

How Global Trade Is Driving Demand For Ports



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Dr. Walter Kemmsies

Chief Strategist

JLL Ports Airports and Global Infrastructure

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Helps owners deliver differentiated assets with improved occupancy, net operating income and valuation for maximized real estate performance.

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Provides understanding of demand and supply chain trends as well as comparative market reconnaissance and benchmarking.

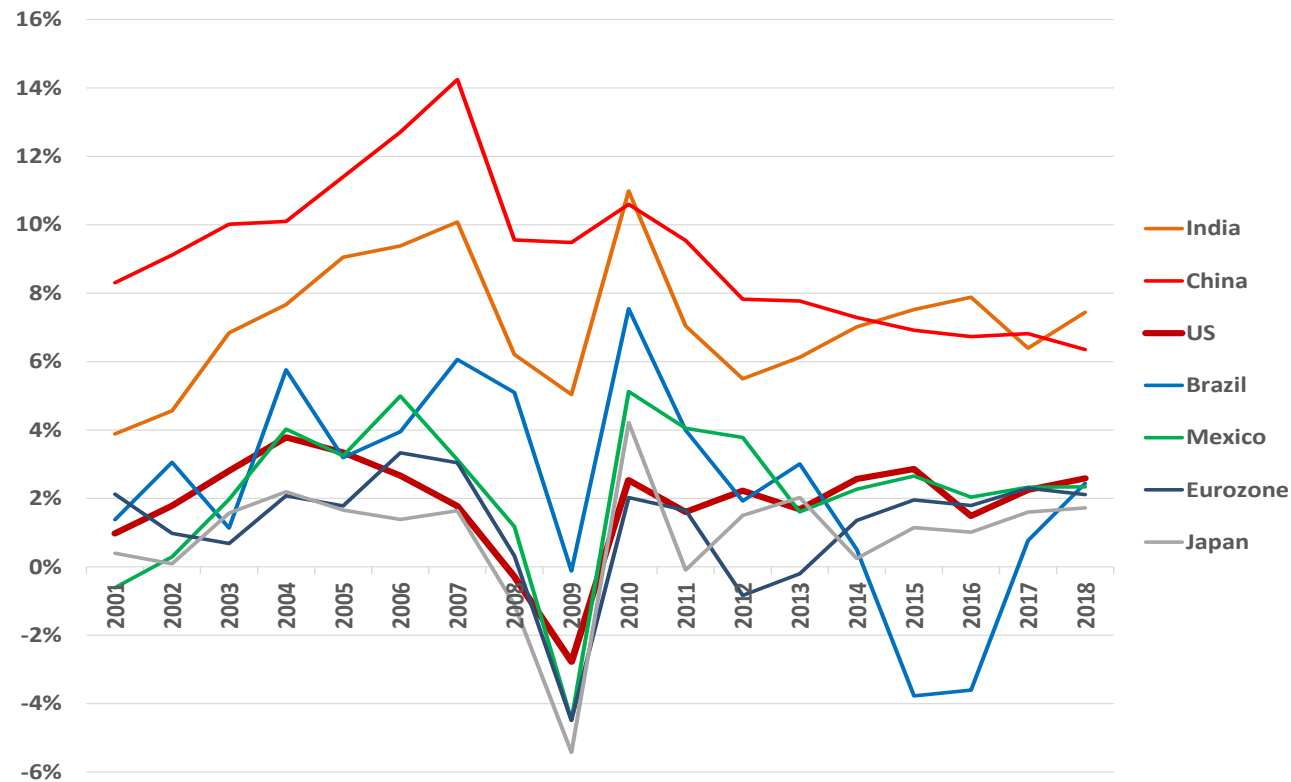
Demand for port services remains strong

- The drivers of global trade remain intact
 - Benign global economic environment continues if productivity picks up
 - Growing global middle class
 - Waterborne freight costs continue to decline
- Congestion, slightly offset by automation, has impacted logistics and retail
 - Shopping at retail outlets is a lot less convenient
 - Logistics and transportation labor productivity declined
 - Worsening reliability requires more safety stock (inventory)
- The three T's of policy indicate more growth ahead, particularly exports
 - Trade agreement renegotiation could open foreign markets
 - Tax reform incentives manufacturing capacity increases
 - Transportation infrastructure investment is critical

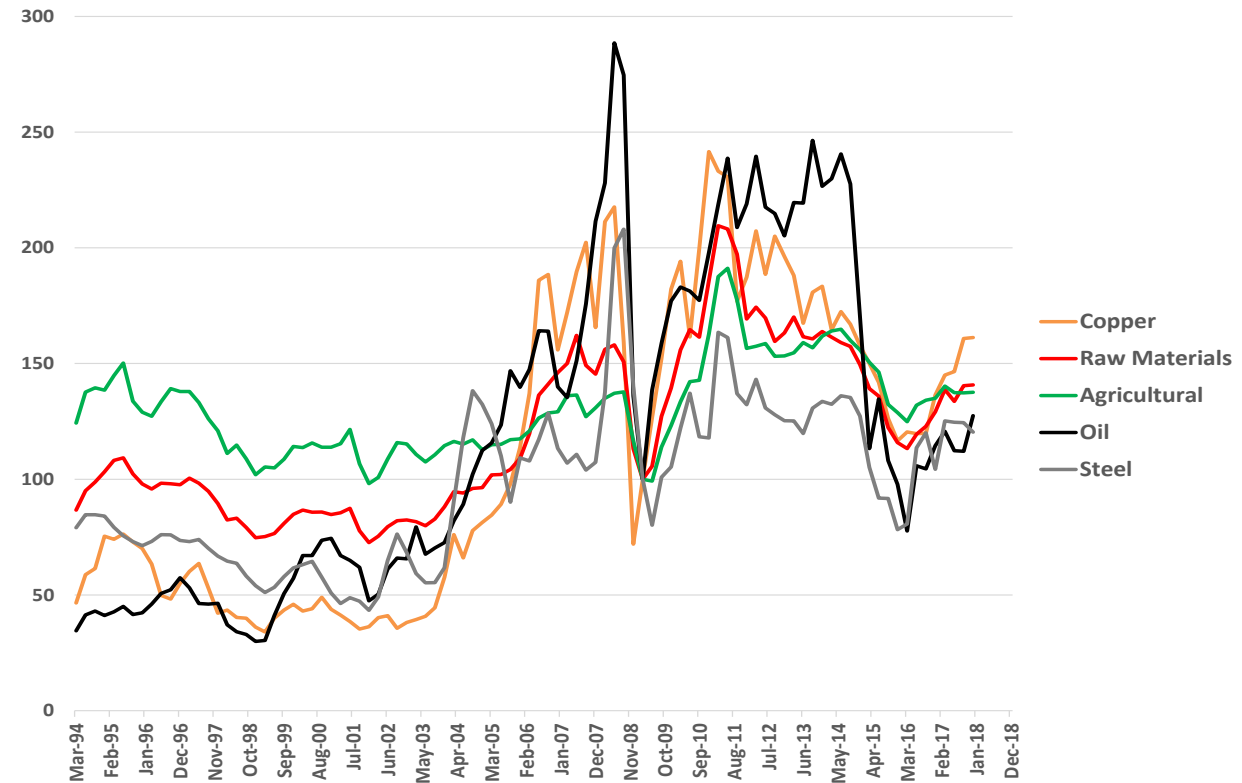
Best global economic environment in 20 years



ANNUAL REAL GDP GROWTH 2001 – 2018(E)

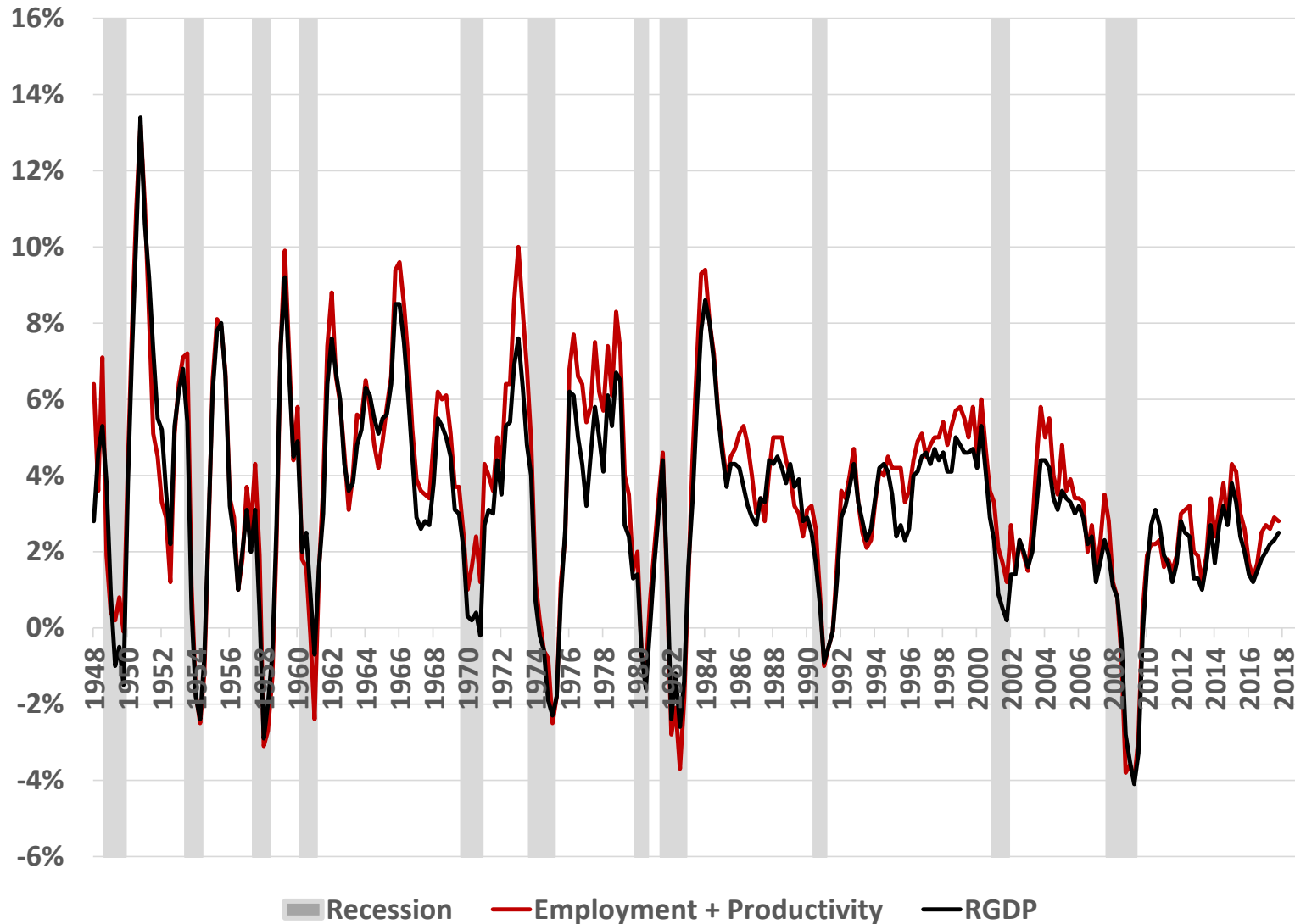


COMMODITY PRICES 1994 – 2018 (2018 =100)



Where is the US in the business cycle?

