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Murky Trade Waters

Regional Tariff Commitments and Non-Tariff Measures in Africa

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Abstract

In several African regions, economic integration has successfully reduced tariff protection by freezing the opportunity to raise applied tariffs against fellow integration partners above those promised. In this paper, we examine whether the regional tariff commitments on the continent have come at the expense of adverse side-effects on the prevalence of other – non-tariff – trade barriers. More specifically, regional tariff commitments have not only amplified applied tariff overhangs – the difference between Most Favoured Nation (MFN) bound tariffs and effectively applied tariffs – for African members of the World Trade Organization (WTO), but have also sharply reduced their tariff policy space within Africa, thus leaving regulatory policies such as sanitary and phytosanitary (SPS) measures and technical barriers to trade (TBT) as two of the few legitimate options to level the playing field with market competitors. Comparing the effects of applied tariff overhangs towards all vis-à-vis African trading partners on SPS and TBT notifications of 35 African WTO members between 2001 and 2017, we find no overall relationship between tariff overhangs and import regulation in our preferred model setting. By contrast, larger tariff overhangs specific to intra-African trade relations have a significant share in increasing the probability of SPS measures and TBT. Our findings have important implications for future Pan-African integration under the recently launched African Continental Free Trade Area (AfCFTA) in that success in fostering continental economic integration does not exclusively depend on the realisation of tariff liberalisation, but at the same time on a mindful coordination with non-tariff provisions.

Keywords: Economic integration, import regulation, non-tariff measures, tariff liberalisation, tariff overhang, trade policy substitution

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Contents

Abbreviations

AD	anti-dumping
AfCFTA	African Continental Free Trade Area
AU	African Union
CEN-SAD	Community of Sahel-Saharan States
COMESA	Common Market for Eastern and Southern Africa
EAC	East African Community
ECOWAS	Economic Community of West African States
EPA	Economic Partnership Agreement
EU	European Union
HIC	high-income country
HS	Harmonised System
IGAD	Intergovernmental Authority on Development
I-TIP	Integrated Trade Intelligence Portal
LDC	least developed country
LMIC	lower middle-income country
MFN	Most Favoured Nation
NTM	non-tariff measure
REC	Regional Economic Community
RTA	regional trade agreement
SADC	Southern African Development Community
SPS	sanitary and phytosanitary
STC	specific trade concern
TBT	technical barriers to trade
UMIC	upper middle-income country
WTO	World Trade Organization

1 Introduction

Over the past decades, the widening of the multilateral trading system and the proliferation of regional trade agreements (RTAs) have facilitated a considerable decline in tariffs. This holds true for all world regions, including the one still revealing the highest degree both of tariff protection and of isolation from world markets, namely Africa (Bouët, Cosnard, & Laborde, 2017; UNCTAD [United Nations Conference on Trade and Development], 2019, 2020). Today, not only are nearly all economies on the continent signatories to the World Trade Organization (WTO) but the average African country also has formal trade ties with another 25 neighbours. The latter results from the existence of partly overlapping Regional Economic Communities (RECs) – a situation which is further intensified by the recent official launch of the African Continental Free Trade Area (AfCFTA). Both club memberships notoriously freeze the opportunity to raise applied tariffs against fellow members above those promised.

In this paper, we examine whether the regional tariff commitments within Africa have come at the expense of adverse side-effects on the prevalence of other – non-tariff – trade barriers. Our suspicion is led by the common notion that economic integration is seldom utterly harmonious. Conversely, while falling tariffs among regional partners render mutual trade less costly, they may also uncover rivalry as well as lock-in comparative and industrial location advantages, particularly in South-South integration schemes, thereby producing both winners and losers alike (Puga & Venables, 1997; Venables, 2003).

Indeed, as trade liberalisation within Africa has concentrated regional trade surpluses on the side of economic powerhouses, such as Côte d'Ivoire, Egypt, Nigeria, and South Africa (UNCTAD, 2018a), it has equally put stress on export expansion in terms trade volumes, economic diversification and, with this, aspirations towards domestic industrialisation in the periphery. For example, Behuria (2019) notes that while Rwanda's membership in the East African Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA) has provided access to a larger integrated market, it has likewise accentuated competitive disadvantage with often better-financed and more advanced firms abroad, and thus hindered emancipation from existing comparative advantage. But it is not only countries threatened by marginalisation that preach commitment and practice restraint: even for South Africa, the all-overshadowing member of the Southern African Development Community (SADC), Nel and Taylor (2013) observe a steady preference for protection from (too much) intra-bloc competition. These experiences resonate with the widespread contradiction of national economic interests and regional commitments on the continent, which has fueled trade disputes among regional partners and raised concerns about the prospects of greater Pan-African integration (see, for instance, Byiers, Karaki, & Woolfrey, 2018; Himbara, 2020).

A second motivation for our research question stems from the generally rather mixed track record of the trade effects of existing intra-African integration agreements. Despite partly substantial tariff liberalisation efforts, only a few studies attest to the creation of widespread trade (for example, Admassu, 2020; Carrère, 2004; Coulibaly, 2009) while others find no, little, or only REC-, member- or even sector-specific effects (see, for instance, Longo & Sekkat, 2004; Mayda & Steinberg, 2009; Musila, 2005; Riedel & Slany, 2019; Yang & Gupta, 2005). What is more, neither country coverage nor their lifetimes have been able to prevent intra-regional trade and the establishment of regional value chains in Africa from

remaining remarkably low compared to any other (developing) world region (De Melo, Solleder, & Sorgho, 2020).

The reasons for this sobering performance are manifold and intra-African trade is chronically plagued by a variety of trade-hampering conditions, including the lack of adequate infrastructure and insufficient productive capacities. Another prominent source blamed for low (formal) cross-country trade in Africa are, however, policy-induced non-tariff measures (NTMs) (see Hoekman & Njinkeu, 2017; Keane, Calì, & Kennan, 2010). These NTMs encompass such obvious obstacles to trade as border control measures or quantitative restrictions. Yet, mirroring the global trend of their increased utilisation (UNCTAD, 2018b), sanitary and phytosanitary (SPS) measures and technical barriers to trade (TBT) are among Africa's most prevalent NTMs.[1] While SPS measures and TBT are not only found to significantly hamper intra-African trade (for example, Abrego, Amado, Gursoy, Nicholls, & Perez-Saiz, 2019; UNCTAD, 2018c; Vanzetti, Peters, & Knebel, 2016), Cadot & Gourdon (2014) additionally identify adverse effects on African households because import regulation usually comes as a mark-up on consumer prices and thereby raises the cost of living.

Governed by two distinct agreements, the WTO allows its members to take sovereign decisions regarding the imposition of SPS measures and TBT. While both are designed to primarily protect consumers' health and safety along with the environment, they are widely seen as having also been imposed for blunt protectionist motives. Aisbett and Pearson (2012) very aptly argue in this regard that any judgement of the motivation for the imposition of SPS measures ultimately depends on its determinants. In fact, even through WTO rulebooks forbid regulatory discrimination, the perception of SPS measures and TBT often differs depending on what trading side one is on and whether or not adaptation is costly. Although there is some evidence that SPS measures and TBT can also increase bilateral trade flows as compliance could entail preferential market access or attract new consumers (see Beghin, Disdier, & Marette, 2016; Crivelli & Groeschl, 2016), the literature suggests that both predominantly constitute impediments to trade.[2] Particularly for least developed-country (LDC) exporters, import regulations significantly level the playing field for market access while compliance can be a substantial challenge, not least in the short-term (Bratt, 2017).

