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Looking forward into uncertainty

Revenue forecasting for ports

Presented By: David Wignall

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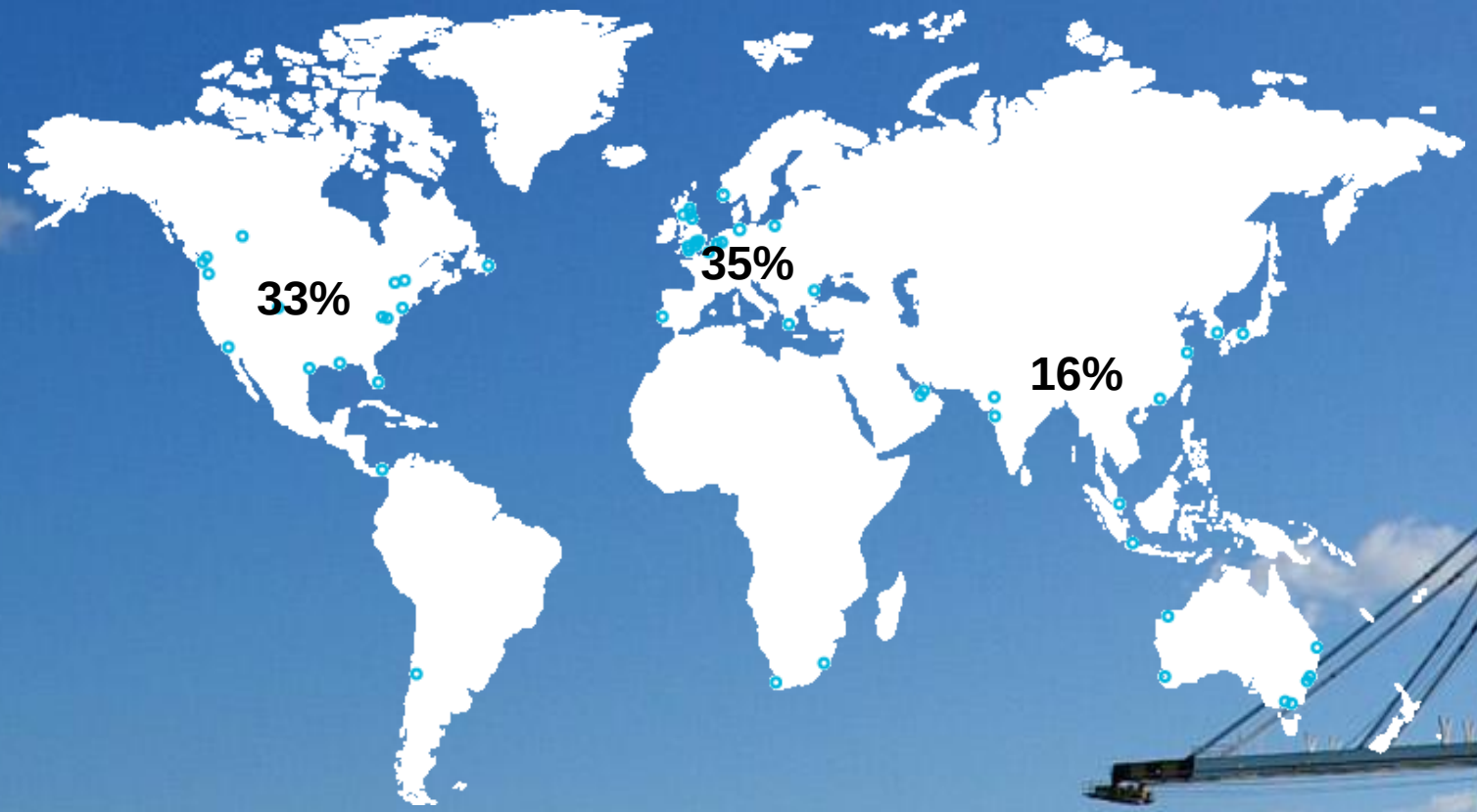
Economic Activity - 1975