ANNUAL REAL GDP, PRODUCTIVITY AND EMPLOYMENT GROWTH 1948 – 2017

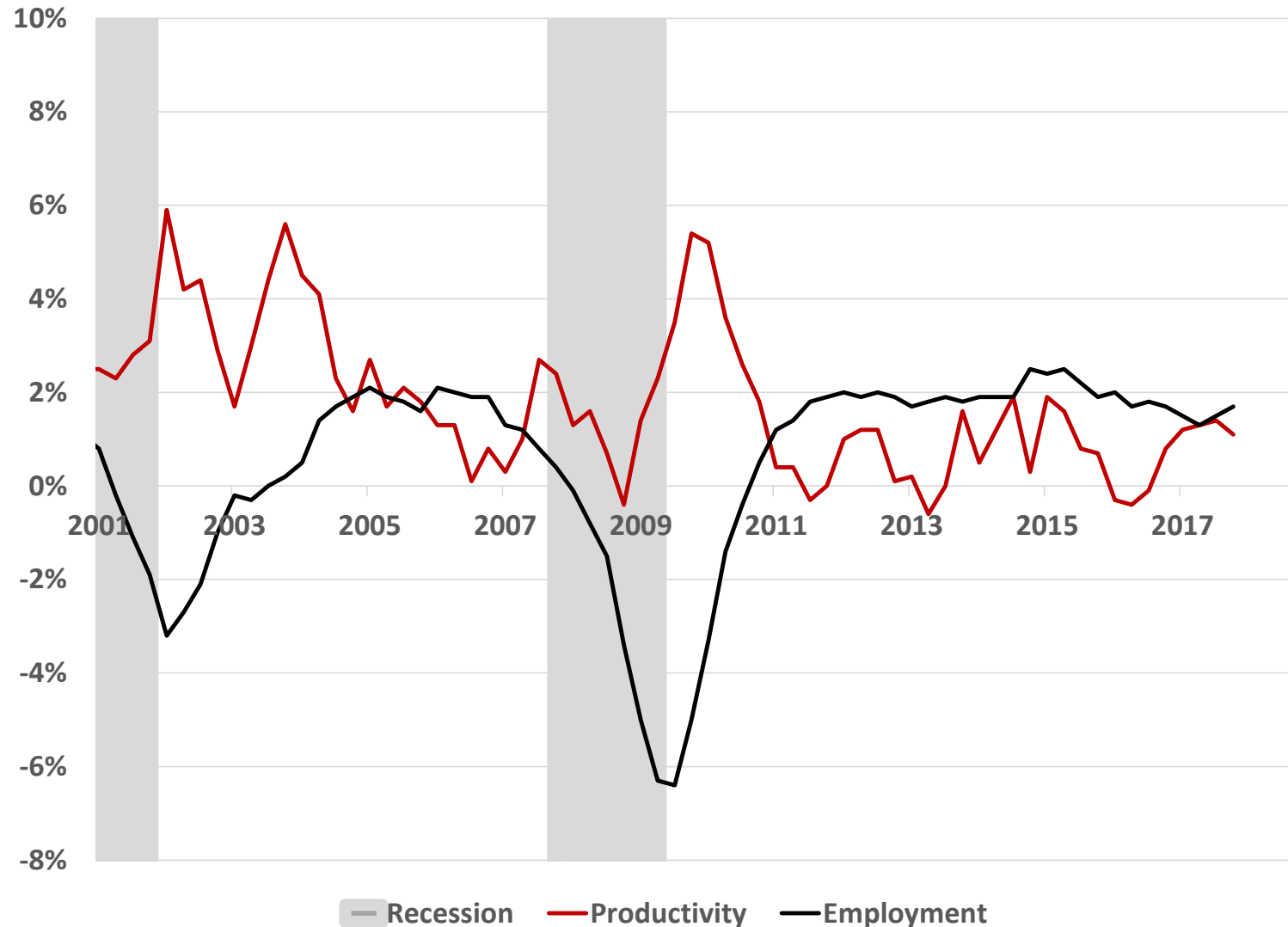


- Average expansion period between 1948 and 2018 is 19 quarters
- Longest expansion period was September 1990 to December 2000 (39 quarters)
- Current expansion period is 34 quarters
- Current expansion period is the first since 1948 not to experience a bounce-back
- Key question is why has growth slowed so significantly in the last few decades

What has happened to the drivers of GDP growth?



ANNUAL PRODUCTIVITY AND EMPLOYMENT GROWTH 2001 – 2017

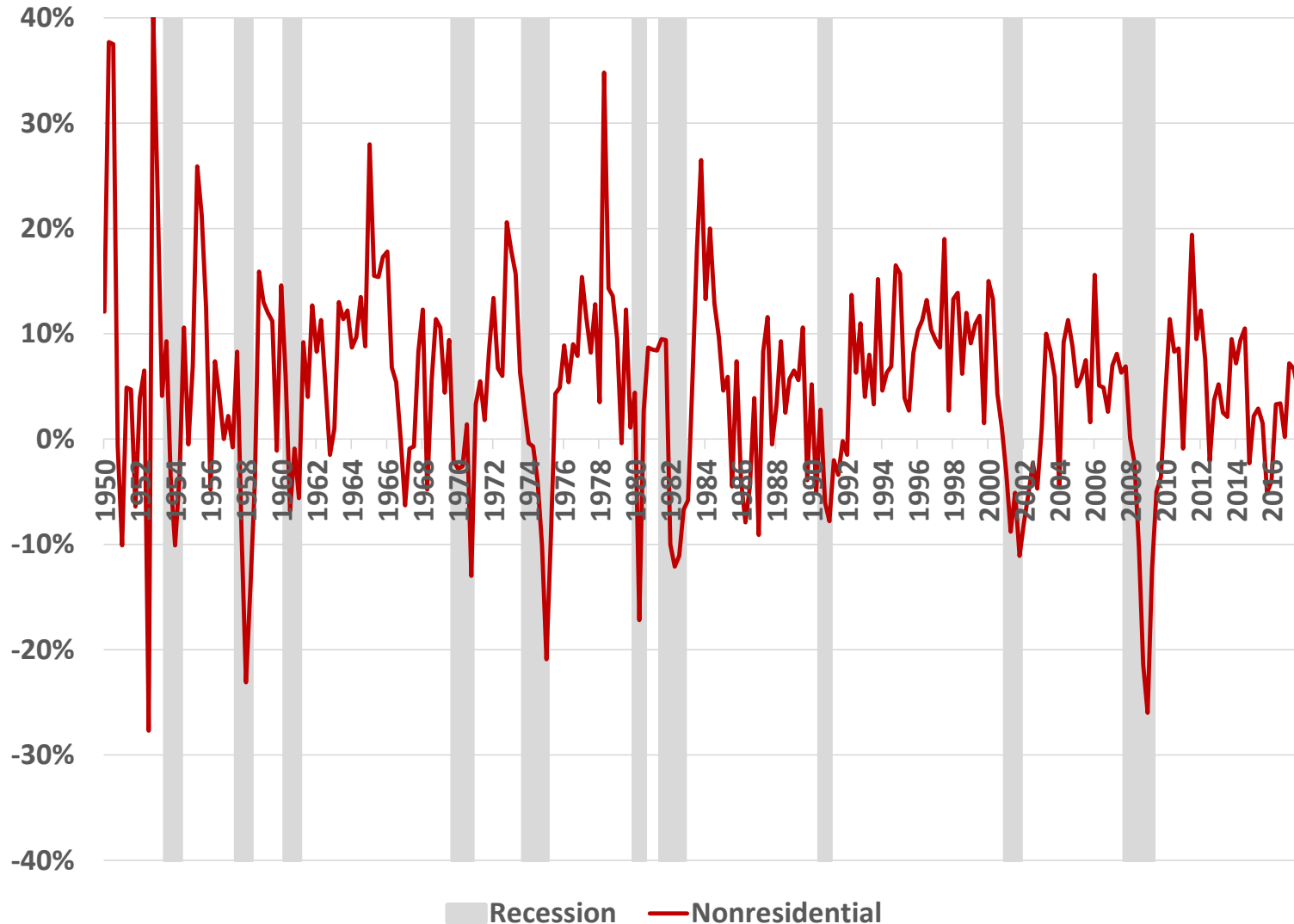


- Employment growth has slowed due to aging population and low labor demand growth
- Key question is why has productivity growth slowed so significantly in the last 10 to 15 years

US investment spending trends



US NON-RESIDENTIAL INVESTMENT SPENDING GROWTH 1950 - 2017

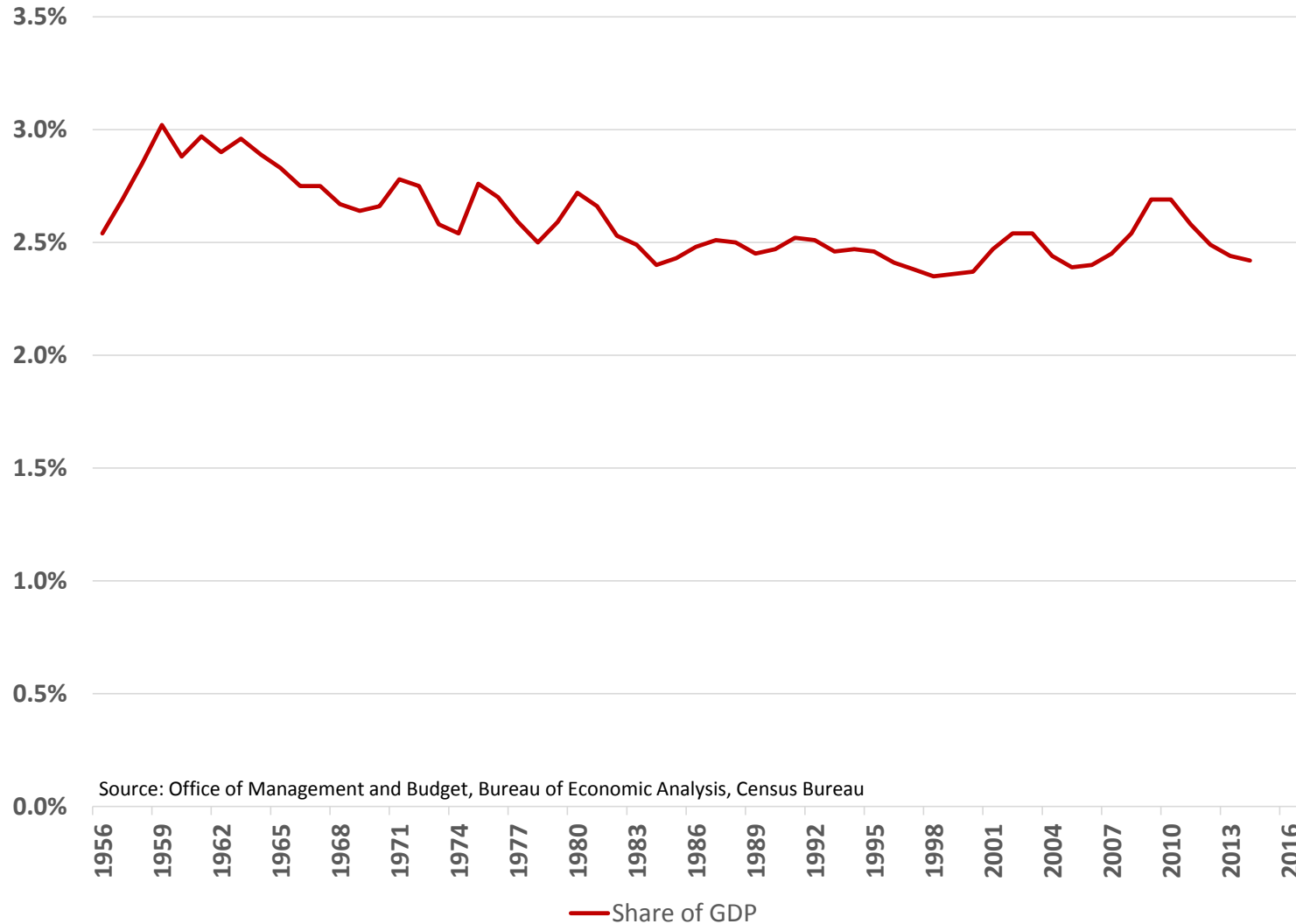


- Average investment spending growth from 1950 to 2017 was 4.9% per year
- Excluding recessions, investment spending growth averaged 7% per year from 1950 to 2017
- Since the 2007 – 2009 recession ended, average investment spending was 4.6% per year
- During the period since the recession corporate profits, dividends and share buy backs increased substantially

