

Renewed U.S. Protectionism and Sub-Saharan Africa: Assessing the Dual Shock of Preference Erosion and Global Value Chain Transmission

Draft

Extended abstract

This paper investigates the prospective impacts of a second Trump administration's trade policy on Sub-Saharan African (SSA) economies, focusing on two principal transmission channels.

The first is a direct trade channel linked to the non-renewal of the African Growth and Opportunity Act (AGOA), which—together with the prior expiration of the U.S. Generalized System of Preferences (GSP)—would force SSA exports to revert to Most Favored Nation (MFN) tariff schedules. Such a shift would substantially erode price competitiveness in AGOA-intensive sectors, including apparel and textiles, leather goods, and processed agricultural products. While some mitigation could arise through expanded use of the European Union's GSP, the overall effect remains ambiguous and may generate a significant negative trade shock.

The second channel concerns indirect spillovers transmitted through global value chains (GVCs). SSA participates in GVCs primarily as an upstream supplier of critical minerals, energy inputs, and intermediate goods. A renewed protectionist orientation in U.S. trade policy would propagate through major GVC hub economies such as China, Vietnam, Malaysia, Thailand, and Mexico, as well as emerging intermediaries including India, Indonesia, and Turkey. Because these economies import SSA-origin inputs for processing and re-export to the United States, their exposure to U.S. tariffs could depress demand for SSA inputs. However, the net impact remains uncertain: while upstream demand may weaken, SSA retains a structurally advantageous position in non-substitutable critical minerals, limiting the scope for sourcing substitution.

The paper quantifies these competing effects using a multi-region computable general equilibrium framework (GTAP-VA), in which the transmission channels are operationalized through explicit tariff wedges and endogenous GVC linkages.

Two policy scenarios are considered. The first isolates the effect of preference erosion, assuming the termination of AGOA and a reversion of SSA exports to MFN tariff rates. The second builds on this baseline by introducing an additional uniform ad valorem tariff of 10 percent, consistent with the reciprocal tariff structure currently implemented following recent U.S. policy developments. In this second scenario, the additional tariff is applied on top of MFN rates for AGOA countries and on top of existing tariffs for all other trading partners.

Importantly, the additional tariff does not apply uniformly across all products and countries. We incorporate the main policy exemptions currently in place, including: (i) products listed in Annex II (covering critical minerals, energy products, and selected commodities), and (ii) Section 232 national-security measures, which supersede reciprocal tariffs in sensitive sectors such as steel, aluminium, and automobiles.

To accurately capture GVC spillovers, the framework also embeds recent policy developments affecting key non-African partners. These include the partial de-escalation of U.S.–China tariffs, bilateral tariff caps for Korea and Switzerland/Liechtenstein, expanded agricultural carve-outs, new

Section 232 measures on medium- and heavy-duty vehicles, and the increasing utilization of USMCA preferences by Canada and Mexico.

The empirical framework enables a clear decomposition of the dual shock of renewed U.S. protectionism on SSA economies, isolating the relative importance of preference erosion and GVC-mediated spillovers. By embedding both channels within a unified general equilibrium setting, the analysis highlights how reduced preferential access and indirect demand effects jointly shape trade outcomes in the Global South. The results also underscore the heterogeneous exposure of SSA countries across sectors and partners, and the importance of accounting for GVC linkages when assessing the consequences of changes in U.S. trade policy.

Experiment design

The analysis considers a scenario in which the political relationship between the Trump administration and a group of African partner countries, particularly lower-income economies, deteriorates, and the African Growth and Opportunity Act (AGOA) is allowed to expire without renewal at its scheduled expiration. As a result, the United States unilaterally withdraws AGOA trade preferences, and all products previously covered by this scheme lose their preferential access to the US market. In practical terms, African exporters move from facing near-zero tariffs on many tariff lines to being subject to the United States' standard Most-Favoured-Nation (MFN) tariff schedule.

The first policy shock introduced in the GTAP model is therefore a pure “preference removal” shock. Under AGOA, eligible African countries benefited from very low or zero tariffs on a broad set of HS products; once AGOA is not renewed, those same flows are taxed at the MFN rate instead. This represents an administrative change in the legal regime: no new tariffs are introduced in the MFN schedule, but the applicable rate for AGOA beneficiaries increases from the preferential level to the MFN level.

To quantify this, we use the World Bank's WITS database, which provides MFN tariff rates at the HS6 level by product and trading partner. These HS6-level MFN rates are then mapped to GTAP sectors and regions. For each GTAP sector and each US–African country pair, MFN tariffs are aggregated using bilateral trade weights, ensuring that the model includes a consistent ad valorem MFN rate at the GTAP level. The removal of AGOA is implemented as an increase in the import tariff on US imports from AGOA-eligible African exporters, moving from the preferential rate (often zero) to the corresponding MFN rate derived from WITS. This provides the first component of the policy experiment: the loss of unilateral trade preferences in the US market.

The second policy scenario, in addition to the first, incorporates the additional tariffs introduced under the Trump administration following recent legal developments. This scenario captures an across-the-board increase in US import protection in the form of additional ad valorem duties. These surcharges are not linked to specific trade agreements and, consistent with the broader US trade policy stance, are applied widely across trading partners, including both countries with preferential agreements and those without, such as Mexico and Canada. Technically, these additional tariffs are modelled in the GTAP framework as extra ad valorem duties applied on top of existing tariffs, differentiated by sector and partner country, and calibrated to remain consistent with pre-existing special measures (for example in sectors such as steel, electrical machinery, pharmaceuticals, and other sensitive products).

From a modelling perspective, it is important to keep the two mechanisms conceptually separate. The non-renewal of AGOA is a legal and administrative shift from a preferential regime to the MFN regime, affecting only those African countries covered by AGOA. For these countries, the tariff faced in the US market becomes “MFN plus the additional surcharge.” For African countries that were not part of AGOA, there is no loss of preference: they continue to face the MFN rate but are still affected by the additional tariffs applied on top of it. In both cases, the final outcome is an increase in the overall tariff applied to African exports to the United States, although the composition of the shock (preference erosion versus additional surcharge) differs.

The combined effect of these two policy changes is introduced into the GTAP model as a set of coordinated tariff shocks on US imports, differentiated by sector and partner. This allows the simulation to capture the impact of the “double shock” associated with Trump-era trade policies on African exporters: first, the erosion of the preferential margin previously granted under AGOA; second, the broader escalation of US import protection through additional tariffs. The scenario therefore provides a coherent framework to assess how these policy changes affect African economies in terms of trade flows, terms of trade, and overall welfare outcomes.

