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TRADE DIAGNOSTIC

Ethiopia

An assessment of Ethiopia's trade structure, competitiveness and AfCFTA integration opportunities using multi-region input–output accounting and CGE simulation.

AICTEM TRADE DIAGNOSTIC

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Models: FE-PPML gravity, corridor network, calibrated Armington sourcing, MRIO value-chain analytics, Caliendo–Parro CGE

Key datasets: GTAP Africa V3 (GTAP 11b, 2017; 62 regions, 65 commodities), World Bank WDI and LPI, AICTEM corridor and port network

Scenarios: 2017 benchmark; AfCFTA facilitation and trade-cost counterfactuals

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Executive Summary

Ethiopia is a landlocked African economy with a GDP of about $126.4 bn. It is a member of COMESA and IGAD and a signatory of the African Continental Free Trade Area (AfCFTA). This assessment applies an integrated spatial–gravity–MRIO–network–CGE pipeline — the same used at continental level — to diagnose why Ethiopia under-trades, with whom, through which corridors and sectors, and what to do about it (Maliszewska and Ruta, 2020; UNECA, 2021).

- **Intra-African trade is realised only partly.** Actual intra-African exports of about $409 m fall short of an estimated frictionless potential of $4.6 bn — a missing-trade gap of $4.2 bn, a fill ratio of 0.09. The gap is wider than earlier rounds of this assessment reported, because pricing port dwell time at the value of time raised modelled delivered costs across the continent — and for a landlocked economy paying for the delay twice, once at the quay in Djibouti and again on the inland haul, it raised them more than most.

- **Its largest regional markets** are Somalia, Sudan and Kenya, but the largest unrealised potential lies elsewhere — in South Africa, Angola and Nigeria, which together account for $1.4 bn of the missing $4.2 bn.

- **Non-tariff and standards reform and port efficiency are the two levers measurably larger than tariff removal.** Ethiopia's average delivered transport cost to African markets is about 18.8% of cargo value, across 1.6 border crossings. Removing tariffs alone raises intra-African exports **+1.8%** — a genuine estimate now that bilateral duties are identified, but an imprecise one, consistent with a substantially larger gain — while the full AfCFTA facilitation package raises them by about **116.6%** (NTB/standards 74.5%; port efficiency 23.1%; corridor upgrading 10.2%; rail 7.8%; one-stop border posts 7.4%). Of the facilitation levers, non-tariff and standards reform and port efficiency are larger than tariff removal at conventional confidence; the corridor, rail and border levers are larger in expectation but their confidence bands overlap it.

- **Import dependence is concentrated** in construction, trade, business services nec, transport nec, where Ethiopia sources inputs from outside Africa even where regional suppliers exist.

- **Regional sourcing responds well to facilitation.** Ethiopia meets **5.46%** of its imported input demand from African suppliers, and the full package lifts that to **6.96%** — **+1.50 percentage points, +27.5% in relative terms**, against a continental average of +16.5%. Landlocked economies gain most in this model, because the overseas alternative they are substituting away from carries an inland haul that coastal economies do not pay (Section 6.6).

- **Economy-wide gains are progressive:** a −20% intra-African trade-cost cut raises welfare by 0.5% in the Caliendo–Parro CGE, mainly through higher real wages.

Recommended reforms, in priority order: (1) dismantle non-tariff barriers and harmonise

standards/SPS; (2) complete one-stop border posts and digital customs; (3) upgrade and climate-proof the priority corridors (Djibouti Corridor) and build corridor redundancy; (4) build value-chain and energy capacity; and (5) implement AfCFTA tariff liberalisation as the enabling foundation.

1. Introduction

Ethiopia's trade is shaped by its geography and economic structure. As a landlocked economy dependent on transit corridors and foreign gateway ports over which it has no direct control and a member of COMESA, IGAD, its realistic market is its African neighbourhood — yet, like most of the continent, it trades far less regionally than its economic size implies (UNCTAD, 2021). Intra-African trade remains a small share of African economies' total, and the gap is not merely statistical: it means producers forgo nearby markets and fail to build the supplier networks that underpin industrialisation.

The candidate explanations are well known but rarely quantified together: geography and distance; thin, port-oriented infrastructure; border and customs frictions; non-tariff barriers and divergent standards; weak and similar productive structures; and missing regional value chains (Limão and Venables, 2001; World Bank, 2020). This assessment runs all of them on one database, so that Ethiopia's constraints can be measured and ranked rather than asserted.

The central question is therefore *why Ethiopia under-trades with its neighbours, with whom, through which corridors and sectors, and which interventions deliver the largest gains*. The report answers it through structural diagnostics (Sections 2–9) and forward-looking simulation (Sections 10–11), then ranks the reforms (Sections 12–14). A note on data: monetary values are GTAP gross flows (larger than official merchandise statistics); macroeconomic figures (Section 2) are approximate (World Bank WDI; IMF; national sources); all model-derived results are exact outputs of the pipeline and reproduced in the annex tables.

Ethiopia's regional-integration agenda runs through the AfCFTA and its RECs (COMESA, IGAD). The AfCFTA — the largest free-trade area by membership in the world — is projected to raise intra-African trade substantially, but the evidence is consistent that the gains come overwhelmingly from trade facilitation and the removal of non-tariff measures rather than from tariff liberalisation, which is already largely accomplished within Ethiopia's RECs (Maliszewska and Ruta, 2020; UNECA, 2021). This assessment quantifies, for Ethiopia specifically, where those facilitation gains would accrue and how large they could be.

Ethiopia is Africa's oldest independent polity and, until very recently, one of its fastest-growing economies, yet it remains a landlocked, low-income state whose trade story is inseparable from its history of state-led development. Never formally colonised, Ethiopia entered the modern era with an imperial bureaucracy and a peasant agrarian base that the 1974 revolution and the Derg's command economy reshaped along Marxist-Leninist lines. The 1991 victory of the Ethiopian People's Revolutionary Democratic Front (EPRDF) under Meles Zenawi installed a developmental-state model explicitly modelled on East Asia: the state would pick winners, channel directed credit through the Development Bank of Ethiopia and the Commercial Bank of Ethiopia, hold the commanding heights

(Ethiopian Airlines, Ethio Telecom, Ethiopian Electric Power, Ethiopian Shipping and Logistics), and pursue agricultural-development-led industrialisation. Growth averaged near double digits through the 2000s and 2010s, financed heavily by public investment in roads, hydropower and the rail link to Djibouti, but built on a thin export base and a chronically overvalued, rationed currency.

Coffee sits at the centre of Ethiopia's economic identity and its export account. Ethiopia is the botanical birthplace of *Coffea arabica* — the forests of Kaffa give the crop its name — and coffee remains the single most important formal export, grown by smallholders across the highlands of Sidama, Yirgacheffe, Jimma, Harar and Guji and traded since 2008 through the Ethiopia Commodity Exchange (ECX) in Addis Ababa. Coffee is woven into ritual, employment and foreign-exchange earnings alike, and the country's "single-origin" reputation gives it a premium that few African exports command. Around this agricultural core the developmental state bolted an aggressive industrial-parks programme: from the mid-2010s the Industrial Parks Development Corporation built state-of-the-art, plug-and-play parks — Hawassa, Bole Lemi, Kombolcha, Mekelle, Adama, Dire Dawa — to attract export-oriented apparel and footwear manufacturers (PVH/Calvin Klein, Children's Place, H&M suppliers, Chinese and Indian firms) under a vision of becoming the "manufacturing hub of Africa" by 2025.

Everything in Ethiopia's external trade runs through Djibouti. Since the 1998–2000 war with Eritrea closed the ports of Assab and Massawa, Ethiopia has routed well over 90 percent of its maritime trade through the port of Djibouti, a single foreign gateway reached by the Addis Ababa–Djibouti road and the Chinese-built standard-gauge electrified railway commissioned in 2018. This dependence on one corridor and one neighbour — captured in the report's modelled Djibouti Corridor (Djibouti $\rightarrow$ ETH $\rightarrow$ South Sudan) and Djibouti's high network betweenness — is the geographic fact around which every logistics calculation turns, and it is why the assessment's emphasis on corridor reliability and redundancy lands so squarely on Ethiopia.

Its integration standing is shaped by being an early regional joiner but a late and partial liberaliser. Ethiopia is a founding member of COMESA and of IGAD, headquarters the African Union and the UN Economic Commission for Africa in Addis Ababa, and signed and ratified the African Continental Free Trade Area, depositing its instrument and beginning AfCFTA tariff scheduling. Yet — crucially for this report — Ethiopia is *not* a member of the COMESA Free Trade Area in the way most members are; it has long maintained MFN tariffs and only selectively offered COMESA preferences, and it is not in any customs union. It has been negotiating WTO accession since 2003 without conclusion. This is the paradox the assessment quantifies: an economy structurally oriented to its neighbourhood (its largest single African markets are Somalia, Sudan, Kenya and Djibouti) yet trading at only 0.09 of its frictionless potential, held back less by its own tariff schedule than by non-tariff frictions, corridor and gateway cost, and capacity.

The central trade challenge is a triad of foreign-exchange scarcity, landlockedness and conflict. Chronic FX rationing — a legacy of the overvalued birr, weak export diversification, and an import bill dominated by fuel, machinery and fertiliser — has for years forced the central bank to ration hard currency, generating import backlogs, parallel-market premia that at times exceeded 100 percent, and

arrears that complicated debt service and triggered a 2021 G20 Common Framework restructuring and a 2024 IMF Extended Credit Facility. Landlockedness compounds this by adding transit costs and a foreign chokepoint to every transaction. And conflict — the 2020–2022 Tigray war, which severed the northern corridor and the Kombolcha and Mekelle parks, alongside insecurity in Amhara and Oromia — has periodically suspended AGOA eligibility (Ethiopia was removed in 2022), disrupted production, and frightened the foreign investors the industrial-parks model depends on. The assessment's diagnosis — that facilitation, corridor resilience and value-chain deepening, not tariff cuts, are the binding levers — speaks directly to a country whose growth model has run ahead of its trade plumbing.

2. Country Economic Structure

2.1 Macroeconomic Profile

Table 1: Ethiopia: Macroeconomic profile

Indicator	Value
Capital	Addis Ababa
GDP (approx.)	$126.4 bn
Population	135.5 million
GDP per capita	$933
Logistics Performance Index	2.4 / 5
Landlocked	Yes
REC memberships	COMESA, IGAD

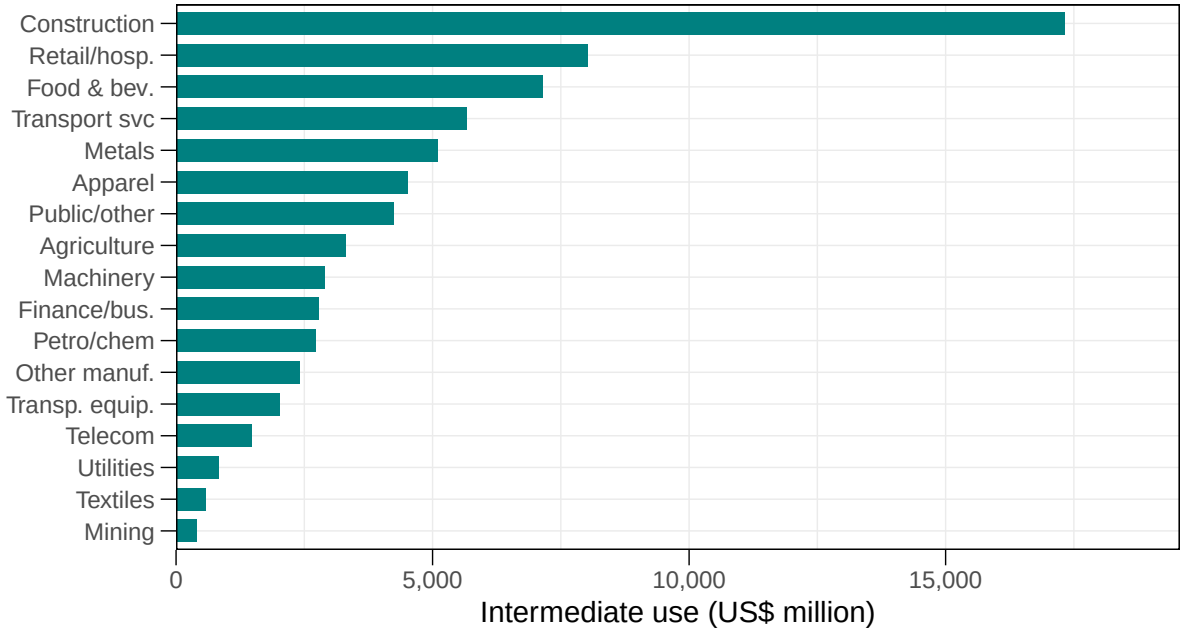
Notes: GDP, population and per-capita figures are approximate external estimates (World Bank WDI, IMF and national sources), not model output.

Two structural facts frame everything that follows. First, Ethiopia's logistics performance (LPI 2.4/5) and the delivered cost of moving its goods to African markets — 18.8% of cargo value on this model's own accounting — make logistics a first-order constraint, not a footnote. Second, its landlocked position means its external trade has no domestic outlet and depends on transit through neighbours and their ports — a dependence the spatial model quantifies in Section 4.

2.2 Sectoral Structure

Ethiopia's industrial structure is best read through intermediate input use, which ranks sectors by how much they buy from other industries rather than by value added. Figure 1 sets it out.

Figure 1: Ethiopia: sectors ranked by intermediate input use



Notes: The 65 GTAP commodities are aggregated for display into 17 broad groups, weighted by the underlying levels, so no commodity is dropped; the commodity-level table is in Annex C. US$ million. Intermediate input use is a proxy for activity scale; primary agriculture reads small on this metric because it generates a high share of its value with little purchased input.

Construction dominates the ranking at $17.31 bn of purchased inputs — more than twice the next sector and a direct reflection of two decades of dam, road, rail and industrial-park building — ahead of maintenance, retail & hospitality at about $8.0 bn (of which trade alone is $5.96 bn), food and beverages at $7.1 bn and transport services at $5.6 bn. Agriculture, despite employing the great majority of Ethiopians, buys only about $3.3 bn of inputs, because smallholder farming generates most of its value with little purchased input. That ordering matters for what follows: these are the sectors whose growth pulls hardest on suppliers, and Section 6.4 shows that a large share of that pull today leaks to suppliers outside Africa rather than to regional ones.

2.3 Production Geography

Ethiopia's economic geography is organised around its commercial-and-industrial core (the capital region and main cities), its agricultural belts, and the border gateways through which its regional trade physically passes — notably the Djibouti Corridor. As a landlocked economy it is also a transit node: goods bound for its interior neighbours pass through it, making its corridors and borders regionally significant. This geography — a producing core feeding goods outward through a ring of border gateways, while drawing imports inward along the main corridors — is the spatial structure the rest of the report analyses.

3. Trade Profile

Ethiopia's economic geography radiates from Addis Ababa, a high-altitude primate city of more than five million that concentrates the country's administration, finance, manufacturing and diplomacy. At roughly 2,355 metres, Addis hosts the African Union, UNECA, the head offices of Ethiopian Airlines at Bole International Airport (the busiest hub in Africa for passengers and a major air-cargo node for perishables), the Commercial Bank of Ethiopia, the National Bank, the Ethiopia Commodity Exchange, and the Bole Lemi and Eastern Industry Zone (Dukem) manufacturing clusters on its periphery. From this core the road and rail trunks fan out: south to the Rift Valley, east along the lifeline to Djibouti, and north toward Amhara and the now war-scarred Tigray. The report's "producing core feeding goods outward through a ring of border gateways" is, concretely, Addis pushing exports down the eastern corridor while pulling imports back up it.

