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Non-tariff Measures and Harmonisation: Issues for the RCEP

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Abstract*: The upcoming Regional Comprehensive Economic Partnership (RCEP) is a critical element of regional integration in East Asia and the Pacific. While tariffs are already low in this region, non-tariff measures (NTMs) remain a key issue in trade in goods. NTMs may bring consequences on sourcing and enforcement costs and may affect the structure of an industry. ASEAN countries have similar patterns of NTM imposition at the product level. International experience shows that regional trade agreements could reduce regulatory distance by 41 percent. The RCEP could bring East Asian countries to improve transparency of their NTMs and encourage mutual recognition.*

Keywords: ASEAN, RCEP, non-tariff measure, regional integration, mutual recognition
JEL Classification: F1, F13, F15

1. Introduction

The upcoming Regional Comprehensive Economic Partnership (RCEP) has the potential to be a critical element of regional integration in East Asia and the Pacific, taking initiatives on regional economic integration in East Asia to a higher level. For this, RCEP commitments would need to be substantially stronger than those under existing Association of Southeast Asian Nations (ASEAN)+1 FTAs, as mere consolidation would risk taking place on the lowest common denominator, delivering in the end less than some of the existing ASEAN+1 FTAs. Thus, to be viable (i.e. seen as worth extended negotiation time and resources), the RCEP would need to be more ambitious. Moreover, given that it effectively includes an implicit FTA agreement among China, Japan, and South Korea, resulting in trade and investment diversion from ASEAN, only deeper facilitation and liberalisation commitments would deliver additional benefits to ASEAN Member States (AMS) as compared with the current ASEAN+1 FTAs.

Yet, the challenge of furthering integration in a bloc bringing together half the world's population and a third of its gross domestic product (GDP), with countries at widely different levels of development, is likely to be a formidable one, especially in the absence of the kind of deep-rooted political drive that characterised the European continent when it embarked on the process of integration after World War II. As leader and facilitator of the RCEP, ASEAN can play a central role in defining its agenda if it proves capable of formulating proposals that hold the promise of substantial and widely distributed welfare increases, while at the same time being sufficiently flexible to accommodate the needs of very heterogeneous partners.

Deep integration in the form of regulatory convergence is a potential new frontier for the RCEP that could fit these requirements, provided that it is approached the right way. In the absence of strong regional disciplines, there is always a risk that regulations, which tend to proliferate everywhere, are 'instrumentalised' one way or another. For instance, they could be captured by special interests as surrogate trade-protection

instruments. As manufacturing jobs are important and growing in many of the RCEP's future partners, there is always a risk of tit-for-tat regulations, although it has not yet materialised to the extent predicted by some observers (see Evenett and Wermelinger, 2010). Alternatively, as wealthier consumers get more health-conscious, without disciplines, risk-averse regulatory systems may over-react to idiosyncratic and transient health crises with permanently stricter regulations, a ratchet effect that could lead to unnecessarily stringent regulations. Moreover, when triggering crises are local and uncorrelated, regulatory systems can end up diverging even though the underlying force is the same everywhere – risk aversion.[1]

Thus, regulatory convergence could be a potentially useful and important item in the agenda of future ASEAN and RCEP negotiations. However, the issues involved are complex. Research summarised in this paper suggests that the gains from harmonisation may not always be as large as sometimes expected. In particular, when poor countries harmonise their regulations with those of richer partners in a regional bloc, they may impose upon themselves 'over-stringent' regulations – regulations that rich countries have built to placate risk-averse consumers – and in so doing subject their producers to disproportionate regulatory burdens, hampering their ability to make headway in other Southern markets where stringent standards confer no marketing advantage. By contrast, something as simple as the mutual recognition of conformity-assessment procedures seems to deliver solid gains, at least provided that weaker member states receive assistance to get their conformity-assessment infrastructure up to speed. This is an area where the ASEAN Secretariat could play a useful role, together with development partners, to improve market access for some of its weaker member states.

In view of the complexities involved, this paper provides an analysis and practical suggestions to move forward with a deep-integration agenda in ASEAN focused on

[1] For instance, the United States (US) reacted to the 1986 Three Mile Island nuclear accident with a freeze on all nuclear-energy projects, whereas Europe kept on steaming ahead with its own; conversely, the European Union (EU) reacted to the bovine spongiform encephalopathy (BSE) crisis of the 1990s with super-precautionary sanitary and phytosanitary (SPS) regulations, whereas the US was going ahead with the marketing of genetically modified organisms (GMOs). In both cases, the underlying force was the fear of catastrophic events, but the triggering crises were not the same. On these issues, see, e.g. Vogel (2012).

'soft' regulatory convergence. The essence of the approach proposed here is to move away from a trade-centred view of non-tariff barrier (NTB) elimination where each move is viewed through a negotiating lens as a 'concession' towards a country-centred view where national regulatory improvement efforts naturally lead to convergence. Specifically, under our proposal each AMS would put in place an institutional setup geared towards establishing what we call 'dynamic disciplines'. By this, we mean subjecting potentially important new regulations to a quality-control process based on consistency with the sanitary and phytosanitary (SPS) and technical barriers to trade (TBT) agreements of the World Trade Organization (WTO) and with international standards. Such a process would naturally promote regulatory convergence even in the absence of formal coordination mechanisms, as best-practice regulations are, in many cases, similar (for instance, SPS regulations based on the Codex Alimentarius tend to look alike). Thus, it would not rely on the need for supranational institutions, which would be difficult to create in the ASEAN context. More importantly, it would contribute to 'multilateralising' the RCEP from the outset by grounding deep integration on international standards, thus avoiding worsening the 'spaghetti bowl' phenomenon (on this, see Baldwin and Kawai, 2013).

The approach could deliver substantial welfare gains. Poorly designed trade-related regulations can fragment markets, create monopoly positions, and stifle regional trade; at the same time, they can fail to achieve consumer-protection objectives at the heart of the role of a modern state. For instance, in some AMSs, pharmaceutical regulations fail to contain widespread traffic of hazardous counterfeits with disastrous consequences for public health. In some cases, trade and non-trade objectives are congruent; in others, trade-offs must be made, and smart regulations must balance multiple objectives. Few governments have effective inter-ministerial coordination mechanisms to ensure that such trade-offs are made explicitly and rationally; our approach is to create one based on the same blueprint in each AMS.

One advantage of such an approach over existing NTB-elimination schemes is that it closes a potentially critical loophole, namely the replacement of eliminated NTBs by new ones. Another advantage is that it bypasses the traditional incentive problem that no

country wants to move first in order not to burn future bargaining chips, making progress dependent on episodic and uncertain negotiation rounds. Instead, it makes regulatory convergence (on best practices) the natural by- product of national regulatory-improvement agendas, themselves embedded in trade-facilitation and doing-business agendas already in place.

The rest of this paper is organised as follows. Section 2 analyses the effects of NTMs and standardisation on market structure and trade. Section 3 provides estimates of the costs involved. Section 4 proposes a new approach to measure a 'regulatory distance' between countries to be bridged by convergence. Section 5 lays out our core proposal. Section 6 concludes.

2. NTMs and Standardisation: Sorting Out the Issues

This section disentangles various components of the cost-raising effect of NTMs and assesses conceptually their channels of influence using the heterogeneous-firms perspective of modern trade theory. Quantification approaches are discussed in the following section. NTMs affect regional trade through two broad types of effects: a stringency effect and a fragmentation effect. These effects are distinct conceptually, although they can interact. Conceptually, the key point is that NTM compliance costs linked to their stringency are likely to matter most when they affect variable rather than fixed costs, whereas fragmentation effects linked to their non-harmonisation matter if they lead to reduced competition. In other words, NTMs and their non-harmonisation matter in as much as they affect firm pricing strategies.

2.1. Stringency Effects

The stringency effect is the trade-reduction effect that is attributable to the increased cost of doing business due to the presence of NTMs. This effect can itself be conceptually separated into two components: a sourcing cost and an enforcement cost.

The **sourcing cost** is due to the possible forced switch of importers from low-grade foreign suppliers to high-grade ones meeting the NTM's requirements. For instance, Indonesia's steel standard mandates a minimum steel quality. The standard precludes the importation of the cheapest kind of steel. For some users, this makes no difference because they source high-quality steel anyway. For instance, Japanese automakers with production facilities in Indonesia procure their steel from Nippon steel, which produces some of the best steel in the world. However, other firms, e.g. in the construction sector, may have imported cheap, low-quality steel before the regulation; those firms now find themselves forced to procure it with more expensive suppliers meeting the technical regulation. The more stringent an NTM, the higher the sourcing cost will be.

The **enforcement cost** relates to the diversion of managerial attention and staff time to proving compliance with the NTM. This may involve dealing with paperwork, inspections by officials from enforcement agencies, or seeking/encouraging the certification of foreign suppliers under the national standard. Enforcement costs are conventionally measured by the Organisation for Economic Co-operation and Development (OECD)'s 'standard cost model', which consists of establishing, based on a survey, the time spent monthly by the staff of affected companies on proving compliance, multiplied by their salaries. The result is a monetisation of the time burden created by paperwork and dealing with the NTM in general. Typically, the more stringent an NTM, the more suspiciously it is enforced, complicating the burden of proving compliance; indeed, anecdotal evidence on the ground suggests that stringency and enforcement costs tend to correlate.

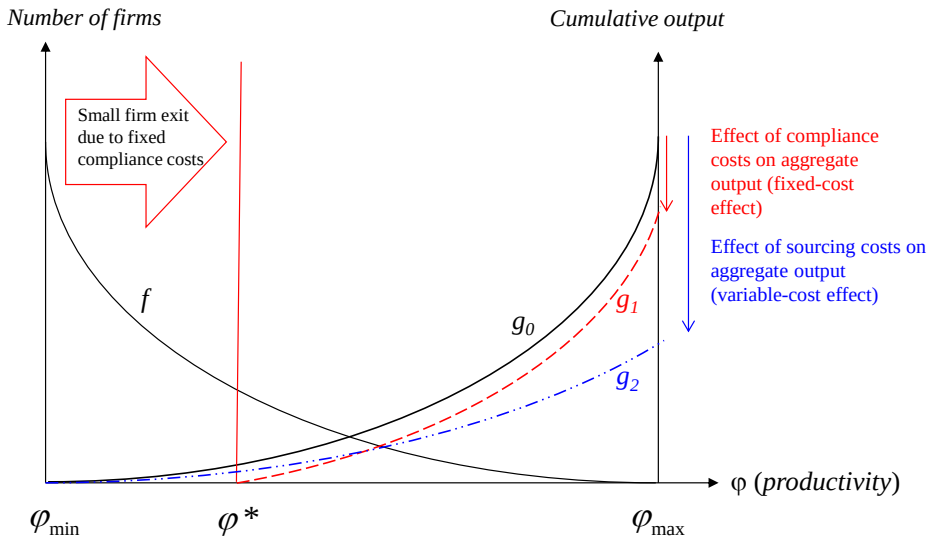
Both sourcing and enforcement costs can affect market structure through firm selection, but how important this effect is, is likely to depend on their nature. Enforcement costs are essentially fixed in the sense that they depend only weakly on the scale of production. In a model of trade with heterogeneous firms à la Melitz (2003), the level of fixed costs affects the entry decision; thus, higher enforcement costs discourage the entry of fringe firms. By contrast, sourcing costs are variable. For instance, if a technical regulation mandates that wire insulation material be fire-retardant, every unit

will become more expensive. This will affect all firms in proportion to their sales, including large ones.