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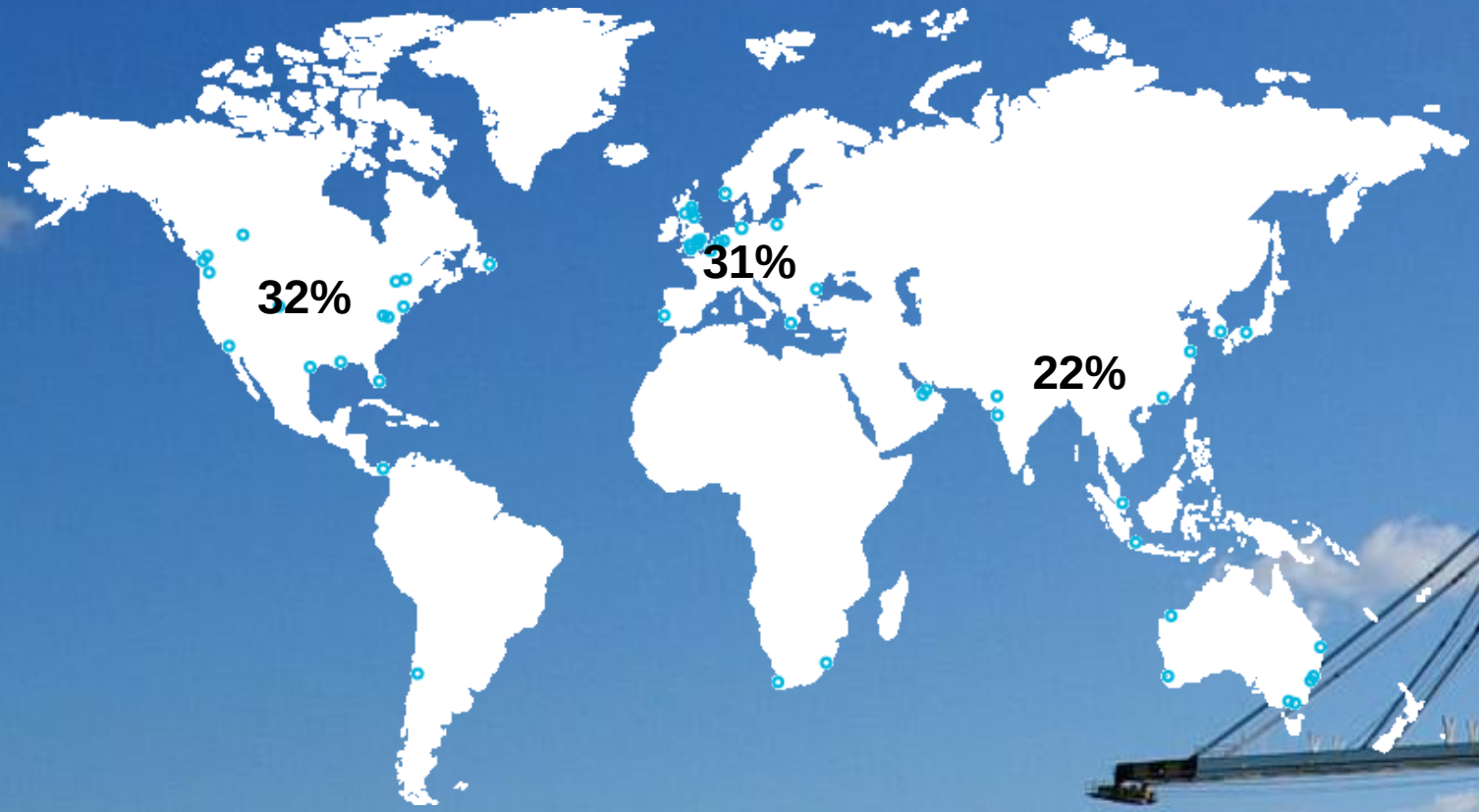
Economic Activity - 2005



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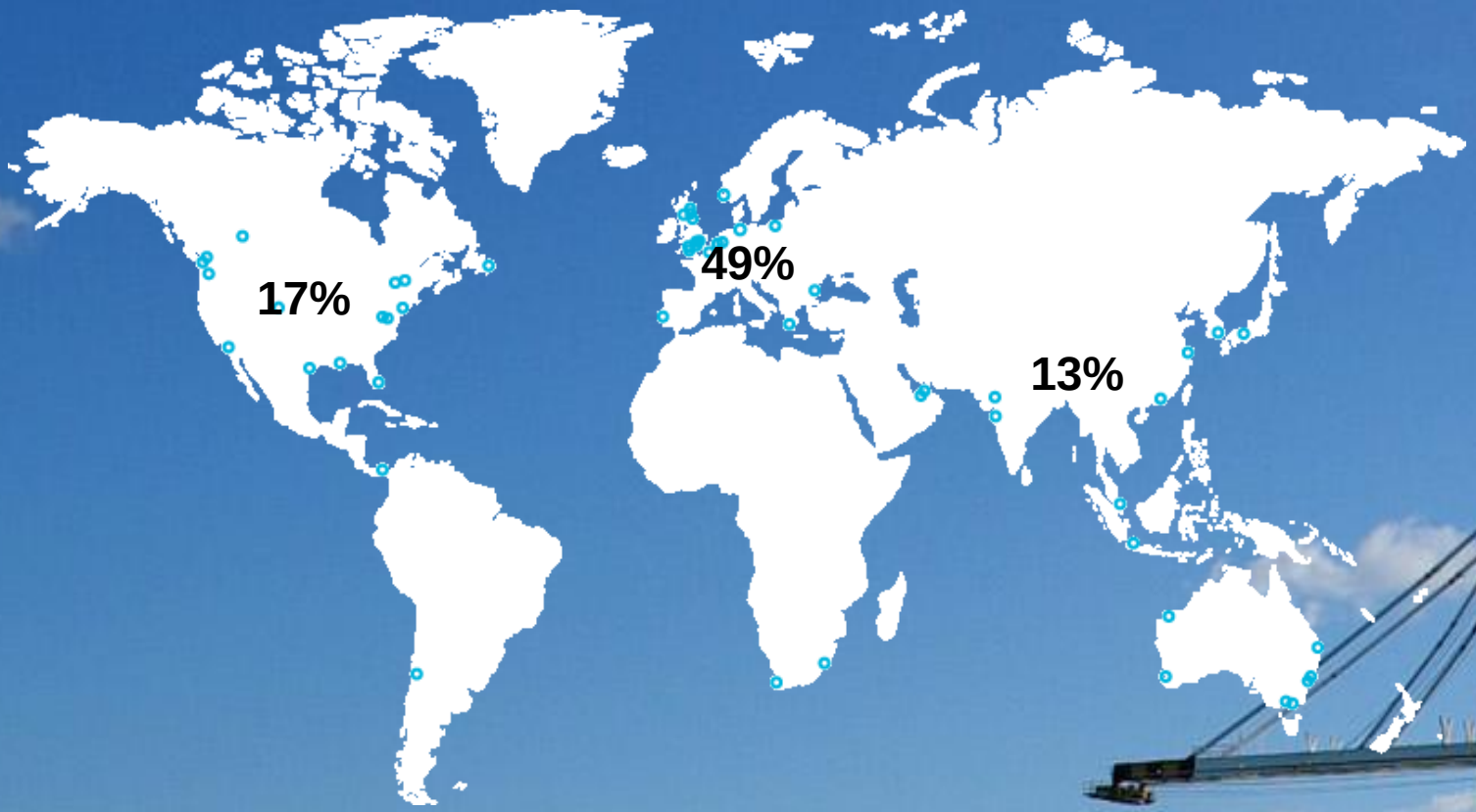
Trade - 1975