Hawassa, on the shore of Lake Awasa in the southern Rift, is the flagship of the industrial-parks push. The Hawassa Industrial Park, opened in 2017 and developed with Chinese contractor CGCOC and anchored by the US apparel group PVH (Calvin Klein, Tommy Hilfiger), was designed as a vertically integrated, eco-friendly textile-and-apparel campus employing tens of thousands, mostly young women drawn from Sidama and the surrounding SNNPR highlands. Hawassa exemplifies both the promise — serviced land, shared power, customs on site — and the fragility of the model, having struggled with worker turnover, low wages, FX repatriation problems and, after the 2022 AGOA expulsion, lost US-market access. Bole Lemi (Phases I and II) in Addis and Kombolcha in Amhara replicate the formula; Kombolcha and Mekelle in the north were directly disrupted by the Tigray conflict.

Dire Dawa, Ethiopia's second city and a historic railway town, anchors the east. Founded around the original French-built Addis–Djibouti metre-gauge railway of 1917, Dire Dawa sits on the main corridor to Djibouti, hosts a free-trade zone and an industrial park, and is the commercial hub of the eastern lowlands and the gateway toward Harar and the Somali region. The corridor between Addis, Adama (Nazret, a major logistics and manufacturing town with the Adama Industrial Park), Awash, Dire Dawa and the border post at Galafi/Dewele is the spine on which the country's trade physically depends.

The agricultural belts give Ethiopia its export commodities. The coffee belt arcs through the southern and southwestern highlands — Sidama, Gedeo (Yirgacheffe), Jimma, Kaffa, Guji and, in the east, Harar — supplying the single-origin arabicas that dominate exports. The oilseed and pulse belt lies in the western and northwestern lowlands of Benishangul-Gumuz, Amhara (Gondar, Humera) and the Tigray fringe, producing sesame (notably the prized Humera and Wollega grades), niger seed and haricot beans largely for China and the Gulf. Khat, a stimulant leaf, is grown around Hararghe and Sidama and exported by air and road to Somalia, Somaliland and Djibouti. The cut-flower industry clusters in the cool highlands around Holeta, Sebeta, Ziway and the Rift Valley lakes, exporting roses to the Dutch auctions via Bole's cold chain. Sugar estates (Wonji, Metahara, Finchaa, Tendaho, Kesem, Omo-Kuraz) dot the Rift and the Awash valley, and large-scale state and commercial farms occupy the western frontier.

Energy geography is dominated by the Grand Ethiopian Renaissance Dam (GERD). On the Blue Nile near the Sudanese border in Benishangul-Gumuz, the 5,150 MW GERD — Africa's largest hydropower project, financed domestically through bonds after Egypt and Sudan objected over Nile waters — began generating in 2022 and reached substantial completion, promising to roughly double national generation and underpin both the industrial-parks agenda and electricity exports to Djibouti, Sudan and Kenya (the latter via the Eastern Africa Power Pool interconnector). Yet domestic grid reliability remains weak, and energy cost and reliability recur in the report as a productive-capacity bottleneck.

The border towns mark Ethiopia's outward connections. Galafi and Dewele are the Djibouti crossings; Metema and Galabat connect to Sudan toward Gedaref and Khartoum (Ethiopia's second-largest African export market in the model, after Somalia); Moyale is the Kenya gateway on the Isiolo–Marsabit highway toward Mombasa; Pagak and Akobo lead to South Sudan; Tog Wajaale connects to Somaliland and the port of Berbera; and Humera sits at the contested Sudan-Eritrea tri-border. Each is a node in the report's accessibility surface, and the cheapness of the Djibouti and South Sudan links versus the cost of reaching distant markets defines Ethiopia's realistic trade map.

3.1 Export Structure

Ethiopia's exports combine its primary-commodity and agricultural base with a growing range of regional manufactures and processed goods. In the MRIO gross accounts its productive export base — the part with the clearest regional growth potential — is concentrated in the sectors where it holds comparative advantage (Section 7); its single largest African market is Somalia. The orientation of the export base, between its African neighbourhood and the rest of the world, is decomposed in Section 3.4.

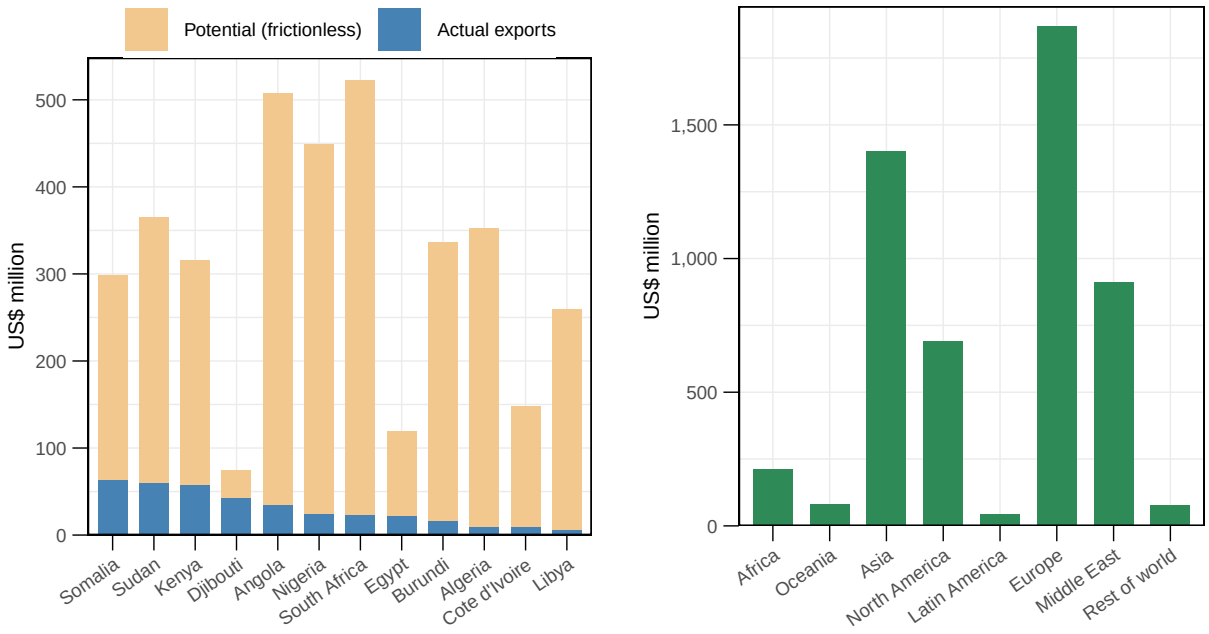
3.2 Import Structure

Ethiopia's imports are dominated by goods it does not yet produce at scale — refined fuels, machinery and electrical equipment, vehicles, pharmaceuticals, chemicals and fertilisers, iron and steel, and (for many economies) staple foods. By origin these come overwhelmingly from outside Africa — China, India, the Gulf and Europe — plus a few regional partners. This import structure is the source of the import-leakage that the MRIO analysis (Section 6.4) identifies as a regional-sourcing opportunity, and it ties Ethiopia's production costs to extra-African supply chains and shipping margins, so that cheaper logistics act like an economy-wide productivity gain.

3.3 Intra-African Trade

Ethiopia's regional exports are concentrated in a handful of neighbouring markets. Figure 2 sets out the largest, actual exports against the frictionless gravity potential, alongside the destination split by world region.

Figure 2: Export markets: African partners and world regions



Notes: Left: largest intra-African export partners, actual (blue) against frictionless gravity potential (orange), US$ million. Right: gross exports by world region, US$ million. Source: GTAP MRIO gross flows.

Ethiopia's African export book is strikingly small and strikingly flat: Somalia leads at $63 m, Sudan follows at $60 m, Kenya at $57 m and Djibouti at $42 m, and no African market takes as much as $70 m (Table 2). Djibouti's gap is the one that is nearest to closed — $42 m actual against a $74 m potential, a fill ratio of 0.57, the best of any partner — and it is closest precisely because Djibouti is reachable overland at 2.7% of cargo value. The largest gaps sit with markets Ethiopia reaches only by sea: South Africa ($500 m missing), Angola ($473 m) and Nigeria ($425 m). So the neighbourhood is where trade is realised and the far coast is where it is forgone; a facilitation effort has to do both, deepening the cheap neighbourhood and cutting the cost of the maritime tail (Section 5).

The ranked partners and the size of each gap are:

Table 2: Ethiopia: Intra-African export partners: actual, gravity potential and missing trade

Partner	Actual	Potential	Missing	Ad-valorem cost
Somalia	$63 m	$299 m	$236 m	14.0%
Sudan	$60 m	$365 m	$305 m	17.3%
Kenya	$57 m	$316 m	$259 m	16.1%
Djibouti	$42 m	$74 m	$32 m	2.7%
Angola	$34 m	$507 m	$473 m	16.7%
Nigeria	$24 m	$449 m	$425 m	19.7%
South Africa	$22 m	$522 m	$500 m	19.1%
Egypt	$22 m	$119 m	$98 m	16.1%

Notes: Gravity potential is the frictionless benchmark; missing trade is the difference. Ad-valorem cost is delivered transport cost as a share of cargo value. Values are GTAP gross flows and exceed official merchandise statistics.

Ethiopia's export basket is overwhelmingly agricultural and primary, led by coffee, oilseeds, khat, cut flowers, gold and a still-modest manufacturing tail of leather and apparel. Coffee is the flagship, typically the largest single foreign-exchange earner, with green arabica beans — Sidama, Yirgacheffe, Jimma, Limu, Harar and Guji single origins — shipped to Germany, Saudi Arabia, the United States, Japan and increasingly China. Oilseeds, chiefly sesame from the Humera and Wollega growing areas plus niger seed, are the second pillar, sold heavily into China for confectionery and oil and into the Gulf and Turkey. Khat is a quietly enormous earner: the fresh stimulant leaf, exported by air and road to Somalia, Djibouti and Somaliland, generates several hundred million dollars annually and is one of the few exports with deep regional (intra-African) orientation, feeding the report's Somalia and Djibouti flows.

Cut flowers transformed Ethiopia into a major horticultural exporter within two decades. Roses and cuttings grown around the Rift Valley lakes and the Holeta–Sebeta highlands fly via Ethiopian Airlines' cold chain to the Royal FloraHolland auctions in the Netherlands and onward to Europe and the Gulf, making Ethiopia the second-largest flower exporter in Africa after Kenya. Gold — much of it artisanally mined in Oromia (Lega Dembi) and Benishangul, but a large share smuggled or sold informally — fluctuates as an earner and was deliberately mobilised by the central bank as an FX source. Leather and leather products (Ethiopia holds Africa's largest cattle, sheep and goat herd, and its highland sheepskin commands a global premium for gloving) and apparel and textiles from Hawassa, Bole Lemi and Kombolcha round out the basket, though both remain far below their potential after the AGOA suspension and the conflict.

Imports are dominated by goods Ethiopia does not yet make: refined fuels, machinery, vehicles, fertiliser, pharmaceuticals, iron and steel, edible oil and wheat. Petroleum products — all imported, refined-fuel demand running through Djibouti's fuel terminals — are the largest single import line and a perennial FX drain, as the report's petroleum input-leakage figure underscores. Capital goods and machinery for the construction and manufacturing drive, vehicles, electrical equipment, fertiliser for the agricultural programme, and large volumes of wheat and edible oil (Ethiopia is a major wheat importer despite a recent self-sufficiency push) complete the bill. By origin, imports come overwhelmingly from outside Africa — China dominates capital goods and is the largest single source, with India, the Gulf states, and Europe following; regional imports come mainly from Egypt, Kenya and Djibouti (re-exports and transit services), matching the report's intra-African import table.

The destination geography of exports splits sharply between a global commodity market and a regional neighbourhood. Coffee, oilseeds, flowers and gold go predominantly extra-African — to Asia (China, Saudi Arabia, Japan), Europe (Germany, the Netherlands) and the Gulf — which is why the report's world-regions chart shows heavy non-African export shares. The genuinely regional exports are khat to Somalia and Djibouti, electricity to Djibouti and Sudan, and an assortment of processed goods and re-exports; the report's identification of Somalia and Sudan as the largest African markets — $63 m and $60 m respectively in gross MRIO terms, ahead of Kenya and Djibouti — reflects the khat, livestock and electricity trades rather than any manufactured export, and confirms how thin the regional book is beside the $1.87 bn that goes to Europe and the $1.40 bn to Asia.

Strategic dependencies cluster around fuel, fertiliser, wheat, pharmaceuticals and the Djibouti gateway, and they intersect with chronic foreign-exchange scarcity. Because every drop of petroleum, most fertiliser, most wheat in deficit years, and the bulk of medicines and capital goods are imported and priced in dollars, Ethiopia's production costs are tethered to extra-African supply chains and shipping margins — precisely the channel the report describes whereby cheaper logistics act like an economy-wide productivity gain. Overlaying all of this is the FX constraint: for much of the 2010s and early 2020s the National Bank rationed scarce dollars, prioritising fuel and strategic imports, generating letter-of-credit queues, a wide parallel-market premium, and import compression that throttled manufacturing — including the very industrial parks meant to earn the foreign exchange. The July 2024 move to a market-determined exchange rate under the IMF programme was designed to unwind exactly this distortion, but the legacy of rationing remains the defining feature of Ethiopia's trade environment and the backdrop to every value chain and corridor discussed below.

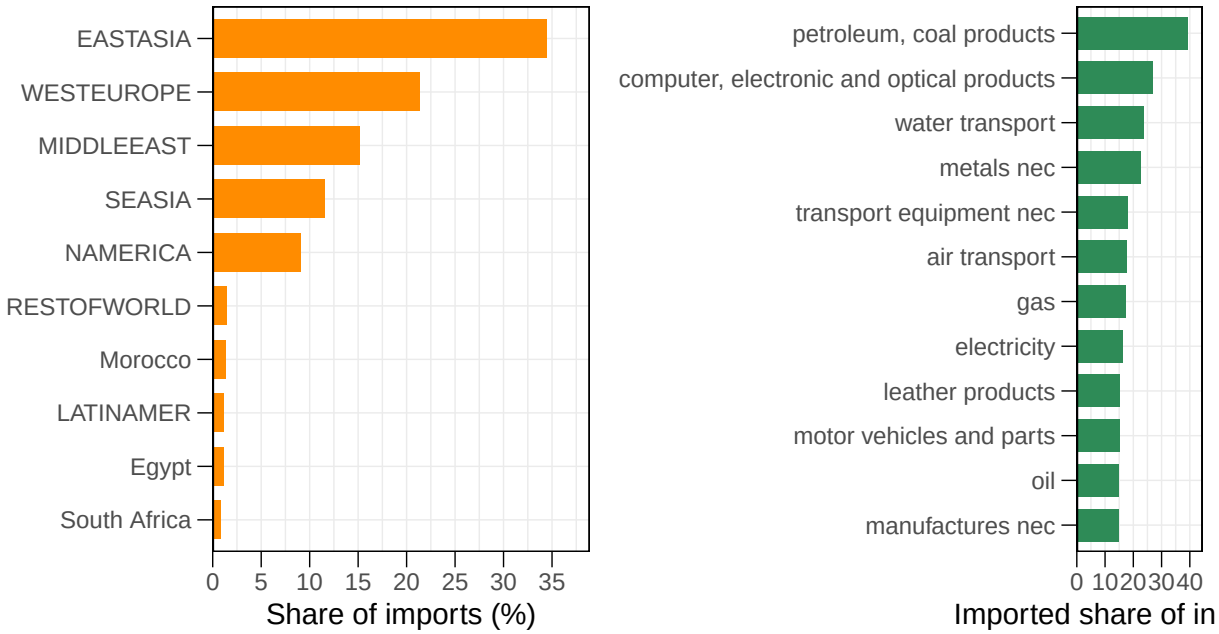
3.4 Extra-African Dependence

The right panel of Figure 2 completes the picture: Ethiopia's $213 m of gross exports to Africa is dwarfed by the $1.87 bn it sends to Europe, the $1.40 bn to Asia, the $909 m to the Middle East and the $689 m to North America, since coffee, oilseeds, cut flowers and gold — the exports that anchor the foreign-exchange account — move overwhelmingly to Asia, Europe and the Gulf rather than to neighbours. The Africa bar is nonetheless the more development-relevant one: it tracks Ethiopia's own production rather than re-exported commodity flows, and it is the part of the export base with headroom to grow, since the heavy extra-African dependence on the import side (Section 3.2) shows the same pattern running the other way (Foster-McGregor et al., 2015).

