

Many moving parts



National Grain and Feed Association





Moffatt & Nichol Background

- Established in 1945 in Long Beach, California, currently:
 - Offices in the Americas, Europe, Middle East and Pacific Rim
 - Practices: Goods Movement, Energy, Ports, Coastal, Urban Waterfronts & Marinas, Inspection & Rehabilitation
- Planning and design of marine and freight transportation
 - Terminal design for all types of freight and passenger movement
 - Freight planning and market analysis
 - Investment/privatization analysis
 - Strategic development plans
 - Port selection/network analysis
 - Coastal engineering
 - Port and waterside construction (marinas)
 - Railroads and capacity expansion
 - Environment issues/emission modeling
 - Port security

Commentary and presentation materials on this occasion are based on the personal views of the speaker and may not coincide with opinions held by Moffatt & Nichol or its employees.



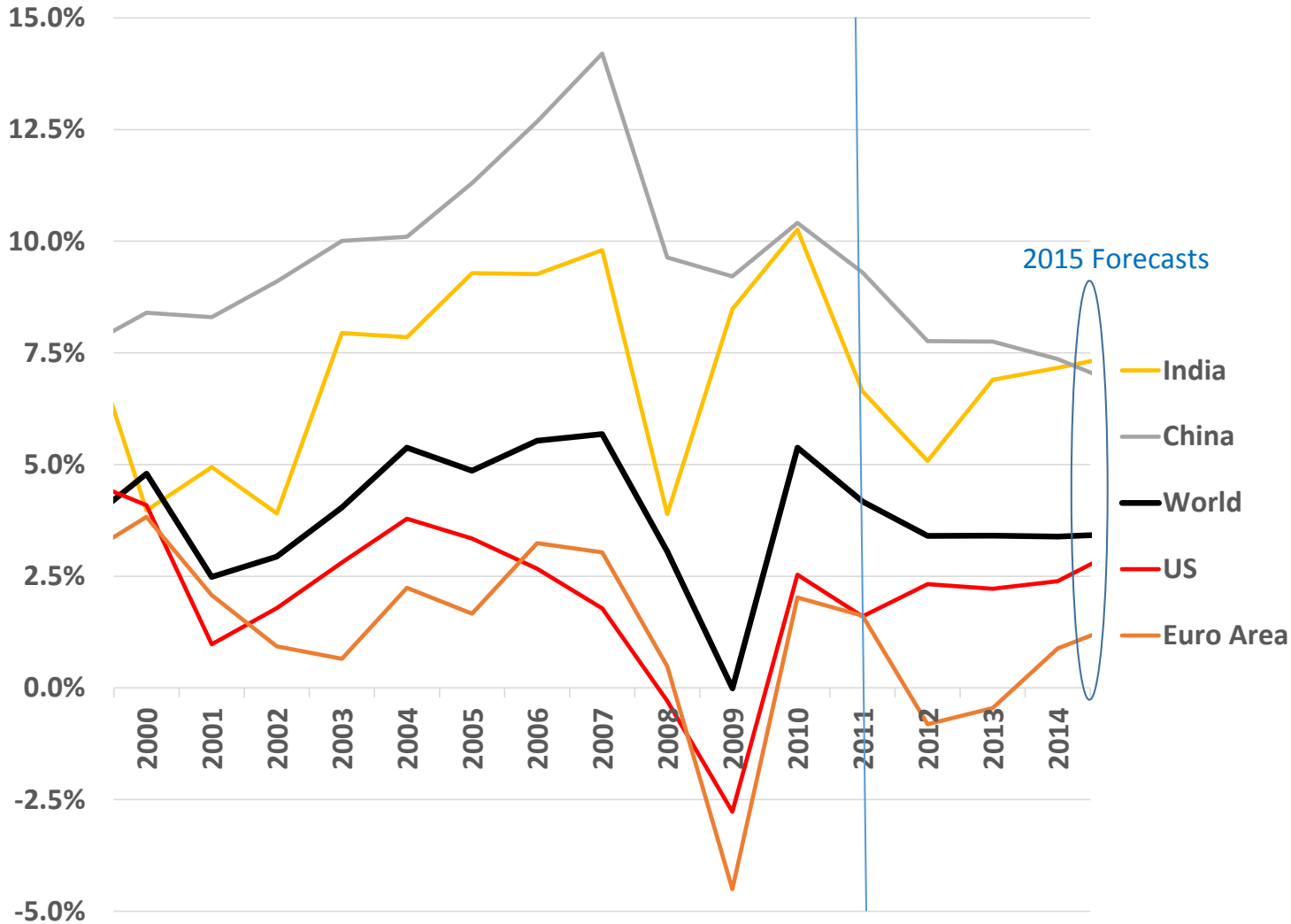
Focus points

- Exports are a national economic priority
- Growing global middle class is the opportunity but also the ultimate logistics challenge
- The US must improve freight corridor productivity to match or exceed that of its competitors in the global market place
 - Condition of infrastructure, capacity, congestion, chassis and container availability, coordination of investments, capital availability are increasing **costs** while currency trends increasingly favor competitors