Slowing investment in transportation infrastructure



US PUBLIC SECTOR INVESTMENT IN TRANSPORTATION AS A PERCENTAGE OF GDP: 1956 - 2015

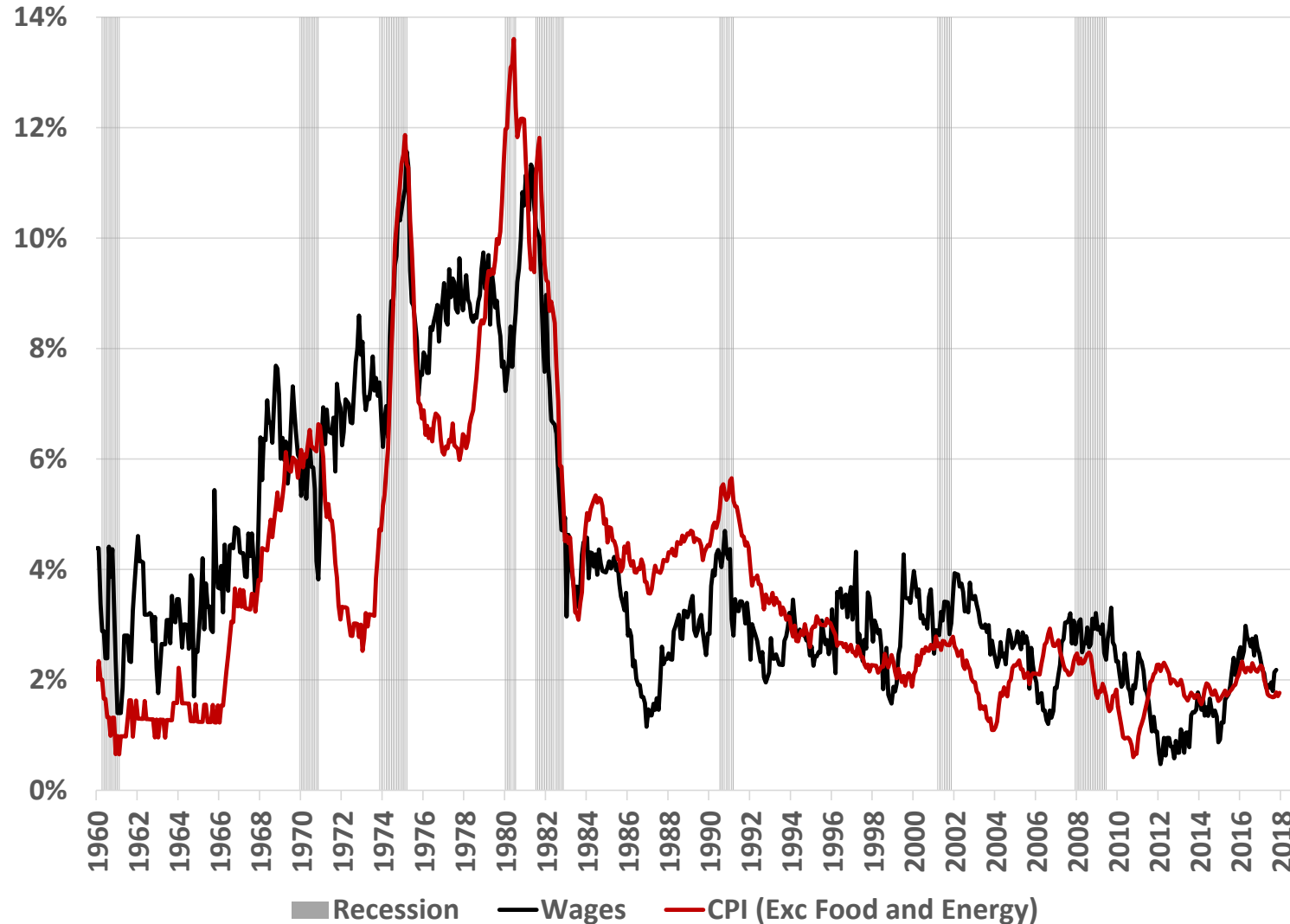


- Public sector investment in transportation infrastructure slowed more than private sector investment

Higher wage growth adds to inflation pressures



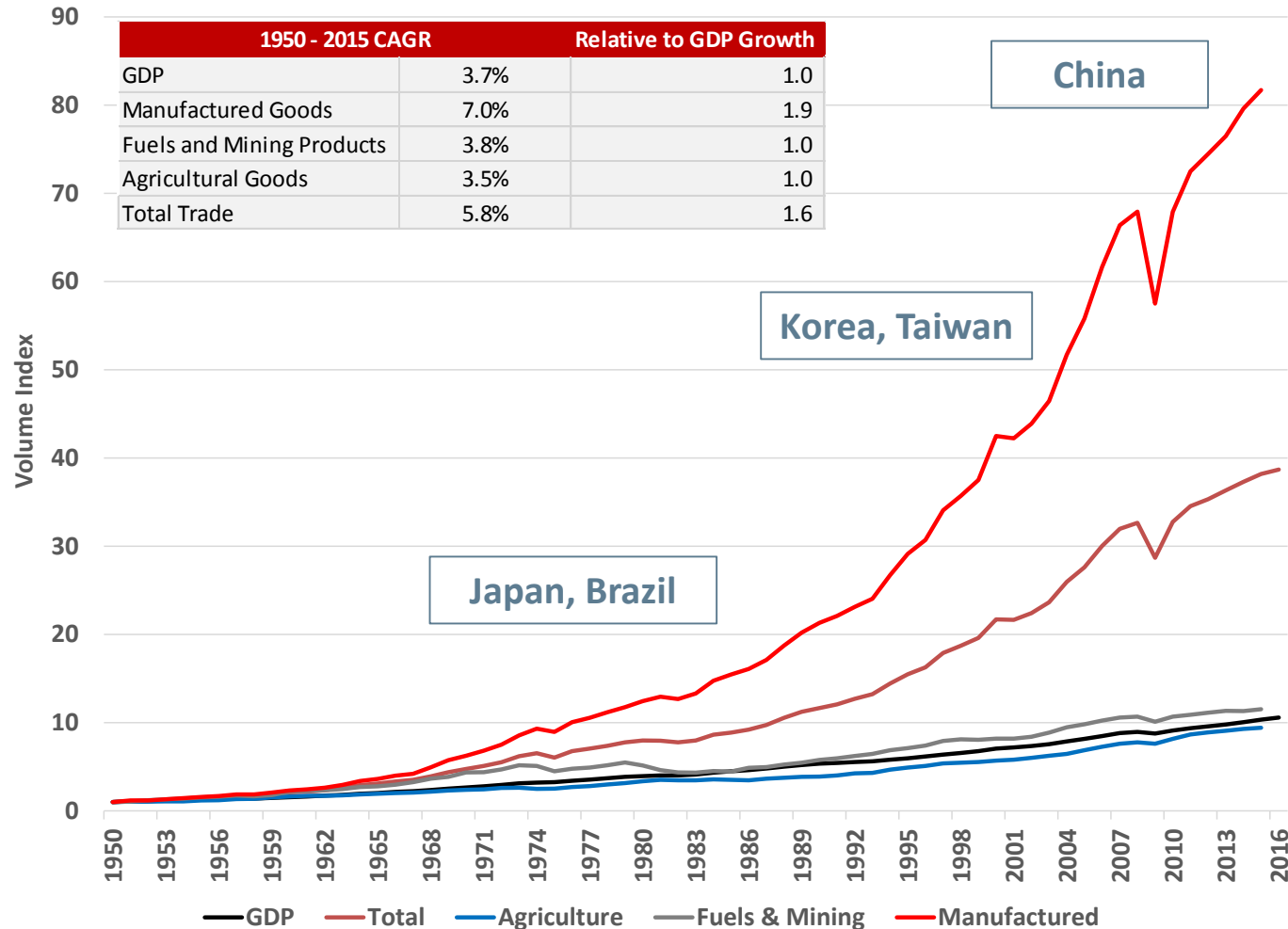
GROWTH IN HOURLY EARNINGS AND CONSUMER PRICE INDEX EXCLUDING FOOD AND ENERGY: 1960 - 2017



- The unemployment rate declined to 4.1% in January 2018.
- The January labor market report also stated that wages grew 2.5%.
- Rising commodity prices, transportation costs and labor costs result in “cost push” inflation

Manufactured goods leads global trade volume growth

WORLD REAL GDP AND TRADE INDEXES 1950-2015E



Trade is driven by:

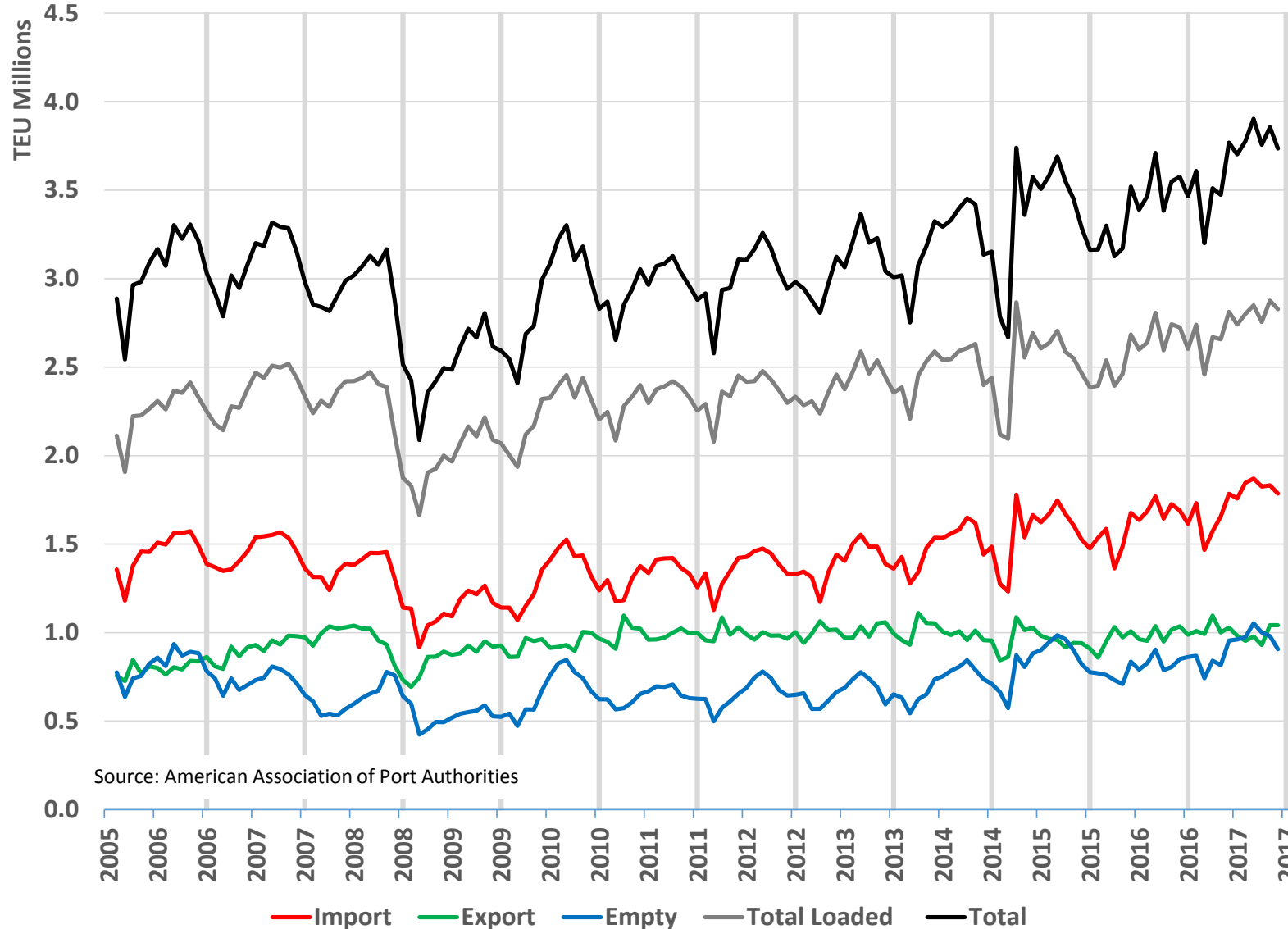
- **Resources** – better to worse endowed countries
- **Demographics** – manufacture in low cost, high demand growth countries
- **Trade Agreements** – no barriers or burdens
- **Infrastructure** – road, rail, ports, fleets
- **Technology** – information and communication