In the specific African context, moreover, the scarcity of legal frameworks and institutional capacity to implement bilateral trade remedy measures across countries, such as anti-dumping (AD) and countervailing duties, could qualify SPS measures and TBT as a means of last resort with which to restrict imports when the manipulation of trade costs is set boundaries by formal tariff commitments. At the same time, while the RECs often provide for dispute settlement mechanisms, African countries generally exercise restraint in this

1 SPS and TBT regulation refers to a formal set of laws, decrees, requirements, and (production) procedures that both domestic and foreign producers must fulfil to obtain market access. Examples range from trivial measures such as product labelling and norms to substantial interventions defining threshold tolerance residue levels or hygienic standards in foods production (SPS), the prohibition of hazardous sustances (TBT), or even sales bans.

2 For a comprehensive overview, see Ederington and Ruta (2016).

respect, and regional trade disputes are rarely taken to court (Erasmus, 2015; Bore, 2020). This circumstance could in turn be taken as carte blanche for the imposition of NTMs.

Despite this intuition, there is no clear-cut evidence of an inverse relationship between tariff liberalisation and NTMs across a growing body of empirical literature, where a large fraction of papers concentrates on AD policy. While the pioneering works by Feinberg and Reynolds (2007) and Moore and Zanardi (2011) suggest that bound and applied tariff cuts, respectively, are determinants of AD for only the group of developing countries, Kuenzel (2020a) argues that a country's decision to substitute tariffs by other forms of trade policy depends not on the mere path of tariff protection, but instead on the specific difference between a country's bound and applied tariffs. To this end, the author shows that reduced tariff policy space, specified as narrow Most Favoured Nation (MFN) tariff binding overhang, explains the increasing incidence of contingent protection even for a larger set of 30 WTO members.[3] Analysing AD utilisation in the context of trade agreements, Silberberger and Stender (2018) find that higher preferential tariff margins between integration partners lead to a higher likelihood of bilateral AD, presumably to reduce competitive pressure. This effect is present particularly in those RTAs with a participation of developing countries.

Using (ad valorem equivalent) proxies for a broader set of aggregate NTMs, some studies find substitution effects between trade policies exclusively for developing countries (Ronen, 2017) and certain economic sectors (Niu, Milner, & Gunessee, 2020). Echoing fears of NTMs acting as trade barriers, however, results by Herghelegiu (2017) suggest that the nexus holds mainly for NTMs which are designated as being trade-restrictive. Using data for Turkey, Limão and Tovar (2011) show that tariff constraints at both the multilateral and the trade agreement level not only increase the likelihood but also the restrictiveness of NTMs.

A similar conclusion can be drawn from Orefice (2017) who finds an increase in specific trade concerns (STCs) for SPS measures and TBT expressed at the WTO following bilateral tariff cuts. Beverelli, Boffa, and Keck (2019) condition analogous findings for STCs on TBT to high-income countries. Analysing all SPS notifications to the WTO between 1996 and 2010, Aisbett and Pearson (2012) find a generally inverse relationship between MFN tariff binding overhangs and the probability of new SPS measures, but conclude that other determinants, such as a country's overall environmental performance, appear to be more important drivers of the increased utilisation of SPS measures. In a similar vein, empirical evidence by Aisbett and Silberberger (2020) is not indicative of tariff liberalisation as a driver for increased SPS measures per se, but that the impact of increased trade pressure depends on whether domestic producers gain or lose from a change in standards.

In terms of methodology, we follow the existing literature for large parts. To the best of our knowledge, however, no previous study has laid a specific focus on Africa. In light of the recently launched AfCFTA, we thus add a significant portion of policy relevance to this strand of literature by informing the ongoing debate on the prospects of deepening African economic integration. While envisaged tariff liberalisation under the AfCFTA, especially

3 In a replication of his earlier findings on AD, Kuenzel (2020b) also provides evidence for a positive nexus between narrowing tariff overhangs and SPS and TBT notifications in a global sample of WTO members.

among members with different REC membership backgrounds, is seen as boosting intra-African trade, many commentators share the view that the greatest trade potential lies within the (additional) removal or harmonisation of NTMs (for instance, Vanzetti, Peters, & Knebel, 2018; World Bank, 2020). Nevertheless, our empirical findings reveal that success in Africa's move towards free(r) continental trade under the AfCFTA is not a given.

Instead, our estimations suggest that former rounds of regional tariff liberalisation within Africa have even contributed to the utilisation of SPS measures and TBT across African WTO members.[4] Given the fact that the trade-hampering effects of NTMs are not only often harder to predict but also said to be partly larger compared to tariffs particularly for developing country trade (Hoekman & Nicita, 2011; Kee, Nicita, & Olarreaga, 2009; Niu, Liu, Gunessee, & Milner, 2018), the positive effect of the envisaged tariff liberalisation under the AfCFTA could even be outweighed. By implication, successful implementation of the AfCFTA thus calls for mindful coordination between trade policies.

On the methodological front, we face the incident that SPS measures and TBT are typically imposed on a multilateral basis. To circumvent discrepancy with region-specific tariff commitments, we model the difference between multilateral commitments, namely MFN bound tariffs, and applied tariffs for all vis-à-vis African trading partners, and compare the effects for the regional distinction of such applied tariff overhangs on the SPS and TBT notifications of African WTO members. In our preferred model setting, we find that changes in applied tariff overhang are not generally associated with increased import regulation. Instead, contrary to the effect of applied tariff overhangs towards non-African trading partners, larger intra-African tariff overhangs have a significant share in increasing the probability of SPS and TBT notifications. We see the nature of Africa's formal trade relations as an explanation for these findings. Notably, while only a few African countries have formal tariff commitments in reciprocal RTAs with non-African countries, tariff commitments in partly multiple RECs have not only significantly moved African countries away from multilateral commitments, but the pledge to regional tariff liberalisation has sharply reduced their tariff policy space within Africa, thus leaving regulatory policies such as SPS measures and TBT as two of the few legitimate options to level the playing field with the by far closest market competitors.[5]

The remainder of this paper is organised as follows: The following section provides a brief overview of regional tariff liberalisation achievements and the resulting tariff overhangs of African WTO members. Here also, we portray the increased incidence of SPS measures and TBT in Africa during the period of intensified regional economic integration and work out the hypotheses for our empirical analysis. The methodology and data used to test our hypotheses are elaborated in Section 3. Section 4 presents and discusses our estimation results while Section 5 offers conclusions.

4 Algeria, Equatorial Guinea, Eritrea, Ethiopia, Libya, Somalia, South Sudan and Sudan are currently not members of the WTO.

5 In this context, Bao and Qiu (2012) provide evidence that TBT imposed by developing countries have a significant effect on other developing countries' exports while there is no significant effect on exports from high-income countries.