Figures 1 and 2 summarise the structure of the tariff shocks across African partners and sectors. In the first scenario (Figure 1), the removal of AGOA reveals a relatively heterogeneous pattern of MFN tariffs across sectors, with average tariffs generally in the range of 3–5 percent but with significantly higher peaks. These maxima are consistently concentrated in a small number of sensitive sectors, most notably dairy products and, in some cases, beverages and tobacco or leather products. This indicates that the loss of preferences is particularly relevant for specific agri-food and light manufacturing sectors, rather than being evenly distributed across the economy. At the same time, minimum tariffs are close to zero across almost all countries and are typically associated with primary products such as sugar crops, reflecting existing low protection in these segments.

In the second scenario (Figure 2), the introduction of additional tariffs leads to a much more uniform pattern across countries, with average tariff levels converging around 14–15 percent. The dispersion across sectors is reduced for the bulk of trade flows, reflecting the across-the-board nature of the policy. However, differences remain at the sectoral level due to the interaction with pre-existing tariff structures and exemptions. In particular, the highest tariffs are now predominantly observed in industrial sectors such as ferrous metals and, in some cases, beverages and tobacco, while minimum tariffs shift upward but remain comparatively low in sectors such as non-metallic minerals. Overall, the comparison between the two figures highlights a transition from a preference-driven and sector-specific shock to a broader and more uniform increase in trade protection, with important implications for the distribution of impacts across African countries and sectors.

Figure 1. Tariffs shocks for the first Scenario (average, max and min by sector and country)

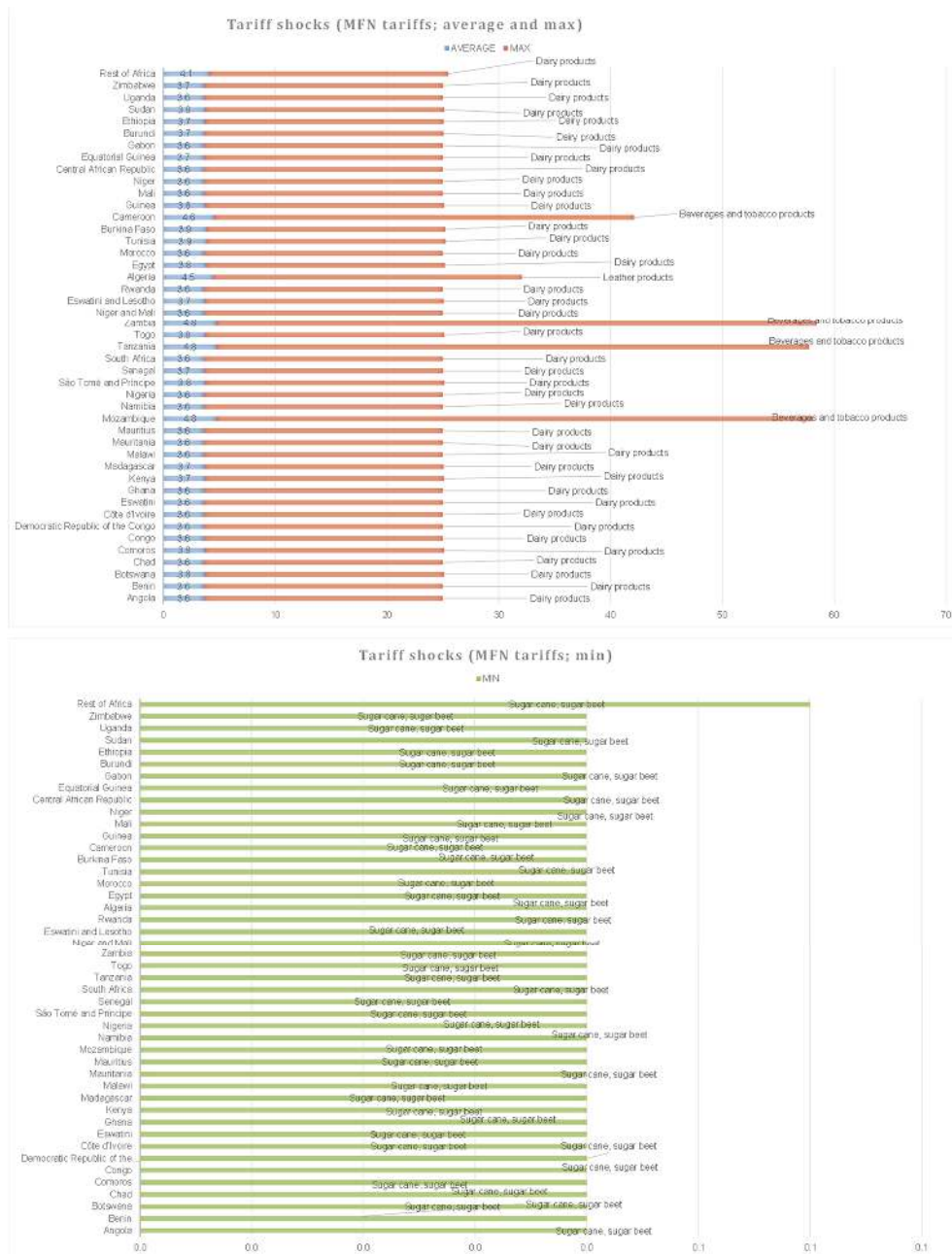
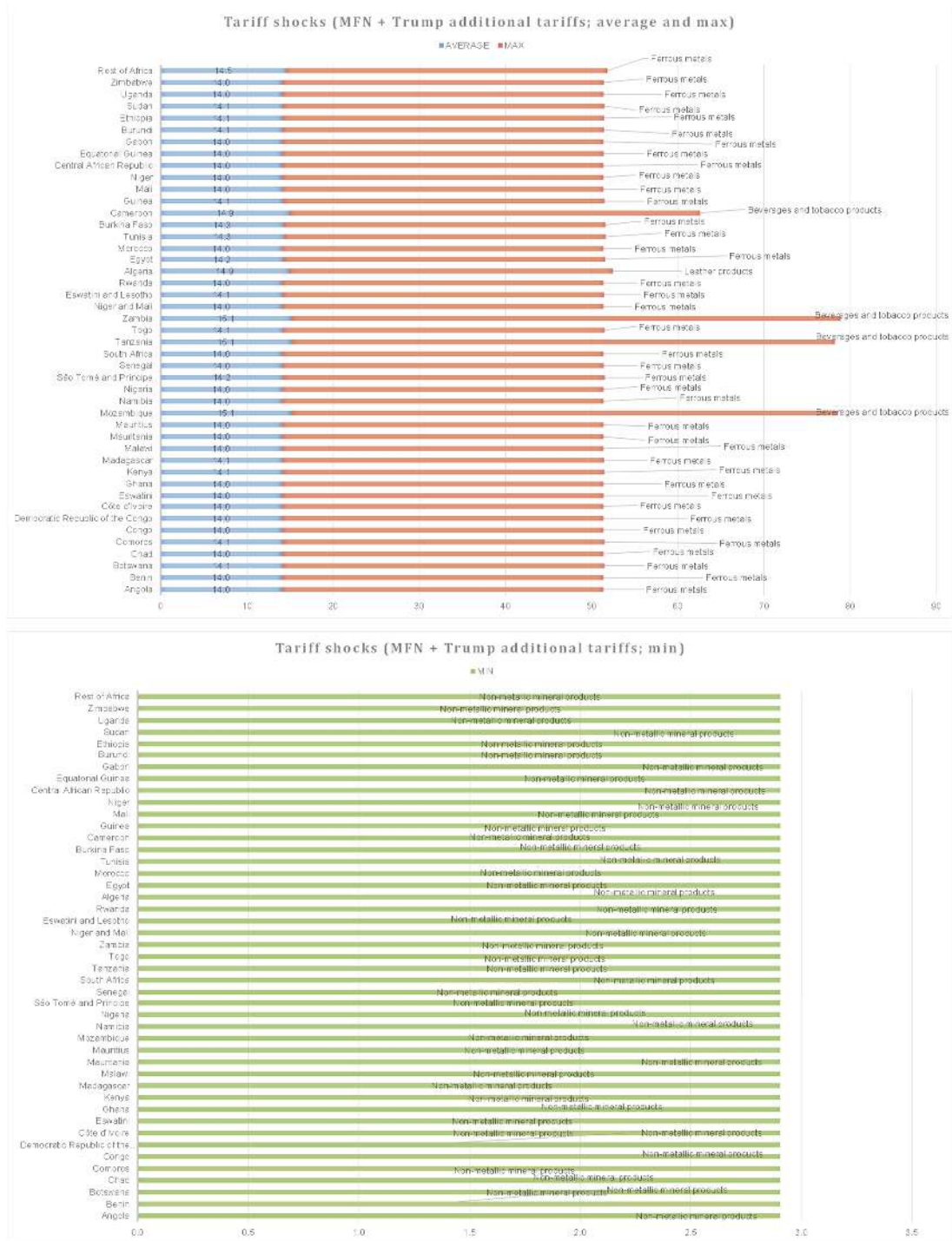