Most trade agreements are focused on manufactured goods, not raw materials

US containerized trade has recovered to new high levels



CONTAINER VOLUME TRENDS – MONTHLY 2006 TO 2016 (12 OF LARGEST 14 CONTAINER PORTS)

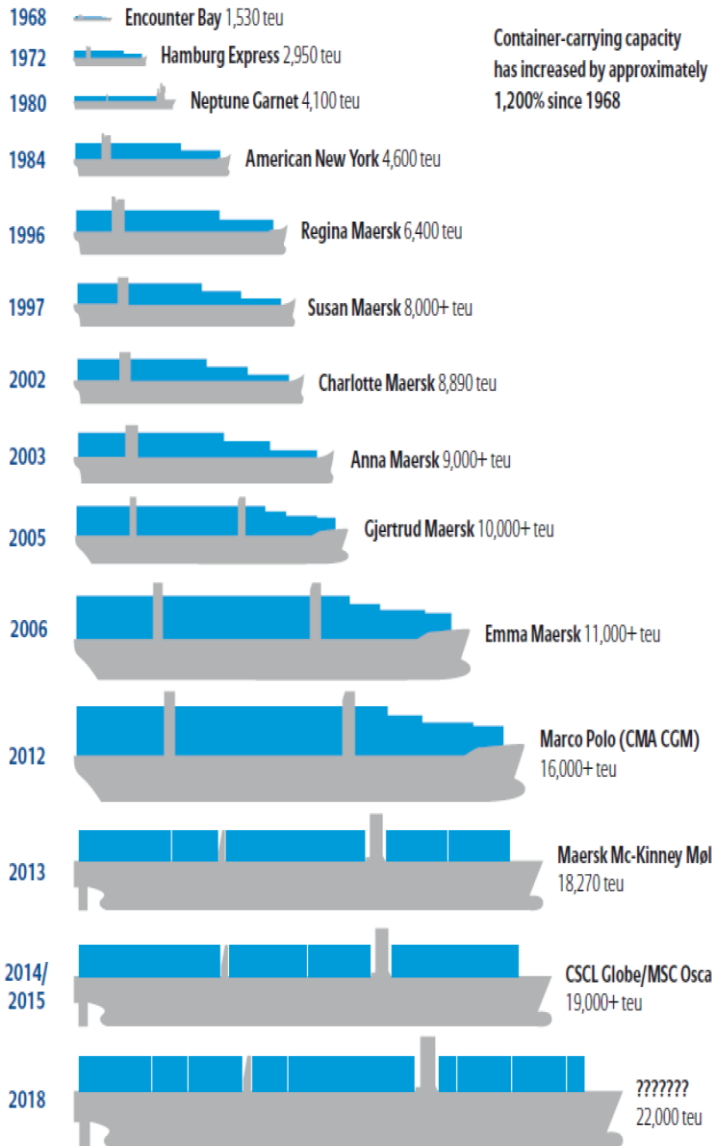


Year	Int'l Volumes	Change	Growth
2005	37,912,734		
2006	40,291,297	2,378,563	6%
2007	40,867,520	576,223	1%
2008	38,664,705	(2,202,815)	-5%
2009	33,597,661	(5,067,044)	-13%
2010	38,593,130	4,995,469	15%
2011	39,244,570	651,440	2%
2012	39,919,197	674,627	2%
2013	40,816,094	896,897	2%
2014	42,622,719	1,806,625	4%
2016	44,265,397	1,642,678	4%
2017	47,368,071	3,102,674	7%

The four largest ports (Los Angeles + Long Beach, New York/New Jersey, Savannah and Seattle - Tacoma) handled 30.5 million TEUs or 65% of the national total

Larger ships have lower average container costs

EVOLUTION OF CONTAINERSHIP SIZE



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LINER WARS 2017

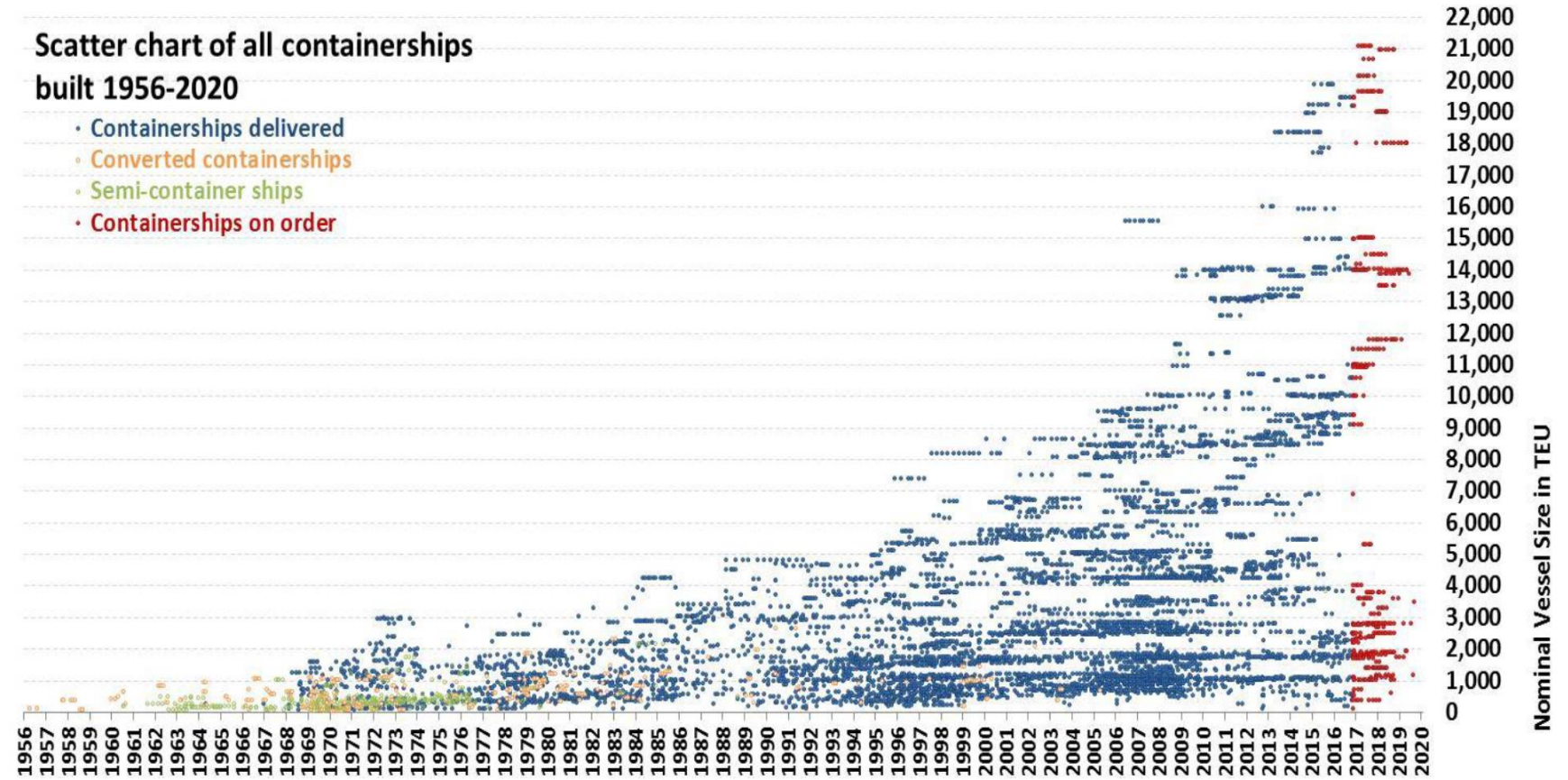
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Race to build larger ships

- Few innovations in industry apart from building larger ships

Scatter chart of all containerships built 1956-2020

- Containerships delivered
- Converted containerships
- Semi-container ships
- Containerships on order



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Largest ocean carriers then and now

TOP 20 IN 2012

Rank	Operator	Total existing	
		TEU	Ships
1	APM-Maersk	2,589,081	614
2	MSC	2,191,401	459
3	CMA CGM	1,359,752	406
4	COSCON	721,299	160
5	Evergreen	720,908	183
6	Hapag-Lloyd	643,529	142
7	APL	586,462	129
8	Hanjin Shg	575,260	109
9	CSCL	571,781	149
10	MOL	513,760	112
11	OOCL	443,492	97
12	Hamburg Süd	414,560	100
13	NYK Line	408,481	95
14	HMM	363,682	63
15	K Line	342,855	70
16	Yang Ming	338,423	81
17	Zim	323,476	86
18	PIL	290,618	141
19	UASC	267,352	44
20	CSAV	264,231	59

Acquired
Bankrupt

Acquired

Acquired
Acquired

TOP 20 IN 2017

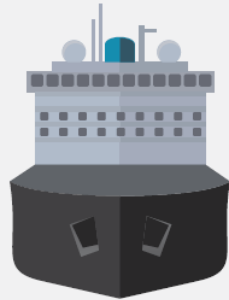
Rank	Operator	Total existing	
		TEU	Ships
1	APM-Maersk	4,151,807	774
2	MSC	3,147,525	505
3	CMA CGM	2,514,170	504
4	COSCO Shg	1,801,243	335
5	Hapag-Lloyd	1,547,865	215
6	Evergreen	1,060,224	193
7	OOCL	689,118	100
8	Yang Ming	594,806	99
9	MOL	584,236	81
10	NYK Line	557,781	95
11	PIL	384,807	132
12	Zim	366,292	76
13	Hyundai M.M.	347,136	61
14	K Line	341,354	58
15	Wan Hai	235,591	90
16	X-Press Feeders	140,112	92
17	KMTC	127,585	59
18	Zhonggu Logistics	123,836	99
19	Antong Logistics	110,920	101
20	SITC	105,312	77