2 A descriptive view and hypotheses

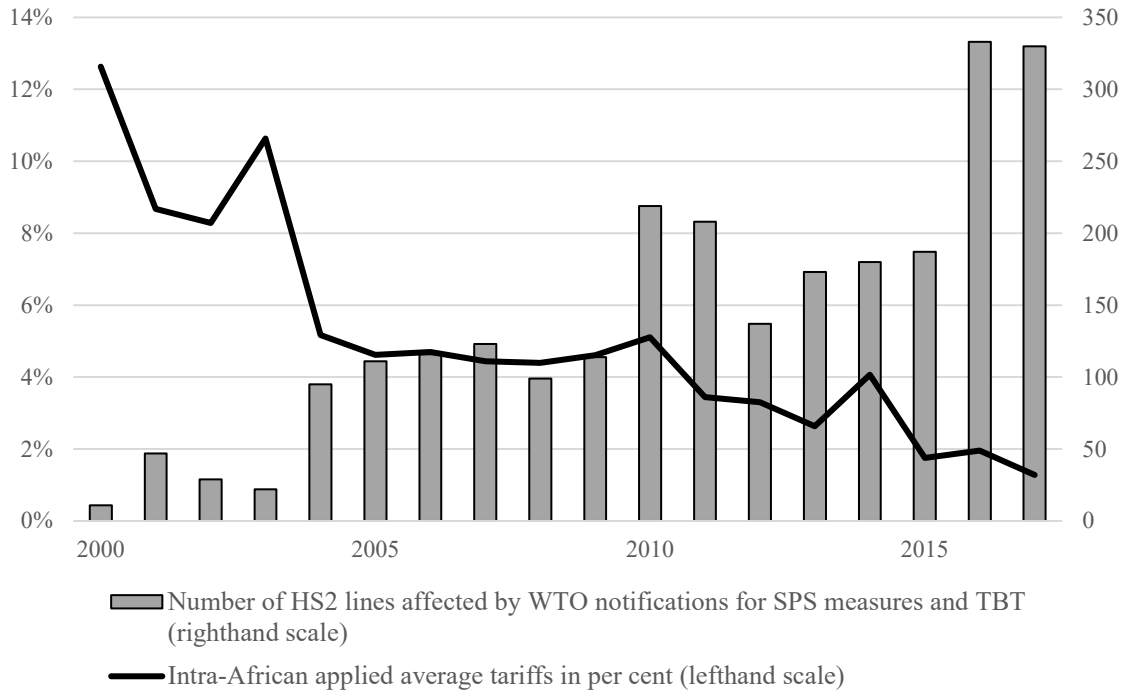
Tariff liberalisation within Africa has been promoted essentially by a number of regional trade blocs embedded in the RECs. Designated by the African Union (AU) as "building blocks" for greater Pan-African integration (Sebahizi, 2016), the RECs are individual regional bodies which differ in age, their number of members, and scope of trade policy provisions, but similarly in speed, coverage, and depth of tariff liberalisation. While generally organised along geographic lines, many African countries belong to several of the officially recognised 8 RECs simultaneously. For example, among Africa's WTO members, Kenya ranks first in its collection of integration partners and currently holds formal ties with an impressive number of 42 African countries through its memberships in COMESA, the Community of Sahel-Saharan States (CEN-SAD), EAC, and the Intergovernmental Authority on Development (IGAD). The overlap of membership has built Africa's reputation of hosting a "spaghetti bowl" of regional integration and cooperation agreements.[6] Less metaphorically speaking however, it also carries the burden of making intra-African trade more complex than necessary through partly diverging commitments and frequent confusion with crisscrossing policy domains.

Among the most advanced RECs, the EAC was the first bloc to completely abolish internal import tariffs. Formally, the EAC achieved the status of a common market as early as 2010, when it extended the free movement of goods to capital, labour and services. By contrast, the Economic Community of West African States (ECOWAS) and the majority of members of COMESA and SADC have formally agreed on a route towards duty-free trade. While intra-bloc tariffs within the three are occasionally already close to zero, they still show remarkable peaks in sensitive sectors (Bouët et al., 2017). Pan-African integration had been given impetus by the 2015 agreement between EAC, COMESA and SADC to create the Tripartite Free Trade Area, but respective integration efforts have since been stagnating and in some places have given way to the larger ambitions under the AfCFTA.

Figure 1 portrays the success of Africa's regional integration efforts in cutting applied tariffs on continental trade. Coming at a time of liberalisation progress particularly within the larger RECs, intra-African tariff rates declined from over 10 per cent at the beginning of the 2000s to under 2 per cent in 2017. Despite these achievements, the spread of NTMs in global trade has also found its echo in Africa, and SPS and TBT notifications (at the Harmonised System two-digit level [HS2]) have grown there by factor of 6 within 15 years. There is no comparable increase for any other type of reported NTMs in Africa (Ghodsi, Grübler, Reiter, & Stehrer, 2017).

6 While not unique to the continent but more extreme than in other regions, the overlapping memberships in RECs can be explained, among other things, by the high number of countries being landlocked, the African history of colonisation and decolonisation, and small market size (see, for instance, Vanheukelom, Byiers, Bilal & Woolfrey, 2016; Hartzenberg, 2011). It has been noted that multiple memberships in regional organisations with differing policy focus allow countries to align regional interests easier with national interests but also lead to selective implementation (Vanheukelom et al., 2016).

Figure 1: Regional tariffs, SPS and TBT notifications of African WTO members, 2000-2017



Notes: Tariff figure based on trade-weighted effectively applied tariffs averaged across all African WTO members, import partners, and HS2 lines. See Section 3 and Appendix Table A2 for further details on data sources.

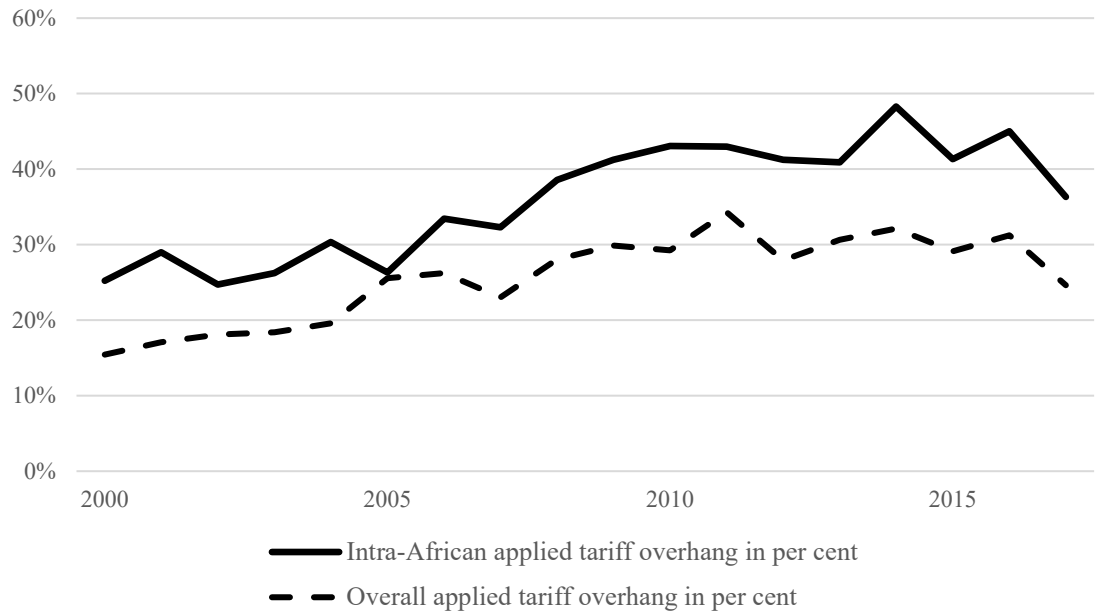
Source: Authors' own illustration

Arguably, the coincidence of regional tariff liberalisation and Africa's surge in NTMs could be driven by efforts to harmonise standards within the RECs. More specifically, mutual agreement on regulation among members could trigger convergence and, with this, lead to both domestic adjustments and increased SPS and TBT notifications. There is, however, no indication for the validity of this line of explanation and the coding of provisions included in trade agreements provided by the Design of Trade Agreements (DESTA) database (Dür, Bacchini, & Elsig, 2014) reveals that the EAC and COMESA, as well as COMESA and SADC merely stipulate the general aim of harmonisation with international SPS and TBT rules, respectively. While convergence towards international standards could certainly bring with it interim regulatory changes, Cadot, Asprilla, Gourdon, Knebel, and Peters (2015) lend early empirical support to the fact that the regulatory distance among fellow REC members continues to prevail. In other words, when it comes to NTMs, REC members still follow individual mindsets.

