclude that there are large variations among these EPAs, resulting in the spaghetti bowl phenomenon. They suggest that the difference in ROO under each EPA may hinder free trade. However, they do not show any empirical evidence of the actual ROO effect. Nakaoka (2017) conducts her empirical research on ROO under Japan's EPAs, focusing on textiles and apparels (HS Section XI). She creates the ROO index suitable for Japan's EPA rules, mainly based on Harris's (2007) index, which is more segmented, based on Estevadeordal's (2000) index. Her results indicate that a one-point increase in ROO causes around a 5 per cent decrease in the EPA utilisation rate. Although these studies have made limited difference in the development of ROO index, the principle idea is common, and the results are consistent. Still, there is no preceding literature on the impact of ROO of Japan's GSP; therefore, the effect of the GSP rule is currently unknown.

The author believes that this is the first paper to focus on the product-specific ROO in GSP context, which contributes to Japan's future policy making so that it can continue to benefit both developing nations and Japan. This paper reveals the effect of ROO on importation under Japan's GSP, using a panel dataset composed of products at the nine-digit tariff level from 97 developing countries and territories for a four-year period from 2013 to 2016. The results imply that a one-point increase in the ROO restrictiveness causes a 19.2 per cent decrease in GSP import value, which corresponds to a 1.3 per cent decrease in total import value of the corresponding products. From these outcomes, it can be seen that ROO can undermine importation. In addition, a tariff reduction of one percentage point brings around a 3 per cent increase in GSP import value. Furthermore, the eligibility of EPAs greatly decreases GSP import value, while exemption from documentary submission requirements does not leave a significant effect. These findings contribute to further policy making on Japan's GSP.

Section 2 provides an overview of ROO and GSP. Then, section 3, describes how to convert ROO into numerical numbers; the obtainment of other data; and the empirical model used. Section 4 presents the results and interpretations, including robustness checks. Finally, policy proposals and concluding remarks are presented in section 5.

2. Background

2.1 Rules of origin (ROO)

ROO are the specific provisions used mainly to determine whether goods being imported attract reduced tariff rates under preferential schemes of GSP or FTAs/EPAs. Why are ROO important? The main reason is 'to prevent trade deflection' (Hakobyan, 2016, p. 410), whereby exports from non-beneficiaries are redirected through an eligible country to avoid customs duties (Brenton & Manchin, 2003). The rules vary

depending on each GSP program or each trade agreement. GSP rules are contained in the provider's own laws and regulations because it is unilateral treatment, whereas ROO of FTAs are negotiated between the FTA partners. In both cases, the ROO are closely related to the countries' concerns about their industrial policy, because each country has domestic industries in which they would like to encourage exportation or which they would like to protect against importation.

The Revised Kyoto Convention⁴ identifies two basic criteria for ROO, which most preferential trade agreements, including NAFTA, apply (Reyna 1995 as cited in Estevadeordal & Suominen, 2004), namely 'wholly obtained or produced' and 'substantial transformation'.

Wholly obtained goods: Goods in this category are produced entirely in one beneficiary country. Primary commodities, such as agriculture products and fuels, are in this category, as are scrap and waste derived from other goods.

Goods that satisfy substantial transformation: Even though non-originating materials are used, if the goods have undergone production in the party and have been transformed substantially, then the goods are recognised as having originating status of the party. The frequently used criteria for substantial transformation are:

- (1) Change in tariff classification (CTC rule). Designated HS tariff classification change is needed for all non-originating materials that are used to produce the goods. Frequently used classifications are change of chapter (CC), change of tariff heading (CTH) and change of tariff sub-heading (CTSH).
- (2) Value added (VA rule). When the added value in the party exceeds a certain percentage, the goods are recognised as originating from beneficiary countries. Mainly there are two ways to calculate the added value: deducting the value of non-originating goods from the final good; and aggregating the value of originating goods and other values, such as profit. Basically, the final value is calculated at the free on board (FOB) level, whereas the non-originating goods value is calculated by using cost, insurance and freight (CIF), as long as it is possible to trace.
- (3) Specific manufacturing or processing operation (Process rule). When goods go through a certain manufacturing process, they get originating status in this category, such as certain chemical reactions and manufacturing processes of clothes, such as spinning and weaving.

In addition to these rules, there are other rules to relax the above origin criteria. For example, the accumulation rule allows that the production in more than two countries can be seen as one manufacturing series and it is counted towards a substantial transformation. Bombarda and Gamberoni (2013) estimate the role of diagonal accumulation under the Pan-European cumulation system to show the relaxing effect on the restrictiveness of the ROO. Another rule, the *de minimis* rule, also permits non-originating goods that do not satisfy the product-specific rules to be disregarded under certain condition of value, weight or volume, so that the goods can get originating status without the need to consider trivial components. This paper, however, does not focus on these supplemental provisions. In addition, even when the origin criteria described above are satisfied, the goods still need to satisfy consignment criteria and customs procedures of proving the originating status in order to obtain the preferential treatment.

2.2 Generalized system of preferences (GSP)

GSP^{5, 6} is a scheme through which developed countries unilaterally provide wider market access with low or zero tariff rates for commodities exported from developing countries, thereby encouraging the exporting industries and economic growth of these trade partners. The establishment of GSP was agreed upon at the United Nations Conference on Trade and Development (UNCTAD) in 1968. Since then, GSP has been a worldwide scheme between developed countries and developing countries. Currently, there are 13 GSP providers listed by UNCTAD.

There are various types of the GSP schemes in the world. Table 1 compares the GSP schemes of Japan, the US and the EU. The top row shows each country’s framework and the bottom row indicates the ROO. Since GSP was introduced in Japan in 1971, Japan has been one of the main nations granting GSP preferences, with more than 3,500 dutiable products imported from about 140 developing countries and territories.⁷ The US also provides a wide range of preferential tariff systems, including the African Growth and Opportunity Act (AGOA). Under AGOA, the US grants greater market access⁸ for Sub-Saharan African countries than the normal GSP where the beneficiary countries satisfy certain conditions relating to human rights and labour standards. On the other hand, the EU’s special system GSP+ has its own objective of promoting sustainable development and good governance, setting conditions such as complying with 27 international conventions on human rights and labour rights. Developing countries that meet the criteria can get greater access to EU markets. Moreover, Japan, the US and the EU all provide GSP for least developed countries (LDCs)⁹ and non-LDCs, where LDCs can enjoy more favourable tariff treatment.¹⁰

Recently, the EU’s GSP was revised to restrict beneficiaries to countries that need support for their development. Japan also revised its condition for GSP graduation, and there is a high possibility that China and some other countries¹¹ that have enough economic competitiveness will graduate in 2019.

The ROO for each country’s GSP varies. For Japan’s GSP¹², the general rule requires a change in CTH, and product-specific rules are classified into the CTC rule, VA rule, process rule and combinations of these rules, which are similar to the EU. On the other hand, the US’s ROO are simple, being a value-added requirement of 35 per cent for all eligible commodities.

Table 1: Comparison of major countries’ ROO for GSP schemes

Japan	US	EU
GSP GSP for LDC	A: GSP A*: GSP with exception for certain countries A+: GSP for LDC AGOA for Sub-Saharan Africa	Standard GSP GSP+ for vulnerable countries EBA (everything but arms) for LDC
General rule: CTH Product-specific rule: CTC, VA and process rules	General rule: VA rule, more than or equal to 35% Materials purchased from third countries can be counted into the 35% only when the material undergoes a double substantial transformation.	Product-specific rule: CTC, VA and process rules Rules are relaxed for LDC countries on some products

Source: United States Trade Representative HP, European Commission HP.

In summary, although GSP is a global concept for promoting export industries in developing countries, preferential schemes and the ROO of each program vary. In the case of the US’s GSP, the ROO are general rules only: value-added rule of 35 per cent. Therefore, Hakobyan (2016) analyses the utilisation rate of the US’s GSP using the local content data calculated by input–output tables. However, her results cannot be applied to Japan and the EU, because the ROO under Japan and the EU’s GSP have product-specific rules. Again, no study has been done to evaluate product-specific ROO in the context of GSP before this paper.

3. Methodology

3.1 Data issues

In order to estimate the effect of ROO empirically, it is necessary to convert ROO—which are written in text—into numerical form to indicate the restrictiveness. The ROO of Japan’s GSP is a combination of the general and product-specific rules, as seen in section 2.2. For evaluating the restrictiveness of product-specific ROO under FTAs, Estevadeordal (2000) first created a ROO index to capture NAFTA’s ROO. After that, Cadot et al. (2006) further developed the index. The basic idea is common, but Cadot et al.’s index is more segmented into the details and suitable for capturing the complicated Japanese GSP rules. Therefore, in this paper the author converted the ROO based on the index of Cadot et al. (2006), with a slight modification to fit Japanese rules.

Following this index, conversion of the ROO is conducted at the HS 6-digit level, ranging from 1 to 7. Level 1 is the least restrictive while level 7 is the most restrictive. The basic idea of assessing the CTC rule is the same as Estevadeordal’s index: CC (which requires the manufacturing process with a change in HS 2-digit level if producers use non-originating materials), deserves restrictiveness level 6; CTH (which requires the manufacturing process with change in HS 4-digit level if producers use non-originating materials) is level 4 because it is easier to satisfy than CC; and CTSH (which requires the manufacturing process with change in HS 6-digit level if producers use non-originating materials) is level 2, since it is easier to fulfil. For example, the ROO of HS chapter 3 is ‘Manufactured from products other than those of Chapter 3’, which corresponds to CC (level 6). In this case, if the final product being exported to Japan is ‘salted fish’, the main material ‘fresh fish’ (same in chapter 3) must be obtained within the beneficiary country, whereas other supplemental material such as ‘salt’ (chapter 25) can be purchased from a third country because there is a chapter change (from chapter 25 to 3).

In the case of the value-added (value-content) rule, Cadot et al. (2006) sets the cut-off point of 60 per cent for local content. If the value-added requirement is smaller than 60 per cent originating (VA1), the restrictiveness level is 4, and if it is higher or equal to 60 per cent, level 5 is assigned (VA2). Also, there are other patterns of requirements, such as the process rule (PROC, which is the same as the technical requirement), exceptions (EXC) and allowances (Allow). Exceptions aggravate the requirement so that exceptions can raise the index one level, whereas allowances mitigate the rule, which can lower the index one level. Other criteria depend on the combinations of several rules, as shown in Table 2. The author converted 6-digit of HS 2012, trying to adhere to Cadot et al.’s (2006) index as much as possible.

Table 2: Conversion criteria for ROO of Japan's GSP

Restrictiveness	Criteria
1	CI
2	CTSH PROC
3	CTH + Allow CTSH + EXC
4	CTH VA1 CTSH + Allow + EXC + VA1
5	CTH + EXC CTH + VA1 CTH + PROC VA2
6	CC CTH + VA2
7	CC + EXC CC + PROC CTH + VA2 + EXC VA2 + CI + EXC

Notes: This criterion is based on the index developed by Cadot et al. (2006). CI = Change of item (9 digit), CTSH = Change of tariff sub-heading (6 digit), CTH = Change of tariff heading (4 digit), CC = Change of chapter (2 digit), VA1 = VA requirement < 60%, VA2 = VA requirement ≥ 60%, PROC = Process rule, Allow = Allowance, EXC = Exception.

One example of a combination of several rules is HS sub-headings 1806.10 to 90: chocolate and other food preparations containing cocoa. Part of these subheadings require 'Manufactured from products other than those of heading 18.06, provided that the value of non-originating products used does not exceed 40% of the value of the products and the sugar and milk (including cream) used is originating'. In this case, 'Manufactured from products other than those of heading 18.06' corresponds to CTH, 'the value of non-originating products used does not exceed 40%', which means that VA requirement is 60 per cent originating (VA2) and 'the sugar and milk (including cream) used is originating' corresponds to exceptions (EXC). Therefore, the combination is CTH + VA2 + EXC, which deserves restrictiveness level 7. In Table 2, VA2 + CI + EXC is for part of HS sub-heading 2106.90 only. CTSH + Allow + EXC + VA1 is for HS sub-heading 9503.00 only.

Some ROO are not compatible with the HS 6-digit level. Some are stipulated at a finer level, or even not exactly corresponding to the 9-digit level. Therefore, if there is more than one ROO within the HS 6-digit level, the author calculated a simple average. For example, HS sub-heading 9603.90 is divided into three groups with different ROO of level 1, 4 and 5. In this case, the author took the average of 3.3. Another

point is that if there is more than one choice between alternative ROO offered for the same product, Cadot et al. (2006) assigns the lowest level, since the exporter can choose which rule applies. However, Japan's GSP does not have an alternative choice in a single commodity, therefore such modification is not included in this data.

Moreover, the author reflects the regulation amendment in 2015 regarding chapter 61 (knitted apparels). Before the amendment, ROO for chapter 61 required two processes. One is making fabrics from textile yarn and the other is manufacturing apparels from the fabrics. In this case, not only satisfying change of chapter (CC) but also going through certain process (PROC) is required, which is equivalent to ROO level 7. However, the two-process rule was relaxed into one process rule in 2015. Consequently, purchasing fabrics from third states and simply producing the final product in the benefitting country is now accepted to use GSP, which corresponds to ROO level 6 (CC).

All data, except for ROO, was obtained from published sources. Japan's GSP import value is taken from Japan Customs' website (Japan Customs, 2018b). Japan Customs data is available from 2013; therefore, the author used four years of import data from 2013 to 2016, which is the maximum of data currently available. In the data, all the GSP-eligible countries and territories in the world are covered (around 140, although this changes every year), although not all the beneficiaries have trade using GSP during the period. That is mainly because some members only export limited commodities, such as crude oil, which has a MFN tariff rate of zero. Hence the data includes 97 developing countries and territories (see Appendix, Table 7). GSP-eligible countries change every year because soon after they achieve economic development to satisfy graduation criteria, they are excluded from the GSP beneficiaries. Croatia and Cook Islands graduated from GSP during the study period, while Samoa also changed from an LDC to a non-LDC country. In this data these changes are fully reflected in the corresponding years.

Japan's total import value, regardless of using preferential tariff or not, is obtained from E-Stat, the trade statistics of Japan. This trade data includes all imports under MFN, EPA and GSP. It is expected that the higher total import value, the greater the import value using GSP. The products (9-digit level) that have a GSP import value of zero are dropped from the data.

Using tariff rates for MFN, GSP and LDCs, the author calculated the tariff margin, which Hayakawa et al. (2014) also introduce into their model, by subtracting preferential tariff rates from MFN rates. The author used 12 patterns of tariff schedules in total: tariff rates for MFN countries, GSP for non-LDCs and LDCs for each year from 2013 to 2016. The tariff schedules are obtained from the World Bank (WITS). In order to make the calculation simpler, 'specific-tariffs' are excluded and use only *ad valorem* tariffs. It is expected that if the tariff reduction is bigger, importers have more incentive to claim preferential tariff, therefore the impact of tariff reduction on import value is predicted to be positive.

EPA availability is also considered. Japan has 15 EPAs in force as of June 2018. Among these EPA partners, 13 countries (Mexico, Malaysia, Chile, Thailand, Indonesia, Philippines, Vietnam, India, Peru, Mongolia, Laos, Myanmar and Cambodia) under 11 EPAs are eligible to both EPA and GSP during the data period. A bilateral EPA with Mongolia entered into force in 2016, while others were all available through the period 2013–2016. Therefore, in total, the author used 41 patterns of EPA tariff schedules obtained from WITS: 10 EPAs from 2013 to 2016 each, plus EPA with Mongolia in 2016. EPA eligibility is predicted to reduce the GSP import value significantly, because when both EPA and GSP preferential tariffs are provided to the same product, and if the EPA rate is less or equal to the GSP rate, importers cannot claim GSP. The only exception is LDC members of Japan–ASEAN EPA (Laos, Myanmar and Cambodia). In the case of these countries, importers can choose to claim either the EPA or the LDC preferential rate. As importers tend to choose the lower tariff rate, the author generated a dummy to identify whether the EPA tariff rate is less than or equal to the GSP tariff rate. It is predicted that if the commodity is eligible for EPA, GSP import value is much less.

Furthermore, documentary exemption is controlled. Some specific goods are exempted from submitting a certificate of origin (CO), with the tariff line specified in administrative regulations, mainly at HS 4-digit level. The author obtained the list from the Japan Customs website and converted it from the version of HS 2017 into HS 2012 using a correlation table obtained from the WCO. The effect of this variable could be positive as exporters do not have the cost of obtaining a CO. Appendix Table 8 shows the summary statistics of these variables and Appendix Table 9 indicates the distribution of ROO restrictiveness in the sample.

3.2 Empirical framework

Here the author describes the empirical framework used to analyse the determinants on GSP import value. Whether GSP is claimed or not must depend on its benefit and cost. The benefit of GSP is getting preferential tariff rates, which are lower than MFN tariff rates. Therefore, it is predicted that the greater the tariff difference between the MFN and GSP rates, the greater the positive impact on the GSP import value.

On the other hand, the cost of GSP is necessary to comply with ROO. Before importers decide to claim GSP, they usually need time to determine the origin criteria applied for each good and sometimes need to make adjustments to satisfy the rule, such as shifting the material supplier from a firm in the third country to a firm within the beneficiary country. In addition, the ROO have procedural provisions: importers must submit the CO to Japan Customs to certify the origin of the goods. Normally, an issuing fee is required to obtain the CO (Form A). For example, getting a CO in Malaysia costs 41–67 RM for 30 sets of documents (Federation of Malaysian Manufacturers, 2017). Moreover, importers sometimes need to deal with origin verification conducted by Customs after importation. If they cannot satisfy Customs confirmation of the origin status, GSP treatment would be denied and may even be subject to additional punitive duties. These burdens and risks are the cost of GSP.

Taking into account these factors, the equation is formalised as follows:

$$\text{Log(GSP)}_{cpt} = \beta_0 + \beta_1 \Delta\text{Tariff}_{cpt} + \beta_2 \text{Log(Imp)}_{cpt} + \beta_3 \text{ROO}_{pt} + \beta_4 \text{EPA}_{cpt} + \beta_5 \text{Document}_p \quad (1) \\ + \gamma_c + \delta_s + \eta_t + \varepsilon_{cpt},$$

where Log(GSP)_{cpt} is the natural log of the import value under Japan's GSP of product p at 9-digit level from country c at year t ; $\Delta\text{Tariff}_{cpt}$ is the tariff rate difference between *ad valorem* MFN and GSP tariff rate of product p at 9-digit level from country c at year t ; Log(Imp)_{cpt} is the natural log of the total import value of product p at 9-digit level from country c at year t , regardless of claiming GSP or not; ROO_{pt} indicates the restrictiveness of ROO under Japan's GSP for product p at 6-digit level at year t (time variation is only in chapter 61); EPA_{cpt} is a dummy which takes value 1 if product p at 9-digit level from country c is eligible for alternative EPA; Document_p is a dummy which takes value 1 if product p mainly at 4-digit level is exempt from procedural requirement of submitting CO; γ_c , δ_s and η_t are the fixed effects for country c , industry s and year t , respectively.

The industry dummy is introduced at the 2-digit section level of HS code. ε_{cpt} is the error term, which represents unobserved errors in each country-product-year. To address the remaining potential correlation within a product at 9-digit level, heteroscedasticity and autocorrelation-consistent (HAC) standard errors or clustered standard errors are employed in all the regressions in this study. Significance levels are at 0.1 per cent, 1 per cent and 5 per cent to see more precise relationships.

4. Results and robustness checking

4.1 Empirical results

The regression results are reported in Table 3. Regression (1) and (2) are obtained by simple OLS, whereas regression (3) to (7) are OLS with fixed effects model. ‘Expected sign’ represents the initial expectation whether each variable has a positive or negative effect on import value under GSP.

Table 3: Estimation results: Impacts on log of import value under Japan’s GSP

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Expected Sign
	OLS	OLS	FE	FE	FE	FE	FE	
ΔTariff		0.032***	0.035***	0.032***	0.036***	0.032***	0.032***	+
		(0.004)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	
Log(Imp)		0.612***	0.621***	0.622***	0.622***	0.623***	0.623***	+
		(0.007)	(0.009)	(0.009)	(0.008)	(0.008)	(0.008)	
ROO	-0.266***	-0.093***	-0.083***	-0.087***	-0.178***	-0.188***	-0.192***	-
	(0.028)	(0.015)	(0.015)	(0.017)	(0.047)	(0.047)	(0.047)	
EPA				-0.386***		-0.643***	-0.641***	-
				(0.116)		(0.128)	(0.128)	
Document				-0.037			-0.036	+
				(0.053)			(0.061)	
Year FE	No	No	Yes	Yes	Yes	Yes	Yes	
Country FE	No	No	Yes	Yes	Yes	Yes	Yes	
Industry FE	No	No	No	No	Yes	Yes	Yes	
Constant	9.777***	2.250***	2.116***	2.198***	3.060***	3.228***	3.258***	
	(0.161)	(0.102)	(0.109)	(0.126)	(0.442)	(0.441)	(0.442)	
Obs.	13,456	13,436	13,436	13,436	13,436	13,436	13,436	
R-squared	0.027	0.643	0.651	0.651	0.696	0.698	0.698	
Std. Error	HAC	HAC	HAC	HAC	HAC	HAC	HAC	

Notes: Clustered standard errors are in parentheses. ***, ** and * indicate significance at the 0.1%, 1% and 5% level, respectively.

In regression (1), ROO restrictiveness is regressed against the GSP import value. The result shows a significant negative effect of ROO on importation, which is consistent with previous studies. However, R-squared is only 0.027, which is too small to explain the overall relationship. It suggests that there must be some omitted variables from which the estimated ROO effect is biased. In regression (2), the author added two control variables, tariff reduction and log of total import value. Hayakawa et al. (2014) calls the tariff reduction a ‘margin effect’ on utilisation rate of FTAs and shows a significant positive outcome. Total import volume is also important to control because it represents total demand for each commodity. After introducing these controls into the regression model, the coefficient of ROO is moderated and R-squared jumps up.

In regression (3) and (4), the author brought in year fixed effect and country fixed effect, which can control unobservable specific effects within each year and each country. In addition, regression (4) contains other possible control variables, binary dummies for EPA eligibility and documentary exemption. Hakobyan (2016) includes the availability of other preferential programs such as FTA to evaluate the determinants of GSP utilisation rate in US. The results of ROO are almost the same as simple OLS regression (2), though absolute value of coefficient slightly decreases.

In regression (5), (6) and (7), the author applied industry fixed effect in HS 2-digit level, which captures constant common characteristics within each industry. Then the negative impact of ROO is broadened, implying there is positive bias in regression (3) and (4) without industry fixed effect. In regression (7), with all controls, it is implied that when ROO restrictiveness is raised by 1 point, import value using GSP decreases by 19.2 per cent even at 0.1 per cent significance level. This figure corresponds to 1.3 per cent decrease in total import value of sample products regardless of claiming GSP or not, as shown in Table 4.

Table 4: Calculation of the impact of ROO on total import value

Total import value	Import value GSP	(Import value GSP)*19.2%
6,943,518 million yen	453,355 million yen	87,044 million yen
$(\text{Import Value GSP}) * 19.2\% / (\text{Total Import Value}) = 0.013$		

Notes: ‘Total import value’ represents total import value of corresponding products in the sample data regardless of claiming GSP or not, exported from the 97 sample countries in 2013–2016. ‘Import value GSP’ is the sum of import value claiming GSP in the sample data exported from the 97 sample countries in 2013–2016.

Note that not all importers may totally abandon trade because of the unavailability of GSP. Instead, it is likely that if ROO becomes more restrictive, some importers simply do not use GSP and import the goods paying MFN duty, or reduce the amount of importation commensurate with their cost balance. As a result, a decrease in the ratio of total import value could be less than 1.3 per cent.

Throughout the regressions in Table 3, tariff reduction and total import value have significant positive effects, while EPA eligibility has a large negative effect as initially expected. These results are consistent with previous studies. When the tariff rate is reduced by one percentage point (e.g. from 4% to 3%), the import value under GSP increases around 3 per cent. Likewise, when the total import value, regardless of claiming GSP, increases 1 per cent, import value under GSP increases around 0.6 per cent. When EPA is applicable for the same commodity, claiming GSP falls about 64 per cent. An additional finding is that documentary exemption does not affect the GSP import value.

4.2 Robustness checks

In order to address the concerns of potential internal validity threat related to the omitted variable bias and possible sample bias caused by large outliers, the author conducted two different robustness checks: adding several control variables, which might affect the import value of GSP; and excluding China, which could lead to a certain bias because of the dominating ratio of observations in the sample.

In the first robustness check—added control variables are GDP per capita—the inflation rate measured by the consumer price index (annual per cent) and the population growth rate (annual per cent). These data are obtained from the World Bank World Development Indicators. The author also incorporated the country-specific linear time trend to eliminate possible endogenous factors on changes within each country. GDP per capita is included because it represents the level of economic development of each country, hence the assumption is possible that the greater the GDP per capita, the more traders have experience with the GSP scheme. For instance, Hayakawa, Kim and Yoshimi (2017) put GDP per capita in their regression to explain the utilisation rate of Korea–ASEAN FTA. The annual inflation rate is added because when the inflation rate is high, the value of domestic currency of sample countries becomes lower, which would promote exportation and might affect GSP export value from these countries. Population growth rate is also included as it is possible that the countries with high population growth have a greater future labour force, which attracts foreign manufacturers and traders, resulting in increased GSP export.

An equation for the first robustness check is formalised as follows:

$$\text{Log(GSP)}_{cpt} = \beta_0 + \beta_1 \Delta\text{Tariff}_{cpt} + \beta_2 \text{Log(Imp)}_{cpt} + \beta_3 \text{ROO}_{pt} + \beta_4 \text{EPA}_{cpt} + \beta_5 \text{Document}_p \quad (2) \\ + \beta_6 \text{GDPcap}_{ct} + \beta_7 \text{Inflation}_{ct} + \beta_8 \text{POP}_{ct} + \text{Trend}^* \gamma_c + \gamma_e + \delta_s + \eta_t + \varepsilon_{cpt},$$

where GDPcap_{ct} is GDP per capita in country c at year t ; Inflation_{ct} is the inflation rate of consumer prices in country c at year t ; POP_{ct} is population growth rate in country c at year t . $\text{Trend}^* \gamma_c$ is the country specific linear time trend.