US and a few other countries have led global growth

CONTRIBUTIONS TO CHANGES IN GLOBAL REAL GDP GROWTH: FIRST THREE QUARTERS OF 2014 VS 2013

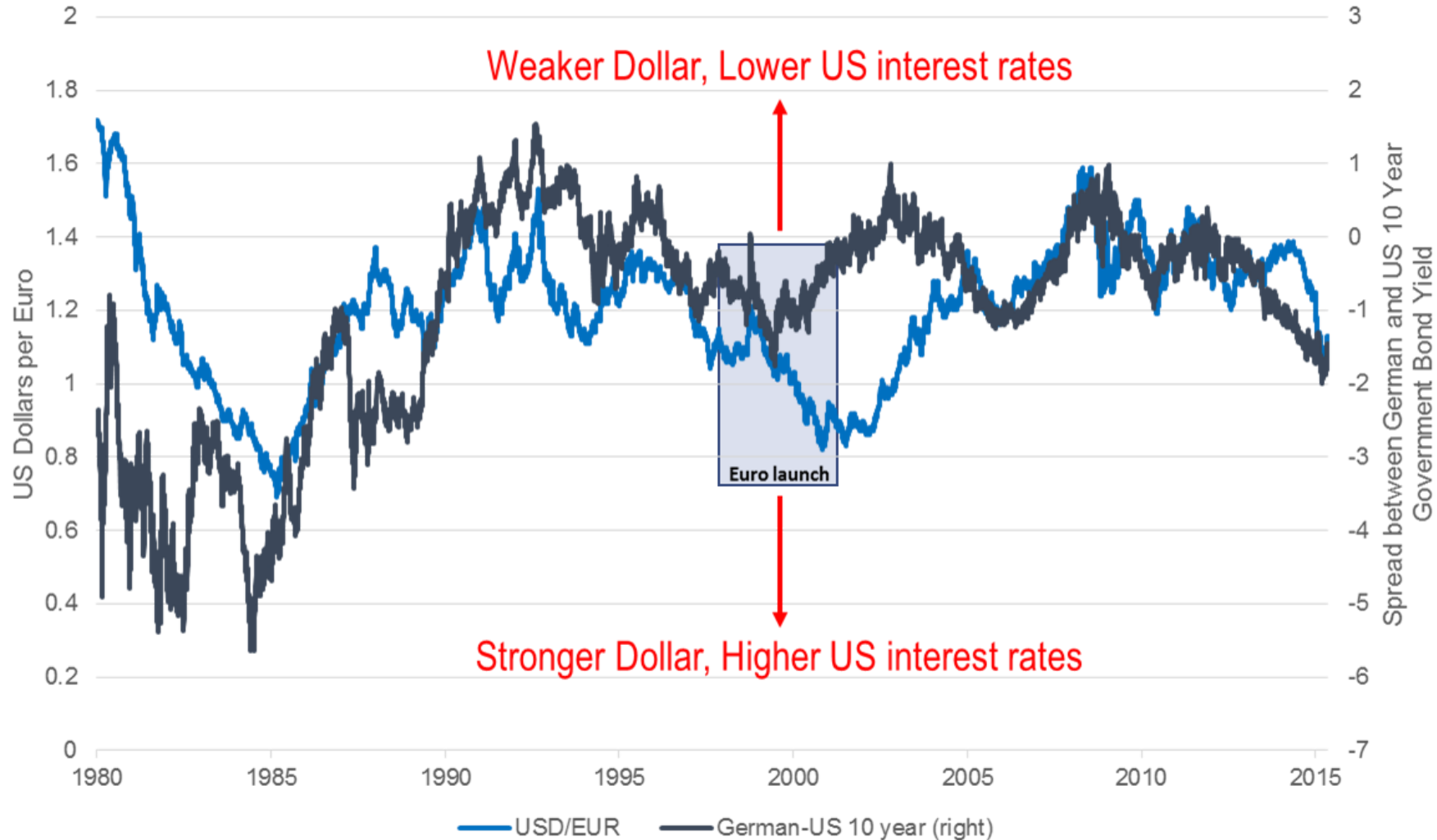


Source: Bloomberg, IMF, Moffatt & Nichol



Strengthening US Dollar may help imports and hurt exports

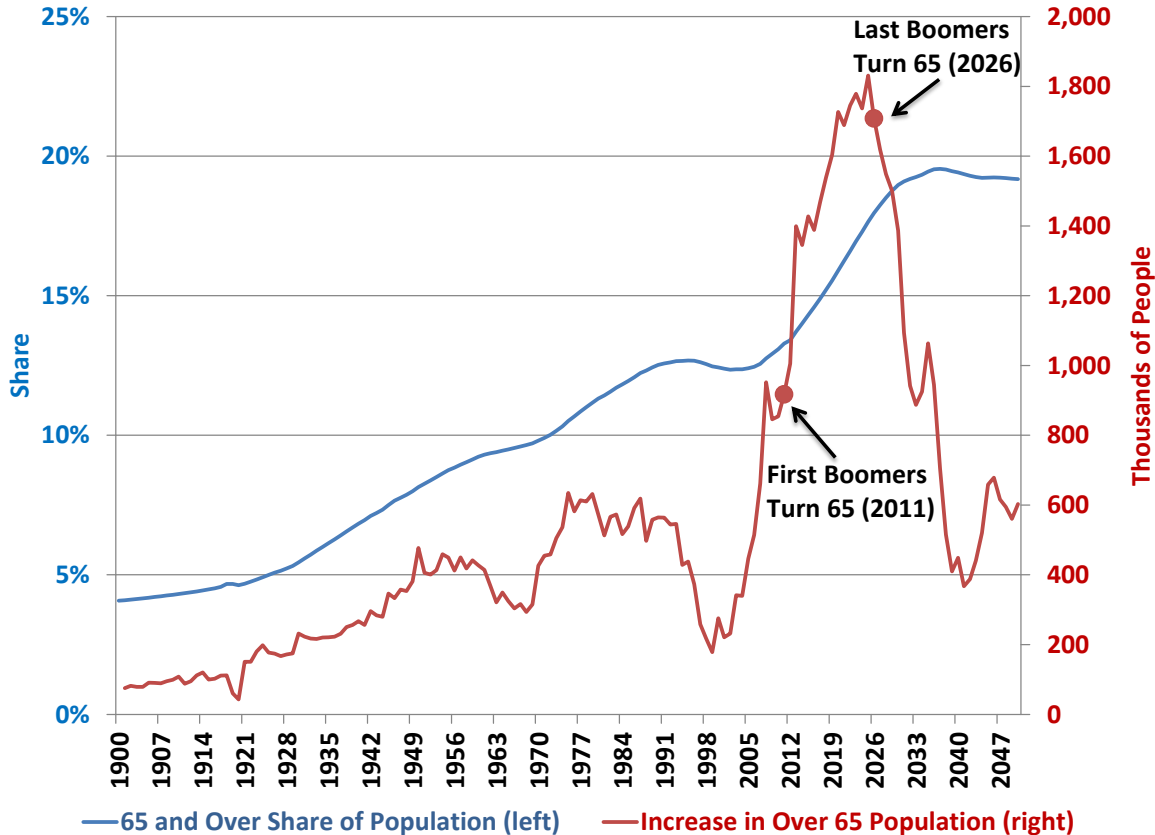
DOLLAR-EURO EXCHANGE RATE AND THE SPREAD BETWEEN US AND GERMAN GOVERNMENT BONDS



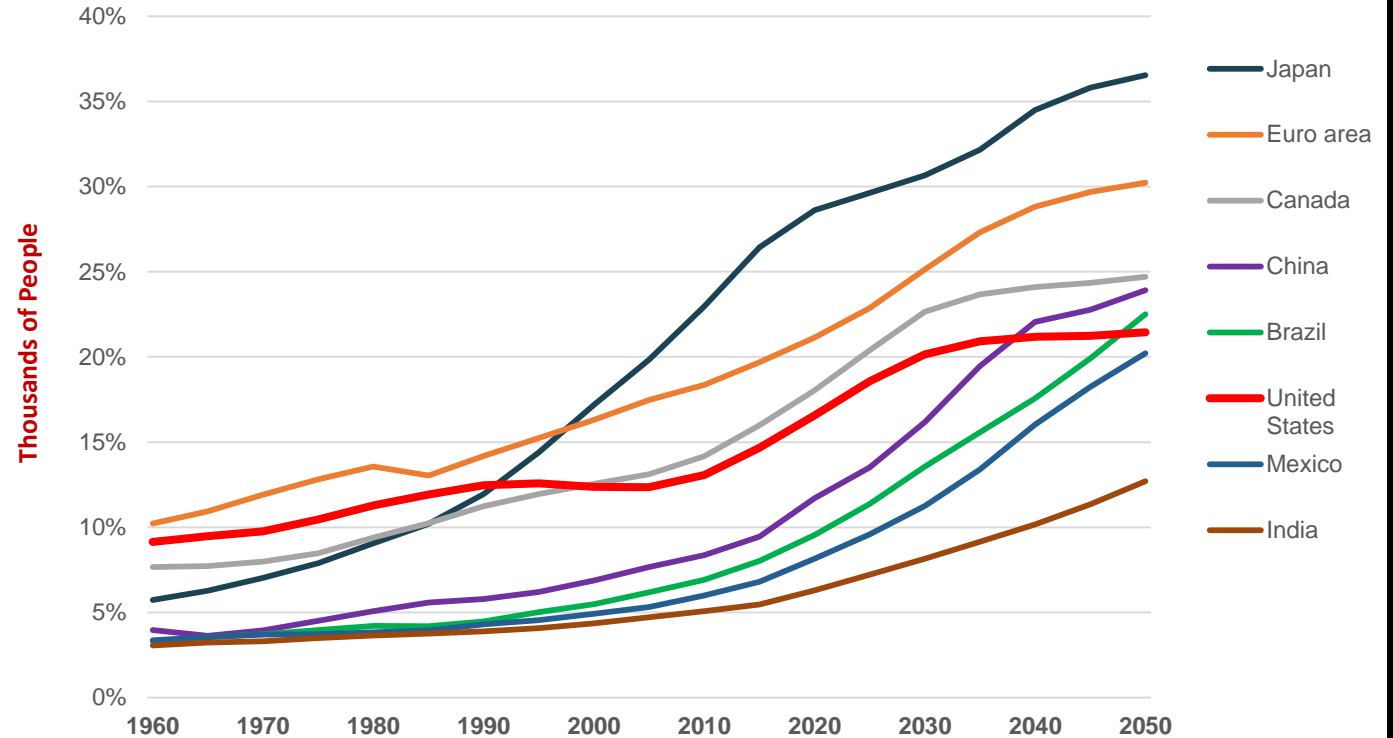


The “Grey Tsunami”

PEOPLE TURNING 65 AND THEIR SHARE OF US POPULATION: 1900-2050



PROPORTION OF POPULATION ABOVE 65 YEARS OF AGE

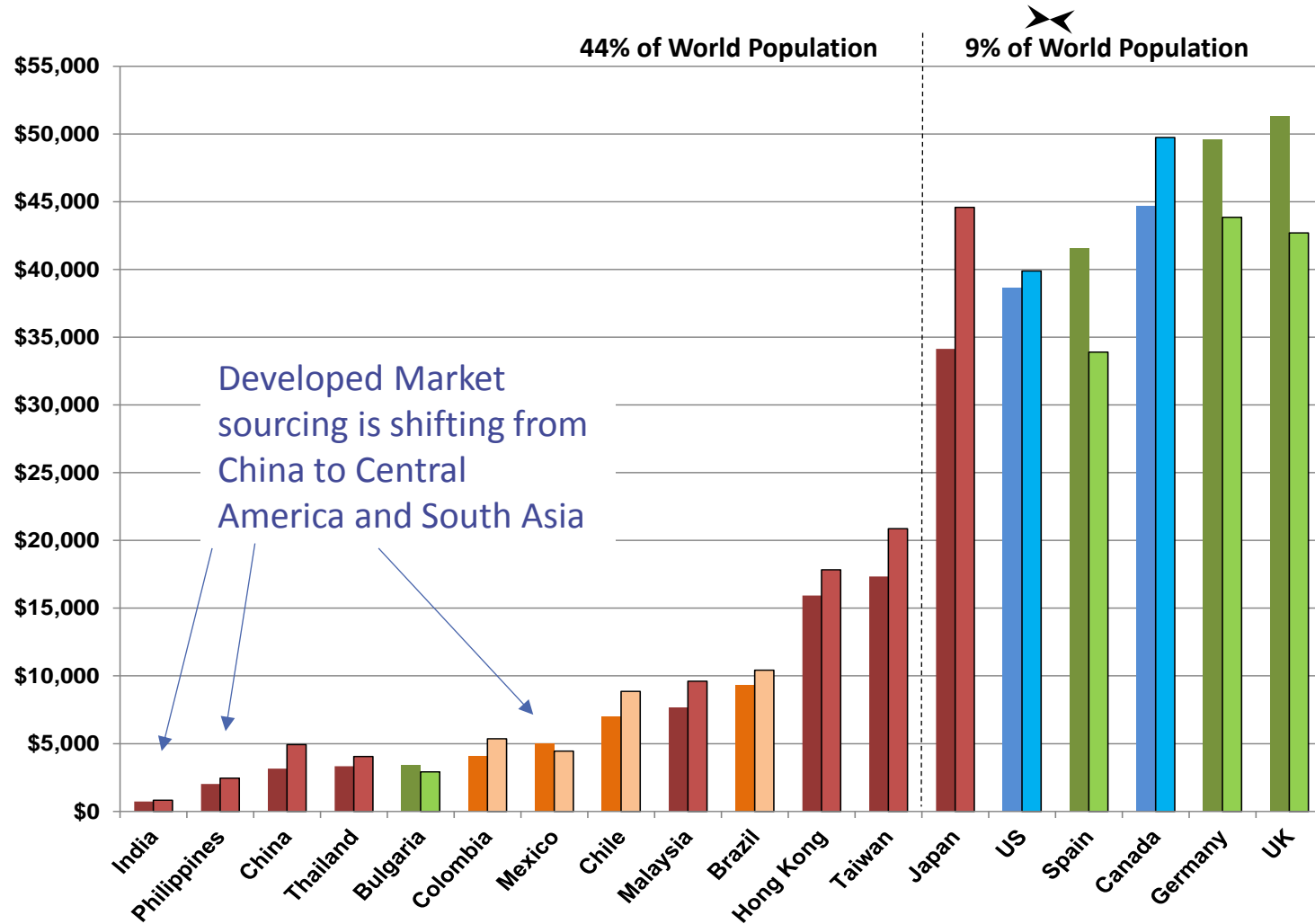


The US has an increasing share of its population that is of retirement age. This impacts labor availability and consumer spending. This trend is not unique to the US but common across developed economies.



Wage differentials drove offshoring now near and on-shoring

Manufacturing Wage Comparisons in US\$ in 2008 and 2014E

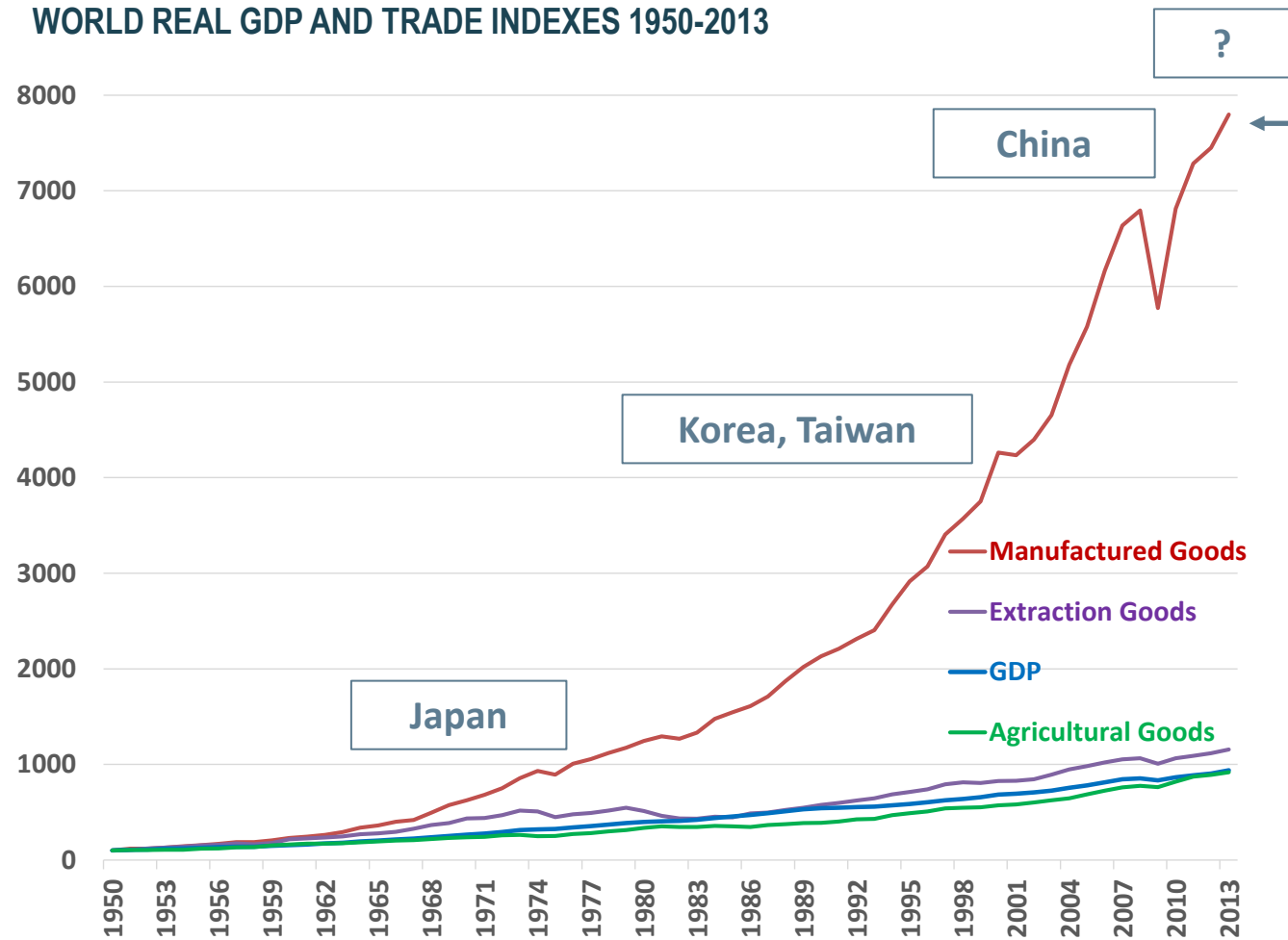


Source: UN ILO, Moffatt & Nichol



The world wants to trade

WORLD REAL GDP AND TRADE INDEXES 1950-2013



When will this become an S-curve?

