Changing Landscape Air Cargo: 2020

CNS Partnership Conference - 2016

Logistics Capital & Strategy

By:
Brian Clancy
Managing Director

Confidential

April 11th, 2016

I. Historical Perspective

II. Forecast Assumptions

III. Strategic Implications

Economic characteristics of air cargo are unique relative to other industries

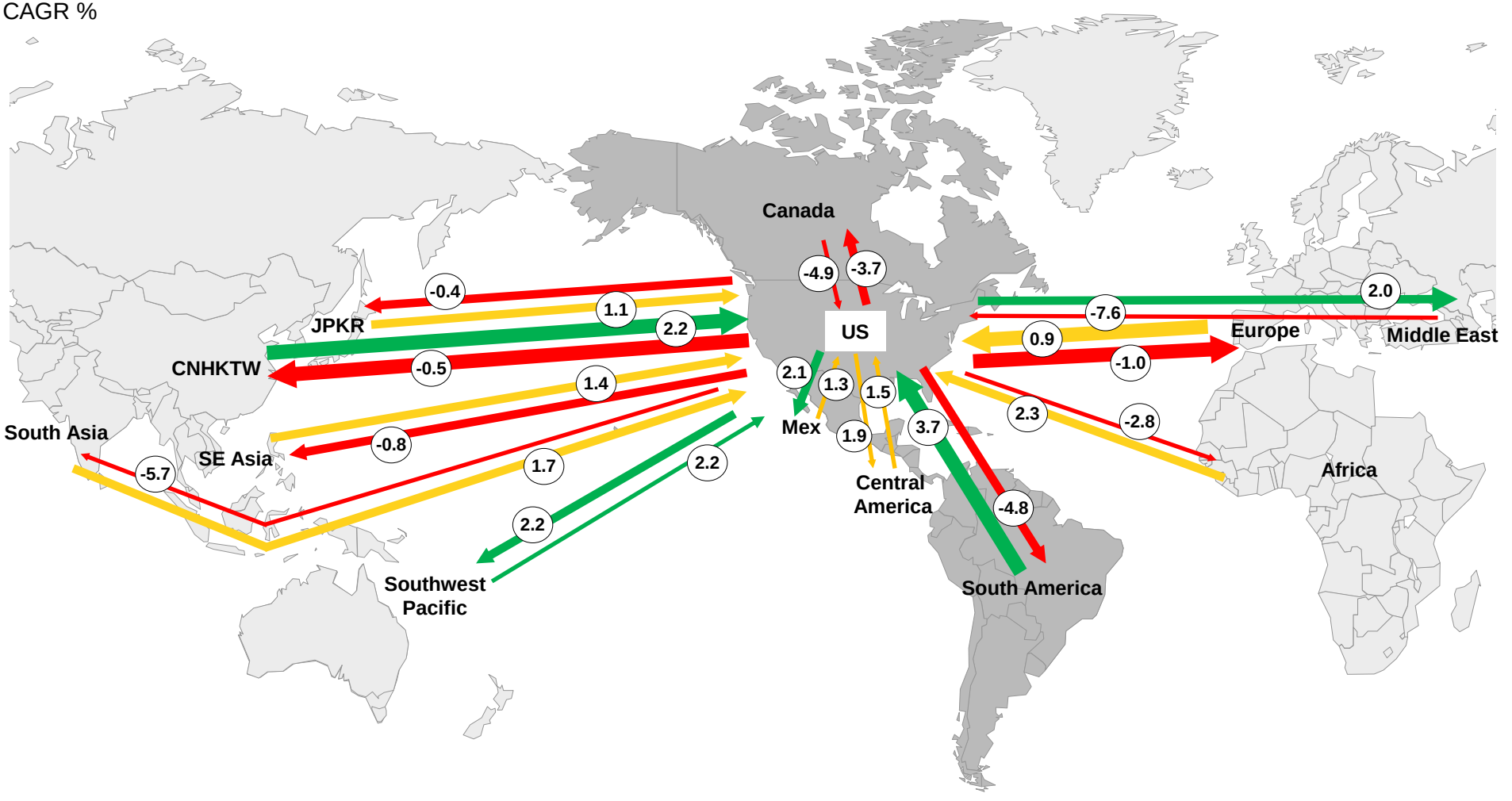
UNIQUE CHARACTERISTICS OF AIR CARGO INDUSTRY

- Time and space are key dimensions of supply and demand
- One-way demand
- Perishability of capacity
- Network complexities
  - Demand and price are O&D-based
  - Supply and cost are leg-based
  - Allocation of revenue and cost is the root cause of evil in pricing and profitability
  - 50% of industry supply curve is a by-product of another industry (belly capacity)
- Patient capital with lower return expectations for the fastest growing freighter carriers

U.S. air trade growth has been slow and mixed since 2010

US AIR TRADE MARKET GROWTH: 2010 – 2015

CAGR %

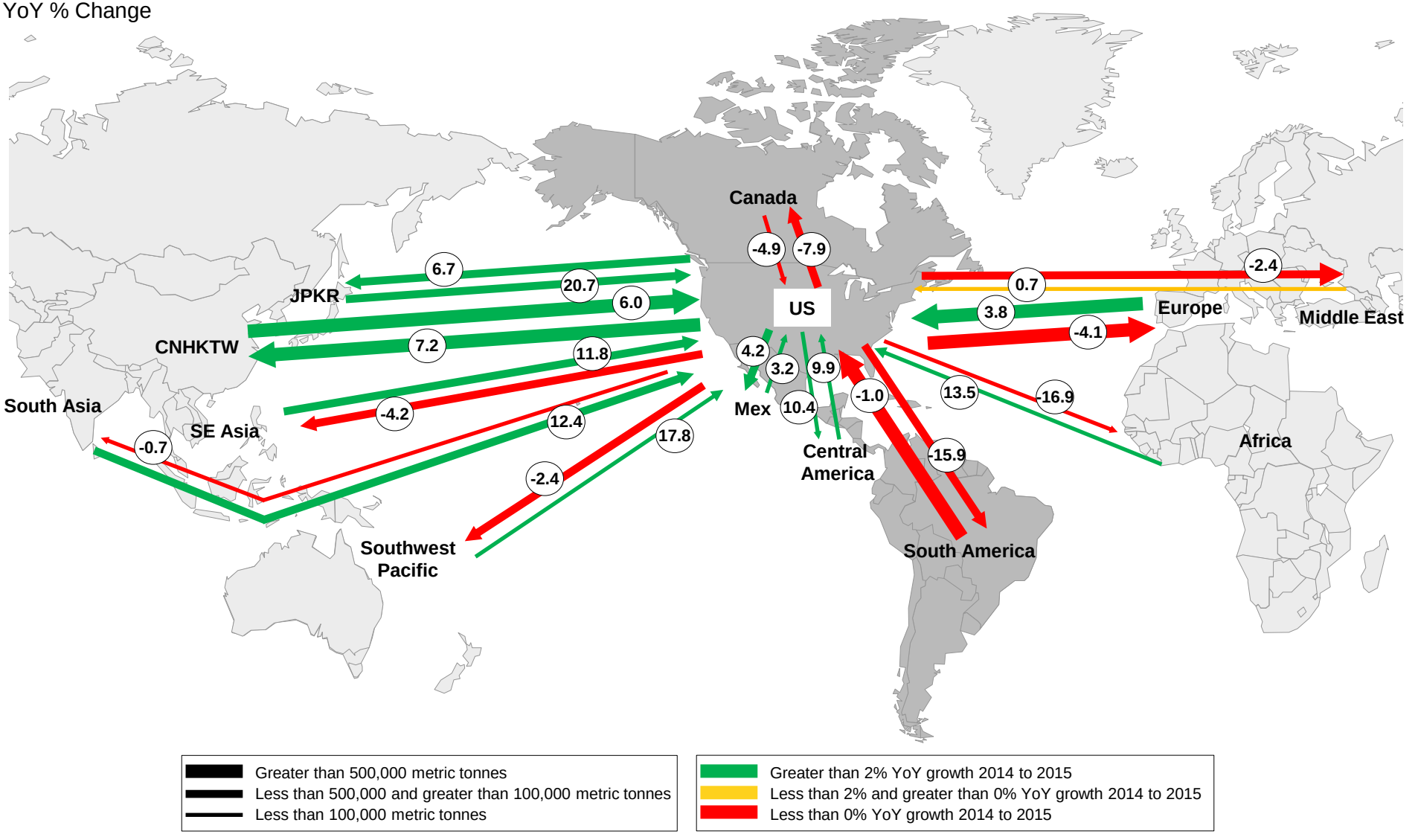


Source: LogCapStrat Analysis: LCS CargoMetrix

West coast port slow down in 2015 generated a mini rally in the Transpacific market otherwise results were weak