Table 5 shows the first robustness checking results. Regression (1) to (7) in Table 5 corresponds to the main results (1) to (7) in Table 3. Even after adding more controls, coefficients and clustered standard errors have hardly changed, whereby the robustness of the main results are confirmed.

Table 5: Robustness Check 1 – adding more controls and country-specific linear time trend

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OLS	OLS	FE	FE	FE	FE	FE
Δ Tariff		0.032***	0.036***	0.033***	0.036***	0.032***	0.032***
		(0.004)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)
Log(Imp)		0.621***	0.622***	0.623***	0.624***	0.624***	0.624***
		(0.008)	(0.009)	(0.009)	(0.008)	(0.008)	(0.008)
ROO	-0.172***	-0.096***	-0.084***	-0.088***	-0.179***	-0.190***	-0.194***
	(0.028)	(0.015)	(0.015)	(0.017)	(0.049)	(0.049)	(0.049)
EPA				-0.395***		-0.660***	-0.658***
				(0.116)		(0.130)	(0.130)
Document				-0.042			-0.035
				(0.054)			(0.062)
GDPcap/1000	-0.007	0.008*	0.015	0.013	0.016	0.014	0.014
	(0.008)	(0.004)	(0.044)	(0.044)	(0.044)	(0.044)	(0.044)
Inflation	-0.085***	0.010***	-0.002	-0.002	-0.001	-0.002	-0.002
	(0.009)	(0.003)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
POP	-0.615***	0.072***	-0.816	-0.854	-0.891	-0.965	-0.970*
	(0.056)	(0.025)	(0.567)	(0.570)	(0.586)	(0.588)	(0.588)
Trend* γ_c	No	No	Yes	Yes	Yes	Yes	Yes
Year FE	No	No	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	Yes	Yes	Yes
Constant	10.29***	2.004***	50.57	50.25	45.11	46.99	47.24
	(0.180)	(0.111)	(42.20)	(42.20)	(42.94)	(42.89)	(42.87)
Obs.	13,369	13,349	13,349	13,349	13,349	13,349	13,349
R-squared	0.097	0.644	0.652	0.653	0.698	0.699	0.699
Std. Error	HAC	HAC	HAC	HAC	HAC	HAC	HAC

Notes: Clustered standard errors are in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels. GDP per capita is divided by 1000 in order to increase visibility.

The second robustness check involved excluding China from the dataset as the sample data from China made up nearly half of all observations (see Table 7 in Appendix), and China already has strong trade competitiveness, unlike other developing countries. Therefore, there is a doubt that Chinese data dominates the whole results and that it is biased. An equation for the second robustness check is the same as the equation (2). The only difference is that all the observations of China are excluded.

Table 6 indicates the results of the second robust check. Regression (1) to (3) in Table 6 is compatible with the main results' regression (5) to (7) in Table 3, and regression (4) to (6) in Table 6 is responding to the regression (5) to (7) in Table 5. These regressions all incorporate country-, year – and industry-fixed effects so that the endogenous problem is controlled as much as possible. In all regressions in Table 6, which excludes China, statistical significance in tariff reduction has been eliminated. Still, the ROO maintain rather strong effects and the magnitude of coefficient is almost the same as the main results in Table 3. Hence, even without China, it can be said that there is clear negative impact of ROO on trade.

Table 6: Robustness check 2 – estimation without China

	(1)	(2)	(3)	(4)	(5)	(6)
	FE	FE	FE	FE	FE	FE
Δ Tariff	0.007	0.003	0.003	0.007	0.002	0.002
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Log(Imp)	0.557***	0.559***	0.559***	0.558***	0.560***	0.559***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
ROO	-0.124**	-0.142***	-0.158***	-0.122**	-0.142***	-0.158***
	(0.051)	(0.051)	(0.051)	(0.055)	(0.055)	(0.054)
EPA		-0.661***	-0.655***		-0.681***	-0.675***
		(0.119)	(0.119)		(0.121)	(0.121)
Document			-0.143*			-0.146*
			(0.0779)			(0.080)
GDPcap/1000				-0.044	-0.048	-0.048
				(0.049)	(0.049)	(0.049)
Inflation				-0.001	-0.002	-0.002
				(0.005)	(0.005)	(0.005)
POP				-0.483	-0.556	-0.587
				(0.568)	(0.570)	(0.571)
Trend* γ_c	No	No	No	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

	(1)	(2)	(3)	(4)	(5)	(6)
	FE	FE	FE	FE	FE	FE
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Constant	3.716***	3.990***	4.109***	-353.7	-71.75	-75.69
	(0.472)	(0.471)	(0.470)	(366.8)	(378.9)	(377.5)
Obs.	7,633	7,633	7,633	7,546	7,546	7,546
R-squared	0.684	0.687	0.687	0.687	0.689	0.690
Std. Error	HAC	HAC	HAC	HAC	HAC	HAC

Notes: Clustered standard errors are in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels. GDP per capita is divided by 1000 in order to increase visibility.

5. Conclusion

This paper empirically analyses how rules of origin (ROO) of GSP affect the importation into Japan, using a fixed-effect regression model with a panel dataset from 97 developing countries and territories for a four-year period from 2013 to 2016. The most significant finding is that the import value under Japan's GSP significantly decreases with the more stringent ROO level. An increase in the ROO level of 1 point causes a 19.2 per cent decline in the GSP import value, which is equivalent to a 1.3 per cent decrease of the total import value of the corresponding products. This outcome was maintained in robustness checks. Another finding is that one-percentage-point tariff reduction brings around a 3 per cent increase in the GSP import value. An additional finding is that the eligibility of EPAs greatly decreases GSP import value, while exemption from documentary submission requirements does not affect the GSP import value.

Taking into account these research outcomes, what can Japan do to realise the objective of GSP (i.e. to encourage export from developing countries and constructing strong economic partnerships with them)? The GSP scheme now stands at a turning point, because the government may need to redefine its role due to changes in the trade environment, nearly 50 years after the policy was established. The biggest beneficiary country, China, will graduate from Japan's GSP treatment soon, and most of the Asian countries and Central/South American states are entering into EPAs with Japan. Therefore, the main beneficiary countries under Japan's GSP will shift from Asia to other parts of the developing world, especially Africa. Since the Tokyo International Conference on African Development (TICAD) will be held in Yokohama in 2019, the Japanese government needs to prepare proposals to strengthen its aid for development with effective tools. The expansion of the GSP program may be one option.

The GSP's objective of promoting exports from developing countries cannot be efficiently achieved solely by cutting tariff rates. The ROO's negative impact must be taken into account when the Japanese government simulates or forecasts the economic impact of duty reduction. In order to allow wider access to the Japanese market and protect domestic industries simultaneously, it may be necessary to appropriately modulate ROO and tariff reductions together. Simplification and relaxation of ROO must be considered as a strategic tool, together with tariff management, by which Japan can provide a future-oriented, mutually beneficial GSP scheme for developing partners.

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Appendix

Table 7: Sample countries and number of observations

Exporting Country	2013	2014	2015	2016	Total
Argentina	27	24	17	19	87
Azerbaijan	1	1	1	1	4
Bangladesh	269	288	327	348	1,232
Belarus	5	3	6	7	21
Belize	1	1	1	1	4
Benin	1				1
Bhutan	1	1	1	3	6
Bolivia	6	6	5	6	23
Bosnia Herzegovina	2	3	3	2	10
Brazil	112	110	103	105	430
Burkina Faso	4	3	3	6	16
Cambodia	114	136	237	266	753
Cameroon	6	4	3	2	15
Chile	6	5	8	7	26
China	1,434	1,482	1,450	1,441	5,807
Colombia	35	28	26	26	115
Costa Rica	8	9	10	11	38
Cote d'Ivoire	1	1	1	1	4
Croatia	1				1
Cuba	1	1	1	1	4
Dominican Republic	3	5	1	1	10
Ecuador	22	21	22	19	84
Egypt	26	23	27	21	97
El Salvador		1	1	1	3
Ethiopia	8	8	10	13	39
Fiji	4	2	2	2	10
Georgia	1	1	1		3

Exporting Country	2013	2014	2015	2016	Total
Ghana	4	2	5	2	13
Guatemala	10	12	11	11	44
Guinea				1	1
Haiti	1			1	2
Honduras	2	1			3
India	8	14	13	8	43
Indonesia	26	20	18	22	86
Iran	23	23	23	19	88
Jamaica	1		1		2
Jordan	1	3	1	3	8
Kazakhstan	5	7	7	5	24
Kenya	18	20	15	15	68
Kiribati	2	3	5	2	12
Kyrgyz	2	4	4	3	13
Laos	51	57	65	57	230
Lebanon	3	2	8	5	18
Lesotho	3	3	2	2	10
Macedonia		1	1	1	3
Madagascar	19	22	28	22	91
Malawi	3	2	2	3	10
Malaysia	5	5	4	3	17
Exporting Country	2013	2014	2015	2016	Total
Maldives	3	2	2	3	10
Mali	1	2	6	2	11
Mauritania	2	4	3	1	10
Mauritius	2	2	3	2	9
Mexico	1	1	2	1	5
Moldova	2	3	3	2	10
Mongolia	10	4	12	5	31

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Exporting Country	2013	2014	2015	2016	Total
Morocco	17	17	24	20	78
Mozambique	2	3	3	7	15
Myanmar	181	189	277	296	943
Namibia	1	1	1		3
Nepal	154	164	159	146	623
Nicaragua			1	1	2
Niger	1	2			3
Nigeria				1	1
Pakistan	61	56	68	55	240
Palau		1			1
Panama	1	1	2	3	7
Papua New Guinea	1		2		3
Paraguay	6	3	4	5	18
Peru	2	2	1	1	6
Philippines	7	6	6	4	23
Rwanda	1	1	1	1	4
Samoa	1	1			2
Senegal	8	10	12	8	38
Serbia	4	5	5	7	21
Sierra Leone				1	1
Solomon Islands	2	2	2	2	8
Somalia				1	1
South Africa	63	68	62	62	255
Sri Lanka	65	70	75	73	283
Sudan	1	2	2	2	7
Tanzania	5	7	5	7	24
Thailand	14	11	11	12	48
Togo			1	2	3

Exporting Country	2013	2014	2015	2016	Total
Tokelau Islands		1			1
Tunisia	8	14	9	14	45
Turkey	211	209	218	194	832
Uganda	4	4	4	3	15
Ukraine	12	13	18	23	66
Uruguay	5	7	9	10	31
Uzbekistan	1	1	1	1	4
Vanuatu	9	9	7	5	30
Venezuela	1	1		1	3
Viet Nam	11	7	7	6	31
Yemen	3	3			6
Zambia	1	2	2	1	6
Zimbabwe	1	2	1	1	5
Total	3,175	3,281	3,512	3,488	13,456

Table 8: Summary statistics of variables

Variables	Observations	Mean	Std. Dev.	Minimum	Maximum
Log(GSP)	13,456	8.371	1.993	5.303	15.182
Δ Tariff	13,436	4.847	4.538	0	50
Log(Imp)	13,456	10.556	2.599	5.303	18.288
ROO	13,456	5.283	1.236	1	7
EPA	13,456	0.131	0.338	0	1
Document	13,456	0.231	0.422	0	1

Table 9: Distribution of ROO restrictiveness in the sample

	1.0	2.5	3.0	3.3	3.5	4.0	4.5	5.0	6.0	6.5	7.0	Total
Live animals, animal products						23			243		40	306
Vegetable products						445			319	26	9	799
Animal or vegetable fats/oils		5				71						76
Food products						94		44	33	61	617	849
Mineral products						74						74
Chemical products	16		132		137	1,670	4	357			17	2,333
Plastics and rubber			12			611		212				835
Leather products						12	6	324				342
Wood products			4		115	345		2				466
Paper products						132						132
Textiles						11	17	764	2,102	16	2,452	5,362
Footwear						83	71	147				301
Stone, ceramic, glass products						188	82	26				296
Precision metal products						26		96				122
Basic metal products						394	23	297			31	745
Machinery						1		29				30
Precision machinery								9				9
Arms and ammunition								15				15
Miscellaneous articles				6	18	302	9	29				364
Total	16	5	148	6	270	4,482	212	2,351	595	87	5,284	13,456

Notes

- 1 Harmonized Commodity Description and Coding System, which is the international product nomenclature developed by WCO.
- 2 She also assesses the effect of cumulation and other preferential scheme eligibility, which have positive and negative impact on utilisation rate of US's GSP, respectively.
- 3 Japan–Singapore, Japan–Mexico Japan–Malaysia and Japan–Philippine Economic Partnership Agreement
- 4 The Revised Kyoto Convention (RKC) was adopted by World Customs Organization (WCO) in 1999 (original version was in 1974) to harmonise customs procedures for trade facilitation, which stipulates the Standards and Recommended Practices regarding ROO in Specific Annex K. RKC defines ROO as ‘the specific provisions, developed from principles established by national legislation or international agreements (‘origin criteria’), applied by a country to determine the origin of goods’ (Chapter 1, Definitions)
- 5 GSP was initially proposed at the first UNCTAD conference in 1964 and agreed upon the second conference in 1968. The Resolutions 21 (2) of the conference report indicates that ‘the objectives of the generalised nonreciprocal, non-discriminatory system of preferences in favour of the developing countries, including special measures in favour of the least advanced among the developing countries, should be: (a) To increase their export earnings; (b) To promote their industrialisation; (c) To accelerate their rates of economic growth;’ (UNCTAD Resolutions 21 (2), 1968, p. 38) To legalise it, GATT approved temporarily as for 10 years of waiver to Article 1 of General Agreement in 1971. This means GSP treatment became a legal exception for most-favoured-nation (MFN) principle of GATT (currently WTO). Finally, in 1979, member countries agreed to maintain the GSP scheme permanently by adopting ‘Enabling Clause’, which states ‘contracting parties may accord differential and more favourable treatment to developing countries, without according such treatment to other contracting parties’ (Decision of 28 November 1979 (L/4903) 1.).
- 6 Recently, WTO members have worked on the relaxation and simplification of ROO used under preferential scheme for LDCs. In particular, ‘the 2013 Bali Ministerial Decision on Rules of Origin for LDCs’ and ‘the 2015 Nairobi Ministerial Decision on Rules of Origin for LDCs’, provide the guideline for granting countries to make ROO easier for LDCs, though they do not have any compelling power.
- 7 Japan established its GSP scheme right after the international legal basis was structured in 1971. Japanese GSP is in faithful accordance with the initial international understanding of the scheme objective to support economic growth of developing countries. Beneficiaries are currently 133 countries plus 5 territories including 47 LDC members as of April 2018, designated in notification Heisei 30, No. 81 by Minister of Finance, Japan. Product coverage under the GSP is also widely generalised. As for agriculture products, which is chapter 1 to 24 under the Harmonized System, Japan grants preferential tariff for about 400 selected products. Regarding industrial products, which is HS chapter 25 to 97, basically all products are subject to GSP except for some sensitive items. In total Japan provide GSP treatment for more than 3500 out of 6000 dutiable 9-digit tariff lines. Moreover, LDC countries can enjoy duty free and quota free treatment for almost all products with a few exceptions of around 200 items.
- 8 Including wider products, such as apparel and footwear, which is not eligible under US's GSP.
- 9 Low-income countries confronting severe structural barriers to sustainable development, which is eligible for several international support measures. United Nations continues to review the criteria of GNI per capita, by which currently 47 countries are designated as of March 2018.
- 10 Under the US's GSP (A*), designated countries are not qualified for certain products specified at 8-digit level. See the country-product list in the US HTSA General Notes 4
- 11 Thailand, Malaysia, Brazil and Mexico are possible to graduate with China in 2019.
- 12 The ROO of Japan's GSP stipulated in article 26 of the Cabinet Order for Enforcement of the Temporary Tariff Measures Law is consistent with the Revised Kyoto Convention's basic ideas. Wholly obtained goods and goods that have been produced with substantial transformation are recognised as originating goods of beneficially countries. The Administrative Rule for Enforcement of the Temporary Tariff Measures Law further clarify the conditions of substantial transformation. The English translation (reference only) of these specific rules are available in the UNCTAD GSP Handbook as of November 2016.

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Diving deeper in performance indicators: What do we know about the AEO in Brazil?

Luís Gustavo dos Santos Marques, Anastasia Kondrashova and Cristiano Morini

Abstract

Controls are useful to combat unfair competition, protect consumer health, combat illicit trade and promote development. On the other hand, controls or inefficient processes may affect the flow of trade and may compromise the competitiveness of economic operators. This paper aims to analyse performance indicators related to international trade and cross-border operations from the economic operator perspective. The method compares the analysis of the indicators found in literature to the indicators at the regulatory level. As a result, our study provides a useful opportunity to unveil the authorised economic operator (AEO) indicators in an implementing country.

1. Introduction

The use of performance indicators is vital to any customs administration. It facilitates the communication of the objectives of all actors involved, providing a better level of service.

When using performance indicators, it is possible to measure the quality and effectiveness of the services performed by Customs and other agencies that operate to control foreign trade, as well as reduce uncertainties (Sawhney & Sumukadas, 2005; Ireland & Matsudaira, 2011). On the one hand, companies require certain skills, strategies and competitive advantages to ensure efficiency and profitability. On the other, customs administrations are required to provide a rationalisation of management and efficient and effective use of resources, with special attention to the level of service (Morini, Inácio Jr, Santa-Eulalia & Serafim, 2015; Pomfret, 2010; Sá Porto, Canuto & Morini, 2015).

There is an ocean of metrics and performance indicators regarding trade logistics in literature. Most of them do not fit the cross-border dimension. The Organization for Economic Cooperation and Development (OECD) has trade facilitation indicators (Moisés & Sorescu, 2013; Moisés & Sorescu, 2015), as does the World Bank (Hillberry & Zhang, 2015; Wilson, Mann & Otsuki, 2004). Discussing performance indicators in this context provides an opportunity to understand the challenges of being an AEO worldwide. The World Customs Organization (WCO) AEO program is designed to facilitate and secure the international trade in global supply chain operations.

The objective of this paper is to analyse the relationship between the literature related to the cross-border trade operations and performance indicators specified in Brazil's AEO legislation. The research questions are:

Q1: What kinds of performance indicators may an economic operator pursue to become an AEO?

Q2: Do the performance indicators match the trade logistics cross-border indicators in the literature?

This paper considers the theoretical approaches from the literature, and the practical approaches from Brazil's trade regulation that an economic operator must take in the context of customs operations.

Our study aims to provide a useful overview of the AEO performance indicators in Brazil. We aim to contribute to the academic body of literature by exploring a variety of indicators and their application by means of qualitative analysis. By comparing the literature on this subject to the AEO performance indicators in use in Brazil, we hope to offer countries that consider implementing AEO a useful insight.

2. Method

The literature review considered a combination of keywords—‘trade’, ‘international trade’, ‘international operations’, ‘international logistics’, ‘indicators’, ‘performance indicator’, ‘border’, ‘customs’ and ‘AEO’—in mixed ways. The keywords were used in the following databases: Web of Science, Scopus and Scielo. They have made possible the application of a first filter regarding the pre-selection of articles. Through the site of the Brazilian Revenue Service it was possible to find a large part of the necessary information relating to the Brazilian AEO Program legislation.

Thereby, we expose indicators obtained from the literature and compare them to the indicators found into the Brazilian legislation. We settled the classifications of indicators grouped into families, according to Gunasekaran, Patel and Tirtiroglu (2001) and other selected authors. Gunasekaran et al. (2001) developed a study based on performance measurement systems (PMS) that measures important aspects of a chain of supplies: planning of orders; partnerships in the chain; production; distribution; level of service; customer satisfaction; finance; and logistical costs of the chain. Finally, we analyse the match and frequency of the indicators, unveiling the possibility of using the indicators as outcomes in other countries, considering that the AEO program is in the process of implementation in several countries.

3. Performance indicators

Trade facilitation is a theme used in discussions related to trade liberalisation policies promoted by international organisations such as the World Trade Organization (WTO), the World Bank, the WCO, the United Nations Economic Commission for Europe (UNECE) and the Organization for Economic Cooperation and Development (OECD). Several issues are related to this topic, including the reduction of transaction costs (Williamson, 1981) related to the execution, regulation and administration of trade policies; the environment in which the commercial transactions are made; the need for transparency and professionalism of Customs; and compliance with the standardisation of regional and international settings (Iwanow & Kirkpatrick, 2007; Ireland, Cantens & Yasui, 2011).

Trade facilitation is seen as a mechanism capable of boosting the economy of a country. This can be understood as a set of policies designed to reduce costs of imports and exports. Trade facilitation is not associated only with the simplification and standardisation of customs formalities, but also with administrative procedures related to international trade, the business environment, the quality of infrastructure, and transparency (Grainger, 2011; Marti, Puertas & García, 2014; Portugal-Perez & Wilson, 2010). In developing countries, trade facilitation is considered effective in promoting the diversification of exports. Some approaches adopted by Asia–Pacific Economic Cooperation (APEC) claim that trade facilitation is any policy that reduces the transactional costs of international trade.

By using a gravitational model, Wilson et al. (2004) estimated the impact of trade facilitation on trade flows. Their results reveal large potential increases in trade and in rates of growth in countries that have below-average rates of commercial transactions. Nordas, Pinali and Grosso (2006) focused on the relationship between international trade and logistics, considering time of importation and exportation. Nordas et al. (2006) conclude that the delays result in smaller volumes of trade and reduce the exports in markets that are sensitive to time. Djankov, Freund and Pham (2006) argue that, on average, each additional day of delay before embarking toward its final destination reduces the value of trade by at least one per cent.

Wilson, Mann and Otsuki (2003) used a gravitational model to evaluate the relationship between flows of trade and trade facilitation in the Asia Pacific region. These authors used four indicators that evaluate four different areas of international trade (Table 1).

Table 1: Gravity model of trade facilitation

Port efficiency	Able to evaluate the quality of infrastructure of ports and airports.
Customs environment	Capable of measuring the direct costs and administrative transparency of customs services.
Regulatory environment	Able to assess the economic approach of the regulations.
Use of E-business	Capable of assessing the existence of domestic infrastructure needed in an economy (logistics companies, financial intermediaries, and telecommunications).

Source: Wilson, Mann & Otsuki (2003).

This gravitational model indicated that regulatory barriers and port inefficiency undermine the trade and the progress of Customs. Each one of these indicators has its specificity and purpose in the economy. An indicator, by itself, is able to assist decision-makers in directing them towards measures aimed at the most promising reforms, trainings and negotiations (Wilson et al., 2003; Sá Porto et al., 2015).

Other studies have also helped to identify key performance indicators, such as Portugal-Perez and Wilson (2010). For these authors, two dimensions differentiated the trade facilitation:

- the ‘hard’ dimension comprises tangible factors related to physical infrastructure and can measure the degree of development and quality of ports, airports, roads and railway lines
- the ‘soft’ dimension comprises intangible factors such as those that involve transparency, the business environment and the customs administration (time, number of documents required for export and import procedures) and covers the procedures of the business and regulatory environment (as indicators of irregular payments, government transparency and anticorruption measures).

Portugal-Perez and Wilson (2010) used around 20 indicators from various sources, such as Doing Business (DB), World Development Indicators (WDI), World Economic Forum (WEF) and Transparency International (TI), to create four new indicators related to Customs and trade facilitation. The broader aim of this contribution is to estimate the impact that indicators have on trade. A factorial analysis and a statistical modelling technique were employed for the construction of new indicators.

Of the four indicators, two are closer to the ‘hard’ dimension of trade facilitation:

1. infrastructure
2. information and communication technology.

The other two indicators are related to the ‘soft’ dimension:

3. efficiency of borders and transport
4. business environment and regulatory environment.

The results indicate that infrastructure is the factor that brings the greatest benefits associated with the growth of exports. However, although improvements in infrastructure are considered relatively expensive, this high cost should be taken into account in the analysis of the cost–benefit ratio. The analyses of the effects of these factors on trade flows, together with simulations and discussions, may promote useful information that will help policy makers seek and prioritise areas where the allocation of resources brings the greatest benefits. These prioritisations have a direct impact on growth, productivity and the development of a country. These studies prove empirically that trade facilitation positively impacts on these issues (Portugal-Perez & Wilson, 2010).

The greater integration between countries, caused by globalisation, is enhanced by the reduction of customs barriers and the commercial opening of many countries. In this sense, it became difficult to distinguish domestic policies from international policies. With the aim of promoting the integration of trade, the opening of markets must be accompanied by a series of complementary policies. These policies call for a smooth functioning of the customs administration, which should promote greater transparency, predictability and a fast clearance of goods (Zamora Torres & Navarro Chavez, 2015).

Customs administrations are vulnerable to rapid change. They are forced to deal with the intensification of international trade and with global threats, such as organised crime and climate change. In this way, Customs should ensure a balance between the simplification of trade and the protection of society (Zamora Torres & Navarro Chavez, 2015).

Zamora Torres and Navarro Chavez (2015) examined the competitiveness of 29 countries, with the main variables that influence the levels of competitiveness of Customs and presented an index derived from the analysis of the degree of competitiveness. Their results showed that all variables used in the study, such as the speed or average time for imports or exports released by Customs; the standardisation of customs procedures; the flow of international trade; and the quality, efficiency and transparency in the services of customs clearance affect the competitiveness of Customs. However, the variables with the greatest importance and influence are taxes and trade flow, followed by quality, efficiency and transparency.

Considering studies from international organisations, one of the most used references regarding performance indicators is the Logistics Performance Index (LPI), published by the World Bank. It uses a set of customs procedures, logistics costs and quality of essential infrastructure for inland transport or maritime (Marti et al., 2014; Demetriades, Bougheas & Morgenroth, 1999).