We nevertheless suspect that there is a link between the RECs and NTMs in Africa: not necessarily through mutual agreement on standards in the RECs, but more indirectly through the tariff changes induced by the RECs. While the inverse relationship between applied tariffs and SPS and TBT notifications is salient in Figure 1 however, we adhere to Kuenzel (2020a) and argue that tariff policy and NTMs in Africa are connected in greater depth. Notably, the RECs have not only stipulated the removal of tariffs among their members, but regional tariff liberalisation has gradually moved African countries away from their multilateral tariff commitments as part of their WTO membership. While African WTO members have also gradually lowered their MFN bound tariffs, this has come at a more moderate pace, and thus partly led to remarkable preferential tariff margins within the RECs

(De Melo et al., 2020). We plot the difference between MFN bound tariffs and applied tariffs for Africa's WTO members in Figure 2, where the dashed line displays overall applied tariff overhang (towards all trading partners), and the solid line towards the sub-group of African trading partners. Over time, both the overall and the regional tariff overhangs have followed similar paths. Besides level differences, however, they are characterised by yet another significant distinction, as we explain below.

Figure 2: Applied tariff overhangs of African WTO members, 2000-2017



Notes: Applied tariff overhang is defined as the difference between MFN bound tariffs and trade-weighted effectively applied tariffs. See Section 3 and Appendix Table A3 for further details on data sources.

Source: Authors' own illustration

Generally, unlike intra-African trade, the bulk of imports from non-African trading partners are traded on the basis of non-discriminatory MFN treatment.[7] According to its founding principle, WTO members must not raise applied tariffs above their MFN bound tariffs. In practice, this means that they cannot impose tariffs exceeding their maximum tariff pledges without bearing the consequences of serious dispute settlement proceedings or retaliation measures (Limão & Tovar, 2011).[8] Therefore, without further (regional) commitments, the difference between MFN bound tariffs and applied tariffs represents hypothetical tariff

7 A notable exception is the European Union (EU) which has signed reciprocal trade agreements, the so-called Economic Partnership Agreements (EPAs), with a number of regional blocs or individual countries in Africa. While the EPA between the EU and Eastern and Southern Africa was already signed in 2012, most of these trade agreements have been signed only recently, however. For instance, individual agreements with Côte d'Ivoire, Ghana, and SADC were all only signed in 2016. Moreover, a common feature of the EPAs is that they provide for long implementation schedules of tariff liberalisation (10-15 years) on the side of African countries. That being said, the tariff-liberalising effect of the EPAs largely falls outside our period of analysis.

8 In the dataset used for empirical analysis, we still observe some rare cases where applied tariffs exceed MFN bound rates. This anomaly is also observed by Kuenzel (2020a) and could possibly stem from aggregation issues, phase-in periods, or simply non-compliance.

policy space for WTO countries to protect their domestic industries without resorting to NTMs (Kuenzel, 2020a). Intuitively, greater flexibility in tariff policy space translates into smaller demand for import market protection through NTMs. Our first hypothesis is thus the following:

H_1: *A larger applied tariff overhang generally entails more tariff policy space for African WTO members, which reduces the demand for resorting to NTMs.*

The paramenters of trade within Africa, however, are more complex. Due to the widespread and often overlapping membership in the RECs, intra-African applied tariffs are on average not only at a lower level than Africa's tariffs towards third countries. Even more significantly, intra-African tariff policy is in fact widely bound by the complex and naturally deeper commitments in the RECs rather than by WTO commitments. For many African WTO members, the RECs thus add an additional regional layer to the tariff commitments already made at multilateral levels (Sandrey, Karaan, & Vink, 2008). That being said, intra-African applied tariffs are largely locked-in by regional tariff commitments in the RECs. Hence, although African WTO members reveal large intra-African applied tariff overhangs, this does not generally come with greater tariff policy space towards neighbouring countries. Instead, a larger regional overhang could be interpreted as the discrepancy of a government's actual (multilateral) tariff policy preference.

This circumstance is coupled with the fact that intra-African trade is fairly different to the continent's exports to third countries. While African countries supply world markets primarily with commodities and raw materials, intra-African trade is characterised by a comparatively large share of industrial goods (see, for example, Abrego et al. 2019; Slany & Riedel, 2019; UNECA [United Nations Economic Commission for Africa], 2015). The larger value-added in industrial trade means that there is more at stake, potentially bringing in a more competitive behavior. By implication, we hypothesise that there is a structurally different effect of intra-African applied tariff overhangs on NTMs compared to the case towards third countries. Our second hypothesis thus reads as:

H_2: *A larger intra-African applied tariff overhang is the result of regional tariff commitments and represents a discrepancy with multilateral tariff preferences, which fosters stronger demand for NTMs to shield domestic markets.*

3 Empirical strategy

3.1 Estimation model

Taking into account the regional differences in applied tariff overhangs for African WTO members, we specify the incidence of SPS measures and TBT as a function of applied tariff overhangs towards all, that is, African and non-African, vis-à-vis African trading partners. Our baseline model thus reads as follows:

$$Pr(NTM_{ikt} = 1 \mid x_{ikt}) = \beta \cdot (1 + Overhang^{j}_{ik,t-1}) + \gamma \cdot \boldsymbol{X}_{ik,t-1} + \delta_k + \nu_{it} + \varepsilon_{ikt} \quad (1)$$

where NTM is a binary variable for the composite occurrence of either an SPS or TBT notification to the WTO of imposing country i in product k (as a benchmark at the two-digit level) at year t, zero otherwise, and ε_{ikt} is the error term. We also test our model specification using both policy measures as separate dependent variables in a later extension.

Our key explanatory variable is the applied tariff overhang which varies by imposing country, product category and time, but we also condition the measure with respect to the regional affiliation of trading partners. Formally, this is expressed as:

$$Overhang^{j}_{ik,t-1} = MFN\ bound_{ik,t-1} - AHS^{j}_{ik,t-1} \quad (2)$$

where superscript j indexes either overall (towards all trading partners) applied tariff overhangs or those specifically towards African trading partners. Applied tariff overhangs are the difference between ad-valorem product-specific MFN bound tariffs and effectively applied tariffs, denoted as AHS. For applied tariffs we use the trade-weighted average tariffs imposed on all and African trading partners, respectively. In technical terms, the latter classification thus operates as a restricted deviation from the overall effect. Although intra-African trade is generally low, given the often heterogeneous import relations of African countries, note that the overall effect occasionally includes a considerable portion of the regional effect.

While MFN bound tariffs are multilateral commitments by definition, the regional variation in applied tariff overhangs entirely stems from the subtrahend of equation (2). Applied tariffs can reveal significant differences across trading partners. For WTO members, applied tariffs are shaped not only by non-discriminatory MFN applied tariffs, but to an even larger extent by the commitments and implementation progress in bilateral or regional trade agreements.

According to the hypotheses formulated above, we expect a significant negative coefficient for the overall tariff overhang (H_1). This would imply that larger tariff policy space generally, that is, as an average over all trading partners, led to fewer SPS and TBT initialisations. For H_2 to hold, we expect a significant positive relationship between the incidence of SPS measures and TBT and tariff overhangs towards African trading partners. This is because H_2 posits the discrepancy of regional tariff commitments and actual tariff preferences rather than tariff policy space.