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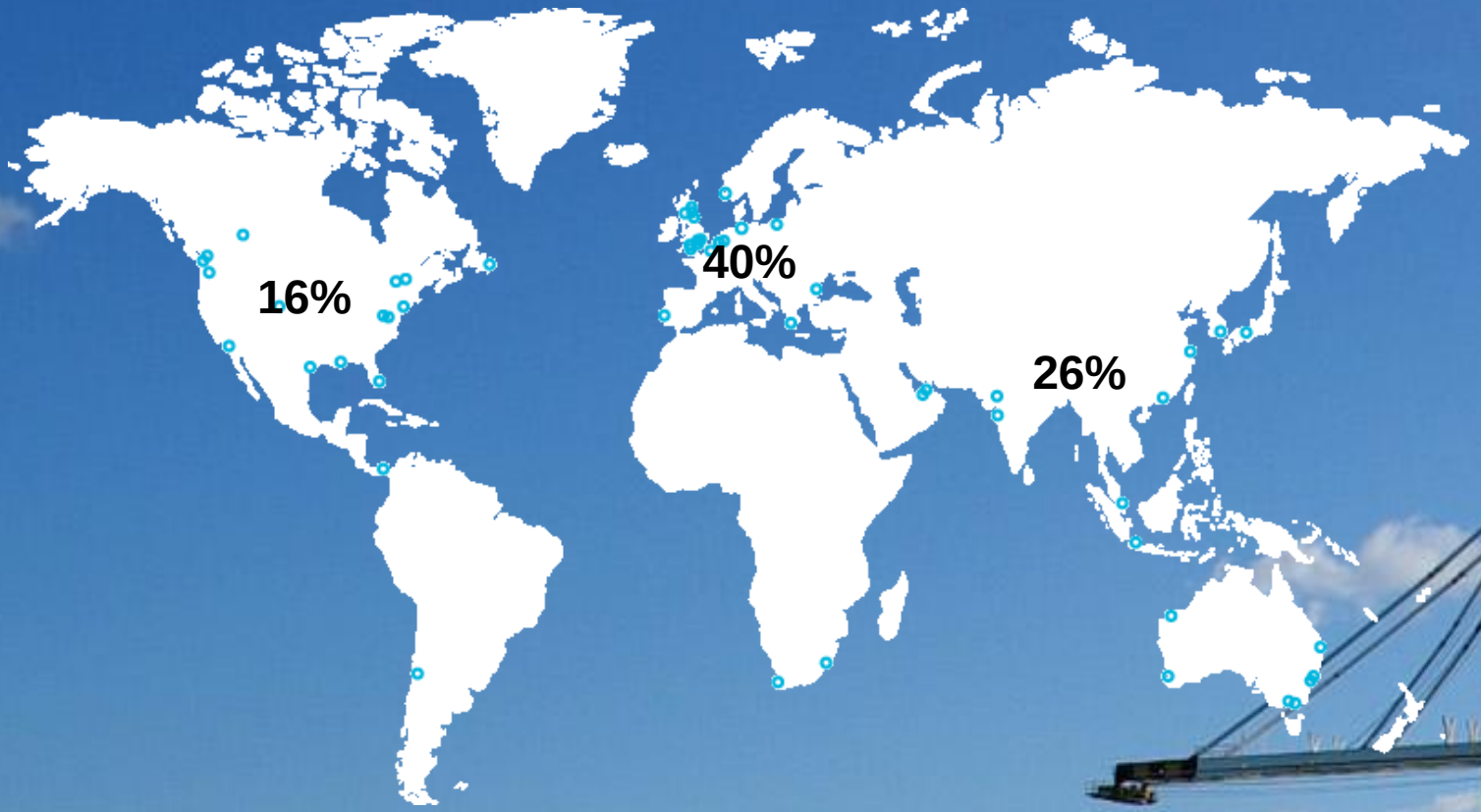
Trade - 2005