The low quality of logistics services or their high price can be considered barriers that undermine international trade. In terms of logistics, the majority of obstacles encountered relate to the delivery time that, when not fulfilled, may undermine the credibility of the actors involved. Developing countries are most likely to struggle with these deficiencies. Although Brazil is one of the largest economies in the world, large investments in its logistics sector are required so that the country can be more competitive in the international trade context (Faria, Souza & Vieira, 2015).

Indicators suggest that the best logistic performance depends on price or time, and how easy it is to predict the supply chain performance (Marti et al., 2014). Table 2 highlights the authors' contributions in terms of literature review in cross-border trade logistics operations.

Table 2: Authors and their respective used indicators

Authors	Indicators
Demetriades, Bougheas & Morgenroth (1999)	Logistics Performance Index (LPI) High logistics performance group (HLPG) Low logistics performance group (LLPG) Domestic logistic costs
Hoekman & Nicita (2011)	Cost of trade
Portugal-Perez & Wilson (2010)	Infrastructure Technology of information and communication Efficiency of borders and transport
Korinek & Sourdin (2011)	Tracking and tracing Customs procedures Infrastructure quality
Batista (2012, adapting from Slack, Chambers & Johnston (2007) to trade facilitation	Speed, Dependability, Flexibility, Quality, Cost
Nordas, Pinali & Grosso (2006)	Service level Quality of movement of loads Time
Wilson, Mann & Otsuki (2003)	Customs environment Regulatory environment
Moisé & Sorescu (2013) OECD trade facilitation indicators	Information availability Involvement of the trade community Advance ruling Appeal procedures Fees and charges Formalities – documents Formalities and automation Formalities and procedures Border agency cooperation – internal Border agency cooperation – external Consularisation Governance and impartiality Transit fees and charges Transit formalities Transit guarantee Transit agreements and cooperation

Table 3 depicts all the indicators identified in this study, along with their respective references. These indicators are the same as found in Table 2, but they were classified into three other levels: strategic, tactical and operational. In addition, the indicators were classified as financial or non-financial. Some indicators may be classified as both financial and non-financial as, for example, indicators that cover both the financial management and management policy. The method used for the classification of indicators in Table 3 was developed by Gunasekaran et al. (2001). We combined this classification with the literature review to develop Table 3.

Gunasekaran et al. (2001) stressed the importance of a clear distinction between metrics at strategic, tactical and operational levels. Gunasekaran’s work is a seminal paper in supply chain management. Even though it is not focused on cross-border operations, it suits the framework used because of the usefulness of a common language in terms of indicators analysis.

Table 3: Indicators organised according to the methodology of Gunasekaran et al. (2001) combined with the literature review

Level	Indicator	Authors	Financial	Non-financial
Strategic	Logistics Performance Index (LPI)	Demetriades, Bougheas & Morgenroth (1999)		•
	Border agency cooperation – internal	Moisé & Sorescu (2013)		•
	Border agency cooperation – external	Moisé & Sorescu (2013)		•
	Advance ruling	Moisé & Sorescu (2013)		•
	Involvement of the trade community	Moisé & Sorescu (2013)		•

Level	Indicator	Authors	Financial	Non-financial
Tactical	Domestic logistic costs	Demetriades, Bougheas & Morgenroth (1999)	•	
	Cost of trade	Hoekman & Nicita (2011)	•	
	Infrastructure	Portugal-Perez & Wilson (2010)		•
	Infrastructure quality	Korinek & Sourdin (2011)		•
	High logistics performance group (HLPG)	Demetriades, Bougheas & Morgenroth (1999)		•
	Low logistics performance group (LLPG)	Demetriades, Bougheas & Morgenroth (1999)		•
	Appeal procedures	Moisé & Sorescu (2013)		•
	Information availability	Moisé & Sorescu (2013)		•
	Consularisation	Moisé & Sorescu (2013)		•
	Formalities – documents	Moisé & Sorescu (2013)		•
	Formalities and automation	Moisé & Sorescu (2013)		•
	Formalities and procedures	Moisé & Sorescu (2013)		•
	Technology of information and communication	Portugal-Perez & Wilson (2010)		•

Level	Indicator	Authors	Financial	Non-financial
Operational	Tracking and tracing	Korinek & Sourdin (2011)	•	
	Flexibility	Batista (2012)		•
	Speed	Batista (2012)		•
	Quality	Batista (2012)		•
	Dependability	Batista (2012)		•
	Time	Nordas, Pinali & Grosso (2006)		•
	Governance and impartiality	Moisé & Sorescu (2013)		•
	Customs environment	Wilson, Mann & Otsuki (2003)		•
	Customs procedures	Korinek & Sourdin (2011)		•
	Service level	Nordas, Pinali & Grosso (2006)		•
	Cost	Batista (2012)	•	
	Quality of movement of loads	Nordas, Pinali & Grosso (2006)		•
	Transit fees and charges	Moisé & Sorescu (2013)	•	
	Fees and charges	Moisé & Sorescu (2013)	•	
	Transit formalities	Moisé & Sorescu (2013)		•
	Transit guarantee	Moisé & Sorescu (2013)		•
	Transit agreements and cooperation	Moisé & Sorescu (2013)		•
	Regulatory environment	Wilson, Mann & Otsuki (2003)		•
	Efficiency of borders and transport	Portugal-Perez & Wilson (2010)		•

The division of levels of indicators is based on the term or focus of each one. The strategic level refers to indicators with a focus on the long term. The tactical level has a greater focus in the medium term, while the operational level has a focus on routine tasks and is short term. As shown in Table 3, the majority of the indicators identified by the literature are non-financial, even though they might have a correlation with finance.

4. AEO in Brazil

The world has witnessed a rise in the process of globalisation since the end of the 20th century. In many countries this process has caused a rapid increase in the flows of goods, people, information and services. Although this brings a growth to the world economy, it is also considered to make countries vulnerable to terrorism. Various terrorist factions throughout the world take advantage of this great trade flow to transport illicit goods. Examples of these criminal practices include trafficking of drugs, money laundering, arms trafficking and smuggling (Receita Federal do Brasil [RFB], 2017).

Looking for a greater dynamism of trade flows and making them more agile without losing the effectiveness of controls of goods, several countries have adopted the AEO based on the recommendations of the WCO (RFB, 2017). Karlsson (2017, p. 25) states there is no contradiction between facilitation and security, 'since a simplified process is easier to secure and a safe process is easier to facilitate'.

According to Hintsa, Urciuoli and Tan (2016), AEO benefits may be related to the following macro categories:

- more streamlined and simplified customs (and related) procedures
- less frequent interventions by customs administration
- increased priority over non-AEO companies (getting to the front of the queue)
- increased (positive) attention by customs administrations
- increased number of other privileges granted by customs administrations.

There are a number of papers that have analysed AEO programs, or C-TPAT (Customs Trade Partnership against Terrorism in the US). Aspects of the program covered by the papers include:

- impact on encouraging international supply chain partnerships (Sheu, Lee & Niehoff, 2006)
- use of IT (Butter, Liu & Tan, 2012)
- administrative innovation (Melnik, Ritchie & Calantone, 2013)
- role of C-TPAT in improving security, resilience and firm performance in a context of public-private partnership (PPP) and relational security (Voss & Williams, 2013)
- ability to boost export numbers (Schramm, 2015)
- attraction of customers or improvements to business relationships (Urciuoli & Ekwall, 2015)
- streamlining customs procedures (Travassos, Navarro & Morini, 2015)
- minimisation of risks (Ni, Melnyk, Ritchie & Flynn, 2016)
- improved competitiveness (Houe & Murphy, 2018)
- performance over PPP (Campos, Morini, Moraes & Inácio Jr, 2018; Park & Park, 2018).

Each country has its own AEO program under international standardisation regulation that might require companies that wish to be certified to implement security standards. In order for these companies to obtain certification they must prove that their processes are reliable and predictable; customs administrations may then focus their efforts on more closely monitoring non-certified entities that might present greater risks in their cargo streams and operations (Travassos et al., 2015).

The Brazilian Program of AEO is based on a certification granted by Customs to the importer, exporter, transporter, cargo agent, depositary of goods under customs control, port operator or airport operator. This certification gives the company the status of being considered secure and reliable in its operations. It is also important to mention it is a program of voluntary compliance of overlapping security criteria in the supply chain (García, 2008; Travassos et al., 2015).

The AEO program in Brazil is under implementation. The first phase was launched in December 2014, and in 2018 it is expected to have other public control agencies aggregated, such as the Sanitation Agency. The Brazilian AEO program lists the following benefits (Table 4).

Table 4: AEO benefits in Brazil

a	Greater agility and predictability in the flow of international trade
b	Improvement in risk management of customs operations
c	Harmonisation of working processes with other regulatory bodies of foreign trade
d	Good relationship between economic operators and the Secretariat of the Federal Revenue of Brazil (RFB)
e	Publish the name of the operator at the site of the RFB as a certified company
f	Benefits of Mutual Recognition Agreements (MRA) signed with other countries
g	Cooperation in consultative forum for legislation changes
h	Possibility to attend seminars, trainings, and events organised by the AEO Centre
i	Dedicated channel of communication with customs administration
j	Priority in analysis of the customs declarations and inspections (when applicable)
k	Low level of physical inspections
l	Waiver of guarantee for customs transit
m	Waiver of guarantee for temporary admission (under economic purposes)
n	Green channel for temporary admission
o	Pre-arrival customs clearance
p	Easiness of access the AEO system through the Siscomex Single Window

Source: Receita Federal do Brasil (2017b).

The certification process examines firstly the admissibility requirements, which identifies whether the operator is able to participate in the certification process for AEO. The eligibility criteria are then used to determine the reliability of the economic operator. These two steps are applied in all categories of certification. After examining these steps the specific criteria are analysed by modality: security criteria and/or compliance criteria (RFB, 2017). Admissibility requirements are show in Table 5. Additional criteria are required specific type of certification (AEO-S, AEO-C, and AEO-P).

Table 5: Admissibility requirements requested by the Brazilian Customs Administration

a.	Adherence to the electronic tax domicile
b.	Adherence to digital bookkeeping
c.	Tax compliance
d.	Registration as a legal entity (more than 24 months)
e.	Acting as an eligible participant for AEO certification
f.	No request rejection in the last six months

Source: Receita Federal do Brasil (2015) and Regulatory Instruction RFB 1834/2018.

5. Discussion and results

After analysing the current legislation (Regulatory Instructions RFB 1598/2015, 1624/2016, 1653/2016, 1736/2017, and Portaria Coana 59/2016), indicators based on four criteria were identified, with a focus in the economic operator: security, risk, compliance and eligibility. In accordance with legislation, the following documents are needed: the application for AEO certification; the self-assessment questionnaire (literally a copy from the WCO); and the complementary validation report. Table 4 summarises the AEO Brazil indicators (grouped in major and minor indicators). The criteria used for classification in Table 6 are the same as those used in Table 3.

Table 6: Brazilian AEO grouped indicators organised according to the methodology of Gunasekaran et al. (2001), and possible match to the literature review

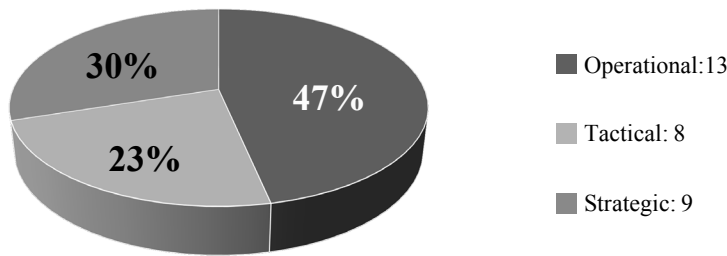
Level	Indicator (from legislation)	Financial	Non-financial	Literature review
Strategic	Integrity of computerised systems		●	Portugal-Perez & Wilson (2010); Batista (2012)
	Integral and specific treatment of goods		●	Batista (2012)
	Review and adjust policy of compliance		●	Korinek & Sourdin (2011)
	Special customs regime		●	Korinek & Sourdin (2011)
	Computerised systems (digital fiscal bookkeeping, electronic tax residence)		●	Portugal-Perez & Wilson (2010); Moisé & Sorescu (2013)
	Strong financial situation	●		Hoekman & Nicita (2011)
	Impact on the financial solvency	●		Hoekman & Nicita (2011)
	Policy of selection of trade partners	●	●	Moisé & Sorescu (2013)
	Policy of selection of human resources	●	●	No match

Level	Indicator (from legislation)	Financial	Non-financial	Literature review
Tactical	Physical security of loading units in storage		•	Portugal-Perez & Wilson (2010)
	Awareness of threats and identification of vulnerabilities		•	Korinek & Sourdin (2011)
	Integrity of accounting data		•	Batista (2012)
	Regularity of documents of customs declarations		•	Hoekman & Nicita (2011); Batista (2012); Wilson, Mann & Otsuki (2003); Moisé & Sorescu (2013)
	Detection and prevention of infractions		•	Batista (2012)
	Confidentiality and integrity of information		•	Portugal-Perez & Wilson (2010); Batista (2012)
	Control and audit of trading partners		•	Batista (2012)

Level	Indicator (from legislation)	Financial	Non-financial	Literature review
Operational	Identification of high-risk loads		●	Nordas, Pinali & Grosso (2006)
	Training relating to the physical security of cargo		●	Batista (2012)
	Pre-inspection of loading units		●	Nordas, Pinali & Grosso (2006)
	Integrity of seals		●	Portugal-Perez & Wilson (2010); Batista (2012)
	Identification of unauthorised persons or vehicles		●	Demetriades, Bougheas & Morgenroth (1999)
	Access control facilities		●	Batista (2012)
	Monitoring cargo transportation		●	Demetriades, Bougheas & Morgenroth (1999); Korinek & Sourdin (2011); Nordas, Pinali & Grosso (2006); Moisé & Sorescu (2013)
	Control of cargo volumes in certain areas		●	Nordas, Pinali & Grosso (2006); Moisé & Sorescu (2013)
	Monitoring facilities		●	Batista (2012)
	Uniformity of harmonised system (HS) for tariff classification of goods		●	Wilson, Mann & Otsuki (2003)
	Control of deadlines		●	Korinek & Sourdin (2011); Batista (2012)
	Exchange rate monitoring		●	Hoekman & Nicita (2011); Wilson, Mann & Otsuki (2003)
	Uniformity of description of goods		●	Wilson, Mann & Otsuki (2003)
Physical security of computer equipment		●	Portugal-Perez & Wilson (2010)	

Each AEO indicator has a relationship with at least one set of indicators in Table 2. Some indicators in Table 6 are associated with more than one set of indicators. Figure 1 illustrates the conclusions gathered from Table 6.

Figure 1: AEO indicators according to the Gunasekaran et al. (2001) method

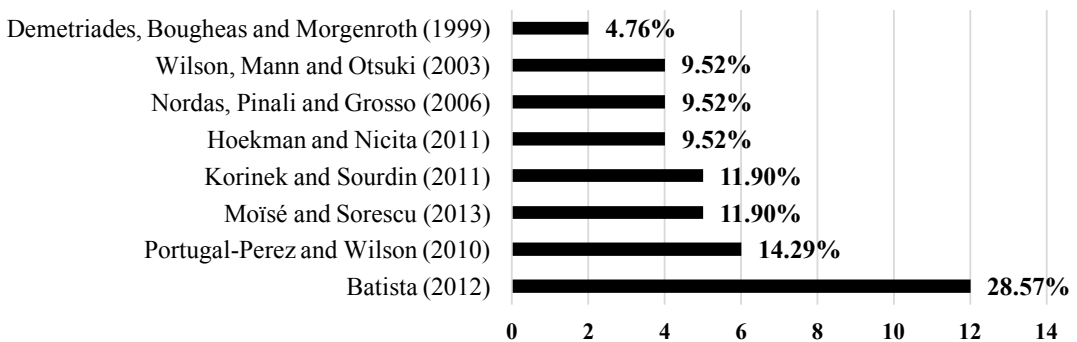


Findings show that the majority of the indicators selected are indicators relating to short-term or daily activities: 47 per cent of the indicators are operational; 23 per cent of the indicators are tactical; and 30 per cent of the indicators are strategic. This indicates that an operator who wished to become an AEO will devote much of the time adjusting their tasks in the short term.

From the associations made in Table 6, it was possible to identify that the indicators related to the AEO certification in Brazil greatly corresponds to the indicators cited by Batista (2012). Surprisingly, Batista (2012) used a Delphi method to set up his framework in the Brazilian expert community. Findings may confirm the Batista’s framework for border-crossing operation, considering speed, dependability, flexibility, and quality, except cost.

As shown in Figure 2, 28.57 per cent of the AEO Brazilian indicators have convergence to Batista’s paper. This percentage represents 12 indicators that are closely related to speed, flexibility, dependability and quality. A major concern of AEO indicators is in tune with the operational level. In parallel with the ‘speed’ indicator, it confirms a focus on agility of operations and the success of them within the target period. Finally, related to ‘dependability’ and ‘quality’ note processes regarding efficiency and effectiveness in operations. It is important to note that we did not consider OECD indicators (Moïse & Sorescu, 2013), as many countries have already considered them for policy making.

Figure 2: Authors found in literature and the matched indicators



The second set of indicators that had more associations with the AEO indicators are the indicators cited in the work of Portugal-Perez and Wilson (2010). They are infrastructure, information technology and communication, and efficiency of borders and transport. Figure 2 illustrates that 14.29 per cent of selected indicators are compared with the indicators cited by Portugal-Perez and Wilson (2010).

Infrastructure is the indicator that draws most attention for being considered by the authors as the one which has the greatest impact on exports. Although changes in infrastructure are considered expensive, an AEO that has at its disposal an excellent infrastructure has great advantages in relation to the cost-benefit ratio.

The sets of indicators cited by Korinek and Sourdin (2011) and Moisé and Sorescu (2013) occupy the third position with 11.9 per cent each. This set of indicators also represents the focus of the AEO in Brazil, both in the relations of the supply chain and in the control of operations. Figure 2 shows that Hoekman and Nicita (2011), Nordas et al. (2006) and Wilson et al. (2003) make the same number of associations with the set of AEO indicators.

The division between financial and non-financial indicators (Figure 3) revealed a number of financial indicators in the AEO certification in Brazil, which confirms the emphasis of the AEO in logistical issues and security. From Figure 3 it can be seen that 6.67 per cent of selected indicators are considered financial ones. This does not mean that there is no relationship of the indicator with issues involving financial expenditure but represents that this is not the major focus of the indicators.

Figure 3. Financial and non-financial indicators

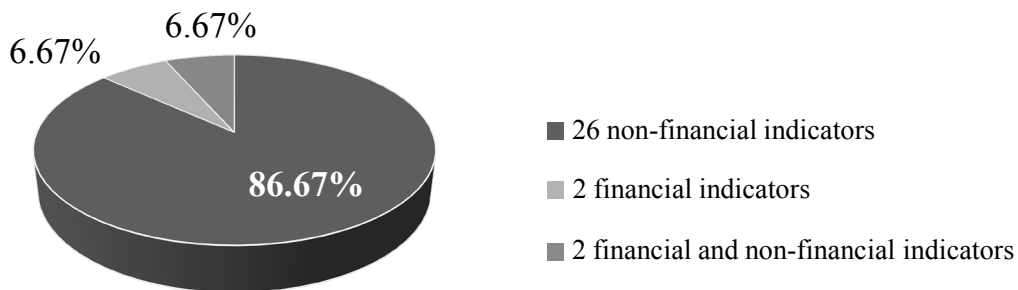


Figure 4 synthesises the results in terms of author’s frequencies identified in the literature, level of analysis, financial or not in the AEO program in Brazil.

Figure 4. Matching figure – AEO Brazil performance indicators



6. Conclusions

Some frameworks for performance indicators related to logistics and trade facilitation are possible to find. Probably the most cited is Gunasekaran et al. (2001) and OECD. However, the topic of performance indicators is unusual in the context of AEO. There is no known framework in use currently.

Holloway (2010) asserts performance indicators must be used considering different groups, as economic operators, and different government agencies, in the disaggregated level. This paper analysed the most commonly used indicators in cross-border trade logistics, from the economic operator perspective.

Next, we compared the category and the usage of the indicator found to the performance indicators set out in the AEO legislation in Brazil. Indicators match to non-financial aspects, with emphasis on quality and compliance; flexibility and dependability; and speed in processes involved in releasing goods at borders. There is neither direct involvement in the cost reduction nor financial benefit. In this way, we answered Q1 (What kind of performance indicators are being considered to assess whether a company can become an AEO in Brazil?)

Considering Q2 (Do they match to the trade logistics cross-border indicators in literature?), results are strongly in line to Batista (2012). Although Batista's work focuses on port efficiency, regulatory environment and e-business usage beyond the customs environment as constructs.

The analysis of the indicators in only one level and their interpretation could be a limitation of this work. Some indicators could be considered on different levels (operational, tactical or strategic), due to the subjectivity of the analysis. However, the implementing country could fit the analysis of the levels within its own reality, considering own constraints and objectives. According to Cantens, Ireland and Raballand (2013), metrics should not be copied from one experiencing country to another. It is necessary to consider and adapt them to local constraints.

An important aspect of the current paper is the reproducibility. Follow the same methodology, other researchers can confirm the findings. After fifteen years since the beginning of AEO implementation worldwide, it may be time to delve deeper into performance indicators in the context of AEO, especially in implementing countries, like Brazil. Future questions should consider whether, after AEO implementation, what level of improvement in enforcement is visible? Is it possible to identify the increased number of seized goods? To what extent have exports increased? In terms of competitiveness, do countries improve their position in global value chains? How well?

This work may contribute to performance indicators not associated to cost reduction or financial ones. Another insight from this paper is that there is no special treatment for small and medium enterprises (SMEs). The investment cost to be AEO may not be attractive to SMEs. Future research could focus on cross-functional indicators encompassing AEO and single window, integrated AEO, and AEO in mutual recognition agreements, considering also the public management perspective in this context.

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Single window in the context of the WTO Trade Facilitation Agreement

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Eduardo Garcia-Godos and Mikhail Kashubsky*

Abstract

This paper is based on the findings of a research project that was designed to support the Australian government's trade facilitation agenda by providing a trade stakeholder position on the development of an effective Australian single window for trade. Among other things, the Australian report examined the standards and best practices promulgated by recognised international authorities on this subject, including the World Trade Organization's Trade Facilitation Agreement (TFA). As this was possibly the first study on single window driven by the private sector of a major developed trading country since implementation of the TFA, certain aspects of the study would seem to be relevant in the larger global context of that agreement and it is these aspects which are discussed in this paper. The paper concludes that all TFA signatories need to carefully consider their implementation priorities under the agreement. In doing so, it presents a series of conclusions from the original research that has relevance to all TFA signatory countries, regardless of their development status.

1. Introduction

In its most widely accepted international definition, a single window is a facility that allows parties involved in trade and transport to lodge standardised information and documents with a single entry point to fulfil all import, export and transit-related regulatory requirements. If information is electronic, then individual data elements should only be submitted once (UNECE, 2015).

Australia has been an active supporter of the World Trade Organization (WTO), and was an early adopter of its Trade Facilitation Agreement (TFA) and other multilateral efforts to foster trade facilitation. As a sizable developed economy heavily dependent on international trade, Australia has a significant number of regulatory requirements impacting cross-border goods movements, directly or indirectly administered and enforced by more than 40 agencies at national and state levels. Australia has implemented a number of electronic reporting and permitting systems supporting cross-border trade, with some having been in place for a number of years. A notable example is the Integrated Cargo System (ICS), first implemented in 2005, which serves as a primary means for a variety of stakeholders in the supply chain to report core import and export data used by government stakeholders for risk assessment and clearance purposes. While this system was linked to some extent to other government agencies, over time it became clear that it did not rise to the level of a single window in line with international standards.

In 2016, the development of a trade single window was expressly adopted as a political priority of the Australian government, motivated by a desire for trade facilitation, particularly for exporters, and a reduction in red tape. The government expressed the goal of designing 'a cutting edge system that is reliable, which provides genuine trade facilitation gains and which will have longevity' (Dutton, 2017),

and it established a dedicated multiagency Inter-Departmental Committee on Single Window (IDCSW) to progress the project as well as bringing the topic to the attention of Australia's National Committee on Trade Facilitation (NCTF), set up under the auspices of the WTO TFA.

This paper is derived from the findings of a research project conducted in 2017 (Widdowson et al., 2018). Funded with the support of a broad coalition of the Australian trade community,¹ its aim was to complement the Australian government's single window project by preparing the way for development of a trade stakeholder position on the development of an effective Australian single window for trade; one reflecting the needs and aspirations of the country's private sector. To do so, it provided a high-level overview of the current Australian import and export process environment, including the extent to which this environment currently involved (or had near-term plans to increase) IT-enabled processes within and across Australian government agencies. It further gathered data on needs and potential benefits of a single window identified by Australian private sector stakeholders and provided a review of the above in light of relevant prescriptions in the TFA, as well as the standards and best practices promulgated by recognised international authorities on this subject, such as the United Nations Economic Commission for Europe (UNECE) and the World Customs Organization (WCO).

The report's recommendations were subsequently adopted and presented to government as a consensus position of the private sector members of Australia's NCTF, where they remain under consideration as a benchmark for future single window implementation in that country.

As this was possibly the first private-sector-driven study on single window in a major developed trading country since implementation of the TFA, certain aspects of the study would seem to be relevant in the larger global context of that agreement and it is these aspects which are in focus in this paper. On the one hand, the TFA's provisions, some directly relevant to single window, are binding on its signatories—unlike the many pre-existing standards and recommendations on the subject—and may require countries with existing or planned single window projects to consider that in their approach. On the other hand, the project conclusions, which incorporate private sector views may, at least in part, reflect the views held by trade stakeholders in the global context and provide useful insights for future single window design and implementation.

2. Background: Contemporary border management

Control of national borders is one of the primary means for a country to assert its sovereignty, and the border has historically also been a substantial source of revenue for government:

The spaces of borders, corresponding to their map lines, are marked by ports of entry and exit. It is here where cross-border transactions of people and goods are processed through the exercise of immigration and customs authorities. Typically, the scope of these border inspection authorities is most broad regardless of legal system. Sovereignty asserts itself aggressively at the border threshold to determine who and what has the right or privilege of entrance (inbound) and exit (outbound). (Bersin, 2012, p. 115)

Virtually all countries have historically assigned control of the border to a powerful agency, traditionally referred to in most countries as Customs, with broad powers to admit (often after payment of duties and other taxes) or deny access to the domestic commerce of the country, or to allow domestic exporters to access markets abroad, generally after a process involving declarations and inspections or other controls.