Figure 2. Tariffs shocks for the second Scenario (average, max and min by sector and country)



Preliminary results and conclusions

The results suggest that most of the adjustment takes place through trade diversion, relative price changes and resource reallocation, rather than through large changes in aggregate output.

Looking at value-added exports to the United States, the decline is primarily driven by direct trade effects when preferences are removed. In this case, the impact is concentrated on bilateral exports, while indirect effects through third countries remain small and can even slightly offset the losses. When the additional tariff measures are introduced, the overall impact becomes significantly larger and more broad-based. Both direct and indirect export channels are negatively affected, indicating a stronger and more systemic shock.

From a sectoral perspective, manufacturing clearly drives the contraction in both scenarios. The largest losses are observed in metals and other manufacturing sectors, together with important declines in apparel and chemical products. This pattern is consistent with the higher protection levels applied to these sectors.

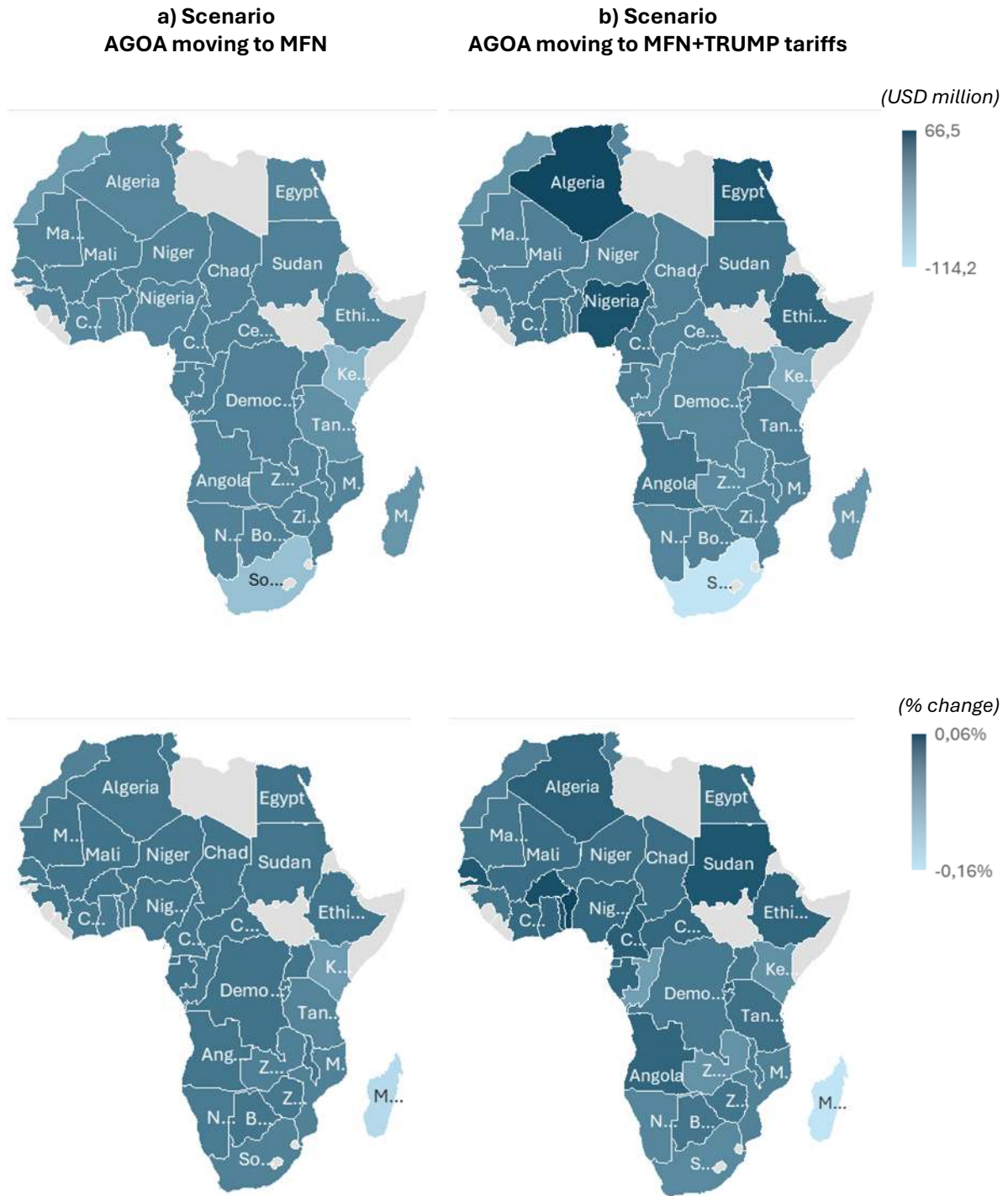
A key difference between the two scenarios concerns the role of global value chains. Under preference erosion alone, indirect effects are limited. By contrast, in the combined scenario, indirect losses become substantial, especially in upstream sectors such as energy and extraction. This reflects the transmission mechanism through global value chains: higher tariffs on major processing economies reduce their activity and, in turn, lower their demand for African inputs.