US AIR TRADE MARKET GROWTH: 2014 – 2015

YoY % Change

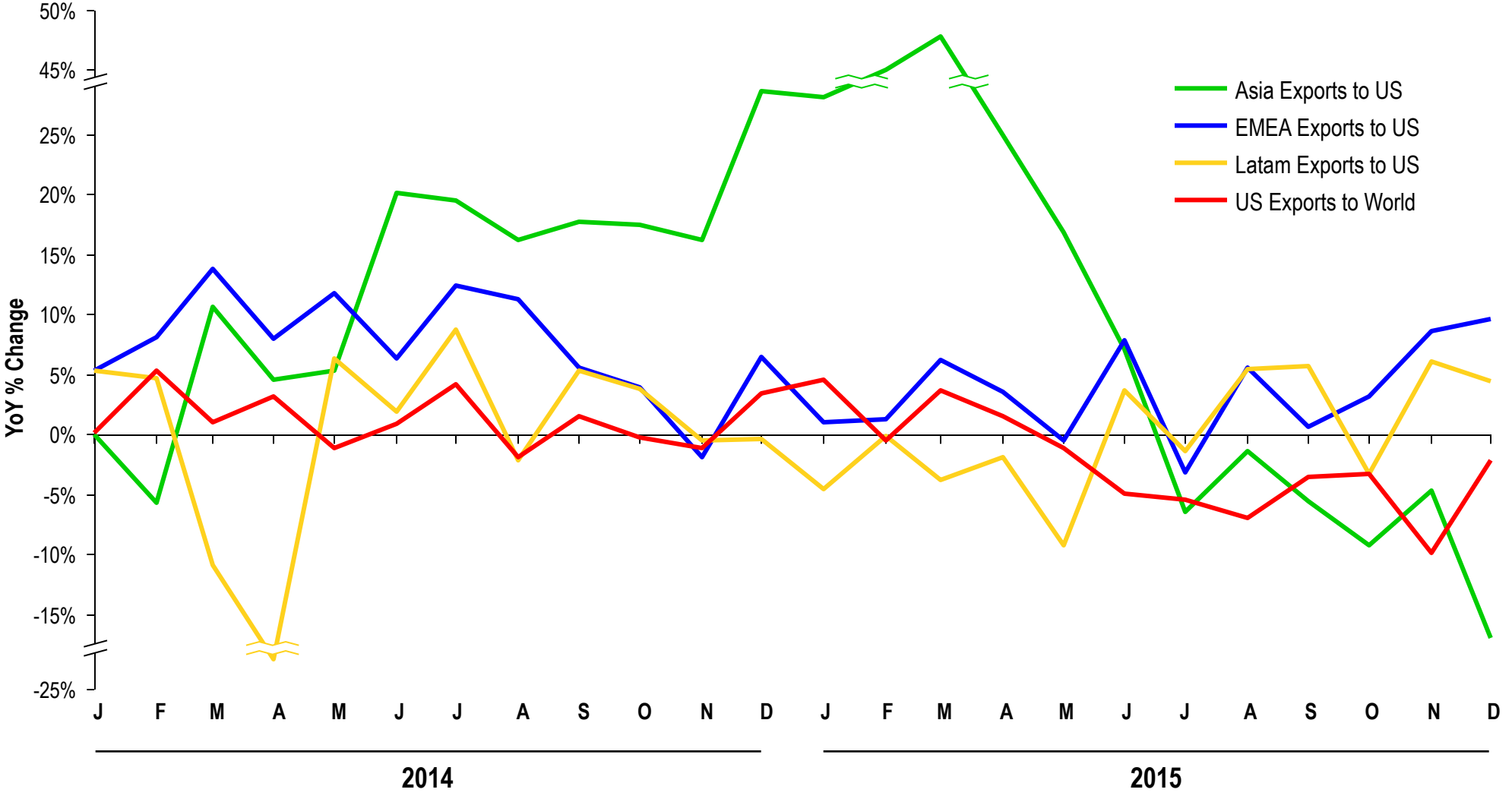


Source: LogCapStrat Analysis: LCS CargoMetrix

Transpacific surge was concentrated in the first half of 2015 and currency headwinds stalled U.S. air export growth

US IMPORTS AND EXPORTS TO WORLD REGIONS GROWTH TREND: 2014 – 2015

YoY % Change



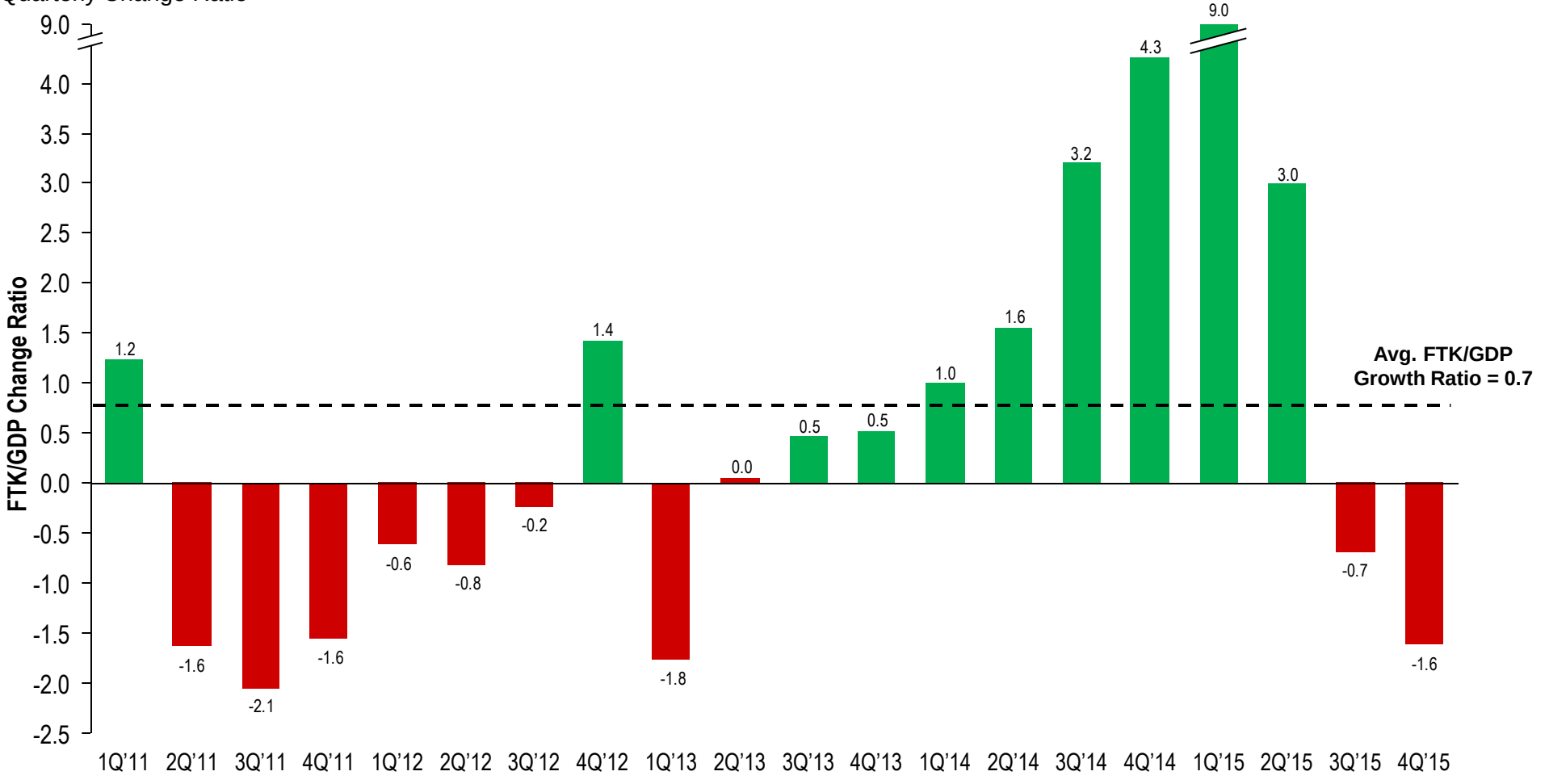
Note: EMEA includes Europe, Middle East, and Africa

Source: LogCapStrat Analysis: LCS CargoMetrix

Relationship between U.S. air import growth and U.S. GDP is volatile and not always economically driven