Over the last several decades, as duty rates have fallen and international trade has grown, the focus of Customs in enforcing domestic safety and conformity requirements at the border has increased, particularly in developed trade-driven countries. In most cases, such requirements are primarily administered by other government agencies (OGAs) with broad responsibility throughout the domestic market—not just at the border.

With the implementation of free trade agreements and the growth of multi-country supply chains, more and more products, previously primarily produced in the domestic economy, are supplemented or replaced with foreign-made equivalents, produced in countries that are not necessarily subject to domestic norms or safety-related regulatory oversight. In recent years, high-profile scandals related to unsafe imports have received widespread publicity at a global level and have been augmented by concerns of potential contamination in the supply chain or bioterrorist activity. As a result, existing regulatory requirements have been tightened and pressure has grown for closer attention to imports. Concerns with unacceptable and anti-competitive trade practices in relation to such things as endangered species, child labour, prison labour and intellectual property, are also leading to new requirements, based on social policy, that require documented compliance as a prerequisite to import clearance.

The above factors have driven increased use of information technology in the border clearance process, with many paper-based declaration and certification requirements transitioning to a virtual environment over the past two decades. This increased use of IT and automation in the border clearance process is reflected in parallel (and often uncoordinated) efforts by agencies to automate their respective product registration, evaluation and certification efforts relating to safety requirements. Another dimension in the border challenge is the need for accurate and timely statistical data collected by both Customs and other border agencies involved in cross-border trade. Modern IT has revolutionised the capacity of effectively collecting, efficiently analysing, and disseminating such data. These factors have rather quickly moved national border processes from a paper-driven customs release process to one where one or more electronic data submissions by properly authorised parties in one or more systems in the appropriate sequence may be required.

While the agency with responsibility for regulatory control over specific products being brought into the domestic market, or produced domestically for export, will generally retain its primary authority, it may be unable to staff the border with its own officers, thereby requiring it to collaborate with Customs in enforcing its priorities at the border.

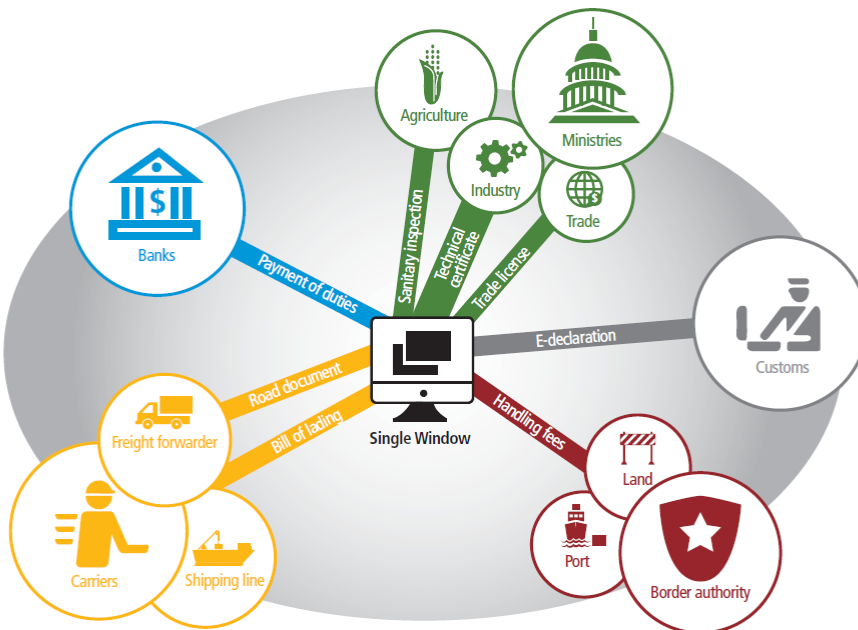
From a practical perspective, then, there is a need for Customs and the other agencies to cooperate closely in managing increasingly IT-enabled and automated border processes in order to facilitate the flow of goods. Failure to do so can lead to undetected non-compliance and impediments to legitimate international trade, harming both the national economy and consumers. The single window concept, with its emphasis on collaboration and sharing of information, offers a vision to enhance these processes to support both trade facilitation and border enforcement.

3. Single window in practice

Within the contemporary border management framework, the single window should be viewed as a concept embracing a set of precepts and building blocks designed to allow government to enhance its ability to administer and enforce legal requirements across multiple agencies via the use of integrated processes, while at the same time enabling the rapid and efficient flow of legitimate trade across the border.

While single window projects almost always involve IT-based innovation, IT is not itself the goal. Rather, the goal is to create a platform for effective collaboration at the border between Customs, OGAs and business – enhanced and enabled by IT and an appropriate level of automation, to facilitate the efficient movement of goods across borders. Advanced single window concepts can connect a range of actors involved in cross-border traffic, as can be seen in Figure 1 (World Bank, 2017, p. 81).

Figure 1: Actors and data exchanges in a single window environment



Source: World Bank (2017, p. 81).

At this point, it is important to point out that the single window concept is focused on the regulatory process as operationally implemented in a synchronised manner with goods movements across the border—pre-arrival/departure permitting or reporting, the lodging of declarations and other documents for incoming or outgoing consignments, and the process of authorising those consignments to continue along the supply chain.

A successful single window is, therefore, both transactional and operational in nature and many of its functions are time-critical. It comes into play once consignments are on the move, or just prior to that point, and is essential to enabling them to complete their international journey. This presents a clear distinction between a single window and the more advance-planning focused ‘trade portal’ or ‘trade informational portal’ facility. While significant potential synergies exist between a single window and a trade portal, they are different concepts and should not be conflated.²

The hard work of building a successful single window requires a step-by-step approach, combining the management of policy, organisational approach, legal issues, operational and communication frameworks, business process re-engineering, IT architectural decision-making, data harmonisation, messaging standards, procurement, project implementation management and—importantly—change management, both during the project and following implementation. Inadequate attention to any of these factors can lead to project delays, cost overruns, and even project failure—and critical problems are often unrelated to IT issues, although they can be exacerbated by them.

4. Single window best practice

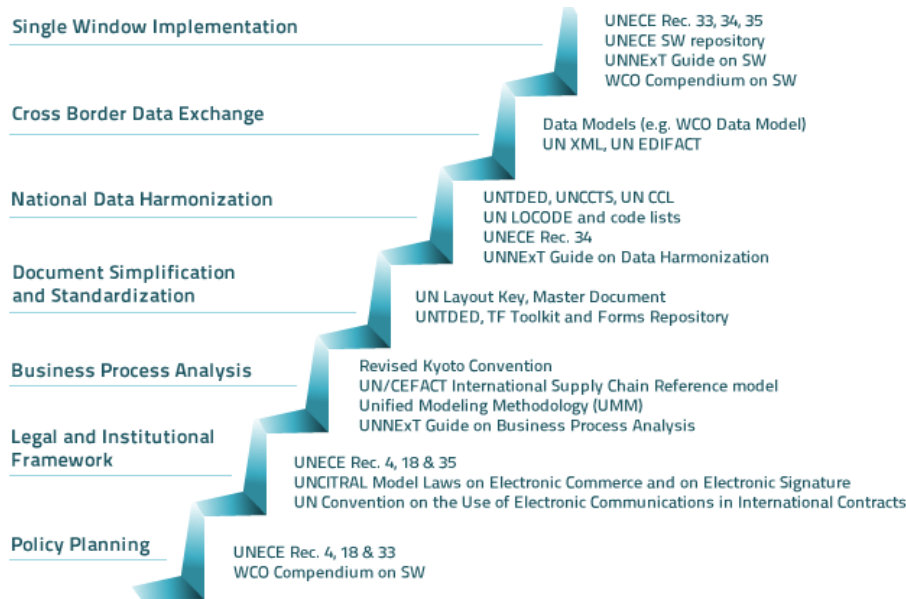
With international trade being long recognised as a driver of national economic growth, multilateral bodies focused on the promotion of economic development have had a focus on the single window concept for some time. Various units of the United Nations (UN) have been notably engaged in gathering information on single window implementations around the world, distilling best practices, and providing guidance and advice to countries looking to start a new project or improve those already underway. The World Bank Group, the Inter-American Development Bank, and other multilateral and national organisations focused on trade promotion for economic development have done a great deal of work in the area of single window.³

UN initiatives related to single window include those led by a variety of UN operating units, including the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), UNECE, United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT), the United Nations Network of Experts for Paperless Trade and Transport in Asia and the Pacific (UNNExT), the United Nations Commission on International Trade Law (UNCITRAL) and the United Nations Conference on Trade and Development (UNCTAD). Both UNECE and UNESCAP have become global focal points for trade facilitation recommendations and electronic business standards in general, and single window has taken on an increasingly large role in their work.

UN/CEFACT was established as the vehicle to provide cooperation and develop standards in these areas. Over the past several decades, all of these UN agencies have produced a large corpus of international standards, best practice recommendations, case studies and guidance documents in the field of trade facilitation, many of them focused on or directly relevant to single window, with periodic updates to reflect technological developments. Although these instruments are not binding, they have been adopted as *de facto* international standards as they collect and organise the know-how that has been gathered in the diverse experiences of countries implementing single window. The work of UNCITRAL, which focuses on international trade law standards, provides further guidance on some of the underlying legal building blocks for single window.

UNECE provides a comprehensive online Trade Facilitation Implementation Guide (UNECE, 2012b), which has a dedicated section on single window (UNECE, 2012c) that is constantly updated with the latest information related to a number of topics (one current project is related to using Blockchain technology as a trade facilitation enabler in the single window context; see UNECE, 2017a), including links to a very extensive set of materials related to single window implementation. Selected ones are referenced below in Figure 2, which depicts, by topic, key steps in the creation of a single window.

Figure 2: UN toolset for single window: Step by step



Source: UNECE (2012b).

These materials provide an essential starting point for any single window project, and even though many are focused on single window implementation in the developing country context, a high percentage of their content is pertinent to developed countries. Notable efforts include the *Data harmonisation and modelling guide for single window environment* (UNESCAP, 2012a), which provides an exhaustive analysis of the benefits of data harmonisation to enable efficient and predictable transactions based on trade facilitation principles and international standards. It delivers a step-by-step approach to help government officials and the trading community in their plans to capture, assess and define data and to structure electronic documents. Another useful document is the *Business process analysis guide to simplify trade procedures* (UNESCAP, 2012b), which presents a methodology to identify, describe and analyse the existing ‘as-is’ business processes, including activities and tasks involved in international transactions within the framework of UNECE’s buy-ship-pay international supply chain model (UNECE, 2012a). It delivers practical steps (and detailed examples) and activities, from scoping the business process analysis project, planning its implementation and collecting relevant data, to analysing the captured data to identify bottlenecks and developing recommendations for improvement.

UNECE has worked over several decades to develop a series of interlinked recommendations (noted in Figure 2 above) that represent a global consensus of best practice on cross-border trade facilitation, including a number of formal recommendations directly relevant to single window. UNCTAD has extensive experience in various areas of international trade, trade facilitation and transport/logistics (UNCTAD, 2016). With the beginning of the WTO trade facilitation agreement negotiations, support to developing countries in these negotiations became another major focus of UNCTAD through analytical and policy publications, training and awareness-raising events, as well as the implementation of technical assistance and capacity-building activities.

Today, the UNCTAD trade facilitation package includes support for implementation of the TFA, along with broader, more ambitious transport, transit and trade facilitation reforms.

UNCTAD support is provided in close collaboration with other international organisations, including the International Trade Centre (ITC) and UNECE, and it has recently expanded its efforts to offer UN members access to guidance, technical assistance, and software tools to build single windows and related applications (see UNCTAD, n.d.).

Another international organisation that is active in this area is the WCO. The WCO is an intergovernmental organisation, based in Brussels and established in 1952 through an international convention termed the Customs Cooperation Council, that represents the global customs community in a wide range of operational and policy issues. It creates and manages conventions, standards and other instruments aimed at improving the efficiency and effectiveness of border regulation in general and customs procedures in particular.

As a key part of its charter, the WCO works with other government and industry organisations, such as the WTO, UN/CEFACT, the International Federation of Freight Forwarders (FIATA) and the International Chamber of Commerce (ICC). This engagement with private and public sector stakeholders is a critical aspect of the WCO's mission. All trade facilitation technical forums at the WCO are typified by extensive representation of the many industry and intergovernmental agencies with an interest in the topics under discussion. The representatives can contribute to discussion equally and, as a result, help shape the outcome.

Since 2003, the WCO has been actively engaged in the promotion of the single window concept in conjunction with UN/CEFACT, including the two-volume single window compendium (WCO, n.d.a) that presents the legal, technical, human resource and procedural aspects of single window from the perspective of executive management and operational staff in Customs.

A key differentiation in the WCO literature on single window is the use of the word 'intelligent' to define how the WCO envisages a single window system operating. It uses the term 'intelligent' because the WCO suggests that any effective single window is to be more than a data switch/gateway to other regulatory agency environments or a web portal. It must provide shared services to all stakeholders, and ideally incorporate integrated risk management that satisfies the requirements of all agencies involved as single window stakeholders, provide for the appropriate sharing of data and represent an integrated duty/tax/fee management system that would include the banking sector. Furthermore, the WCO is of the view that a best-practice system must achieve a combined transactional response to the trader, one which either signals a release or alerts the trader to any impediment to release by providing adequate information on the governmental requirements (whether from Customs or any other agency involved in the single window) to enable the trader to resolve them.

The WCO's single window compendium has been augmented over the years with the addition of several explanatory and related documents, such as the IT Guide for Executives (WCO, n.d.c), which provides invaluable advice for Customs or other agency heads contemplating large-scale IT projects such as a single window system, and the 2015 *Supplement edition to the WCO SW compendium*, which reads, in part:

The Single Window concept examines regulatory controls through the eyes of the trader and views all interactions between trade and regulatory agencies without regard for the internal divisions within government. (WCO, 2015, p. 3)

Another important related document is the WCO Single Window Data Harmonization guidelines (WCO, 2007), which are much the same as UN/CEFACT Recommendation 34 on the same topic, but were tabled and accepted in February 2007, before the UN recommendation. This is of significance because in recommending data harmonisation, the WCO is in a position to offer the WCO Data Model (WCODM) as the base template against which countries can create a standardised national data set.

The WCODM was aimed originally at creating an international standard for data and message structures required for the various exchanges between Customs and trade in order to manage the various border regulatory requirements. With the single window concept in mind, the WCODM was extensively upgraded from 2005 to include the data and messaging for a wide range of other border regulatory requirements, such as human health, food standards, animal and plant quarantine. Apart from data structures, the WCODM includes the United Nations Rules for Electronic Data Interchange for Administration, Commerce and Transport (UN/EDIFACT) and xml standard message templates, business process and information models and a wide range of international and national code sets. Through the creation of the Government Cross Border Regulatory (GOVCBR) UN/EDIFACT message in 2009 based on data model structures, the WCO championed the first standard message set able to manage information exchanges in a single window environment, and it continues to work in this area.

Other WCO initiatives that have strong links with single window include the Coordinated Border Management (CBM) concept and the Framework of Standards to Secure and Facilitate Global Trade (the SAFE Framework).

CBM is a term used in WCO parlance to describe closer collaboration between border agencies for a wide range of potential activities—it is a concept that is widely promulgated by the World Bank, UN agencies and the WTO (and, indeed, several TFA provisions are aligned with it), sometimes under slightly different terminology, such as ‘Collaborative Border Management’, but with the same intent. Single window can be seen as a part of this wider interagency cooperation. CBM is an important component of the WCO’s vision for the 21st century and it incorporates a broad range of procedural, administrative, legal, physical, data and technical issues, such as joint controls, shared facilities and joint intelligence and targeting centres, and it is closely linked to prescriptions in the TFA (see Section 7 below).

The SAFE Framework was the collective customs response to the terrorist actions of 9/11 and its core concept is awareness of the importance of seeing the international trade supply chain as an interconnected series of actions and exchanges of information at a significant number of physical locations amongst a wide array of private and public sector actors, many of whom would be unaware of each other and the role(s) they play. Since the development of SAFE Framework in 2005, the importance of cooperation between Customs and other government/intergovernment agencies involved in the border regulation of international trade and supply chain security has increased. In recognition of this, WCO introduced tools and instruments, such as CBM and the WCODM, and augmented the SAFE Framework with a number of standards covering Customs to other government agency cooperation. This provides further context to the importance and relevance of single window to the strategic thinking of the WCO.

5. Key success factors in single window projects

Two decades of experience in the implementation of single windows around the globe, reflected in the work of the multilateral agencies, have highlighted the factors that must be addressed in order to achieve successful implementation. Single windows, if successfully implemented, have been lauded as a key part of what the World Bank calls a national digitalisation strategy, and can have a significant positive effect on economic growth (UNECE, 2017d). Nevertheless, single window implementations around the world also provide more than a few cautionary tales, with a recent report noting:

It is not uncommon to see, in one country, several entities claiming to be Single Windows, acting in a coherent framework, notably when this stems from a strategic approach by the authorities. But most often, Single Window initiatives are implemented in an uncoordinated manner, against a background of hidden rivalries among administrations, with totally unproductive results for the country. At the level of architectures, power relations may also impose sometimes cumbersome, costly and ineffective operational architectures. (African Alliance for Electronic Commerce, 2017, p. 19)

Distilling the lessons learned, best practices, and recommendations encapsulated in the many reference works produced by multilateral agencies on the topic of single window, we summarise some key factors to be kept in mind from the outset of any single window project.

Legal framework

National laws governing cross-border trade, including those relating to the authority of Customs or other agency vested with the primary role of controlling national borders, tend to be aligned with border processes (such as importing goods), in part due to the coordinating work of the WCO over the past 50+ years and the provisions of the Revised Kyoto Convention and exhibit broad similarities from country to country. But the enabling legislation for other agencies, which often have an operational focus that is primarily domestic in nature, is often widely divergent and, even where it grants border-related authority or imposes mandates enforceable at the border, it rarely does so in a way which is aligned with customs law or customs operations. Also, to the extent agency legislation mandates information collection, permitting, or the like, it will often do so in a way which is not entirely compatible with modern IT processes.

This being the case, there is a major legal component essential to the preparation of any single window project, which is why multilateral agencies such as UNECE (UNECE, UNESCAP & UNNExt, 2013), UNCITRAL,⁴ UN/CEFACT⁵ and the WCO (WCO, n.d.) have devoted significant time and resources to setting out comprehensive guidance, recommendations, and explanatory information for parties to consider when embarking upon a single window (UNECE, 2010a) and the legal aspects feature prominently.

A single window requires a firm foundation in the national legal framework. For example, depending upon the solution chosen, a country's customs legislation might need significant amendment to provide Customs with the authority to be the lead agency, and to require Customs as well as OGAs to collaborate as they progress initiatives to incorporate their trade-facing activities into the single window. Similarly, legislation giving power to OGAs to inspect goods, collect data and so on, will need to be amended to reference the new data-sharing system and the division of responsibilities between Customs and the OGAs. Alternatively, it is possible that a single window might obtain its legal authority courtesy of a purpose-built enabling Act, overriding previous conflicting legislation at the agency level.

Lead agency and operational model

A single window project can only succeed in a national environment where agencies with border responsibilities have established a collaborative working relationship.⁶ As a practical matter, a single window facility needs to have a lead agency (or an agency that represents the government in a public-private partnership) in charge of its planning and implementation, and to take the primary role in running the system once it is operational. Typically, this agency is Customs (or the nearest national equivalent with border control responsibility).

As noted above, appointment of a lead agency requires a grant of authority, preferably legislation-based, which is binding on the lead agency as well as all OGAs participating in the single window. This grant of authority may be accompanied by a mandate from the highest level (e.g. the prime minister's/president's office) that agencies with responsibilities touching on goods crossing the national borders must utilise the single window as the primary means of gathering information, monitoring compliance with regulatory requirements, and collaborating with the lead agency on decisions and actions relating to cross-border movements of goods within their scope of jurisdiction.

Once a grant of authority and a mandate for OGA participation are in place, the lead agency must establish a close working relationship among all agencies which will participate in the single window from the earliest possible planning stage. Close and effective inter-agency communication is essential

for the success of any single window, and crucial aspects, such as risk management, data harmonisation, and business process re-engineering, can only be accomplished with a shared vision and close (and continuing) collaboration.

Once a single window is operational, the need for close collaboration continues as the involved agencies will need to handle any emerging issues (for example, system availability/functionality issues) in tandem and manage the inevitable changes in regulatory requirements, technology, and the trading environment over time. The single window needs to incorporate principles of good IT governance, including clear and effective rules (authorisations, access criteria, monitoring, data protection, archiving), and be capable of significant scalability.

Multi-agency risk management

One of the most significant (and underestimated) challenges in creating a single window is harmonising the risk management strategies of the agencies involved in a way that enhances trade facilitation. Risk management is a topic to which much attention has been paid in the customs and border management context, and multilateral agencies, such as the WCO, UN agencies and the World Bank, have devoted considerable resources to devising, documenting and promoting best practices,⁷ with many countries having adopted them. But the topic of risk management of internationally traded goods is not always in focus in those agencies with a domestic mandate (e.g. safety- or consumer-protection-related requirements).

In most countries, Customs has moved away from a 'stop and search' methodology applied to all cross-border consignments to much more sophisticated risk management techniques involving advance information, intelligence gathering, profiling and targeting, statistical sampling, compliance-based risk profiling and 'trusted trader' schemes. Where possible, risk analysis is applied by use of advance information about the goods, the trader and the supply-chain, so that the risk can be mitigated by making a determination about the regulatory treatment of imported goods prior to them reaching the border (or even before they depart the point of origin). The same logic applies to exports where risk assessment must be performed well before loading on the international means of transport, ideally as soon as possible after they are dispatched from their point of origin.

In less critical situations, imported goods can be allowed to cross the border with the condition that post-entry modifications (e.g. labelling) are used to bring the goods into conformity with national standards before being brought into domestic commerce. Whereas national customs authorities utilise these methods as a matter of course, OGAs may not be familiar with them, or may be hesitant to use them, and indeed may simply maintain that their mandate requires 100 per cent inspection of certain items and an assurance that they are completely in conformity with relevant standards before they physically enter the country. While there are circumstances where this may be justified, such measures impede trade and alternatives may be available to lessen the impact on commerce. For countries exporting foodstuffs, quality assurance is of great importance and may be significantly augmented through greater interagency collaboration in a single window.

In a multi-agency single window environment, it is essential that all such issues be discussed and risk management agreed between Customs and all OGAs prior to implementation within the single window environment. It is essential that each agency communicate the risk management measures it intends the single window (as managed by the lead agency) to perform, including detail on timing and format of information to be collected, whether risk assessment and risk management decisions should be dealt with directly by operation of the single window (e.g. through automation or instructions to border personnel), or after obtaining OGA input.

It is also important to document the parameters relating to whether consignments associated with risk factors can be released only after such have been mitigated through physical or documentary inspection, or whether post-entry/pre-loading treatments are available. In most cases, the lead agency will need to enter into an agreement with each OGA, documenting these matters, with periodic updates to take account of operational and regulatory changes.

Data sharing and data protection

The sharing of sensitive data for risk assessment and other purposes within a single window raises issues of privacy, commercial confidentiality and data protection. Some of that can be managed legislatively ((for example, *Electronic Transaction ACT 1999* in Australia, or similar) but many of the detailed procedural issues may be managed through memoranda of understanding or other written agreements between agencies guaranteeing the interests of all stakeholders involved in the single window. Data protection issues can be difficult even in a domestic inter-agency single window context, but they become exponentially more so in an international environment, as when the single window is linked into a multi-country networked environment.

Involvement of trade stakeholders

While the initial decision to pursue a national single window strategy lies with the government, in most cases the decision will be predicated on either direct input from trade stakeholders or economic analyses which bolster the case for a return on investment (accruing to government, but in line with TFA precepts, also generating gains in trade efficiency for trade stakeholders in general). Any new government system will have an impact on trader processes, and the impact needs to be clearly understood and reflected in the overall project cost-benefit and regulatory impact analysis. Some impacts may not be clear to government and this makes involvement of key trade stakeholders in the feasibility study phase of the project essential.

Once the project is launched, involvement of trade stakeholders in all project phases continues to be essential to ensure that the single window captures both the relevant aspects of trade processes and opportunities for process improvements during the design phase, but also to generate a sense of collaboration and ownership among traders, which can greatly ease system implementation and the inevitable issues which may arise when the system goes live. As noted above, once the system is operational, continuing dialogue with trade stakeholders is essential to identify further improvements in the single window and to effectively tackle new regulatory developments as they arise.

Financial aspects

As with any major IT system project, financing is essential from the outset. Single window financing models vary greatly from country to country, and run the gamut from systems wholly financed by the government (whether motivated by anticipated economic growth, cost savings, improved revenue collection, or all of the above), to systems financed, at least in part, by user fees, to systems which involve public–private partnership models designed to pay for themselves or even to generate operational revenue. Project planning and implementation options will be closely dependent on the model chosen, so it is essential that the financing model is clear before the project begins.

Another financial aspect relates to the method by which operational revenues—which can include duties, goods and services or value-added tax (GST/VAT), and fees for permits, and registrations—are collected and distributed (e.g. to the involved agencies, with or without revenue sharing to the agency running the

single window). From a trader perspective, the single window as a ‘one-stop-shop’ for payment can be a benefit in itself, especially if the single window model allows for periodic payment via a consolidated bill. As with the single window project financing model, this operational model needs to be determined earlier rather than later as it is a central issue in discussions between banks, agencies and the trade, and also has an impact on system design.