3.5 Trade Dependency Analysis

Figure 3 puts the two halves of that dependence side by side.

Figure 3: Ethiopia: import dependence by partner and by sector



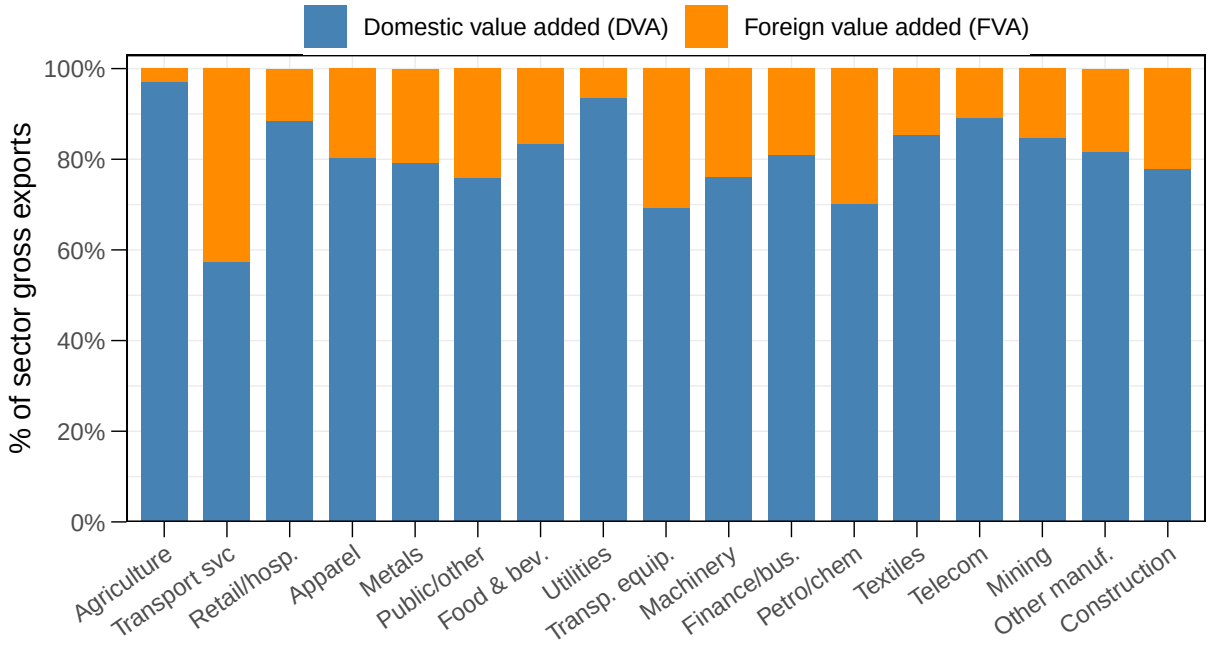
Notes: Left: the ten largest import-source partners as a share of total imports. Right: the twelve GTAP commodities of the 65 with the highest imported share of intermediate inputs.

East Asia supplies 34.4% of Ethiopia's imports, Western Europe 21.4%, the Middle East 15.2%, South-East Asia 11.6% and North America 9.1% — a sourcing map with no African origin large enough to reach the top of the ranking, which is the mirror image of the export book above. The sector panel names where that dependence is concentrated: petroleum and coal products, computer and electronic products, water transport, metals nec and transport equipment each meet a large share of their intermediate needs from imports, and the first of those is the fuel bill that dominates Ethiopia's foreign-exchange problem.

3.6 Value-Added Decomposition of Exports

Gross exports overstate what a country actually earns from trade, because part of their value is imported content merely passing through. Figure 4 splits Ethiopia's exports into the two.

Figure 4: Ethiopia: domestic and foreign value added in gross exports



Notes: The 65 GTAP commodities are aggregated for display into 17 broad groups, weighted by the underlying levels, so no commodity is dropped; the commodity-level table is in Annex C. Domestic value added (DVA, blue) and foreign value added (FVA, orange) by broad sector. The foreign share is the sector's backward GVC-participation rate.

The domestic share is high almost everywhere — agriculture retains 97% of the value of its exports, utilities 93% and telecommunications 89% — which is what a coffee-, oilseed- and flower-led export base looks like. The exception is transport services, at 57% domestic: the fuel, aircraft and vessel services that carry Ethiopia's exports are themselves overwhelmingly imported. A high domestic share is not, however, unambiguously good news. It reflects shallow processing rather than deep domestic sourcing, and the task is to deepen the chains without surrendering the ratio.

4. Spatial Connectivity and Market Access

4.1 Domestic Transport Network

Ethiopia's freight moves predominantly by road; rail is typically thin and only partly operational, and modal options such as inland-water and air carry niche flows. The quality of the trunk network to the border gateways, and of the feeder roads that connect production to those trunks, is the first-mile determinant of its regional competitiveness (Teravaninthorn and Raballand, 2009).

4.2 Regional Corridors

Ethiopia's external trade moves on the Djibouti Corridor, linking it to gateway ports and to its interior neighbours. Because it is landlocked, the reliability of these corridors and the efficiency of the borders they cross are, geographically, the binding determinants of its trade costs.

4.3 Travel Time and Logistics Costs

The spatial model computes, for Ethiopia, an average delivered transport cost of about 18.8% of cargo value, an average transit time of about 390 hours, and an average of 1.6 border crossings to reach an African destination. The cost figure now includes port dwell time priced at the value of time on any maritime leg, as border waiting already was on the land legs, which is why it sits above the figure earlier rounds reported. For a landlocked economy this is not an accounting nicety: the days a container spends on the quay at Djibouti are Ethiopian days, paid for in Ethiopian working capital, and they belong inside Ethiopia's delivered cost exactly as the inland haul does. These continental averages conceal a wide range — cheap, fast links to immediate neighbours and expensive, multi-day links to distant markets — which Figure 5 makes explicit.

4.4 Market Access

Figure 5 plots this relationship destination by destination.

Djibouti and South Sudan sit at the cheap, fast end of the distribution — 2.7% and 4.0% of cargo value respectively, reached in under two days and the only two African destinations Ethiopia reaches overland at all — while Libya anchors the costly maritime tail at 32.1%, with the Central African Republic and Tunisia at about 28.7%, each requiring three to four border crossings and a sea leg (Limão and Venables, 2001; Donaldson and Hornbeck, 2016). Ethiopia's realistic market for bulky, lower-value goods is therefore its immediate neighbourhood; the distant markets in the tail are worth pursuing only for the high-value, low-bulk exports — coffee, cut flowers — that already travel by air.

The Djibouti Corridor is Ethiopia's economic jugular, carrying well over ninety percent of the country's external trade. Running from the port of Djibouti through the border posts at Galafi and Dewele, across the Afar lowlands via Awash and Adama to Addis Ababa, the corridor exists in two physical forms: the trunk road, which still moves the overwhelming majority of containerised and bulk freight by truck, and the standard-gauge railway. This single axis — modelled in the report as the Djibouti Corridor (Djibouti $\rightarrow$ DJI $\rightarrow$ ETH $\rightarrow$ SDS) and the only corridor flagged as serving Ethiopia — concentrates the country's entire maritime trade on one foreign neighbour and one cluster of terminals, making its reliability the binding determinant of national trade costs.

The Addis Ababa–Djibouti Railway is the corridor's flagship and a centrepiece of the developmental state. The 752-kilometre electrified standard-gauge line, built by the Chinese contractors CREC and CCECC for roughly four billion dollars and commissioned for commercial operation in 2018, replaced the colonial-era French metre-gauge railway of 1917 that had fallen into disrepair. Operated jointly through the Ethio-Djibouti Railway company, it cut nominal transit times between Addis and the coast dramatically and was intended to shift freight off congested, accident-prone roads. In practice the line has been underutilised — power supply interruptions, a shortage of rolling stock and locomotives, dry-port and customs bottlenecks, and the dominance of established trucking interests have limited its share of corridor freight — which is exactly why the report's scenario analysis assigns a meaningful but mid-range uplift (7.8%) to rail investment rather than treating the

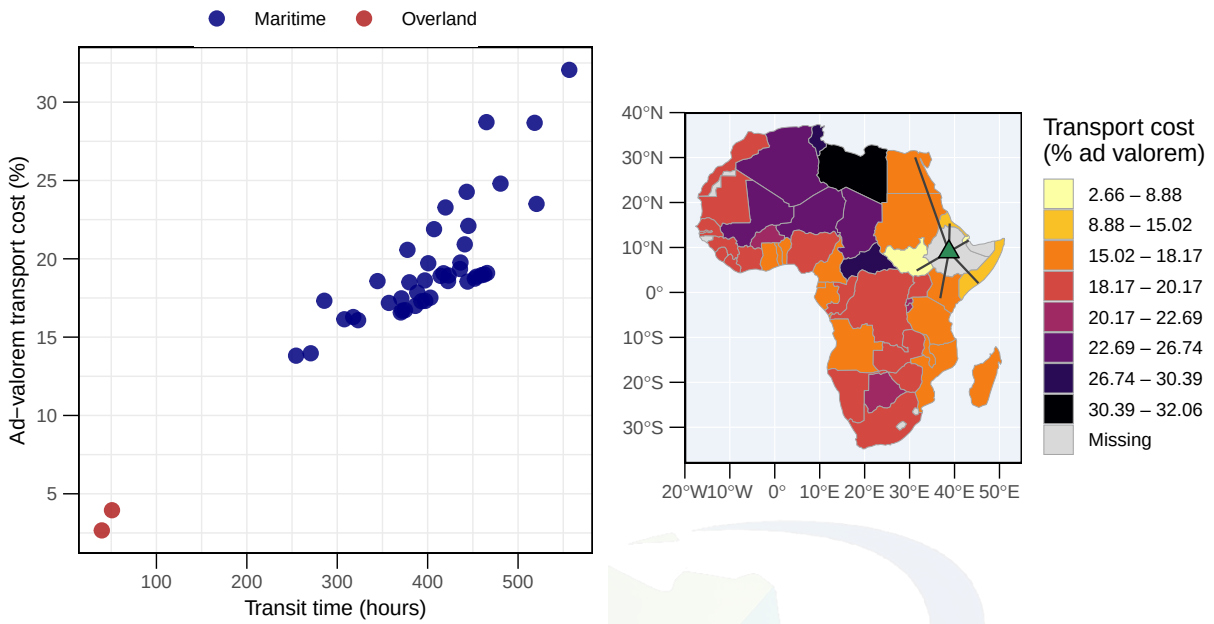
railway as already transformative.

The Djibouti port complex is the corridor's seaward end and a structural chokepoint. Ethiopia's trade funnels through the Doraleh Container Terminal, the Port of Djibouti's general-cargo berths, the Doraleh fuel and gas terminals, and specialised facilities including a livestock export terminal and a potash/bulk terminal. Cargo is then trans-shipped inland to a network of dry ports — Modjo (the largest, near Adama), Mekelle, Dire Dawa, Kombolcha, Gelan and Semera — operated by Ethiopian Shipping and Logistics Services Enterprise, where customs clearance occurs. Djibouti's outsized importance is captured in the report's network analysis, where the port of Djibouti ranks second in continental betweenness centrality behind Tanger Med: it is simultaneously Ethiopia's greatest logistical leverage and its single largest point of failure.

Corridor redundancy is therefore a strategic obsession, and Berbera and Lamu/Mombasa are the principal alternatives. The most advanced is the Berbera Corridor through Somaliland: DP World's expansion of the Port of Berbera and the upgrading of the Berbera–Tog Wajaale–Jigjiga–Dire Dawa road, in which Ethiopia took an equity interest, offers a second Red Sea gateway to the country's eastern and Somali-region trade and to livestock and khat exports. Ethiopia's 2024 memorandum of understanding with Somaliland over sea access — controversial because it touched on recognition and inflamed relations with Somalia — signalled how seriously Addis pursues an alternative outlet, including ambitions for a naval and commercial port. To the south, the Lamu Port–South Sudan–Ethiopia Transport (LAPSSET) corridor through Kenya, anchored on the new Lamu port and the Isiolo–Moyale highway, offers a long-term southern alternative linking Ethiopia to the Indian Ocean and to South Sudan, though it remains only partly built. Eritrea's ports of Assab and Massawa briefly reopened to Ethiopian trade after the 2018 peace, raising the prospect of the shortest route to the sea, before relations soured again.

The land border posts complete the corridor map and define Ethiopia's regional reach. Galafi and Dewele handle the Djibouti traffic; Metema–Galabat is the crossing to Sudan toward Gedaref, Khartoum and ultimately Port Sudan, underpinning one of the country's two largest African export relationships and a route badly disrupted by Sudan's 2023 civil war; Moyale is the gateway to Kenya and the Mombasa hinterland via the tarmacked Isiolo–Moyale road and the one-stop border post there; Tog Wajaale connects to Berbera; and Pagak and Akobo serve South Sudan. The chokepoints are concrete and recurring: congestion and slow clearance at Modjo dry port and the Djibouti terminals; the single-gateway exposure to Djibouti; the closure or insecurity of the Sudan and northern routes during conflict; weak feeder roads from production zones to the trunk; and the underused rail that leaves trucking as the costly default. The report's prescription — corridor upgrading, one-stop border posts, rail investment and, above all, redundancy and climate-proofing for a landlocked economy — maps almost exactly onto this physical reality.

Figure 5: Transport cost and market access to African destinations



Notes: Left: delivered transport cost against transit time to each African market, overland and maritime routing. Right: the same delivered cost drawn spatially. Cost is ad-valorem, as a share of cargo value.

5. Gravity Model Analysis

The gravity model estimates how much Ethiopia *should* trade with each African partner given size and frictions, by fixed-effects Poisson pseudo-maximum-likelihood — the best-practice specification that absorbs size and multilateral resistance and identifies the friction effects from bilateral variation (Anderson and van Wincoop, 2003; Santos Silva and Tenreyro, 2006; Head and Mayer, 2014).

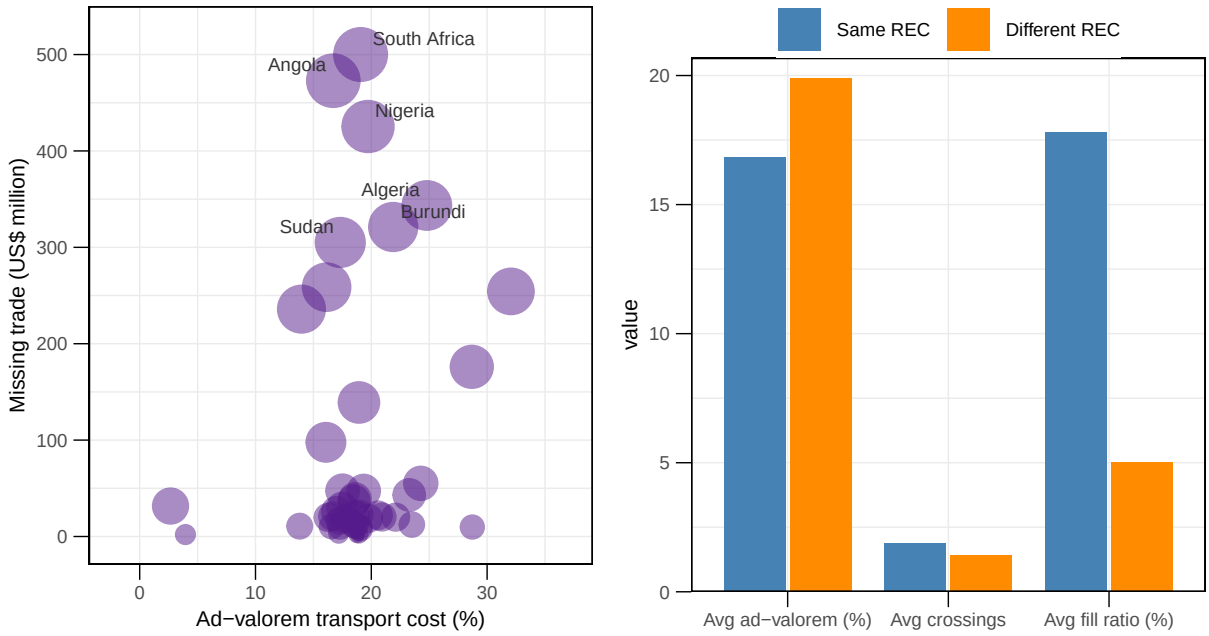
5.1 Actual vs Potential Trade

Aggregated across partners, Ethiopia's actual intra-African exports of $409 m fall short of a frictionless potential of $4.6 bn — a missing-trade gap of $4.2 bn, a fill ratio of 0.09. The gap is concentrated on its largest, highest-friction partners (Figure 2).