1950 – 2013 CAGR	
Manufactured Goods	7.2%
Extraction Goods	4.0%
GDP	3.6%
Agricultural goods	3.6%

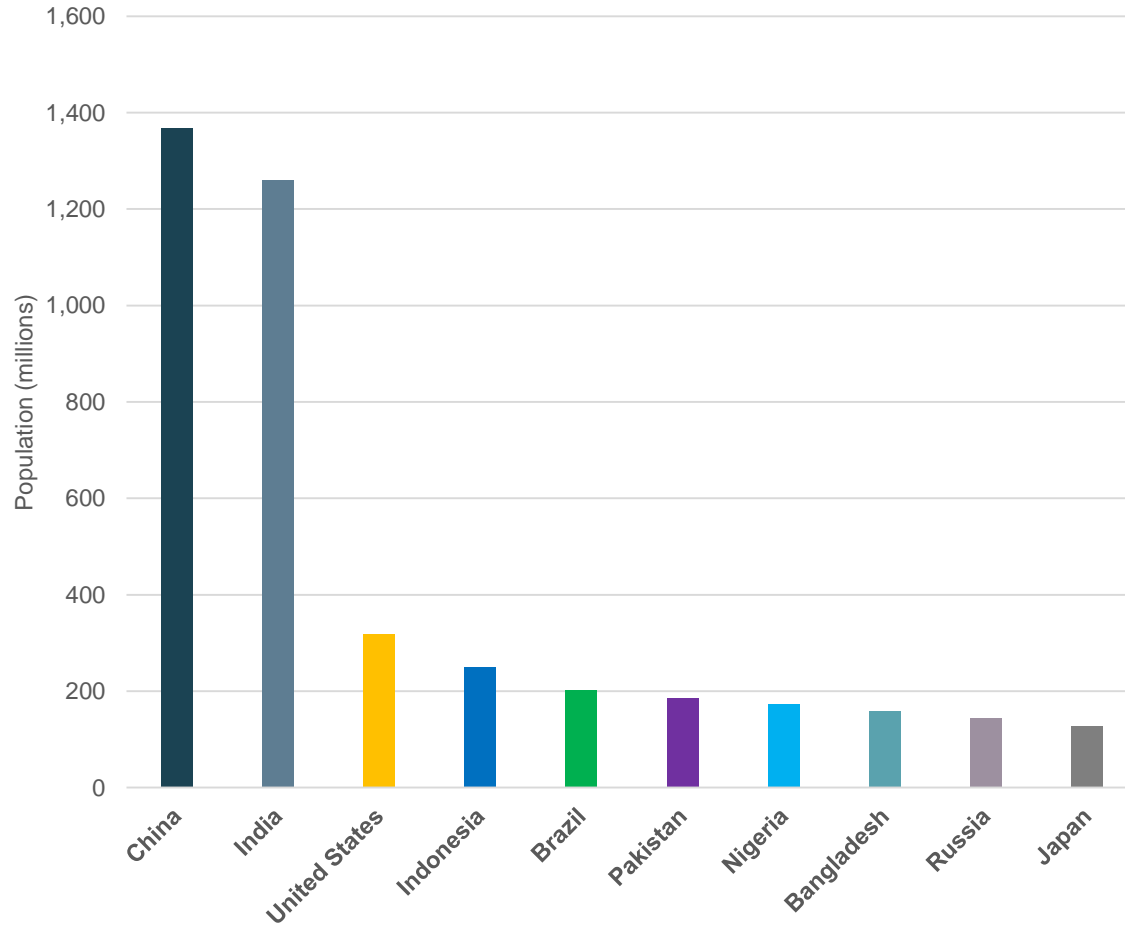
From 1950 to 2013, manufactured goods trade has grown twice as fast as real GDP. Among other trends, this is due to:

- Free Trade Agreements
- Information/Communication Technology
- Maritime and Inland Connectivity Infrastructure
- Demographic Trends

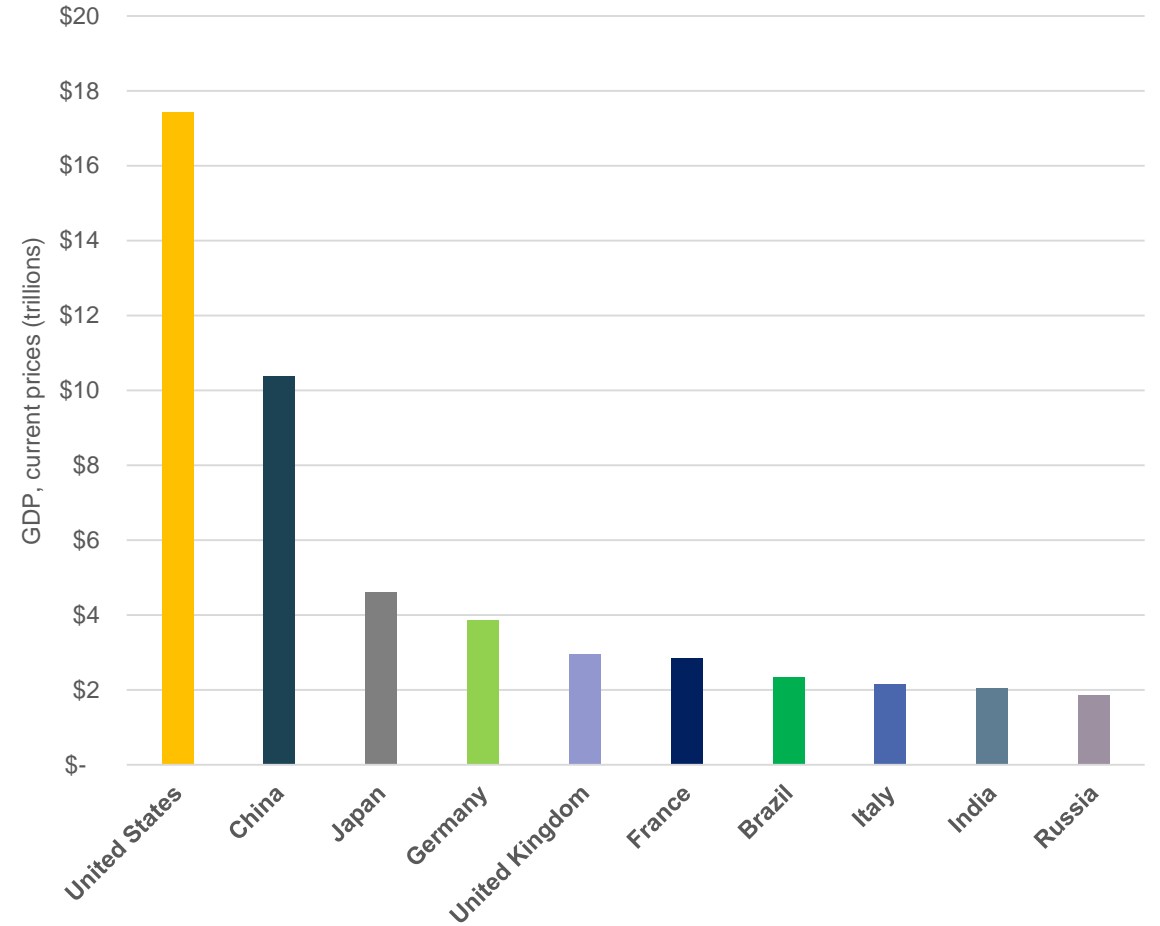


The global economy

TOP 10 POPULATIONS BY COUNTRY



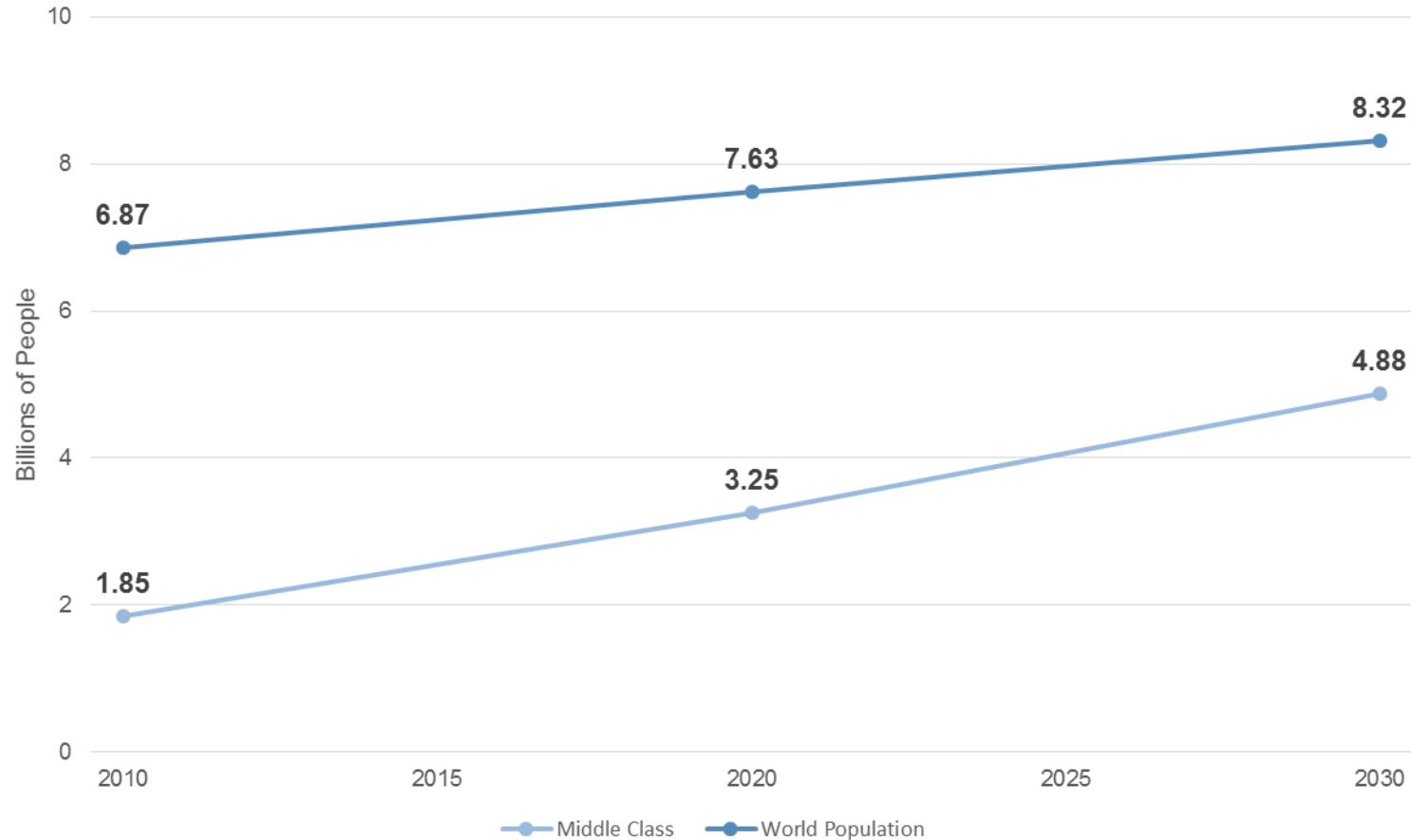
TOP 10 GDPs BY COUNTRY





The ultimate global logistics challenge

WORLD POPULATION AND OECD GLOBAL MIDDLE CLASS PROJECTIONS

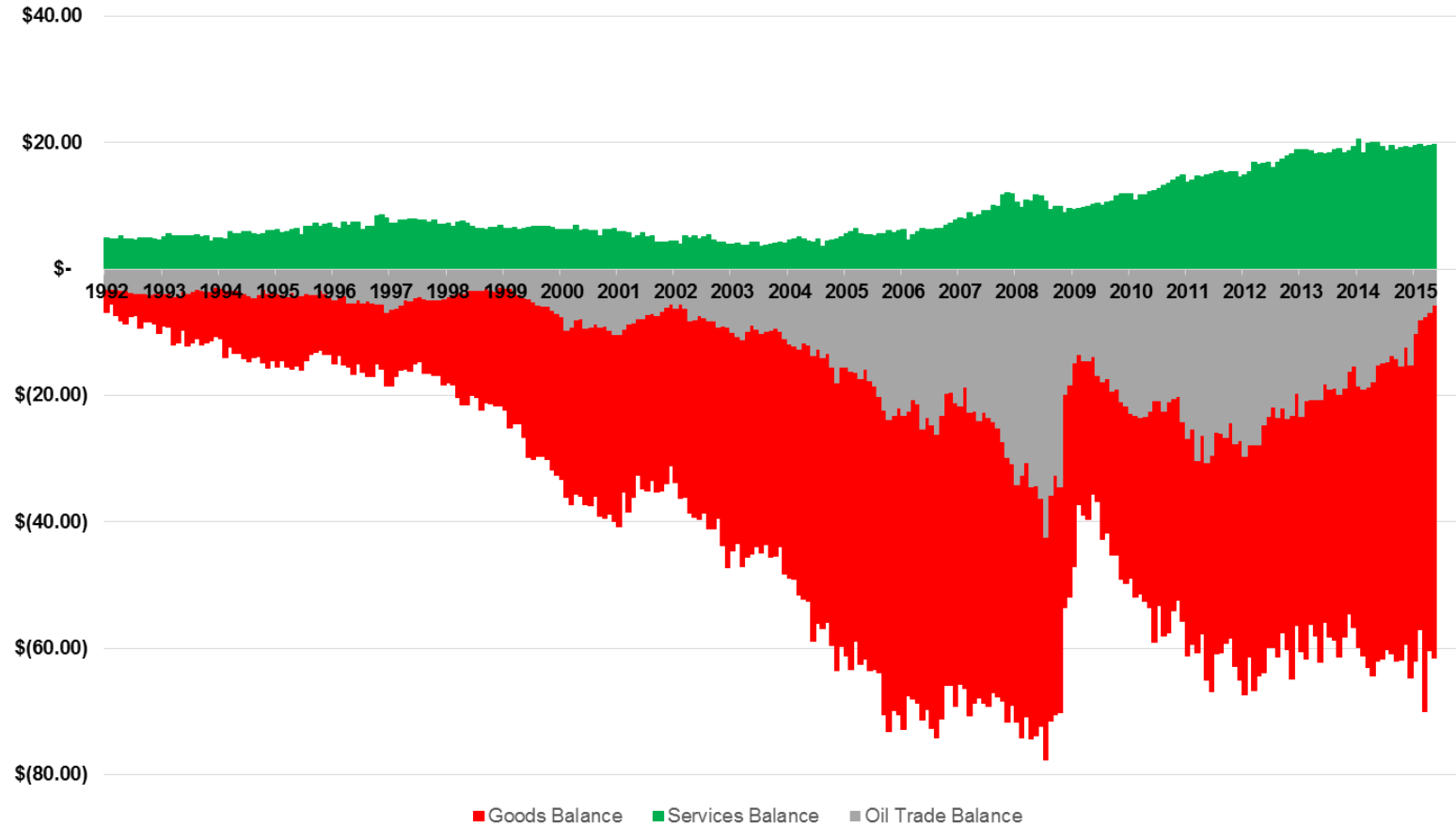


*Emerging markets are more than just large economies growing quickly, they are developing significant middle classes too. For the developed economies to sustain higher growth in the long term, they must focus on this market segment. Developed economies need growth in order to support their retirees. Need more infrastructure and less waste if these forecasts are correct. **This is the ultimate global logistics challenge.***



US Trade deficit remains high but declining

US TRADE DEFICIT



9% of the trade deficit is due to oil, used to be more than 40%

The US has helped the world economy develop, particularly emerging market economies, by allowing its trade balance to be in deficit. This isn't sustainable in the long run. Reducing the trade deficit is important for employment and therefore economic growth. The decreasing US oil trade deficit has directly helped strengthen our goods balance and in the process helped US employment recover from the deep 2007-2009 recession. But more, [a further reduction in the deficit, is needed.](#)



What can the US competitively export?