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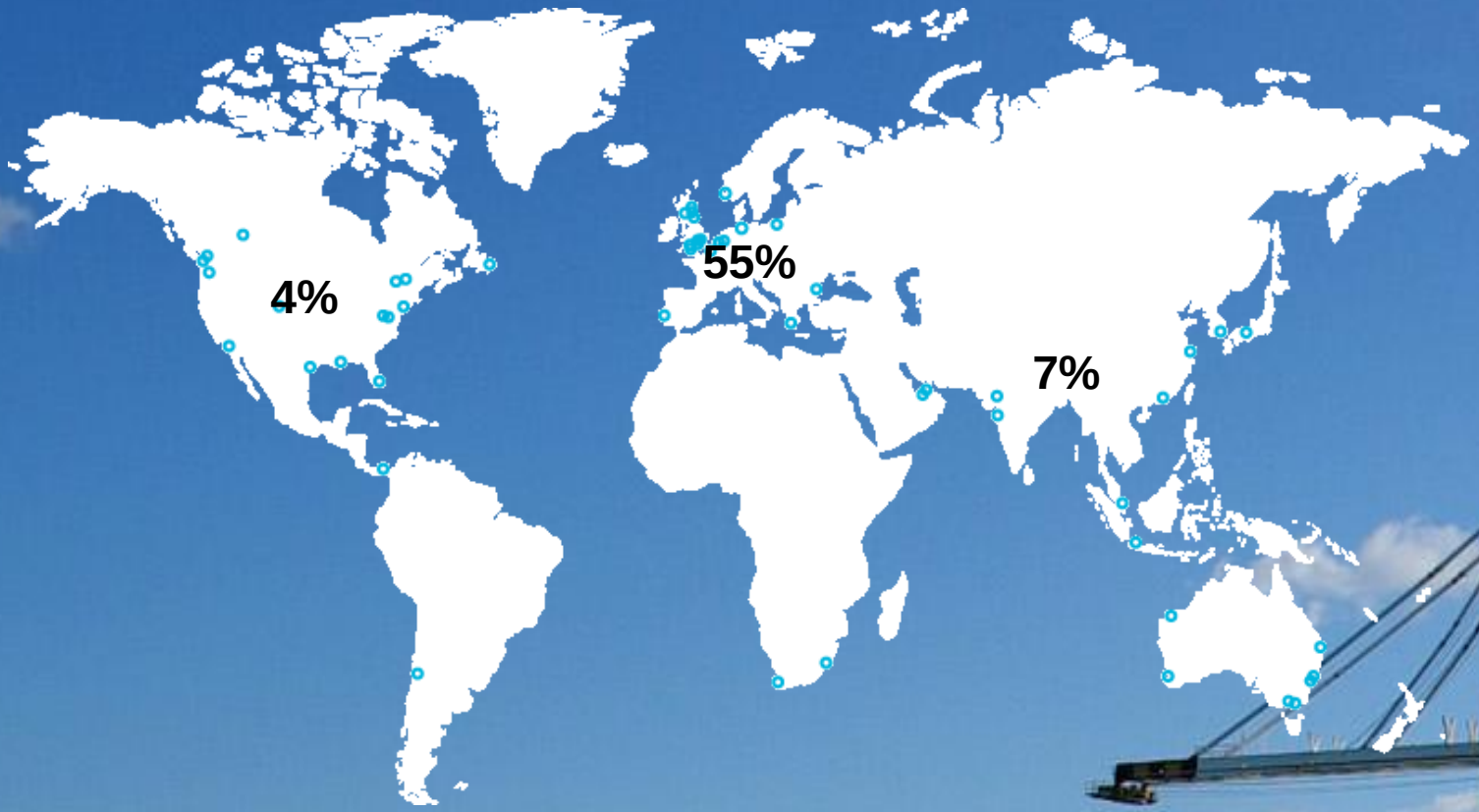
Ship Owning - 1975



22% of fleet in open registers

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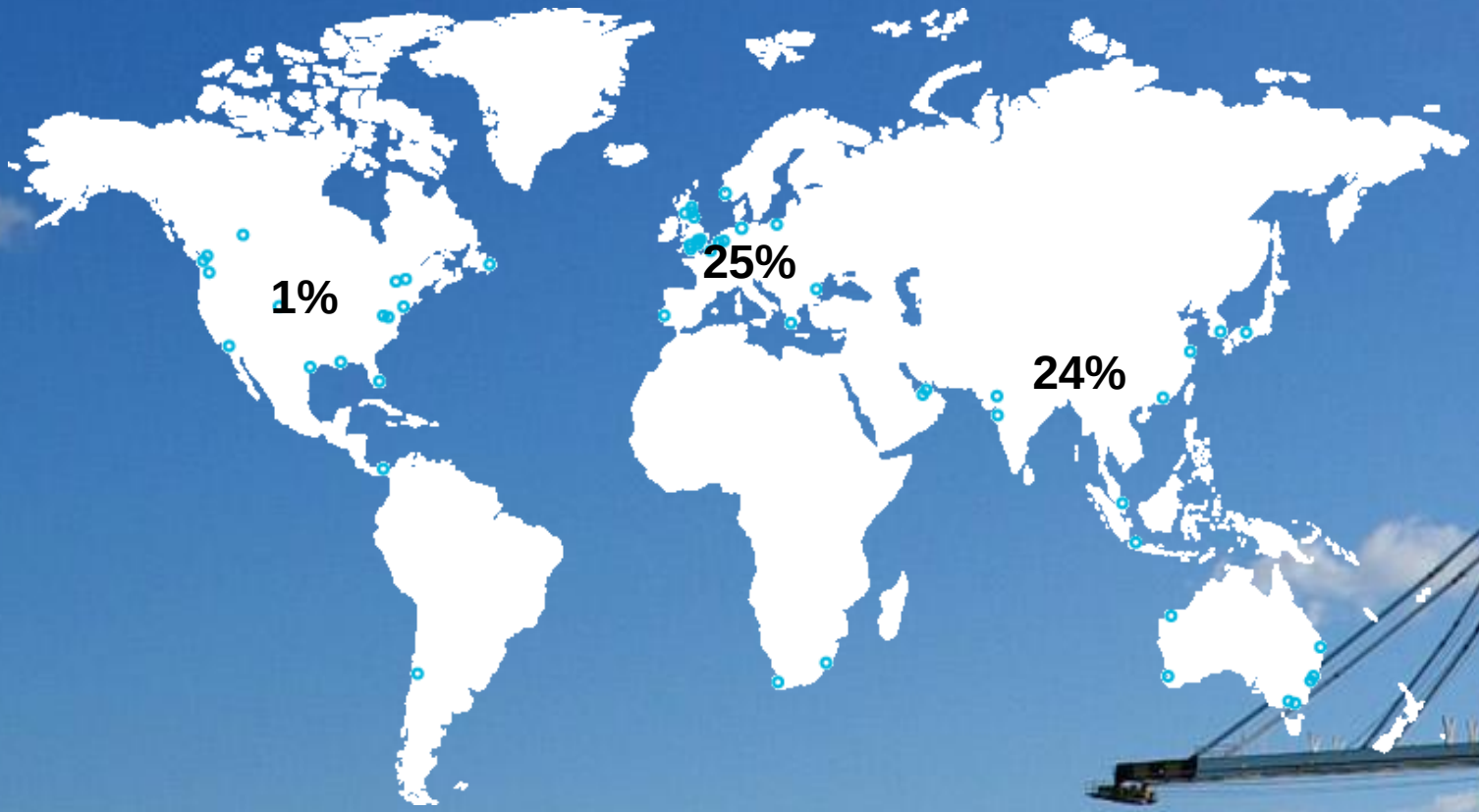
Ship Owning - 2005



