# MACAO SAR AIR CARGO PROFILE ICAO - ECONOMIC DEVELOPMENT - 2025

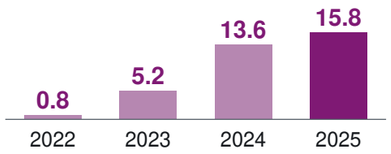
## AIRLINES AIR CARGO INDICATORS, 2025

| 15.8 | 25.9 | 0.0 | 112.8 | 23.0% |
|---|---|---|---|---|
| FREIGHT (thousand tonnes) | FREIGHT TONNE-KM (million) | MAIL TONNE-KM (million) | CARGO AVAILABLE (million tonne-km) | CARGO LOAD FACTOR (percent) |

Source: ICAO Forms A and A-S, 2025.

## FREIGHT EVOLUTION

Freight tonnes (thousand tonnes).




Source: ICAO COMP_MASTER, 2022-2024; ICAO Form A, 2025. 2025 preliminary.

## DOMESTIC vs INTERNATIONAL

| DOMESTIC | INTERNATIONAL |
|---|---|
| 0.0% | 100.0% |
| 0.0 freight | 15.8 freight |
| 0.0 FTK | 25.9 FTK |

Source: ICAO Forms A and A-S, 2025. Freight in thousands of tonnes. FTK in million.

## SERVICE TYPE

| | |
|---|---|
| Scheduled | 100.0% |
| Non-scheduled | 0.0% |

Source: ICAO Forms A and A-S, 2025.

## AVERAGE FREIGHT DISTANCE

| | |
|---|---|
| DOMESTIC | N/A |
| INTERNATIONAL | 1,639.4 km |

Source: ICAO Forms A and A-S, 2025.

## FREIGHT INTENSITY

Freight tonnes per departure

| | |
|---|---|
| ALL INTERNATIONAL AIRLINES | 1.4 |
| DOMESTIC CARRIERS | 0.6 |

Source: ICAO Form C, 2025.

## CARGO OPERATING MODEL

| | |
|---|---|
| FREIGHTER | 63.7% |
| PASSENGER BELLY | 36.3% |

Source: ICAO Form C, 2025. Share of reported freight tonnes. All international airlines to/from Macao SAR.

## DIFFERENT AIRCRAFT, DIFFERENT CARGO ROLES

| FREIGHTER AIRCRAFT | | PASSENGER BELLY CARGO | |
|---|---|---|---|
| BOEING 777 F | 88.6% | BOEING 737 900 | 79.6% |
| AIRBUS A330 200F | 84.2% | AIRBUS A330 300 | 39.3% |
| AIRBUS A330 300F | 78.3% | AIRBUS A321 | 19.7% |

Source: ICAO Form C, 2025. Ranked by CLF within each cargo role. Leading aircraft types on international services to/from Macao SAR.

## INTERNATIONAL NETWORK - FREIGHT

Top five round-trip routes; reported in thousands of tonnes.

| ALL INTERNATIONAL CARRIERS | | DOMESTIC CARRIERS | |
|---|---|---|---|
| MFM-IST | 12.4 | MFM-TPE | 2.3 |
| MFM-MAD | 8.6 | MFM-BKK | 1.7 |
| MFM-KUL | 7.6 | MFM-SHA | 1.7 |
| MFM-BKK | 2.8 | MFM-HGH | 1.5 |
| MFM-KCH | 2.7 | MFM-DAD | 1.2 |

Source: ICAO Form B, 2025. Both directions combined.

## ROUTE CARGO LOAD FACTORS

International routes ranked by reported cargo load factor.

| ALL INTERNATIONAL CARRIERS | | DOMESTIC CARRIERS | |
|---|---|---|---|
| MFM-MAD | 93.1% | MFM-HAN | 36.3% |
| MFM-IST | 88.1% | MFM-TYO | 27.0% |
| MFM-FRU | 84.2% | MFM-BKK | 24.6% |
| MFM-HSA | 84.2% | MFM-TPE | 24.0% |
| MFM-CIT | 84.2% | MFM-HGH | 23.1% |

Source: ICAO Form C, 2025.