5.2 Missing Trade

Figure 6 plots each partner's missing trade against the friction Ethiopia faces reaching it.

Figure 6: Missing trade and the frictions behind it



Notes: Left: missing trade by partner (US$ million) against the transport friction to that partner; bubble area is gravity potential. Right: average transport cost, border crossings and fill ratio for partners inside and outside the same Regional Economic Community.

South Africa is the largest bubble, with $500 m missing at a 19.1% delivered cost, and the rest of the upper tail is the same story of size meeting distance: Angola ($473 m at 16.7%) and Nigeria ($425 m at 19.7%). Sudan, the one large neighbour, sits lower at $305 m and a moderate 17.3%, with Kenya at $259 m and Somalia at $236 m. Low-friction neighbours such as Djibouti ($32 m missing at 2.7% cost) cluster near the origin, confirming that Ethiopia's missing trade is concentrated where high latent demand meets high friction rather than distributed randomly — the configuration most responsive to facilitation, and the basis for localising the counterfactuals of Section 10 (Novy, 2013).

5.3 Drivers of Under-Trade

The right panel of Figure 6 compares partners inside and outside Ethiopia's RECs. Bloc partners average about 16.8% delivered cost against 19.9% outside the bloc, and realise roughly 18% of their gravity potential against 5% — though they cross *more* borders on average (about 1.9 against 1.4), because Ethiopia's bloc partners are overland neighbours while its non-bloc partners are reached by sea. The same pattern holds partner by partner: Djibouti, an IGAD and COMESA partner reached at a 2.7% delivered cost and a single border crossing, realises 57% of its gravity potential, while South Africa, outside Ethiopia's blocs and reached at 19.1% cost, realises only 4%. This is the empirical fingerprint of the gravity model's positive common-REC effect: shared bloc membership bundles lower transport cost and — decisively — more realised trade (Carrère, 2006; Baier and Bergstrand, 2007). Extending Ethiopia's bloc commitments, and the facilitation they bundle, to its non-bloc partners is therefore among the cheapest ways to raise realised trade.

Taken together, the gravity results identify Ethiopia's missing trade as a logistics-and-non-tariff problem,

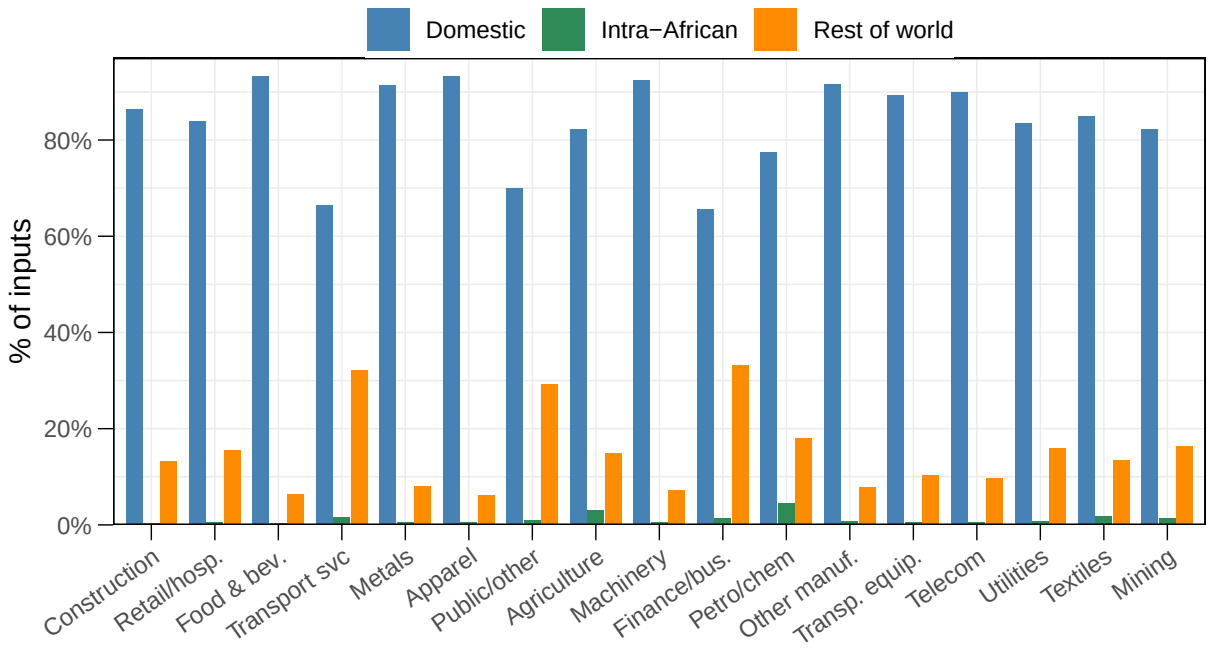
and the estimated coefficients are now worth setting out precisely, because the corrected model supports a sharper claim than earlier rounds made. All six friction terms are correctly signed: distance (-0.35), common language ($+0.66$), shared REC ($+0.91$), delivered ad-valorem cost (-0.09), border crossings (-0.28) and bilateral tariffs (-0.004). Earlier rounds published the crossings term as marginally *positive*; that wrong sign traced to port dwell being left out of delivered cost, which understated the cost of the low-crossing maritime routes, and it is corrected. Four of the six are significant — common language, shared REC, delivered cost and, for the first time in this series, border crossings — and the crossings term still should not be read as "the border effect": the delivered-cost wedge already prices border waiting at the value of time and carries roughly 60% of it, so what crossings adds on its own ($p = 0.035$) is the remainder, and cost and crossings tested jointly are significant (Wald $p = 0.013$). For Ethiopia, which averages 1.6 crossings, that is the right reading of why one-stop border posts still pay (+7.4%): they pay by cutting delay and cost, not by cutting the number of posts. The tariff term is now identified, having been reported as exactly zero in earlier rounds only because the tariff variable was collinear with the common-REC dummy and was discarded by the estimator; at -0.004 with $p = 0.79$ it is indistinguishable from zero, but in a band wide enough to admit a substantial effect. These coefficients are the empirical engine behind the counterfactual scenarios of Section 10, which hold Ethiopia's economic structure fixed and ask what its trade would be under different frictions (Anderson and van Wincoop, 2003; Head and Mayer, 2014). The policy reading that follows is therefore half-supported rather than unambiguous: facilitation and infrastructure are where the model places its large point estimates, but of the levers built on these coefficients only non-tariff and standards reform and port efficiency are larger than tariff liberalisation at conventional confidence.

6. MRIO Value Chain Analysis

6.1 Domestic and Regional Linkages

Figure 7 breaks input sourcing down by sector into domestic, intra-African and rest-of-world shares.

Figure 7: Ethiopia: input sourcing by sector



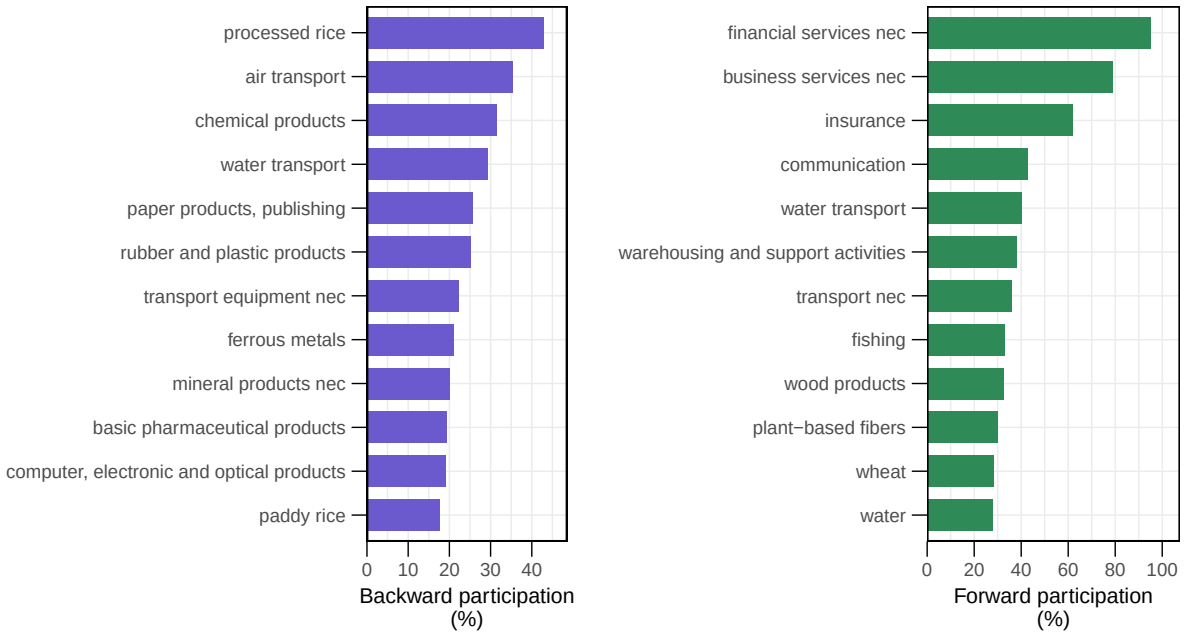
Notes: The 65 GTAP commodities are aggregated for display into 17 broad groups, weighted by the underlying levels, so no commodity is dropped; the commodity-level table is in Annex C. Domestic (blue), intra-African (green) and rest-of-world (orange) shares of intermediate input use.

Domestic sourcing dominates in the largest sectors — food and beverages (93%), apparel (94%) and machinery (93%) source almost everything at home — but where domestic sourcing is lower, the gap is filled almost entirely by rest-of-world imports rather than African ones. Financial and business services is the extreme case: 33.5% of its inputs come from outside Africa against 0.9% from the continent. Transport services (32.0% rest-of-world) and the public, health and education group (29.3%) show the same pattern. The largest intra-African shares anywhere in the economy are petroleum and chemicals at 4.3% and agriculture at 2.7%, and economy-wide the split is 84.2% domestic, 14.9% rest-of-world and 0.9% intra-African. Ethiopia's value chains therefore run domestic-then-global, largely skipping the regional layer; that rest-of-world share is the import leakage regional suppliers could in principle capture, quantified sector by sector in Section 6.4 (Foster-McGregor et al., 2015).

6.2 Backward Linkages

Figure 8 (left panel) ranks sectors by backward participation — the foreign value-added share of output.

Figure 8: Backward and forward participation in global value chains



Notes: Left: backward participation, the foreign value-added share of output by sector. Right: forward participation, domestic value re-exported as inputs by sector.

Backward participation peaks in processed rice at 43.0%, ahead of air transport (35.4%), chemical products (31.6%), water transport (29.1%) and paper products and publishing (25.6%) — a list of processing and transport activities rather than of Ethiopia's export staples, which sit far below it. Growing air transport or chemicals therefore stimulates mostly foreign, not domestic or regional, upstream activity today; converting that stimulus to regional sourcing (Section 6.6) is where the continent's thin value chains would be built (Hummels et al., 2001; Koopman et al., 2014).

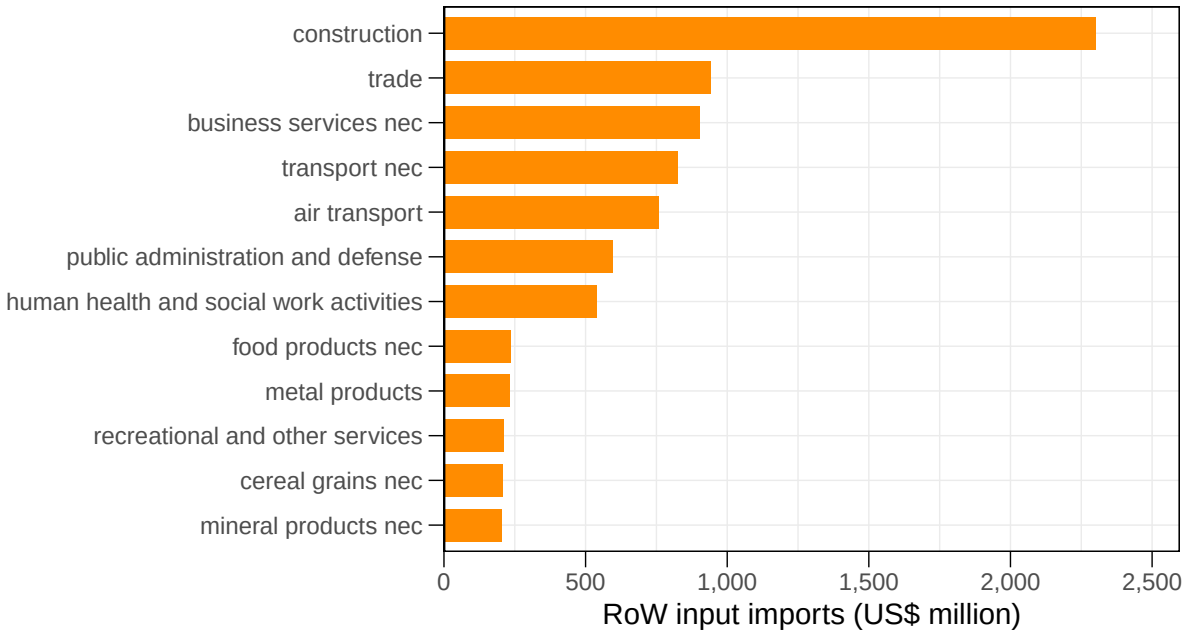
6.3 Forward Linkages

The right panel of Figure 8 tells a different story from the sourcing chart above: forward participation — domestic value re-exported as inputs by other producers — is led by financial services at 95.1%, business services (78.9%), insurance (61.9%), communication (42.7%) and water transport (40.2%). Ten commodities are excluded from the panel because their forward participation exceeds 100% of their own gross exports, an artefact of normalising by a near-zero export base rather than a supplier role, and none is quoted here. The ranking is therefore a services ranking: Ethiopia's producer services, not its farms or factories, are what other sectors most depend on, and coffee, oilseeds and flowers rank low because their output is consumed rather than re-processed. Deepening the chains means capturing more downstream processing at home and routing those linkages to African rather than extra-African processors (Daudin et al., 2011; Antràs et al., 2012).

6.4 Import Leakage

Figure 9 ranks the extra-African input bill in dollar terms.

Figure 9: Ethiopia: extra-African input imports by sector



Notes: The twelve largest of the 65 GTAP commodities are shown, ranked on the plotted quantity; the full 65-commodity table is in Annex C. US$ million. This is the addressable regional-sourcing opportunity: demand currently met from outside Africa that a regional supplier could in principle capture.