45% of fleet in open registers down from 48% in 2000

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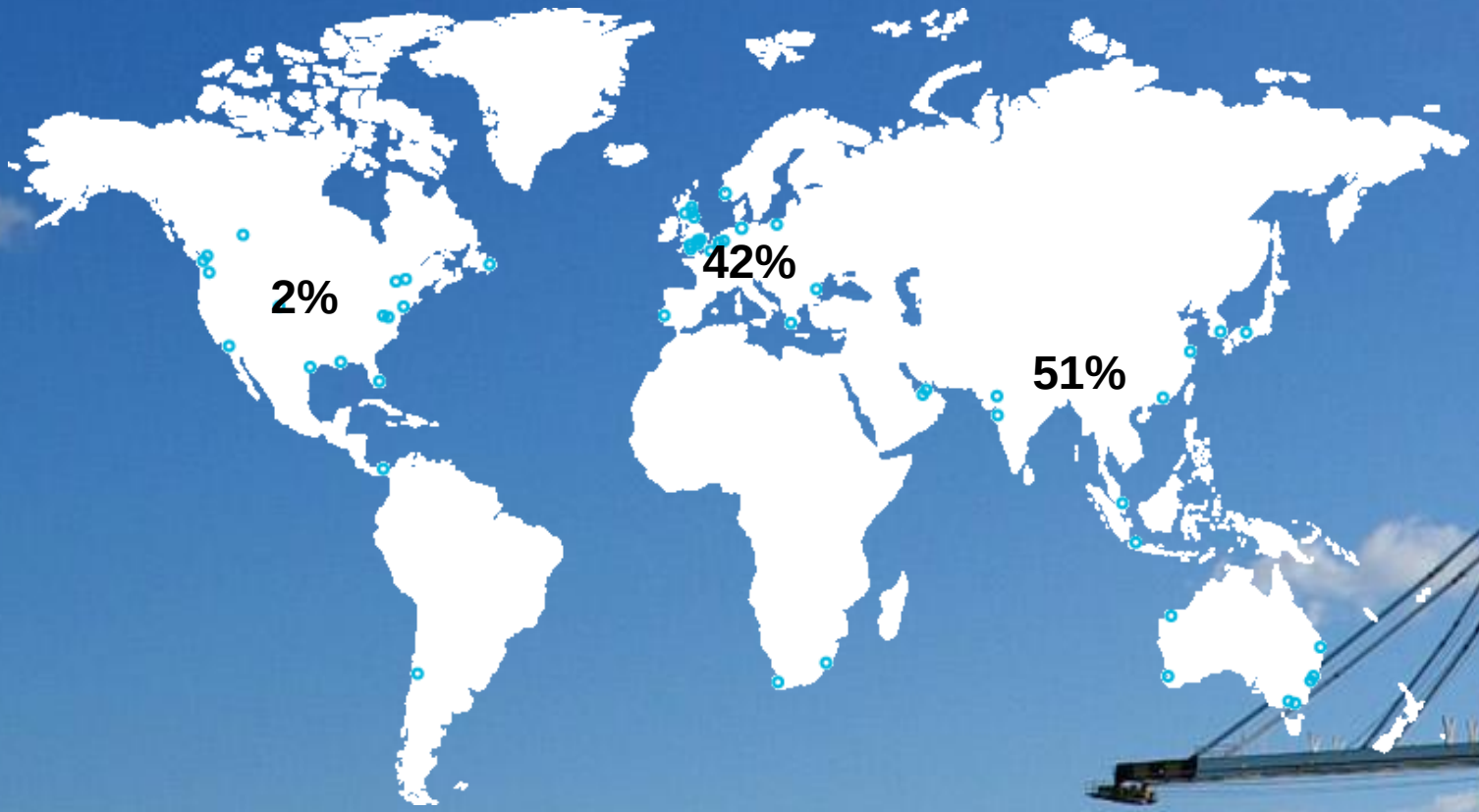
Ship Building - 1975