Authentication and information security

Another issue surrounds authentication (confirming the accuracy and trustworthiness of information), which is a general legal concern with automated exchanges of information, but which assumes particular importance in a single window environment given the number of parties dealing with sensitive information, the complex legislative environment that may prevail, and the variety of trader/agency, agency/agency, and even (in the case of an interoperable single window) government/government exchanges. All parties must agree the means by which they can be identified, the integrity of exchanges and how issues such as identity assurance and non-repudiation (i.e. that the sender of data is really the sender and cannot later deny the fact) should be managed.

With today’s omnipresent cybersecurity risks, a single window system represents a tempting target. The system processes vast amounts of data, much of it commercially confidential and related to privacy concerns, and the system is essential to the smooth flow of trade across the national border. If the system is down, goods may not be easily cleared. If critical commercial data is hacked, the national economy may suffer as a result. This means that the single window needs to be designed from inception with such security concerns in mind and it must be resilient enough to remain in service despite attacks and be capable of having its defences regularly updated.

Business process re-engineering

International best practice and the written advice of international agencies such as the UN (see UNNExT, 2016) and the WCO (WCO, n.d.a), recommend that a change initiative as broad and complex as single window ought to be accompanied by a business process review and, where appropriate, a business process re-engineering exercise. It is a long-established fact of automation that computerising poor or outmoded procedures will not lead to the optimum outcome—rather, it can entrench those outmoded and inefficient procedures.

Taking paper documents and simply exchanging them for electronic document images is a common mistake and rarely leads to trade facilitation. The greatly increased collaboration amongst border regulatory agencies and their new methods for dealing with industry provide a potentially rich basis for a successful review and changes to existing procedures, and it is indeed in this area that the TFA provides a strong motivation for single window implementation.

Technical architecture

Single window embraces a variety of technical issues, but within that descriptor, there are several categories of overarching importance. One of these is the system architecture. Will the single window be a discrete system, monolithic in nature, or will it be a networked gateway behind which exist an array of interlinked systems? Today’s technology landscape presents many options, and these must be analysed and agreed amongst all parties to the single window at project inception, and options will be partly dependent upon the legal issues mentioned above.

Decisions as to whether the system should be interoperable with external systems, such as banks, trade portals and port communities, must also be taken and incorporated into the architecture. The policy decision about lead agency and whether the single window should be managed by an external provider are further influences on the final system design.

The IT security aspects mentioned previously also play a significant role in single window architecture decisions, as do operational fail-safes, such as parallel processing, multiple instances and system cutover capabilities. Data backup methods need to ensure that the system can be brought back online with all data re-constituted in a very short timeframe, and fallback procedures need to be known and operationally tested in the event of system downtime.

Experience has shown that, without an appropriate operational security architecture in place, the single window can easily become a ‘single point of failure’, instantly being transformed from a tool of trade facilitation to an impenetrable obstacle to cross-border trade. This aspect of single window design is very much a moving target (indeed, the standard-setting agencies such as UN/CEFACT are only now working to update their recommendations, see, e.g. UNECE (2017c), which addresses these topics), and the system must be designed not only to meet the challenges of today’s environment, but also for evolving future threats—and the budget for the system needs to be set accordingly.

Data and data standards

The messaging modalities for the single window need to be defined, and be as flexible and modern as possible, along with the data structure, both in the context of trade-facing data transmission as well as inter-agency data sharing and access. If it is felt that a common data platform is best, then a data harmonisation exercise will be needed (also a key factor in business process re-engineering) and that, in turn, means that a base data standard must be chosen.

Once again, UN/CEFACT (UNECE, 2010b) and the WCO (2007) recommend data harmonisation as an essential accompaniment to single window using the United Nations Trade Data Element Directory (UNTDDED) and using the WCODM as the standard, at least to the extent that the national single window’s internal data structure is harmonised with and can easily interact with the WCODM. Note that no international standard, on its own, will likely be able to handle all needs in a national single window, and therefore data standards often need to be supplemented and extended to meet country needs.

Change management and future-proofing

A single window is never ‘done’; changes to the national regulatory environment, the international trading environment and technological capabilities are constant, and any single window system (and the system’s operational management and budget) must be set up to stay on top of this change resiliently, without being overwhelmed.

While historically government IT systems were typically built on a customised model characterised as ‘state-of-the-art’ at a particular time, all governments have learned that this model leads to (expensive) legacy systems that need to either be updated and expanded (often very expensive) or phased out and completely replaced. Today’s technology options are much more flexible and interoperable than in the past, and any single window system needs to take advantage of this by a ‘future-proof’ architecture that embraces continual change, but incrementally without the need to replace the entire existing system.

6. Single window trends

While single window implementations advance, so do the associated technologies and innovative ideas to apply in them, and there are several topics impacting single window that are generating discussion at present. All should be reviewed and considered in terms of whether they could (or should) play a role in an eventual single window for a country, and the following summaries of three such ‘hot topics’ are provided as background.

Trade portal

Over the past several decades, most government agencies have established an internet presence, generally incorporating information about the agency and its responsibilities, with links to contact details, guidance, enabling legislation and the like. Over time, many agencies have also taken further steps to provide services (of various levels of complexity) to the public, for example replacing paper forms and approvals with electronic ones, allowing for electronic payment of fees, and moving the process of applying for permits online. Agencies with responsibilities at the border often have a specific section for importers and exporters, focused on their needs and requirements. And in most countries, Customs has a comprehensive website aimed at importers and exporters.

But each of these agencies develops its website in its own style and with information specific to its own scope of authority; it is rare to find agencies that present import and export information in a comprehensive manner that also covers the steps and requirements of other relevant agencies. All of this combines to challenge the ability of the importer or exporter to be assured that they are aware of all requirements applying to a given consignment, even in their own country, let alone in other countries.

Up until recently, it has been unusual to find a national government that provides a website providing a 'one-stop shop' covering all requirements for import or export into a country. Some countries have government-sponsored websites that are called 'trade portals', but they often tend to be focused on promoting exports and do not provide much useful information on general border procedures. That this state of affairs is detrimental to cross-border trade is not surprising. The World Bank observes:

A single source of all regulatory information, provided it is comprehensive, accurate and up-to-date, can result in tangible benefits in terms of trade facilitation. For a start there would be substantial cost savings if proper guidance can be obtained without the need to seek advice in person from several locations. Furthermore, conflicts would be avoided by having a single authoritative reference point, as would potential penalties for non-compliance. Cumulatively, these savings in time and cost should cut the overall cost of doing business and reduce the time to import or export goods thus contributing to a country increasing its overall standing in terms of transparency and ease of doing business. (Pugliatti, 2012, p. 3)

The appeal of this sort of trade portal is evident to almost anyone in the business world looking to access foreign markets or foreign suppliers. Until very recently, with ratification of the TFA, the multiple agencies with responsibilities touching on the border in any given country have had little incentive (and often no budget) to come together and agree on the implementation of a trade portal unless they received a specific mandate from above. The dearth of trade portals currently in existence (they are currently being implemented in countries that are involved in trade facilitation development projects sponsored by the World Bank, but they are otherwise currently virtually non-existent) shows that it is rare that a government has made creation of such a portal a priority.

Nevertheless, it should be immediately evident that the organisational factors which are necessary pre-requisites for a single window project would also lend themselves to creation and maintenance of a national trade portal. In fact, the necessity for a successful single window to maintain its currency with the changing regulatory requirements of the agencies involved in it means that the lead agency must track and document all such developments impacting single window-enabled import and export processes. The incremental cost of providing that information to traders in a comprehensive trade portal would seem to be minimal.

Conceivably, a trade portal could move beyond the provision of information to assist traders in preparing for a cross-border shipment to the provision of services, such as registration, permitting, and payment of border-agency related fees. If a national single window exists, these (non-time-critical) services could

be cross-linked to the single window (where rapid release is desirable and often critical) for purposes of validation, authentication and risk management, leading to trade facilitation treatment which may be much more ‘personalised’, yet be largely automated, than would otherwise be possible. Even where such cross linkages are not in place, it is of critical importance that the trade advice in a portal is fully consistent with the operational functionality of a single window.

Interoperability of single window

Recognition of the benefits of national single windows has led to a realisation of the potential advantages of scaling the single window concept to cross-border exchanges of data. The great number and variety of public agencies means that the main challenges remain the simplification, harmonisation and standardisation of data collection (whether electronic or in paper form) and procedures. Other critical challenges include cross-border authentication, mutual recognition of respective legal domains and above all, mutual trust.

‘Interoperability’ refers to the exchange of specific categories of foreign trade-related information in a structured format between two or more single window systems in different economies or countries. According to the UN/CEFACT Recommendation 36 (released in early 2017), the aim of interoperability should be to exchange accurate, complete data (datasets) speedily, seamlessly and securely and to the greatest benefit for operators and users.

The scope of single window interoperability may be adjusted depending on the interest of parties. Recommendation 36, for instance, points out that they can be bilateral, or multilateral if more than two countries are included; as well as sectoral if interoperability operates only between specific sectors (Customs to Customs,⁸ phytosanitary authorities, or maritime agencies). Increasing interest in interoperability has led to proposals to include specific provisions in the latest preferential trade agreement negotiations.⁹

Countries and economies with mature single windows or data exchange systems in place are developing interoperability projects at the multilateral level, notably the Association of South East Asian Nations (ASEAN) group.¹⁰ The Pacific Alliance regional free trade arrangement (consisting of Chile, Columbia, Peru and Mexico) is the first to establish by treaty the obligation of members’ national single window systems to interoperate at a regional level; it defines the obligation as establishing the ‘capacity of the systems to allow the electronic exchange of information, aligned to internationally accepted standards’.¹¹

The system’s Interoperability Pack (IOP) started operations in July 2016¹²; it is an integrated platform for facilitating trade through faster clearance of cargo and release of shipments among Pacific Alliance countries. The IOP connects each member country’s single window which enables standardised submission and processing of data, as well as a single point of approval for clearance of cargo. The scope of this project is currently limited to exchange of phytosanitary and certificate of origin messages among the country members, but it is expected that, in the near future, the customs declaration will also be included in the system (see Ministry of Foreign Trade and Tourism of Peru, 2017). It is likely the world’s first case of multilateral single window interoperability in action.

It appears that the topic of single window is increasingly being directly included in free trade agreement discussions as part of the topic of trade facilitative measures, with focus specifically on the benefits that interoperability can bring.

Port community system

Port environments encompass a complex network of transactions with multiple and diverse public and private actors. Based on the characteristics of port operations, two groupings can be discerned: the port/cargo logistics services and operations (e.g. loading, unloading, mooring, towage, pilotage), traditionally known as the port community system (PCS), and the other related to regulatory reporting requirements (declarations to port authority, coast guard, immigration, Customs, etc.) for vessel and cargo clearance to and within the port premises; often called a ‘port single window’.

A PCS is a collaborative electronic platform that facilitates end-to-end information flow and creates value for port users, trade and logistics businesses and government agencies. It is meant to be neutral and open and enables intelligent and secure exchange of information among parties to improve the efficiency and competitive position of the sea and airports’ communities and optimises, manages and automates logistics processes through a single submission of data and by connecting transport and logistics chains.

At the conceptual level, a PCS is a system that aims to provide interoperable information exchange amongst a diverse stakeholder base and that corresponds very closely with the single window idea. PCSs share many architectural and other technical similarities with the single window concept and the information exchanged is often, at least in part, data which is also required in trader declarations and government reporting mandates.

The growth of requirements for real-time exchange of information and the rapid development of IT systems are creating demand for more integration between both environments, leading to an expansion of the previous narrow PCS notion into a more comprehensive one encompassing government agency reporting procedures. Because of this, in some countries, PCSs are linked to Customs and OGA applications and this model could provide a useful example in terms of a collaborative data sharing in the single window context.

A PCS integrated into a single window would, at minimum, embrace those reporting requirements related to the vessel and cargo that are required by government (e.g. in declarations). From a business process model perspective, such may be classified as follows:

- Regulatory: IMO-FAL forms, cargo manifests
- Operational: Vessel arrival notice
- B2B messaging: Booking, nomination of pilots
- Services requests: Bunkering, container pick up
- Delivery of information: Port services performance indicators, single window.

While UN/CEFACT Recommendation 33 is currently by design not applicable to B2B data exchanges, UNECE is engaged in a Single Submission Portal project (UNECE, n.d.) to bring in other categories of single-window-like platforms (which can include B2B aspects) under coverage of its range of recommendations. This effort is, in part, a response to work by the International Maritime Organization (IMO), which has contributed to this area by providing standards for the electronic exchange of information on cargo, crew and passengers as part of a revised and modernised annex to the *Convention on Facilitation of International Maritime Traffic (FAL Convention)*, known as ‘FAL-Forms’ (IMO, 2019) and are promoting a new ‘Maritime Single Window’ initiative (IMO, 2014).

7. Single window and the WTO Trade Facilitation Agreement

Up until 2017, virtually all work on single window projects was comprised of national implementations that were voluntary in nature, motivated by national, mainly government-centric considerations, such as a desire for more efficiency in border operations, more effective enforcement, and IT-driven cost and personnel savings. Although multilateral donor organisations, such as the World Bank and the regional development banks, began to promote (and finance) such systems over the last two decades as being beneficial to the economy of developing countries (by making access to international markets less costly), there was no binding obligation on national governments to implement single window systems.

As discussed above, while UN agencies, the WCO and others produced a very comprehensive and useful range of guidance on how best to implement single windows, whether to do so (and take account of that guidance) was a decision left to each country. With the entry into force of the TFA in early 2017, single window may be perceived to have a stronger foundational mandate than previously, at least in those countries which have acceded to the treaty's provisions. The discussion below examines whether, and to what extent, this perception is accurate.

TFA provisions on single window

The TFA contains specific provisions relating to single window, in Article 10, entitled 'Formalities Connected with Importation, Exportation and Transit', specifically in Article 10, Section 4, set forth below:

4 Single Window

- 4.1 Members shall endeavour to establish or maintain a single window, enabling traders to submit documentation and/or data requirements for importation, exportation, or transit of goods through a single entry point to the participating authorities or agencies. After the examination by the participating authorities or agencies of the documentation and/or data, the results shall be notified to the applicants through the single window in a timely manner.
- 4.2 In cases where documentation and/or data requirements have already been received through the single window, the same documentation and/or data requirements shall not be requested by participating authorities or agencies except in urgent circumstances and other limited exceptions which are made public.
- 4.3 Members shall notify the Committee of the details of operation of the single window.
- 4.4 Members shall, to the extent possible and practicable, use information technology to support the single window.

It should be noted from the outset that much of Article 10, including Section 4, is phrased to place obligations on 'Members', being WTO member states, in relation to formalities at the border. These provisions are clearly intended to address the government as a whole, encompassing all agencies imposing requirements on goods which move across the national border, not just on Customs (this is underlined by the fact that other TFA provisions do address Customs specifically, e.g. in Article 12), and regardless of whether those goods movements are in the nature of imports, exports, or transit.

Section 4.1 initially requires members only to 'endeavour' to establish or maintain a single window; this is not a mandatory requirement. If such a single window is in place, however, Section 4.1 requires them to enable '...traders to submit documentation and/or data requirements for importation, exportation, or transit of goods through a single entry point to the participating authorities or agencies.' It further states that, after examination of documentation and data submitted, the government shall notify the 'applicants' of the results 'through the Single Window', and 'in a timely manner'. This sets a relatively high set of standards for the authorities in those countries with single windows. Section 4.2 arguably sets an even

higher bar, by requiring agencies participating in a single window to refrain from demanding duplicative ‘documentation and/or data requirements’ (‘except in urgent circumstances and other limited exceptions which are made public’).

As with the definition of single window in UN/CEFACT Recommendation 33, none of the above TFA prescriptions necessarily imply that the single window is in fact an IT system; the implication is that it could be an entry point for submission of documents. Nevertheless, Section 4.4 does require (the word ‘shall’ is used) members with a single window to use information technology to support the single window (the ‘shall’ is then softened considerably by ‘to the extent possible and practicable’).

As part of Article 10, Section 4 needs to be read in light of Article 10, Section 1.1, which sets the standards by which all members’ border formalities are to be judged:

1 Formalities and Documentation Requirements

1.1 With a view to minimizing the incidence and complexity of import, export, and transit formalities and to decreasing and simplifying import, export, and transit documentation requirements and taking into account the legitimate policy objectives and other factors such as changed circumstances, relevant new information, business practices, availability of techniques and technology, international best practices, and inputs from interested parties, each Member shall review such formalities and documentation requirements and, based on the results of the review, ensure, as appropriate, that such formalities and documentation requirements are:

- (a) adopted and/or applied with a view to a rapid release and clearance of goods, particularly perishable goods;
- (b) adopted and/or applied in a manner that aims at reducing the time and cost of compliance for traders and operators;
- (c) the least trade restrictive measure chosen where two or more alternative measures are reasonably available for fulfilling the policy objective or objectives in question; and
- (d) not maintained, including parts thereof, if no longer required.

Of particular relevance to the single window discussion is that admonition to ‘take into account... availability of techniques and technology, international best practices...’. This appears to be especially relevant to meeting the tests of Section 1.1 (a) and (b) above.

TFA Article 10 also contains, in Section 3, a clear recommendation to members to take account of international standards in defining border formalities—a not-so-subtle link to the work of the UN agencies and the WCO outlined above, much of it directly relevant to the single window:

3 Use of International Standards

- 3.1 Members are encouraged to use relevant international standards or parts thereof as a basis for their import, export, or transit formalities and procedures, except as otherwise provided for in this Agreement.
- 3.2 Members are encouraged to take part, within the limits of their resources, in the preparation and periodic review of relevant international standards by appropriate international organizations.

Border agency cooperation and informational requirements

Although the only specific mention of single window is in Article 10, Section 4, the TFA also contains, in Article 8, a very clear mandate which can certainly be read to guide any and all activities pursued under Article 10, including any national single window project:

ARTICLE 8: BORDER AGENCY COOPERATION

1. Each Member shall ensure that its authorities and agencies responsible for border controls and procedures dealing with the importation, exportation, and transit of goods cooperate with one another and coordinate their activities in order to facilitate trade.

This provision essentially serves to mandate the CBM concept promoted by the WCO and other multilateral organisations, as discussed previously in this paper. Implicit in this cooperation is coordination of risk management, and effective implementation of it in any single window system. In contrast to CBM in the WCO context, however, the focus of the mandate here harkens back to TFA Article 10, Section 1.1, with its goal of achieving results—‘...in order to facilitate trade’. This arguably means that the overarching goal of a single window implementation in any WTO member which has accepted the TFA must be doing so ‘in order to facilitate trade’.

An oft-cited obstacle to cross-border trade is the lack of easy access to accurate information on requirements for import and export, not just in terms of the actual border procedures, but also in terms of pre-requisites (e.g. registration requirements, permits, examinations) and the related costs.¹³ Government agencies, to the extent they provide such information at all, often do it only for their own regulatory processes, and leave it up to the trader (or their service provider) to build the various pieces into an overall picture of what it takes to move a given consignment of goods from a domestic factory to a customer in a foreign destination or to import foreign-produced goods into the country. In particular, small- and medium-sized traders may be reluctant to engage in international trade because of the lack of information and resulting unpredictability.

One way to address this issue is for a government to implement a trade portal. Perhaps not surprisingly, given its goal to facilitate cross-border trade, the TFA also contains provisions which are relevant to the Trade Portal concept discussed in Section 6 above. The provisions fall under TFA Article 1, entitled ‘Publication and Availability of Information’. Initially, Article 1 mandates that:

- 1.1 Each Member shall promptly publish the following information in a non-discriminatory and easily accessible manner in order to enable governments, traders, and other interested parties to become acquainted with them:
 - (e) procedures for importation, exportation, and transit (including port, airport, and other entry-point procedures), and required forms and documents;
 - (f) applied rates of duties and taxes of any kind imposed on or in connection with importation or exportation;
 - (g) fees and charges imposed by or for governmental agencies on or in connection with importation, exportation or transit;
 - (h) rules for the classification or valuation of products for customs purposes;
 - (i) laws, regulations, and administrative rulings of general application relating to rules of origin;
 - (j) import, export or transit restrictions or prohibitions;
 - (k) penalty provisions for breaches of import, export, or transit formalities;
 - (l) procedures for appeal or review;
 - (m) agreements or parts thereof with any country or countries relating to importation, exportation, or transit; and
 - (n) procedures relating to the administration of tariff quotas.

The above mandate in Article 1(1) does not extend to providing such information in any but the country’s national language and does not mandate provision of all such information via the internet. Article 1(2) does, however, go on to require a more general summary of national border regulatory procedures be published on the internet, ‘where practical’ also in one of the official languages of the WTO:

- 2.1 Each Member shall make available, and update to the extent possible and as appropriate, the following through the internet:
- (o) a description of its procedures for importation, exportation, and transit, including procedures for appeal or review, that informs governments, traders, and other interested parties of the practical steps needed for importation, exportation, and transit
 - (p) The forms and documents required for importation into, exportation from, or transit through the territory of that Member;
 - (q) contact information on its enquiry point(s).
- 2.2 Whenever practicable, the description referred to in subparagraph 2.1(a) shall also be made available in one of the official languages of the WTO.
- 2.3 Members are encouraged to make available further trade-related information through the internet, including relevant trade-related legislation and other items referred to in paragraph 1.1.

With regard to the ‘enquiry point’ referred to in Article 1(2.1)(c), this refers to the provisions on enquiry points in Article 1(3), which encourages a country ‘within its available resources’ to:

...establish or maintain one or more enquiry points to answer reasonable enquiries of governments, traders, and other interested parties on matters covered by paragraph 1.1 and to provide the required forms and documents referred to in subparagraph 1.1(a).

Article 1(3) goes on to require countries to ‘answer enquiries and provide the forms and documents within a reasonable time period’ and encourages them to do so without requiring fees (however, if fees are charged, countries ‘shall limit the amount of their fees and charges to the approximate cost of services rendered’).

As with many provisions of the TFA, there is a whole-of-government focus throughout Article 1; the provisions apply not only to Customs, but equally to all government agencies with responsibilities touching on cross-border movements. The requirements on publication of border-related requirements in Article 1(1), on provision of ‘a description of...procedures’ and other details in Article 1(2), and the provisions relating to the ‘enquiry point’ in Article 1(3) are all comprehensive in nature, and as such, presuppose a level of standardisation, coordination, and change management among the various government agencies which, while mandated by TFA Article 8, may present a serious challenge in implementation for any national government (and even require changes in legislation), even in the most developed countries.

Nevertheless, as should be evident from the discussion in Section 5 above, these requirements are fully aligned with the pre-requisites which must be in place for effective single window implementation and operation. Once these are in place, the stage is set for both a successful single window as well as a trade portal implementation, and the TFA provisions would seem to imply that both should be pursued in tandem.

8. Conclusions

As noted above, the TFA does not mandate that member countries establish a single window, rather TFA Article 10, Section 4.1 simply provides that ‘Members shall endeavour to establish or maintain a single window’. Nevertheless, the TFA does include mandatory provisions relating to border agency cooperation and transparency, the implementation of which could be eased via and aligned with a single window, and the TFA does arguably create an impetus towards a national single window in countries without them. As the TFA’s provisions are intended to be binding on all signatory countries (over time), whether having developed or developing status, this impetus for single window would seem to apply even to highly developed economies and would be augmented to the extent such a project could generate significant potential gains to efficiency across agencies and promote trade facilitation.

Clearly, all TFA signatories need to carefully consider their implementation priorities under the treaty. With the TFA requiring only an ‘endeavour’ to create a national single window, and no firm mandate to do so, a country may wish to postpone such a daunting project until after it has performed a comprehensive assessment of its compliance with the TFA’s mandates. In this regard, while a multi-agency border regulatory environment may appear to provide a good foundation for efficiency gains in cross-border trade via a single window, it is equally important to first lay the groundwork for such a system by focusing on improvements in cooperation among agencies, transparency, and other mandatory TFA provisions. This was one of the conclusions of the Australian private sector consultations (Widdowson et al., 2018). Other industry-based conclusions that are potentially of broader applicability to TFA signatory countries, regardless of a country’s development status, include the following:

- Regardless of whether implementation of a single window proceeds, a trade information portal, aligned with TFA Article 1, should be developed and maintained to support industry in identifying the myriad regulatory (and other) matters associated with international trade.
- If a decision to implement a national single window is made, a series of options should be proposed ranging from a relatively modest approach built around process improvements to a much more aspirational—potentially expensive—cross-border interoperable single window application that incorporates all domestic import/export data needs and also incorporates integrated risk assessment. The choice of options should explicitly incorporate funding models, and any model chosen must be sustainable for the long term and incorporate measures to adequately address inevitable ongoing regulatory and technological change.
- Any decision to implement a national single window should take account of the existing IT landscape across those agencies with border responsibilities, and, to the extent possible, incorporate and build upon effective solutions and processes which currently exist in an evolutionary manner.
- Should a decision to implement a national single window be made, the initial proposals on scope, timeline, budget and system architecture should be made public at an early stage, and industry input should be sought through a forum such as the NCTF in a manner that enables industry opinion to influence the way forward.
- Any decision to implement a national single window should incorporate international best practice, and be in conformity with relevant international standards to enable interoperability and comply with the TFA requirements on border agency cooperation.

It is not the intent of this paper to discuss the findings of the Australian study as they relate to the national regulatory environment.¹⁴ However, the feedback from the private sector demonstrated that Australian industry already, in a very real sense, views trade in the way the TFA views trade: not agency by agency, but from a whole-of-government perspective, and not broken down into discrete processes governed by various uncoordinated pieces of legislation, but rather from the perspective of an end-to-

end facilitated supply chain. The level of familiarity of these businesses with single window concepts like interoperability and coordinated border management may not have been high, but what they wish to see in terms of international trade facilitation appears to be very compatible with a single window implementation, especially one which incorporates a trade informational portal and provides a path to interoperability with the systems of Australia's trading partners.

In relation to the current state of the Australian government's IT landscape and its readiness for a national single window, the private sector highlighted significant challenges that would need to be addressed should a decision be made to go forward.¹⁵ For example, at the time of our review the Australian government had yet to engage with the private sector on single window. Meanwhile, the feedback from the private sector confirmed that, while trade stakeholders report frustrations and irritations with duplicative and inefficient trade processes at a granular level, some of these issues involve either requirements from the country to which they are exporting, or problems related to service providers, which may not be alleviated by a single window. Perhaps not surprisingly, given the lack of a government private-sector engagement strategy, many industry stakeholders were ill- or under-informed about the concept or potential features of a single window in general.