Construction tops the list at $2.30 bn — cement, steel, bitumen, plant and fittings for the dam, road and industrial-park programme — followed by trade at $941 m, business services nec at $904 m, transport nec at $823 m, air transport at $757 m and public administration at $597 m. Not all of this is equally addressable — aircraft, refined fuel and heavy machinery have thin African substitutes — but construction materials in particular have plausible regional suppliers, and closing even a fraction of that bill would be Ethiopia's largest single regional-sourcing win (World Bank, 2020).

6.5 Export Value-Added

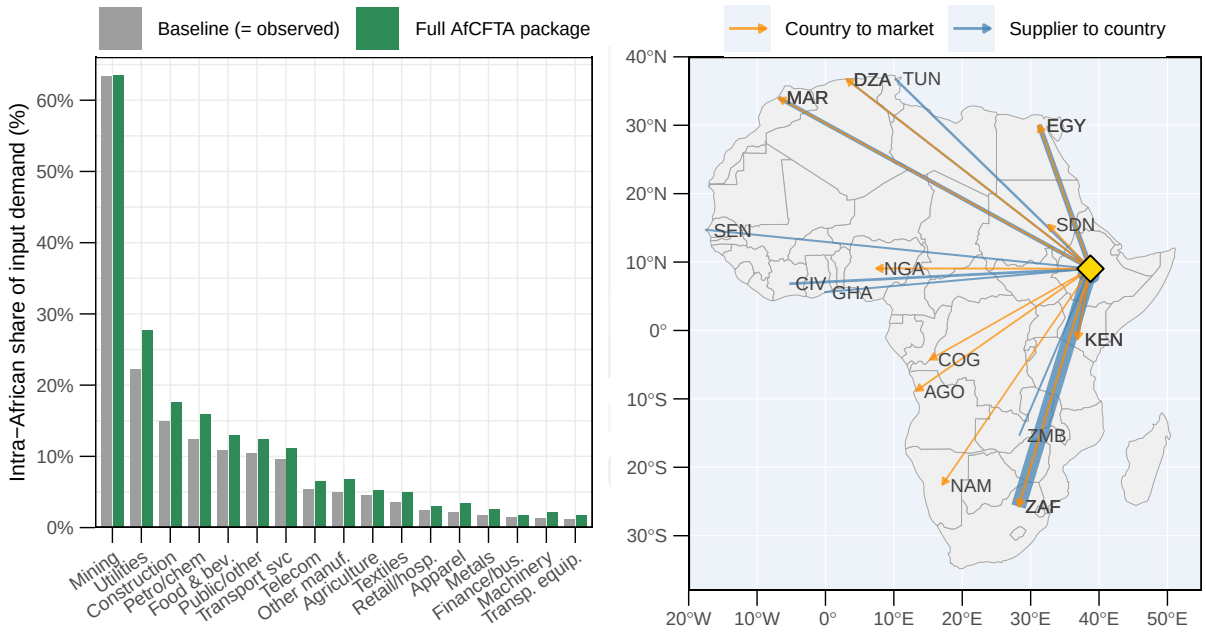
This mirrors the value-added split already shown for exports specifically in Figure 4: the domestic share runs from 97% in agriculture down to 57% in transport services, among the higher ratios in this sample, but — as the backward-linkage figures above make clear — that reflects shallow processing rather than deep domestic sourcing. The policy task is to deepen the chains, through more local content and more processing, while keeping the domestic-value-added ratio high, not to treat a high DVA share as evidence the value chain is already working well (Koopman et al., 2014).

6.6 Regional Sourcing and its Response to Facilitation

The sourcing layer asks how much of Ethiopia's imported input demand is met from African suppliers, and how far that share moves when frictions fall. It models the split as an **Armington CES expenditure share**, at GTAP's own import-source substitution elasticity (ESUBM) for each of the 65 commodities, between African suppliers — priced at the corridor friction of Section 4 — and a rest-of-world backstop, itself priced per destination from GTAP's observed international transport margin plus dwell time at the

gateway and the inland haul to the capital. That last term matters more for Ethiopia than for almost any other economy here: it means the overseas alternative is priced with the Djibouti quay and the road to Addis inside it, so the backstop responds to the same port and corridor levers as the regional option does — which the flat constant used in earlier rounds could not. Both the destination and the supplier margins are calibrated cell by cell to the observed 2017 pattern, which means **the model's baseline equals Ethiopia's observed sourcing by construction**: there is no "optimal versus actual" gap to report, and what the model produces instead is the *response*. The allocation is smooth throughout, carrying a positive share on every supplier the CES gives a finite weight, with nothing pinned at a bound. Figure 10 sets out the result, the sector split on the left and the supplier and market links the same allocation implies on the right.

Figure 10: Ethiopia's regional input sourcing and its response to the AfCFTA package



Notes: Left: Ethiopia's intra-African sourcing share by sector, calibrated baseline (grey, equal to observed by construction) against the full AfCFTA package (green). Right: the supplier and market links the same allocation implies. Sourcing is an Armington CES on GTAP's own import-source substitution elasticities; its friction matrix is transport cost only and carries no tariff channel, so tariff removal produces no response here.

The response is substantial. Economy-wide, Ethiopia's intra-African share of imported input demand rises from **5.46% to 6.96%** under the full AfCFTA package — **+1.50 percentage points, +27.5% in relative terms**, against a continental average of +2.30 pp and +18.6%. In proportional terms Ethiopia is well above the continental norm, which is what the continental pattern predicts: the largest gains go to the landlocked and interior economies, because the backstop they are substituting away from carries an inland haul that coastal economies do not pay, so a fall in corridor cost shifts the relative price further for them. The commodity detail (Annex C) locates it. The strongest movements are in **chemical products (+7.5 pp)**, **transport nec (+4.2 pp on an $823 m extra-African bill)** and **leather products (+4.2 pp)**, followed by **public administration (+2.1 pp)**, **recreational services (+2.1 pp)** and **air transport (+1.6 pp)**. Against that, Ethiopia's third-largest extra-African input bill — **business**

services at $904 m — moves only **+0.3 pp**, with **machinery** at the same **+0.3 pp** and **ferrous metals** at **+0.2 pp**, because these are inputs for which either no African supplier exists or the supplier that does is not the one freight cost is keeping out. The sectors that respond are those where African supply exists and friction, rather than the absence of a supplier, is what currently sends the order overseas.

One thing this panel cannot show. The sourcing model's friction matrix is built from delivered *transport* cost alone; tariffs enter the gravity model next door and have no channel here at all. AfCFTA tariff removal therefore registers no movement in this figure, and that zero is a structural blind spot in the sourcing model, not evidence that tariffs are irrelevant to where Ethiopia buys its inputs.

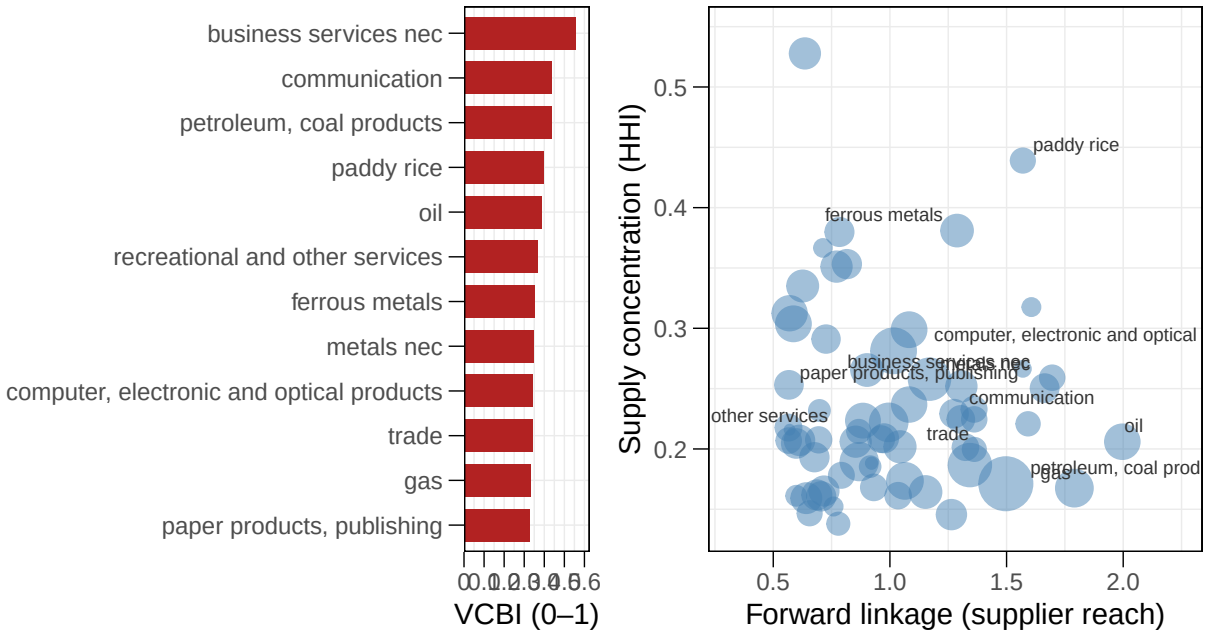
A second thing is worth stating, because the two models appear to disagree about ports and do not. Port-efficiency reform raises Ethiopia's intra-African export volumes substantially in the gravity model (+23.1%, its second-largest single lever), while nudging the regional *share* of its input sourcing very slightly down in the CES. Both are right, and the mechanism is the same in each: every import passes a port once, so faster quays at Djibouti cut the delivered cost of the overseas backstop at least as much as the regional option — much of which reaches Ethiopia overland from Kenya, Sudan and Somalia and never touches a berth — while the gravity model, having no rest-of-world alternative in view, sees only the volume gain. Better performance at Djibouti makes Ethiopia trade more with Africa in absolute terms and marginally shifts the composition of what it buys toward suppliers overseas. Neither result cancels the other.

The right-hand panel now tells a different story from earlier rounds, and the difference is instructive. Under the linear programme Ethiopia's modelled sourcing concentrated on South Sudan and Djibouti, and that locality was read as a finding about its realistic frontier. It was an artefact of cornering: a programme that picks the single cheapest delivered supplier on each row will always look local, because proximity is what makes a supplier cheapest. With curvature in the allocation, Ethiopia's modelled sourcing is **continental, not neighbourhood** — led by **South Africa**, then **Egypt**, **Morocco**, **Kenya**, **Cote d'Ivoire** and **Tunisia**, with Algeria, Zambia, Ghana and Senegal behind them — which is what one would expect of an economy importing chemicals, machinery, metals and processed inputs that only the continent's large industrial producers make. Its *outbound* links, by contrast, stay close to home: South Africa and Kenya first, then Egypt, Nigeria, Algeria, the Congo, Namibia, Morocco and Sudan. The policy reading changes accordingly. Deepening the cheap IGAD and COMESA neighbourhood remains the right frame for Ethiopia's *exports*, but its regional-*sourcing* opportunity runs to the continent's industrial cores, and is therefore a question of long-haul corridor, port and standards reform rather than of border posts with Djibouti and Kenya alone. Both agendas are in the package; they are not the same agenda.

6.7 Value-Chain Bottleneck Index

The Bottleneck Index combines a commodity's supplier reach with the concentration of the supply that serves it: a high score marks an input many downstream users depend on and few sources provide. Figure 11 ranks them.

Figure 11: Ethiopia: the Value-Chain Bottleneck Index



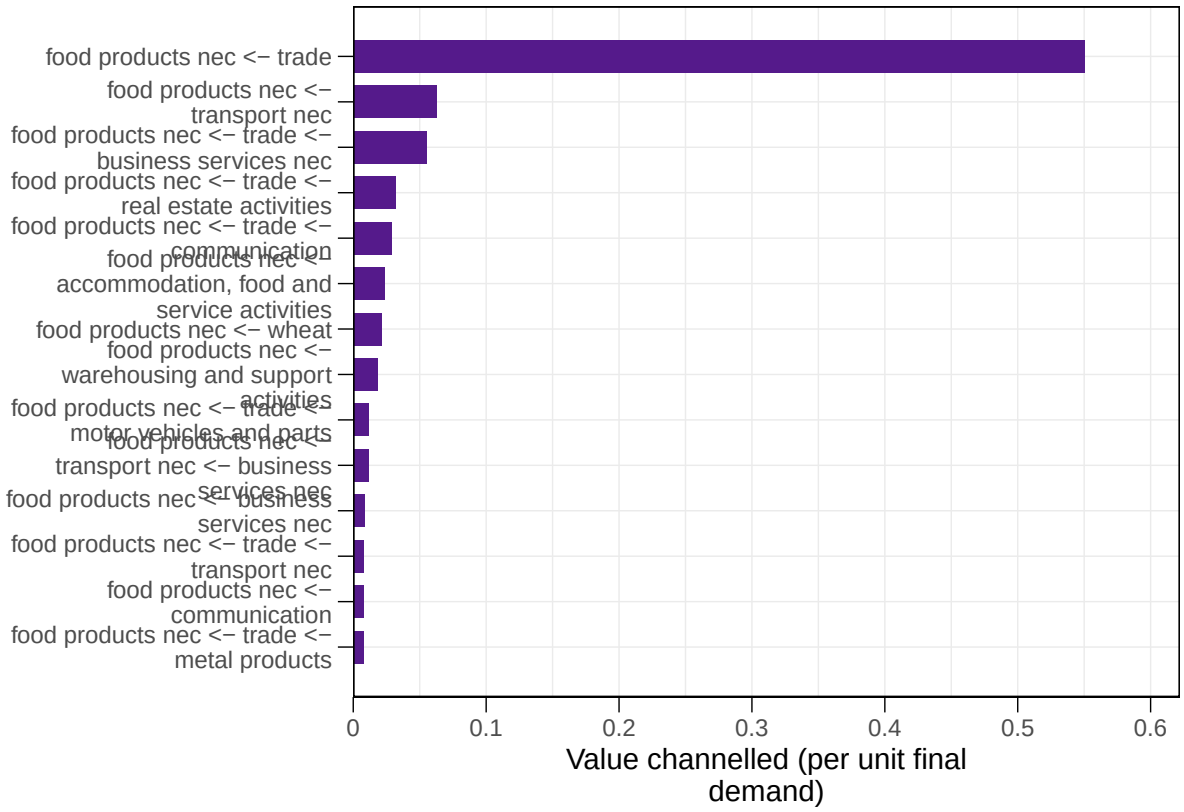
Notes: Left: the twelve GTAP commodities with the highest Value-Chain Bottleneck Index (VCBI) of the 65. Right: the underlying drivers for all 65 — forward linkage (supplier reach) against supply concentration (HHI), with bubble area proportional to import dependence.

Business services nec heads the index at 0.55, ahead of communication (0.44), petroleum and coal products (0.43), paddy rice (0.40) and oil (0.39). The energy entries carry the policy reading: Ethiopia refines nothing, so petroleum products and crude reach every downstream chain through a single imported channel priced in scarce dollars — wide supplier reach, concentrated supply, exactly what the index is built to flag. The producer-services entries say something different but equally Ethiopian: telecommunications and business services were monopoly sectors until the 2021–2024 liberalisation, and the concentration the index measures is as much regulatory as geographic.

6.8 Structural Path Analysis

Structural path analysis traces the same dependence in the other direction, following the dominant chains of purchases that deliver value into Ethiopia's largest processing sector. Figure 12 sets out the leading paths.