TOP 10 HIGH POTENTIAL US NET EXPORTS*

Containerized		Score	Bulk/Breakbulk		Score
	Wood Pulp Scrap and Waste	9.4	→	Oil Seeds (Soy)	32.7
→	Oil Seeds (Soy)	1.1	→	Meat and Other Edible Animal Parts	28.7
→	Raw Hides and Leather	0.8	→	Cereal Grains	3.9
→	Cotton – Untreated, Yarn and Woven Fabric	0.7	→	Animal Feed	3.4
→	Animal Feed	0.7		Wood and Charcoal	0.4
→	Meat and Other Edible Animal Parts	0.3		Crude Oil and Refined Petroleum/Natural Gas Products	0.3
	Plastic Feedstock and Manufactured Goods	0.2	→	Live Animals	0.2
	Iron and Steel	0.1		Wood Pulp Scrap and Waste	0.2
	Paper and Paperboard	0.1	→	Fish and Crustaceans	0.1
	Chemical Products	0.1	→	Dairy Products, including Eggs and Honey	0.1
→	Cereals	0.1		Organic Chemicals	0.1
	Organic Chemicals	0.1		Plastics Feedstock and Manufactured Goods	0.1

**Based on relative comparative advantage as defined by Bela Belassi*

Agriculture, Capital Goods, Energy

Labor is more expensive and capital is cheaper in the US compared to fast growing emerging market economies such as China. The US has comparative advantage (and competitive) advantages in the production of goods that use little labor. This is shown in the list of goods that the US has been prone to export.

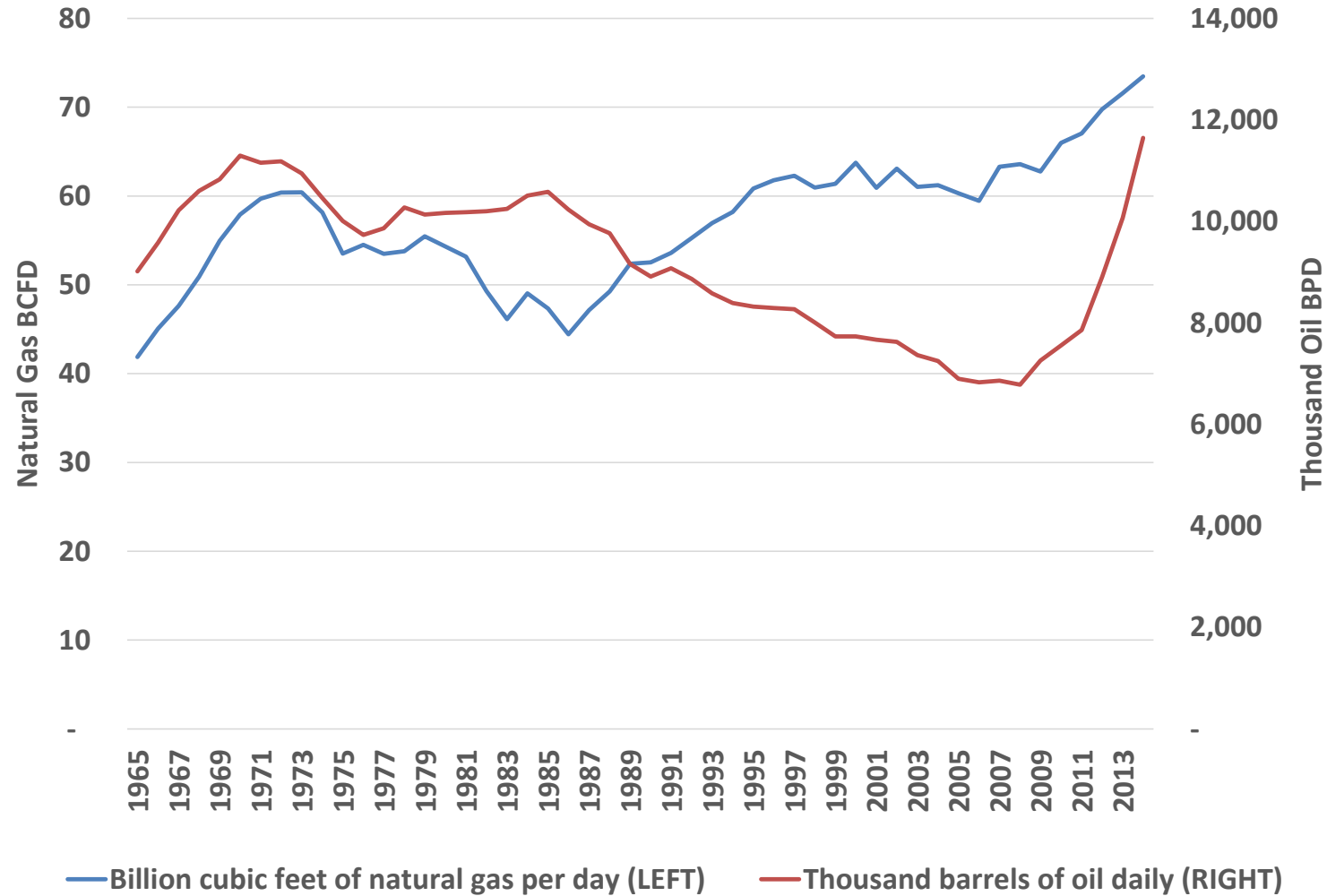
Agriculture dominates both top ten lists.

Source: US Census Bureau, Moffatt & Nichol



US energy production exceeds previous peak levels

PETROLEUM AND NATURAL GAS PRODUCTION: 1965 - 2014

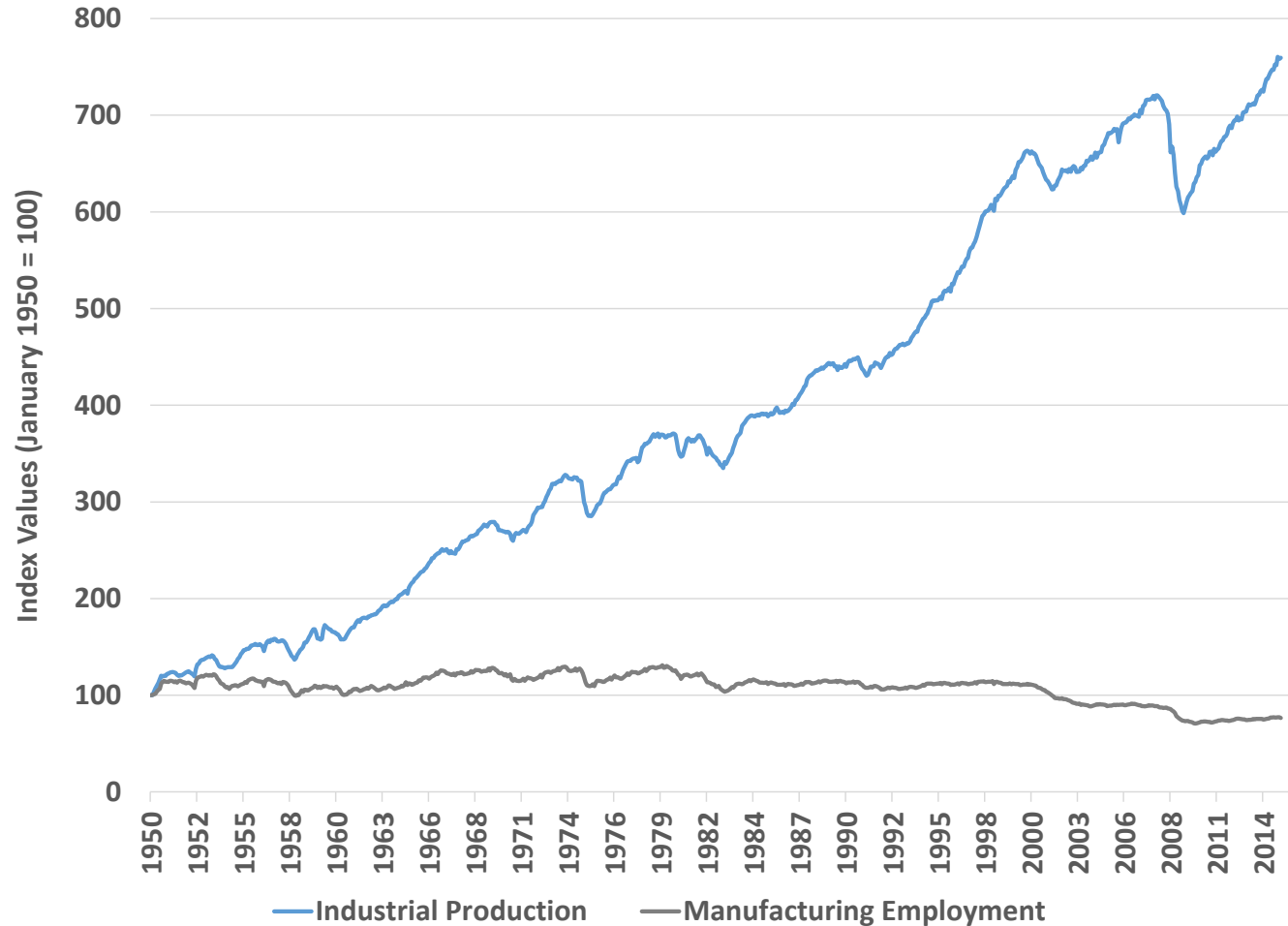


• Source: British Petroleum, Moffatt & Nichol



US manufacturing is growing but using less labor

WORLD POPULATION AND OECD GLOBAL MIDDLE CLASS PROJECTIONS

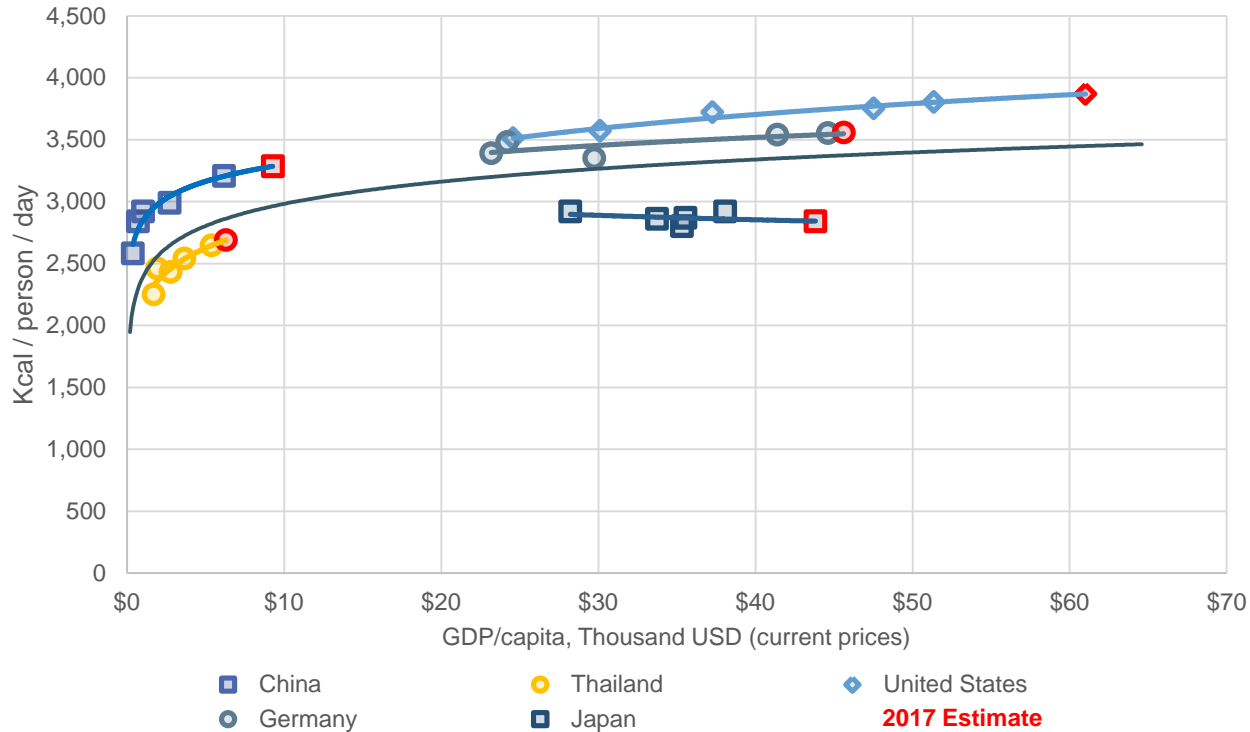


US manufacturing output is almost 8x the level of 1950 while employment is 25% lower. This is due to the changing nature of the commodities manufactured in the US (higher technology content) and automation. Using a minimum of relatively expensive US labor allows capital goods to be cost competitive.