Our findings in the Australian context also indicated the possibility that fine-tuning existing systems and inter-agency processes (in line with the mandatory requirements of the TFA) might deliver the improved efficiency and intra-agency coordination desired by industry more quickly and cost-effectively than building a single window. Keeping that in mind, however, in light of the single window related deliberations of the Australian government, a clear message from the private sector was that there needed to be a disclosure of the government agenda for the single window and meaningful engagement with industry at a stage that is early enough to enable industry opinion to influence the way forward.

While private sector support and engagement has proved to be an essential factor in successful single window implementation, the impetus for any national single window needs to come from government, as do the initial proposals on scope, timeline, budget, and system architecture. Once these have been formulated, they should be made public at an early stage and—again in line with TFA requirements—private sector stakeholders should be brought into the discussion, with the expectation that any single window should be able to demonstrate a positive effect on the national economy by facilitating cross-border trade in goods.

Where a country has established an NCTF¹⁶ and, like Australia, involves trade stakeholders directly in the discussions, the Committee can provide an ideal forum for government/private sector dialogue on a single window project, with involvement in planning, monitoring, and decision-making from project inception through implementation and post-implementation stages to ensure that the single window remains aligned with TFA objectives and acts in the collective best interests of the national economy, balancing the priorities of government and industry stakeholders.

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Notes

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- 2 Note in this context that UNECE recently published a guidance document; see UNECE (2017d).
- 3 For an overview of single window related activities of the World Bank Group and the Inter-American Development Bank see Sections 4.6 and 4.7 of Widdowson, et al. (2018).
- 4 There are many documents on the UNCITRAL website that discuss the legal implications of single window. See, e.g. Rajput (2016).
- 5 There are many references to single window on the UN/CEFACT website. The following link is for a conference on the subject in October 2017, but it has within it links to various other core concepts such as the various single window recommendations; see UNECE (2017b).
- 6 For an extensive introduction to the existing conceptual frameworks for agency collaboration, see Standing Committee for Economic and Commercial Cooperation of the Organization of Islamic Cooperation (2016), pp.10–22.
- 7 For example, see Widdowson (2012); Widdowson & Holloway (2010, p. 95).
- 8 WCO has developed a comprehensive study on C2C exchanges called ‘Globally networked Customs’; see WCO, n.d.b.
- 9 For discussion in the context of the Pacific Alliance see Marczak & George (2016).
- 10 Although this project has ambitious goals, progress has been slower than anticipated; see ASEAN (2013).
- 11 Article 5.9 of Commercial Protocol of Pacific Alliance. Spanish version available at: <https://alianzapacifico.net/en/>
- 12 For Official Statement by Minister of Foreign Trade of Perú (member of Pacific Alliance) see Ministry of Foreign Trade and Tourism of Peru, n.d.
- 13 See Pugliatti (2012).
- 14 These can be found in Section 7 et seq in Widdowson, et al. (2018).
- 15 See Section 7 et seq in Widdowson, et al. (2018).
- 16 For a detailed discussion on NCTFs see Widdowson, D., Short, G., Blegen, B., & Kashubsky, M. (2018).

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The use of customs law and regulation to support the development of small and medium enterprises: Evidence from Indonesia

Milyan Risydan Al Anshori and Haniff Ahamat

Abstract

Small and medium enterprises (SMEs) have proven to be a reliable reflection of the national economy of many countries, including Indonesia. SMEs in Indonesia are well known for the uniqueness of their local crafts, but often face obstacles in business management. Hence, the Government of the Republic of Indonesia has introduced several packages of economic policies aimed at SME development. As a result, advanced and developed opportunities are provided to the SMEs. Furthermore, the Ministry of Finance, through its Customs Department, issued policies in its 2015 economic policy package to support SMEs to grow and to seize market opportunities at domestic, regional and international levels. As part of this policy package, SMEs were also provided with a relaxation of the provisions of the Import Facility for Export Purpose (IFEP) requirements, including the removal of cash guarantee or bank guarantee preconditions. However, this article identified that the facilities were only conferred to SMEs with industrial characteristics. Additionally, SMEs do not possess a Customs Identity Number (Nomor Induk Kepabeanan (NIK)), which is a requisite to import raw materials. As a result, an initiative has been introduced in the form of a collaboration between SMEs and the bonded logistic centre (BLC)—(known as SMEs–BLC) to provide an opportunity for SMEs to export their products through ‘bonded landfill’ arrangements.

1. Introduction

The Indonesian economy went through a difficult period over recent years, during which most of the economic sectors experienced an economic downturn. However, while many industries and trade sectors weakened, others survived or were almost unaffected, particularly the SMEs. Based on this premise, the Government of the Republic of Indonesia issued a complex economic policy package that included policies aimed at developing SMEs.

As a backbone of the Indonesian economy, and with a proven ability to maintain economic stability during crises, SMEs have the capacity to absorb up to 97 per cent of all workers in Indonesia. Unfortunately, large foreign companies, which only absorb 3 per cent of the Indonesian workforce, control almost half (43%) of the national Gross Domestic Product (GDP) (Lembaga Pengembangan Perbankan Indonesia, 2015). Despite their limited capacity compared to large companies, Indonesian SMEs contribute significantly to the stability for the labour market in Indonesia. Furthermore, since 60 per cent of the large companies are foreign-owned (Chandra, 2016), if these companies left Indonesia, the Indonesian economy would be weakened. Hence, there is a need to re-strengthen the foundation of SMEs. Contrary to popular

perception, SMEs provide more jobs than the big corporations in developed countries. For example, SMEs provide 60–70 per cent of jobs in OECD countries (OECD, 1998, pp. 3, 7), indicating that SMEs in developed countries play a more significant role in the economy than in developing countries.

In order to advance and develop SMEs, market opportunities need to be exploited. Economic globalisation, especially through the implementation of the ASEAN Economic Community, creates such market opportunities for SMEs. ASEAN’s market comprises of approximately 600 million people, with 24 per cent from the middle-class group (2010 figures), which, according to the Asian Development Bank, will increase to 65 per cent by 2030 (Ratnasari, 2016, p. 57). One such market opportunity is in high-end consumer products, such as eyelashes and wigs. These products, some of which were worn by Hollywood artists, are produced by the small and medium industries in Purbalingga, Central Java. This is clear evidence that these products meet the quality standards that enabled them to penetrate the international market.

However, SMEs also face problems in terms of business management. Most SMEs have difficulties in raising capital, obtaining raw materials, assembling good professional and management teams, maintaining competitiveness against rapid business competition, building on innovation, developing strategies to deal with government policies that do not support SMEs, and keeping up with rapidly changing consumer tastes. To help overcome these problems, the Director General of Customs and Excise, as authorised by the Ministry of Finance, issued a policy as part of the 2015 economic policy package. The policy is a form of government support for SMEs to grow and is designed to enable SMEs to be competitive in local, national and international markets.

This paper looks at the ‘bonded landfill’ concept. Bonded landfill refers to an area in which imports are stockpiled so that they can be used in the processing and production of exported goods. Based on this concept, the initiatives taken by the Indonesian Government in developing Indonesian SMEs, particularly in terms of exports, will be examined.

2. Characteristics of SMEs

Before proceeding with the development of SMEs, the characteristics of small and medium enterprises need to be understood. Table 1 highlights the varying perceptions of what constitutes a SME by different international institutions.

Table 1: Characteristics of SMEs according to international institutions

Institution	Max no of employees	Max turnover or income	Max assets
World Bank	300	\$ 15,000,000*	\$ 15,000,000
MIF-IADB ¹	100	\$ 3,000,000**	–
ADB (Africa) ²	50	–	–
ADB (Asia) ³	There is no official definition. The definition of each member country is adopted.		
UNDP ⁴	200	–	–

Source: Gibson & Van Der Vaart, 2008, p. 5.

*With 1 USD equal to Rp. 13,000.00, 15 million dollars is equivalent to 195 billion rupiah.

** With 1 USD equal to Rp. 13,000.00, 3 million dollars is equivalent to 39 billion rupiah.

Based on the tabulated characteristics and requirements, there is naturally some confusion about what constitutes an SME. The World Bank considers companies with assets worth of 194 billion rupiahs and employees of less than 300 people as SMEs, even though they may have significant strength in the market despite the quantum of their assets and employees being slightly lower than the specified thresholds. Therefore, it is important to know how Indonesian law defines SMEs.

Article 6 of Law No. 20 of 2008 on Micro, Small and Medium Enterprises, specifies that:

(1) Microenterprises:

- (a) Have a net worth of at most Rp50,000,000.00 (fifty million rupiahs), excluding land and building of business premises; or

Have sales proceeds of at most Rp300.000.000,00 (three hundred million rupiahs).

(2) Small enterprises:

- (a) Have a net worth of more than Rp50,000,000.00 (fifty million rupiahs) up to a maximum of Rp500,000,000.00 (five hundred million rupiahs) excluding land and building of business premises; or
- (b) Have annual sales of more than Rp300,000,000.00 (three hundred million rupiahs) up to a maximum of Rp2,500,000,000.00 (two billion five hundred million rupiahs).

(3) Medium enterprises:

- (a) Have a net worth of more than Rp500,000,000.00 (five hundred million rupiahs) up to a maximum of Rp10,000,000,000.00 (ten billion rupiahs) excluding land and building of business premises; or
- (b) Have annual sales of more than Rp2,500,000,000.00 (two billion five hundred million rupiahs) up to a maximum of Rp50,000,000,000.00 (fifty billion rupiahs).

It is important to note that the nominal value mentioned above can be amended in accordance with the needs of economic development, as regulated by Presidential Regulations.

Comparing the criteria of SMEs under Indonesian law with those prescribed by the World Bank, a company with assets of approximately 194 billion rupiahs is still a small-to-medium-sized business. However, in Indonesia a company with such value is not considered to be an SME. By the virtue of Law No. 20 of 2008, business entities whose assets do not exceed 10 billion rupiahs are regarded as SMEs.

3. The importance of SMEs to the Indonesian economy

The SME sector has an important role in encouraging the growth of the Indonesian economy. With the existence of SMEs, unemployment (i.e. the unabsorbed labour force) is reduced. During the 1998 Indonesian economic crisis, only the SMEs sector survived the collapse. This affirmed the position of SMEs as one of the main pillars (Soko Guru) of the people's economy.

The contribution of the SME sector to the gross domestic product (GDP) and the country's foreign exchange earnings is also unquestionable. SMEs have become the main focus of Indonesia's economic development and the current Indonesian government has shown renewed interest in giving preference for SMEs as part of its economic and development policy goals.

In line with the spirit of *Nawacita*, which represents the nine priority areas developed by the Jokowi Administration, the government seeks to improve people's productivity and competitiveness internationally. It also aims to foster economic independence with the strategic sectors of the domestic

economy (Kompas, 2014). The government policies that support SMEs are seen as precursors to the presence of healthy and strong SMEs in Indonesia, thus becoming the main pillar of the economy. The policies focus on providing support to the various barriers faced by SMEs, such as technological limitations, financial constraints and limited access to raw materials.

Apart from major stakeholders, SMEs also play an important role in boosting economic growth, high employment opportunities and distribution of income. In order to improve the role of SMEs in Indonesia, various policies on macroeconomic aspects need to be implemented. The government's SME-development agenda can have a significant impact on economic growth, employment and establishing a more equitable income distribution in Indonesia by providing larger economic stimulus to the sector. The stimulus in question can include providing fiscal facilities; easing licensing requirements for SMEs; and providing special programs for SMEs in government, private and foreign investment projects.

4. Customs support in the development of SMEs

The Customs Department, which falls under the jurisdiction of the Ministry of Finance, issued a policy, as part of that was included in the 2015 economic policy package, to promote the growth of SMEs. The package included incentives in the form of the Import Facility for Export Purpose (Kemudahan Import Tujuan Eksport (KITE)) for SMEs, which abolished the requirement for cash guarantee, bank guarantee or customs bond. This facility was previously applicable to small and medium industries (SMIs) only.

On the other hand, the three types of companies commonly found in Indonesia are the trade, service and manufacturing companies (the latter being better known as 'industry'). To date, the Import Facility for Export Purpose (KITE) has only been made available to manufacturing importers who intend to manufacture new goods from imported materials with the added value before they are exported. However, if the goods are not exported, a fine along with tax will be imposed (Regulations No. 253 and 254/2011) (Hukumonline, 2012). Through these regulations, the KITE-SME facility aims to increase economic growth to strengthen the foundation of the economy by supporting the development of export-oriented SMEs. The facility is also expected to create export products with national branding and strengthen Indonesia's competitiveness in the ASEAN Economic Community.

Under the provisions of the Customs Act, not all SMEs that manufacture goods from imported materials can access the available facilities. In order to determine future applications of the facility, the Customs Department conducted several public hearings in Bali, Semarang (Central Java), Tumang (Riau) and Boyolali (Central Java). Based on the outcome of these hearings, many SME products are exported by another party on their behalf, while other SMEs use express delivery services to export their goods. Furthermore, SMEs must pay import duties and import taxes for the imported raw materials they require to produce their goods. Ideally, if the country is seeking to prioritise the growth of its export-oriented SMEs, import duty should not be imposed on these SMEs.

On the other hand, the Bonded Logistics Centre (Pusat Logistic Berikat (PLB/BLC)) was established by the government as mandated by Article 44(1a) of the Customs Act. This bonded stockpiling base was developed to improve national competitiveness, lower logistics costs, reduce the burden of stockpiling, and reduce dwell time in ports. The BLC is expected to meet government and business needs in creating conducive economic conditions in the following manner:

- Bring the businesses closer to raw materials in the country to reduce the price of raw materials and factory production costs. Domestic businesses will also benefit from this as they can obtain raw materials at a cheaper price and within a shorter time period. This will enable the production to reach and compete in the international market more quickly.
- Attract investment, where BLC expects foreign companies to establish a branch or open a representative company in Indonesia. This promises state revenue from taxation.

- Reduce the burden of accumulation and decrease dwell time in ports. With BLC, businesses are expected to use the storage facility to stockpile goods and not accumulate goods at the port. Reducing the accumulation of the goods at the port will result in the minimisation of dwell time because the goods can be immediately shifted to the BLC from the port.

Hence, by addressing these needs, SMEs are empowered to increase their exports as the common drawback for most SMEs is the acquisition of raw materials from foreign sources. Furthermore, most SMEs do not possess the Customs Identity Number (Nomor Induk Kepabeanan (NIK)), which is required to import raw materials. Therefore, a collaboration (PLB (BLC)-IKM) was made between SMIs (Industri Kecil dan Menengah (IKM)) and the BLC. Among the earliest PLB-IKMs founded is in the centre of Bali. The purpose of developing this bonded logistics centre, among other things, is to lower logistics costs so that the national manufacturing companies can obtain their raw materials from a domestic warehouse company rather than having to import raw materials from abroad. Another goal is to ensure raw materials are available quickly and cheaply. Additionally, with shorter port dwelling time, Indonesia can aspire to become a regional distribution centre in Southeast Asia. Indonesia could become the transit point for ASEAN countries contributing to the receipt of income tax (pajak penghasilan) for business enterprises from warehousing companies.

Due to the globalisation of world trade, market penetration becomes competitive and the cost of expensive logistics makes it difficult for entrepreneurs to enter the international market. Therefore, the Indonesian export products need to be improved to be able to compete. This can only be done by increasing the efficiency of production and distribution of goods; enhancing the quantity/quality of goods; accelerating the flow of goods into and out of Indonesia; and by ensuring that the promotional and marketing activities are supported. Improving the quality and production efficiency can be achieved if the supply of raw materials for the domestic industries is available quickly and on time. The above is also achievable if the final product is not burdened with customs, excise and taxation duties.

The above-mentioned acts alongside amendments to the existing provisions on bonded shelter are a part of the policy package issued by the Indonesian government to create conducive economic conditions for their SMEs. The determination of premises as a BLC, and the granting of a license to the BLC organisers for a specified period of time is stipulated by Decree of the Minister of Finance. Therefore, in order to obtain the designation as a BLC and the operator license, the interested party must meet the following requirements:

- Provide proof of ownership or control of a region, place or building that has clear boundaries, along with a map of location/place and layout plan/plan that will be used as a BLC
- Have a business place permit, environmental document, and other necessary permits from the relevant technical institutions
- Report the business to be confirmed as a taxable person for VAT purposes and submitted the last annual income tax form for the last fiscal year for those who are required to submit an annual tax return.

The building, place or area that will become BLC must meet the following minimum requirements:

- is accessible by container transporter and/or other means of transportation
- has clear boundaries and areas
- has a place for physical inspection of imported goods and/or exported goods
- has a place for hoarding, loading, unloading, importing and discharging goods to and from outside customs areas or elsewhere in customs areas

- has a place or area of transit for goods which has been registered to its customs notification prior to the expenditure of goods (except in cases where BLC candidate will have to accumulate goods with certain characteristics, e.g. liquid, gas).
- has a clear layout and boundary to perform each activity.

The activities that may be exercised in a BLC are:

- packing or repackaging
- sorting
- standardising (quality control)
- merging (kitting)
- packing
- tuning
- consolidating export destination goods
- providing export destination goods
- reinstalling and/or repairing
- painting, and other strategic industrial maintenance
- blending
- labelling in Indonesian
- sticking excise tape or other customs marking marks on excisable goods
- auctioning capital goods of origin outside the customs area
- exhibiting imported goods and/or the origin of any other place within the customs area
- inspecting by relevant technical institution or institution in fulfillment of import and/or export restriction provisions
- inspecting for the issuance of Certificate of Origin (SKA) by the relevant technical agency in the framework of import and/or export
- performing other simple activities which may be stipulated by the Director General of Customs and Excise.

PLB-IKM is a breakthrough initiative to expand the function of the bonded warehouse as a provider of raw materials and receiver of production output for consolidation or export. The items in the SME list will be granted a suspension only when they are exported, with benefits including no upfront payment and waived taxes. However, if the SMEs change their mind and fail to export, they will have to pay the taxes. PLB-IKM also serves as a place of exhibition.

To get a better perspective on the issues faced by SME operators, hearings, workshops and surveys were conducted by the Indonesian Customs. Based on the results, two queries were resolved: how to get the cheap raw materials efficiently, and how to rejuvenate its machines for SMEs. However, the other apparent problem was found to be the capital. The Indonesian Customs, in collaboration with the Indonesia Export Financing Agency (LPEI) under the Ministry of Finance, created a consortium of

SMEs. The SME consortium represents a business entity that can be established by the SME association under one centre. Once the consortium is established by banks or LPEI, they can provide financial support by borrowing/crediting capital or for purchasing raw materials. So, in addition to BLC there is also a consortium for the provision of raw materials. The reason for not using BLC-IKM in Indonesia is that BLC entrepreneurs only exist in Bali, while SMEs are found throughout Indonesia. Therefore, for areas where there is no BLC, a consortium of SMEs will be formed, and the raw materials will be provided.

In order to supervise this facility, the Indonesian Customs uses an IT inventory system. In contrast to large companies that already possess their own equipment, SMEs will be asked to fill out a report as part of a raw material management module so that there is a record of activities. The modules will be associated with CEISA (Customs-Excise Information and Automation), a customs-excise information technology and information system for KITE facilities. With this technology the SMEs are just required to key in live input data to the system.

In addition to the formation of BLC as a new form of bonded landfill, the government is constantly developing and improving the provision related fiscal incentives to encourage investment interests. Some of these are as follows:

- Harmonising fiscal incentives (customs and/or excise tax treatments) provided through existing facility schemes, such as excise exemption in the bonded shelter and no VAT subjected to the submission of goods discharged from BLC to the facility receiving company. The objectives of aligning the fiscal facility are to reduce the high factory production prices in Indonesia and to smooth over the flow of goods effectively and efficiently. These would increase the need for raw materials for domestic industries and enhance the competitiveness of national products in the domestic, regional and global markets.
- Adding the place of origin and disposal destination of the goods sent in the bonded landfill so that the goods stockpiled in the bonded shelter can also come from the special economic zones (Kawasan Ekonomi Khusus (KEK)), free trade zones and free ports (free zone). The goods may also be for the purpose of a KEK and/or a free zone. This is done to harmonise facilities provided to stakeholders by providing convenience to the company that uses facilities in the procurement or supply of goods for the needs of the industry (supply chain).
- Adding the location of duty-free shops at the arrival terminals of the international airports at the customs area. The information is intended to provide convenience to travellers who are entitled to purchase imported goods at the customs shop and is expected to be a part of the government's efforts to improve the economy through tourism.

Apart from the above-mentioned problems, the need for machines is also a factor contributing to the difficulties faced by SMEs in production. Machines used by most SMEs are old and not equipped with the latest technology. Expenses associated with machinery include procurement, maintenance, upgrading and diversification. In fact, the customs law has a specific role with regards to the machinery concerning rehabilitation, diversification and the industry, as well as duty-free facilities for raw materials and for machinery.

5. Latest trends in import–export figures

Refurbished economic policies were implemented by the Ministry of Finance, through Customs, in 2015. Therefore, it is relevant to compare the export and import data for 2015 and 2016.

Table 2: Imports by 2015

Month	Value (US \$)	Weight (kg)
January	12,612,648,838	11,995,411,291
February	11,510,111,399	12,134,877,571
March	12,608,691,718	12,815,242,585
April	12,626,278,785	13,205,353,501
May	11,613,585,485	11,452,923,855
June	12,978,091,752	12,789,548,820
July	10,081,863,504	9,777,959,395
August	12,399,248,090	12,392,071,524
September	11,558,601,330	12,517,106,390
October	11,108,916,259	11,725,231,343
November	11,519,468,515	12,396,999,154
December	12,077,298,548	13,890,623,811
Total	142,694,804,223	147,093,349,240

Source: BPS (Badan Pusat Statistik, 2015).

Table 3: Exports by 2015

Month	Nilai/Value (US \$)	Weight (kg)
January	13,244,876,798	43,443,195,035
February	12,172,802,863	39,768,342,677
March	13,634,041,965	48,209,231,343
April	13,104,596,804	44,113,167,148
May	12,754,659,044	41,543,644,059
June	13,514,101,879	40,886,554,951
July	11,465,779,764	40,908,711,755
August	12,726,037,507	41,703,962,148
September	12,588,359,371	41,130,727,934
October	12,121,740,572	43,492,324,676
November	11,122,182,554	41,572,222,679
December	11,917,112,382	42,889,680,221
Total	150,366,291,503	509,661,764,626

Source: BPS (Badan Pusat Statistik, 2015).

Table 4: Imports by 2016

Month	Value (US \$)	Weight (kg)
January	10,466,995,371	11,170,356,250
February	10,175,631,438	12,777,162,927
March	11,301,709,941	14,280,888,506
April	10 813,624,836	12,028,222,569
May	11,140,679,613	13,132,879,687
June	12,095,220,496	13,501,715,838
July	9,017,159,102	10,138,881,648
August	12,385,153,588	14,001,735,399
September	11,297,511,237	12,809,168,012
October	11,507,180,543	12,391,159,183
November	12,669,434,720	12,804,703,935
December	12,782,515,616	12,988,497,126
Total	135,652,816,501	152,025,371,080

Source: BPS (Badan Pusat Statistik, 2015).

Table 5: Exports by 2016

Month	Value (US \$)	Weight (kg)
January	10,480,584,793	39,337,444,244
February	11,312,036,578	38,294,637,870
March	11,810,032,191	43,027,260,113
April	11,475,850,260	39,171,200,196
May	11,514,324,050	40,622,301,548
June	12,974,447,405	44,698,807,002
July	9,530,763,081	39,029,224,415
August	12,748,346,481	45,794,031,993
September	12,568,504,138	44,141,784,993
October	12,742,630,019	47,376,224,320
November	13,503,594,905	46,605,885,965
December	13,828,711,909	45,544,615,771
Total	144,489,825,811	513,643,418,430

Source: BPS (Badan Pusat Statistik, 2015).

Based on the tabulated data, the total value for imports in 2015 and 2016 was 142 billion USD and 135 billion USD, respectively. While exported goods recorded a 150 billion USD and 144 billion USD for 2015 and 2016, respectively. Indonesia enjoyed a trade surplus of about 8 billion USD in 2015 and about 9 billion USD in 2016.

There was an increase in trade surplus of approximately 1 billion USD from the previous year (2015), with 8–9 billion USD in 2016. However, there was a decline in the export value from USD 150 billion (2015) to USD 144 billion (2016). Similarly, there was a significant decline in the import value from 142 billion USD (2015) to 135 billion USD in 2016. This significant drop suggests an increase in economic resilience and independence, which is mainly indicated by the decline in the value of imported goods from abroad.

More comprehensive research on the effectiveness of the above-mentioned policies, especially in terms of the interaction between those policies and the increase of the share of SME products in Indonesian exports, should be documented. Law, which is a tool to foster cost-effective production, is expected to provide significant returns in achieving the national objectives, especially from an economic point of view.

5. Conclusion and recommendations

The Indonesian Government has taken measures in the form of government support to the growth of SMEs. Such measures include the 2015 economic package in which SMEs are given relaxation from KITE. Such relaxation eliminates the obligation to risk collateral in the form of cash or bank guarantees. This facility is only applicable to businesses classified as small and medium industries (SMIs).

The KITE-SME facility aims to strengthen the foundation of the economy and increase national economic growth. It is expected that such facilities can support the development of export-oriented SMEs. The facility is also expected to create export products with national branding and strengthen Indonesia's competitiveness in facing the ASEAN Economic Community. In order to improve national competitiveness, logistics costs were lowered, the burden of stockpiling was reduced, and port dwelling time was reduced. Furthermore, as mandated by Article 44 paragraph (1a) of the Customs Act, the government developed another form of a bonded stockpiling base (BLC), which is expected to meet the needs of businesses and the government in creating conducive economic conditions.