34 million GT delivered

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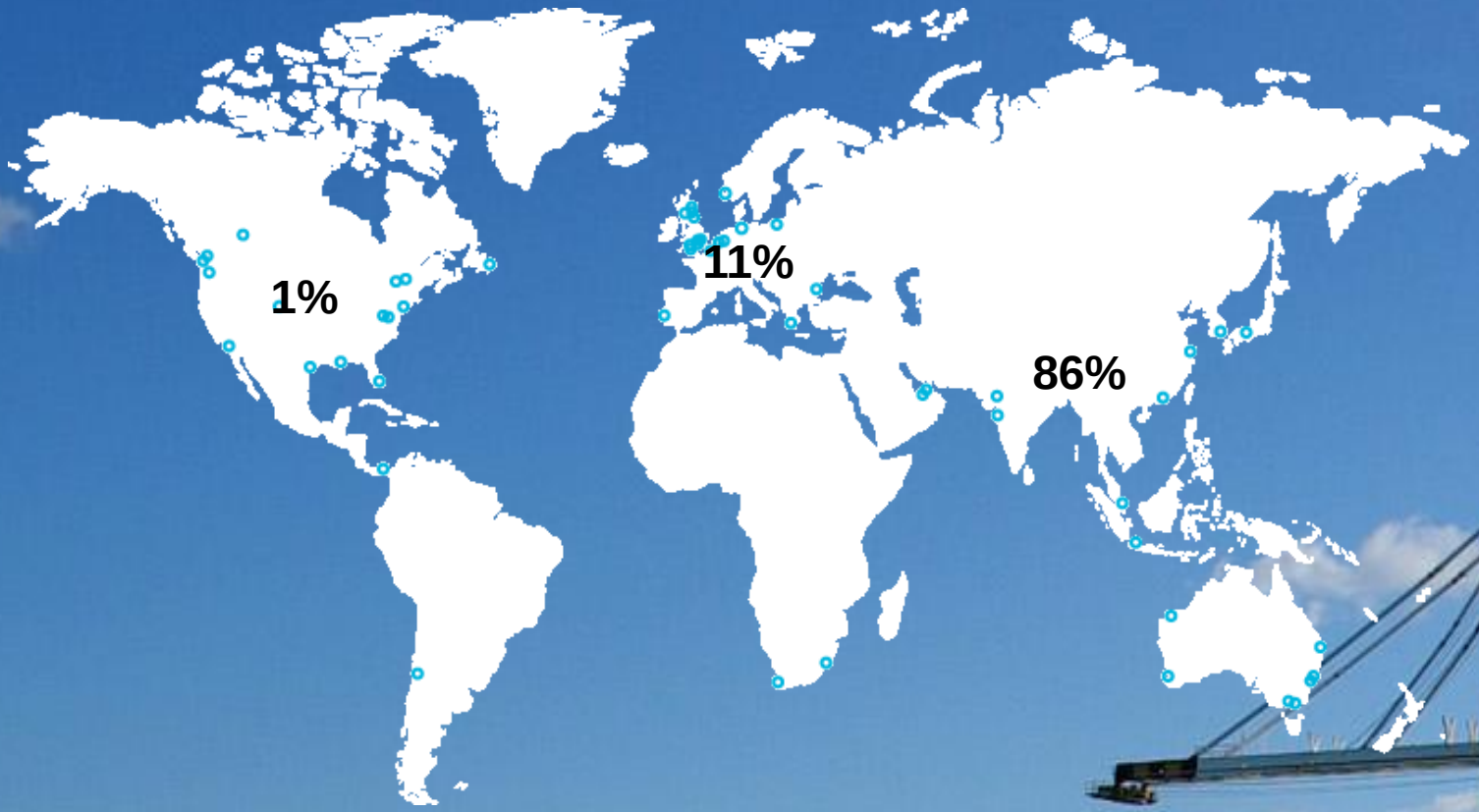
Ship Building - 2005



40 million GT delivered

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Major Ocean Transits

	Route	Ocean	Transits	'representative' ship
Tanker	Middle East - Americas	Atlantic	1,000	VLCC (280,000 dwt)
	Middle East – Asia	Indian	3,600	VLCC (280,000,dwt)
	Africa – Americas	Atlantic	1,400	Suezmax (140,000dwt)
Dry bulk	Africa – Asia	Indian	400	Capesize (150,000 dwt)
	Americas – Europe	Atlantic	2,500	Capesize (150,000 dwt)
	Americas – Asia	Pacific	3,500	Cape / Panamax (100,000 dwt)
	Australia – Europe	Indian	700	Capesize (150,000 dwt)
Container	Americas – Europe	Atlantic	4,000	2,450 TEU
	Americas – Asia	Pacific	6,000	2,900 TEU
	Europe - Asia	Indian	6,500	3,350 TEU

Ocean	Transits	Growth
Atlantic	8,900	Neutral
Indian	11,200	High
Pacific	9,500	Moderate

Crude/POL

- Main lines routes
  - Gulf – East coast
  - Gulf – Japan
- Evolving into more disparate trades
  - West Africa
- Houston – Rotterdam – Singapore
- The benefit of VLCCs in question
  - Why not larger?
  - Flexibility
  - Chinese and Indian Ports

Dry bulk

- Coal
  - Cape, Panamax and Handy…
  - Multiple hold trades
- Iron Ore
  - Brazil, Australia…
  - Large long term contracts
- Grain
  - Major trading companies
  - Volatile, key spot market
- Other Trades