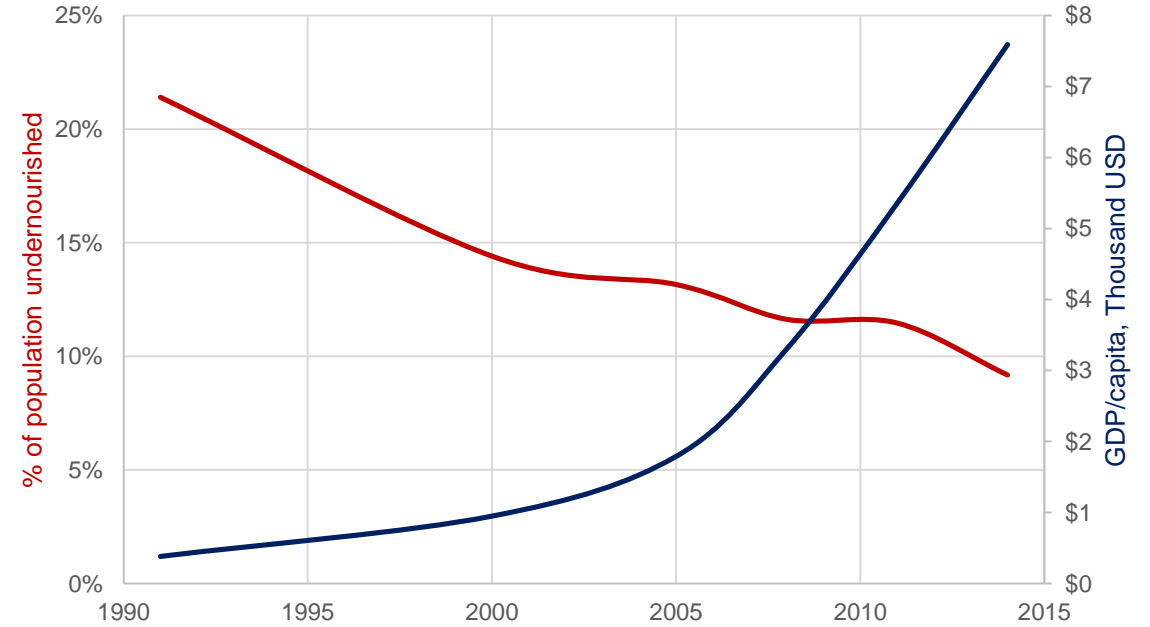


China's increasing food consumption ahead of GDP growth

FOOD CONSUMPTION VS GDP/CAPITA, 1990-2012



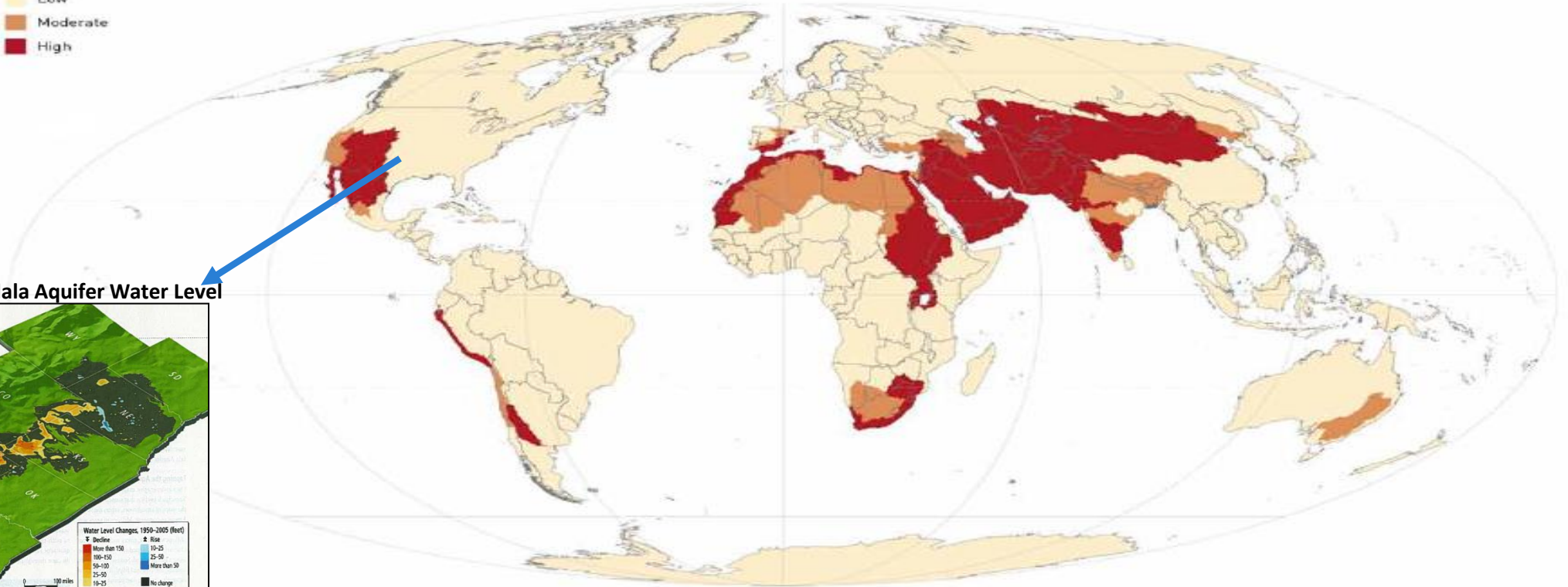
PERCENT OF CHINA'S POPULATION UNDERNOURISHED



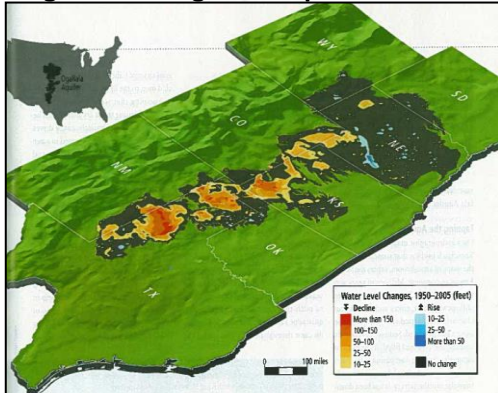


Water is the overlooked looming resource crisis

GLOBAL DISTRIBUTION OF PHYSICAL WATER SCARCITY



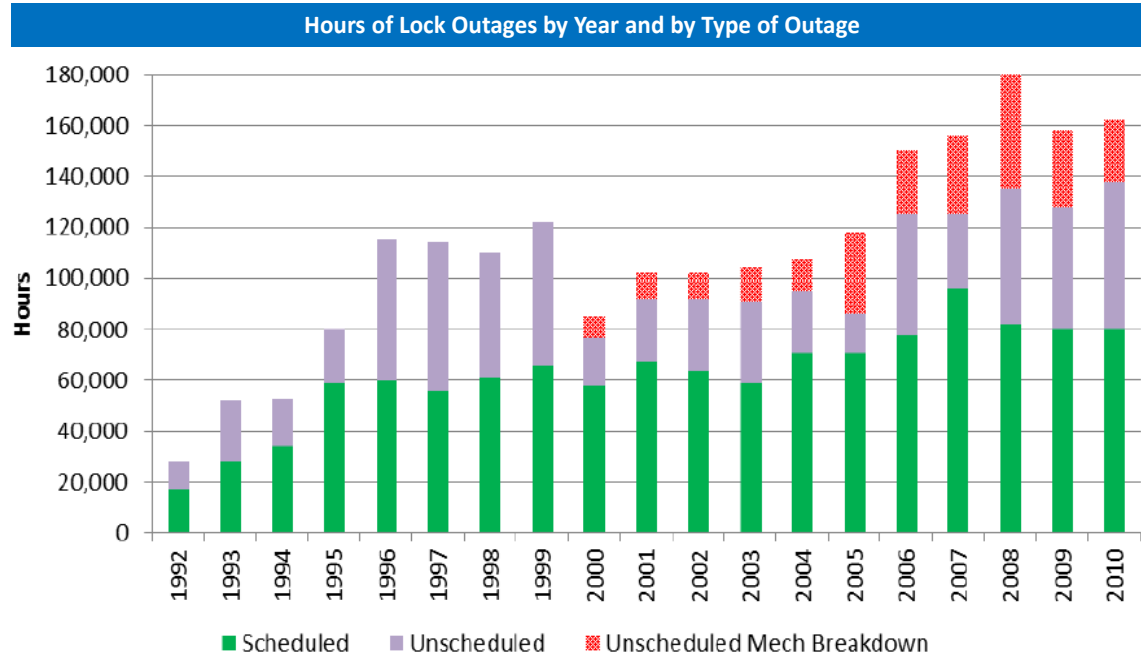
Changes In The Ogallala Aquifer Water Level



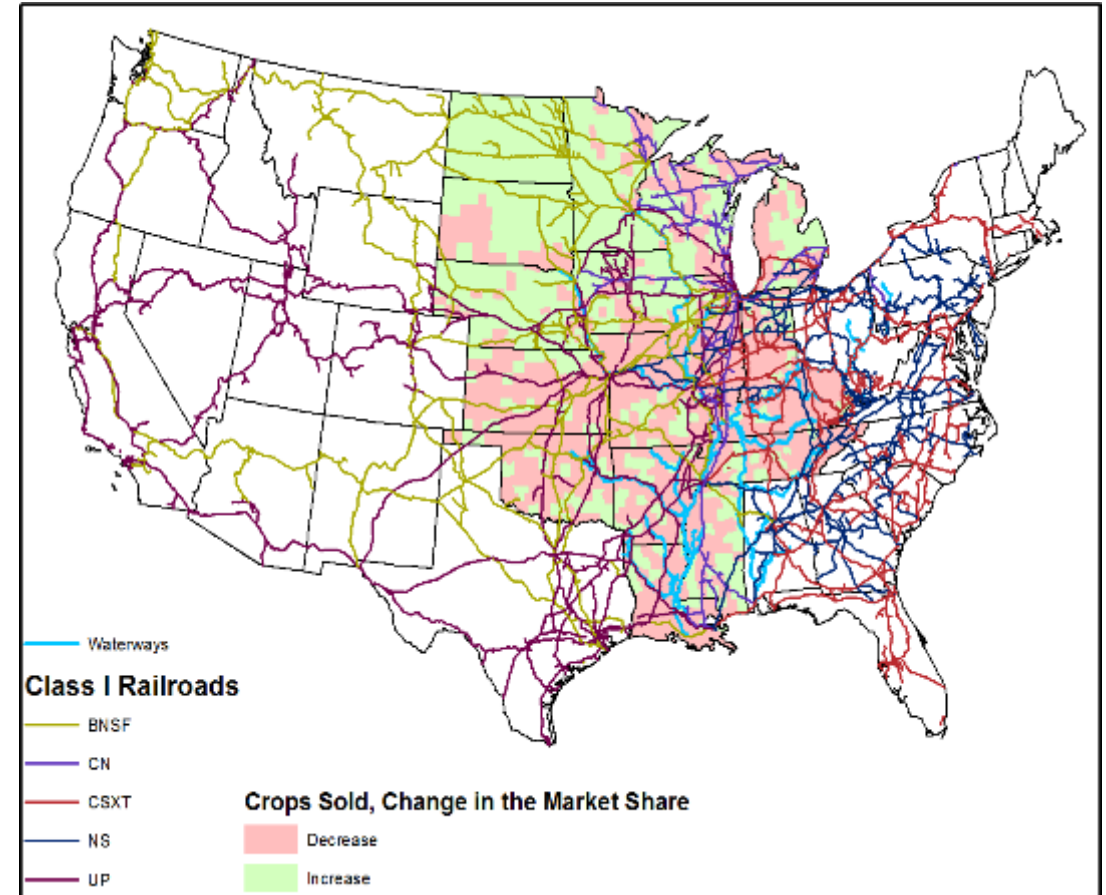
Water is becoming increasingly scarce in Asia, the Middle East and in the Western half of the US. The Americas otherwise have abundant water and are likely to grow in importance as the world's breadbasket.