Which ones are likely to be most important for aggregate outcomes? The answer is shown in Figure 1. The horizontal axis ranks firms in terms of productivity, from least to most productive. The distribution is shown by curve *f*, which roughly reproduces a Pareto distribution: Lots of low-productivity (small) firms, and fewer and fewer at higher levels. The scale of curve *f*, in terms of number of firms, is measured on the left-hand side vertical axis. Curve g_0 shows the cumulative output of those firms, measured in, say, US dollars on the right-hand side vertical axis. Increments are initially small, as addition of more small, low-productivity firms does not raise cumulative output much, and then becomes increasingly steep as one moves to progressively larger and more productive firms.

Suppose now that a certain country imposes an NTM with large enforcement costs. Those induce massive exit of small firms, shown by the thick arrow, with only firms above a critical productivity level φ^* able to survive. Although the exit as shown is massive, the effect on aggregate production, shown by the downward shift of the *g* curve from g_0 to g_1 is small, because the exit affects the low-productivity fringe firms only. By contrast, sourcing costs affect the pricing and output decisions of all firms, including the largest and most productive ones. The effect on aggregate output, shown by the drop of the *g* curve from g_0 to g_2, is now much larger. This is one of the insights of the recent heterogeneous-firms models: policy interventions affecting fixed costs typically have smaller effects than those affecting variable costs. In that sense, the salience of cumbersome procedures and costly certification in surveys should be put in perspective; as long as enforcement costs are not variable, they should not be over-emphasised in the policy debate.

Figure 1: Why Variable Sourcing Costs Matter More than Fixed Enforcement Costs



Source: Authors' description

Figure 1 shows that fixed-cost increases related to the enforcement of NTMs may end up having small aggregate effects on production and trade, as they affect essentially the smallest and least productive firms. However, this does not mean that these effects are irrelevant to the policy debate: small firms may provide employment outside of agglomeration centres, employ vulnerable populations, etc. NTMs that make compliance difficult for small firms may thus have detrimental social effects. We will return to these considerations in section 4 below.

2.2. Fragmentation Effects

The fragmentation effect of NTMs is the barrier between markets created by differing NTMs, irrespective of their stringency. It is particularly important economically, as it affects not just the level of firm costs, but also market structure and the degree of competition. When countries impose different technical regulations, producers incur differentiation costs to adapt products to them. As a result, they tend to specialise by market, reducing the extent of competition. To see this, imagine that

country A imposes a technical regulation prohibiting the use of certain pigments in paint for domestic uses, while country B prohibits only the use of lead in paints. A producer manufacturing paint for sale in country B may want to use pigments banned in A because they are cheaper, provided that they contain no lead. But then paints produced in the same facility using only pigments permitted in A will be polluted by residues left from the batch destined for B, unless a costly clean-up is performed between batches. As a result, tacit arrangements will arise whereby some producers manufacture according to A's standard and sell only there, while others manufacture according to B's standard and sell only there. Under certain conditions, this may well suit their interests, if the forsaken economies of scale are more than compensated by reduced competition and higher prices. In other words, the fragmentation effect is akin to a regulation-induced collusive device. Note that this effect is not directly related to the stringency of A's standard: the maximum residual level of banned pigments could be relaxed up to a certain level in A without changing the incentive for firms to specialise by market.

Stringency and fragmentation effects affect regional and multilateral trade through essentially the same channels, because modern NTMs apply on a most-favoured nation (MFN) basis. That is, by Article III of the General Agreement on Tariffs and Trade (GATT), technical or SPS regulations must apply equally to all 'like' products irrespective of origin –domestic, preferential, or other imports. Indeed, it would not make sense to loosen SPS regulations on shrimps for preferential partners. We will discuss later on in this paper what institutional arrangements (harmonisation, mutual recognition, and so on) can reduce compliance costs selectively at the regional level. This section is concerned with ways to assess empirically how NTMs affect regional trade, irrespective of the fact that they are notionally MFN. We will describe two relatively crude but nevertheless useful ways of getting towards such an assessment and point towards methods that could improve on them.

3. Measuring the Effects

This section takes the analysis of the last section to the data and assesses empirically the effect of NTMs and various modes of harmonisation on estimated compliance costs and trade flows. The assessment is constrained by key data limitations including the absence of price data, replaced by trade unit values, and the current state of NTM data collection, whose coverage is only partial. Therefore they should be interpreted cautiously. Be that as it may, they suggest that deep-integration clauses in RTAs such as harmonisation and mutual recognition have identifiable, albeit limited effects in reducing compliance costs. However, their effects on trade patterns are complex when development levels differ in the bloc, with possible adverse effects in the presence of a 'premature harmonisation' syndrome.

3.1. Can NTMs Inadvertently Hurt Regional Trade?

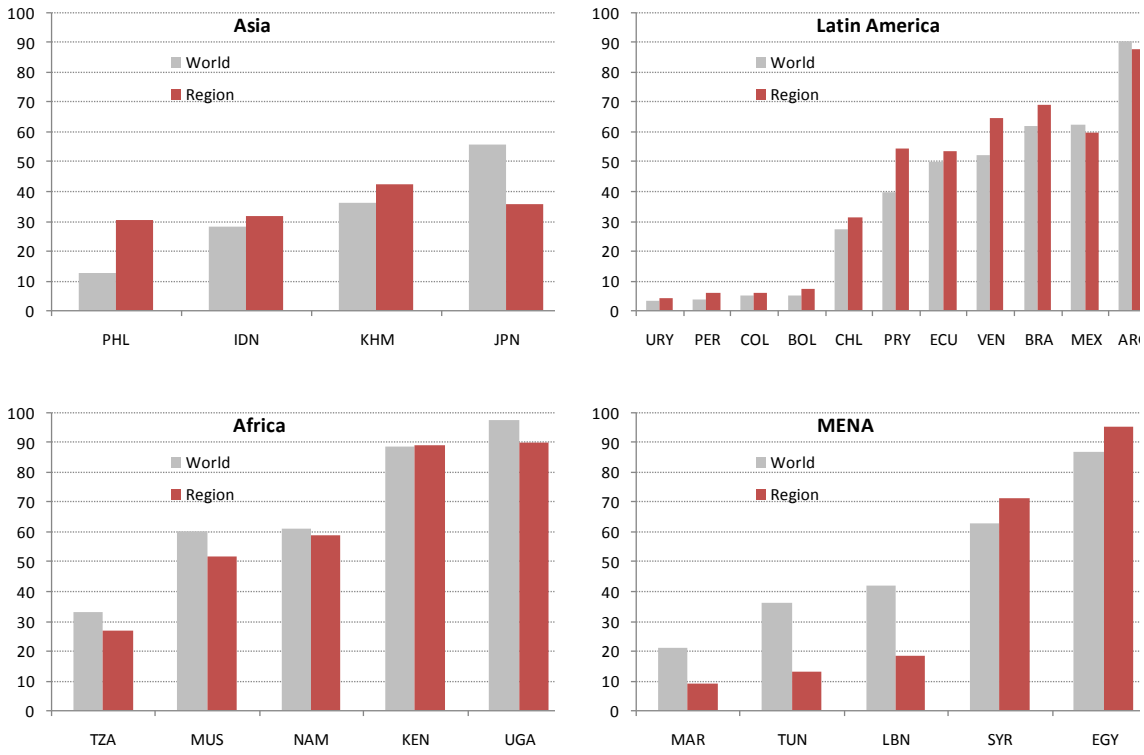
Even when applied in a non-discriminatory way in accordance with GATT Article III, NTMs can still penalise trade more with certain partners than others just because coverage ratios differ, depending on the product composition of bilateral trade. For instance, SPS measures fall more heavily on trade with partners having a comparative advantage in foodstuffs, and TBT on those with a comparative advantage in manufactures. The same reasoning applies at the regional level. If intra-regional trade has a strong component in foodstuffs relative to trade with the rest of the world, it will be affected by SPS measures more than proportionately.

This suggests a simple approach to measuring the potential of NTMs to affect regional trade using coverage ratios. A coverage ratio, in general, measures the proportion of trade covered by one or more NTMs. Here we adapt the concept to measure the share of regional vs. out-of-region trade that is covered by NTMs, depending on their respective product compositions. The formulae we use are derived in the Appendix.

Figure 2 shows the result of this calculation for four regions of the world for which data is available (without particular reference to formal trading blocs). For each

importing country labelled by its ISO3 code, the red bar corresponds to formula (9) in the appendix (coverage ratio for intraregional imports) and the grey one to formula (8) (overall coverage ratio). When the former is higher than the latter, NTMs fall disproportionately on regional trade, and *vice versa*. This is the case for the Philippines whose NTMs fall disproportionately on regional trade. For Indonesia and Cambodia, the coverage of NTMs is roughly balanced between regional and non-regional imports. For Japan, by contrast, their weight falls more on out-of-region imports.

Figure 2: Coverage Ratio for Imports from Regional Partners



Note: PHL = Philippines; IDN = Indonesia; KHM = ; JPN = Japan; URY = Uruguay; PER = Peru; COL = Colombia; CHL = Chile; PRY = Paraguay; ECU = Ecuador; VEN = Venezuela; BRA = Brazil; MEX = Mexico; ARG = Argentina; TZA = Tanzania; MUS = ; NAM = Namibia; KEN = Kenya; UGA = Uganda; MAR = Morocco; TUN = Tunisia; LBN = Lebanon; SYR = Syria; EGY = Egypt.

Source: Authors' calculations based on COMTRADE Database.

In sum, except in the case of the Philippines, patterns of NTM imposition in documented ASEAN countries do not suggest that they fall disproportionately on regional trade due to the composition of intra-regional trade. At a broad level, this is consistent with the heavy content of regional trade in capital equipment, high-tech intermediates, and electronics components, which are affected by relatively few NTMs compared with food products.

3.2. Does Deep Integration Actually Help?

In this section, we explore what could be expected from harmonisation or, more broadly, from regulatory convergence as part of the RCEP through a quantitative ex-post assessment of how deep-integration clauses (harmonisation or mutual recognition) in Regional Trade Agreements (RTAs) have reduced NTM compliance costs and enhanced trade. First, we assess effects on compliance costs using a price equation. Then we assess trade effects using a gravity equation, highlighting a 'premature harmonisation' syndrome that has been discussed only recently in the literature. Results from both approaches suggest that expectations should not be set too high on the benefits to be derived from deep integration, but that the mutual recognition of conformity-assessment procedures might provide a possible quick win with sizable benefits.