US IMPORT FTK TO GDP GROWTH: 2010 – 2015

Quarterly Change Ratio

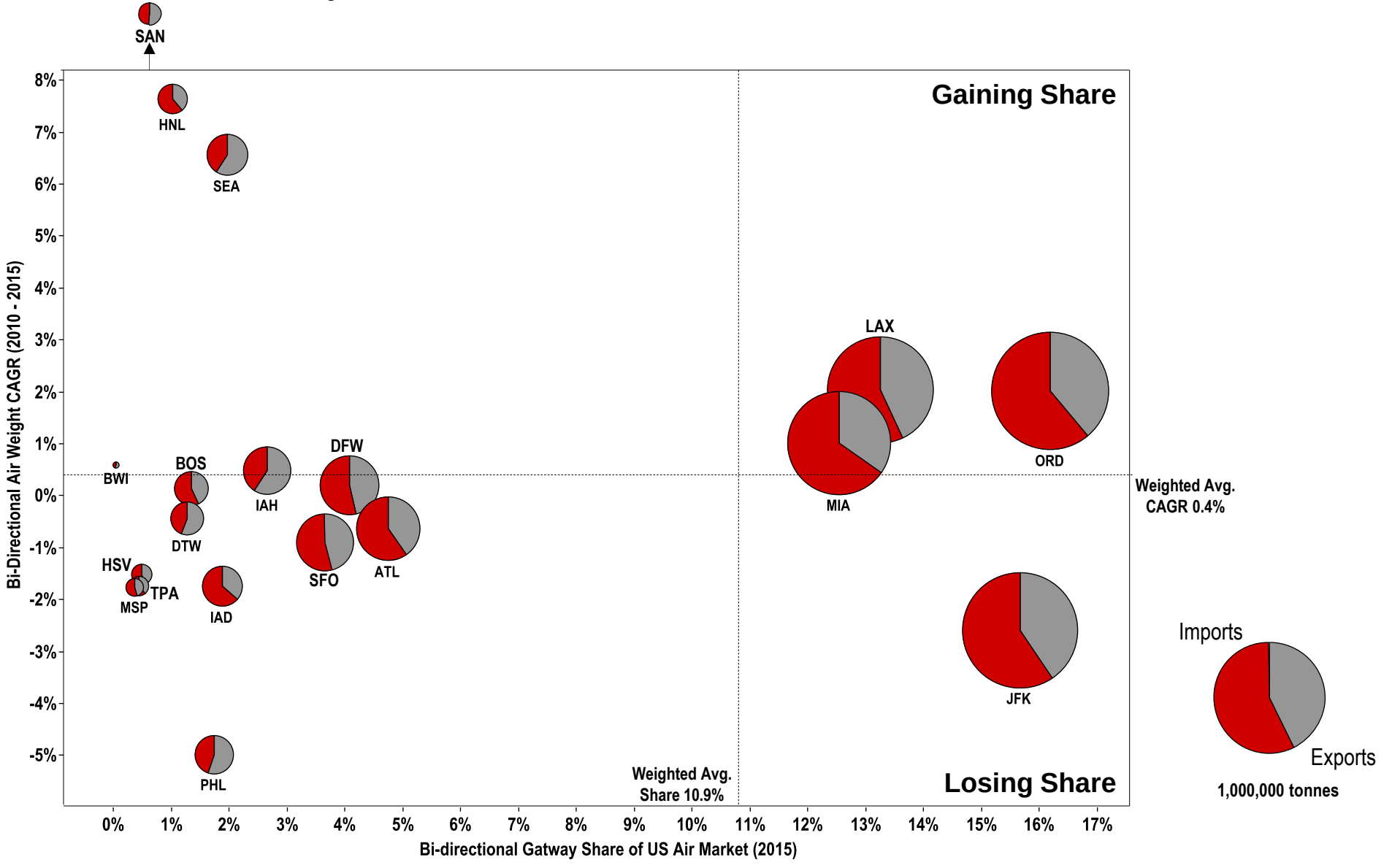


Source: LogCapStrat Analysis: LCS CargoMetrix, WEO Outlook October 2015

Major gateways are taking share as forwarders and carriers consolidate operations to drive handling scale

US INTERNATIONAL AIR CARGO GATEWAY COMPETITIVE POSITION

2010 – 2015 CAGR vs. 2015 Air Weight Share of US Total

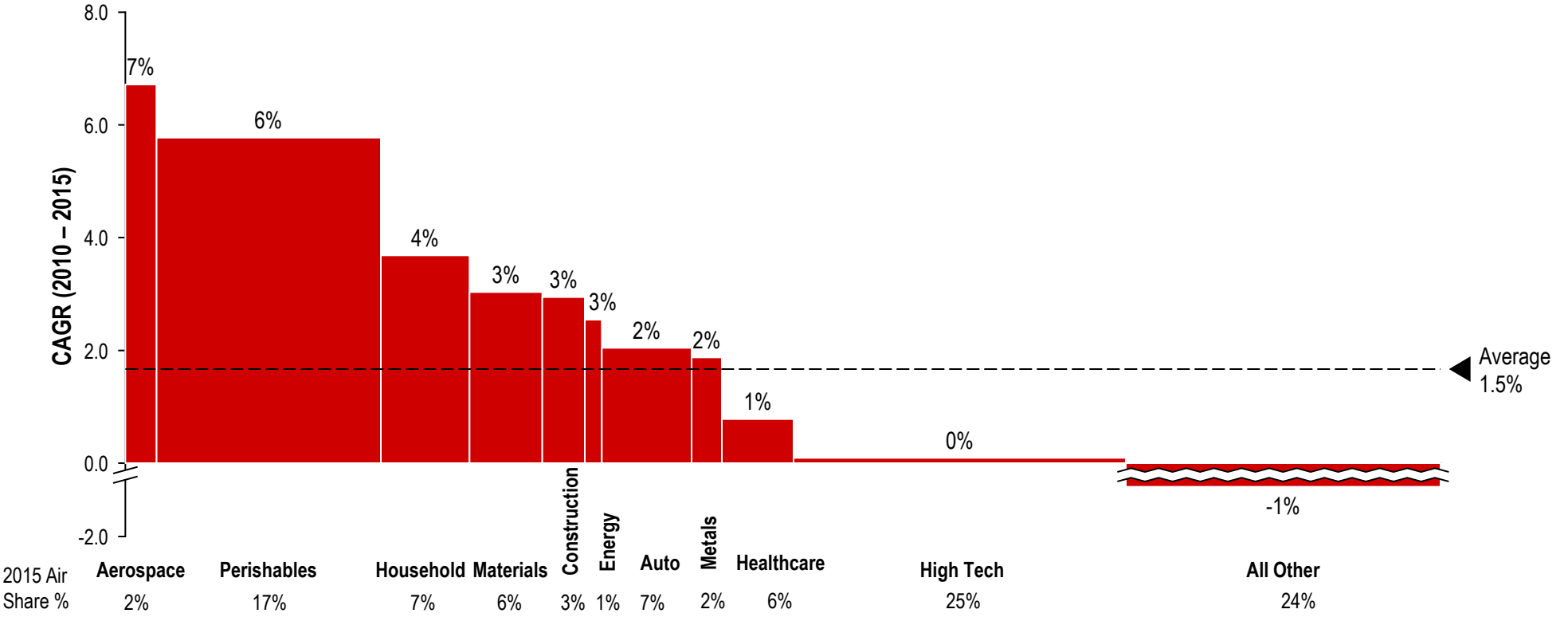


Source: LogCapStrat Analysis: LCS CargoMetrix

Aerospace was the fastest growing air import vertical followed by perishables and household goods between 2010 and 2015

US AIR IMPORTS HISTORICAL GROWTH BY VERTICAL: 2010 – 2015

CAGR %, 2015 Segment Size



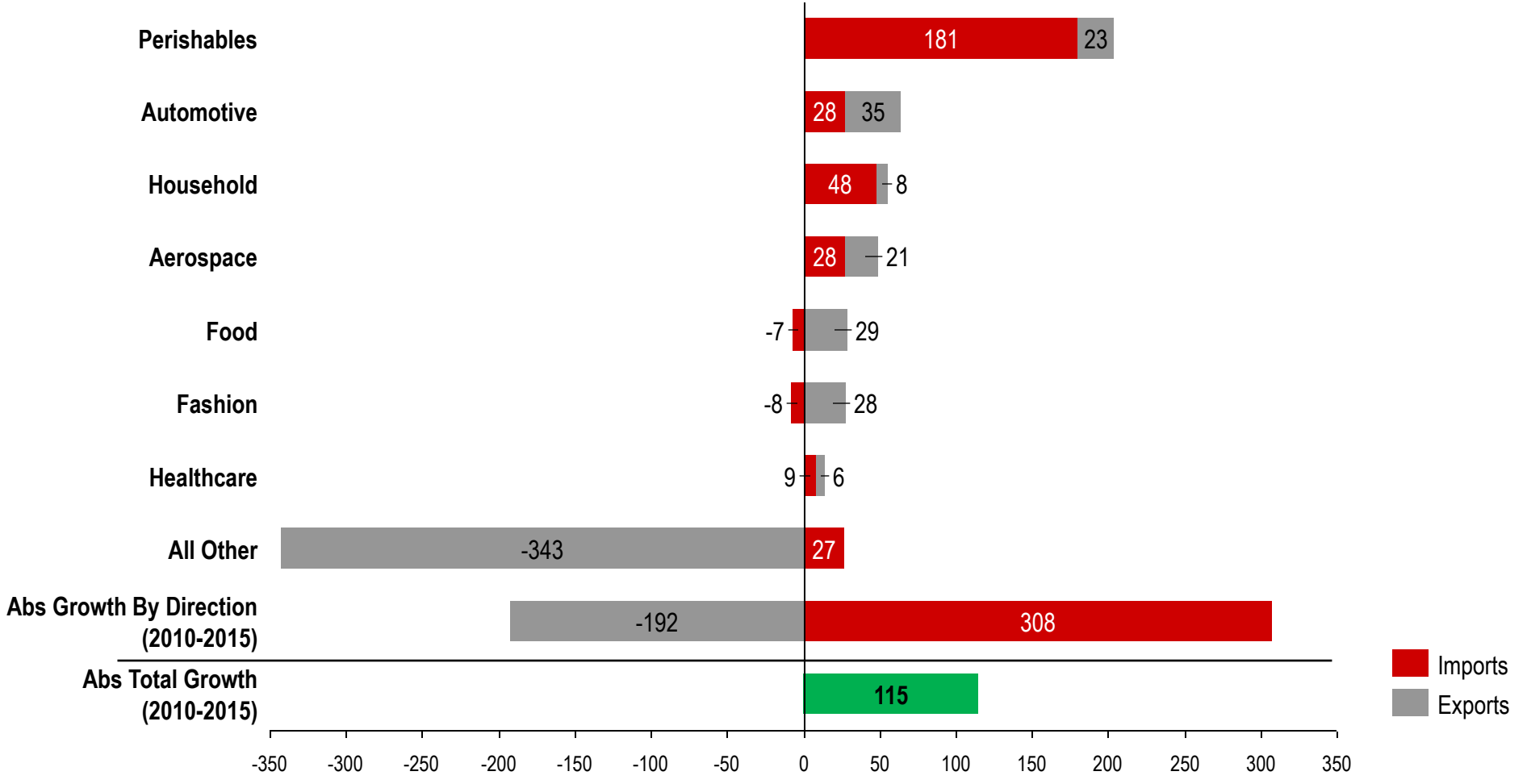
Note: Width of column corresponds to 2015 Air Weight