Deteriorating US inland infrastructure a serious problem



CHANGES IN SHARE OF CROP PRODUCTION: 1997 VS 2012



SHARES OF US GRAIN AND OIL SEED EXPORTS

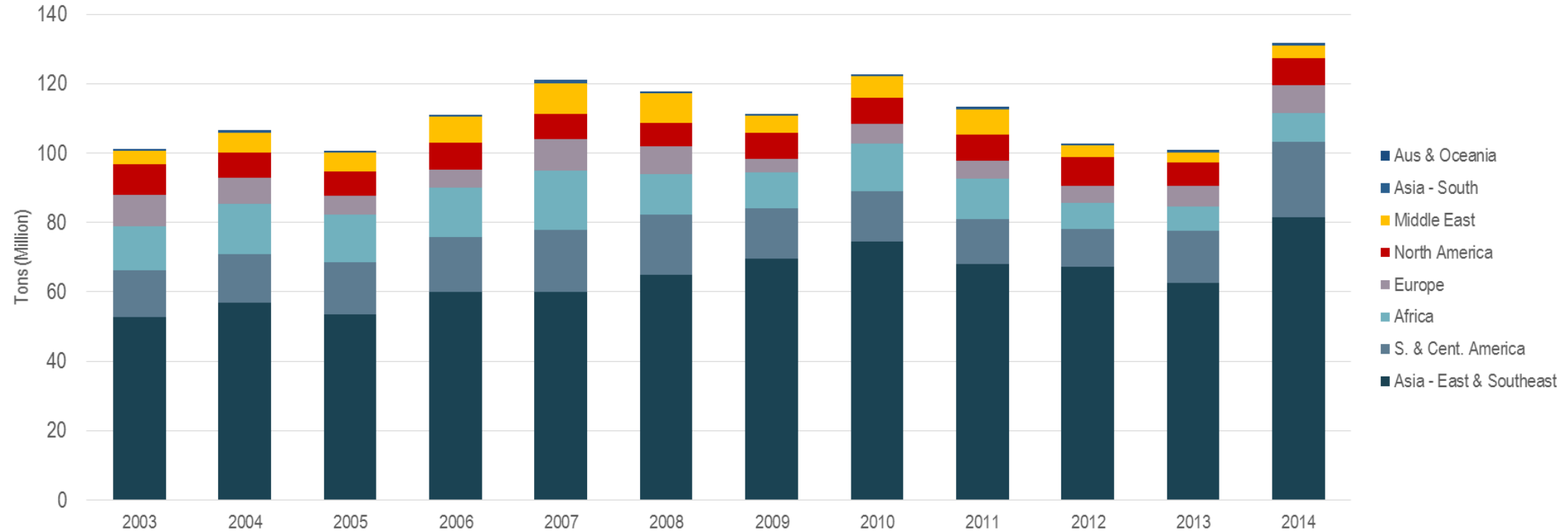
	2003	2005	2007	2009	2011	2013	2014	+/- Share
New Orleans	61%	52%	51%	52%	48%	49%	52%	-8.7%
Columbia-Snake	14%	16%	16%	15%	18%	20%	19%	5.2%
Seattle, WA	8%	13%	11%	12%	12%	8%	8%	0.2%
Los Angeles, CA	1%	2%	4%	3%	4%	4%	3%	2.1%
Norfolk, VA	1%	1%	2%	2%	2%	3%	2%	1.9%
Other	15%	16%	17%	15%	17%	16%	14%	-0.6%
	100%	100%	100%	100%	100%	100%	100%	

Soybean Transportation Coalition studied US inland waterways. Key points: *54% of the Inland Marine Transportation System's (IMTS) structures are more than 50 years old and 36% are more than 70 years old.* Along with water issues probably, this has impacted where grain is produced and exported. Grain increasingly moves on steel rivers (railways).



Asia is the dominant destination of US grains and oilseeds

US GRAIN AND OILSEED EXPORTS (MILLION METRIC TONS) BY DESTINATION



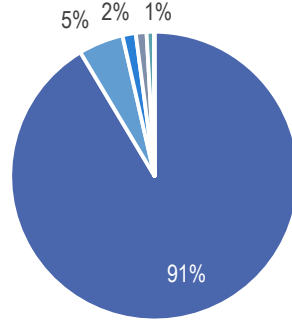
	2003	2005	2007	2009	2011	2013	2014	+/- Share
Asia - East & Southeast	52%	53%	50%	63%	60%	62%	62%	10%
China	11%	10%	10%	21%	21%	34%	30%	19%
South & Central America	14%	15%	15%	13%	11%	15%	17%	3%
Africa	13%	14%	14%	9%	11%	7%	6%	-6%
Europe	9%	5%	7%	4%	4%	6%	6%	-3%
North America	9%	7%	6%	7%	7%	7%	6%	-3%
Middle East	4%	5%	7%	4%	6%	3%	3%	-1%
Asia - South	0%	0%	1%	0%	0%	0%	0%	0%
	100%	100%	100%	100%	100%	100%	100%	

Source: US Census Bureau, Moffatt & Nichol



East coast grain and oil seed destinations are more diversified

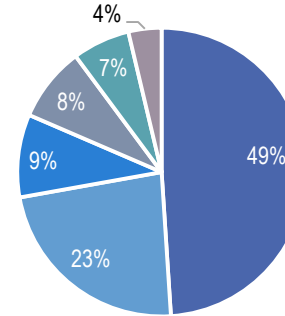
COLOMBIA-SNAKE



25 M tons
 99% bulk
 1% containerized

- Asia - East & Southeast
- S. & Cent. America
- Middle East
- Asia - South

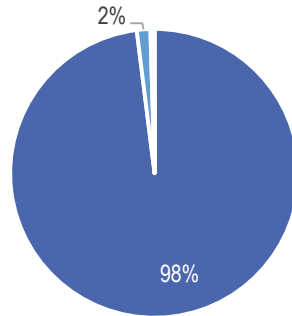
NEW ORLEANS, LA



69 M tons
 100% bulk
 0% containerized

- Asia - East & Southeast
- S. & Cent. America
- North America
- Europe
- Africa
- Other

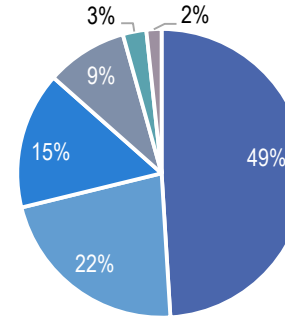
SEATTLE, WA



11 M tons
 83% bulk
 17% containerized

- Asia - East & Southeast
- Middle East
- Aus & Oceania
- S. & Cent. America
- Europe
- Other

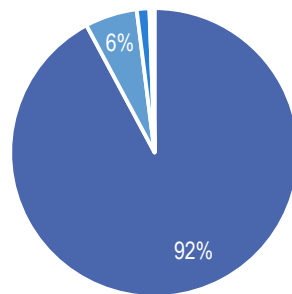
NORFOLK, VA



3 M tons
 77% bulk
 23% containerized

- Asia - East & Southeast
- S. & Cent. America
- Africa
- Europe
- North America
- Other

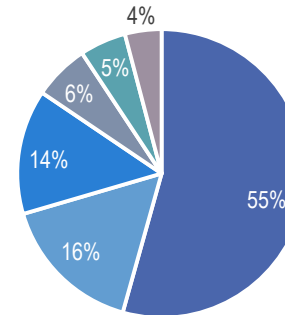
LA/LB



4 M tons
 24% bulk
 76% containerized

- Asia - East & Southeast
- Middle East
- S. & Cent. America
- Asia - South
- Europe
- Other

NY/NJ



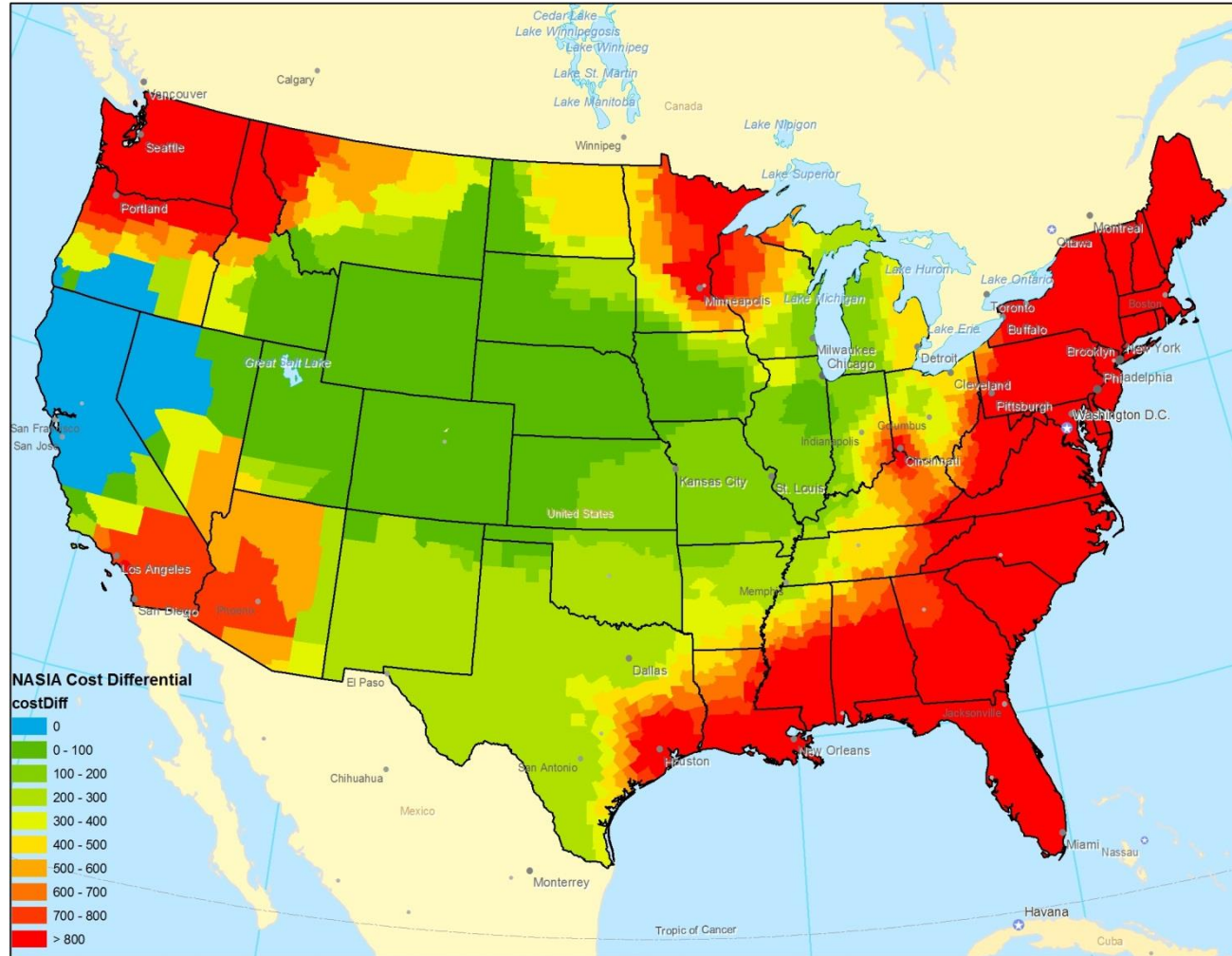
800,000 tons
 53% bulk
 47% containerized

- Asia - East & Southeast
- Africa
- S. & Cent. America
- North America
- Europe
- Other