3.2.1. Reducing compliance costs

Here we follow the novel approach of Cadot and Gourdon (forthcoming) to the estimation of NTM ad-valorem equivalents (AVE) based on a comparison of trade unit values (i.e. prices) with vs. without NTMs. The approach is thus an econometric generalisation of the price-gap method widely used in trade law. Price increases are interpreted as a combination of compliance costs (essentially sourcing costs, since enforcement costs, being fixed, should affect prices only indirectly if at all) and quality-enhancement effects. In a second step, the presence of NTMs is interacted with deep-integration clauses such as harmonisation or mutual recognition in regional trade agreements (RTA) to assess if the latter mitigate the price-raising effect of NTMs. If such is the case, this mitigating effect is interpreted as a reduction in NTM compliance costs, as there is no reason to believe that deep-harmonisation clauses would mitigate

quality-enhancement effects. That is, let $p_{cc'k}$ be the unit value of product *k* export from *c* to *c'* without NTM, $p_{cc'k}^{NTM}$ its price in the presence of an NTM, and $p_{cc'k}^{NTM,h}$ its price in the presence of the same NTM but combined with a harmonisation clause between countries *c* and *c'*; and suppose that

$$p_{cc'k} < p_{cc'k}^{NTM,h} < p_{cc'k}^{NTM} \quad . \tag{1}$$

The log-price differential $\ln\left(p_{cc'k}^{NTM}\right) - \ln\left(p_{cc'k}\right)$ is the NTM's AVE on product *k*, interpreted as a combination of compliance costs and quality-enhancement effects, while $\ln\left(p_{cc'k}^{NTM}\right) - \ln\left(p_{cc'k}^{NTM,h}\right)$ is the AVE reduction, which we ascribe entirely to reduced compliance costs, brought about by harmonisation.

The analysis focuses on SPS (type-A) and TBT (type-B) measures as deep-integration clauses concern essentially those. Let *h* stand for standards harmonisation, *m* for mutual recognition, and *a* for mutual recognition of conformity-assessment procedures. Define a set of dummy variables marking type of RTAs based on their deep-integration clauses $\ell = \{h, m, a\}$ as coded by Budetta and Piermartini (2009):

$$I_{cc'}^{\ell} = \begin{cases} 1 & \text{if } c \text{ and } c' \text{ have an RTA with deep-integration clause } \ell \\ 0 & \text{otherwise} \end{cases} \tag{2}$$

Estimation is carried out separately product by product, as in Kee, Nicita, and Olarreaga (2009). Let δ_c and $\delta_{c'}$ be country fixed effects, $t_{cc'k}$ the tariff imposed by *c'* on product *k* imported from *c*, $\mathbf{x}_{cc'}$ a vector of country-pair determinants such as distance, common language etc., and $I_{c'k}^{n}$ a dummy variable marking the imposition of NTM *n* on product *k* by country *c'* as defined in (4). Recall that there is only one year of data, so no time indices are needed. The estimation equation is then

$$\ln p_{cc'k} = \delta_c + \delta_{c'} + \sum\nolimits_{n=A,B,\text{other}} \alpha_1^n I_{c'k}^n + \sum\nolimits_{n=A,B,\text{other}} \beta_1^n \left(I_{c'k}^n \times I_{cc'}^{\ell}\right) + \beta_2 \ln\left(1 + t_{cc'k}\right) + \mathbf{x}_{cc'}\boldsymbol{\gamma}_1 + u_{cc'k} \tag{3}$$

Equation (3) is estimated on a database with the largest number of observations available, i.e. with all countries for which NTM and deep-integration clauses data exist.[2] Results are shown in synthetic form in Table 1, suggesting that the mutual recognition of conformity-assessment procedures is susceptible of yielding the largest gains across the board in terms of compliance-cost reduction for TBT measures. The mutual recognition of technical and SPS regulations (second line) yields the lowest reductions in compliance costs, while the remaining three approaches yield roughly equivalent reductions. One way of interpreting the low results for mutual recognition of TBT and SPS measures is that it happens typically between countries that have bridged their regulatory distances through partial harmonisation, yielding few additional gains.

Table 1: Mutual Recognition of Conformity-assessment Procedures Yields Large Reductions in Compliance Costs

		SPS (A)	TBT (B)
Mutual recognition	Conformity-assessment procedures	-15.1	-27.6
	Technical/SPS regulations	-3.6	-9.9
Harmonization	Conformity-assessment procedures	-11.8	-20.0
	Technical/SPS regulations	-13.6	-20.3
Transparency requirements		-15.4	-21.1

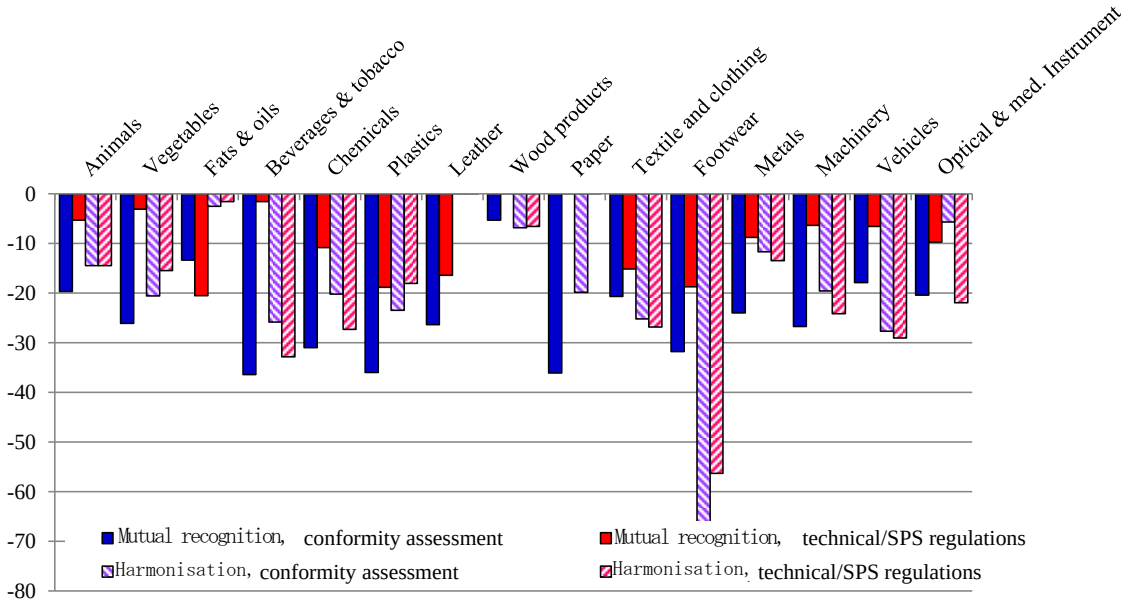
Note: The reduction shown is in percentage points of the baseline AVEs, not in 'raw' percentage points. Thus, the first entry (-15.1) means that the average AVE of SPS regulations (2.8 percent) is reduced by 15 percent or 0.4 percentage points, to 2.4 percent, by the mutual recognition of conformity-assessment procedures.
Source: Cadot and Gourdon (forthcoming).

Results are decomposed by sector in Figure 3. Each bar measures the reduction in NTM AVEs, again in percentage of the baseline AVE and not in 'raw' percentage points.[3] In 11 sections, the mutual recognition of conformity-assessment procedures brings the largest reduction in NTM costs; on average, mutual recognition of conformity

[2] Unfortunately, there are not enough data for ASEAN countries alone to separate the estimation between ASEAN and non-ASEAN countries, so results are worldwide averages.
[3] For instance, for animals, the combined estimated AVE of all NTMs is 26.2 percent. Mutual recognition of conformity-assessment procedures (the dark blue bar) would reduce that by 20 percent, i.e. 0.2 × 26 percent = 5.2 percent, bringing back the AVE of combined NTMs to 21 percent.

assessment procedures reduces by one-sixth the AVE of SPS measures and by one quarter that of TBT measures. The footwear sector stands out as one where harmonisation seems to yield very large gains in terms of cost reduction.

Figure 3: Mutual Recognition of Conformity-assessment Procedures Yields Large Cost Reductions



Note :SPS = sanitary and phytosanitary.
Source: Cadot and Gourdon (forthcoming).

All in all, the results presented here seem to suggest that harmonisation does not seem to be much more powerful than mutual recognition in mitigating the cost of complying with NTMs, even though it is perhaps the most ambitious and politically difficult route. Most strikingly, the mutual recognition of conformity-assessment procedures, which is relatively easy to achieve and has low visibility, seems to deliver substantial gains. As some countries in ASEAN are struggling to get their conformity-assessment infrastructures up to speed, this suggests a strategy whereby the ASEAN Secretariat would target conformity-assessment infrastructures (standard bureaus, testing laboratories, etc.) for technical assistance with a view to achieving area-wide mutual recognition within a short horizon.

3.2.2. Trade diversion from 'premature harmonisation'

Here we go one step further and assess whether deep-integration clauses in RTAs seem to enhance trade, with particular emphasis on the distinction between North–South and South-South trade, a distinction that is particularly relevant in ASEAN where development levels vary substantially. The policy question is as follows. Suppose that Southern or relatively poor country *c* harmonises its SPS or TBT regulations with Northern or richer country *c'*. In most cases, regulations are most stringent in *c'* (on this, see Maur and Shepherd, 2011) so the burden of adjustment falls on *c*, where producers must adopt the relatively expensive technology compliant with the stringent standard in *c'*. Is it possible that, in so doing, *c*'s producers price themselves out of *other* Southern markets where the level of standard imposed by *c'* is irrelevant? In this case, the North–South RTA's deep-integration clauses would create or reinforce a hub-and-spoke trade pattern where relatively poor countries trade with the richer one but not with potential Southern out-of-bloc partners. This would be akin to an unusual form of trade diversion: Whereas standard, Vinerian trade diversion predicts that the bloc's *imports* shrink, this form predicts that the bloc's *exports* shrink.

The analysis is based on the gravity equation and draws from Cadot, Disdier, and Fontagné (forthcoming). The sample of bilateral trade flows (covering 1990–2006) is split into two sub-samples corresponding respectively to North–South and South–South trade relations,[4] dropping North–North relations. The definition of deep integration clauses in RTAs draws again from Piermartini and Budetta (2009), updating it with recent North–South RTAs.

The variable explained by the model is bilateral trade flows; for North–South trade relations, the 'treatment variable' is a dummy equal to one when countries *c* and *c'* both belong to the same North–South RTA, interacted with the same deep-integration clauses used in the previous section, with a further refinement depending on whether harmonisation is on regional (ad-hoc) or international standards (like the Codex

[4] In addition, a Chow test suggests that estimated coefficients on both sub-samples differ significantly and confirms this divide.

Alimentarius). For South–South relations, the treatment is whether *c* or *c'* belongs to an RTA with a Northern country, again interacted with deep-interaction clauses.