Source: LogCapStrat analysis; LCS CargoMetrix

Perishables, automotive, and household were the biggest contributors of absolute growth over the last five years

US IMPORT AND EXPORT INCREMENTAL GROWTH BY VERTICAL: 2010 – 2015

Volume in thousand metric tonnes



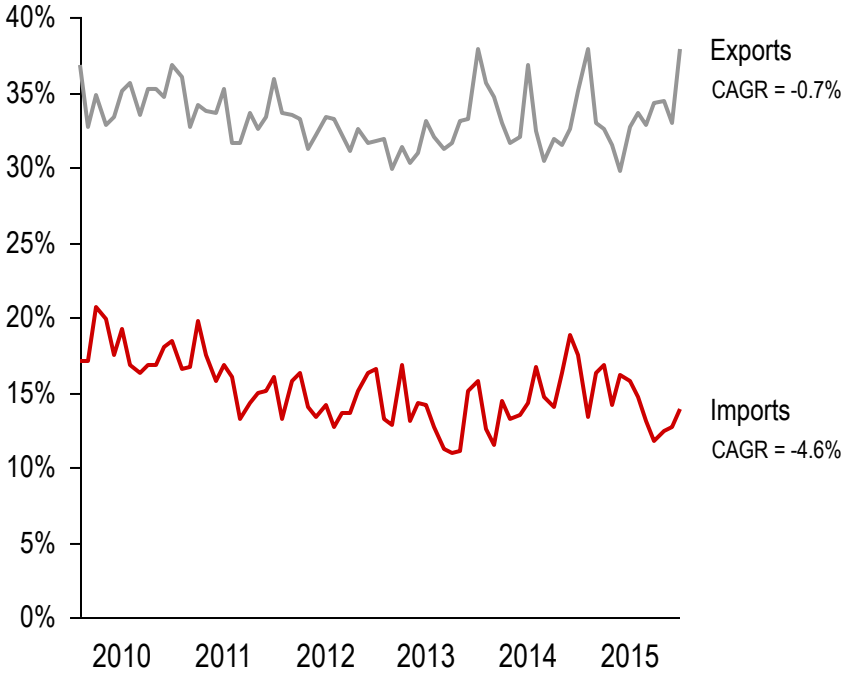
Note: All Other includes Construction, Transport, Materials, Extraction, Industrial, Metals, Hightech, and Chemicals

Source: LogCapStrat Analysis: LCS CargoMetrix

High tech air import weight penetration rate has been contracting at almost 5% per year since 2010 as shippers optimize their supply chain modal mix

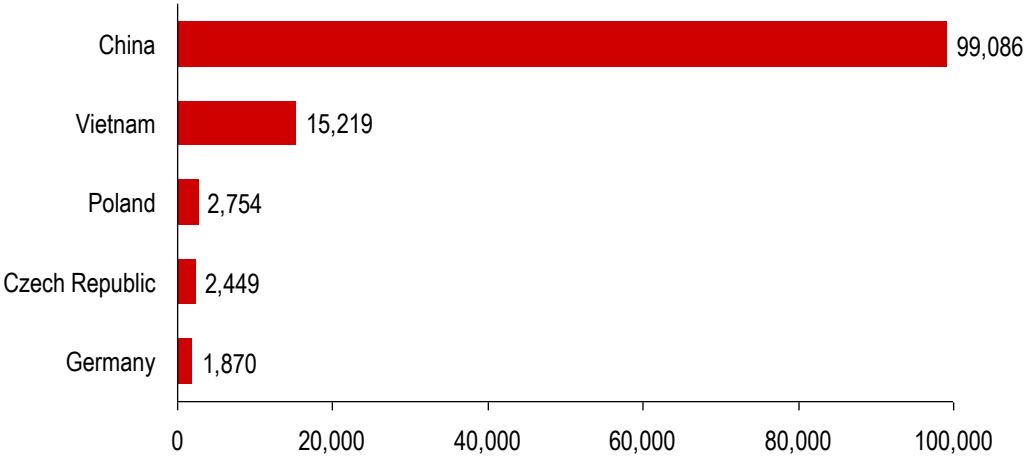
HIGH TECH AIR CARGO PENETRATION

Monthly Air Weight Penetration: 2010 – 2015



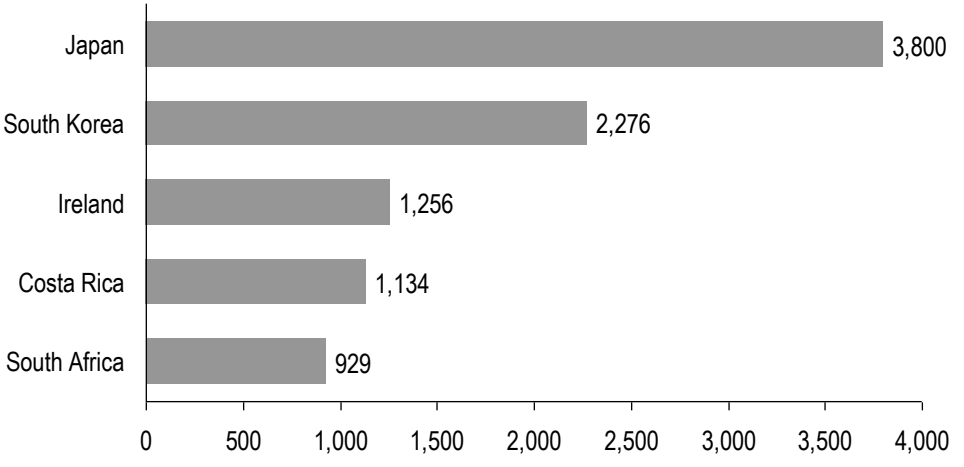
HIGH TECH IMPORTS: TOP 5 ORIGINS

Absolute Growth in metric tonnes: 2010 – 2015



HIGH TECH EXPORTS: TOP 5 DESTINATIONS

Absolute Growth in metric tonnes: 2010 – 2015

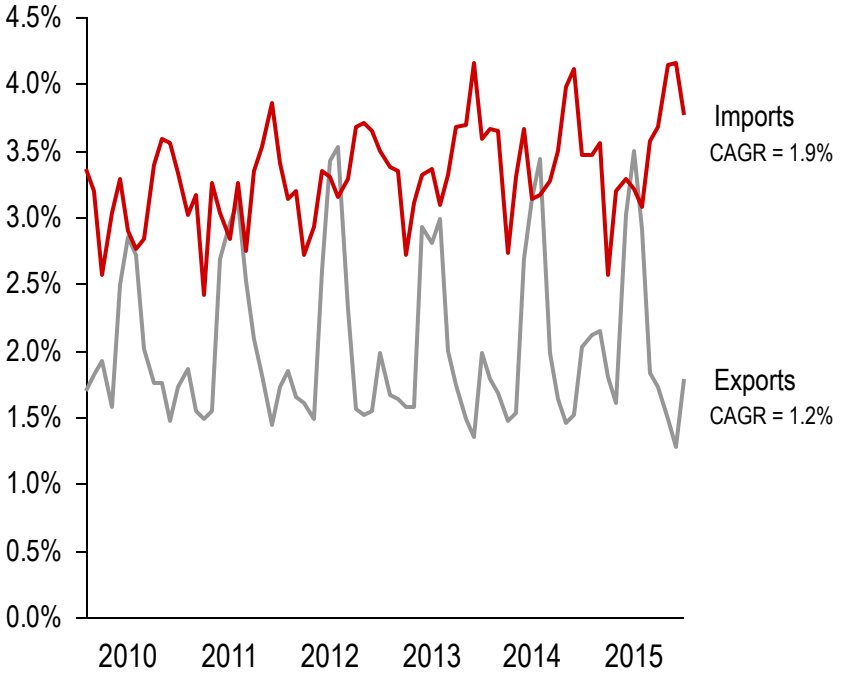


Source: LogCapStrat Analysis: LCS CargoMetrix

South America remains the primary sourcing point for U.S. perishables air imports and Asia is the primary customer base for air exports