As competitive pressure appears as a natural determinant for trade protectionism, we capture the value of imposing countries' imports by two variables in vector $\boldsymbol{X}$. Following our approach for tariff overhangs, we differentiate between overall and intra-African imports. Lastly, δ_k are HS sections fixed effects, and ν_{it} are country-time fixed effects. The inclusion of country-time fixed effects accounts for unobserved heterogeneity at the country level, including the rolling number of REC- or extra-African RTA partners and the occurrence of economic crises, both of which may determine a country's trade policy decisions. HS sections fixed effects are employed to control for differences in the propensity to initiate

SPS measures and TBT in different sectors.[9] To mitigate possible reverse causality, all variables are lagged by one period.

While our fixed effects specification comprehensively addresses a potential bias stemming from omitted variables, further time-varying country-product-specific factors could influence both our tariff policy measures and the notification of SPS measures and TBT. These determinants include other NTMs that are either imposed complementarily to or in exchange for SPS measures and TBT. However, neither is it possible to explicitly capture all such effects due to data limitations, especially within Africa, nor can we proxy other NTMs with country-product-time fixed effects (in exchange for those included) as this would perfectly predict our dependent variable.

Due to the dichotomous nature of the dependent variable, equation (1) is implemented in a non-linear model framework using the logit estimator. The logistic regression model relates the effects of explanatory variables to the probability occurrence of a dependent variable. Since non-linear estimators are prone to the incidental parameter problem when involving a large number of fixed effects (Greene, 2012), we additionally present estimates from a linear probability model as a robustness check. Notably, given our fixed effects specification, the logit estimator only uses information on the HS categories in which at least one SPS measure and TBT was initiated over time. This leads to a relatively high prevalence of SPS and TBT initialisation in our HS2 estimation sample, and we observe SPS and TBT notifications for 10.9 per cent and 16.2 per cent, respectively, of all observations.

3.2 Data

In our empirical analysis, we utilise annual country-level panel data of 35 African countries which notified either amendments or new impositions of SPS measures and TBT to the WTO between 2001 and 2017. In accordance with WTO rulebooks, the public notification of regulatory changes is obligatory in the case of divergence from international standards and a (potentially) significant impact on trade, but naturally restricted to its members.[10] Imposing countries are, therefore, considered in our sample only upon their accession to the WTO, which leaves us with a highly unbalanced panel. We refer the reader to Appendix Table 1 for the full list of sample countries and their initial years of observation.

For data on SPS measures and TBT, we draw on the dataset compiled by Ghodsi et al. (2017). This dataset is a user-friendly compilation of NTM notifications from the WTO's Integrated Trade Intelligence Portal (I-TIP) and comes with the advantage of fully imputed HS codes of affected products. Imputation procedures by the authors provide for an

9 An overview of HS classifications by sections can be found at https://unstats.un.org/unsd/tradekb/Knowledgebase/50043/HS-2002-Classification-by-Section.

10 However, coverage of SPS and TBT notification is still far from complete in Africa. Grübler and Reiter (2020) note that Angola, Chad, D.R. Congo, Djibouti, Guinea-Bissau, Lesotho, Mauritania, Niger and Sierra Leone have not reported SPS measures and TBT although being WTO members. According to Aisbett and Pearson (2012), a lack of national notification authorities might be one reason for this.

allocation at the HS6 level of aggregation, but we carry out our analysis at the HS2 level as our benchmark and at the HS4 level as a data validation check because many, especially developing countries, originally report at highly aggregated sectoral levels to the WTO.[11] Further, as our unit of observation is the unilateral country-product-level, we consider only those SPS measures and TBT which have been imposed multilaterally, and remove all bilateral measures. The editing, however, concerns only a handful of notifications to the WTO for African countries.

The dataset by Ghodsi et al. (2017) shares with the WTO's I-TIP the lack of a precise disentanglement of trade-hampering versus trade-facilitating SPS measures and TBT. Aiming at assessing the potential substitution between one form of trade protectionism with another, ideally, our emphasis should be on the former. While a distinction is generally possible from textual analysis of the individual measures' descriptions, nevertheless, they are frequently complex and often touch upon a wider set of objectives. Despite the allaying clarification in Aisbett and Silberberger (2020) that trade-facilitating NTMs are a rather rare occurrence, and the broad consensus that Africa's NTMs generally act as de facto barriers to trade, one shortcoming of our analysis is the latent confusion with trade-facilitating measures.

In view of recent advancements in the recording of NTMs, other databases provide more explicit information of their (likely) effects on trade. For example, the Global Trade Alert database (https://www.globaltradealert.org/) is a high-frequency source which allows a specific break-down of various trade policy measures to the product-level and affected countries. However, the database only starts in 2008, that is, at a time when tariff liberalisation within the RECs was already fairly advanced, and moreover has a strong focus on high-income countries, with only a handful of observations on SPS measures and TBT for African countries. An alternative way to identify trade-hampering NTMs could include the exploitation of data on STCs raised at the WTO. However, the publically available database contains hardly any complaints about the NTMs of developing countries, a circumstance described by Boza and Fernandes (2016). Reasons for this finding include low trade volumes and lacking legal capacity of developing countries (see, for instance, Sattler & Bernauer, 2011; Busch, Reinhardt, & Shaffer, 2008).

We match SPS and TBT notifications with product-specific MFN bound tariffs and effectively applied tariffs from the UNCTAD Trade Analysis and Information System (TRAINS) database provided through the World Bank's (2021) World Integrated Trade Solution (WITS). Although the database is the most comprehensive source in its coverage of tariffs, data availability essentially depends on the reporting of imposing countries, and African countries especially are notoriously negligent in this respect. Data gaps are present particularly at lower levels of product aggregation but diminish at higher ones, adding another substantial justification to our preference for the HS2 and HS4 levels of aggregation.

Lastly, the Base Pour l'Analyse du Commerce International (BACI) dataset provided by the Centre d'Études Prospectives et d'Informations Internationales (CEPII) (2020) is used for

11 Our dependent variable equals unity regardless of the actual number of SPS measures or TBT at lower HS levels. For example, multiple NTM notifications at the HS6 level translate into unity for our dependent variable at both the HS2 and the HS4 level. We do not make use of count data models, since the imputation based on broadly designed NTMs could lead to misleading NTM initialisations at lower HS levels.

trade data. The BACI dataset is a cleaned dataset with trade data originally from United Nations Comtrade, building on the methodology of Gaulier and Zignago (2010).

Full variable descriptions and respective data sources are given in Appendix Table A2. We provide summary statistics for our sample in Appendix Table A3. Emphasising the descriptive picture of Figure 2, the summary statistics show that intra-African trade is characterised by stronger tariff commitments than overall trade. While the average intra-African tariff overhang in our estimation sample is 43.6 per cent, overall tariff overhangs are on average 6 per cent lower.

4 Results and discussion

4.1 Baseline results

We present our baseline logit model results as average marginal effects in Table 1. The initial four columns show findings at the HS2 level whereas the latter four indicate their respective replications at the HS4 level. Across columns, we use the composite observation of regular SPS measures and TBT as dependent variable. Given the nested relationship of the overall and regional tariff overhang variables in equation (1), a bias stemming from multicollinearity could be inherent in their joint estimation. As for the estimations in which both measures are included separately however, magnitudes of coefficient estimates are only marginally different to the ones in the full model specifications while hardly showing alteration in the comparatively small standard errors, which prompts us to advocate for the validity of our full model specification.[12]

Turning towards our hypotheses raised above, we begin our discussion at the HS2 level. Except for column (3), there is no statistical indication of a general relationship for applied tariff overhangs and the utilisation of NTMs by African WTO members at any of the conventional significance levels. In other words, generalised over all their trading partners, tariff policy space does not lower the demand for NTMs of African WTO members and vice versa. Although coefficient signs are predominantly negative, we thus do not find H_1 to statistically hold when analysed at the highly aggregated HS2 level. A different picture is painted at the HS4 level where we find statistically significant support for H_1 in the full model specifications.