Overall, the results point to a shift from a mostly bilateral trade shock to a broader systemic impact, where indirect linkages play an increasingly important role. Our results suggest that the non-renewal of AGOA would represent a significant negative shock for several Sub-Saharan African economies, particularly those with a strong specialization in AGOA-intensive sectors such as textiles and light manufacturing. This reinforces the importance of predictable and stable preferential trade regimes for low-income economies.

The analysis also highlights that the broader shift toward U.S. protectionism amplifies these effects through global value chains. Even in cases where direct exports to the United States are limited, African economies are indirectly exposed through their role as upstream suppliers. This suggests that traditional bilateral trade analysis may underestimate the full extent of exposure for resource-based economies. From a strategic perspective, the results point to the need for diversification of export destinations and upgrading within value chains. Strengthening regional integration and expanding access to alternative markets, including the European Union and emerging economies, could partially mitigate the negative effects of preference erosion.

Finally, the findings underline the importance of incorporating GVC linkages into policy analysis. Policies that affect major hub economies can have significant indirect effects on third countries, particularly those integrated upstream. Ignoring these channels may lead to an incomplete assessment of trade policy impacts.

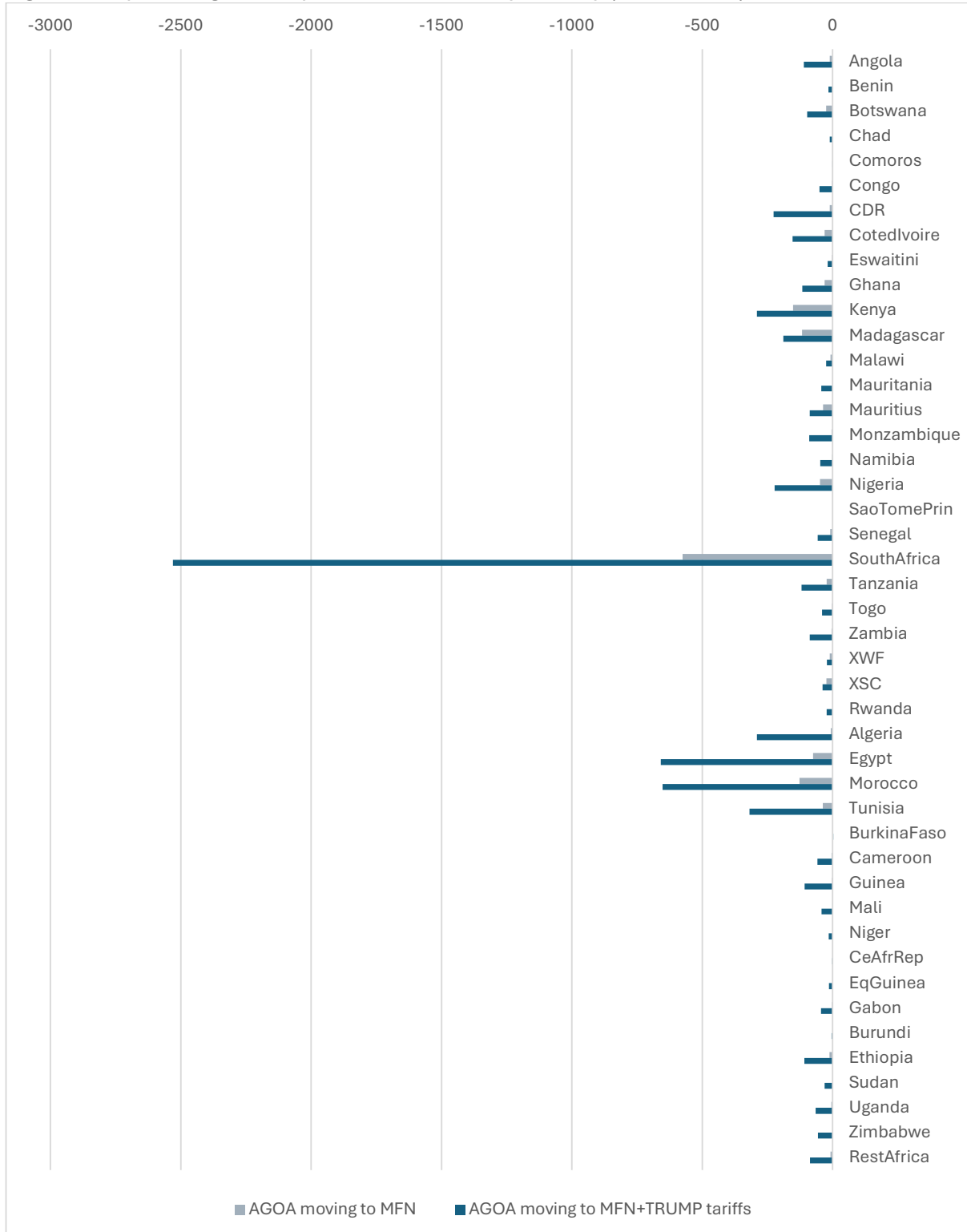
Figure 3. Impact on GDP (USD million and % change)



Note: Not covered countries: Libya (xnf); Eritrea, Djibuti, Somalia (xec); Liberia, Sierra Leone, Guinea-Bissau, The Gambia (xwf); Lesotho (xsc)