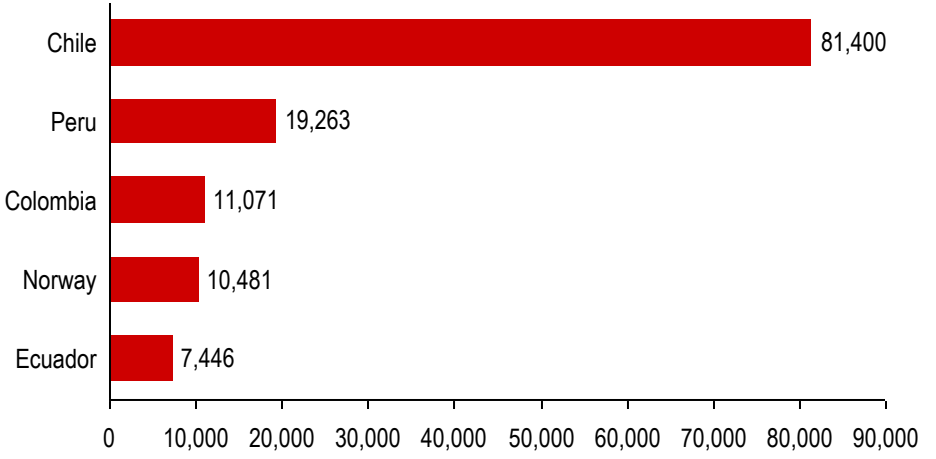
PERISHABLES AIR CARGO PENETRATION

Monthly Air Weight Penetration: 2010 – 2015



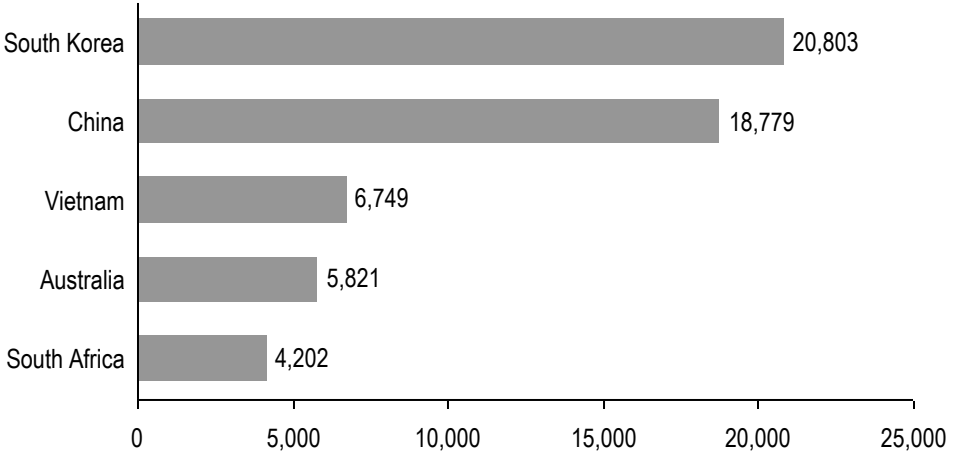
PERISHABLES IMPORTS: TOP 5 ORIGINS

Absolute Growth in metric tonnes: 2010 – 2015



PERISHABLES EXPORTS: TOP 5 DESTINATIONS

Absolute Growth in metric tonnes: 2010 – 2015

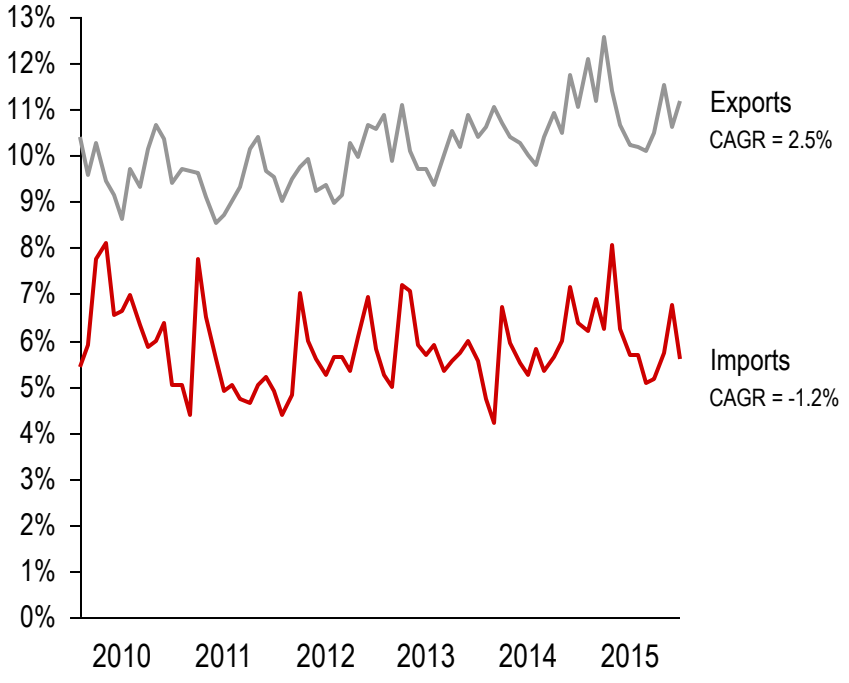


Source: LogCapStrat Analysis: LCS CargoMetrix

Vietnam generated the most incremental growth in fashion air import volumes since 2010

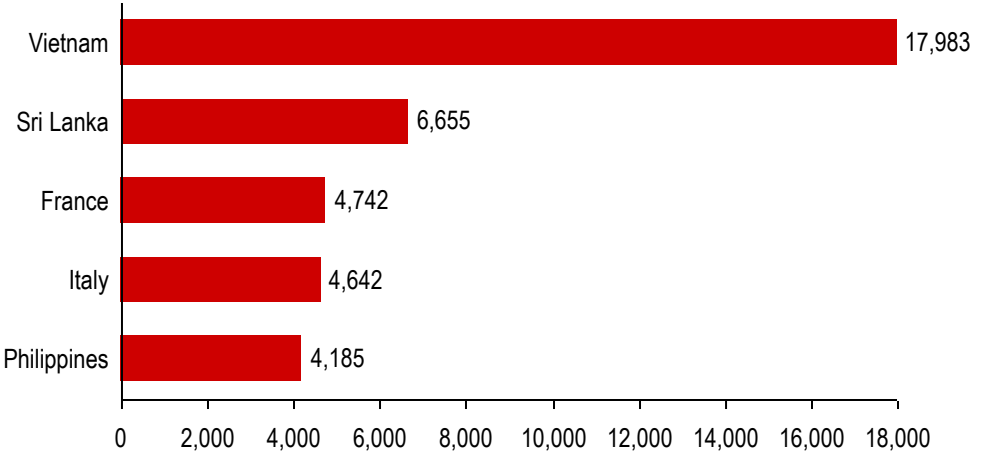
FASHION AIR CARGO PENETRATION

Monthly Air Weight Penetration: 2010 – 2015



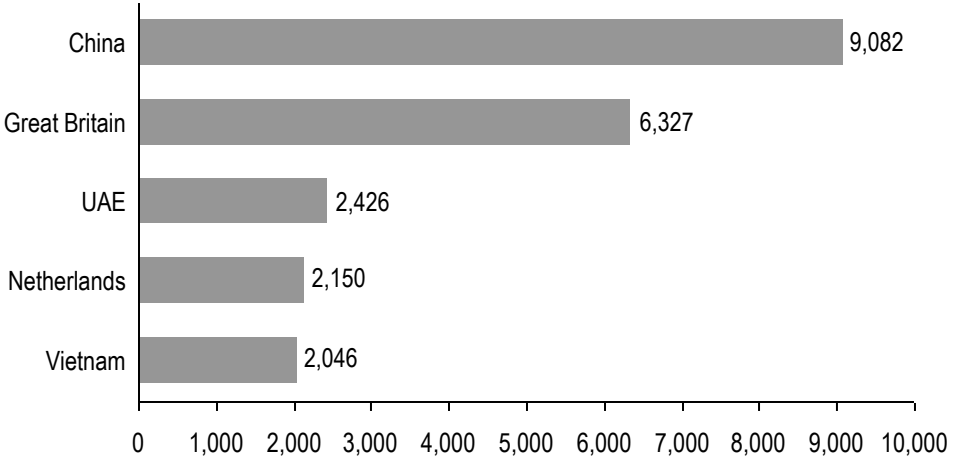
FASHION IMPORTS: TOP 5 ORIGINS

Absolute Growth in metric tonnes: 2010 – 2015



FASHION EXPORTS: TOP 5 DESTINATIONS

Absolute Growth in metric tonnes: 2010 – 2015

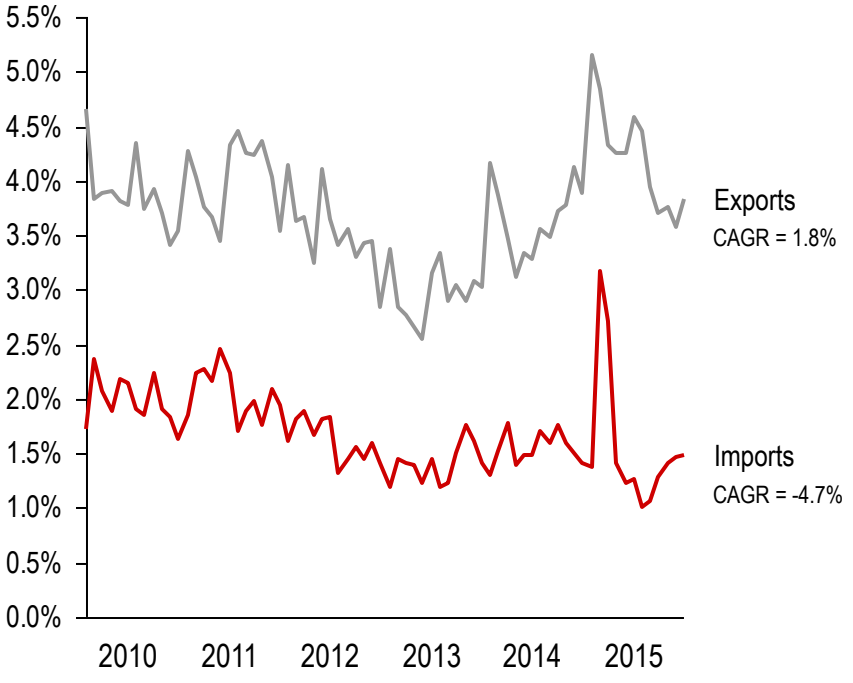


Source: LogCapStrat Analysis: LCS CargoMetrix

Automotive volumes are increasingly bi-directional between the same set of countries