Merging

Panama Canal expansion

Prior locks

Maximum capacity
of transiting vessels
4,400 TEU



←-- 32 m --→



←-- 294 m --→

New locks

Maximum capacity of
transiting vessels up
to 14,000 TEU

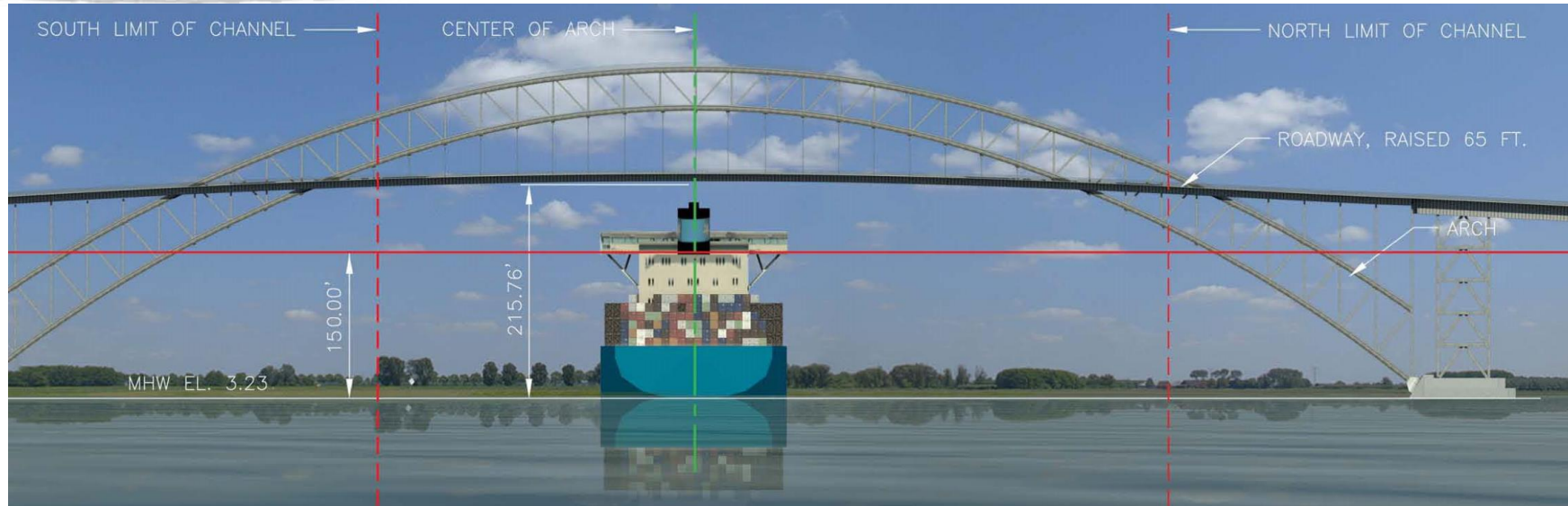


←-- 49 m --→



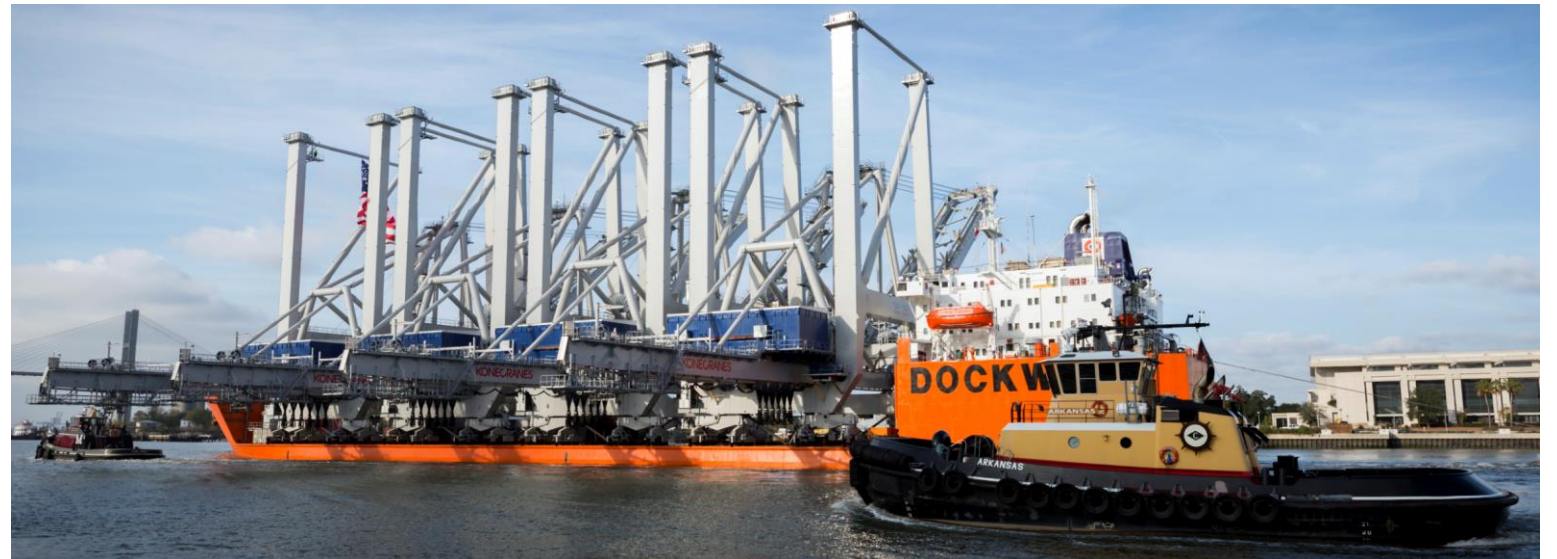
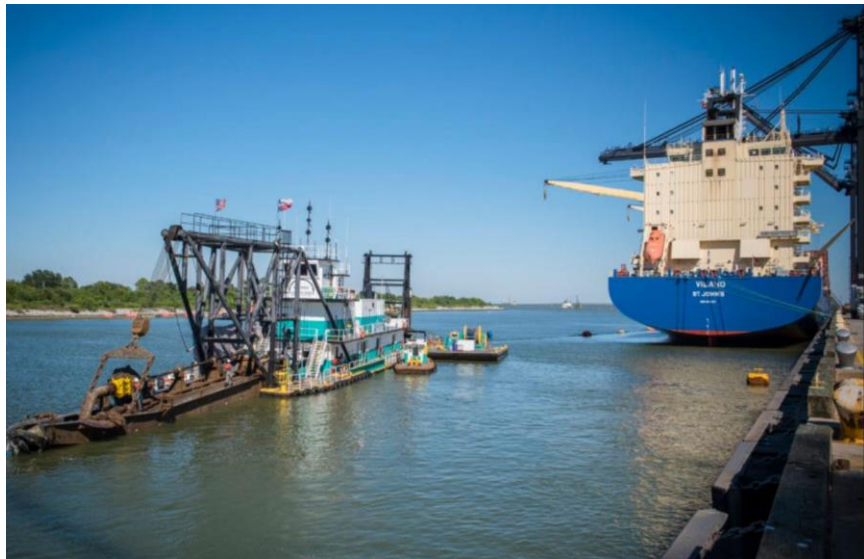
←-- 366 m --→

Accommodating larger vessels



Who pays?

- Federal Government
- State Governments
- Port Authorities



What it means to handle a 13K TEU vessel service



77% moved by truck
10,600 one-way truck trips
122 miles of trucks end-to-end



642,200 TEUs per year
93,410,909 sf of DC space



13,000 TEU Vessel
95% Full
13,700 lifts to unload and load



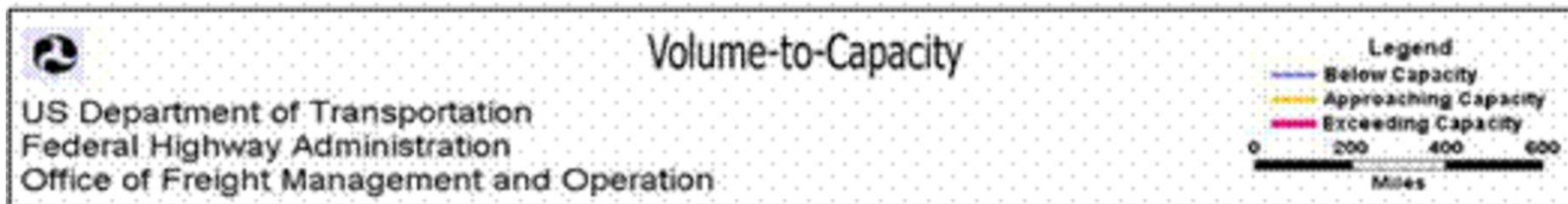
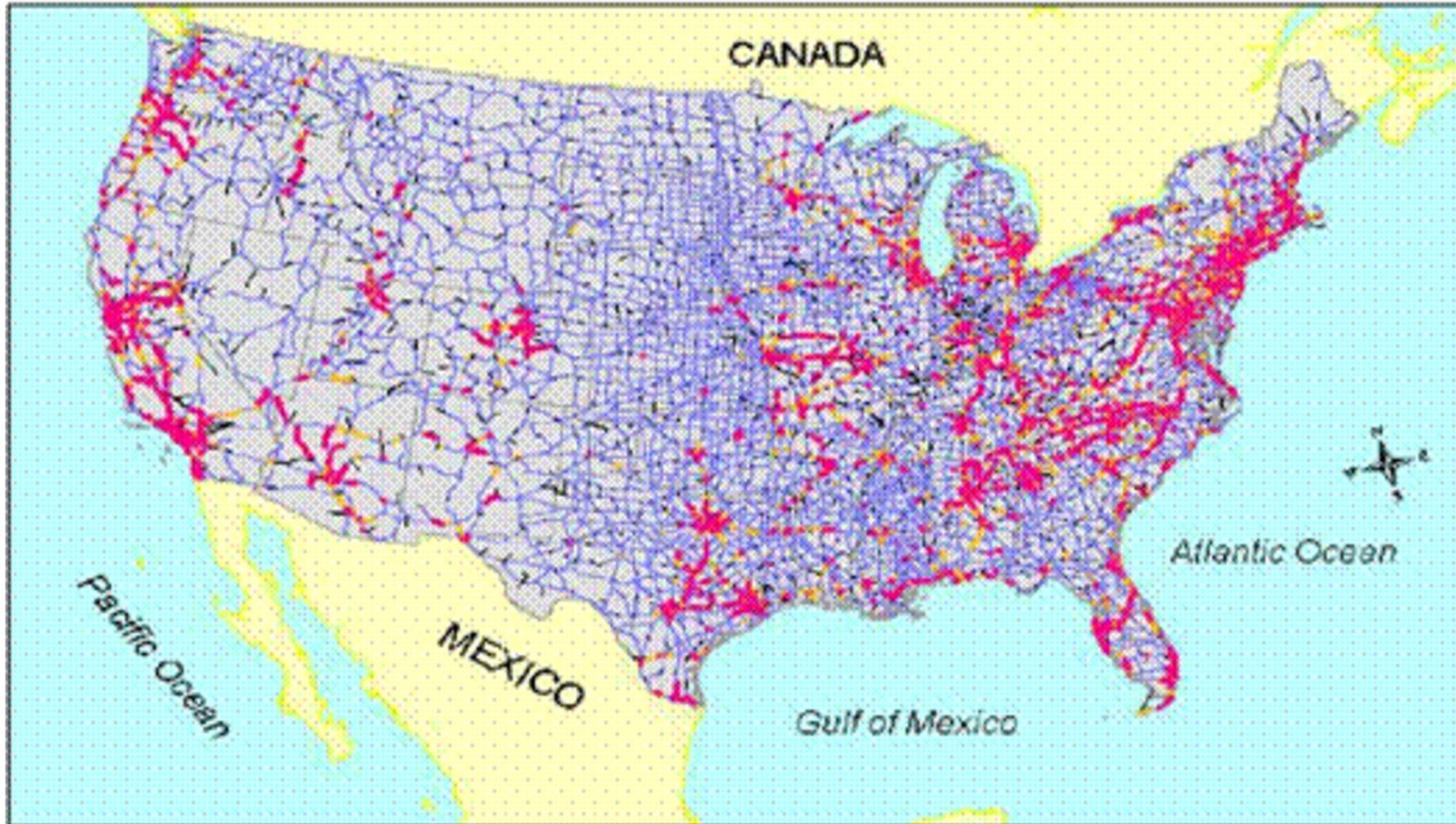
23% moved by rail
9 unit trains
18 miles of trains end-to-end