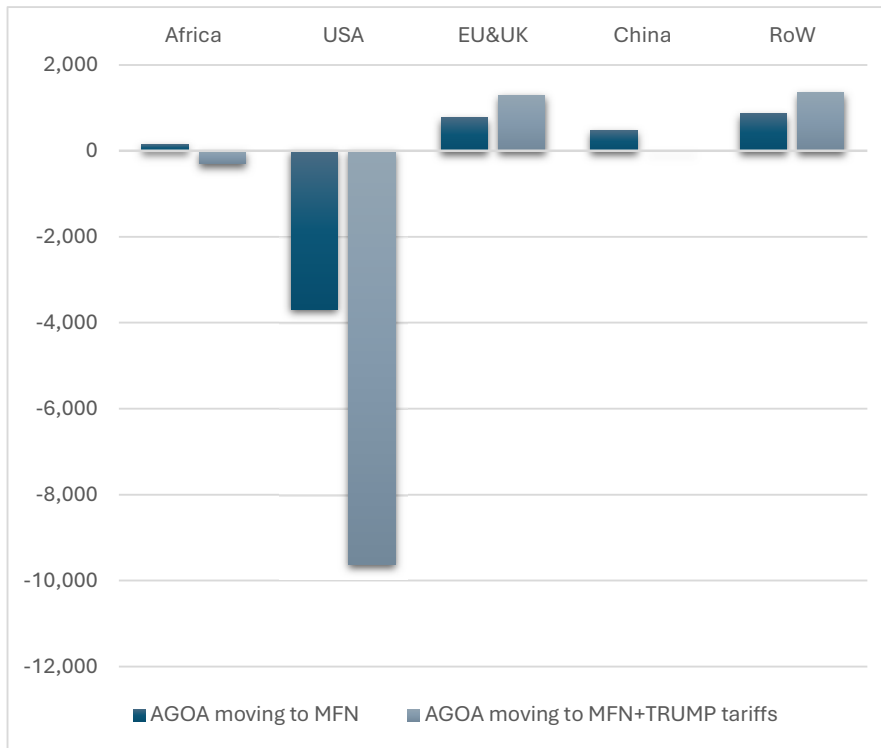
Source: Authors' simulation using the GTAP model.

Figure 4. Impact on goods exports to the world, by country (USD million)



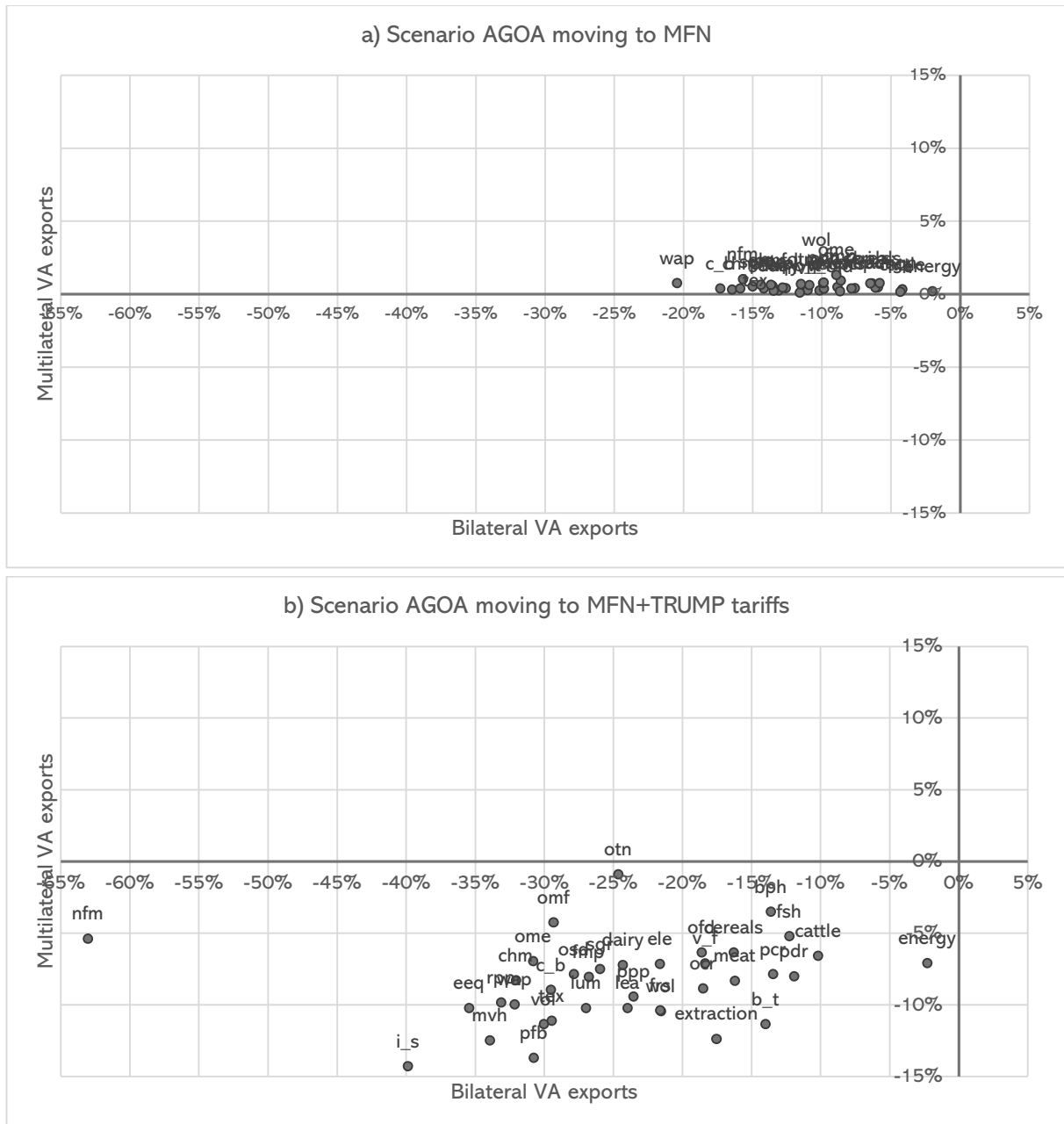
Source: Authors' simulation using the GTAP model.

Figure 5. Impact on goods exports, by destination (USD million)



Source: Authors' simulation using the GTAP model.

Figure 6. Variation in African exports of sectoral value-added to the US, bilateral and multilateral (% , excluding intra-Africa)



Source: Authors' simulation using the GTAP-VA model.