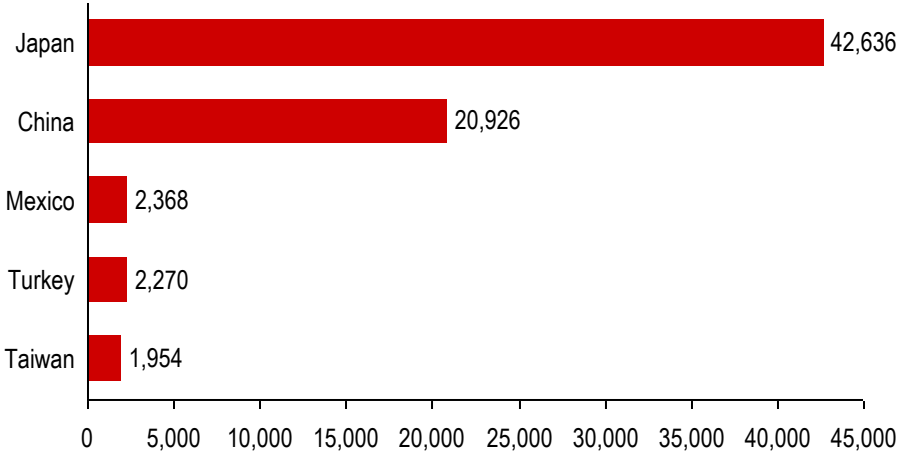
AUTOMOTIVE AIR CARGO PENETRATION

Monthly Air Weight Penetration: 2010 – 2015



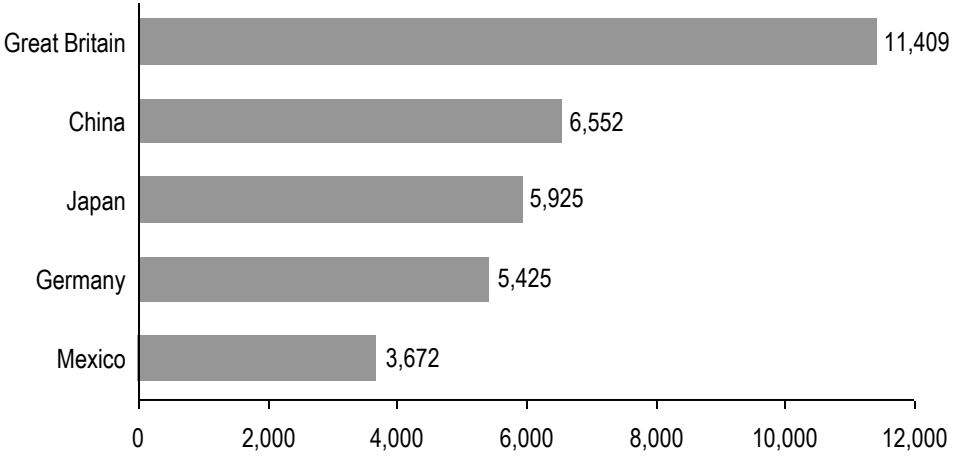
AUTOMOTIVE IMPORTS: TOP 5 ORIGINS

Absolute Growth in metric tonnes: 2010 – 2015



AUTOMOTIVE EXPORTS: TOP 5 DESTINATIONS

Absolute Growth in metric tonnes: 2010 – 2015

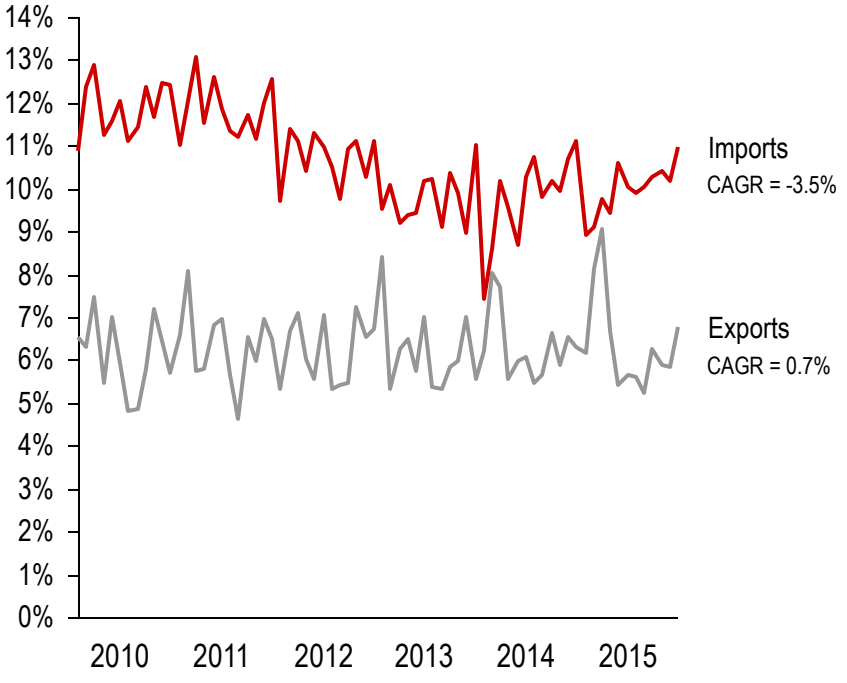


Source: LogCapStrat Analysis: LCS CargoMetrix

India and China account for over 50% of the growth in healthcare imports into the U.S.