## SHARE OF INTERNATIONAL FTK BY REGION



**51.6%**
**ASIA/PACIFIC**

| EUROPE | MIDDLE EAST | OTHER REGIONS |
|---|---|---|
| 47.7% | 0.5% | 0.2% |

Source: ICAO Form C, 2025. Share of reported FTK. All international airlines to/from Macao SAR.

## TOP AIRLINES BY REPORTED FTK

International services to/from Macao SAR

| | | |
|---|---|---|
| 1 | ETHIOPIAN | 92.1m FTK |
| 2 | THY | 56.2m FTK |
| 3 | M Jets International | 22.4m FTK |
| 4 | AIR MACAO | 21.9m FTK |
| 5 | Thai Lion Air | 1.0m FTK |

Source: ICAO Form C, 2025.

## NETWORK STRUCTURE

International freight, 2025.

**HERFINDAHL-HIRSCHMAN INDEX (HHI)**
**1,305.2**
**DIVERSIFIED NETWORK**
Freight is distributed across a broad set of routes.
Range: >0 to 10,000; higher values indicate greater route concentration.

**DIRECTIONAL ASYMMETRY**
**85.4%**
**HIGHLY ONE-DIRECTIONAL**
Freight moves predominantly in one direction.
Lower percentages indicate more balanced two-way flows; higher percentages indicate greater directional imbalance.

**FLOW ORIENTATION**
**81.8%**
**Outbound**
**OUTBOUND-ORIENTED**
More freight moves from Macao SAR than to Macao SAR.

Source: ICAO Form B, 2025.

## KEY TAKEAWAYS

1. **Strong international orientation.** 100.0% of freight reported by Macao SAR airlines is international.
2. **Diversified network.** Freight is spread across a broad set of routes; the leading route is MFM-IST.
3. **Outbound-oriented flows.** A stronger export-oriented than import-oriented pattern is observed in terms of freight tonnage transported (81.8% outbound).
4. **Key strengths.** ETHIOPIAN leads reported international FTK, and Asia/Pacific accounts for 51.6% of international FTK to/from Macao SAR.
5. **Freight evolution.** Over 2015-2024, freight declined at a compound annual growth rate of 2.6%, while preliminary 2025 freight is higher than 2024 by 16.3%.

Sources: ICAO COMP_MASTER, 2015-2024; ICAO Forms A and A-S and Form B, 2025.

Methodology: round-trip routes combine both directions; cargo ATK = max(ATK - 0.1 x ASK, 0) per observation. Figures may not reconcile across forms because reporting scope and carrier coverage differ.

# ICAO - ECONOMIC DEVELOPMENT - 2025

## ATR DATA STATUS - 2025

| ATR Form | Status | Records used |
|---|---|---|
| ICAO Forms A/A-S | **REPORTED** | 12 |
| ICAO Form B | **MIXED** | 336 |
| ICAO Form C | **MIXED** | 175 |

## DATA STATUS DEFINITIONS AND REPORTING NOTE

**Reported**: source records used are classified as Reported in DATA_TYPE. **Provided**: source records used are classified as Provided in DATA_TYPE; a provenance label from the ICAO source dataset that does not imply a new estimate by the renderer. **Mixed**: both Reported and Provided records are present in the eligible source universe. **Unavailable**: no eligible records from the ATR enter the profile after the approved filters.

**Member States are encouraged to submit their Air Transport Reporting (ATR) Forms to the ICAO Secretariat in a timely and complete manner.**