Global Trends

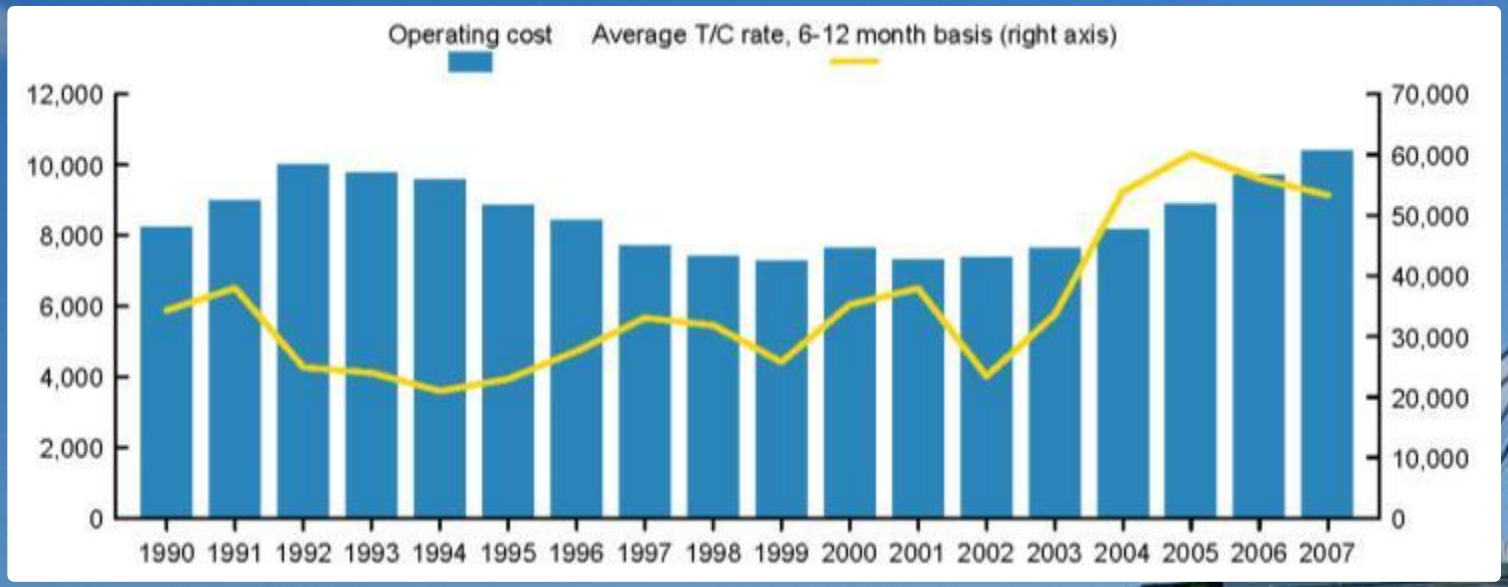
- Globalisation is forcing the pace of growth in the transportation sector
  - Demand at times outstripping supply
  - New players, new ideas, innovation
- Supply chains shifting as companies relocate production
  - Exporting finished goods
  - Importing raw materials
  - Intra-asian trading, new markets and components

Global Trends

- Outsourcing of non-core competencies are restructuring transportation
- Consolidation is providing scale and leading to move from domain management to industrial management
- Information and data are becoming all pervasive

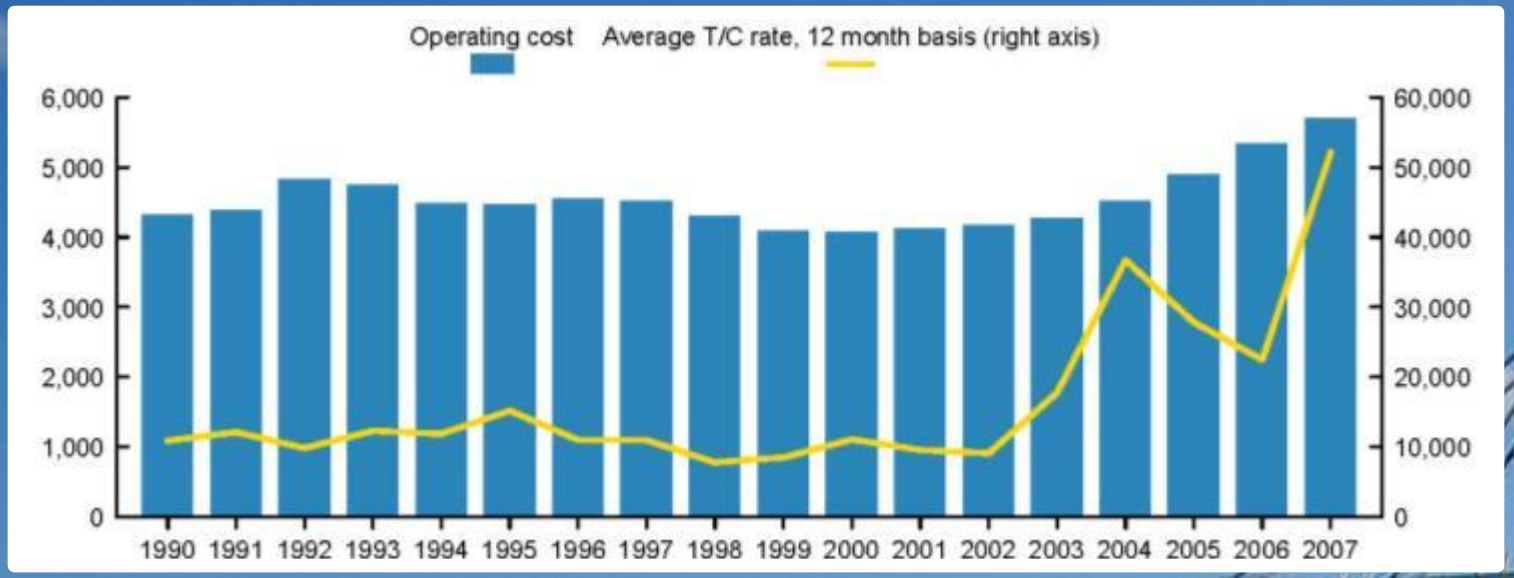
Longer term perspective

- Look us forecasters have doubts…
- VLCC (US$/day)



Longer term perspective

- Very real doubts
- Panamax (US$/day)



and crashes occur...