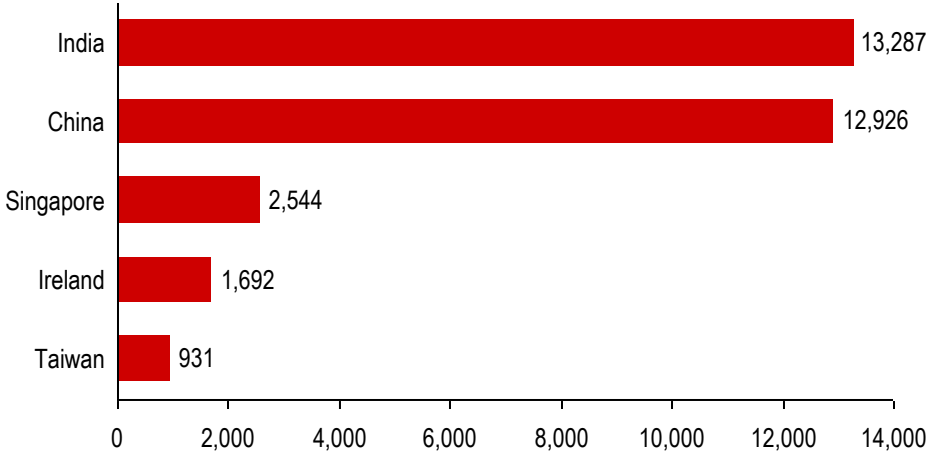
HEALTHCARE AIR CARGO PENETRATION

Monthly Air Weight Penetration: 2010 – 2015



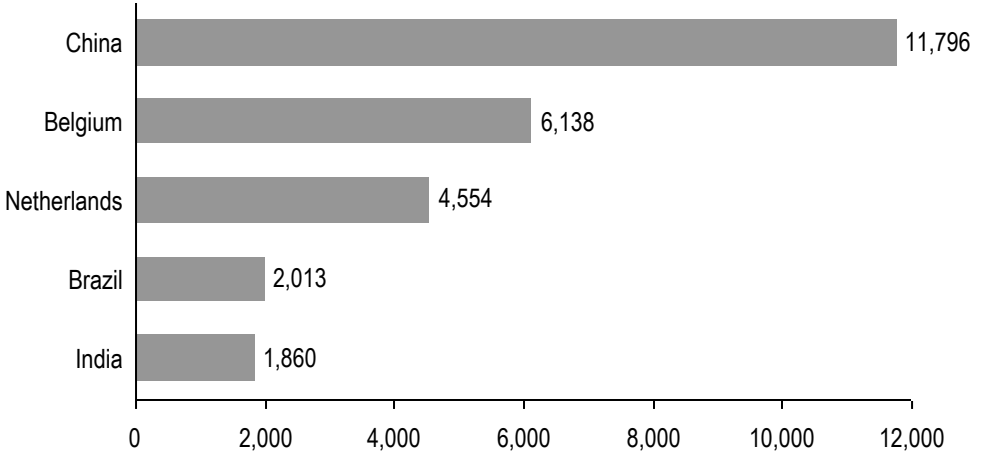
HEALTHCARE IMPORTS: TOP 5 ORIGINS

Absolute Growth in metric tonnes: 2010 – 2015



HEALTHCARE EXPORTS: TOP 5 DESTINATIONS

Absolute Growth in metric tonnes: 2010 – 2015



Source: LogCapStrat Analysis: LCS CargoMetrix

I. Historical Perspective

II. Forecast Assumptions

III. Strategic Implications

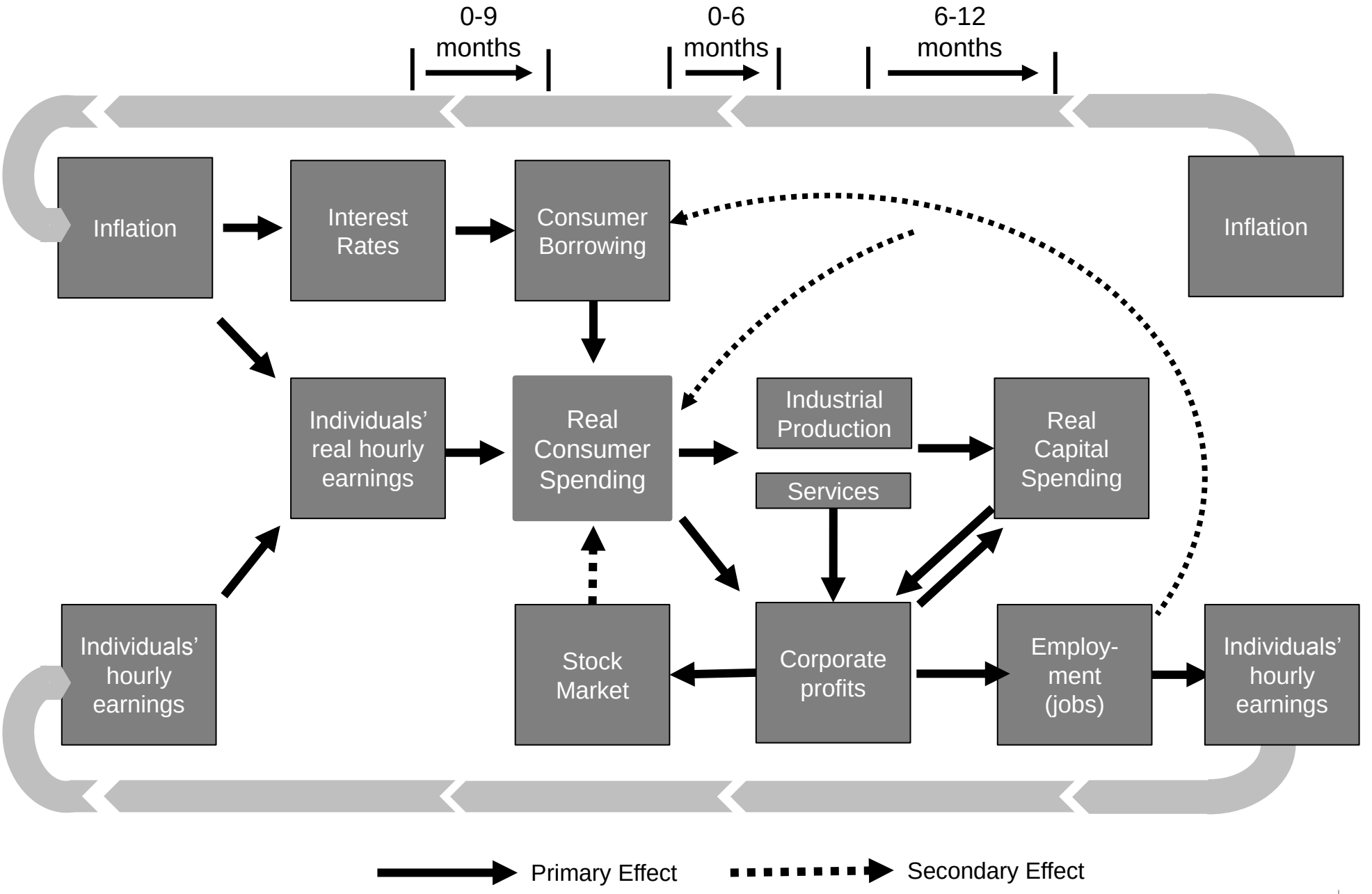
The air cargo industry will continue to face challenges from macro economic trends and resulting network adjustments

FACTORS IMPACTING AIR CARGO DEMAND: 2016-2020

Slow Growing Episodic Demand	• Volatility in consumer demand • Amplified industry cyclicality • Volatility in manufacturing
Declining Length of Haul	• Reduction in supply chain length (ex. Asia to Mexico manufacturing) • Seek to lower freight costs • Reduced pipeline inventory • Increased customer service levels
Rising Shipment Density	• Product design optimization to maximize shipping density, handling efficiency and shock protection • Reduce demand for volumetric transportation capacity • Lowered freight costs • Reduce storage footprint requires less distribution center capacity and retail shelf space
Shift to Hybrid Inventory Strategies	• Low interest rates reduce opportunity cost of capital of pipeline inventory and safety stock • Reduced shipping frequency and increased average shipment size • Shipment consolidation and extensive use of modal substitution • Priority express → deferred express; Air freight → sea freight; Truckload → intermodal; LTL → multi-stop truckload

Source: LogCapStrat analysis and Penn State Supply Chain Trends Assessment

Personal wage growth is still the most important variable that triggers end-user demand and air trade growth – it is now a key political theme



Source: Aheadofthecurve.com

Air cargo market consists of four end-user segments

PRIMARY AIR CARGO DEMAND DRIVERS: 2015

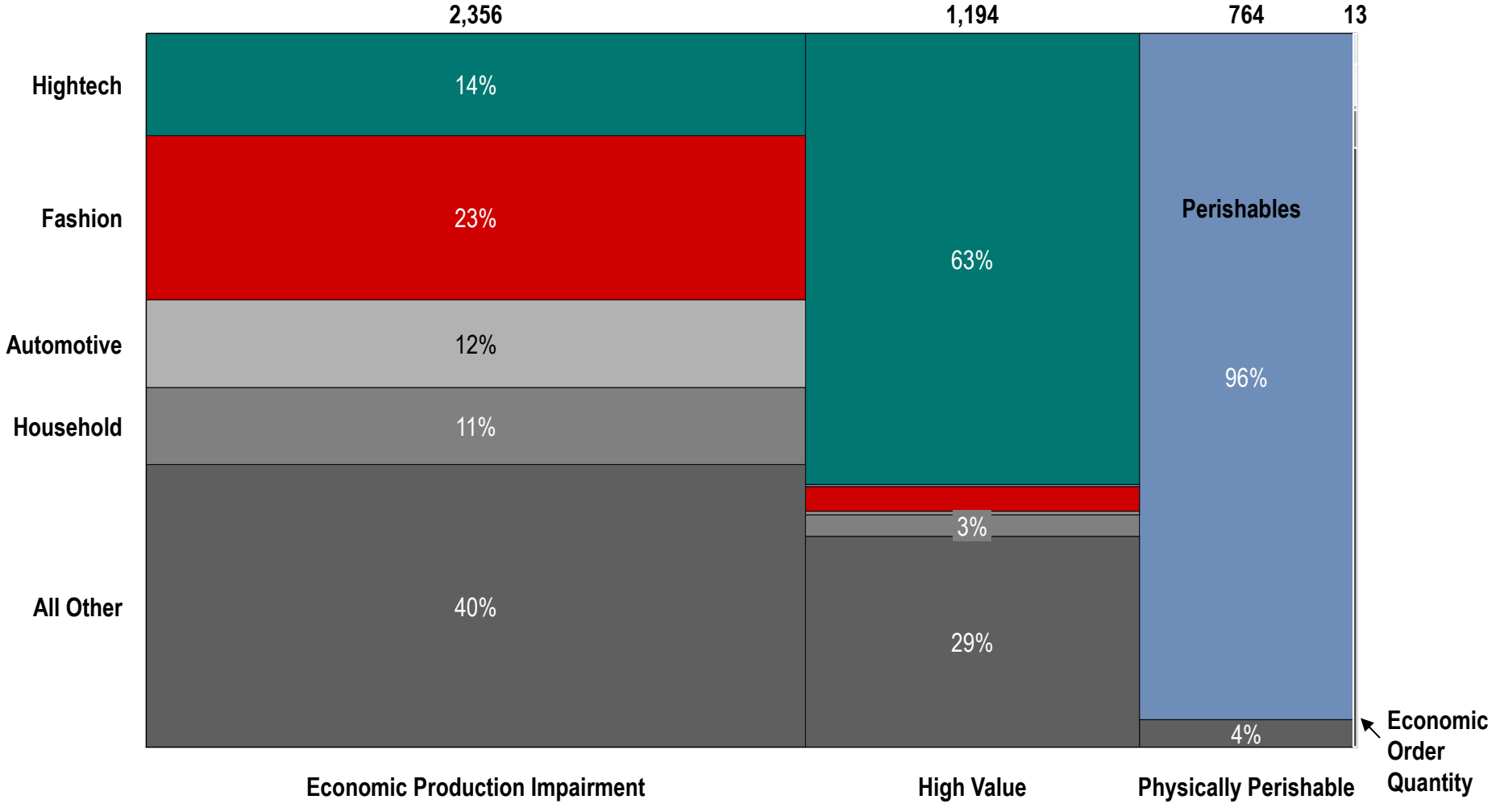
Characteristic	High Value Density Product	Physically Perishable Product	Economic Process Impairment	Economic Order Quantity
Definition of usage driver	High value products use air cargo minimize inventory carrying costs, risk of damage and theft	Low value products that have limited physical shelf life	Equipment or parts used to deliver a high value service will use air cargo to avoid service disruption and associated economic costs	Slower transit times result in lost sales and high inventory costs, therefore decreased transit times provide a cost advantage
Product examples	Cell phones, laptops, semiconductors, pharmaceuticals	Cut flowers, seafood, fruit, vegetables, certain life science products	Components feeding automotive assembly plant, spare parts for textile machinery	Fast fashion, online retailers
North America air imports (air weight %)	**29%**	**16%**	**54%**	**1%**
North America air exports (air weight %)	**25%**	**9%**	**63%**	**1%**