12 Furthermore, the inclusion of import control variables reduces the number of observations and leads to different estimation samples across columns. Estimations using the estimation samples of columns (4) and (8), however, yield nearly identical results to those reported.

Table 1: Baseline logit model results (average marginal effects)

	Regular SPS and TBT (HS2)				Regular SPS and TBT (HS4)			
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MFN bound versus AHS								
World	0.0145		**-0.102****	-0.0545	-0.00102		**-0.118*****	**-0.100*****
	(0.0196)		**(0.0470)**	(0.0424)	(0.00545)		**(0.0226)**	**(0.0263)**
Africa		**0.0354***	**0.124*****	**0.0951*****		**0.0117***	**0.125*****	**0.107*****
		(0.0183)	**(0.0433)**	**(0.0368)**		**(0.00680)**	**(0.0228)**	**(0.0264)**
Import controls								
World				0.0344***				0.00649***
				(0.00411)				(0.000902)
Africa				0.00264				-0.000492
				(0.00281)				(0.000761)
Observations	7,455	6,954	6,946	6,293	78,636	52,451	52,443	40,192
Pseudo R^2	0.3012	0.2958	0.2969	0.3307	0.4044	0.3941	0.3948	0.4051

Notes: Robust standard errors in parentheses. Asterisks denote the level of statistical significance with *** p<0.01, ** p<0.05, * p<0.1. Country-year and HS sections fixed effects always included but not reported.

Source: Authors

Possible explanations for the insignificant overall tariff overhang estimate at the HS2 level include the neutralisation of opposing effects at more disaggregated levels and the occasionally considerable portion of intra-African trade in overall imports. Another explanation could be the dependence of African countries on imports from third countries in broadly aggregated product categories. Not least the ongoing Covid-19 pandemic has emphasised the continent's lack of self-reliance in aggregate food and medical supplies (see, for example Akiwumi, 2020; Banga, Keane, Mendez-Parra, Pettinotti, & Sommer, 2020). More generally, effective replacement of imports from third countries is a challenge for most African economies for reason of insufficient own productive capacities. Following this line of argumentation, even in the absence of tariff policy space, it is reasonable to assume that trade protection in the form of NTMs would not appear as being desirable.

Next – as we speculated under H_2 – we find a positive relationship between applied tariff overhangs towards African trading partners and NTMs. The effect is estimated to be statistically significant throughout, at both the HS2 and the HS4 levels. As we discussed in Section 2, our explanation for these findings is that a larger intra-African tariff overhang could be interpreted as the enforced discrepancy of a government's actual (multilateral) tariff policy preference, resulting from multi-layered tariff commitments in the RECs. Coupled with the fact that intra-African trade is more competitive than the continent's trade with the rest of the world, our estimates suggest that this discrepancy fosters stronger demand for NTMs to shield domestic markets.

Although we report logit model results as average marginal effects, due to the non-linear influence of explanatory variables on outcome probabilities in logit regressions, mindful interpretation of logit models should be restricted to coefficient signs and significance. This is because the inherent non-linear relationship means that *average* marginal effects are highly ambigiuous as true marginal effects vary significantly depending on the values of righthand-side variables. What is more, although coefficients for the intra-African tariff overhang variable are larger by magnitude than those for the overall tariff overhang variable and, with this, providing strong evidence for opposing effects on NTMs, this does not necessarily imply that tariff liberalisation undertaken by African WTO members increases the *total* probability of their utilisation of NTMs. Instead, more modestly, our estimations suggest that increases in intra-African tariff overhangs have a significant share in increasing the probability of SPS measures and TBT. Given that intra-African tariff overhangs are also implicit in overall tariff overhangs, with the extent depending on the share of intra-African in total imports, the net effect of tariff liberalisation on SPS measures and TBT in Africa remains ambiguous as long as coefficients for the overall tariff overhang are statistically significant.

With regard to our control variables, estimates suggest that increasing overall imports are a significant driver for SPS measures and the TBT of African WTO members. The coefficient for overall imports is always positive and statistically significant, at both the HS2 and HS4 levels. The regional conditioning for intra-African imports, by contrast, is consistently insignificant. Although competition with similar countries could be attached to a comparatively larger threat to domestic industries than that with third countries, we do not find evidence for a deviating effect of imports from African trading partners on NTMs. One explanation could be that, for some regions in Africa, trade is not recorded in official

statistics but rather occurs informally, and there is empirical evidence that NTMs even increase this informality further (Bensassi, Jarreau, & Mitaritonna, 2019).

Table 2: HS2 logit model results (average marginal effects) for alternative dependent variables

	Regular SPS	Regular TBT	Regular and emergency SPS and TBT
VARIABLES	(1)	(2)	(3)
MFN bound versus AHS			
World	-0.00546	-0.0712	-0.0537
	(0.0450)	(0.0542)	(0.0414)
Africa	**0.0809****	**0.136*****	**0.0936*****
	(0.0400)	**(0.0491)**	**(0.0360)**
Import controls			
World	0.0321***	0.0411***	0.0330***
	(0.00505)	(0.00504)	(0.00397)
Africa	-0.000138	0.00400	0.00254
	(0.00334)	(0.00348)	(0.00273)
Observations	3,759	4,656	6,523
Pseudo R^2	0.3859	0.3254	0.3336

Notes: Robust standard errors in parentheses. Asterisks denote the level of statistical significance with *** p<0.01, ** p<0.05, * p<0.1. Country-year and HS sections fixed effects always included but not reported.

Source: Authors

We provide full model linear probability estimates at both the HS2 and the HS4 levels as robustness checks in Appendix Table A4. For ease of comparison, we use the same sample composition as for the logit regressions.[13] Our baseline findings supporting hypothesis H_2 are confirmed throughout. Moreover, in unreported logit model robustness checks, we also excluded outliers in terms of overly large tariff overhangs, that is, tariff overhangs greater than 200 per cent, and used changes in imports rather than their levels, but found no significant changes to the results reported. Also, as SPS and TBT notifications could be correlated within product categories, we have additionally run estimations using clustered standard errors at the HS section and HS section-country level, with both leaving our above findings unchanged.

While the above estimation results are more pronounced at the HS4 level, developing countries mainly report SPS measures and TBT at more aggregated levels (see discussion in Section 3). Moreover, data quality for trade and tariffs becomes poorer with the level of

13 Linear probability estimates using all observations – including from those HS categories without any inititation of SPS measures and TBT over time – lead to very similar results compared to those reported.

disaggregation, and data are also missing for a considerable amount of years. In the following, we hence focus on the more conservative estimations at the HS2 level.

Our findings thus far employ the composite observation of SPS measures and TBT as dependent variable. Columns (1) and (2) in Table 2 show estimations for the separate consideration of regular SPS measures and TBT, respectively, with no qualitative difference to our baseline results. Omitted variables could be an issue in separate regressions if we assumed substitution effects between NTMs. More specifically, countries could be reluctant to impose further SPS measures if TBT were already in place and vice versa. Traditionally, however, SPS measures and TBT affect different sectors, that is, SPS measures mainly affect agriculture while TBT affect the manufacturing trade. We have nevertheless also run model specifications taking into account the notifications of the respective other NTM, with no changes to our baseline results.