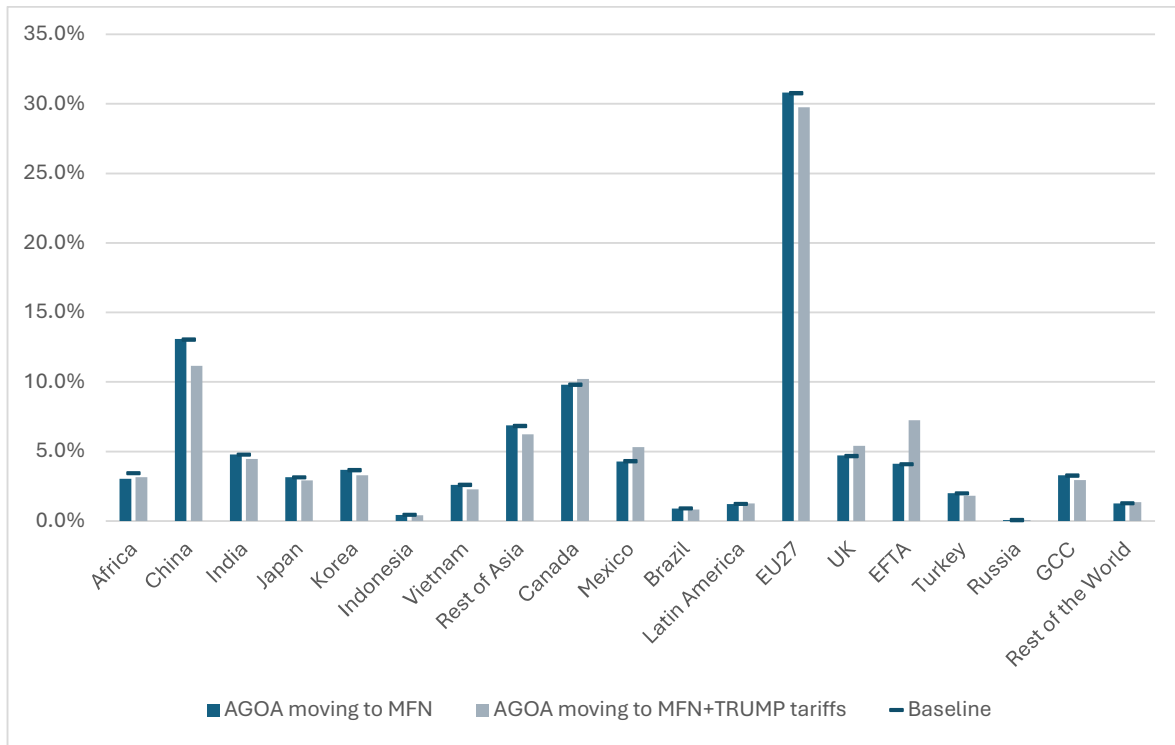
Table 1. Variation in Africa's VA to the US, by sector of origin of VA (USD million)

	a) Scenario AGOA moving to MFN			b) Scenario AGOA moving to MFN+TRUMP tariffs		
	Direct exports	Indirect exports	Total VA exports	Direct exports	Indirect exports	Total VA exports
Agriculture	-199,9	1,6	-198,3	-404,8	-162,0	-566,8
pdr	-1,1	0,0	-1,1	-2,2	-1,7	-3,9
cereals	-4,8	0,0	-4,8	-12,3	-5,1	-17,4
v_f	-51,2	0,0	-51,2	-92,4	-30,6	-123,0
osd	-15,4	-1,1	-16,5	-43,4	-18,2	-61,7
c_b	-6,4	-0,2	-6,6	-10,9	-2,3	-13,2
pfb	-3,4	0,0	-3,4	-7,4	-18,3	-25,7
ocr	-98,4	2,9	-95,6	-184,0	-39,6	-223,6
cattle	-5,1	-0,1	-5,2	-12,5	-5,5	-18,0
wol	-0,1	0,1	-0,1	-0,3	-0,7	-1,0
frs	-11,4	0,1	-11,3	-32,4	-37,5	-69,9
fsh	-2,5	-0,1	-2,6	-7,0	-2,5	-9,5
Energy	-109,0	3,9	-105,1	-123,4	-686,1	-809,5
Extraction	-42,5	0,0	-42,5	-121,7	-296,3	-418,0
Food	-108,4	-0,8	-109,1	-212,0	-43,0	-254,9
meat	-6,2	0,0	-6,2	-11,3	-2,7	-14,0
vol	-9,3	-0,2	-9,6	-22,2	-7,8	-30,0
dairy	-13,4	-0,3	-13,6	-24,8	-3,4	-28,2
pcr	-0,5	0,0	-0,5	-0,9	-0,3	-1,2
sgr	-7,0	-0,2	-7,2	-12,2	-2,0	-14,2
ofd	-56,4	-0,1	-56,6	-121,0	-17,7	-138,6
b_t	-15,5	0,0	-15,5	-19,6	-9,1	-28,7
Manufacturing	-1234,9	13,2	-1221,8	-3572,2	-631,2	-4203,4
tex	-55,0	-5,4	-60,4	-98,2	-18,8	-117,0
wap	-211,1	0,0	-211,1	-331,7	-9,9	-341,6
lea	-7,8	-0,1	-7,9	-14,5	-4,9	-19,4
lum	-17,9	-0,5	-18,4	-44,3	-11,9	-56,2
ppp	-14,3	-0,4	-14,7	-34,1	-13,2	-47,3
chm	-84,2	-3,6	-87,8	-169,8	-68,3	-238,1
bph	-6,5	0,1	-6,4	-13,5	-1,1	-14,6
rpp	-47,7	0,9	-46,9	-116,5	-31,9	-148,4
i_s	-22,3	0,2	-22,1	-152,6	-42,5	-195,1
nfm	-476,5	20,6	-455,9	-1912,5	-352,1	-2264,6
fmp	-19,0	0,3	-18,7	-59,1	-14,5	-73,6
ele	-22,5	0,3	-22,3	-33,8	-8,0	-41,8
eeq	-12,7	0,5	-12,2	-33,5	-19,2	-52,7
ome	-12,6	0,4	-12,2	-43,4	-6,2	-49,6
mvh	-42,6	0,2	-42,4	-124,5	-21,7	-146,2
otn	-7,1	0,0	-7,1	-15,2	-0,4	-15,6
omf	-175,0	-0,2	-175,3	-374,9	-6,7	-381,7
Toal goods	-1694,7	17,9	-1676,8	-4434,0	-1818,6	-6252,6

Note: Multilateral exports include other African countries as intermediate link towards the US.