Results are shown synthetically in Table 2, which reports only coefficients on the variables of interest. All coefficients on standard gravity variables (importer and exporter GDP, fixed effects, distance, etc.) have expected signs and magnitude and are omitted.

Table 2: Deep Integration between Rich and Poor Countries, a Non-conventional Trade Diversion

	Coefficient a/
North-South trade b/	
RTA with SPS/TBT harmonization:	
On regional standards	-0.20
On international standards	0.52
South-South trade c/	
Importer belongs to a NS RTA	-0.11
Exporter belongs to a NS RTA:	
Any RTA	-0.20
RTA with SPS/TBT harmonization	-0.22

Note :RTA = Regional trade agreement; SPS = Sanitary and phytosanitary; TBT = Technical barriers to trade; NS = North–South.
Notes: a. Coefficients are from the PPML estimator and therefore their magnitude cannot be interpreted the same way as ordinary least squares (OLS) coefficients. All coefficients reported in the table are significant at the 1 percent level.
b. 1,731 observations (only country pairs documented in the Piermartini–Budetta database); fixed effects by exporter-year, importer-year, and exporter-importer dyad.
c. 24,803 observations; year and dyad fixed effects.
Source: Adapted from Cadot, Disdier and Fontagné (forthcoming).

The first two lines of Table 2, pertaining to North–South trade, i.e. intra-bloc trade in North–South RTAs suggest that trade agreements between rich and poor countries with deep-integration clauses foster intra-bloc trade only to the extent that harmonisation takes place on international standards. When regional standards are promoted instead, the effect on trade is negative, possibly because regional standards are often ad-hoc and influenced by special interests.

The third line is suggestive of standard, Vinerian trade diversion, as Southern countries belonging to North–South RTAs tend to import less from other Southern countries. The most interesting results are in the last two lines. They show that North–South RTAs also tend to generate non-conventional trade-diversion effects, as Southern members also tend to *export* less to out-of-bloc Southern markets and even less – although the additional effect is small – in the presence of deep-integration clauses.

These results suggest two observations. First, the benefits of North–South RTs for Southern countries – enhanced access to Northern markets – depend on the quality of regulatory convergence at play in the bloc. If it is based on international standards, i.e. best practice, the market-access effect is positive; if it is based on ad-hoc regional standards, likely to be tainted by special-interest politics, there is no market-access gain anymore. Second, those benefits, when they exist, come at a cost – a reduced ability to export to outside Southern markets, partly, presumably, because of a compliance-cost effect. Note that these results are consistent with those discussed in the previous section, where it appeared that harmonisation of technical and SPS regulations carried the lowest benefits in terms of compliance-cost reduction.

Thus, there is a 'dark side' to harmonisation. Moreover, in practice, harmonisation can be driven by special interest; for instance, harmonisation on stiff standards can be pushed by large players to drive out smaller ones for whom compliance is more difficult to achieve (recall the exit of small players illustrated in Figure 1). As large players are likely to have the best access to policy processes, manipulations of this sort may be frequent in practice.

4. Towards Regulatory Convergence: How Distant are Partners?

Before reducing the regulatory differences potentially responsible for the fragmentation of regional markets, one needs a way to assess how large are those differences. We propose here a broad, two-way categorisation: at the 'extensive margin'

and at the 'intensive margin', with a conceptual and visual tool to measure those differences. The tool could be useful as a way of assessing, prior to the launch of regional negotiations on harmonisation/mutual recognition, how wide is the gap between member states' practices. While this would not replace technical work by industry experts to assess what measures could or should be harmonised and what adaptation costs would be involved for producers, it would help assess the overall difficulty and chances of success of negotiations. It could also be useful to identify quick wins to gather momentum in the negotiations.

Regulatory distance at the extensive margin (RD–EM) captures differences in patterns of imposition of NTMs of different types (particular forms of SPS or TBT measures as classified by the MAST nomenclature) on different products. Regulatory distance at the intensive margin measures differences in the stringency of measures of the same type on a given product; for instance, differences in maximum residual levels (MRLs) of a given toxic substance on a given product.

4.1. Extensive Margin

RD–EM answers the following question: Do countries tend to apply the same type of measure (e.g.quotas or inspection requirements) to the same products? It can be measured, for pairs of countries for which NTM inventories classified according to the MAST nomenclature is available, from data available on WITS, the World Bank's trade-data portal. The RD–EM variable is built up from the product-measure level. Suppose that country *A* imposes one type of NTM, say B840 (inspection requirements) on a given product defined at the six-digit level of the harmonised system, say HS 840731 (spark ignition reciprocating piston engines of a kind used for the propulsion of vehicles of Ch.87, of a cylinder capacity not >50cc). If country *B* imposes the same type of measure (coded as B840) on that same product, for the given measure-product pair, countries *A* and *B* are said to be 'similar'. We then code the regulatory distance variable as zero. By contrast, if *B* imposes a different regulatory requirement, but not B840, or if it imposes no NTM at all on that product, then *A* and *B* are 'dissimilar' for measure-product pair (B840, 840731) and the regulatory-distance variable is coded as one.

Formally, let *c* index countries, *k* HS6 products, and *n* NTM types, and let

$$I_{cnk} = \begin{cases} 1 & \text{if country } c \text{ applies NTM type } n \text{ to product } k \\ 0 & \text{otherwise} \end{cases} \quad (4)$$

Regulatory distance at the measure-product level is

$$d^{EM}_{cc'nk} = \left| I_{cnk} - I_{c'nk} \right|.$$

Letting $N = \max\{N_c; N_{c'}\}$ be the total number of NTMs used by any of the two countries and $K = \max\{K_c; K_{c'}\}$ the total number of products covered in any of the two countries, aggregate regulatory distance between *c* and *c'* is

$$D^{EM}_{cc'} = \frac{1}{NK} \sum_n \sum_k D_{cc'nk} \quad (5)$$

i.e. the sum of the absolute values of the differences in NTM application status. Because regulatory distance is normalised by the grand total of product–NTM combinations, it lies between zero and one and is typically a small number.

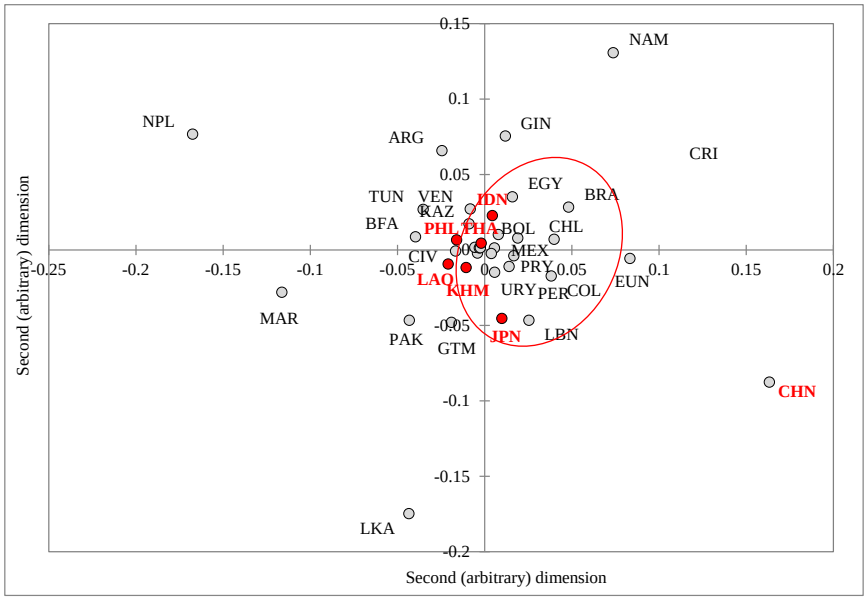
The complete matrix of bilateral regulatory distances between countries in the United Nations Conference on Trade and Development (UNCTAD)'s NTM database is shown in Appendix Table A1. Large tables can be unwieldy to use, so Figure 4 shows a new and alternative way of representing regulatory distance. The idea is to project bilateral distances onto a plane akin to a map. Mathematical details of the method are given in the Appendix.[5] To interpret Figure 4, note that the axes are arbitrary: they are scaled so as to fit the range of bilateral distances and merely represent the cardinal points in which distances are mapped.

Figure 4 suggests several observations. First, a small number of countries stand out for unusual patterns of NTM imposition. Those include Nepal (NPL), Sri Lanka (LKA),

[5] The mapping cannot be perfect; with 33 countries to place on the map (we treat the EU as one, as the regulatory distance amongst them is zero) and arbitrary distances between them, only a 32-dimensional space could provide a perfect representation. As the number of dimensions shrinks, the distortion in the representation of distances grows. The distortion for a two-dimensional projection is shown in the appendix. If there was no distortion, all points would lie on the 45^o line; it can be seen that the distortion remains moderate.

China (CHN), Morocco (MAR), and Namibia (NAM).[6] Second, there is a 'core' of countries with similar patterns of NTM imposition at the product level. Interestingly, all ASEAN countries for which we have data are well inside that core, suggesting that either national governments have developed regulatory patterns that are inspired by international experience, or that ASEAN's efforts to bring regulatory convergence have had some effect.

Figure 4: Map-like Representation of Regulatory Distances



Source: Authors' calculations.

Is there any evidence that FTAs, in general, foster regulatory convergence? As a first pass, Table 3 shows the results of a regression of regulatory distance on RTA dummies, using Piermartini and Budetta's database (Piermartini and Budetta, 2009). The dependent variable in the regressions is the bilateral regulatory distance measure shown in Appendix Table A1, which we regress on dummy variables marking if a given country pair belongs either to any FTA (column 1) or to a particular one (column 2).

[6] We recoded Chinese data to transform all NTMs erroneously coded as B for products other than agri-food products (Chapters HS01 to HS24) into A, keeping the last three digits the same.

Table 3: Regression Results, Regulatory Distance, and Regional Trade Agreements

	(1)	(2)
Both in the same RTA (any)	-0.033	
	(8.07)***	
Both in aladi		-0.029
		(2.83)***
Both in andeancom		-0.023
		(0.77)
Both in cacm		-0.049
		(0.72)
Both in comesa		-0.033
		(0.85)
Both in sadc		-0.045
		(1.14)
Both in safta		0.018
		(0.46)
Constant	0.086	0.083
	(24.33)***	(26.15)***
Observations	992	992
R-squared	0.01	0.01

Note :Estimator: OLS; dependent variable: bilateral regulatory distance.
Robust t-statistics in parentheses.
* significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

The coefficient in the first column of Table 3 is negative and statistically significant (at the 1 percent level), suggesting that, on average, RTAs reduce regulatory distance between their members. The effect is quantitatively very large: The average regulatory distance between country pairs in our sample is 0.079. Thus, the average RTA cuts regulatory distance by 0.033/0.079 = 41 percent. The second column breaks down this effect by individual agreement. The estimated effect for Asociación Latinoamericana de Integración (ALADI) is also negative and highly significant. For other agreements, we do not have enough observations to estimate statistically significant effects, but they are all negative except for South Asian Free Trade Area (SAFTA). More research is needed to assess if those results are confirmed on a larger sample and with adequate controls; but the prima facie results are encouraging. From a policy perspective, they suggest that RTAs do induce a convergence of regulatory systems 'at the extensive margin'; i.e.

member states tend to apply the same type of measures to the same products. This should facilitate further harmonisation at the intensive margin, i.e. convergence in the level of stringency of the measures.