Average Intermodal Shares of Various Ports
Los Angeles/Long Beach 40% New York 25%
Savannah 18% Norfolk 35%

Roadway congestion is getting worse



2020 CONGESTION FORECASTS, WITH TRUCKS



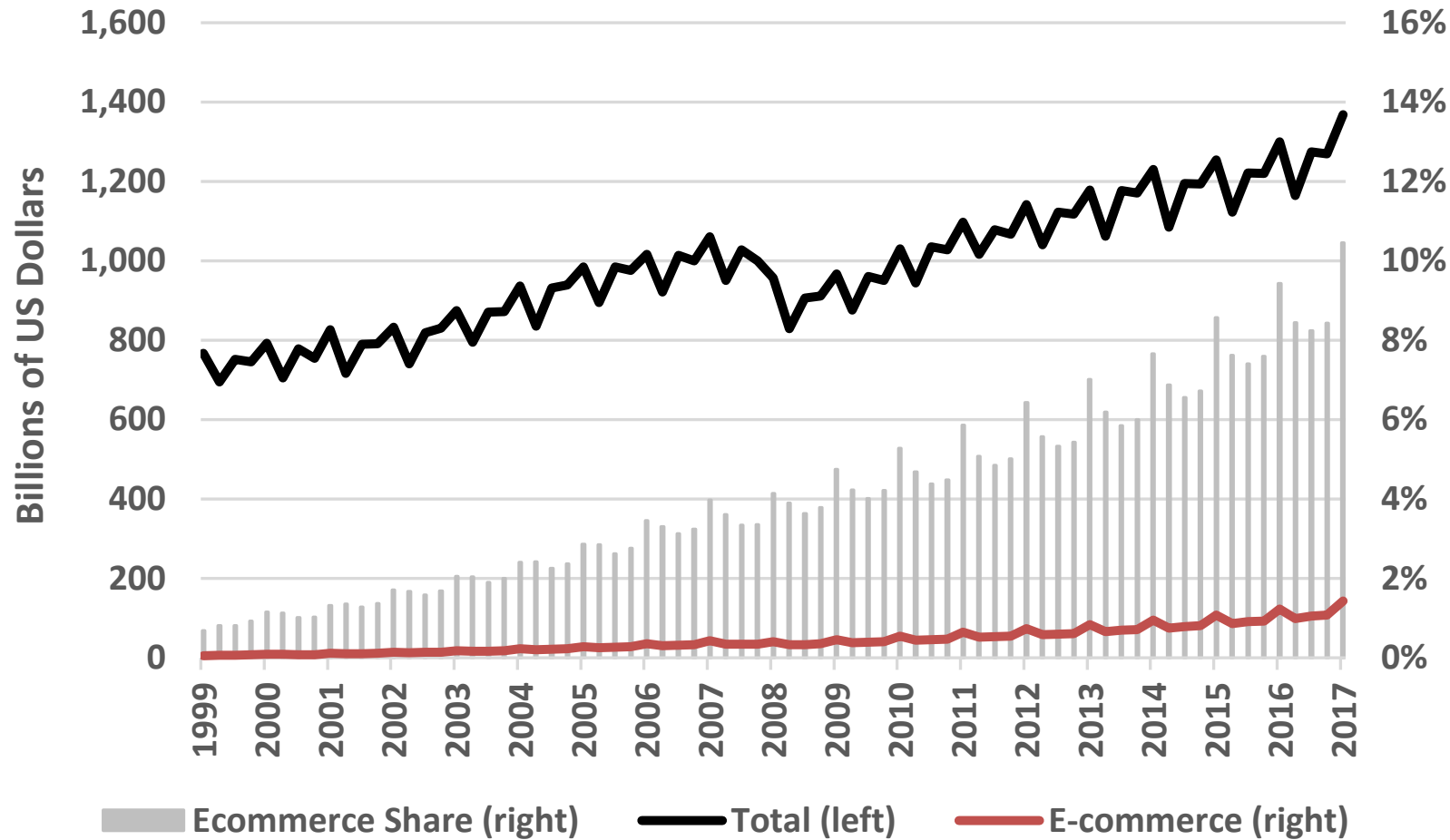
No gas tax increases in 20 years left the Highway Trust Fund in financial distress

Other considerations:

- FMCSA increased restrictions on Hours of Service
- National truck driver shortage estimated to be 200,000 drivers
- Younger generation prefers not to spend the night away from home
- Electronic Logging Devices (ELD) required as of April 1, 2018

Ecommerce trends

RETAIL AND ECOMMERCE SALES



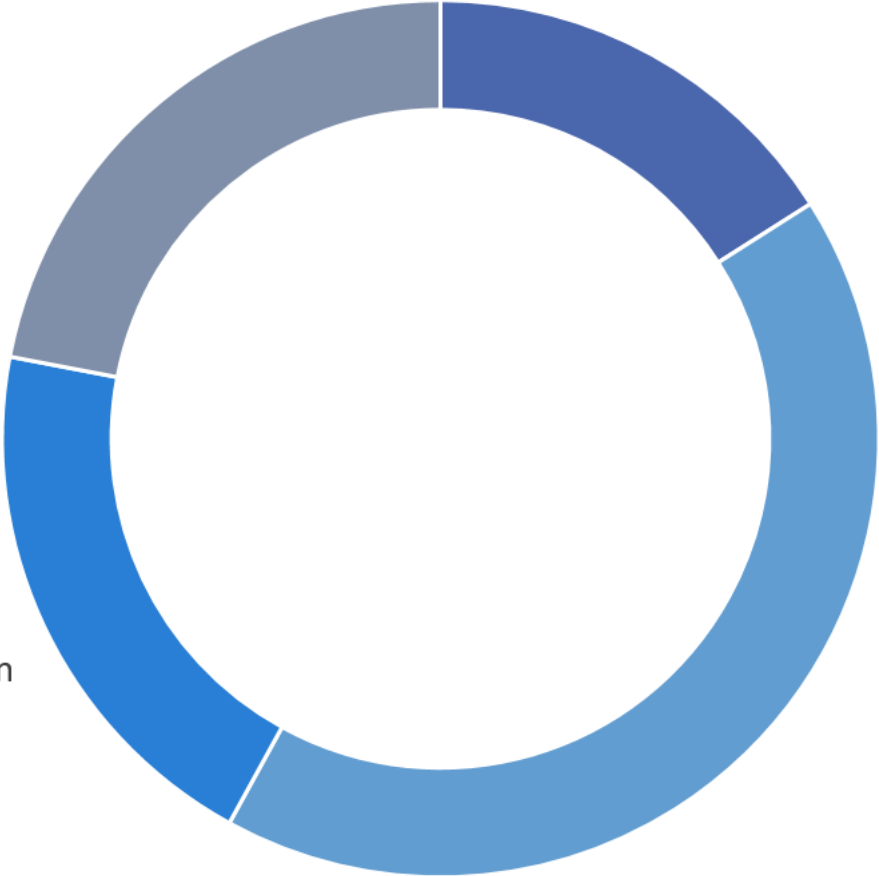
- Ecommerce share of retail sales has increased from less than 1% in Q4-1999 to 10.5% in Q4-2017
- Ecommerce is expected to continue to gain share as retailers adapt their business models and re-optimize their distribution networks
- The goal is to develop a successful omnichannel strategy

How purchases were made in 2016

CONSUMER SEGMENTS BASED ON SHOPPING BEHAVIOR

Research online and
in store, buy in store
22%

Research online and
in store, buy online
16%



Search and buy in
store
20%

Search and buy
online
42%

A total of **58% of shoppers made purchases online** in 2016, a shift away from in store purchases.

Survey of 5,000 shoppers in a Wall Street Journal study

Source: American Association of Port Authorities, JLL



Omnichannel strategy

Operating profile vs. distance to MSA

20 miles

Local distributors with fast-moving, high-cost, time-sensitive products requiring proximity to population and infrastructure

- Fresh and frozen foods
- Small tech goods (i.e., cell phones)
- Parcel delivery carriers



50 miles

Regional distribution, requires modern, Class A building specifications

- Retailers
- Consumer products
- Consumer durables



75+ miles

Super-regional distribution or e-commerce / omnichannel facilities

- Tires
- Furniture
- Discount retailers



75+ miles 

50 miles 

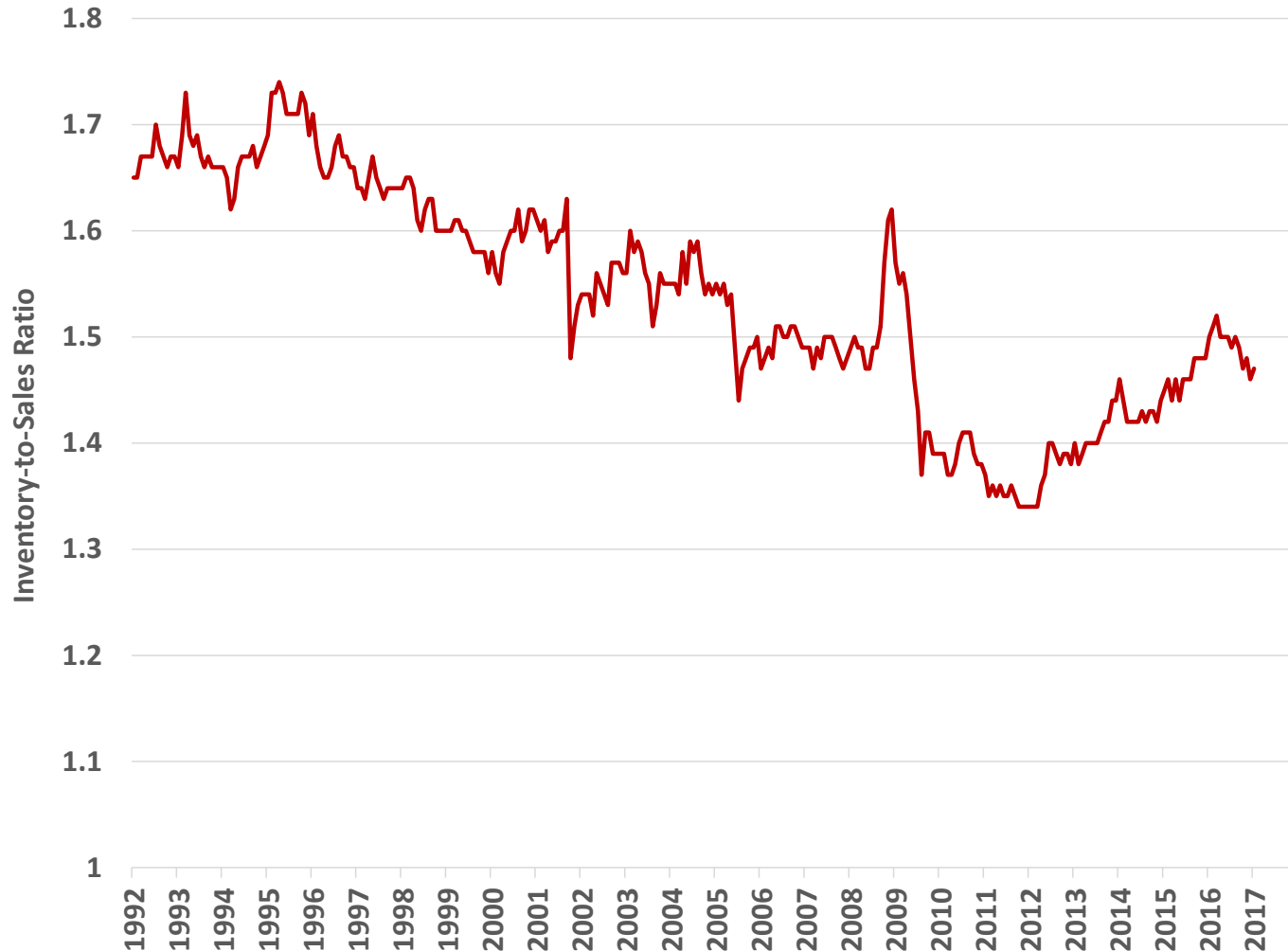
20 miles 

Urban core

- Omnichannel is about maximizing share of each type of consumer
- Ecommerce requires more inventory in more places
- Successful retail outlets display more and hold less inventory
- Ecommerce fulfillment can be used to replenish retail outlets
- Successful omnichannel strategy requires more locations and types of structures
- Distribution networks development requires a lot more expertise compared to 10 years ago