West Coast ports remain as low cost path to US heartlands

PORT OF OAKLAND'S COST DIFFERENTIAL OF SERVING INLAND EXPORTS OF A SPECIFIC COMMODITY DESTINED TO NORTH ASIA

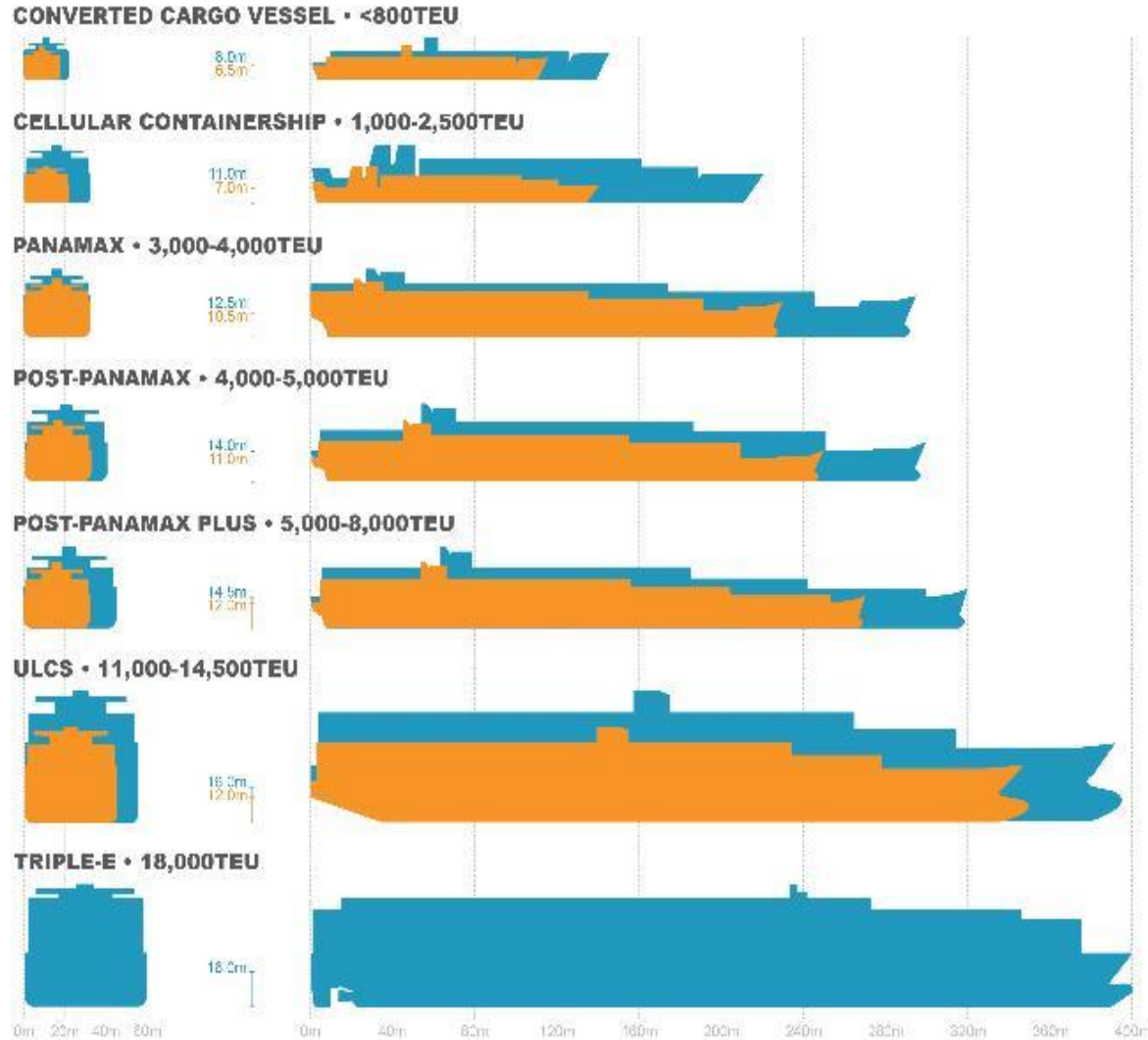


Focus is not on segments of supply chains but total gateway operating costs



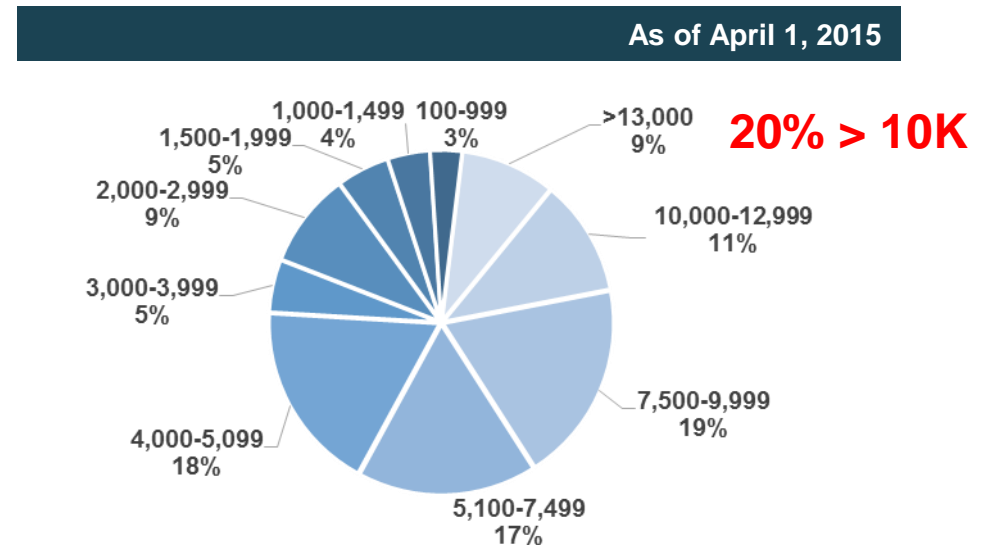
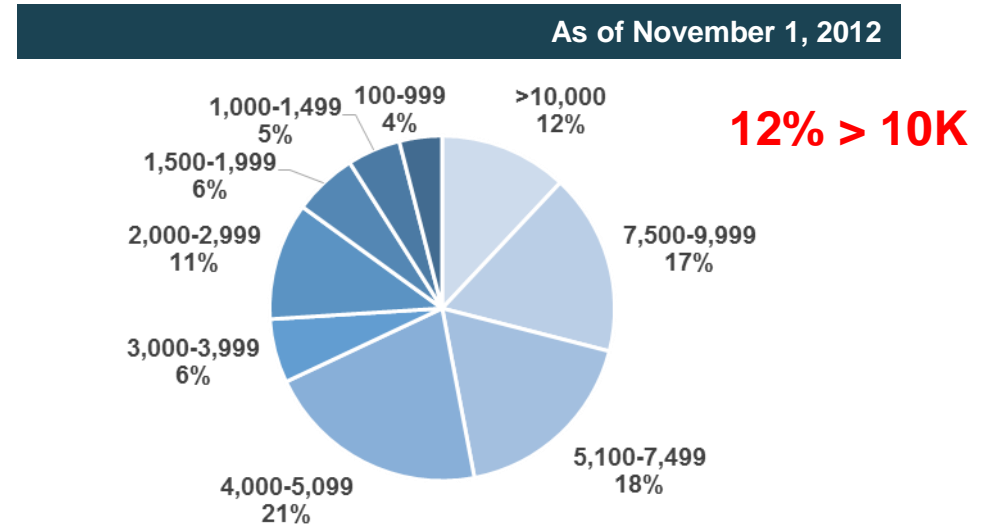
Ships continue to get larger

EVOLUTION OF CONTAINERSHIP SIZE



Source: Alphaliner, Moffatt & Nichol

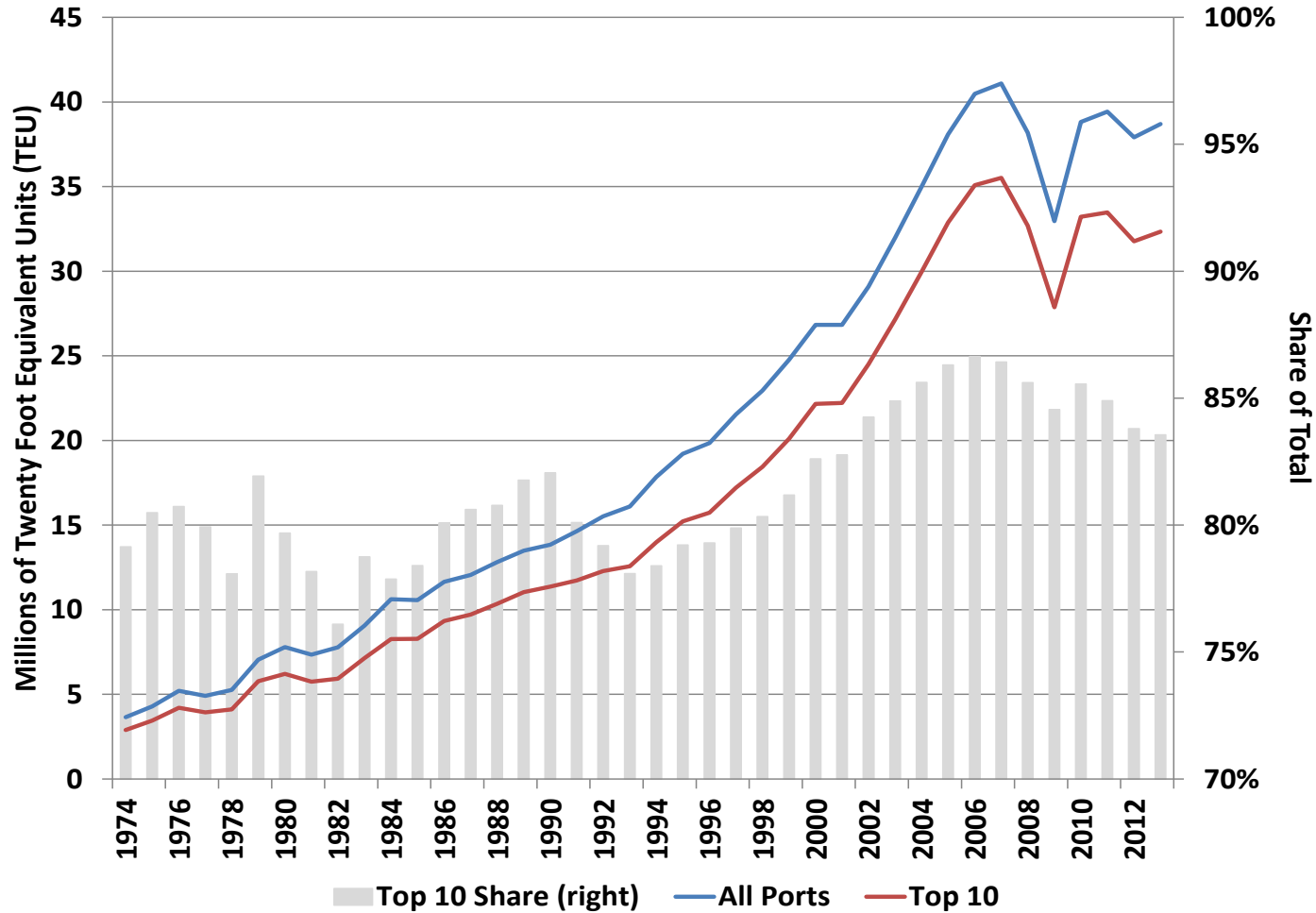
FLEET CAPACITY BREAKDOWN BY TEU SIZE RANGE





More freight in fewer gateways

US INTERNATIONAL CONTAINER VOLUMES AND PORT SHARES: 1974-2014



As volumes concentrate in fewer ships to reduce average fixed costs per slot, they concentrate in fewer ports to increase revenue-generating time.