4.2. Intensive margin

The concept of regulatory distance can also be applied at the intensive margin (RD–IM), where it answers the following question: For a given (homogeneous) type of measure and a given product, how distant is the measure's stringency between two countries? As an example, consider a fungicide called Imazalil used to reduce the perishability of oranges during transport and storage. The Imazalil molecule, known as enilconazoleis, is listed as 'known to the State to cause cancer' under California's Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986) and carries a warning label in the US.[7] It was developed by Janssen, a New Jersey chemical company, part of the Johnson & Johnson group, which however divested from it in 2006.[8] Table 4 shows, for selected countries (including all ASEAN members with published data) the maximum residual levels (MRL) of Imazalil in citrus fruit, expressed in ppm (last column), and the regulatory distance calculated as the difference between the MRLs of each country pair as a proportion of the maximum level (10 ppm (parts per million) for the whole database). For instance, the US accepts 10ppm, the world's highest level, while Cambodia accepts only 5 ppm; their regulatory distance is then 5/10 = 0.5.

In terms of regional blocs, although there is no formal mechanism to harmonise SPS regulations in NAFTA (the US exerts a *de facto* leadership), all three members share a high 10 ppm MRL for Imazalil, while practically all other countries except Australia have a substantially lower MRL at 5 ppm.

[7] It is rated by the US Environmental Protection Agency (EPA) as only moderately toxic. See http://pmep.cce.cornell.edu/profiles/extoxnet/haloxyfop-methylparathion/imazalil-ext.html.
[8] http://www.janssenpmp.com

Table 4: MRL on Imazalil in Oranges
Selected Countries and Codex Alimentarius

Regulatory distances, intensive margin	Australia	Cambodia	Canada	China	Codex	EU	India	Indonesia	Mexico	NZ	Philippines	Singapore	Taiwan	Thailand	USA	Vietnam	MRL level
Australia		0.5	0	0.5	0.5	0.5	0.5	0.5	0	0.5	0.5	0.5	0.5	0.5	0	0.5	10
Cambodia			0.5	0	0	0	0	0	0.5	0	0	0	0	0	0.5	0	5
Canada				0.5	0.5	0.5	0.5	0.5	0	0.5	0.5	0.5	0.5	0.5	0	0.5	5
China					0	0	0	0	0.5	0	0	0	0	0	0.5	0	5
Codex						0	0	0	0.5	0	0	0	0	0	0.5	0	5
European Union							0	0	0.5	0	0	0	0	0	0.5	0	5
India								0	0.5	0	0	0	0	0	0.5	0	5
Indonesia									0.5	0	0	0	0	0	0.5	0	5
Mexico										0.5	0.5	0.5	0.5	0.5	0	0.5	10
New Zealand											0	0	0	0	0.5	0	5
Philippines												0	0	0	0.5	0	5
Singapore													0	0	0.5	0	5
Chinese Taipei														0	0.5	0	5
Thailand															0.5	0	5
United States																0.5	10
Viet Nam																	5

Note: EU = European Union; NZ = New Zealand; USA = United States of America; MRL = maximum residual levels.
Source: https://www.globalmrl.com

With several regulated substances, the principle of regulatory distance at the intensive margin illustrated for one pesticide in Table 4 can easily be extended as follows. Let x_{ck} be the MRL on substance *s* imposed by country *c* for product *k* measured in, say, ppm. The multi-dimensional regulatory distance at the intensive margin between countries *c* and *c'*, for product *k*, is then

$$d_{cc'k}^{IM} = \frac{1}{N_{sk}} \sum\nolimits_s \left| x_{csk} - x_{c'sk} \right| \tag{6}$$

where N_{sk} is the number of regulated substances for product *k*. When a country imposes no MRL for a given substance, the MRL database codes it as a missing value; x_{csk} is then undefined and substance *s* drops out of the sample when taking the differences in (6), which only include cases where both *c* and *c'* impose MRLs on the same substance.

While only illustrative, these calculations are suggestive of the kind of analysis that could be conducted in preparation for future ASEAN negotiations on harmonisation and mutual recognition to assess the 'distance' that must be bridged, overall, in order to achieve convergence.

5. Regulatory Convergence in ASEAN: The Way Forward

This section explores ways of moving forward a deep-integration agenda in ASEAN, based on existing international experience as well recent initiatives in Southeast Asia. While top-down efforts have proved only moderately successful in other regions so far, a bottom-up approach based on 'dynamic disciplines' and technical cooperation between national regulatory agencies offers promise.

5.1. Lessons from the International Experience

As multilateral efforts to reduce NTBs have progressed only slowly, a number of regional secretariats have tried to give an impulse to NTB reduction, harmonisation, and mutual-recognition agendas to reduce regulatory differences and the abuse of regulatory measures for protectionist purposes. This section briefly reviews the experience of selected regional arrangements including the EU, NAFTA, ASEAN, the East African Community (EAC), the Southern African Development Community (SADC), and the Common Market for Eastern and Southern Africa (COMESA)[9] as well as a number of North–South bilateral agreements. To preview the result of the discussion, whereas the EU and (to a much lesser extent) NAFTA have adopted a top-down approach to regulatory convergence, South–South agreements have attempted to set up bottom-up approaches based on the identification of NTBs by the private sector, but with very limited success.

[9] Information on regulatory convergence in Mercosur is virtually non-existent and the issue is not discussed in the Inter-American Development Bank's reports.

The reduction of non-tariff barriers to trade features prominently in ASEAN efforts to promote economic integration in the region, reflecting a widespread view that NTBs have superseded tariffs as relevant barriers to trade. In particular, the ASEAN Economic Community (AEC) blueprint has mainstreamed the reduction of NTBs in regional integration efforts, together with improvements in trade facilitation through single windows.

The ASEAN Trade in Goods Agreement (ATIGA), adopted in 2008, set a schedule for the elimination of NTBs in three stages (see ASEAN, 2012). The approach consisted of classifying NTBs into three categories: green for NTMs that were not NTBs, i.e. justified measures; amber for NTMs whose trade-restrictiveness could be discussed, or red for clear-cut NTBs. ASEAN member countries were supposed to submit lists of NTMs which the ASEAN secretariat would then classify into green, amber or red. The Secretariat's classification would be reviewed by member countries, after which measures would be examined and prioritised for elimination by a number of negotiating bodies including the Coordinating Committee on the Implementation of the CEPT for AFTA (CCCA).[10]

Several action plans involving the removal of the core NTBs have been set up, by 2010 for ASEAN–5 (Brunei Darussalam, Indonesia, Malaysia, Singapore, and Thailand), by 2012 for the Philippines, and by 2018 for Cambodia, Lao People's Democratic Republic, Myanmar, and Viet Nam. On top of that, a number of regulation harmonisation efforts in cosmetics, automobile, electrical and electronic equipment, medical devices, pharmaceuticals, and ICT have been endorsed and conducted. ASEAN has recently also set up the ASEAN Consultative Committee on Standards and Quality (ACCSQ), which works with the sectors mentioned above, and also prepared food and rubber products.[11] However, the ATIGA mechanism suffers from an incentive problem as governments are expected to provide information that will then be put on a bargaining table, although they have an incentive to hoard it instead. It also expects governments to set up inter-ministerial coordinating mechanisms to centralise information on regulations

[10] See Ando and Obashi (2009) for more details.

[11] For details, see Prassetya and Intal 2015, Pettman 2013, and ACCSQ, http://www.asean.org/news/item/accsq.

issued by various agencies. The problem is that governments are expected to overcome a collective-action problem to provide a public good – market access for regional partners.

What lessons can be drawn from international experience on streamlining NTMs? The EU's experience is probably the most advanced, but its replicability is limited by the fact that the EU integration project was from the start a more ambitious deep-integration project than most other regional blocs. Still, it is useful to note that mutual recognition was the key step forward when the European Court of Justice (ECJ) adopted the 'Cassis de Dijon' decision in 1979. Since then, mutual recognition and harmonisation have played complementary roles and progressed in parallel, with the European commission setting broad guidelines through Regulations and Directives or, alternatively, Decisions on particular issues, and mutual recognition applying to all other cases.[12] Politically, the impetus for regulatory convergence in the EU has come from the implicit cooperation of the European Commission and the ECJ, with the ECJ breaking up national barriers to trade and competition and the Commission replacing them with new EU-wide regulatory regimes (see Dzabirova, 2010). Some member states had feared that mutual recognition would set off a race to the bottom with some countries loosening regulations in order to attract manufacturing. But those fears do not seem to have materialised, possibly because the Commission's legislative activity pushed the model towards increasing reliance on harmonisation. The model's reliance on two powerful and driven supranational institutions (the Commission and the ECJ) limits its replicability in the ASEAN context, which lacks such supra-national institutions. However, two lessons emerge from the EU model – (i) mutual recognition appeared as a simpler initial step than attempting to negotiate common rules between governments; and (ii) it did not trigger a race to the bottom in spite of uneven starting points in terms of development and regulatory stringency between Mediterranean and Northern countries.

[12] A regulation is similar to a national law with the difference that it is applicable in all EU countries. Directives set out general rules to be transferred into national law by each country as they deem appropriate. A decision only deals with a particular issue and specifically mentioned persons or organisations. See http://ec.europa.eu/legislation/index_en.htm.

The North American Free Trade Agreement (NAFTA) was always much less ambitious than the EU in terms of deep integration, although the agreement contains specific provisions on regulatory convergence. For instance, for SPS measures, Chapter 7B encourages member states to consider each other's measures when developing their own. For TBT measures, Chapter 9 encourages them to make their regulations compatible. NAFTA does not have a universal mutual-recognition principle like the EU's Cassis de Dijon decision; what comes closest is Article 714, which states that 'an importing Party shall treat another NAFTA country's SPS measure as equivalent to its own if the exporting country demonstrates objectively that the measure achieves the importing Party's appropriate level of protection'.[13] The wording suggests that the burden of proof is on the exporting country, which must demonstrate that its regulations are equivalent to those of the importing country, rather than the other way around, which is quite different from a blanket mutual-recognition principle. A number of proposals have been periodically floated for further integration (see Irish, 2009 or Manley, *et al*., 2005), in particular when enhanced security measures at US borders hampered Canadian exports after 11 September 2001.[14] Interestingly, in the post–9/11 era a key motivation for further integration in North America was security rather than trade, with the recognition that enhanced security might imply the emergence of supra-national regulatory bodies (unless US agencies were given hegemonic power over the entire bloc, which other nations would be unlikely to accept). However, few of the new ideas have been put into practice. Some degree of regulatory convergence took place, or at least enhanced tripartite cooperation, under the 2005 Security and Prosperity Partnership (SPP), although on a limited agenda. Proposals on how to move forward include one that is directly relevant for ASEAN and will be discussed in more detail in the next section –

[13] See Irish (2009:339) or Meilke (2001).