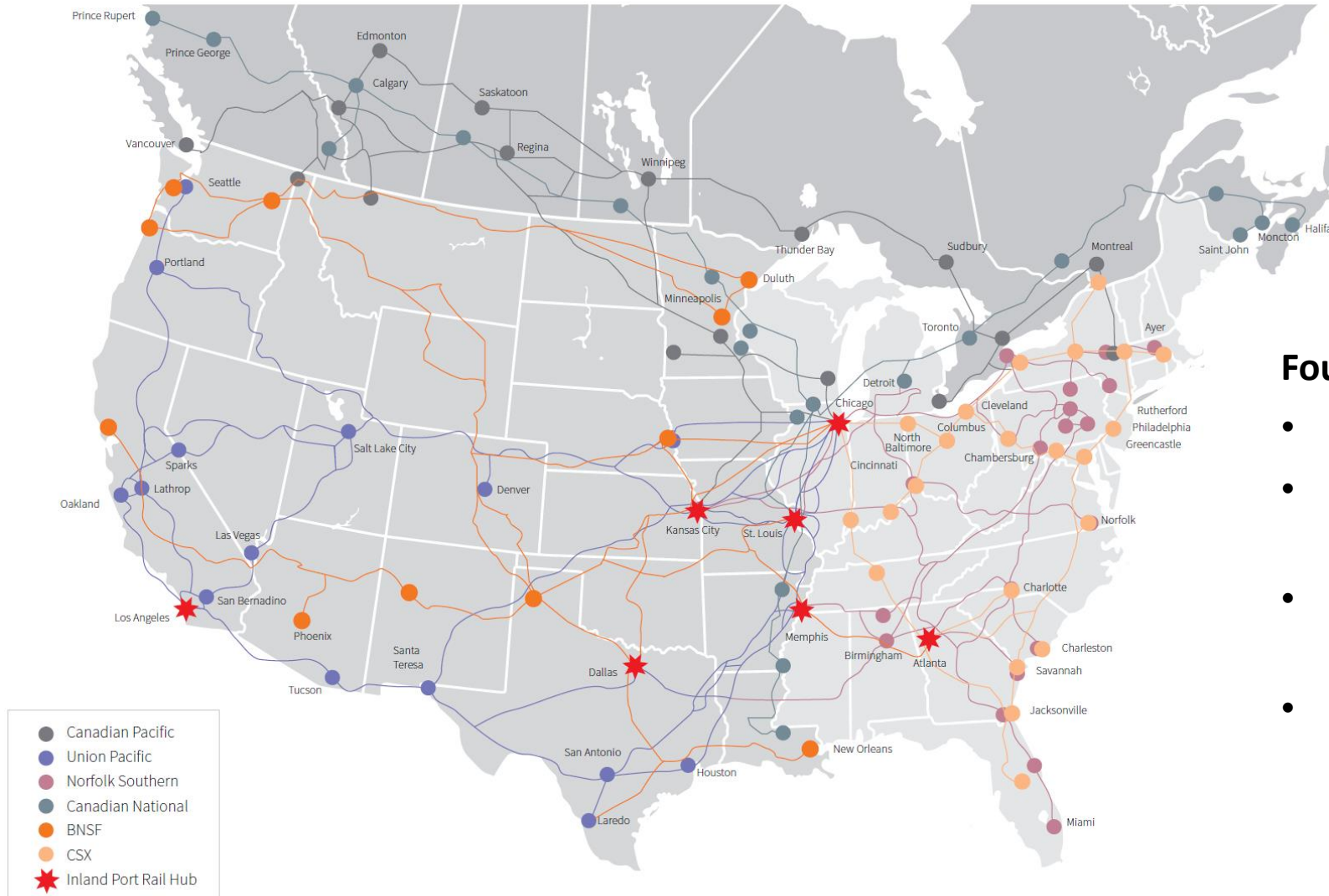
Inventory-to-sales ratio is structurally different

CONSUMER SEGMENTS BASED ON SHOPPING BEHAVIOR



- Lower interest rates means capital tied up in inventories is less expensive
- Ecommerce/omnichannel means retailers hold more inventory in more places
- DCs are increasing in number, size and complexity
- Worsening congestion and truck driver shortage requires greater safety stocks

Inland hubs are becoming more numerous

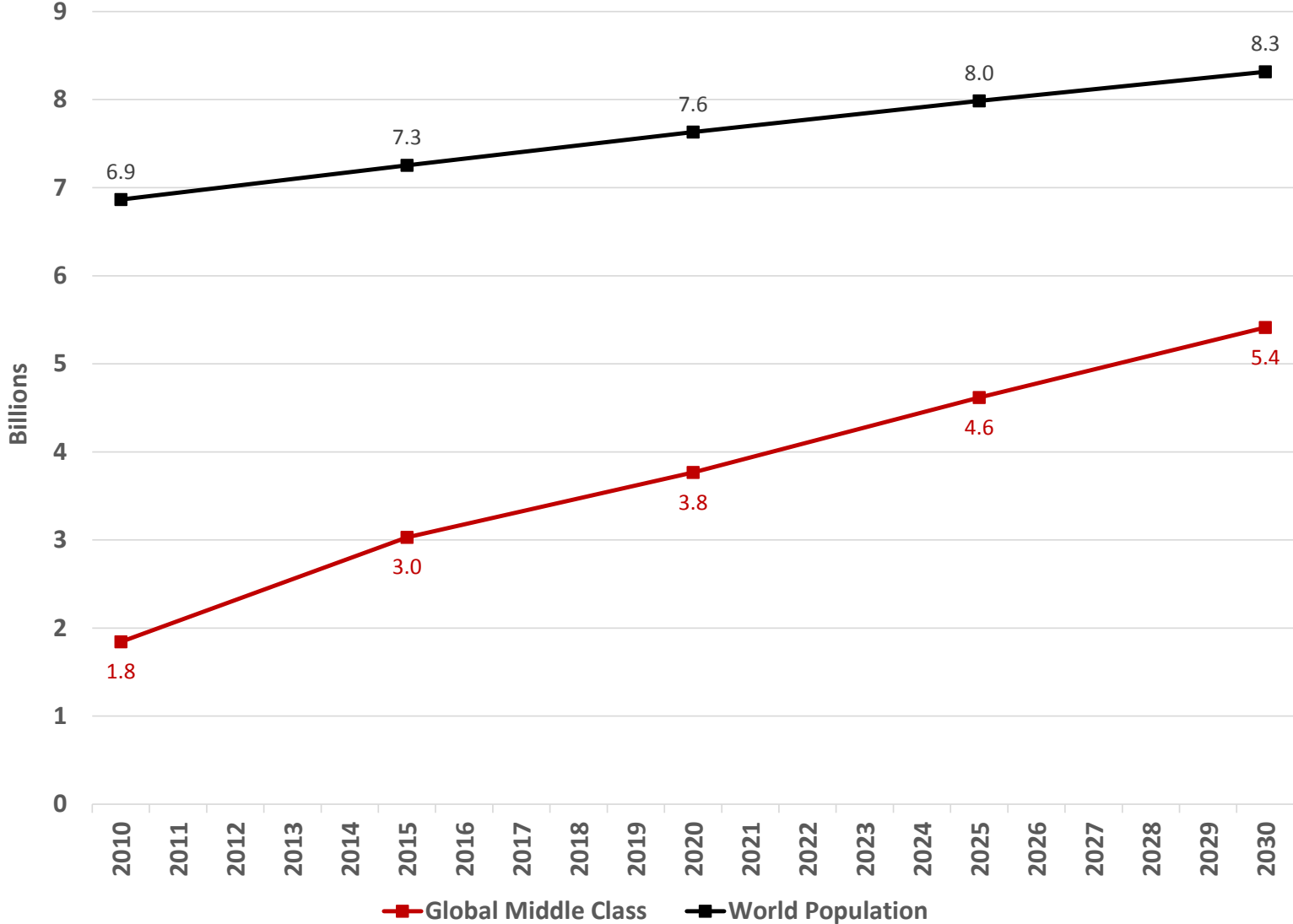


Four Kinds of Inland Hubs:

- DC clusters, e.g., Inland Empire
- Railyards, e.g., Logistics Park Kansas City
- Private sector developments, e.g., Centerpoint
- Public sector operated, e.g., Cordele

Growing global middle class is the largest sustainable source of growth

WORLD POPULATION AND OECD GLOBAL MIDDLE CLASS PROJECTIONS



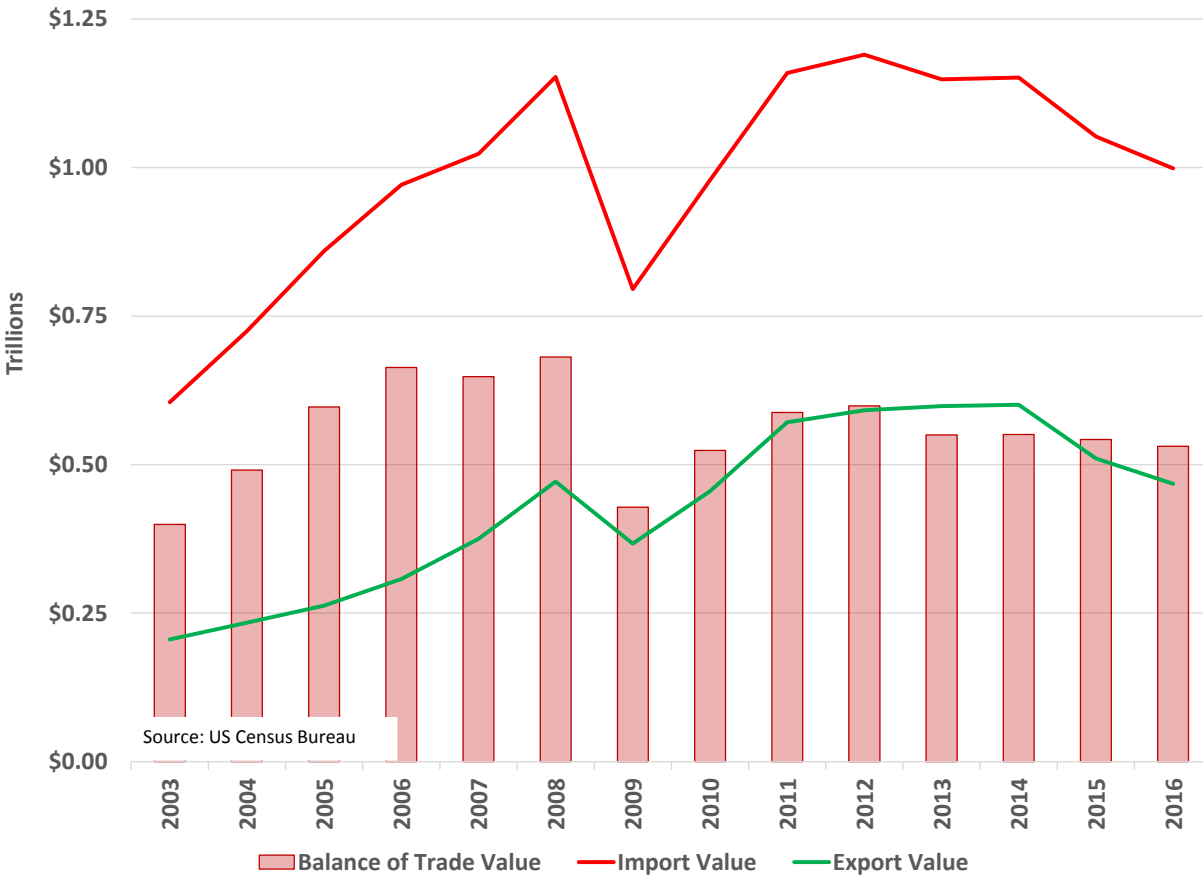
- For US growth to be sustained above 3% it will be necessary to sell into this market
- US exports are the focus of the current national economic policy