Source: Authors' simulation using the GTAP-VA model.

Figure 7. Changes in the weights of the main linking countries channeling African VA to the US (p.p.)



Source: Authors' simulation using the GTAP-VA model.

Appendix I

Main sources for the simulation design

Federal Register — Executive Order 14257 (Apr 2, 2025): Reciprocal tariff framework (<https://www.federalregister.gov/documents/2025/04/07/2025-06063/regulating-imports-with-a-reciprocal-tariff-to-rectify-trade-practices-that-contribute-to-large-and>

White House — Executive Order 14257 (Apr 2, 2025) (<https://www.whitehouse.gov/presidential-actions/2025/04/regulating-imports-with-a-reciprocal-tariff-to-rectify-trade-practices-that-contribute-to-large-and-persistent-annual-united-states-goods-trade-deficits/>

White House — EO (Jul 31, 2025): Further Modifying the Reciprocal Tariff Rates (<https://www.whitehouse.gov/presidential-actions/2025/07/further-modifying-the-reciprocal-tariff-rates/>

GovInfo — Executive Order 14326 (Jul 31, 2025) record (<https://www.govinfo.gov/app/details/DCPD-202500815>

Public Inspection PDF — EO 14326 (Jul 31, 2025) incl. Annex I rates (<https://public-inspection.federalregister.gov/2025-15010.pdf?1754406907=>

White House — EO (Nov 14, 2025): Modifying the Scope... (Certain Agricultural Products) (<https://www.whitehouse.gov/presidential-actions/2025/11/modifying-the-scope-of-the-reciprocal-tariff-with-respect-to-certain-agricultural-products/>

Public Inspection PDF — EO (Nov 14, 2025) (<https://public-inspection.federalregister.gov/2025-21203.pdf>

CBP CSMS — Agricultural Products Exempted from Reciprocal Tariffs (Nov 14, 2025) (<https://content.govdelivery.com/accounts/USDHSCBP/bulletins/3fb83cb>

CBP CSMS — Reciprocal Tariff Updates Effective Aug 7, 2025 (<https://content.govdelivery.com/accounts/USDHSCBP/bulletins/3ec7b5e>

White House — Proclamation (Jun 3, 2025): Adjusting Imports of Aluminum and Steel (<https://www.whitehouse.gov/presidential-actions/2025/06/adjusting-imports-of-aluminum-and-steel-into-the-united-states/>

White House — Fact Sheet (Jun 3, 2025): Steel & Aluminum tariffs 25% → 50% (<https://www.whitehouse.gov/fact-sheets/2025/06/fact-sheet-president-donald-j-trump-increases-section-232-tariffs-on-steel-and-aluminum/>

Federal Register — Proclamation (Jun 3, 2025): Aluminum & Steel (<https://www.federalregister.gov/documents/2025/06/09/2025-10524/adjusting-imports-of-aluminum-and-steel-into-the-united-states>

White House — Proclamation (Oct 17, 2025): MHDVs/parts & buses (<https://www.whitehouse.gov/presidential-actions/2025/10/adjusting-imports-of-medium-and-heavy-duty-vehicles-medium-and-heavy-duty-vehicle-parts-and-buses-into-the-united-states/>

White House — Fact Sheet (Oct 17, 2025): MHDVs/parts & buses (<https://www.whitehouse.gov/fact-sheets/2025/10/fact-sheet-president-donald-j-trump-addresses-the-threat-to-national-security-from-imports-of-medium-and-heavy-duty-vehicles-parts-and-buses/>

USTR — Fact Sheet: U.S.–Korea Strategic Trade and Investment Deal (<https://ustr.gov/about/policy-offices/press-office/fact-sheets/2025/november/fact-sheet-united-states-and-korea-agree-korea-strategic-trade-and-investment-deal>

Federal Register — Implementing tariff elements of the U.S.–Korea deal (Dec 4, 2025) (<https://www.federalregister.gov/documents/2025/12/04/2025-21940/implementing-certain-tariff-related-elements-of-the-us-korea-strategic-trade-and-investment-deal>

White House — Fact Sheet: U.S.–Switzerland–Liechtenstein trade deal (Nov 14, 2025) (<https://www.whitehouse.gov/fact-sheets/2025/11/fact-sheet-the-united-states-switzerland-and-liechtenstein-reach-a-historic-trade-deal/>)

White House — Joint Statement: U.S.–Switzerland–Liechtenstein framework (Nov 14, 2025) (<https://www.whitehouse.gov/briefings-statements/2025/11/joint-statement-on-a-framework-for-a-united-states-switzerland-liechtenstein-agreement-on-fair-balanced-and-reciprocal-trade/>)

Swiss Federal Council — Declaration of intent (tariff limited to 15%) (Nov 14, 2025) (<https://www.news.admin.ch/en/newsb/EUhpFWGrZhLKPQaSusIrb>)

Reuters — What did Trump and Xi agree to? (Nov 1, 2025) (<https://www.reuters.com/world/us/what-did-trump-xi-agree-tariffs-export-controls-fentanyl-2025-11-01/>)

PIIE — US–China fentanyl deal (20% → 10%) and average tariff effect (Oct 30, 2025) (<https://www.piie.com/blogs/realtime-economics/2025/us-china-fentanyl-deal-could-benefit-economy-and-save-lives>)

White House — Fact Sheet (Apr 2, 2025): USMCA compliant goods 0%; non-compliant 25%; energy/potash 10% (<https://www.whitehouse.gov/fact-sheets/2025/04/fact-sheet-president-donald-j-trump-declares-national-emergency-to-increase-our-competitive-edge-protect-our-sovereignty-and-strengthen-our-national-and-economic-security/>)