Figure 12: Ethiopia: structural path analysis of the leading sector



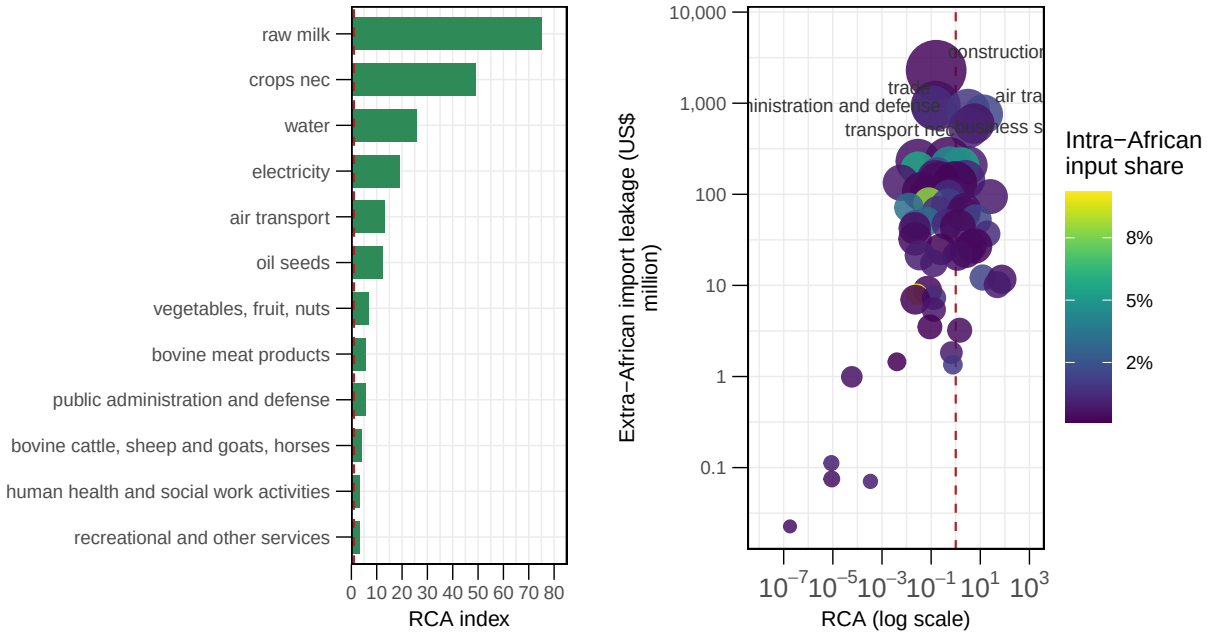
Notes: The dominant supply paths delivering inputs into the sector, ranked by the value each channels per unit of final demand. Each step "A ← B" reads "A draws inputs from B".

The target is food products nec, and the dominant paths run through trade and transport rather than through farming: food products draws first on trade margins, then on transport services, then on trade again at one remove, via business services and real estate. That is the signature of a chain whose cost is distribution rather than raw material — which is why the corridor and facilitation agenda of Section 10, and not an agricultural-input programme, is what would most lower the delivered cost of Ethiopian processed food.

7. Priority Value Chains

Figure 13 sets out Ethiopia's revealed comparative advantage by sector.

Figure 13: Comparative advantage and the value-chain opportunity map



Notes: Left: revealed comparative advantage by sector; RCA above 1 indicates advantage. Right: RCA (horizontal) against extra-African import leakage (vertical), with bubble area proportional to sector scale.

Raw milk has by far the strongest RCA at 75.32 and crops nec at 49.09, but both are near-untraded commodities whose index is inflated by a tiny world-export denominator. The economically meaningful advantages sit below them: water (25.78) and electricity (19.12), the GERD-era energy and utility exports; air transport (13.23), the Ethiopian Airlines effect; oilseeds (12.53), vegetables, fruit and nuts (6.78) and bovine meat products (5.85) — the agricultural and agro-logistics base. Everything else — notably metal products (0.03), chemical products (0.03) and electrical equipment (0.02) — shows deep comparative disadvantage, concentrated in the same import-dependent manufacturing identified by the backward-linkage results above (Balassa, 1965; Koopman et al., 2014). This is the menu of sectors a targeted growth strategy should build on.

The right panel of Figure 13 combines that RCA ranking with the leakage figures from Section 6.4, and for Ethiopia the two air- and land-transport lines are where the axes cross: air transport pairs an RCA of 13.23 with a $757 m extra-African input bill, and transport nec an RCA of 3.14 with $823 m. Both are competitive exports that buy their own inputs almost entirely outside Africa. Construction is the mirror image — the largest leakage bill in the economy at $2.30 bn but an RCA of 0.16 — so it is a regional-sourcing target rather than an export-promotion one. These are Ethiopia's highest-value targets for combined policy, ahead of sectors that score highly on only one axis (World Bank, 2020).

Across the portfolio, Ethiopia's priority value chains are its **agro-processing and food** chains (where regional demand and comparative advantage are strongest), its **construction-materials and basic-manufacturing** chains (large regional demand, import-substitutable inputs), and the **enabling services** (transport, logistics, ICT, finance) whose friction raises the cost of trading everything else. For each, the binding constraints recur — standards and SPS, border and corridor friction, energy cost, finance and scale — which is why the cross-cutting reforms of Sections 10 and 12 benefit the whole

portfolio rather than any single chain.

Coffee is Ethiopia's deepest and most internationally celebrated value chain, yet it remains shallow in processing terms. Roughly four to five million smallholder households grow arabica across Sidama, Yirgacheffe, Jimma, Guji and Harar; cherries are pulped or sun-dried, traded — historically through the Ethiopia Commodity Exchange, with a 2017 reform restoring direct specialty-export traceability for cooperatives and exporters — and shipped as green beans through Djibouti to roasters in Germany, the Gulf, Japan, the US and China. The constraint is that almost all value-adding roasting and branding happens abroad: Ethiopia captures the farmgate and export-handling margin but little of the retail value, and ageing trees, low yields, climate stress on the highland belts, and FX-driven smuggling cap earnings. The opportunity is single-origin premiumisation, certification (the Sidama, Yirgacheffe and Harar geographical-indication trademarks), and domestic roasting for the regional market.

Leather and footwear is the chain where Ethiopia's natural endowment is largest and its underperformance most striking. Ethiopia holds the largest livestock population in Africa — tens of millions of cattle, sheep and goats — and its highland sheepskin (the famous "Ethiopia highland" grade) commands a global gloving premium. Tanneries cluster around Addis, Modjo and Sebeta, and footwear firms — domestic champions such as Anbessa Shoes and the export-oriented Huajian Group's Chinese-invested factory at the Eastern Industry Zone in Dukem — have shown the chain can move up to finished shoes and gloves. Yet a ban on raw and semi-processed hide exports, intended to force domestic value addition, collided with quality problems (ekek skin disease, abattoir defects), chemical-input and FX shortages, and effluent-treatment costs, leaving capacity underused. Finished leather goods, gloving and footwear for the Gulf, Europe and the region are the clear opportunity.

Textiles and apparel is the spearhead of the industrial-parks model and the chain most exposed to its shocks. Anchored by the eco-industrial Hawassa park (PVH and its suppliers), Bole Lemi, Kombolcha, Mekelle, Adama and Dire Dawa, the sector attracted global buyers — Calvin Klein, Tommy Hilfiger, The Children's Place, H&M and PVH suppliers — on the promise of low wages, duty-free AGOA and EU access, cheap hydropower and serviced land. Cotton from the Awash and Omo valleys feeds spinning and weaving, but the chain is heavily dependent on imported fabric, trims and accessories (the report's apparel and textile import leakage). The 2022 AGOA suspension stripped US market access, the Tigray war shut the northern parks, and FX and wage frictions caused high turnover. With AGOA restoration, deeper backward integration into local cotton and fabric, and the regional market, the chain retains large latent capacity.

Floriculture is a logistics-intensive success that earns hard currency on thin margins. Around two hundred farms near Holeta, Sebeta, Ziway and the Rift lakes grow roses and cuttings exported within forty-eight hours through Ethiopian Airlines' cold chain to the Dutch auctions, making Ethiopia Africa's second-largest flower exporter. The chain depends critically on air-cargo reliability, the cold chain, and FX to import planting material, fertiliser and packaging; its opportunity lies in diversifying into summer flowers, herbs and vegetables and in serving Gulf and regional markets.

Agro-processing and sugar represent the import-substitution frontier the developmental state

most aggressively pursued. The Ethiopian Sugar Corporation's estates and factories — Wonji-Shoa, Metahara, Finchaa, Tendaho, Kesem and the Omo-Kuraz complex — were meant to make the country a sugar exporter, but cost overruns, the troubled Indian-financed Tendaho and Omo projects, and management failures left several plants incomplete and the country a net sugar importer; a privatisation drive is now under way. Edible-oil processing (to cut palm-oil imports), wheat milling and flour, brewing (BGI/Castel, Heineken, Diageo's Meta), and dairy round out an agro-processing sector that the report's strong food-and-beverages RCA marks as a priority, with regional demand and comparative advantage aligned.

Cement and construction materials supply a vast domestic building boom and a nascent export. Dangote Cement's large plant at Mugher, alongside Derba (MIDROC), National and Mugher Cement, gives Ethiopia substantial clinker and cement capacity built on local limestone, serving the housing, road, dam and industrial-park construction programmes and exporting modest volumes to neighbours. The constraints are power and coal/pet-coke fuel imports, FX for spares, and transport cost; the report's strong construction RCA and large regional demand make cement a credible regional supplier within the AfCFTA. **Pharmaceuticals**, finally, is a strategic, infant chain: domestic producers such as Cadila/Kilitch, EPHARM and the firms in the dedicated Kilinto pharmaceutical industrial park supply a fraction of a heavily import-dependent market, with FX, active-ingredient imports, regulatory capacity and scale as binding constraints — but with import-substitution and regional-supply potential that aligns squarely with the report's import-leakage and regional-sourcing logic.

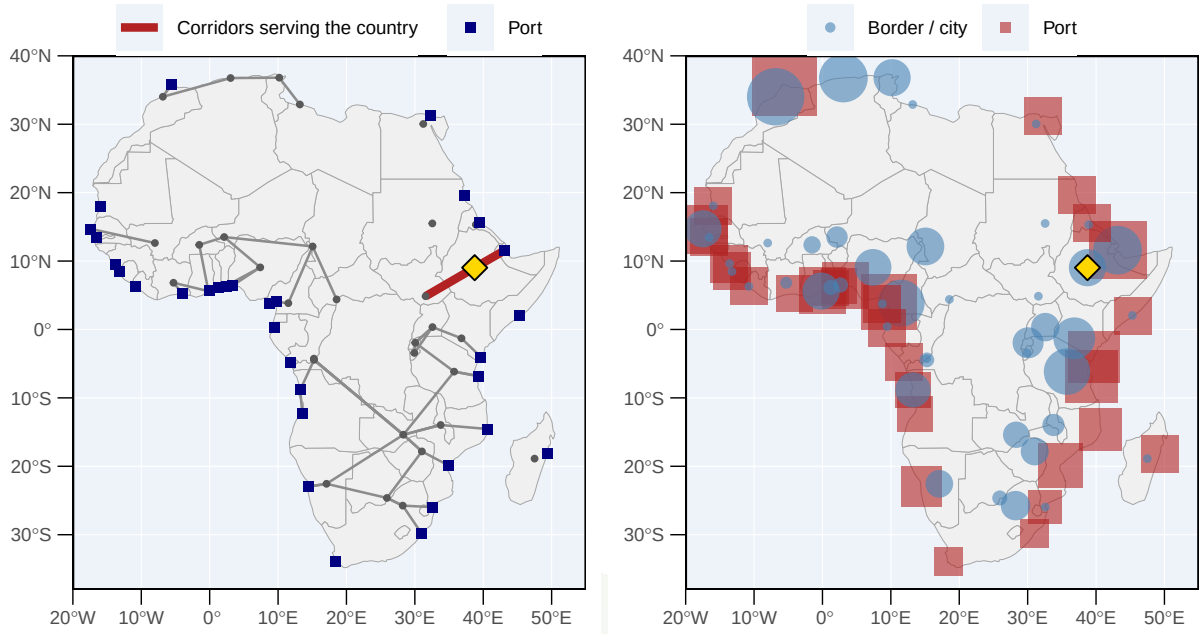
8. Trade Network Position

The corridor-plus-maritime network is assembled by `build_network`; country-to-country reach is computed by the spatial-access function `accessibility` (least-cost Dijkstra routing); and centrality is assessed by betweenness on the same network (Freeman, 1977).

8.1 Country as Trade Node

Figure 14 draws the corridor network geographically, with Ethiopia's own links highlighted, and ranks ports and gateways by betweenness centrality.

Figure 14: Position in the African trade-corridor network



Notes: Left: the corridor network drawn geographically, with this country's corridors highlighted and its capital starred. Right: betweenness centrality of ports and border gateways; marker area is proportional to betweenness.

The wider network is radial and port-oriented: corridors run from coastal gateways inward to capitals, with few links between interiors. Ethiopia sits at the end of a single spoke, the Djibouti Corridor, and the port of Djibouti itself ranks second in continental betweenness (0.08) behind only Tanger Med — a single foreign chokepoint through which the whole of Ethiopia's maritime trade must pass. That structure, not any deficiency of Ethiopia's own infrastructure, is why corridor reliability and border efficiency are the binding determinants of its trade costs.

8.2 Accessibility and Reach

This surface is the geographic expression of the result already shown in Figure 5 (Section 4): a dark, cheap inner ring around Djibouti and South Sudan, and a bright, costly outer tier toward Libya, Tunisia and the Central African Republic. Deepening trade with the low-cost neighbourhood, not chasing the costly periphery, is the efficient strategy for the bulk of Ethiopia's tradable output.

8.3 Centrality and Critical Nodes

The right panel of Figure 14 shows betweenness concentrating at the gateway ports through which landlocked trade must funnel, and for Ethiopia that means Djibouti above all: at 0.08 betweenness — second only to Tanger Med across the whole continental network, as Table 10 sets out — it is simultaneously the country's greatest source of logistical leverage, since an efficiency gain there propagates to every route that uses it, and its single largest point of failure.

8.4 Vulnerability

Ethiopia's network exhibits the vulnerabilities the model is designed to expose: a dependence on a small number of foreign corridors and gateway ports (single points of failure), with limited redundant routing, and exposure to climate and security shocks on those corridors. The resilience implication is to invest in redundancy and climate-proofing alongside efficiency, because the same fragile logistics that constrain trade can, under a shock, surrender years of integration gains (Maliszewska and Ruta, 2020).

9. Bottleneck Diagnostics

9.1 Physical

Transit dependence on foreign corridors and ports; road condition and feeder-road gaps; thin and poorly interconnected rail; congested border infrastructure; and, for many sectors, the cost and reliability of power.

9.2 Policy

Non-tariff barriers and divergent standards are the single largest constraint in the model (the largest scenario lever, Section 10); customs procedures, documentation and rules of origin add cost; tariffs, already low within Ethiopia's RECs, are second-order (Kee et al., 2009; UNCTAD, 2021).

9.3 Productive capacity

Energy cost and reliability; limited access to affordable finance; a shallow technical-skills base; small firm size; and dependence on imported inputs (Section 6.4) that raises costs and exposes producers to supply shocks.

9.4 Institutional

Agency coordination at borders; incomplete one-stop-border-post and single-window coverage; partial electronic customs and cargo tracking; and the capacity of standards bodies and mutual-recognition arrangements.

Foreign-exchange rationing has been, for a decade, the single most pervasive bottleneck across every Ethiopian value chain. With export earnings narrow and the import bill dominated by fuel, fertiliser, wheat, machinery and medicines, the National Bank of Ethiopia rationed scarce dollars through directed letter-of-credit allocations that prioritised strategic imports, generating long clearance queues, a parallel-market premium that at times doubled the official rate, and chronic import compression. Manufacturers in the industrial parks could not import fabric, trims, spares or active pharmaceutical ingredients on time; cement plants idled for want of spares; and foreign investors struggled to repatriate profits, undermining the very FDI the developmental model required. The July 2024 float of the birr under the IMF Extended Credit Facility is intended to dismantle this distortion, but

the unwinding is painful — sharp depreciation, inflation pass-through — and the institutional habits of rationing run deep.