Moreover, in Table 1, we focused exclusively on regular SPS and TBT notifications. However, WTO members can generally apply regulatory changes on either a permanent or temporary basis. The latter – known as emergency measures – are nevertheless highly exceptional cases and are restricted to reactions to sudden and unforeseen domestic or international incidences. In the course of the Covid-19 pandemic, for instance, several WTO members temporarily imposed more stringent SPS requirements for the import of live animals. Given their short-lived nature, there is no reason to assume a systematic relationship between emergency measures and tariff policy. For the sake of completeness, however, we have also included emergency SPS and TBT measures in the estimations. Column (3) in Table 2 reports findings when using composite regular and emergency SPS and TBT notifications as dependent variable. Yet, observation size increases only marginally and we do not find changes to the above results.

4.2 Extensions

Thus far, our two key explanatory variables have been specified as the difference between MFN bound tariffs and effectively applied tariffs, thereby expressing either hypothetical overall tariff policy space or the specific deviation from multilateral commitments for intra-African trade relations. In the context of regional tariff commitments however, the evaluation of a country's positioning in applied tariffs is arguably not primarily led by the comparison with multilateral commitments. In fact, even in the absence of RTA tariff commitments, WTO members rarely fall back on the application of MFN bound tariffs and instead often widely apply lower non-discriminatory MFN applied tariffs.

A more relevant measure of the discrepancy between effective and *desired* tariffs could hence build on actual tariffs towards third countries. We proxy this hypothetical reference tariff by MFN applied tariffs and model applied tariff overhang in an alternative to our baseline specification as the difference between MFN applied tariffs and effectively applied tariffs. Following our above procedure, we define the measure for both overall tariff policy and intra-African trade relations. Estimation results are presented in Table 3. While the modification of the overhang measures increases the observation size in comparison to our baseline results in Table 1, resulting from the fact that even at a level of high aggregation tariff lines for African WTO members are not bound entirely, our above findings are confirmed throughout. Note, however, that the results in Table 3 have to be read with

caution. While regional integration within Africa has led to a discrepany between intra-African and MFN applied tariffs for most countries on the continent, except for the EU under the EPAs, non-African trading partners hardly ever receive tariff preferences that go beyond MFN applied tariffs. That being said, the variation for the overall tariff overhang measures mainly comes from those resulting from intra-African tariff policy, which could explain its statistical insignificance.

Table 3: HS2 logit model results (average marginal effects) for alternative tariff overhang measure

	Regular SPS and TBT			
VARIABLES	(1)	(2)	(3)	(4)
MFN applied versus AHS				
World	0.0446		-0.0416	-0.0671
	(0.0622)		(0.0741)	(0.0836)
Africa		**0.0616*** **	**0.0692** **	**0.0608** **
		(0.0239)	**(0.0280)**	**(0.0248)**
Import controls				
World				0.0316***
				(0.00338)
Africa				0.00336
				(0.00248)
Observations	10,631	9,925	9,925	9,116
Pseudo R^2	0.2922	0.2862	0.2862	0.3174

Notes: Robust standard errors in parentheses. Asterisks denote the level of statistical significance with *** p<0.01, ** p<0.05, * p<0.1. Country-year and HS sections fixed effects always included but not reported.

Source: Authors

Moreover, tariff liberalisation in the course of regional economic integration may put adverse effects on industrialisation aspirations especially in lower-income countries and LDCs. While lower-income countries and LDCs are generally often scarcely equipped with highly-skilled labour or capital, resulting in comparative advantage mainly for the production and export in low-value sectors, regional economic integration with more advanced (developing) countries offers little scope for the expansion of and diversification to higher-value economic output for these countries. By implication, with falling regional tariffs, lower-income countries and LDCs in particular may find motivation to substitute tariffs with NTMs to shield domestic (infant) industries.

A natural question that arises is thus whether there are significant differences for the effect of tariff overhangs on NTMs across African countries based on their development status. As a second extension, we therefore split our sample according to the development status and run separate regressions for reporting countries following the classification of the World Bank Atlas Method. We use 2010 as reference year for the sample split. Among the 35 sample countries, 28 are defined as lower middle-income countries (LMICs) and LDCs, and

7 as upper middle-income countries (UMICs) and high-income countries (HICs). Although Beverelli et al. (2019) find trade policy substitution mainly in high-income where the costs of compliance with regulatory changes are relatively low, our expectation is that LMICs and LDCs are generally more open to substituting tariffs with NTMs because their markets may find it comparatively difficult to withstand increasing competitive pressure in the course of (regional) tariff liberalisation. By contrast, some of the more advanced countries on the continent, including Egypt and South Africa, also have functional trade remedy authorities in place. With this, these countries have available the legal framework and practical scope to apply AD duties, which are not only easier to set up and monitor than SPS measures and TBT, but also generate tariff revenue. Estimation results for the comparison of income groups are shown in columns (1) and (2) of Table 4 and confirm our above expectation. More specifically, while we do not find any statistically significant effects for UMICs and HICs, larger intra-African applied tariff overhangs for the group of LMICs and LDCs lead to a higher probability to initialise SPS measures and TBT.

Lastly, we revisit the concern that our results might be driven particularly by the members of those RECs which stipulate NTM harmonisation with international standards. Under this scenario, falling intra-African tariffs and, with this, larger tariff overhangs towards African trading partners could go along with increased notifications of SPS measures and TBT if convergence towards international standards provoked interim regulatory changes. To address this concern, we exclude sample countries of selected RECs from our estimation.[14] We do not exclude countries from all RECs simultaneously because only very few observations would be left. Columns (3) to (6) of Table 4 present the results of this exclusion exercise.

Assuming that not all RECs stipulated NTM harmonisation at the same time (and degree), we would expect to see differences in the African overhang coefficient if harmonisation was a significant driver of NTM notifications. Apart from the exclusion of COMESA, nevertheless, there appear to be no significant differences across columns. Note, however, that the exclusion of COMESA members reduces the observation size significantly and leads to a considerable increase in the standard error for the African tariff overhang estimate. Therefore, we speculate that the larger coefficient for the intra-African tariff overhang variable is the result of a less precise estimation rather than structural difference with other sample countries.

Another difference compared to our HS2 baseline results arises from the exclusion of SADC. Using the restricted sample, the coefficient for the overall tariff overhang is now statistically significant while showing a negative sign, thus lending evidence to H_1. We speculate that this finding might be driven by the exclusion of SADC's economically most potent member South Africa. In comparison to most African countries, South Africa's imports are characterised by foreign intermediates, due to deeper integration into value chains, for example, in the automobile sector (UNCTAD, 2019). Therefore, even when faced with a tighter tariff policy space, this could keep South Africa from introducing trade protectionism via NTMs.

14 We drop member countries of the RECs stipulating NTM harmonisation with international standards, that is, COMESA, EAC, and SADC, and additionally ECOWAS. These four RECs also reveal the deepest degree of trade integration among all RECs. For simplicity, we consider the current REC membership status for the country exclusion.

Table 4: HS2 logit model results (average marginal effects) for sample variations						
	Development status		Excluding RECs			
	LDCs + LMICs	UMICs + HICs	COMESA	EAC	ECOWAS	SADC
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
MFN bound versus AHS						
World	-0.0726	-0.0204	-0.0822	-0.0565	-0.0710	**-0.0874***
	(0.0490)	(0.124)	(0.0988)	(0.0396)	(0.0459)	**(0.0492)**
Africa	**0.0874****	0.134	**0.205****	**0.0984*****	**0.0872****	**0.0933****
	(0.0400)	(0.120)	**(0.0962)**	**(0.0340)**	**(0.0384)**	**(0.0393)**
Import controls						
World	0.0390***	0.0249***	0.0299***	0.0268***	0.0357***	0.0346***
	(0.00542)	(0.00674)	(0.00523)	(0.00404)	(0.00454)	(0.00514)
Africa	-3.41e-06	0.00397	-0.00274	0.00142	0.00438	0.00246
	(0.00374)	(0.00437)	(0.00335)	(0.00267)	(0.00308)	(0.00348)
Observations	4,175	2,101	2,987	5,022	5,526	4,274
Pseudo R^2	0.3413	0.2977	0.3612	0.3202	0.3213	0.3497

Notes: Robust standard errors in parentheses. Asterisks denote the level of statistical significance with *** p<0.01, ** p<0.05, * p<0.1. Country-year and HS sections fixed effects always included but not reported.