This article shows that the KITE-SME facilities can only be utilised by export-oriented SMEs. Many SMEs in Indonesia are not export-oriented, but depend on imported goods as raw materials, such as the tempe and tofu industries. These industries, whose basic ingredients are soybean, depend on inputs which are not produced adequately within the country. Therefore, other facilities that can facilitate such SMEs should be considered. This is because the strong economic structure of a country is not only determined by the amount of foreign exchange received. Instead, it is also reflected on how well a country meets its needs, either through own production or through importation. The need for raw materials by SMEs cannot be considered less important than the state's fiscal and monetary needs, especially when micro and very small enterprises are taken into account. At the same time, consumers need to have access to important goods such as clothing and imported food. Therefore, although it becomes inevitable for the raw materials to be imported, the need for their consumption by everyone, including the poor, should still be satisfied.

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Regulation of the Government of the Republic of Indonesia Number 85 of 2015 on Amendment to Government Regulation Number 32 Year 2009 on Bonded Hoarding Places

Regulation of the Minister of Finance of the Republic of Indonesia No. 272 / PMK.04 / 2015 on Bonded Logistics Centers

Notes

- 1 The Multilateral Investment Fund (MIF) is an independent fund administered by the Inter-American Development Bank (IDB), created in 1993 to support private sector development in Latin America and the Caribbean.
- 2 AfDB (African Development Bank) is a multinational development bank supported by 78 member countries from around the world. In addition to Africa, member states are from North and South America, Europe and Asia.
- 3 The Asian Development Bank (ADB) is a regional development bank established to promote social and economic development in Asia.
- 4 United Nations Development Program (UNDP) is a global development network of the United Nations. UNDP advocates change and connects countries with the knowledge, experience and resources to help people build a better life. It provides expert advice, training and grants to developing countries, with an emphasis on aid to underdeveloped countries.

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New findings on the benefit of transfer pricing rules for customs valuation purposes

Michael Landwehr

Abstract

This article summarises new findings on the benefit of transfer pricing rules for customs valuation purposes. It is an extract of the author's doctoral thesis on the subject '*Customs value methods to prove that the price agreed between related parties has not been influenced by their relationship*' (in German: *Zollwertrechtliche Methoden zum Nachweis der Unbeeinflusstheit von Preisvereinbarungen zwischen verbundenen Kaufvertragsparteien*').¹

1. Arm's length standard in the GATT Customs Valuation Code (GCVC)

As an international standard laid down in the OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations (OECD TPG), price agreements between related parties shall comply with the arm's length principle (OECD 2017, Chapter I). The arm's length principle also has to be followed in establishing the customs value of goods. It is stated in Art. 1 para. 2 lit. a) sentence 2 of the Agreement on Implementation of Article VII of the General Agreement on Tariffs and Trade 1994 (also known as GATT Customs Valuation Code or GCVC) in conjunction with the explanatory note, No. 3 sentence 3 to Art. 1 para. 2 GCVC. The aforementioned explanatory note is worded as follows:

Where it can be shown that the buyer and seller, although related under the provisions of Article 15 [GCVC], buy from and sell to each other as if they were not related, this would demonstrate that the price had not been influenced by the relationship.

The GCVC lacks a coherent methodology concerning the pass or fail of the arm's length test. However, such a methodology or review procedure is necessary for the uniform and transparent application of law for transactions between associated enterprises.

The uncertainty of the arm's length standard in the GCVC thus requires interpretation.

2. Interpretation of the arm's length standard in GCVC using the principle of systematic integration

In order to avoid 'fragmentation' and a 'drifting apart' of the various international legal instruments, Art. 31 para. 3 lit. c) of the Vienna Convention on the Law of Treaties (VCLT) embodies an interpretation method which aims at 'their consistent linkage in the sense of the unity of international law as a coherent and contradiction-free legal order' (Herdegen, 2016, § 5 margin number 21).

According to Art. 31 para. 3 lit. c) VCLT, any relevant rules of international law applicable in the relations between the parties shall be taken into account when interpreting a treaty.

This method of interpretation follows the principle of ‘systematic integration’ (McLachlan, 2005). It is a more general principle of interpretation (also called ‘General key’ or ‘Master key’, see: UN, 2006; McLachlan, 2005), based on the nature of international agreements which, as a part of international legal norms, may claim only a scope limited by other international law norms. An interpretation by reference to this principle applies to all questions that arise in the application of the international treaty concerned, but which cannot be resolved by the treaty itself on the basis of its express wording or otherwise (McLachlan, 2005, p. 311).

According to the principle of systematic integration, a reference to the legal environment of an international obligation and its objective is sought in the event of overlapping, conflicting or inconsistent regulations (UN, 2006, No. 420, 423). If such a reference can be established, the regulatory contribution of the international legal environment to this joint objective is extracted (UN, 2006, No. 412 et seq.) and the agreement in question is interpreted considering the regulatory contribution from other sources of international law (McLachlan, 2005).

However, this method of interpretation will be questioned critically, if its use would displace the provisions of the law applicable (cf. Higgins, 2003, p. 238 et. seq., no. 48 et seq.).

The interpretation method of Art. 31 para. 3 lit. c) VCLT could be used as the means of ascertaining the arm’s length principle’s legal purpose in Art. 1 para. 2 lit. a) sentence 2 GCVC in conjunction with the explanatory note, No. 3 sentence 3 to Art. 1 para. 2 GCVC.

3. General review procedure

The arm’s length principle under customs valuation law needs to be specified if the respective customs legislation of a state or customs territory concerned does not explicitly regulate how an arm’s length test must be executed.

In the absence of such explicit regulations (e.g. customs law of the European Union), the *ratio legis* of the GCVC can be specified according to the principle of systematic integration under certain conditions in the light of the otherwise existing multilateral or bilateral obligations at the level of international law.

The following generally valid review procedure for the specification of the arm’s length standard under customs valuation law according to the interpretation principle of systematic integration is applicable to the vast majority of states that are World Trade Organization (WTO) members and whose customs valuation law is based on the GCVC’s rules of international law (Landwehr, 2018).

Under international law, any of the following conditions have to be met to allow the application of an existing arm’s length arrangement (including its implementing provisions) for customs valuation law between the contracting states involved in the exchange of goods:

- a. There are no detailed provisions on the implementation of the arm’s length principle in the applicable customs law of a state obliged to carry out customs valuations.
- b. There is an international agreement (e.g. a bilateral double tax treaty) between the contracting states involved in the business transaction under consideration (e.g. import of goods according to a sales contract) and this agreement contains rules on the specification of the arm’s length principle or forms the basis for rules on the specification of the arm’s length principle, which have been implemented in national legislation or administrative practice.
- c. Application of these rules has the intended effect. It neither replaces a provision of the applicable customs law nor contradicts the wording and the meaning of the applicable customs law.

Since treaty law does not constitute mandatory international law, there is no obligation for a state to conclude treaties (e.g. double-taxation treaties). In the absence of an agreement containing legally

binding arm's length rules, there is no room for the method of interpretation pursuant to the principle of systematic integration under customs valuation law.

The intended effect (*effet utile*) of the application of this review procedure lies in the specification of the arm's length principle in customs valuation law (for more details on the origin of the *effet utile* under interpretation law see Landwehr 2018, p. 148 et seqq. with further references). Point c) above is to be seen against the background that Art. 31 para. 3 lit. c) VCLT may only be applied if the rules for carrying out transactions at arm's length conditions under another international agreement do not conflict with the source of law to be interpreted (here: GCVC). The other international agreement shall not be applicable instead of the source of law to be interpreted and it must not restrict the applicability of the source of law to be interpreted. The other international agreement has solely the hermeneutic function to shed light on the issue of how the arm's length principle in the GCVC can be executed with legal certainty (McGrady, 2008, p. 607).

4. Conclusions

In order to ensure a uniform and legally watertight implementation of Art. VII GATT, the arm's length principle in the GCVC has to be substantiated. Basically, the interpretation according to Art. 31 para. 3 lit. c) VCLT is suitable to achieve that purpose. The ambiguity as to how the arm's length comparison should be carried out under customs valuation law can be eliminated by means of a corresponding contribution to the regulation in other international agreements or in the national transfer pricing laws enacted on the basis of an international agreement. Such a contribution could be made by the OECD TPG or other international transfer pricing rules anchored in national law.

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Section 2

Practitioner Contributions

Could dividends justify a customs value adjustment?

Juan Pablo Rizzi

Abstract

This paper analyses whether dividends could justify an adjustment of customs value under the terms of Articles 1 and 8.1.d of the Agreement on Implementation of Article VII of the General Agreement on Tariffs and Trade 1994 (hereinafter Customs Valuation Agreement or CVA). It concludes that this is not possible, since a *contrario sensu* interpretation of the Interpretative Note No. 4 to Art. 1 of the CVA could affect certainty, uniformity and neutrality with which the CVA should be applied by all the members of the World Trade Organization (WTO) and the current Principle of Legality in tax–customs matters in some of the member countries.

Introduction

Dividends are one of the social benefits that can be distributed among shareholders. They establish the main source of profitability of shares along with the possible capital earnings obtained by revaluation.

The profit, which enables dividends to be paid to shareholders, can have many causes. Among these causes are those derived from the use of merchandise imported for consumption by an import–export company. In this framework, the seller/exporter can be a shareholder of the buying or importing company, and be related in customs terms (CVA, Article 15.4) and receive dividends from the buyer after the payment for the sale from the merchandise has been received.

Pursuant to Articles 639–641 of the Argentine Customs Code (ACC), the import tax refers exclusively to importation for consumption and may be specific or *ad valorem*. The value of the *ad valorem* import duty is calculated as a percentage of the customs value of the merchandise (CVA, Article 15.1.a).

However, for member countries of the WTO, the customs value of the merchandise being imported is regulated by the CVA. On the other hand, for goods being exported, the value rules of the ACC and its Exhibition of Motives (arts. 733) are applied.¹

As defined in Article 1 of the CVA, the ‘transaction value’ paid or payable for the merchandise must be applied to determine the customs value of the imported merchandise (CVA, General Note, Interpretative Notes, Sequential Application of Valuation Methods).

Article 1 must be read with Article 8, which provides for adjustments to the price paid or payable where elements considered to form a part of the value for customs purposes are incurred by the buyer but are not included in the price paid or payable for the imported goods. Furthermore, as set out in the preamble of the CVA, ‘the basis for valuation of goods for customs purposes should, to the greatest extent possible, be the transaction value of the goods being valued’.

Among the various reasons that justify an adjustment of the customs value, Article 8.1.d of the CVA states:

In determining the customs value under the provisions of Article 1, there shall be added to the price actually paid or payable for the imported goods: ... d) the value of any part of the proceeds of any subsequent resale, disposal or use of the imported goods that accrues directly or indirectly to the seller.

In addition, Interpretative Note No. 4 to Art. 1, states:

The price actually paid or payable refers to the price for the imported goods. Thus, the flow of dividends or other payments from the buyer to the seller that do not relate to the imported goods are not part of the customs value.

Although there are different ways of reading this interpretive note, it is most commonly considered that the dividends do not justify an adjustment of customs value—in terms of the referred norms—because they are not part of the payment for the sale of the merchandise (Lascano, 2003, p. 258; González Bianchi 2015, p. 219; Sherman & Glashow, 1987, p. 156). However, Herrera Ydañez (1986) interprets this note in a different way. *Contrario sensu*, the author understands that if the payments for dividends are related to the imported merchandise then they are part of the customs value of those and, therefore, it is possible to make an adjustment of customs value (p. 125).

On the issue of international transactions between affiliated companies, the International Monetary Fund (IMF) considers that transfer prices and professional consulting and administration services can be used as hidden dividends. In this context, the situation becomes more complex (IMF, 2009, p. 150).

In this paper, the author discusses whether the dividends can be considered to be part of the customs value of the merchandise imported by the terms of Art. 8.1.d of the CVA. This is followed by an analysis of the customs valuation treatment applicable to dividends that are hidden in transfer prices or in technical assistance services.²

Analysis

The dividend is the remuneration that partners receive as a return on their investments in the company. In Argentina, the distribution of dividends relies on:

- social investment
- realised and liquid earnings
- balance drawn up regularly and approved.

For other WTO member countries, the legal conditions for the distribution of dividends varies according to their national regulations, but there will be one element in common: the essential relationship that exists between dividend and investment. As can be seen below, there is no essential relationship, or cause–effect relationship, between the payment of the imported merchandise and the dividends of a company.

Q1. Can the dividends justify an adjustment of the customs value in the terms of Art. 8.1.d of the CVA?

In answering this question, the following must be considered:

1. Could the dividends of a company be related to the use of the imported merchandise? If this were possible, would that relationship be essential? Alternatively, could the promise of payment of future and uncertain dividends determine the sale of the merchandise for its subsequent import and use?
 2. Could the dividends be part of the payment for the sale of the merchandise?
 3. Does the *contrario sensu* interpretations of an international agreement fulfil the requirements of the principle of legality in tax-customs matters?
1. The dividend could be considered to be the result of the company's actions that include using imported merchandise. Consequently, there may be a relationship between dividends and the use of imported merchandise. However, the use of imported merchandise does not determine the generation of dividends. Indeed, if there are no dividends, then there cannot be an essential relationship between them and the use of the imported merchandise. However, it should be noted that this situation differs from the case of royalties agreed for the use of intellectual property related to imported merchandise because, in that case, there is an essential relationship between the use of intellectual property and the profit that results from that use.
 2. The previous point does not mean that the sale of merchandise for its subsequent importation cannot be a condition of the production under which the seller (exporter) will only sell the merchandise if the buyer (importer) undertakes the delivery of a part of the eventual dividends related to the use of that one. Nonetheless, objective and quantifiable data to measure 'that part' is not available. We do not know how, or to what extent, the benefits of using the merchandise determined the payment of dividends. It would be almost impossible to determine if the profits obtained from the use of the imported merchandise are related, even remotely, with the dividends of a certain period or with those of another period. And, as we know, the CVA is applied to achieve certainty and uniformity in terms of customs valuation (CVA, General Introductory Commentary and Article 8.3).
 3. In Argentina (Articles 4, 17 and 19 of the Argentine National Constitution), as in all countries where the Principle of Legality applies (e.g. Spain, the country where Herrera Ydañez is from)³, there are no taxes without a law that previously establishes them. Consequently, only dividends could be taxable if Article 8.1.d of the CVA prescribes that those profits can justify an adjustment of customs value. On the contrary Interpretative Note No 4 to Article 1 of the CVA would seem to deny such a possibility.

Futhermore:

- *Contrario sensu* interpretations of the law do not fulfill the requirements derived from the Principle of Legality, which requires that the law expressly describes the taxable aspects of the dividends.
- No WTO member country take a unilateral interpretation of the CVA because precisely what is intended is uniformity in its application and for this there is a competent international authority in charge of such activity: the Technical Committee on Customs Valuation (CVA, Annex II.1). As a result, a WTO member country could not tax dividends related to the use of imported merchandise or force a new interpretation of Article 8.1.d in that sense.⁴⁴

Based on the above discussions, dividends cannot justify an adjustment of customs value in the terms of Article 8.1.d. of the CVA.

Q2. What valuation–customs treatment is applicable where dividends are hidden in transfer prices or in technical assistance services?

The IMF outlines what adjustments should be made in relation dividends, paying attention to the flow of direct investment due to its strict relationship with the measures of direct investment income.

As set out in the IMF Manual:

11.101 Transfer pricing at values that differ significantly from arm’s length prices is usually associated with shifting resources between related enterprises, so it relates to direct investment income measures. Transfer pricing may be motivated by income distribution or equity buildups or withdrawals. Examples may be the provision of goods and services without explicitly charging, or at understated or overstated values. Where transfer pricing is identified and quantified with a high degree of certainty, the relevant entry should be adjusted to an arm’s length value...;

...In addition to the adjustment to the flow itself, there should be a corresponding entry, as stated below: (a) if a direct investment enterprise is overinvoiced on a good or service provided by the direct investor or (b) if a direct investor is underinvoiced on a good or service provided by the direct investment enterprise, then the transfer pricing acts as a hidden dividend from the direct investment enterprise, so dividends should be increased by the difference between the market value of the goods and services and the prices actually charged: (a) if a direct investment enterprise is underinvoiced on a good or service provided by the direct investor or (b) if a direct investor is overinvoiced on a good or service provided by the direct investment enterprise, then the transfer pricing acts as a hidden investment in the direct investment enterprise, so direct investment equity flows should be increased by the difference between the market value of the goods and services and the prices actually charged...’ (IMF 2009, p. 203).

Notwithstanding this, hidden resource transfers between related companies also have an impact on tax and customs matters.

Ad valorem taxes applicable to the importation of merchandise exchanged between related parties could be calculated in these cases on a basis that unduly included hidden dividends— that is, on the basis of a customs value obtained from a fictitious purchase price, which is expressly forbidden by the CVA (CVA, General Introductory Commentary and Article 7.2.g).

In these cases, the ‘transaction value’ (CVA, Article 1) should not be accepted as an appropriate basis for valuation since the relationship will have influenced the price (CVA, Article 1.2.a) to the extent that it was used to hide dividends. Given this situation, the CVA allows the importer to demonstrate that the value closely approximates any of the options that are regulated in Article 1.2.b in order to be able to value the merchandise in accordance with the first valuation method.

On the other hand, with a similar criterion to the one indicated by the IMF, it is possible to investigate whether, among related companies, the dividends can be hidden in contexts different from the case studied. For example, hiding in contexts in which the CVA expressly allows the possibility of adjusting the customs value under the terms of Articles 1 and 8 of the CVA, such as the case of royalties for technology transfer (CVA, Article 8.1.c). In such cases, notwithstanding the Principle of Legality, we understand that the conclusions mentioned in the previous paragraph also apply on this case. As in any case, the transaction value would be unacceptable as a valid basis for customs valuation given the influence of the customs relationship.

Finally regarding Argentine legislation, the concealment of dividends in transfer prices (or royalties) could result in the infringement of Article 954.1.c of the ACC, since it would have declared a fictitious price to the customs administration.

Conclusion

1. Dividends cannot be used for a customs value adjustment under the terms of Article 8.1.d. of the CVA. Otherwise, the Principle of Legality in tax–customs matters would be violated and the certainty and uniformity that is intended in the application of the Agreement would be undermined.
2. If, in the transactions between related companies, dividends are hidden in the price of the international sale of goods, we would have a fictitious transaction value that would not be acceptable as a basis for valuation due to the influence of the customs relationship. In this case, the importer should prove that the declared price is very close to those established by art. 1.2.b of the CVA. Otherwise, merchandise should be valued according to the method of customs valuation that is most appropriate to the specific case according to Articles 2 to 7 of the CVA.

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Notes

- 1 As a guide to the legal interpreter, it is maintained in the Exhibition of Motives of the ACC that the central idea of the articles of the Code refers to the real value of the merchandise. Therefore, if the exporter has agreed to the sale under conditions of commercial independence, it will be adjusted to the norm of the taxable value (Exhibition of Motives of the ACC, Chapter Six, point 13).
- 2 Remember that: ‘... the customs value shall not include the following charges or costs, provided that they are distinguished from the price actually paid or payable for the imported goods: a) charges for...technical assistance...’ (CVA, Note to Article 1.3.a).
- 3 Article 31.3 of the Constitution of Spain.
- 4 González Bianchi (2015, p. 199), affirms that the Customs of the Oriental Republic of Uruguay has adopted in some specific cases the position of Herrera Ydañez taxing the dividends in the terms of art. 8.1.d. of the CVA.

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Application of post-clearance audit (PCA) as a trade facilitation tool in Bangladesh: Challenges and needed initiatives

Mohammad Akbar Hossain and Mohammad Abu Yusuf

Abstract

The Customs post-clearance audit (PCA) environment has been in use as a robust tool to facilitate trade across the world for many years. The Revised Kyoto Convention (RKC) of the World Customs Organization (WCO) emphasises maximising post-clearance controls and minimising physical controls to expedite the customs clearance process. Moreover, the recently enacted WTO trade facilitation agreement (TFA) has mandated PCA for facilitation of trade. Following the ratification of the WTO TFA, the importance of PCA has increased significantly for WTO members. This study is an attempt to take stock of PCAs in Bangladesh, the challenges in using PCA as a facilitation tool and the way forward to enhance the practice of PCA in Bangladesh. Based on primary and secondary evidence, this study finds that the PCA mechanism can be used more effectively if other support measures, such as risk management, information sharing among the public offices and automation, are properly implemented.

1. Introduction

1.1 Background

Post-clearance audit (PCA) is regarded as an important tool to expedite import–export clearance. The Revised Kyoto Convention (RKC) of the World Customs Organization (WCO) and the trade facilitation agreement (TFA) of the WTO have recommended that member countries use this tool to facilitate trade across borders. Although the WCO has long advocated implementing PCAs for effective and efficient customs controls, its members have not fully complied with this. However, following the ratification of WTO TFA, members have increased their efforts to make the tool functional as the implementation of PCAs is a requirement of the agreement. This paper focuses on the roles of PCA in trade facilitation, with special attention to the context of Bangladesh.

1.2 PCA definitions and objectives

The PCA process has a number of definitions. The WCO defines PCA as a ‘structured examination of a business’ relevant commercial systems, sales contracts, financial and non-financial records, physical stock and other assets as a means to measure and improve compliance.’ The United Nations Conference on Trade and Development (UNCTAD) and the WCO have advanced a detailed overview of PCA. In their view,

Post-clearance audit means audit-based Customs control performed subsequent to the release of the cargo from Customs’ custody. The purpose of such audits is to verify the accuracy and authenticity of declarations and covers the control of traders’ commercial data, business systems, records and books.

Such an audit can take place at the premises of the trader, and may take into account individual transactions, so-called ‘transaction-based’ audit, or cover imports and/or exports undertaken over a certain period of time, so-called ‘company based’ audit. (UNCTAD, 2011)

The main objective of PCA is to facilitate trade while ensuring compliance with national legislation with regard to the import and export of goods. PCA reduces time and the costs of business as traders can release their goods immediately from port after import, eliminating the need to pay port charges. Customs also benefit as it reduces its workload. PCAs, thus, present a tool for a win-win situation.

With the paradigm shift from physical control-centric Customs to facilitation-centric Customs across the globe, PCA has assumed growing importance. Taking into consideration the growing importance of PCA, which is covered by the WTO TFA (Article 7.5), the WCO Secretariat intends to support its willing members to embark on reform initiatives toward PCA introduction and better performance (WCO, 2015). PCAs contribute to the faster release of goods and to lower trade costs. PCA is now used not only as a stand-alone tool to facilitate trade under the TFA, but also as a supportive tool for the successful implementation of another vital trade facilitation measure, the Authorized Economic Operator (AEO) program.

Like other customs administrations of the world, Bangladesh Customs has increasingly been using PCA to facilitate legitimate trade while ensuring compliance with Customs and import–export regulations.

1.3 The Bangladesh context

Bangladesh is an emerging economy of South Asia, with a population of around 170 million people. The country was actively involved in the negotiation of the WCO TFA and, subsequently, ratified the agreement in September 2016. The country is also a signatory to the WCO RKC. PCA is not new to the customs administration as it has been using PCA as a tool of customs control since the 1980s. With the ratification of the TFA, the country has been working closely with development partners to modernise its PCA system. Furthermore, initiatives have commenced to establish a proper link between PCA and the risk management system so as to achieve the maximum benefits at the clearance level.

2. Literature review

Audits assist administrations to ensure transparency and accountability. That is why international organisations like the WCO and WTO highlight the importance of audit-based customs controls rather than the physical examination of every consignment. Power (1994) rightly said that auditing seems as natural and as necessary as policing. One may argue about its precise form, for example the balance between prevention and detection, but its *raison d’être* cannot be denied. Without auditing there would be more fraud, deception, waste, error and poor administration. Likewise, PCAs not only facilitate the smooth release of goods but assist to improve integrity in customs administration and in the governance of stakeholders who are directly involved with the process of doing business. In highlighting the importance of audits for ensuring accountability, Power (1994) also noted that accountability is so closely associated with ideas of transparency that the two concepts are often used interchangeably.

Niu (2010) highlighted an interesting debate about voluntary compliance after auditing. Tax professionals argue that, after an audit—especially when an audit results in additional tax liabilities—a firm may assume that the tax authorities are closely monitoring its activities and may feel that it will be caught again if it attempts to conceal revenue. For this reason, the firm may report higher sales revenue than it would have otherwise reported had it not been audited. Other tax professionals argue the opposite. In their view, after an audit, a firm may think that it is less likely to be selected for re-audit in the future, which may provide the firm with incentives to cheat. Finally, Niu (2010) found a positive relationship between audits and voluntary compliance.

The OECD (2006) argued that the taxpayer audit function plays a critical role in the administration of tax laws in all member countries. In addition to their primary role of detecting and deterring non-compliance, tax auditors are often required to interpret complex laws and carry out intensive examinations of taxpayers' books and records, while, through their numerous interactions with taxpayers, operating very much as the 'public face' of a revenue body. These factors, as well as the sheer size of the audit function in most revenue bodies, provide a strong case for all revenue bodies paying close attention to the overall management of the tax audit function.

3. Problem statement

Bangladesh Customs has been practicing PCA since the 1980s in order to facilitate trade. The country has introduced, as a first step, post-importation transaction-based controls. It is yet to implement systems-based PCAs. The PCA that Bangladesh conducts seems not to be based on global best practices. Although Bangladesh has been emphasising PCA and risk management for effective utilisation of limited resources of Customs while facilitating legitimate trade, the results of the PCAs are not encouraging (as learnt from exploratory interviews and authors' own experience in Bangladesh customs) in terms of a commensurate decrease in border controls with increased PCA activities and its effects on revenue collection in Bangladesh. In other words, Bangladesh still lacks an effective PCA regime.

This article is an attempt to explore and document the current state of PCA in Bangladesh Customs and the results of PCAs conducted in the last 2–3 years. This article also highlights the weaknesses and challenges facing customs administration in establishing an effective PCA in Bangladesh. The objective of this exercise is to provide an informative document to the policy makers regarding PCAs. It is expected that the study (based mainly on secondary resources and interviews with key informants) will provide necessary insights to the policy makers to devise a new strategy and action plan to implement PCAs across customs stations for the promotion of legitimate trade while guarding against unscrupulous activities by traders. The next section highlights the international framework for PCA followed by the legal framework of Bangladesh.