Source: OECD, US Census Bureau

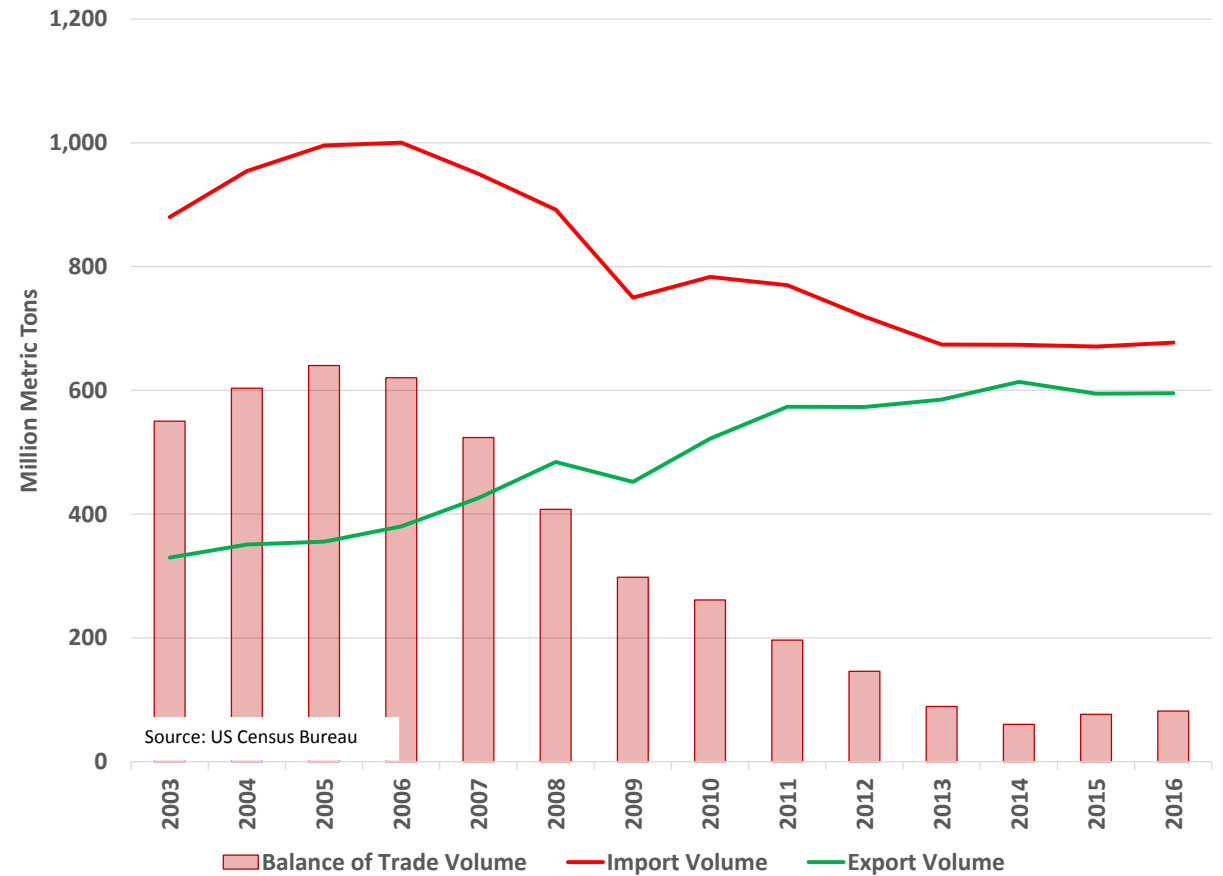


The trade deficit value gap

GOODS TRADE DEFICIT IN US\$: 2003 – 2016E



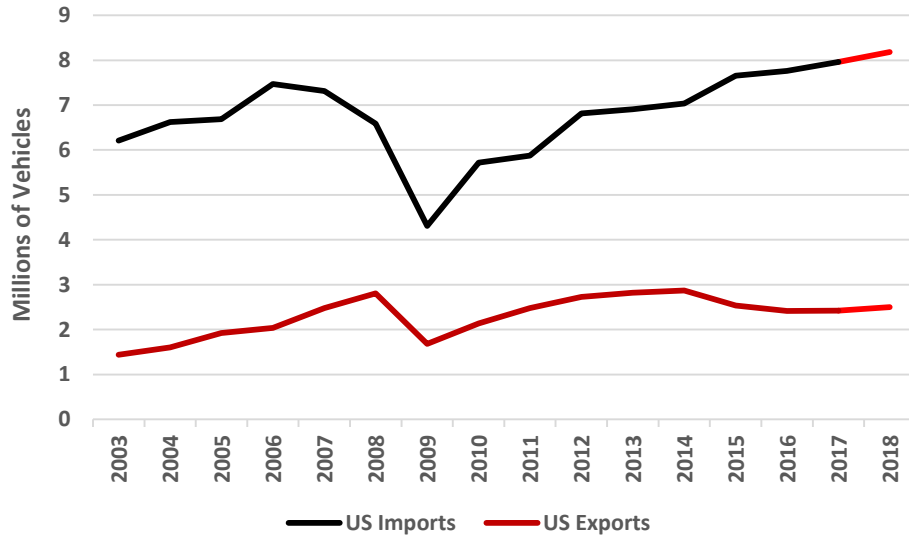
GOODS TRADE DEFICIT IN METRIC TONS: 2003 – 2016E



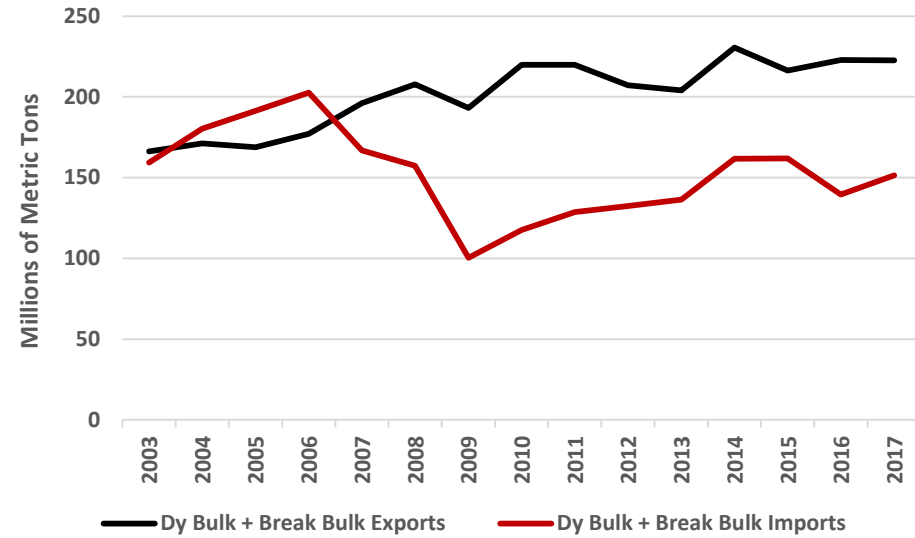
- US imports high value per ton goods and exports low value per ton goods
- Imports have been able to support import-oriented infrastructure investment
- To support higher economic growth, the US needs to focus on growing low value per tons

Non-containerized trade trends

VEHICLES IMPORTS AND EXPORTS

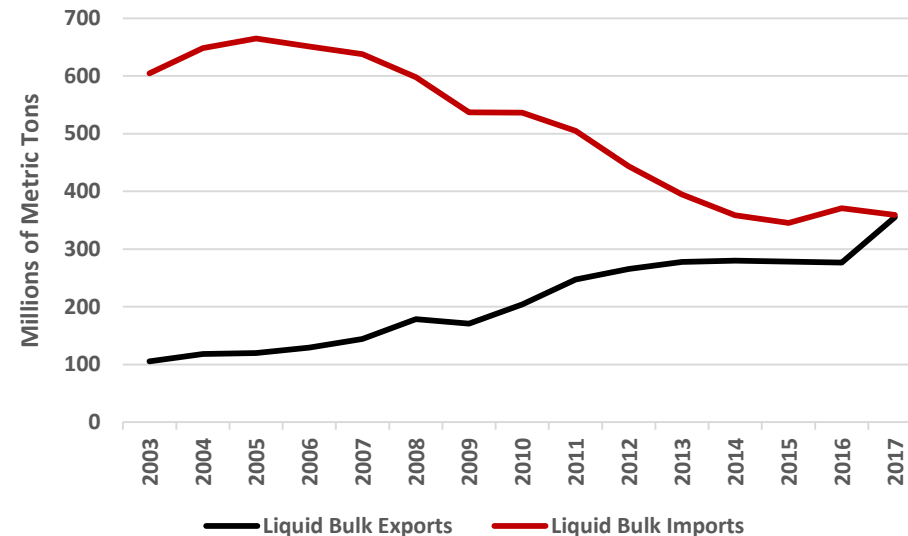


BULK/BREAKBULK IMPORTS AND EXPORTS



- Liquid bulk, petroleum and natural gas, provide the best opportunities to improve the US trade deficit
- US must focus on growing agriculture, capital goods and energy exports

LIQUID BULK IMPORTS AND EXPORTS



Summary

- **The drivers of global trade remain intact**
- **Unbalanced investment in freight corridors underlies the West to East coast shift**
- **The three T's of policy indicate more growth ahead, particularly exports**

PAGI thanks you for your time

For more information visit us online at www.us.jll.com/pagi or contact one of our team members:

Mark Levy

+1 703 389 4203 mark.levy@am.jll.com

Walter Kemmsies

+1 443 451 2607 walter.kemmsies@am.jll.com

Keith Stauber

+1 773 458 1386 keith.stauber@am.jll.com

Jonathan Walk

+1 202 531 6997 jonathan.walk@am.jll.com

Steve Ostrowski

+1 773 458 1417 steve.ostrowski@am.jll.com

Michael Morehead

+1 443 804 9505 michael.morehead@am.jll.com