[14] Amongst the proposals, Irish (2009:335) lists 'investment in border infrastructure, law enforcement and military cooperation, support for economic development in Mexico, a North American energy strategy, a permanent North American tribunal for dispute resolution, a unified approach to anti-dumping and countervailing duty actions, a trinational competition commission, labour mobility between Canada and the US, mutual recognition of professional standards and degrees, a North American education programme, an annual North American summit meeting of the leaders of government, a North American Advisory Council and a North American Inter-Parliamentary Group'.

to check for regulatory convergence (possibly through mutual consultation) *prior* to the issuance of new regulations, as part of routine regulatory impact analysis, so as to end the 'tyranny of small differences' (Hart, 2006). Where NAFTA has made substantial progress is in the mutual recognition of conformity assessment procedures contained in Articles 906(6) and 908(6),[15] which the econometric analysis of the previous section found to be particularly important.

Beyond NAFTA and the EU themselves, preferential agreements involving the EU and the US often involve commitments to reduce NTBs (Horn *et al*, 2009), falling into two broad types: 'WTO+' commitments going beyond WTO agreements (e.g. SPS or TBT agreements) but building on them; and 'WTO–X' commitments covering areas not covered by the WTO (e.g. labour *or* environment).

Many US and EU agreements have WTO+ clauses, typically deeper for those involving the EU, although relatively few make them enforceable. Lesser (2007) notes that most of the North–South and South–South agreements signed by Chile, Mexico, and Singapore rely on mutual recognition of conformity assessment results and transparency/notification requirements. Many also call for the establishment of joint bodies to monitor the implementation of TBT provisions and facilitate cooperation and include dispute-settlement mechanisms for regulatory disputes. Mutual recognition arrangements for conformity assessment have often been adopted in sectors like telecoms, electrical, electronic, and medical equipment.

Three key factors seem to influence the depth of regional TBT commitments. The first is the level of development of the parties. Standards harmonisation and even more mutual recognition of conformity assessment results are much easier among countries with similar levels of development. The second factor is the agreement's degree of integration. Deeper agreements such as customs unions and common markets can go more easily beyond WTO commitments. The third factor is the presence of the EU or the US as one of the parties to the agreement. Agreements involving the US often include acceptance of partner technical regulations as equivalent, alignment on international standards, and mutual recognition of conformity assessment. Agreements

[15] See Coffield (1998).

involving the EU often rely on alignment with the EU's own regulations, standards, and conformity assessment procedures, especially with close partners such as Mediterranean countries.

In a review of over 70 PTAs covering several regions, levels of development, and depth of integration, 58 of them with TBT provisions, Piermartini and Budetta (2009) also found that harmonisation is more frequent than mutual recognition for technical regulations (29 agreements against 15), but mutual recognition of conformity assessment is the most frequent approach (39 agreements) followed by harmonisation of conformity assessment procedures (25 agreements). Harmonisation of technical regulations is a characteristic of EU agreements, sometimes, as noted, implying adoption of the EU *acquis communautaire* by RTA partners.

In South–South agreements, progress on regulatory convergence has been both more recent and shallower. Article 6 of the SADC Trade Protocol calls for the elimination of all NTBs and for member states to refrain from imposing new ones, but implementation has been haphazard, essentially bearing on monitoring through yearly implementation audits and the creation of a SADC Trade Monitoring and Compliance Mechanism (TMCM) in 2008. The TMCM's idea was to offer an online portal for private-sector complaints and a dispute-settlement mechanism, but the workflow from private-sector complaints to settlement of the issues has been largely ineffective. Similarly, Article 49 of the COMESA Treaty obliges member states to remove all existing NTBs to imports of goods originating from the other member states and thereafter refrain from imposing any further restrictions or prohibitions (Imani Development, 2009).

Regarding the EAC, Kirk (2010) showed that most NTBs prioritised for removal (so-called 'Category A') are still in place. All in all, only half the complaints received by SADC and 20 percent received by COMESA have been resolved under the Tripartite (SADC–COMESA–EAC) Monitoring Mechanism. Reasons for the failure of efforts to reduce NTBs and foster regulatory convergence include weak administrative capabilities at the national level and in regional secretariats. Indeed, the complaint portals have largely been developed by donors like TradeMark East Africa, with limited appropriation or active participation by governments or regional secretariats. But there is

no doubt that, beyond capability issues, many political-economy issues lurk in the background. All of the mechanisms discussed in this section rely essentially on moral suasion rather than binding commitments with enforcement mechanisms. However, for such mechanisms to work, there must be a political drive for deep integration at the highest level, which typically must go beyond the mere issue of regulatory convergence. What can be hoped for from capacity-building efforts is to tackle at least those problems that can have technical solutions and to gather momentum for reform from observed successes.

5.2. An Institutional Setup to Foster Convergence

The discussion above suggests that the dominant approach in South–South agreements, with the possible exception of ASEAN, was at least designed as bottom up, relying on the private sector to identify problems and on intergovernmental negotiation forums to pick up and address issues. However implementation has been largely donor-driven and plagued by a lack of political commitment and weak capacity. In view of its achievements so far, it seems fair to say that this approach apparently offers limited promise.

While the degree of high-level political commitment must be taken as a given, the objective of this section is to offer an alternative institutional setup potentially offering more promise, based on the World Bank's recent experience with a number of ASEAN countries and offering a blueprint which, if adopted at the regional level, could generate sustainable and, most importantly, self-fuelling progress.

The approach is based on the World Bank's 'toolkit' for NTM streamlining (World Bank, 2011) and centres around the creation of regulatory supervisory bodies at the national level. Such bodies are viewed as having a twin role:

i. Promote inter-ministerial dialogue and cooperation to internalise 'regulatory externalities' (the fact that a regulation addressing one issue, say plant health, may have effects on competitiveness and trade);
ii. Provide an evidence-based analysis of regulatory costs and benefits, based on the WTO principles of necessity and proportionality, and using relevant international

evidence, so as to ground the regulatory process on a sound assessment of economic and societal benefits and costs.

If implemented in earnest, this approach has the potential to bypass some of the constraints that have plagued past efforts to reduce the economic cost of poorly-designed regulations and to bring multiple benefits, in particular if coordinated at the regional level.

First, past approaches have been aimed at existing regulations, the hardest battles to win as rent-creating regulations have had time to generate special interests willing to fight for them; while no disciplines were imposed on the flow of new regulations. Thus, there was a danger that if battles against existing regulations were won (which was difficult to start with), they could simply lead to the displacement of the problem with new regulations replacing the old. The creation of a 'dynamic discipline' in the form of a quality-control process imposed on all new regulations can thus close a potentially important loophole in NTM streamlining efforts.

Second, best-practice regulations tend to follow similar patterns; for instance, best-practice SPS regulations often follow the Codex Alimentarius. Such international standards do not fragment markets, because they are the same everywhere. On the contrary, regulations that fragment markets are often idiosyncratic ones, at odds with international standards and best practices. A regulatory supervisory agency would systematically promote the use of international standards in all areas because this would be part of its mandate. If similar agencies were set up in parallel in all ASEAN countries, their collective influence would be to reduce fragmentation simply by fostering convergence towards best practices *even in the absence of formal coordination mechanisms*.

Third, the approach draws on the experience of countries using Regulatory Impact Assessment (RIA) and tries to strike a balance between full-fledged cost-benefit analysis, which is much too burdensome to be used systematically, and 'box-checking' RIA, which is often too shallow to be useful, by relying on sound economic analysis and evidence. Moreover, if more advanced countries in ASEAN were doing evidence-based

RIA (which, when technically complex, could be pooled between countries and/or outsourced to research bodies), less advanced ones with limited capabilities could in many cases take those analyses 'off the shelf' and adapt them to their context, which would be much less demanding in terms of capabilities. This, again, would not require formal coordination mechanisms, but simply a willingness to share the results of technical analyses.

Fourth, regulatory supervisory bodies should be merged with competition authorities at the national level. Several arguments militate in favour of having the same agency in charge of both missions. On one hand, bad regulations often create monopoly power by restricting entry (sometimes on purpose); thus, competition and regulation issues are deeply intertwined. Moreover, the skills required to investigate collusion or abuses of dominant positions are typically the same as those required to investigate the impact of regulations – law and economics, with an emphasis on microeconomics and industrial organisation. On the other hand, the key problem for regulatory supervisory bodies is one of clout: to have teeth in battles with special interests, they must be able to dominate the debate analytically and enjoy widespread respect. An agency with a mandate is to impose welfare-enhancing disciplines on both the private and public sectors will have much more clout than two separate ones.

The creation of such agencies in all ASEAN countries does not require explicit coordination and could even be seen as an ambitious reading of the Trade Facilitation Agreement (TFA) signed in Bali in 2013. The TFA mandates the creation of trade portals and trade facilitation committees. These obligations could be fulfilled *a minima* by the creation of a committee to discuss doing-business issues and a trade portal giving basic information on customs procedures. However, a more ambitious reading of the agreement would use it as the impulse towards the creation of trade-centred regulatory supervisory bodies with a mandate to cover both the issues discussed above and the maintenance of up-to-date inventories of all trade-relevant regulations, all made accessible via the trade portal. Singapore, Malaysia, Indonesia, and Thailand have been developing trade portals, and lately followed by the Philippines, Brunei Darussalam, Vietnam, Cambodia, Lao PDR, and Myanmar.

Although explicit coordination at the regional level is not a prerequisite for the blueprint discussed here, it could substantially enhance the speed of regulatory convergence. For instance, technical staff in supervisory agencies (whether called NTM committees, as in Cambodia, or otherwise) could be trained in common sessions open to all or subsets of ASEAN countries. Through common training, staff would acquire and build a common vision and establish networks of contacts that could facilitate future consultations when new regulations are designed. Such prior consultations have been discussed in the context of NAFTA's deepening (see supra) or the TTIP. While difficult to impose as a systematic requirement, they could be greatly facilitated by personal familiarity between the agency personnel of member states.

In this, the ASEAN Secretariat could play a key role through advocacy, raising the visibility of successful experimentation, providing technical assistance (e.g. in collaboration with development partners), and pushing for a general approach to regulatory convergence based on a 'better-regulations' philosophy rather than the usual 'give-and-take' approach adopted in failed NTB-elimination efforts.

6. Concluding Remarks

This paper shows that regulatory convergence is a complex matter where ultimate effects can be different from those expected and where the results of past efforts have been uneven. When levels of development differ, regulatory needs differ. In such a context, forcing harmonisation may be counterproductive and does not necessarily lead to enhanced efficiency. Moreover, absent the very strong political drive of the EU, political commitment for regulatory convergence has been slow to emerge.