Source: Authors

5 Conclusions

Within the past decades, African countries have accomplished a substantial reduction of their applied tariffs, especially within Africa. This success has been enabled in particular through the regional tariff commitments formulated in the RECs. In this paper, however, we examined whether the tariff liberalisation achievements at regional levels had come at the expense of adverse effects on the prevalence of NTMs, and thereby whether they had even unintentionally contributed to the surge of SPS measures and TBT in Africa.

Exploring this question, we compared the effects of applied tariff overhangs towards all vis-à-vis African trading partners on SPS and TBT notifications of 35 African WTO members between 2001 and 2017. While we found no overall relationship between tariff overhangs and import regulation in our preferred model setting, larger tariff overhangs specific to intra-African trade relations had a significant share in increasing the probability of SPS measures and TBT for African WTO members. We see the nature of Africa's formal trade relations as an explanation for these findings. Notably, while only a few African countries have formal tariff commitments in reciprocal RTAs with non-African countries, tariff commitments in partly multiple RECs have not only significantly moved African countries away from multilateral commitments, but the pledge to regional tariff liberalisation has sharply reduced their tariff policy space within Africa, thus leaving regulatory policies such as SPS measures and TBT as two of the few legitimate options to level the playing field with the by far closest market competitors.

Our findings have important implications for the prospects of the AfCFTA. Notably, the trade policy substitution mechanism identified in this paper could significantly undermine tariff liberalisation efforts under the AfCFTA. That said, our results confirm conjecture that NTMs are the key to a successful implementation of the AfCFTA. More specifically, our findings demonstrate that the success of the AfCFTA does not exclusively depend on the realisation of tariff liberalisation but also on a mindful coordination with non-tariff provisions. An isolated concentration in efforts to reduce tariffs or enforce tariff commitments could even exacerbate NTMs as a further arena.

The AfCFTA Agreement makes explicit reference to WTO rights and obligations for the use of SPS measures and TBT, and the aim of harmonising import regulations with international standards. In the same breath, members are given formal dispute settlement mechanisms to take legal action against the unjustified imposition of NTMs by fellow members. While dispute settlement equivalents already exist at the REC-level, this channel has rarely been utilised but could be a previously unappreciated way to increase the inhibition threshold for the excessive use of NTMs under the AfCFTA.

Our empirical findings are put into perspective by the fact that they seem to be driven particularly by LMICs and LDCs instead of the economically more powerful countries on the continent which are credited with a certain leadership role in the implementation of the AfCFTA. This distinction has two implications: First, the special and differential treatment of tariff liberalisation schedules under the AfCFTA, that is, allowing low-income countries longer implementation phases, is therefore a welcome remedy to reduce pressure from NTM utilisation not only for this group of countries, but for the overall realisation of the AfCFTA. Second, in view of ensuring lasting and widespread acceptance of continental free trade under the AfCFTA, the economically weaker members have to qualify for an active and

beneficial participation. Therefore, in order to keep pace with increased intra-African competition, enabling policies should be designed at both national levels and in the spirit of continental solidarity.

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Appendix

Table A1: Country sample

Benin	Congo	Guinea	Morocco	*South Africa*
Botswana	Cote d'Ivoire	Kenya	Mozambique	Tanzania
Burkina Faso	Egypt	Liberia*	*Namibia*	Togo
Burundi	Eswatini	Madagascar	Nigeria	*Tunisia*
Cabo Verde*	*Gabon*	Malawi	Rwanda	Uganda
Cameroon	Gambia	Mali	Senegal	Zambia
Central African Republic	Ghana	*Mauritius*	*Seychelles**	Zimbabwe

Notes: Countries written in italics were classified as upper-middle or high-income countries in 2010 by the World Bank. An asterisk indicates a later initial year of observation than 2001.

Table A2: Variable definition and sources

Variable	Definition	Source
SPS regular	Dummy = 1 if regular SPS initiated in respective HS2 line in a given year	Ghodsi et al. (2017)
TBT regular	Dummy = 1 if regular TBT initiated in respective HS2 line in a given year	
SPS and TBT emergency	Dummy = 1 if emergency SPS or TBT initiated in respective HS2 line in a given year	
$Overhang^{World}$	Difference of trade-weighted MFN bound rate and trade-weighted AHS applied rate against all trading partners	World Bank (2021)
$Overhang^{Africa}$	Difference of trade-weighted MFN bound rate and trade-weighted AHS applied rate against African trading partners	
$Overhang^{World}$ (alternative)	Difference of trade-weighted MFN applied rate and trade-weighted AHS applied rate against all trading partners	
$Overhang^{Africa}$ (alternative)	Difference of trade-weighted MFN applied rate and trade-weighted AHS applied rate against African trading partners	
$Imports^{World}$	Value of overall imports in HS line (in thousands current USD; CIF).	CEPII (2020)
$Imports^{Africa}$	Value of imports from African Exporters in HS line (in thousands current USD; CIF).	

Notes: USD = US dollars; CIF = cost, insurance, freight

Table A3: Summary statistics

	Data at HS2 level			Data at HS4 level		
Variable	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
SPS Regular	7,463	0.109	0.312	78,644	0.0738	0.261
TBT Regular	7,463	0.162	0.369	78,644	0.0951	0.293
SPS and TBT Emergency	7,463	0.0229	0.150	78,644	0.0132	0.114
$Overhang^{World}$	7,377	37.52	46.46	67,952	29.83	31.42
$Overhang^{Africa}$	6,961	43.58	73.97	46,660	34.42	34.81
$Overhang^{World}$ (alternative)	7,441	3.567	6.947	69,237	3.024	7.555
$Overhang^{Africa}$ (alternative)	7,006	9.193	49.06	47,317	6.517	14.90
$Imports^{World}$	6,827	380,978	1,386,492	71,788	32,358	167,540
$Imports^{Africa}$	6,483	36,581	328,894	67,672	2,295	60,861

Source: Authors

Table A4: Baseline linear probability model results				
	Regular SPS and TBT (HS2)		Regular SPS and TBT (HS4)	
VARIABLES	(1)	(2)	(3)	(4)
MFN bound versus AHS				
World	**-0.152****	-0.0838	**-0.135*****	**-0.119*****
	(0.0595)	(0.0585)	**(0.0267)**	**(0.0300)**
Africa	**0.173*****	**0.127****	**0.0950*****	**0.0753****
	(0.0551)	**(0.0541)**	**(0.0267)**	**(0.0300)**
Import controls				
World		0.0300*** (0.00384)		0.00532*** (0.000998)
Africa		0.00228 (0.00273)		0.00138* (0.000790)
Constant	0.192*** (0.00851)	-0.143*** (0.0327)	0.139*** (0.00285)	0.105*** (0.00737)
Observations	6,946	6,293	52,443	40,192
Adjusted R^2	0.276	0.302	0.321	0.336

Notes: Estimations performed with Ordinary Least Squares (OLS). Robust standard errors in parentheses. Asterisks denote the level of statistical significance with *** p<0.01, ** p<0.05, * p<0.1. Country-year and HS sections fixed effects always included but not reported.

Source: Authors

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