## METHODOLOGY BY PANEL

| Panel | Source | Statistical universe, calculation and ranking/aggregation rule |
|---|---|---|
| **1. Airlines Air Cargo Indicators** | Forms A/A-S | Freight = sum(FRT) / 1,000; FTK = sum(TKF) / 1,000,000; MTK = sum(TKM) / 1,000,000. Cargo ATK is calculated per observation as max(ATK - 0.1 x ASK, 0), then aggregated and displayed in millions. Cargo Load Factor = [sum(FTK) + sum(MTK)] / sum(cargo ATK) x 100. SERVICE_TYPE = All Services; scheduled and non-scheduled flights. |
| **2. Freight Evolution** | ICAO Compfile Master + Form A | ICAO COMP_MASTER freight tonnes for 2022, 2023 and 2024 (carrier-level rows for the State; aggregate 'ALL AIRLINES' rows are used only when no carrier rows exist, to avoid double counting) and preliminary Form A freight tonnes for 2025, each in thousand tonnes. CAGR 2015-2024 = [(F2024/F2015)^(1/9)-1] x 100 and Growth 2024-2025 = [(F2025/F2024)-1] x 100 are analytical fields used in Key Takeaways Point 5 and are not rendered in the panel. 2025 is never estimated. |
| **3. Domestic vs International** | Forms A/A-S | Within the national-airline universe, aggregate freight tonnes and FTK by FLIGHT_STAGE_TYPE. Freight shares are calculated from domestic and international freight tonnes and reconcile to 100.0% within rounding tolerance. Freight displayed in thousands of tonnes and FTK in millions. |
| **4. Service Type** | Forms A/A-S | Aggregate freight tonnes by Scheduled flight and Non-scheduled flight within SERVICE_TYPE = All Services. Each share equals category freight / total scheduled plus non-scheduled freight x 100. |
| **5. Average Freight Distance** | Forms A/A-S | Calculated separately for Domestic and International operations: average freight distance = sum(FTK) / sum(freight tonnes). If the freight denominator is zero or unavailable, N/A is published. |
| **6. Freight Intensity** | Form C | Freight tonnes per departure = sum(FREIGHT) / sum(NB_OF_FLIGHT) for all international airlines serving the State (records with exactly one endpoint in the State) and for domestic carriers (airlines of the State) within the same universe. |
| **7. Cargo Operating Model** | Form C + aircraft lookup | Each aircraft type is classified from AIRCRAFT_TYPE -> PAX/FRT in the registered aircraft master (regiones_and_cuerpos.xlsx, 'cuerpos'). FREIGHTER maps to Freighter; PASSENGER maps to Passenger Belly. Role share = role freight / total international freight x 100. PASSENGER_SEATS is not used. Unmapped types are excluded and flagged in QC. |
| **8. Different Aircraft, Different Cargo Roles** | Form C + aircraft lookup | Aggregate FTK, MTK and cargo ATK by aircraft type within each cargo role. Aircraft CLF = [sum(FTK) + sum(MTK)] / sum(cargo ATK) x 100. Only 0.0%-100.0% values are retained; Top 3 ranked by CLF with FTK as deterministic secondary tie-breaker. |
| **9. International Network - Freight** | Form B | International records with exactly one endpoint in the State; both directions of each city pair are combined into one round-trip route key (State endpoint first); freight tonnes are aggregated and the Top 5 routes ranked. Right column: airlines of the State (displayed as DOMESTIC CARRIERS). |
| **10. Route Cargo Load Factors** | Form C | Both directions of each route combined. FTK, MTK and cargo ATK aggregated before calculating route CLF = [sum(FTK) + sum(MTK)] / sum(cargo ATK) x 100. Only valid 0.0%-100.0% routes are published, ranked by CLF with FTK as secondary tie-breaker; no traffic threshold applied. |
| **11. Share of International FTK by Region** | Form C | Each eligible international observation is assigned to the geographic region of the partner (non-State) endpoint using Form C region fields harmonised to the approved six-region taxonomy. Regional share = region FTK / total eligible international FTK x 100; leading, second and third regions shown; the remainder aggregated as OTHER REGIONS. |
| **12. Top Airlines by Reported FTK** | Form C | Aggregate eligible international FTK by reporting airline and rank the Top 5 within the State's international universe. Entities are shown exactly as reported in Form C. |
| **13. Network Structure** | Form B | From all valid round-trip routes in the Form B universe: HHI = sum[(100 x route freight share)^2]; Directional Asymmetry = sum\|Outbound - Inbound\| / sum(Outbound + Inbound) x 100; Flow Orientation shows the dominant outbound/inbound share. Route pairs with no reporting in the opposite direction are excluded from asymmetry and orientation and flagged. |
| **14. Key Takeaways** | Validated analytical object | Source-supported executive statements generated only from validated profile indicators. Point 2 does not repeat the numerical HHI. Point 3 translates Flow Orientation into freight-direction language and is not a customs trade statistic. Point 4 uses only profile indicators (leading airline and leading partner region); no external evidence. Point 5 translates CAGR 2015-2024 and Growth 2024-2025. |