4. Legal framework

International guidelines and legal bases for establishing PCAs are critical for any customs administration. Customs must strike a balance between the physical examination of goods and release of goods without intervention in order to best use its scarce resources. Through its risk management system, Customs releases blue channel consignments without physical intervention. These will subsequently be audited after clearance. This PCA tool, mandated by the WCO and WTO, has made the journey easier for customs administrations. Apart from the WCO and WTO, other international agencies, such as the World Bank, have guidelines for PCA. Bangladesh needs to consult these international instruments and tools and embrace best practices (keeping in view its local context) in designing its own PCA regime and guidelines. Drawing on global best practices and applying those practices with adaptations will help achieve a sound and proper PCA system. Among the international instruments, three prominent documents may support local regulations: RKC, SAFE Framework of Standards, and the WTO TFA. Furthermore, the WCO PCA implementation guidelines (volumes 1 and 2) help Customs administrations design and implement PCA-related projects.

4.1 Revised Kyoto Convention (RKC)

The RKC provides the legal framework and a range of standards for improving customs operations by standardising and harmonising policies and procedures throughout the world. The RKC strongly recommends that countries institute fast-track clearance for traders with good records of compliance. A PCA program is one means of implementing fast-track clearance. General Annex Chapter 6 of the convention contains the standards for risk management and PCA, which reads as follows:

Standard 6.6 Customs control systems shall include audit-based controls

Standard 6.10 The Customs shall evaluate traders' commercial systems where those systems have an impact on Customs operations to ensure compliance with Customs requirements.

4.2 WTO Trade Facilitation Agreement (TFA)

The WTO TFA requires members to introduce PCA for quick clearance of goods at customs points.

Bangladesh is a signatory to the agreement and ratified it in 2016. So, Bangladesh must implement risk management and PCA in line with the timeframe it chooses by categorising the trade facilitation measures as A, B or C in the context of the TFA. Article 5 of the TFA sets out the requirements of members as follows:

- 5.1 With a view to expediting the release of goods, each Member shall adopt or maintain post clearance audit to ensure compliance with Customs and other related laws and regulations.
- 5.2 Each Member shall select a person or a consignment for post-clearance audit in a risk-based manner, which may include appropriate selectivity criteria. Each Member shall conduct post clearance audits in a transparent manner. Where the person is involved in the audit process and conclusive results have been achieved the Member shall, without delay, notify the person whose record is audited of the results, the person's rights and obligations, and the reasons for the results.
- 5.3 The information obtained in post-clearance audit may be used in further administrative or judicial proceedings.
- 5.4 Members shall, wherever practicable, use the result of post-clearance audit in applying risk management.

4.3 Legal framework for PCA in The Customs Act, 1969

Customs operations in Bangladesh are governed by the Customs Act, 1969. This act has been updated in accordance with the provisions of the RKC and the TFA. There are adequate provisions for having an effective PCA. Eleven sections are devoted to providing legal backing for implementing an effective PCA regime, including authority to ask for samples and the obligation to keep business records for a minimum of 5 years.

5. PCA initiatives and TFA

After a protracted negotiation, the WTO reached a consensus by concluding the historical TFA to enhance flow of goods across borders. The OECD study (2014) showed that implementation of TFA would result in a cost reduction of 14.1 per cent for low income countries, 15.1 per cent for lower–middle-income countries, and 12.9 per cent for upper–middle-income countries. Additionally, it will boost global trade by up to \$1 trillion per year. Seizing the opportunity of globalisation, developing countries have connected themselves to the global supply chain that has increased the volume of cross-border cargos exponentially over the years. Therefore, to address the surge of cargo movements, the WTO introduced several measures, one of the important measures being PCA.

Article 7 of the TFA delineates the implementation of PCA, along with other measures regarding the release and clearance of goods. This measure is important as the proper functioning of other indicators also depends on the effective, efficient implementation of PCAs. For instance, the results from an audit are fed back to the risk analysis/targeting team so that the risk rating of the business in question can be adjusted accordingly. Through this process, the findings of the PCA assist to establish a functional risk management regime for expeditious clearance and identification of non-compliant traders. This information will also help to determine the need for follow-up and repeat audits.

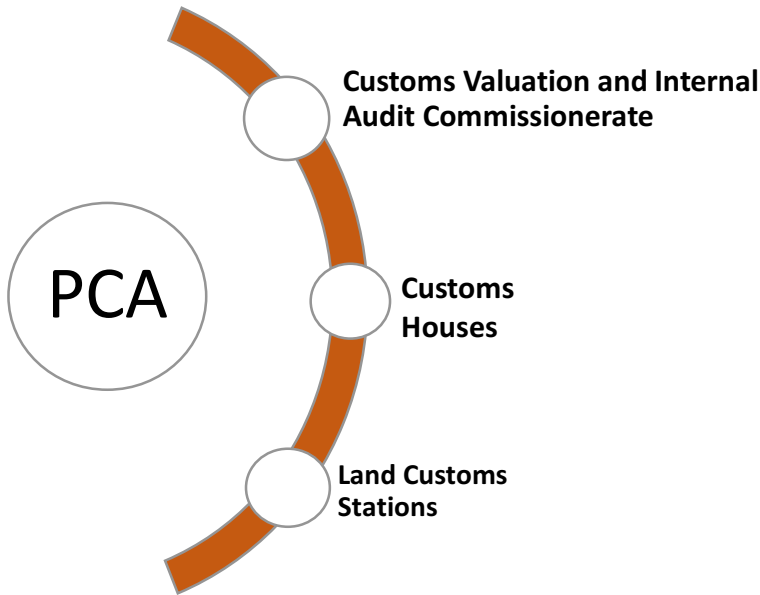
The PCA mechanism also checks the effectiveness of the risk management system. Furthermore, since the customs administration uses information technology (i.e. ASYCUDA World), the use of risk management for auto-selectivity has been a common phenomenon to facilitate smooth clearance, without the need for physical examination of all consignments at the ports.

While submitting the categorisation of measures to the WTO, Bangladesh categorised the PCA and risk management provisions as category C, and is yet to decide the timeline for raising this to category B or A. Although Bangladesh has been using PCAs since the 1980s, the National Board of Revenue (NBR) asked for technical assistance and has already engaged the Asian Development Bank (ADB), World Bank Group (WBG) and the USAID to implement effective PCA and risk management in line with international best practice. The development partners have provided significant training for the auditors; a group of expert trainers have been created; and manuals on system-based and transaction-based PCAs have been prepared. Recommendations have also been made by these partners to overhaul the existing PCA organisational structure in order to conduct PCA successfully. On the other hand, a separate directorate for risk management has been initiated and a team is working under the auspices of the WBG.

6. Current state of PCA in Bangladesh

Before moving forward, we need to assess Bangladesh's existing audit system. Bangladesh has six custom houses and around 30 active land customs stations (LCS) bordering India and Myanmar. In each custom house there is a separate PCA branch/unit that regularly conducts transaction-based PCA. Figure 1 shows that PCA is being conducted by three types of offices. The main office that centrally carries out PCA in all customs offices across the country is the Customs Valuation and Internal Audit Commissionerate (CVIAC). This office was set up in 2002 as an exclusive office for valuation and audit matters. The office is headed by a commissioner with 100 staff. This office is the central body for conducting audits across the country. The headquarters of the CVIAC is located in Dhaka with a branch office in Chittagong. The senior management team comprises two assistant commissioners, five deputy commissioners, two joint commissioners and one additional commissioner who assists the commissioner. Additionally, there are about 70 junior officers in the human resource team of the CVIAC. Although the title of the office refers to internal audits, the CVIAC and its field officers are particularly entrusted with the responsibility of conducting PCAs throughout the country.

Figure 1: Offices conducting audits



After releasing goods, the PCA unit of the customs houses conducts PCAs based on risk management. Usually, customs officials scrutinise all documents of selected import consignments, based on risk factors such as nature of import, track record of importers, clearing agents, and duty structure under the PCA system after releasing the goods from the port. Only a few customs offices, such as the Chittagong and Dhaka customs houses, use ASYCUDA World (AW) software for risk management and PCAs, although Bangladesh Customs has been using ASYCUDA since 1994. In most of the land customs stations, consignments are selected for PCA manually. This manual selection leaves scope for both arbitrary and subjective selection of consignments.

It is pleasing to note that, recently, the system has been updated with web-based AW. AW has all facilities for implementing automated risk management and PCA. The NBR adopted and circulated a PCA manual in August 2018 for the smooth operation of the system. However, the NBR is yet to adopt any robust policy for risk management.

Due to inadequate skills of PCA auditors, lack of proper and adequate documentation, challenges in accessing trails of the physical movement of goods to see a sample of cleared goods, and the lack of application of risk management in conducting PCAs, the overall results of PCAs are not yet satisfactory. Table 1 presents the flat picture of PCA results conducted by the CVIAC.

Table 1: PCA results

Financial year	No. of audits	Revenue leakage detected (million taka)	Comments
2015–16	961	859.510	The irregularities are mainly under-invoicing, wrong HS classification, fake documents, and understatement of quantity, etc.
2016–17	573	296.219	
2017–18	872	292.100	
2018–19 (Up to Sept. 2018)	206	613.754	

Source: CVIAC, collected by the authors on 7 October 2018.

Generally, we know that the AW system has four channels: yellow, blue, red and green. In AW ambience, the submitted declarations are destined to go to any of the lanes. Only the declarations routed to the blue channel will automatically be selected for PCAs. A significant number of declarations will be routed to the green channel and be released without any customs intervention, if an effective risk management infrastructure is in place.

Bangladesh Customs is not reaping the benefits of the green channel—despite having the infrastructure of AW—due to a number of weaknesses and shortcomings.

6.1 Challenges in conducting effective PCAs

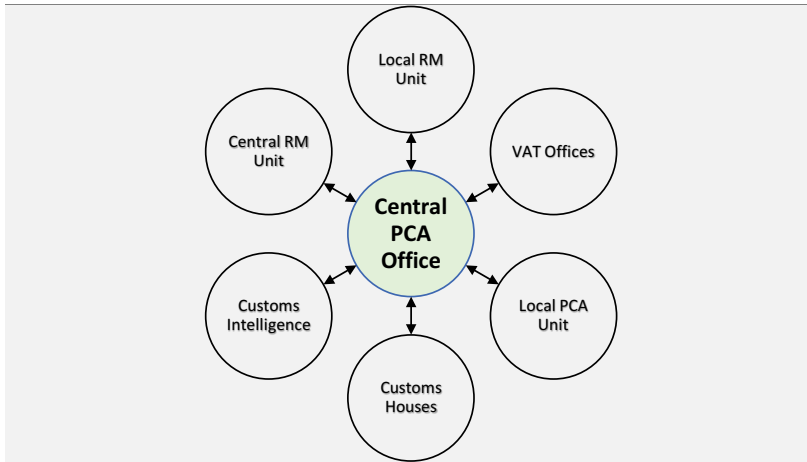
A number of challenges stand in the way of implementing an effective PCA system in Bangladesh. These include:

- Lack of automated selectivity through a functional risk management system; import consignments are still selected by officers manually
- PCAs are mainly transaction-based checks; a system-based PCA has not yet been initiated
- Lack of skills and training for PCA auditors
- Lack of original documents and samples in conducting PCAs
- The officers of CVIAC are not enthusiastic as they do not have incentives and motivations to work in PCA
- Country culture: Once goods left customs control, it is very difficult to ensure compliance through PCA. Importers' addresses are often changed and it is difficult to trace them.

6.2 Information sharing

As the apex body for Customs PCA and valuation matters, the CVIAC shares information with other customs offices. The main offices with which CVIAC shares information are customs houses, central and local risk management units, the Customs Intelligence and Investigation Directorate (CIID) and value added tax (VAT) offices. The CVIAC functions are set out in the NBR guidelines and instructions. Figure 2 shows CVIAC's information-sharing.

Figure 2: PCA information sharing



6.3 Method of audit

The CVIAC is responsible for conducting PCAs across the country. As there are six customs houses in the country, the CVIAC sends its team to these offices directly to select the declarations for auditing. This office basically conducts transaction-based audit. Sometimes, acting on tip-offs, the office undertakes targeted audits as well.

7. Some practical cases detected by PCA

Practical cases have been examined whilst conducting this study. Furthermore, we have interviewed auditors identify the common problems and methods of evasion that they frequently encounter. The synopsis of the findings is set out below.

7.1 Ghost traders

The interviewed PCA officers indicated that in some cases they audited the declarations and found anomalies. Subsequently, they tried to contact the importers, but failed to find them over telephone or at their address as the importers used fake information while importing the goods. Interviewees suggested that a significant number of registered importers provided false information. It may be noted that the VAT authorities have issued around 300,000 business identification numbers (BIN), but only around 50,000 BIN holders submit monthly VAT returns. The registration system, without proper verifications, has created many ghost importers who evade taxes as it is difficult for the tax authorities to locate them because of their false information. Recently, the government initiated a VAT online registration process, to address the problem of ghost traders being registered as importers and exporters.

7.2 Fake invoice

The auditors mentioned that fake invoices are also used to evade duties and taxes at the import stage. In many cases, the auditors detected anomalies auditing the invoice that was submitted with the customs declaration. The importer used two invoices: one for the bank and one for the customs authorities. The importer changed the quantity and value of goods in the duplicate invoice submitted with the customs declaration. As Customs needs to process hundreds of declarations daily, it is almost impossible for them to check the authenticity of each document. However, during PCAs, the auditors compared the submitted invoice with the invoice submitted to the lien bank and identified any differences. The importers masked the original price and quantity to evade duties and taxes.

7.3 Duplicate packing list

Packing lists mainly entail the total weight and quantity of imported goods with net and gross weight of each package. As with the invoices, some importers prepared two packing lists—one for the lien bank and another for Customs. The auditors collected some packing lists from the lien banks and compared those with the audited packing lists submitted to Customs and found differences in the listed quantity and weight where importers were trying to conceal the real quantity and weight to evade duties and taxes.

7.4 Incorrect HS Code

In the AW environment, if the importers just put the HS Code of the imported goods, the system will automatically calculate duties and taxes for that goods. An examination of a number of audited declarations of goods (locally called Bill of Entries) at CVIAC revealed that in many cases the importers used the wrong HS Code to evade taxes. However, the wrong HS Code was also used to hide the licence requirements of restricted imports, as demonstrated in the following examples:

- The importer imported transmission conveyor belting 37.5 mm x 4 ply from India declaring the HS Code 4010.19.00, but the officers found that the HS Code should be 4010.39.90; the rate of duty of the declared HS Code was lower than the actual HS Code.
- The importer imported polyester resin declaring HS Code 3909.31.90. The officers found that the correct HS Code was 3208.90.90. The importer intentionally declared an incorrect HS Code to evade import taxes.
- To misuse the benefits of the South Asian Free Trade Area (SAFTA) treaty, an importer imported carbon black N 660 Lp; the officers found that the signature of the certificate issuing officer was not similar with the sample signature of the designated officer. The importer tried to evade taxes through the use of a forged SAFTA certificate.

7.5 Incorrect Customs Procedure Code (CPC)

The Customs Procedure Code (CPC) is used in AW to allow the tax benefits in the case of some special imports. The auditors noticed that some importers intentionally used the wrong CPC to obtain special benefits for which they were not entitled to. For instance, an importer who is a commercial importer/trader used the CPC of a manufacturer to obtain tax exemption benefits as a manufacturer. We can note an example: the NBR created a CPC 201 for shipbuilders who export 100 per cent of their produced goods to exempt them from all import duties and taxes except 5 per cent customs duty. A shipbuilder imported MS plate/sheet and declared the CPC 201 to obtain the tax exemption benefits. Afterwards, the auditors found that the importer is not an exporter. His CPC should be 250, which attracted 5 per cent Advanced Trade VAT (ATV), 3 per cent AIT and 5 per cent customs duty.

7.6 Incorrect activity code

The country grants special privileges to manufacturers importing raw materials. Some traders who are not involved in any type of manufacturing activities declared themselves to Customs as manufacturers and illegally obtained ATV exemption benefits. It is pertinent to mention that only manufacturers enjoy exemption from ATV as per the existing regulations of the country. For instance, a renowned company imported pan release concentrate (vegetable oil) from India through Benapole customs house. They submitted the VAT-7 form that included this item as a raw material of that company and so did not need to pay any trade VAT. Later, the officers found that the VAT-7 form that they submitted to Customs was fake.

8. Conclusions and recommendations

From the above discussions, it is clear that customs control through PCA plays a vital role in facilitating cargo clearance; at the same time, it ensures the legitimate share of public revenue by detecting noncompliant stakeholders. Furthermore, it educates stakeholders so that they can voluntarily comply and reap the benefits of PCA. The government and business community need to work cooperatively to ensure an effective and efficient PCA environment for facilitating cross-border trade that ultimately helps the economy to grow. The study suggests the following recommendations for establishing a meaningful and effective PCA regime:

(a) **Capacity building of PCA officers:** The officers require more training on PCA-related matters. The country needs to arrange more training of trainers (ToT) programs to ensure the sustainability of training following the departure of foreign experts.

(b) **Organisational structure:** At present, the country has a PCA commissionerate with around 100 staff in Dhaka and a small office in Chittagong. As custom control will be based mainly on PCA in accordance with WTO TFA requirements, Bangladesh needs to reorganise its existing structure to increase the number of staff and offices to accommodate the clearance system of its six custom houses and 30 functional land customs stations.

(c) **Implementation of the blue channel:** Bangladesh is using AW software to manage customs operations. Among the four AW channels (red, yellow, blue and green), only the blue channelled consignments will be selected for PCA. However, Bangladesh is yet to activate this facility. As such, activation of the blue channel is vital for the successful implementation of PCAs.

(d) **Connectivity with other offices:** Connectivity with other offices, especially, with risk management office, is vital for the success of PCA. The central and local risk management units will provide information to the PCA office; at the same time, the PCA office will transmit their findings to the risk management offices for re-visiting the selectivity criteria to ensure proper channelling of the consignments.

(e) **Private sector involvement:** Consultation and participation with the private sector will be essential for the proper execution of PCAs for the facilitation of trade. The audit issues should be discussed with the trader openly to work collaboratively to improve compliance. The auditor should also allow a short period of time (maybe 5–7 days) for the audited firm to respond to any formal audit issues. This recommendation is suggested in the World Bank Guide on PCAs (pp. 44–45).

(f) **Combination of different skills and competence:** PCA teams by nature are multifunctional. The team should, therefore, be composed of members whose skills reflect the various levels of knowledge and experience required to carry out PCA activities. In other words, there should be a balance between agency and industry knowledge, audit techniques and other skills and qualification requirements (Widdowson & Preece, 2011).

(g) **Implementation of a national single window (NSW):** Bangladesh has already started to implement a comprehensive NSW to connect all government organisations online. This connectivity will reduce the submission of fake documents. Furthermore, the PCA auditors will be able to verify the authenticity of documents through NSW.

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Section 3

Special Report

Softening hard borders through tech: Brexit and the Irish border

Gareth Lewis

What is a hard border and when are hard borders required?

Not so long ago, nations, nation states and even individual cities behaved just like medieval castles replete with moats, large walls and extreme caution bordering on paranoia should anybody approach. That perception of ‘the other’ beyond our safe border is still politically and socially potent, but it has long been tempered by an understanding of the economic benefits of open trade. There is a real tension between these two competing views of the border; is it a castle wall to protect us, or is it an ‘imaginary line’ that creates artificial divisions and works against our best interests? As with most complex subjects, there is no simple black versus white answer. The tension that exists between the two extreme positions—living as a hermit state versus total abandonment of any concept of security, safety or other border possibility—is at the heart of trade negotiations, border regulation and even sovereignty itself.

Although we live in a digital age, the idea of a physical border remains. In recent history the Berlin Wall is a prime example, but there are many others, including Hadrian, China and walled cities, not to mention today’s contentious US–Mexico wall. Hard borders are characterised by physical barriers, often military, police or defence, and a relative lack of trust. The hard border is also a conceptual thing—more than a line on a map, it is something described in legislation for example and it is the basis for national border regulatory agencies such as Customs, quarantine and safety officials.

A hard border is needed when there is a lack of trust on one or both sides of that border with respect to the governance, rule of law and safety on the other side. It has always been so and despite today’s advanced technology and moves toward globalism, the concept remains not only valid, but exercised in practice at countless border crossing points globally.

How does technology help manage traffic at hard borders?

The first requirement for effective border management is to adopt a risk-based approach. Not all passengers, ships, aircraft or trucks, cargo consignments or crew present the same levels of risk to society. The trick is to establish those large numbers of transactions that are of zero or negligible risk so that scarce resources can be trained on those that might pose a real threat.

Key to identifying risk is information and this is where modern technology comes to the fore. High-quality electronic information received from the source of the transaction under review allows for early risk assessment, early intervention (if required), and optimal control. For many years, countries have worked with electronic data to mitigate risk but today’s growth in breakthrough technologies—such as blockchain, the Internet of Things (IoT) and data analytics—promise groundbreaking innovation in the ability for the border custodians to better manage risk and consequently, to better manage the border.

This is not something on the radar for tomorrow; it is already happening apace in modern ports, airports and land border crossings where previously unimaginable data sources and data-crunching capabilities are giving the kind of holistic picture of risk that is enabling entirely new ways of managing the ports and dealing with potential physical and other dangers. The concept of the border remains, but the way in which it can be seen and managed in this digital age is very different.

Could technology be used to remove hard borders entirely?

As implied above, this is as much a question of mutual trust and rules of governance on either side of the border. Modern technology is an enabler of better means to evaluate a wide range of factors that have an impact on the safety and security of a border. For example, blockchain technology enables, in theory, far greater certainty in the authentication of data flows between parties operating at arms' length. In turn, this means that there can be greater trust in the quality and reliability of the huge and complex array of information exchanged between commercial and government actors involved in cross-border traffic. In combination with data analytics and artificial intelligence (AI)-enabled IoT devices such as CCTV, scanners, smart seals and other sensors, the possibilities for rapid control of previously impossibly complex scenarios is, in fact, now possible.

This might not remove the need for physical intervention at the border, but modern technology ought to allow the great majority of transactions to be processed behind the scenes with little or no inconvenience to legitimate traders, travellers or any other party involved in crossing the border, while ensuring that any illegitimate activity is identified swiftly and allowing for efficient resource allocation where it matters most.

The short answer to the question posed above is 'no', but a lot of the hassle can be removed.

Brexit and the Irish border

Prior to the United Kingdom (UK) joining the European Union's (EU) Customs Union as part of its accession to the then European Economic Community (EEC) in 1973, a border was already in place between the UK and the independent Irish Republic. This border has been marked through much of the 20th century by the ongoing sectarian divide in Ireland. Joining the customs union meant that there was no longer a regulatory 'imaginary line' between Northern Ireland and the Irish Republic, but nonetheless, a hard border with armed checkpoints remained. In other words, the need for border regulation of cross-border trade had little or nothing to do with the hard border in Ireland. On that basis, if there were a need to reintroduce customs controls (which would be with the 27 member states of the EU, not just with Ireland) under Brexit, then in tandem with the innovations mentioned above and given that in recent years there is excellent trust and cooperation on either side of that border, there would not seem to be any compelling reason to introduce a hard border.

If that were to happen, it would be for political reasons, and not to do with trade management or more mundane border regulation. When considering this point, it is worth bearing in mind that there are several examples of borders in place today that are, in fact, not hard, with Canada/US being a prime example of a technologically enabled soft border (Riley-Smith, 2018).

How feasible is it that a tech solution (together with other elements) could solve the need for a hard border on Northern Ireland/Ireland?

As already explained, high-quality data obtained from source, validated in a blockchain, and automatically analysed using predictive analytics and AI would provide the kind of augmented risk-assessment environment where there would be a high degree of certainty that unsafe or fraudulent activity would be discovered.

The technology would provide assurance in a wide range of controls, not just customs. It would cover dangerous goods, human health and food safety plus all other ordinary border regulatory and control functions to be expected at any international border.

What would those other elements need to be?

Above and beyond technology, the two key determinants for a successfully managed border are mutual trust and a rigorous risk-management regime. There must be appropriate legal backing and the political will to make things work, but as already stressed, trust is the biggest factor.

Conclusions and predictions on the future state of a frictionless, soft border

In summary, Brexit does not necessarily imply the need for a hard border between the UK and the rest of the EU at the border in Ireland—it is much more a question of intergovernmental agreement. There is no reason why a soft border cannot eventuate given the sophisticated technology boasted by both the UK and EU customs authorities, which enables the kind of assurance that has been described elsewhere in this short article.

Despite the current noise on both sides of the Brexit debate, the foundations are in place for a seamless border, and modern innovative technology only makes that enviable outcome ever more plausible.

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Gareth is an independent trade and customs consultant based in Adelaide, Australia, and a senior research fellow with the Centre for Customs and Excise Studies specialising in the interaction between customs processes, automation and international coordination. He possesses over 30 years' experience in the customs space, having undertaken operational and management roles for customs authorities in numerous locations, including Australian Customs' head office in Canberra and the nation's major port, Melbourne. Subsequently, he worked as Senior Technical Officer at the World Customs Organization (WCO) in Brussels, and currently consults governments, NGOs and private enterprises on customs operations, technology and collaboration.

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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
- 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*.

Practical applications, including case studies, issues and solutions

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 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.

Papers published elsewhere

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: editor@worldcustomsjournal.org

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Charles Sturt University, Australia *Editor-in-Chief*

Professor David Widdowson is Chief Executive Officer of the Centre for Customs and Excise Studies at Charles Sturt University, Australia. He is President of the International Network of Customs Universities, a member of the WCO's PICARD Advisory Group and Scientific Board, and a founding director of the Trusted Trade Alliance. David holds a PhD in Public Sector Management and has over 40 years' experience in international trade regulation, including 21 years with the Australian Customs Service. In 2019 he was appointed as a Member of the Order of Australia for significant service to higher education in the field of international trade and customs.

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