These difficulties should not be construed as meaning that regulatory convergence does not matter or is too ambitious to be achievable. First, it matters. Poorly designed regulations are pure deadweight losses, hampering business and trade without bringing any revenue (unlike tariffs) and often failing to achieve legitimate non-trade objectives. The approach proposed here is based on 'soft' harmonisation through convergence on

best practices, while leaving space for slow convergence for the least advanced member states. The idea is to put in place, at the country level, an institutional setup ensuring that regulations pass tests of economic rationality and properly internalise key societal trade-offs (e.g. between environmental protection and competitiveness).

Solving trade-offs explicitly is the right approach to maximising social welfare, but it is well known that governments are exposed to pressures from various lobbies intent on hijacking regulations to further special interests. Technical regulations are often difficult to understand and therefore offer ways of distorting markets while obfuscating the issues. In the presence of such distortionary intents, no well-wishing regulatory setup can ensure that flawed decisions will not be taken. Sometimes, battles will need to be fought, and there is no guarantee that they will be won. However, even when politically important jobs or commercial interests are at stake, regulations often offer only third-best options. WTO-consistent trade remedies, while having many drawbacks of their own, can often achieve the same result at lesser cost in terms of economic distortions. When poorly designed regulations are proposed based on fudge of trade and non-trade objectives, a smart regulatory supervisory body would be able to tell motivations apart and propose specific solutions to each at lesser cost – trade remedies to protect jobs and regulations to protect health. Thus, even in the presence of political-economy considerations, the naïve welfare-maximising proposal in this paper may not be naïve after all.

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Appendix A

Regional and out-of-region coverage ratios

Let M_{ik} be country *j*'s imports of product *k* from all of its partners in the world, and let

$$I_{jk}^{NTM} = \begin{cases} 1 & \text{if country } j \text{ imposes one or more NTM on product } k \\ 0 & \text{otherwise} \end{cases} \tag{7}$$

The NTM coverage ratio on country *j*'s imports is

$$c_j = \frac{\sum_k I_{jk}^{NTM} M_{jk}}{\sum_k M_{jk}}. \tag{8}$$

Similarly, let M_{irk} be country *j*'s imports of product *k* from regional bloc *r*; the NTM coverage ratio on country i's regional imports is

$$c_{jr} = \frac{\sum_k I_{jk}^{NTM} M_{jrk}}{\sum_k M_{jrk}} \tag{9}$$

That is, a country's regional coverage ratio is the proportion of its imports from the regional bloc covered by one or more NTM. The out-of-bloc coverage ratio can be calculated similarly. Let $M_{i,-r,k}$ be country *i*'s imports of product *k* from all countries outside of bloc *r*. The equivalent of (9) for out-of-bloc imports is

$$c_{i,-r} = \frac{\sum_k I_{ik}^{NTM} M_{i,-r,k}}{\sum_k M_{i,-r,k}} \tag{10}$$

Regulatory distances

Let *i* index countries, *k* HS6 products, and *j* NTM types; and let $I_{i\ell k}$ be an indicator function defined by

$$I_{i\ell k} = \begin{cases} 1 & \text{if country } i \text{ applies NTM } \ell \text{ to product } k \\ 0 & \text{otherwise} \end{cases} \tag{11}$$

The RD measure at the measure-product level is the absolute value of the difference between this indicator function between the two countries: $r_{\ell k} = \left| I_{i\ell k} - I_{j\ell k} \right|$.

In the second step, regulatory distances at the measure-product pair level are aggregated into an overall measure of dissimilarity or 'regulatory distance' at the country-pair level.

That is, let *N* be the total number of observed product–NTM combinations. The country-level regulatory distance measure for countries *i* and *j*, D_{ij} , is

$$D_{ij} = \frac{1}{N} \sum_k \sum_\ell r_{i\ell k} \tag{12}$$

As D_{ij} is normalised by the grand total of product–NTM combinations, it lies between zero and one. In our sample, it ranges from 0.009 between Madagascar and Tanzania and 0.304 between China and Nepal.

We now turn to the two-dimensional projection of regulatory distances in Section 3. Let *i* and *j* index countries and D_{ij} stand for the distance between *i* and *j*. The dissimilarity matrix is

$$\Delta = \begin{bmatrix} D_{11} & \dots & D_{1m} \\ \dots & \dots & \\ D_{m1} & \dots & D_{mm} \end{bmatrix} \tag{13}$$

which is a square, symmetric matrix with zeroes on the diagonal and bilateral distances off the diagonal. The Δ matrix of regulatory distance is shown in Appendix Table A1 below. Multidimensional scaling (MDS) consists of finding *m* coordinate vectors $\mathbf{x}_i$ (one for each country) such that, using an appropriate distance metric (noted $\| \ \|$),

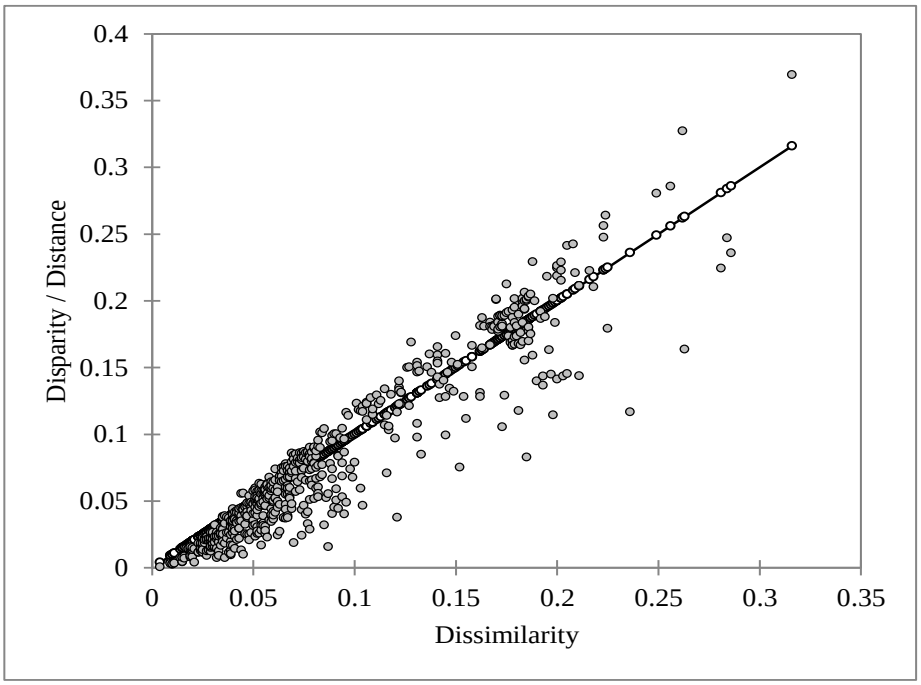
$$D_{ij} \approx \left\| \mathbf{x}_i - \mathbf{x}_j \right\| \tag{14}$$

i.e. the projection of the individuals onto a space of less than *m* dimensions represents reasonably well their true dissimilarity. If the space had *m* dimension, the representation would be perfect; as the number of dimensions shrinks (e.g. to two in a plane projection) the distortion potentially grows. The most usual way of formulating the problem is to minimise a quadratic loss function:

$$\min_{\mathbf{x}_1,\dots,\mathbf{x}_m} \sum_{i<j} \left(D_{ij} - \left\| \mathbf{x}_i - \mathbf{x}_j \right\| \right)^2 \tag{15}$$

Figure A 1 shows the distortion imposed by MDS onto a 2-dimensional space for our RD measure by plotting true dissimilarities (true values of the RD) on the horizontal axis and represented ones on the vertical axis.

Figure A 1: Shephard's Diagram
(distortions due to the 2-dimensional projection)



Source: Authors' calculations.