Source: LogCapStrat Analysis; LCS CargoMetrix

Economic process impairment is the primary air freight use case for most verticals whereas unit value drives high tech

US AIR IMPORTS VOLUME SHARE BY VERTICAL AND AIR FREIGHT USE CASE: 2015

Volume in thousand metric tonnes



Note: All Other includes Industrial, Materials, Healthcare, Construction, Aerospace, Metals, Chemicals, Energy, Food, Extraction, and Transport

Source: LogCapStrat Analysis: LCS CargoMetrix

U.S air import growth multipliers vary considerably by shipper/use case segment

U.S. AIR IMPORT SHIPPER/USE CASE SEGMENT CHARACTERISTICS

% of Weight	Shipper Segment	Industries Examples	Strategic Implications	US Air Import Growth Rate Relative to GDP: 2010-2015
	Planned Users			
29%	High Value / Weight Ratios	▪ Mobile phones ▪ IT equip ▪ Healthcare	▪ Highest unit value products remain air freight users while lower unit value shift to ocean and/or near shoring – highly granular supply chain segmentation	**0.6x**
16%	Physical Perishability	▪ Fresh fruit ▪ Seafood ▪ Flowers	▪ Cost of doing business in near term but refrigeration technology will enable mode shift – carbon footprint risk in EU	**4.1x**
1%	Economic Order Quantity	▪ Apparel ▪ Manufacturing	▪ Further optimization of supply chain transit times to reduce carrying and handling costs	**-3.3x**
	Emergency Users			
54%	Economic Process Impairment	▪ Components for assembly ▪ Spare parts production machinery	▪ Rebounding industrial production triggers increased plant shutdown risk ▪ Production machinery ▪ Automotive parts for assembly ▪ Color dyes ▪ Packaging material	**-0.1x**

Source: LogCapStrat Analysis; LCS CargoMetrix

U.S. air export market potential will vary by destination economy

DESTINATION MARKET CLASSIFICATION BY AIR IMPORT GROWTH PROPENSITY

	Advanced Mature Destination Economies	Developing Economies Dependent on Re-Exports	Old Emerging Markets	New and Almost Emerging Markets
Countries included	▪ North America (CA) ▪ Europe ▪ JP ▪ AUNZ	▪ Northeast Asia (CN, HK, KR, & TW) ▪ NA/EU (MX, CZ, HU, PL)	▪ Old emerging (BR, ID, IN, PH, TH, RU)	▪ New examples: (TR, ZA, EG, VN, CO) ▪ Almost (everywhere else)
Degree of Dependency on Re-Exports to NA and EU Markets	Bi-lateral air trade between NA and EU has limited dependency on re-exports to advanced economies	High degree of exposure to high technology component and finished product flow and other manufacturing inputs	Less air-centric re-export risk	Wide range of variation in re-export exposure risk
Destination Market GDP Exposure to Natural Resources	Australia, Canada and Norway are among the highest countries with small populations and resource exposure	Minimal because of net importer status	Brazil and Russia have highest exposure among old emerging markets	Gulf States, Central Asia, Nigeria and Venezuela driven by energy
Economy Ability to Support Local Consumption of Air Imports	Size of local consumption base is high but incremental growth is moderate to low due to structural factors	Government spending on infrastructure projects and services (e.g. defense and health care supports local market)	Wide variation in local consumption economy performance	Growing middle class can purchase some branded goods but often substitute for cheaper private label products which lower cost

Source: LogCapStrat analysis

Forecast U.S. air exports to destination markets is expressed as a multiple of destination GDP by shipper/use case segment

US AIR EXPORT PROPENSITY BY DESTINATION MARKET TYPE

		Weighted Average US Air Export/GDP Multiplier			
% of Weight	Shipper Segment	Advanced	Developing Re-Export	Old Emerging Markets	New and Almost Emerging Markets
	Real GDP CAGR%	**2.3%**	**3.0%**	**5.5%**	**5.7%**
	Planned Users				
29%	High Value / Weight Ratios	**1.6x**	**0.3x**	**0.1x**	**-0.1x**
16%	Physical Perishability	**0.3x**	**3.5x**	**0.3x**	**3.4x**
1%	Economic Order Quantity	**2.5x**	**1.2x**	**-0.6x**	**2.4x**
	Emergency Users				
54%	Economic Process Impairment	**0.7x**	**0.3x**	**-0.5x**	**-0.2x**

Source: LogCapStrat Analysis; LCS CargoMetrix

I. Historical Perspective

II. Forecast Assumptions

III. Strategic Implications

Belly capacity growth, the need for non-integrated freighters, integrator fleet composition, and seasonality/trade imbalance will impact the air cargo supply curve in 2020

KEY FACTORS IMPACTING AIR CARGO SUPPLY IN 2020

Belly Capacity Growth

- Belly capacity will outpace freighter capacity growth as passenger air-travel demand grows and freighter orders remain at an all-time low
- The ratio of belly capacity per seat will continue to increase due to aircraft design

Need for Non-Integrated Freighters

- The need for non-integrated freighters will continue to exist due lot/shipment size, directionality, and seasonality
- Belly capacity has yet to exceed freighter total capacity and has its limitations (e.g. B777 belly pallet space makes it difficult for forwarders to achieve economies of scale)

Integrator Fleet Composition

- UPS, FDX and DHL control significant portion of freighter fleet with Chinese integrators and Amazon as new market entrants
- Integrators will likely augment fleets with B777s over B747-8s; the future supply curve will look different as the B747-400 retires and capacity shrinks

Seasonality & Directional Trade Imbalance

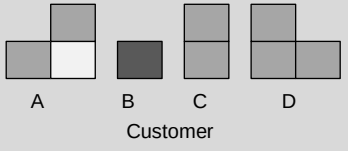
- International seasonality for consumer products will likely continue to change as consumers order more efficiently
- Directional imbalance, which has historically been driven by China, could be affected by changes in China's export as a percentage of imports

Freight forwarders must know their costs and invest in automation and analytics to effectively compete in the transforming supply/demand landscape

KEY IMPLICATIONS: FREIGHT FORWARDERS

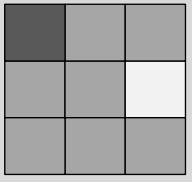
Given that freight forwarding is a buy/sell-spread business optimized by consolidation-arbitrage mix, forwarders need state-of-the-art technology in order to maintain service levels and prevent customers from defecting to integrators.

Forwarder Buy-Sell Spread



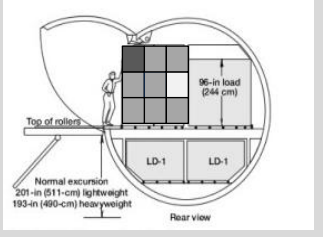
"Sell Side" Revenue (from Shippers)

-



Forwarder Consolidation Expense

-



"Buy-Side" Transportation Expense

=

GRATE MARGIN

"Buy-Sell Spread" Gross Revenue After Transportation Expense ("GRATE")

Key Implications:

- Due to industry trends, it is likely that shipment sizes that forwarders handle will decrease
- Forwarders will need to keep costs low to service various HAWB and MAWB sizes
- As the cost of technology decreases, forwarders should make critical investments in automation, IT, and analytics in order to better serve customers, manage costs, and preserve margins

Non-integrated carriers – network passenger carriers, LCCs, mixed-fleet carriers, and all-cargo freighter carriers – all need to make investments in IT to improve customer experience while lower costs with productivity

KEY IMPLICATIONS: AIRLINES

Carrier-Type	Key Implications
Network Passenger Airlines	• Need to invest in IT to manage costs and increased ground-handling efficiency (e.g., RFID, etc.) • Must effectively manage security posture and strategize for participation in a potential international e-commerce boom
Low Cost Carriers	• Need to increase participation in the global airfreight market without a hub-and-spoke network • Must effectively compete against trucks on point-to-point segments • Optimize limited physical cargo space due to narrow-body belly capacity
Mixed Fleet Carriers	• Need to invest in IT around cargo terminals, space control, revenue management (allocating capacity/mix across assets), and pricing (discriminating across customer segments to price levels) • Focus on pricing independently from belly and freighter to preserve margins • Must improve cargo-handling operations and integration with departure-control systems (e.g., ticketing and payload balance)
Mixed Fleet Petro Dollar Carriers	• Need to consider how structural headwinds of low oil prices could impact operations • Continued investment in IT capabilities required for improving operations
Non-Integrated All Cargo Airlines	• Will face significant risk in market downturns due to operation of swing capacity • Need to offer differentiated value in the marketplace, such as flying to non-standard destinations and offering specialized handling of cargo • Must have a quality sales force, robust client segmentation, specialized cargo-pricing knowledge, and access to specialty markets