Congestion is a global problem that needs local solutions

TRUCK TRAFFIC IN ROTTERDAM



PORT TRAFFIC IN SOUTHERN CALIFORNIA



TRUCK LINES AT THE PORT OF PARANAGUA, BRAZIL



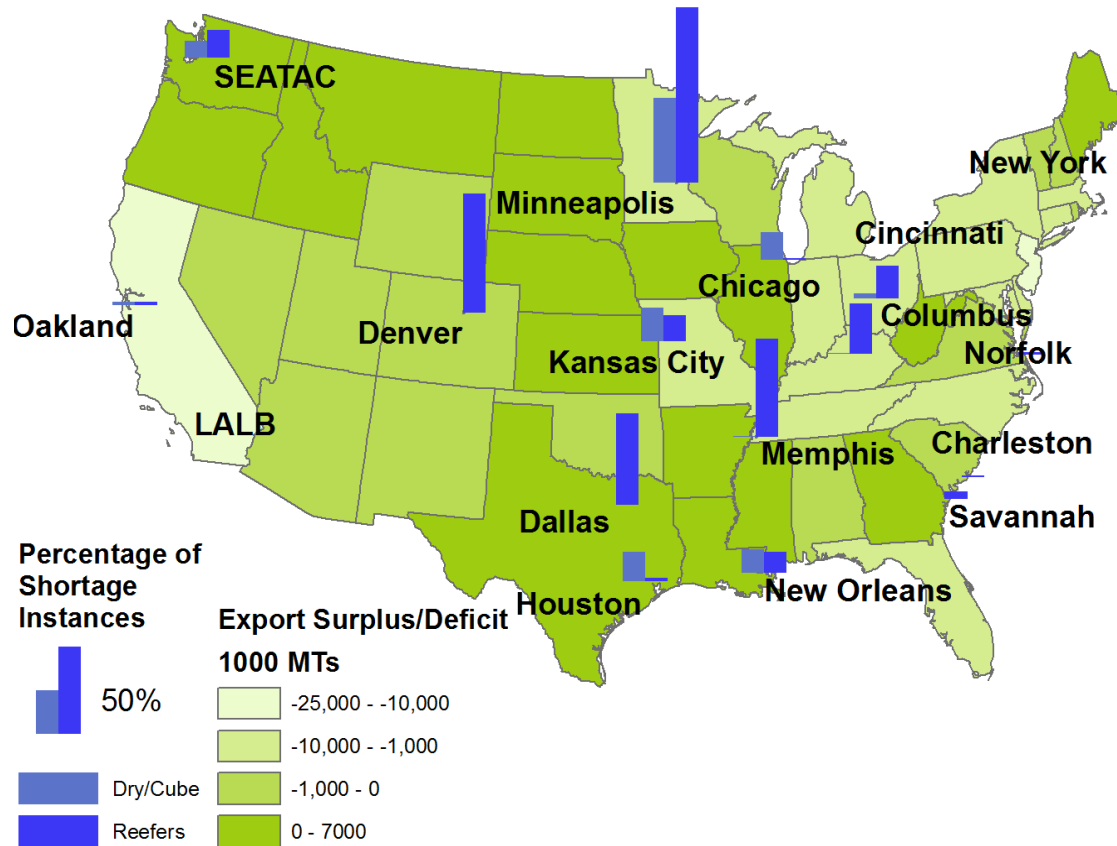
PORT OF SHANGHAI, CHINA





Empty container availability is very poor in less urban areas

CONTAINER SHORTAGE INCIDENCE BY CITY



	Dry				Reefer		
	20ft	40ft	40ft High	Average	40ft	20ft	Average
East	New York	0%	0%	0%	0%	0%	0%
	Norfolk	0%	0%	0%	0%	2%	1%
	Charleston	0%	0%	0%	0%	13%	0%
North-Central	Savannah	0%	0%	0%	0%	8%	4%
	Minneapolis	45%	68%	25%	46%	100%	100%
	Chicago	0%	51%	13%	21%	2%	4%
	Cincinnati	0%	0%	0%	0%	4%	49%
	Columbus	0%	6%	0%	2%	8%	32%
South Central	Kansas City	2%	51%	4%	19%	0%	42%
	Memphis	0%	2%	0%	1%	13%	100%
	New Orleans	11%	15%	19%	15%	11%	28%
	Dallas	0%	0%	0%	0%	2%	98%
	Houston	26%	49%	2%	26%	0%	8%
West	Denver	0%	0%	0%	0%	55%	70%
	LALB	0%	0%	0%	0%	0%	0%
	Oakland	9%	0%	0%	3%	8%	4%
	Seattle	4%	0%	21%	8%	0%	8%
	Tacoma	0%	11%	25%	12%	51%	2%
Average	5%	14%	6%	8%	15%	30%	23%

Exporters in areas of the Midwest that are not very urban have the least amounts of containers available. This hampers agricultural exports that are best suited for containerization.



Brazil is becoming a competitive soy supplier



Saída pelo Norte reduzirá em 34% custo de frete



Cerrado Region
- Larger than US Cornbelt
- 3 growing seasons



Global grain and oilseed origin-destination matrix

2014 Grain and Oilseed trade (tons)											
Importer/Exporter	Argentina	Australia	Brazil	Canada	China	Egypt	Europe	Japan	Mexico	USA	Total Imports
Argentina	-	1,270	3,330	691	204	322	1,555	9	577	7,035	15,423
Australia	9,844	-	1,062	5,208	14,857	532	5,292	1,075	256	25,948	64,758
Brazil	2,250,548	208	-	333,963	2,965	2,080	31,803	51	689	2,643,076	5,265,382
Canada	11,316	2,484	468	-	35,611	727	13,665	398	3,333	2,012,090	2,083,659
China	6,079,790	6,478,282	32,690,179	6,622,781	-	317	2,932,884	1,359	297	39,125,889	93,932,225
Egypt	1,944,321	282,408	1,521,882	94,788	48,193	-	6,643,113	36	133	3,991,487	14,526,405
Europe*	458,308	881,442	5,205,682	3,565,271	143,432	63,980	20,288,066	653	142,873	4,425,298	35,175,003
Japan	673,313	2,381,731	1,922,983	4,979,386	279,192	1,956	972,978	-	1,830	19,821,398	31,034,768
Mexico	15,170	60,340	76,284	2,520,058	12,309	141	34,297	15	-	18,384,491	21,103,106
USA	172,906	175,746	1,089,635	8,123,964	115,044	10,643	364,225	801	208,012	-	10,260,975
Total Exports	11,615,949	10,264,594	42,511,506	26,249,675	652,255	80,740	31,287,877	4,398	357,999	90,436,712	213,461,705

*Europe includes France, Germany, Italy, Spain, Ukraine, United Kingdom

Font = net exporter

Font = decreased imports since 2000

2000 Grain and Oilseed trade (tons)											
Importer/Exporter	Argentina	Australia	Brazil	Canada	China	Egypt	Europe	Japan	Mexico	USA	Total Imports
Argentina	-	4,860	10,242	1,554	68	102	20,526	7	440	15,743	53,542
Australia	2,166	-	826	1,261	9,734	422	3,303	581	1,635	184,177	204,107
Brazil	9,509,342	290	-	183,410	20,157	295	43,326	57	530	101,580	9,858,987
Canada	64,345	5,884	4	-	44,694	562	68,538	13,535	2,323	2,941,517	3,141,402
China	2,824,982	2,217,954	2,119,581	2,326,333	-	0	1,001,411	1,128	100	5,596,502	16,087,990
Egypt	1,310,460	567,628	30,086	86,156	287,236	-	343,410	96	8,356	8,447,673	11,081,101
Europe*	2,157,218	762,427	3,292,784	1,454,948	170,281	17,483	18,150,790	607	921	5,725,389	31,732,850
Japan	559,640	4,136,307	751,561	4,800,186	897,493	4,946	431,956	-	8,775	25,961,518	37,552,382
Mexico	18,808	119,393	156,362	1,892,672	9,570	2	40,602	45	-	17,429,372	19,666,826
USA	106,382	325,986	3,247	61,074,305	25,508	4,580	80,399	1,323	95,716	-	61,717,446
Total Exports	16,553,342	8,140,729	6,364,692	71,820,826	1,464,742	28,392	20,184,262	17,378	118,796	66,403,472	191,096,632

*Europe includes France, Germany, Italy, Spain, Ukraine, United Kingdom

Font = net exporter



Re-cap

- Exports are a national economic priority
- Growing global middle class is the opportunity but also the ultimate logistics challenge
- The US must improve freight corridor productivity to match or exceed that of its competitors in the global market place
 - Condition of infrastructure, capacity, congestion, chassis and container availability, coordination of investments, capital availability are increasing **costs** while currency trends increasingly favor competitors



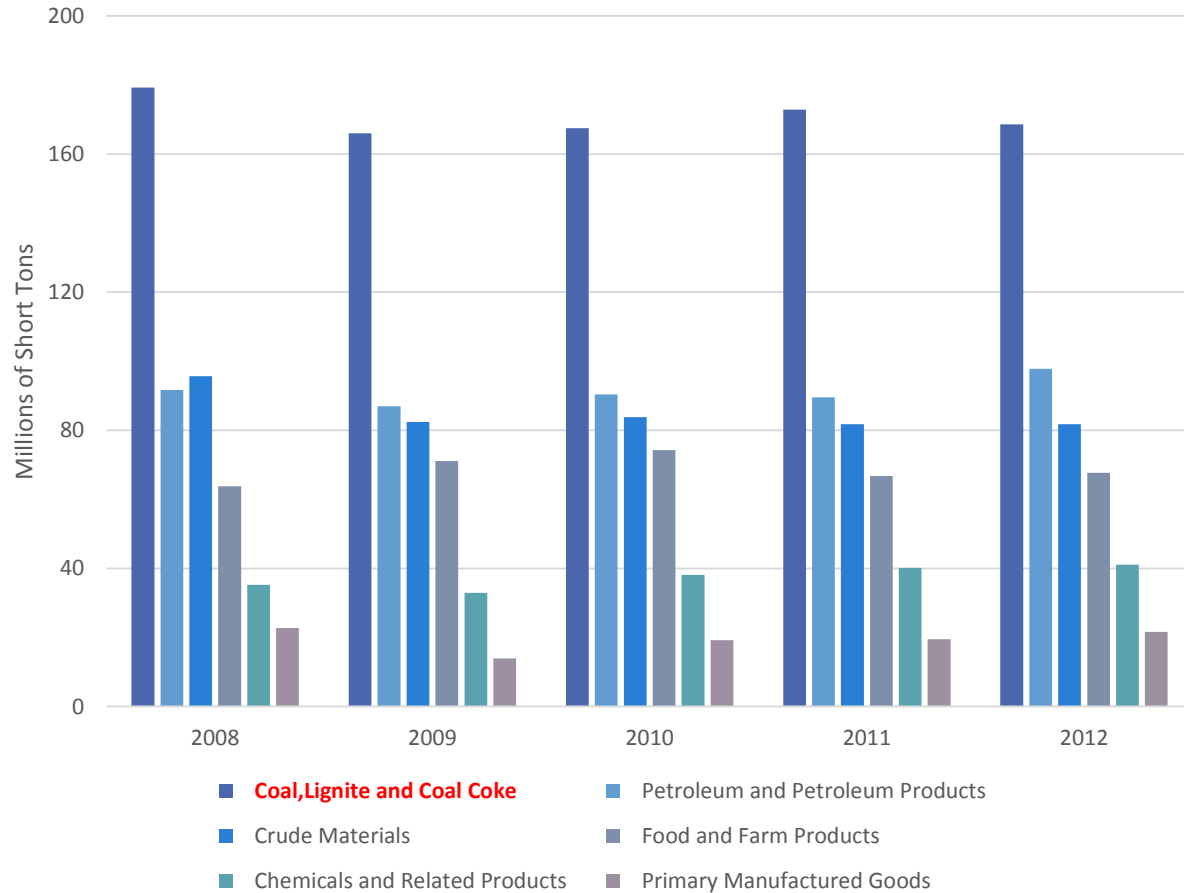
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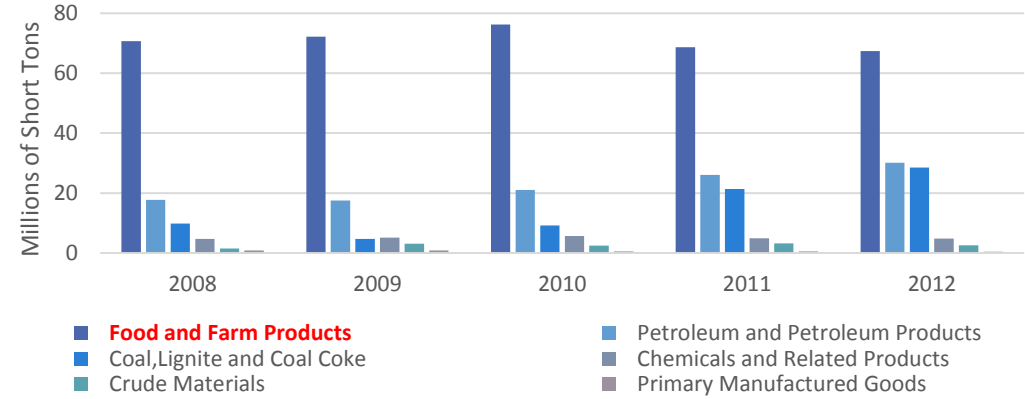
>680M short tons of cargo was moved on the Mississippi in 2012

CARGO MOVING ON MISSISSIPPI RIVER – DOMESTIC FUEL FLOWS DOMINATE BUT EXPORTS ARE GROWING FASTER

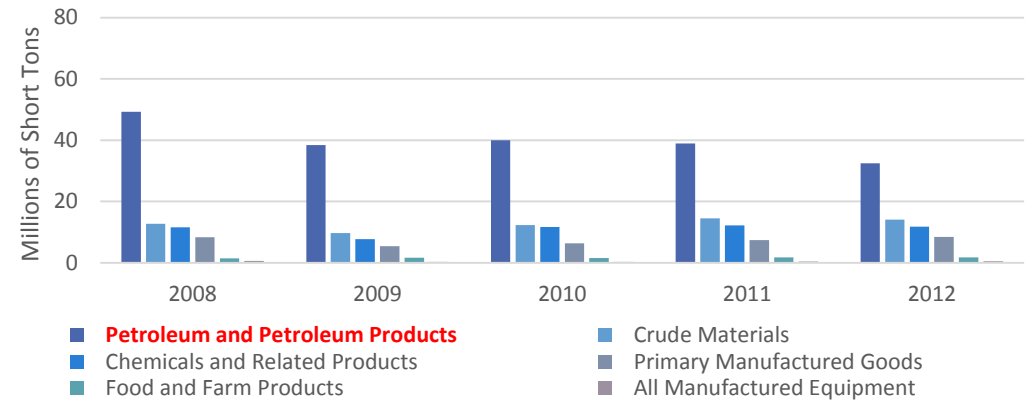
Total Domestic



Exports



Imports



>100M short tons of cargo was moved on the Columbia River in 2012

CARGO MOVING ON COLUMBIA RIVER – EXPORTS DOMINATE AND AGRICULTURE HAS THE LARGEST SHARE