Appendix II

AGOA countries and Aggregation

Table A1. 2025 List of AGOA Eligible and Ineligible Countries

nr.	country	included	nr. gtap	code	country/region
1	Angola	yes	135	AGO	Angola
2	Benin	yes	122	BEN	Benin
3	Botswana	yes	158	BWA	Botswana
4	Cabo Verde	yes	134	XWF	Rest of Western Africa
5	Chad	yes	137	TCD	Chad
6	Comoros	yes	144	COM	Comoros
7	Republic of the Congo	yes	138	COG	Congo
8	Democratic Republic of the Congo	yes	139	COD	Democratic Republic of the Congo
9	Cote d'Ivoire	yes	125	CIV	Côte d'Ivoire
10	Djibouti	<i>n.a.</i>			
11	Eswatini	yes	159	SWZ	Eswatini
12	The Gambia	yes	134	XWF	Rest of Western Africa
13	Ghana	yes	126	GHA	Ghana
14	Guinea-Bissau	yes	134	XWF	Rest of Western Africa
15	Kenya	yes	146	KEN	Kenya
16	Lesotho	yes	162	XSC	Rest of South African Customs Union
17	Liberia	yes	134	XWF	Rest of Western Africa
18	Madagascar	yes	147	MDG	Madagascar
19	Malawi	yes	148	MWI	Malawi
20	Mauritania	yes	129	MRT	Mauritania
21	Mauritius	yes	149	MUS	Mauritius
22	Mozambique	yes	150	MOZ	Mozambique
23	Namibia	yes	160	NAM	Namibia
24	Nigeria	yes	131	NGA	Nigeria
25	Rwanda*	no	151	RWA	Rwanda
26	Sao Tome & Principe	yes	142	STP	Sao Tome and Principe
27	Senegal	yes	132	SEN	Senegal
28	Sierra Leone	yes	134	XWF	Rest of Western Africa
29	South Africa	yes	161	ZAF	South Africa
30	Tanzania	yes	153	TZA	Tanzania, United Republic of
31	Togo	yes	133	TGO	Togo
32	Zambia	yes	155	ZMB	Zambia

*(AGOA apparel benefits suspended by POTUS effective July 31, 2018).

Source: [2025 List of AGOA Eligible and Ineligible Countries 12212024.pdf](#)

Table A2. Regional aggregation

Africa countries		
Macro region	Decsription	Comprising
North Africa	Algeria	dza
	Egypt	egy
	Morocco	mar
	Tunisia	tun
Western Africa	Benin	ben
	Burkina Faso	bfa
	Cameroon	cmr
	C te d'Ivoire	civ
	Ghana	gha
	Guinea	gin
	Mali	mli
	Mauritania	mrt
	Niger	ner
	Nigeria	nga
	Senegal	sen
	Togo	tgo
	Rest of Western Africa*	xwf
Eastern Africa	Angola	ago
	Central African Republic	caf
	Chad	tcd
	Congo	cog
	Democratic Republic of the Congo	cod
	Equatorial Guinea	gnq
	Gabon	gab
	Sao Tome and Principe	stp
	Burundi	bdi
	Comoros	com
	Ethiopia	eth
	Kenya	ken
	Madagascar	mdg
	Malawi	mwi
	Mauritius	mus
	Mozambique	moz
	Rwanda	rwa
	Sudan	sdn
	United Republic of Tanzania	tza
	Uganda	uga
	Zambia	zmb
	Zimbabwe	zwe
Southern Africa	Botswana	bwa
	Eswatini	swz
	Namibia	nam
	South Africa	zaf
	Rest of Southern African Custom**	xsc
	Rest of Africa	xec, xnf
Non-Africa countries		
	China	chn hkg
	India	ind
	Japan	jpn
	Korea	kor
	Indonesia	idn
	Vietnam	vnm
	Rest of Asia	mng twn xea brn khm lao mys phl sgp tha xse afg bgd npl pak lka xsa
	USA	usa
	Canada	can
	Mexico	mex
	Brazil	bra
	Latin America	arg bol chl col ecu pry per ury ven xsm cri gtm hnd nic pan slv xca dom hti jam pri tto xcb

	EU27	aut bel bgr hrv cyp cze dnk est fin fra deu grc hun irl ita lva ltu lux mlt nld pol prt rou svk svn esp swe
	UK	gbr
	EFTA	che nor xef
	Turkey	tur
	Russia	rus
	GCC	bhr kwt omn qat sau are
	Oceania	aus nzl xoc
	Rest of World	xna alb srb blr ukr xee xer kaz kgz tjk uzb xsu arm aze geo irn irq isr jor lbn pse syr xws xtw

* Includes: Cabo Verde, Gambia, Guinea-Bissau, Liberia, Saint Helena, Sierra Leone

** Includes: Lesotho

Source: Authors' elaborations using the GTAP Data Base (v12).

Table A3. Sectoral aggregation

Macro category	no.	sector	gtap code	description
Agriculture	1		pdr	Paddy rice
	2	Cereals	wht	Wheat
			gro	Cereal grains nec
	3		v_f	Vegetables, fruit, nuts
	4		osd	Oil seeds
	5		c_b	Sugar cane, sugar beet
	6		pfb	Plant-based fibers
	7		ocr	Crops nec
	8	Cattle	ctl	Bovine cattle, sheep and goats
			oap	Animal products nec
	9		wol	Wool, silk-worm cocoons
Food products	10		frs	Forestry
	11		fsh	Fishing
	12	Meat prd.	cmt	Bovine meat products
			omt	Meat products nec
	13		vol	Vegetable oils and fats
	14	Dairy	mil	Dairy products
			rmk	Raw milk
	15		pcr	Processed rice
Energy	16		sgr	Sugar
	17		ofd	Food products nec
	18		b_t	Beverages and tobacco products
			coa	Coal
Extraction			oil	Oil
			gas	Gas
			p_c	Petroleum, coal products
Manufacturing	19	Energy	oxt	Minerals nec
			nmm	Mineral products nec
	20	Extraction	tex	Textiles
	21		wap	Wearing apparel
	22		lea	Leather products
	23		lum	Wood products
	24		ppp	Paper products, publishing
	25		chm	Chemical products
	26		bph	Basic pharmaceutical products
	27		rpp	Rubber and plastic products
	28		i_s	Ferrous metals
	29		nfm	Metals nec
	30		fmp	Metal products
	31		ele	Computer, electronic and optic
	32		eeq	Electrical equipment
	33		ome	Machinery and equipment nec
	34		mvh	Motor vehicles and parts
	35		otn	Transport equipment nec
	36		omf	Manufactures nec
Services	37		otp	Transport nec
	38	Transport	wtp	Water transport
			atp	Air transport
			ely	Electricity
			gdt	Gas manufacture, distribution
			wtr	Water
			cns	Construction
			trd	Trade
			afs	Accommodation, Food and servic
			whs	Warehousing and support activi
			cmn	Communication
			ofi	Financial services nec
			ins	Insurance
			rsa	Real estate activities
			obs	Business services nec
			ros	Recreational and other service

			osg	Public Administration and defe
			edu	Education
			hht	Human health and social work a
			dwe	Dwellings

Source: Authors' elaborations using the GTAP Data Base (v12).