Non-tariff barriers and divergent standards are, in the report's modelling, the largest single trade lever, and Ethiopia's institutional landscape explains why. SPS and quality requirements, conformity assessment, licensing, permits and documentation impose costs that dwarf the country's already-low effective tariffs on regional trade. Ethiopia's standards architecture — the Ethiopian Standards Agency, the Ethiopian Conformity Assessment Enterprise, the Ethiopian Food and Drug Authority — has limited mutual-recognition coverage with COMESA and AfCFTA partners, and the country's selective, non-FTA stance within COMESA means it does not automatically extend the bloc's preferences. Harmonising standards and SPS, and concluding mutual-recognition arrangements, is the cheapest, fastest and highest-impact reform the assessment identifies.

Energy and logistics frictions bite hard despite massive public investment. Notwithstanding GERD and one of Africa's larger hydropower fleets, the domestic grid suffers frequent outages, load-shedding and transmission losses that force manufacturers onto costly diesel back-up — a serious handicap for energy-intensive cement, textiles and agro-processing, and a recurring complaint of the Hawassa and Bole Lemi park tenants whose just-in-time apparel orders cannot absorb unscheduled downtime. The country's hydrology adds a seasonal dimension: dry-season drawdown on the Gibe, Tekeze and Awash cascades has historically forced rationing, even as GERD's reservoir filling proceeds. Logistics costs are correspondingly high: the report's delivered transport cost of roughly 18.8 percent of cargo value, transit times averaging some 390 hours, congestion at the Modjo dry port and Djibouti terminals, an underused railway whose freight share trails its capacity, weak feeder roads from the coffee and oilseed belts to the trunk corridor, and a state-dominated freight-forwarding sector (the ESLSE monopoly was only recently liberalised) all add cost and delay. Demurrage and container-imbalance charges at Djibouti, where Ethiopia's import-heavy trade leaves empties to be repositioned, inflate the bill further. The delivered transport cost of 18.8% of cargo value, and the 1.6 border crossings the average African shipment must clear — this model's own accounting, not a published logistics-performance score — are the summary symptom of these compounding frictions. That cost figure now carries dwell time at Djibouti priced at the value of time, which is why it sits above what earlier rounds reported and why demurrage at the gateway shows up in the model rather than only in the complaint.

Conflict and security are an episodic but devastating bottleneck unique in its severity among the comparator economies. The 2020–2022 war in Tigray severed the northern corridor, shut the Kombolcha and Mekelle industrial parks, and triggered Ethiopia's removal from AGOA in 2022 — at a stroke stripping the apparel chain of its principal export market. Subsequent insecurity in Amhara (the Fano insurgency) and Oromia (the OLA), banditry and roadblocks on inland routes, and the spillover from Sudan's 2023 civil war — which disrupted the Metema–Gedaref route to one of the country's two largest African markets and turned Port Sudan into an unreliable backstop — keep security risk a live constraint on production, investor confidence and corridor reliability. Periodic friction with Eritrea over the Red Sea, and the 2024 rupture with Somalia over the Somaliland sea-access MoU, add

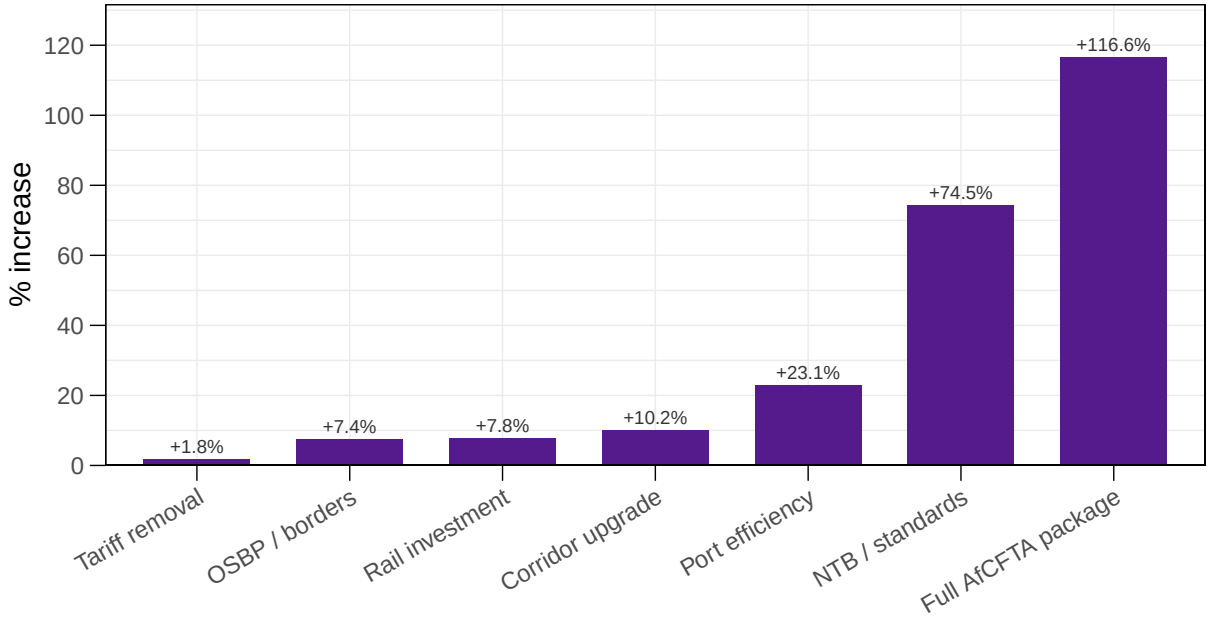
a diplomatic layer of corridor risk. The report's warning that a security or climate shock could *cut* intra-African trade by a double-digit margin is, for Ethiopia, not hypothetical but a lived experience of the past five years.

Finance, customs and institutional coordination compound the physical and policy frictions. Access to affordable finance is constrained by a banking sector long dominated by state banks and directed credit, crowding-out of private firms by public borrowing, and only a nascent capital market (the Ethiopian Securities Exchange opened in 2025) and recently opened banking sector. At the border, customs modernisation through the Ethiopian Customs Commission and the rollout of electronic single-window and ASYCUDA systems remains incomplete; one-stop border posts (Moyale with Kenya is the furthest advanced) are not yet the norm; rules-of-origin administration and inter-agency coordination at crossings add documentation and delay. Trade-finance and payments integration with regional partners is thin, and the capacity of standards, customs and trade-negotiation institutions — stretched by simultaneous WTO accession, AfCFTA implementation, and a sweeping domestic reform agenda — is itself a binding constraint on how fast the high-return facilitation reforms can actually be delivered.

10. Scenario Analysis

Figure 15 ranks Ethiopia's policy levers by their projected uplift to intra-African exports.

Figure 15: Ethiopia: projected uplift in intra-African exports by policy scenario



Notes: Percentage increase against the calibrated baseline. Each scenario is a counterfactual on the estimated gravity frictions, holding economic structure fixed.

Non-tariff and standards harmonisation alone accounts for **74.5%**, by far the largest single lever; **port efficiency** follows at **23.1%**, then corridor upgrading at 10.2%, rail investment at 7.8%, one-stop border posts at 7.4% and AfCFTA tariff removal at 1.8%, with the full combined facilitation package raising

exports by **116.6%** — a more than doubling, from a base of only $409 m (Table 3). Two of these positions have moved for structural reasons, and one of them will look surprising for a landlocked country. **Port efficiency** was reported as zero in earlier rounds because the lever scaled port dwell time, which entered travel time only, while the gravity model routes and prices on delivered cost. Dwell is now monetised at the value of time, as border waiting already was on the land legs — and it ranks second for Ethiopia precisely *because* the country is landlocked. Ethiopia has no port of its own, but it pays for one: every container bound for an African market by sea sits on the quay at Djibouti, and those days are Ethiopian working capital. A landlocked economy pays for gateway delay twice, once at the berth and again on the inland haul, which is why the lever is far from negligible here even though the asset belongs to a neighbour. **Tariff removal** was likewise reported as exactly zero, because the tariff variable was perfectly collinear with the common-REC dummy and the estimator discarded it; it now scales measured bilateral applied duties and returns 1.8%, a small central estimate with an interval wide enough to include a materially larger gain — a weak measurement, not a demonstrated irrelevance. The honest ranking claim is correspondingly sharper than earlier rounds made: **non-tariff and standards reform and port efficiency are the two levers larger than tariff removal at conventional confidence**; the corridor, rail and border levers are larger in expectation but their confidence bands overlap it, so the ordering among those three should not be read as established (Maliszewska and Ruta, 2020; UNECA, 2021).

Table 3: Ethiopia: Projected uplift in intra-African exports by policy scenario

Scenario	Uplift
Full AfCFTA package	116.6%
NTB / standards harmonisation	74.5%
Port efficiency	23.1%
Corridor upgrading	10.2%
Rail investment	7.8%
One-stop border posts	7.4%
AfCFTA tariff removal	1.8%

Notes: Each scenario is a counterfactual on the estimated gravity frictions, holding economic structure fixed. The combined package is sub-additive because the levers overlap. The tariff lever now scales a measured bilateral applied rate rather than a proxy; its estimated effect is small and imprecise, so a low figure here is a weak estimate rather than a demonstrated irrelevance.

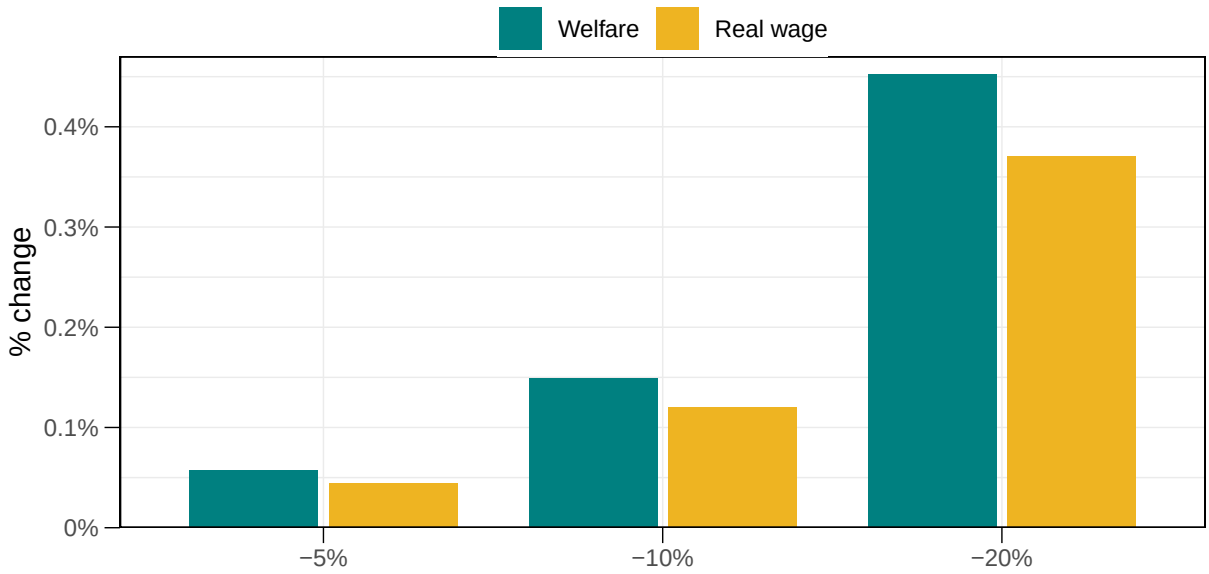
The sub-additivity of the combined package — its uplift is less than the naïve sum of the individual levers — reflects the fact that the levers overlap: once Ethiopia's borders are fast and its non-tariff barriers gone, part of the corridor-upgrade gain is already banked. But the package still substantially exceeds the largest single lever, which shows that the reforms are complementary and that Ethiopia should pursue facilitation, standards harmonisation and infrastructure investment together, not sequentially.

Conversely, the same machinery implies that a climate or security shock to Ethiopia's corridors would *cut* its regional trade by a comparable double-digit margin — the resilience cost of fragile logistics, and the case for building redundancy and climate-proofing into the corridor agenda.

11. Economic Impact Assessment

Figure 16 traces Ethiopia's welfare and real-wage response to increasing depth of intra-African trade-cost cuts.

Figure 16: Ethiopia: general-equilibrium welfare and real-wage gains



Notes: Welfare (teal) and real wage (gold) by depth of intra-African trade-cost cut, Caliendo–Parro CGE.

Table 4: Ethiopia: General-equilibrium welfare and real-wage gains by trade-cost cut

Cost cut	Welfare	Real wage
5.0%	0.06%	0.04%
10.0%	0.15%	0.12%
20.0%	0.45%	0.37%

Notes: Caliendo–Parro multi-sector Eaton–Kortum CGE. Gains are percentage changes against the calibrated baseline.

The response is sharply convex: a 5% trade-cost cut raises welfare by 0.06%, a 10% cut by 0.15%, and a 20% cut by 0.45% — the gain triples as the cut merely doubles from 10% to 20%. The real-wage gain tracks the welfare gain closely at every step, a little below it (0.04%, 0.12%, 0.37%), confirming that Ethiopia's gains accrue mainly through higher real wages, a broad-based and progressive channel rather than one concentrated in profits or rents (Caliendo and Parro, 2015; Costinot and Rodríguez-

Clare, 2014). That convexity means half-measures under-deliver: a full, deep facilitation programme is worth more than the sum of its incremental steps.

Through the model's structure and the trade responses of Section 10, a serious facilitation programme would raise Ethiopia's exports (led by its competitive value chains), lower input costs, expand output and employment in the labour-intensive tradable sectors, and — through the real-wage channel — reduce poverty, while a modal shift to rail and corridor efficiency would lower freight-emissions intensity.

12. Policy Prioritisation

Ranking reforms by **impact** × **feasibility** × **cost-efficiency** × **time** sorts Ethiopia's options into tiers:

- **Quick wins (0–2 years):** non-tariff-barrier removal and standards/SPS harmonisation (the largest lever, ≈74.5%, institutional and fast); dwell-time reduction at the gateway — principally Djibouti, and negotiable through the transit arrangement rather than buildable (≈23.1%, the second-largest lever); one-stop border posts and digital customs (≈7.4%).
- **Medium-term (2–5 years):** regional-sourcing and local-content coordination; standards-body and customs modernisation; trade-finance and payments integration.
- **Strategic infrastructure (5–15 years):** corridor upgrading (≈10.2%) and regional rail (≈7.8%), with corridor redundancy and climate-proofing a priority for a landlocked economy dependent on a single gateway.
- **Industrial policy:** energy-cost reduction, serviced industrial land, and capacity-building in the priority value chains (Section 7).
- **Enabling:** AfCFTA tariff liberalisation — necessary as the legal floor, and worth ≈1.8% on its own on the model's central estimate, though with a band wide enough that a larger gain cannot be ruled out.

Two cautions apply throughout: trade-cost-reducing measures raise welfare even where they lower measured GDP and must not be discarded on a GDP test; and financing matters as much as design, since an intervention's growth case can be undone by how it is paid for.

13. Implementation Roadmap

Ethiopia's trade-policy agenda is now organised around the Homegrown Economic Reform Programme, the most consequential liberalisation in a generation. Launched in 2019 under Prime Minister Abiy Ahmed after the EPRDF gave way to the Prosperity Party, the Homegrown Economic Reform Agenda (and its second iteration, HGER 2.0) marked a deliberate pivot from the orthodox state-led developmental model toward a more market-oriented, private-sector-driven growth strategy. Its pillars — macroeconomic stabilisation, structural reform and sectoral liberalisation — directly

target the bottlenecks this assessment foregrounds: exchange-rate distortion, financial repression, state-enterprise dominance and a closed services sector. The programme is the policy umbrella under which the foreign-exchange float, the opening of telecoms and banking, and the privatisation drive all sit.

The macroeconomic centrepiece is the July 2024 move to a market-determined exchange rate, anchored by an IMF and World Bank programme. After years of FX rationing and a yawning parallel-market premium, Ethiopia floated the birr in July 2024 as the precondition for a roughly $3.4 billion IMF Extended Credit Facility and a parallel World Bank package, alongside a G20 Common Framework debt restructuring begun in 2021. The reform is designed to restore export incentives, clear the import backlog, attract FDI and unify the exchange rate — precisely the distortions the report identifies as throttling the industrial parks and value chains — at the cost of near-term inflation and depreciation that the social-protection elements of the programme are meant to cushion.