Regulatory Distances

Table A 1: Bilateral Regulatory Distances

	ARG	BFA	BOL	BRA	CHL	CHN	CIV	COL	CRI	ECU	EGY	EUN	GIN	GTM	IDN	JPN	KAZ	KHM	LAO	LBN	LKA	MAR	MDG	MEX	MUS	NAM	NPL	PAK	PER	PHL	PRY	SEN	THA	TUN	TZA	URY	VEN
ARG	-	0.091	0.064	0.070	0.075	0.208	0.081	0.085	0.072	0.074	0.091	0.111	0.121	0.097	0.080	0.096	0.078	0.080	0.069	0.106	0.205	0.162	0.071	0.069	0.065	0.181	0.203	0.116	0.073	0.081	0.061	0.081	0.068	0.095	0.067	0.069	0.077
BFA	0.091	-	0.047	0.083	0.072	0.200	0.048	0.072	0.052	0.053	0.067	0.106	0.070	0.082	0.056	0.078	0.054	0.050	0.041	0.078	0.199	0.133	0.042	0.056	0.041	0.158	0.197	0.087	0.053	0.051	0.044	0.053	0.038	0.070	0.037	0.052	0.060
BOL	0.064	0.047	-	0.053	0.043	0.173	0.029	0.047	0.027	0.029	0.044	0.080	0.075	0.055	0.035	0.054	0.032	0.030	0.020	0.055	0.173	0.113	0.020	0.031	0.020	0.138	0.174	0.064	0.025	0.029	0.021	0.035	0.016	0.050	0.015	0.029	0.035
BRA	0.070	0.083	0.053	-	0.057	0.196	0.068	0.075	0.059	0.062	0.077	0.096	0.103	0.083	0.069	0.078	0.066	0.068	0.057	0.094	0.202	0.150	0.058	0.058	0.056	0.173	0.209	0.102	0.062	0.068	0.052	0.071	0.055	0.081	0.054	0.057	0.068
CHL	0.075	0.072	0.043	0.057	-	0.184	0.056	0.062	0.051	0.052	0.066	0.090	0.098	0.073	0.059	0.066	0.053	0.056	0.045	0.082	0.189	0.137	0.046	0.048	0.047	0.154	0.200	0.089	0.050	0.056	0.041	0.057	0.043	0.066	0.042	0.050	0.058
CHN	0.208	0.200	0.173	0.196	0.184	-	0.184	0.193	0.179	0.177	0.192	0.198	0.216	0.192	0.184	0.188	0.179	0.181	0.173	0.211	0.281	0.256	0.175	0.179	0.172	0.286	0.316	0.218	0.176	0.186	0.173	0.185	0.172	0.188	0.171	0.181	0.184
CIV	0.081	0.048	0.029	0.068	0.056	0.184	-	0.059	0.034	0.039	0.049	0.090	0.076	0.066	0.040	0.061	0.039	0.033	0.024	0.059	0.182	0.117	0.023	0.040	0.025	0.141	0.178	0.068	0.038	0.032	0.028	0.039	0.019	0.055	0.018	0.039	0.043
COL	0.085	0.072	0.047	0.075	0.062	0.193	0.059	-	0.051	0.046	0.071	0.104	0.095	0.078	0.061	0.076	0.056	0.060	0.049	0.085	0.186	0.141	0.050	0.055	0.049	0.151	0.200	0.095	0.046	0.060	0.044	0.051	0.046	0.074	0.045	0.047	0.059
CRI	0.072	0.052	0.027	0.059	0.051	0.179	0.034	0.051	-	0.034	0.049	0.084	0.076	0.060	0.039	0.057	0.036	0.035	0.025	0.059	0.176	0.118	0.025	0.038	0.025	0.142	0.178	0.070	0.035	0.034	0.028	0.039	0.021	0.056	0.020	0.037	0.041
ECU	0.074	0.053	0.029	0.062	0.052	0.177	0.039	0.046	0.034	-	0.052	0.089	0.079	0.062	0.043	0.060	0.036	0.040	0.029	0.066	0.180	0.122	0.030	0.039	0.030	0.146	0.185	0.074	0.031	0.040	0.028	0.040	0.026	0.056	0.025	0.036	0.040
EGY	0.091	0.067	0.044	0.077	0.066	0.192	0.049	0.071	0.049	0.052	-	0.100	0.089	0.078	0.054	0.074	0.052	0.048	0.040	0.074	0.195	0.131	0.040	0.052	0.041	0.155	0.194	0.084	0.052	0.049	0.043	0.053	0.036	0.068	0.035	0.053	0.056
EUN	0.111	0.106	0.080	0.096	0.090	0.198	0.090	0.104	0.084	0.089	0.100	-	0.131	0.106	0.092	0.092	0.089	0.088	0.081	0.116	0.211	0.170	0.080	0.079	0.077	0.193	0.224	0.122	0.088	0.091	0.077	0.094	0.077	0.101	0.076	0.084	0.093
GIN	0.121	0.070	0.075	0.103	0.098	0.216	0.076	0.095	0.076	0.079	0.089	0.131	-	0.108	0.082	0.104	0.079	0.080	0.069	0.106	0.223	0.163	0.070	0.083	0.071	0.185	0.225	0.115	0.080	0.079	0.073	0.082	0.066	0.099	0.065	0.079	0.086
GTM	0.097	0.082	0.055	0.083	0.073	0.192	0.066	0.078	0.060	0.062	0.078	0.106	0.108	-	0.068	0.078	0.066	0.065	0.054	0.092	0.174	0.145	0.057	0.063	0.054	0.170	0.184	0.074	0.061	0.067	0.052	0.067	0.053	0.082	0.052	0.062	0.067
IDN	0.080	0.056	0.035	0.069	0.059	0.184	0.040	0.061	0.039	0.043	0.054	0.092	0.082	0.068	-	0.063	0.041	0.035	0.032	0.067	0.186	0.123	0.031	0.042	0.033	0.145	0.186	0.075	0.041	0.040	0.033	0.043	0.027	0.059	0.026	0.042	0.044
JPN	0.096	0.078	0.054	0.078	0.066	0.188	0.061	0.076	0.057	0.060	0.074	0.092	0.104	0.078	0.063	-	0.063	0.060	0.051	0.087	0.190	0.142	0.051	0.058	0.051	0.163	0.202	0.094	0.056	0.061	0.052	0.063	0.048	0.071	0.047	0.059	0.064
KAZ	0.078	0.054	0.032	0.066	0.053	0.179	0.039	0.056	0.036	0.036	0.052	0.089	0.079	0.066	0.041	0.063	-	0.040	0.029	0.065	0.179	0.121	0.030	0.040	0.032	0.144	0.183	0.074	0.039	0.039	0.032	0.041	0.025	0.054	0.024	0.041	0.045
KHM	0.080	0.050	0.030	0.068	0.056	0.181	0.033	0.060	0.035	0.040	0.048	0.088	0.080	0.065	0.035	0.060	0.040	-	0.025	0.060	0.178	0.115	0.024	0.040	0.023	0.141	0.177	0.069	0.039	0.033	0.029	0.039	0.020	0.053	0.019	0.039	0.044
LAO	0.069	0.041	0.020	0.057	0.045	0.173	0.024	0.049	0.025	0.029	0.040	0.081	0.069	0.054	0.032	0.051	0.029	0.025	-	0.051	0.171	0.109	0.015	0.030	0.016	0.131	0.169	0.059	0.029	0.024	0.019	0.030	0.011	0.045	0.009	0.031	0.034
LBN	0.106	0.078	0.055	0.094	0.082	0.211	0.059	0.085	0.059	0.066	0.074	0.116	0.106	0.092	0.067	0.087	0.065	0.060	0.051	-	0.205	0.141	0.050	0.066	0.051	0.167	0.202	0.094	0.065	0.058	0.055	0.067	0.045	0.082	0.044	0.067	0.070
LKA	0.205	0.199	0.173	0.202	0.189	0.281	0.182	0.186	0.176	0.180	0.195	0.211	0.223	0.174	0.186	0.190	0.179	0.178	0.171	0.205	-	0.263	0.172	0.178	0.171	0.262	0.249	0.162	0.179	0.183	0.171	0.182	0.169	0.198	0.168	0.180	0.187
MAR	0.162	0.133	0.113	0.150	0.137	0.256	0.117	0.141	0.118	0.122	0.131	0.170	0.163	0.145	0.123	0.142	0.121	0.115	0.109	0.141	0.263	-	0.109	0.122	0.109	0.223	0.236	0.152	0.122	0.117	0.112	0.120	0.104	0.131	0.103	0.123	0.127
MDG	0.071	0.042	0.020	0.058	0.046	0.175	0.023	0.050	0.025	0.030	0.040	0.080	0.070	0.057	0.031	0.051	0.030	0.024	0.015	0.050	0.172	0.109	-	0.030	0.015	0.131	0.168	0.059	0.028	0.023	0.019	0.031	0.010	0.047	0.009	0.031	0.034
MEX	0.069	0.056	0.031	0.058	0.048	0.179	0.040	0.055	0.038	0.039	0.052	0.079	0.083	0.063	0.042	0.058	0.040	0.040	0.030	0.066	0.178	0.122	0.030	-	0.030	0.147	0.183	0.075	0.037	0.040	0.026	0.045	0.027	0.056	0.025	0.035	0.042
MUS	0.065	0.041	0.020	0.056	0.047	0.172	0.025	0.049	0.025	0.030	0.041	0.077	0.071	0.054	0.033	0.051	0.032	0.023	0.016	0.051	0.171	0.109	0.015	0.030	-	0.132	0.167	0.061	0.029	0.025	0.019	0.032	0.011	0.046	0.010	0.029	0.033
NAM	0.181	0.158	0.138	0.173	0.154	0.286	0.141	0.151	0.142	0.146	0.155	0.193	0.185	0.170	0.145	0.163	0.144	0.141	0.131	0.167	0.262	0.223	0.131	0.147	0.132	-	0.284	0.175	0.145	0.141	0.136	0.128	0.127	0.158	0.126	0.148	0.149
NPL	0.203	0.197	0.174	0.209	0.200	0.316	0.178	0.200	0.178	0.185	0.194	0.224	0.225	0.184	0.186	0.202	0.183	0.177	0.169	0.202	0.249	0.236	0.168	0.183	0.167	0.284	-	0.187	0.183	0.178	0.173	0.186	0.164	0.200	0.162	0.183	0.167
PAK	0.116	0.087	0.064	0.102	0.089	0.218	0.068	0.095	0.070	0.074	0.084	0.122	0.115	0.074	0.075	0.094	0.074	0.069	0.059	0.094	0.162	0.152	0.059	0.075	0.061	0.175	0.187	-	0.073	0.068	0.064	0.074	0.054	0.089	0.053	0.074	0.079
PER	0.073	0.053	0.025	0.062	0.050	0.176	0.038	0.046	0.035	0.031	0.052	0.088	0.080	0.061	0.041	0.056	0.039	0.039	0.029	0.065	0.179	0.122	0.028	0.037	0.029	0.145	0.183	0.073	-	0.039	0.027	0.041	0.025	0.056	0.024	0.033	0.040
PHL	0.081	0.051	0.029	0.068	0.056	0.186	0.032	0.060	0.034	0.040	0.049	0.091	0.079	0.067	0.040	0.061	0.039	0.033	0.024	0.058	0.183	0.117	0.023	0.040	0.025	0.141	0.178	0.068	0.039	-	0.028	0.040	0.018	0.056	0.017	0.040	0.043
PRY	0.061	0.044	0.021	0.052	0.041	0.173	0.028	0.044	0.028	0.028	0.043	0.077	0.073	0.052	0.033	0.052	0.032	0.029	0.019	0.055	0.171	0.112	0.019	0.026	0.019	0.136	0.173	0.064	0.027	0.028	-	0.034	0.015	0.049	0.014	0.025	0.031
SEN	0.081	0.053	0.035	0.071	0.057	0.185	0.039	0.051	0.039	0.040	0.053	0.094	0.082	0.067	0.043	0.063	0.041	0.039	0.030	0.067	0.182	0.120	0.031	0.045	0.032	0.128	0.186	0.074	0.041	0.040	0.034	-	0.027	0.055	0.026	0.044	0.047
THA	0.068	0.038	0.016	0.055	0.043	0.172	0.019	0.046	0.021	0.026	0.036	0.077	0.066	0.053	0.027	0.048	0.025	0.020	0.011	0.045	0.169	0.104	0.010	0.027	0.011	0.127	0.164	0.054	0.025	0.018	0.015	0.027	-	0.042	0.004	0.027	0.030
TUN	0.095	0.070	0.050	0.081	0.066	0.188	0.055	0.074	0.056	0.056	0.068	0.101	0.099	0.082	0.059	0.071	0.054	0.053	0.045	0.082	0.198	0.131	0.047	0.056	0.046	0.158	0.200	0.089	0.056	0.056	0.049	0.055	0.042	-	0.041	0.057	0.063
TZA	0.067	0.037	0.015	0.054	0.042	0.171	0.018	0.045	0.020	0.025	0.035	0.076	0.065	0.052	0.026	0.047	0.024	0.019	0.009	0.044	0.168	0.103	0.009	0.025	0.010	0.126	0.162	0.053	0.024	0.017	0.014	0.026	0.004	0.041	-	0.026	0.029
URY	0.069	0.052	0.029	0.057	0.050	0.181	0.039	0.047	0.037	0.036	0.053	0.084	0.079	0.062	0.042	0.059	0.041	0.039	0.031	0.067	0.180	0.123	0.031	0.035	0.029	0.148	0.183	0.074	0.033	0.040	0.025	0.044	0.027	0.057	0.026	-	0.043
VEN	0.077	0.060	0.035	0.068	0.058	0.184	0.043	0.059	0.041	0.040	0.056	0.093	0.086	0.067	0.044	0.064	0.045	0.044	0.034	0.070	0.187	0.127	0.034	0.042	0.033	0.149	0.167	0.079	0.040	0.043	0.031	0.047	0.030	0.063	0.029	0.043	-

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