Sectoral liberalisation has opened sectors that were closed for decades. Ethio Telecom's monopoly ended with the 2021 award of a licence to the Safaricom-led Global Partnership for Ethiopia consortium and the launch of Safaricom Ethiopia and its M-PESA mobile-money service; a partial privatisation of Ethio Telecom itself is under way. The financial sector has been opened to foreign banks under a 2024 banking proclamation, the Ethiopian Securities Exchange opened in 2025, and a privatisation pipeline targets Ethiopian Airlines (a minority stake), Ethiopian Shipping and Logistics, sugar estates and industrial parks. Logistics was liberalised by ending the ESLSE freight-forwarding monopoly and opening the sector to private and foreign participation — directly relevant to the report's corridor and facilitation agenda.

The successive national development plans frame the structural ambition. The Growth and Transformation Plans (GTP I, 2010–2015, and GTP II, 2015–2020) drove the public-investment, hydropower, rail and industrial-parks build-out; they have been succeeded by the Ten-Year Development Plan (2021–2030), "A Pathway to Prosperity," which reorients toward private-sector-led, export-oriented and import-substituting growth, manufacturing competitiveness, agricultural commercialisation (including the wheat self-sufficiency drive) and digital and logistics modernisation. These plans are the domestic counterparts to which the report's implementation roadmap calls for alignment.

On the multilateral and regional front, Ethiopia is simultaneously pursuing WTO accession and AfCFTA implementation while maintaining a cautious COMESA stance. WTO accession negotiations, dormant since 2003, were revived under the reform agenda, with Ethiopia tabling revised goods and services offers and working through the accession working party — accession would lock in liberalisation and discipline trade policy but is politically sensitive for protected sectors. Ethiopia signed and ratified the AfCFTA and is preparing its tariff-liberalisation schedule, sequencing sensitive and excluded products to protect infant industries such as pharmaceuticals, sugar and metals. Within COMESA and IGAD it remains an early member but a partial liberaliser, having historically stayed outside the COMESA Free Trade Area and offering preferences selectively; deepening these REC commitments — and the facilitation they bundle — is, as the report stresses, among the cheapest routes to higher realised trade.

The clear policy priorities that emerge for Ethiopia track the assessment's own ranking. First, dismantle non-tariff barriers and harmonise SPS and quality standards with COMESA and AfCFTA partners, concluding mutual-recognition arrangements — the largest, cheapest and fastest lever, worth 74.5% on its own, or roughly two-thirds of the full package's uplift, and the larger of the two levers the model can place above tariff liberalisation at conventional confidence. Second, attack dwell time at the Djibouti gateway, which the corrected model now scores at 23.1% — the second-largest lever, and for a country without a port of its own a matter of the transit agreement and the dry-port interface rather than of capital works. Third, complete one-stop border posts (building on Moyale) and digital customs through the single-window and electronic-cargo-tracking rollout. Fourth, invest in corridor reliability and redundancy: upgrade the Djibouti Corridor, raise the railway's freight share, and operationalise the Berbera and LAPSSET alternatives so that no single foreign gateway can hold the economy hostage — with climate-proofing as a first-order concern for a landlocked, drought-and-flood-exposed country. Fifth, lower energy cost and reliability risk (translating GERD's generation into a dependable grid) and build value-chain capacity in coffee, leather, apparel, agro-processing and pharmaceuticals. Sixth, implement AfCFTA tariff liberalisation as the enabling legal floor — worth 1.8% on its own on the model's central estimate, small but measured rather than assumed, and estimated imprecisely enough that it should not be dismissed. Pursued together and built resiliently, this is the programme through which Ethiopia would convert its 0.09 fill ratio into the substantial, broad-based gains the assessment quantifies.

14. Conclusions and Recommendations

Ethiopia trades below its potential with its region — a fill ratio of 0.09 — for reasons this assessment has measured and ranked: **non-tariff barriers and divergent standards** (the largest lever), **port-dwell, transport and border frictions** on the gateways and corridors that connect it to its neighbours, **shallow regional value chains and high extra-African import leakage**, and **productive-capacity gaps**. **Non-tariff and standards reform and port efficiency are the two levers this model can place above tariff liberalisation at conventional confidence**; the measured tariff effect is small (1.8%) but imprecise, and should not be read as a demonstration that tariffs do not matter. Its best opportunities lie in deepening trade with its natural neighbouring markets (Somalia, Sudan, Kenya and Djibouti) while cutting the maritime cost that keeps Nigeria, Angola and South Africa out of reach, and in scaling its competitive value chains into both. Its priority reforms, in sequence, are: dismantle non-tariff barriers and harmonise standards; cut dwell time at the Djibouti gateway, which for a landlocked economy is a transit-agreement question as much as an engineering one; complete one-stop border posts and digital customs; upgrade and de-risk the corridors and build redundancy; lower energy costs and build value-chain capacity; and implement AfCFTA tariff liberalisation as the enabling floor. Done together and built resiliently, these reforms could raise Ethiopia's intra-African exports by about 116.6% and deliver broad-based, progressive welfare gains (Maliszewska and Ruta, 2020; UNECA, 2021).

A. Data Sources and Reproducibility

Built on the GTAP MRIO database and World Bank indicators with the `TradeAnalytics`, `TradeFuture` and `KITEAnalytics` Julia packages. Gravity flows (`missing_trade`, `missing_pairs`) are in US dollars; MRIO sourcing and GTAP bilateral values in thousands; all converted to US$ million for display. GTAP records gross flows, so magnitudes exceed official merchandise statistics. Macroeconomic figures (Section 2) are approximate external sources (World Bank WDI; IMF; national statistics). All figures are reproducible from `country_figures.jl`, `country_optimize_all.jl` and `country_report_gen.jl`; every model result is also written as a CSV under `output/`.

B. Intra-African trade partners

Table 5: Ethiopia: top 15 intra-African export partners

Partner	Actual ($m)	Potential ($m)	Missing ($m)	Ad-val %	Crossings	Same REC
Somalia	63	299	236	14.0	1	Yes
Sudan	60	365	305	17.3	1	Yes
Kenya	57	316	259	16.1	1	Yes
Djibouti	42	74	32	2.7	1	Yes
Angola	34	507	473	16.7	1	
Nigeria	24	449	425	19.7	1	
South Africa	22	522	500	19.1	2	
Egypt	22	119	98	16.1	1	Yes
Burundi	15	336	321	21.9	4	Yes
Algeria	9	352	343	24.8	2	
Cote d'Ivoire	8	147	139	18.9	1	
Libya	5	259	254	32.1	4	Yes
DR Congo	5	44	39	18.6	2	Yes
Ghana	3	51	47	17.5	1	
Eritrea	3	14	11	13.8	1	Yes

Notes: Ranked by value. Values are GTAP gross flows and exceed official merchandise statistics. The full partner list is in the model output under `assets/data/`.

Table 6: Ethiopia: top 15 intra-African import partners

Partner (origin)	Actual ($m)	Potential ($m)	Missing ($m)	Ad-val %	Crossings	Same REC
Morocco	334	6249	5915	19.3	1	
Egypt	284	1606	1322	16.1	1	Yes
South Africa	221	5384	5163	19.1	2	
Sudan	205	1259	1054	17.3	1	Yes
Kenya	96	552	456	16.1	1	Yes
Tunisia	78	5885	5807	28.7	3	
Algeria	28	1093	1066	24.8	2	
Nigeria	23	448	425	19.7	1	
Niger	14	515	501	24.3	2	
Mali	12	415	403	23.5	2	
Tanzania	9	133	124	16.3	1	
Djibouti	8	14	6	2.7	1	Yes
Angola	7	103	96	16.7	1	
Uganda	7	61	54	18.6	2	Yes
Liberia	6	109	103	18.5	1	

Notes: Ranked by value. Values are GTAP gross flows and exceed official merchandise statistics. The full partner list is in the model output under `assets/data/`.

C. Sector diagnostics

Table 7: Ethiopia: input sourcing, its response to AfCFTA and value-chain indicators by sector

Sector	Domestic	Intra-Af.	RoW	AfCFTA Δ	RCA
Construction	14965	50	2299	+2.6 pp	0.16
Trade	4992	28	941	+0.3 pp	0.15
Business services nec	1670	34	904	+0.3 pp	0.12
Transport nec	2192	48	823	+4.2 pp	3.14
Air transport	782	33	757	+1.6 pp	13.23
Public administration…	1200	11	597	+2.1 pp	5.65
Human health and…	1313	18	540	+1.4 pp	3.38
Food products nec	4367	17	234	+4.2 pp	0.50
Metal products	3053	17	231	+1.2 pp	0.03
Recreational and…	1019	11	209	+2.1 pp	3.35
Cereal grains nec	713	53	207	+0.5 pp	1.66
Mineral products nec	1278	71	204	+1.0 pp	0.57
Chemical products	487	40	190	+7.5 pp	0.03
Water transport	197	8	171	+1.1 pp	0.18
Beverages and tobacco…	807	7	150	+0.7 pp	0.15
Leather products	1317	17	145	+4.2 pp	2.53
Communication	1320	8	141	+1.1 pp	0.23
Ferrous metals	784	7	134	+0.2 pp	0.01
Machinery and…	1773	9	134	+0.3 pp	0.18
Wearing apparel	2897	7	132	+0.1 pp	0.94
Motor vehicles and…	1294	5	108	+0.9 pp	0.04
Transport equipment…	500	3	98	+0.1 pp	0.57
Manufactures nec	1812	6	95	+1.8 pp	0.08
Water	633	5	94	+5.9 pp	25.78
Education	399	6	94	+1.3 pp	0.50
Wheat	189	23	81	+0.0 pp	0.08
Textiles	483	10	76	+1.5 pp	0.48
Paper products…	154	8	72	+3.0 pp	0.01
Accommodation, food…	388	2	68	+1.9 pp	2.29
Minerals nec	321	5	64	+0.1 pp	0.18
Warehousing and…	584	3	61	+1.4 pp	2.00

continued on the next page

Table 8 (continued)

Sector	Domestic	Intra-Af.	RoW	AfCFTA △	RCA
Vegetables, fruit…	273	7	52	+2.1 pp	6.78
Rubber and plastic…	170	8	51	+2.8 pp	0.06
Fishing	253	4	47	+1.7 pp	0.44
Basic pharmaceutical…	157	5	46	+0.7 pp	0.02
Metals nec	822	3	44	+3.5 pp	1.23
Computer, electronic…	381	2	42	+2.1 pp	0.02
Electricity	59	1	37	+3.0 pp	19.12
Electrical equipment	511	2	32	+0.8 pp	0.02
Bovine cattle, sheep…	348	3	27	+4.5 pp	4.14
Bovine meat products	764	2	27	+11.1 pp	5.85
Real estate activities	337	1	25	+0.3 pp	0.25
Forestry	416	1	23	+5.1 pp	2.63
Wood products	243	2	21	+0.2 pp	0.03
Sugar	235	1	21	+3.6 pp	1.19
Financial services nec	111	1	17	+1.1 pp	0.13
Oil seeds	79	2	12	+5.9 pp	12.53
Raw milk	200	1	12	+10.5 pp	75.32
Crops nec	106	1	10	+4.0 pp	49.09
Dwellings	48	1	9	+0.0 pp	—
Meat products nec	192	1	9	+10.9 pp	0.07
Paddy rice	7	2	8	+0.2 pp	0.03
Wool, silk-worm…	42	1	7	+20.1 pp	0.13
Dairy products	234	1	7	+1.6 pp	0.02
Insurance	44	0	5	+0.9 pp	0.13
Vegetable oils and…	56	0	4	+1.1 pp	0.09
Animal products nec	60	0	3	+1.9 pp	1.45
Sugar cane, sugar beet	24	0	2	+6.4 pp	0.67
Processed rice	3	0	1	+0.0 pp	0.00
Plant-based fibers	5	0	1	+0.3 pp	0.77
Petroleum, coal…	15	0	1	+1.7 pp	0.00
Oil	1	0	0	+1.7 pp	0.00
Coal	1	0	0	+0.1 pp	0.00
Gas manufacture…	0	0	0	+0.6 pp	0.00
Gas	0	0	0	+16.5 pp	0.00

Notes: Sourcing values are US$ million of intermediate input use. Regional sourcing is modelled as an Armington CES on GTAP's own import-source substitution elasticities, calibrated cell by cell to the observed 2017 pattern, so the model's baseline reproduces observed sourcing exactly and there is no "optimal versus actual" gap to report. The AfCFTA △ column is the modelled response instead: the change, in percentage points, in the share of the commodity's *imported* input demand met from African suppliers under the full AfCFTA package. That denominator is the model's import demand for the commodity and is not the denominator of the three value columns beside it, so the two should not be reconciled against each other. Economy-wide the same measure moves from 5.46% to 6.96%, +1.50 pp. The sourcing model's friction matrix is transport cost only and carries no tariff channel, so tariff removal produces no response in this column – a limit of the model, not a finding about tariffs. RCA above 1 indicates comparative advantage.

D. Corridors and network

Table 9: Ethiopia: Regional transport corridors

Corridor	Mode	Reliability	Serves Ethiopia	Route
Northern Corridor	road/rail	0.60		Mombasa → KEN → UGA → RWA → BDI
Central Corridor	road	0.55		Dar es Salaam → TZA → RWA → UGA → BD
North-South Corridor	road	0.65		Durban → ZAF → BWA → ZWE → ZMB → C
Dar-Copperbelt (TAZARA)	rail/road	0.50		Dar es Salaam → TZA → ZMB → COD
Maputo Corridor	road/rail	0.70		Maputo → ZAF
Beira Corridor	road/rail	0.55		Beira → ZWE → ZMB → MWI
Nacala Corridor	rail	0.50		Nacala → MWI → ZMB
Trans-Kalahari Corridor	road	0.75		Walvis Bay → NAM → BWA → ZAF
Walvis Bay-Ndola-Lubumbashi	road	0.60		Walvis Bay → NAM → ZMB → COD
Lobito Corridor	rail	0.50		Lobito → AGO → COD → ZMB
Abidjan-Lagos Corridor	road	0.60		Abidjan → CIV → GHA → TGO → BEN → NG
Dakar-Bamako Corridor	road/rail	0.55		Dakar → SEN → MLI
Tema-Ouagadougou Corridor	road	0.60		Tema → GHA → BFA → NER
Lagos-Niamey Corridor	road	0.50		Lagos → NGA → NER → TCD
Djibouti Corridor	road/rail	0.65	Yes	Djibouti → DJI → ETH → SDS
Douala Corridor	road	0.50		Douala → CMR → TCD → CAF
Trans-Maghreb Corridor	road	0.70		Tanger Med → MAR → DZA → TUN → LBY

Notes: Delivered cost is ad-valorem, as a share of cargo value.

Table 10: Ethiopia: Trade-network nodes by betweenness centrality (top 10)

Rank	Node	Type	Country	Betweenness	Avg delay (h)	Score
1	Tanger Med	port	Morocco	0.10	348	0.22
2	Djibouti	port	Djibouti	0.08	320	0.15
3	Douala	port	Cameroon	0.07	273	0.13
4	Mombasa	port	Kenya	0.06	306	0.12
5	Dar es Salaam	port	Tanzania	0.06	297	0.12
6	Dakar	port	Senegal	0.05	323	0.10
7	Lagos	port	Nigeria	0.05	277	0.10
8	Morocco	city	Morocco	0.08	19	0.09
9	Tema	port	Ghana	0.05	279	0.09
10	Beira	port	Mozambique	0.04	313	0.08

Notes: Betweenness centrality on the modelled corridor-plus-maritime network; the full ranking is available on request.

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