The New York Times

Late Edition

NEW YORK, THURSDAY, SEPTEMBER 18, 2008 $1.50

...s Less Likely ...ange, Poll Finds

...ime as Before Conventions

...ngtime Beacon, ...g Fewer Nations

AMERICAN EXCEPTION

NEW PHASE IN FINANCE CRISIS AS INVESTORS RUN TO SAFETY

On Monday, a bankruptcy: Lehman Brothers collapses. Merrill Lynch is sold to Bank of America.

On Tuesday, a bailout: The Federal Reserve provides $85 billion to keep American International Group out of bankruptcy.

On Wednesday, credit tightens: Washington Mutual outs itself up for sale; Morgan Stanley and Wachovia enter merger talks.

NYSE

In the last three days, the yield on short-term Treasury bills has plummeted as nervous investors have had to their relative safety

3-month Treasury yield

Borrowing costs for banks and companies have escalated, fueling the credit crisis.

2.80%

2.79%

3.69%

London Interbank Offered Rate (Libor) rising for the U.S. dollar

The stock market was down on Monday, but it rebounded on Tuesday on the news that the Fed agreed to help A.I.G.

...but the bailout failed to stem runaway fears on Wednesday

+1.2%

-4.4%

-4.7%

Dow Industrials

GLOBAL REACTION

Credit Markets Suffer — Borrowing Costs Soar as Result

By YUKI BALI

The financial crisis entered a perilously dangerous new phase on Wednesday when many credit markets stopped working normally as investors around the world frantically moved their money into the safest investments, like Treasury bills.

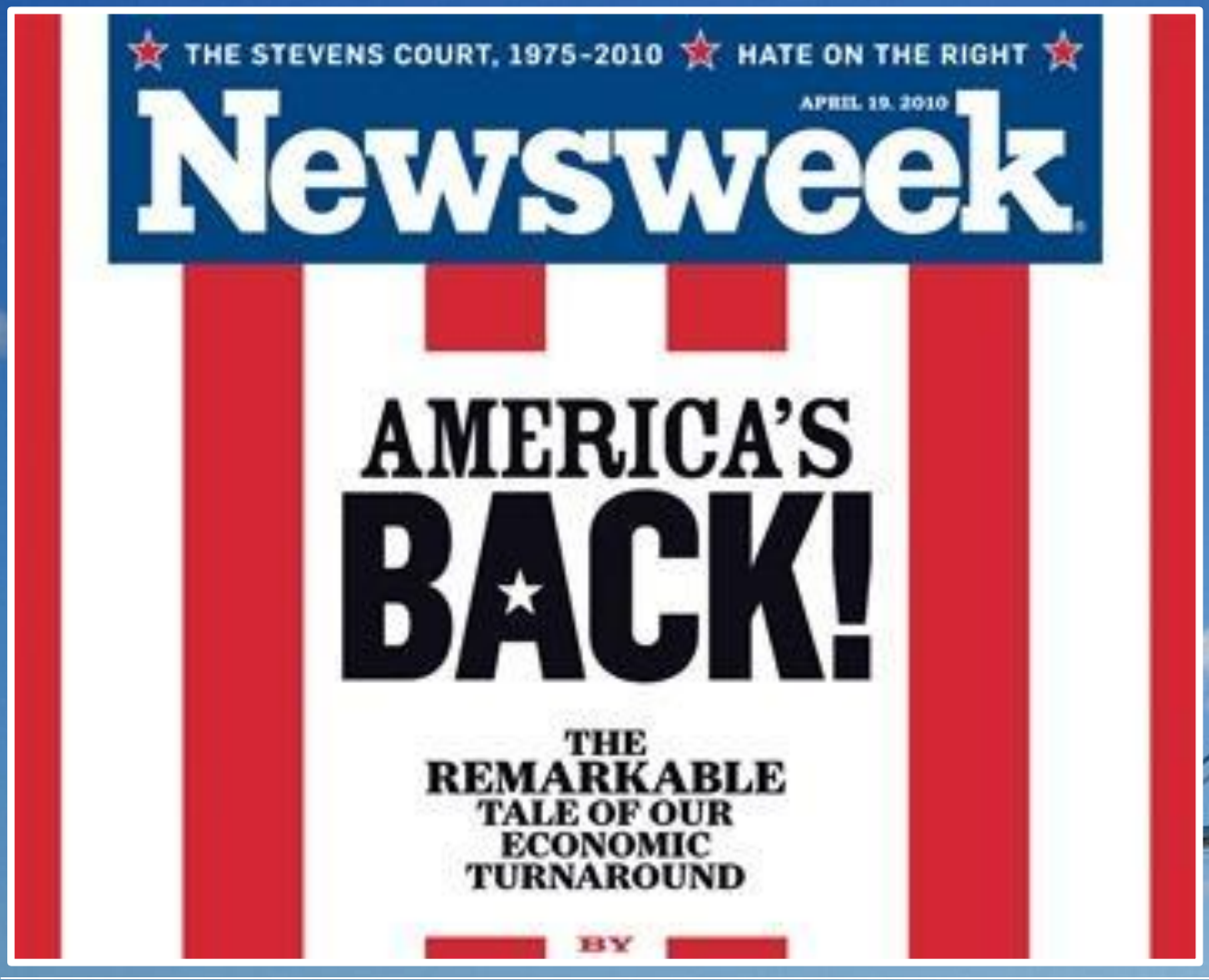
As a result, the cost of borrowing soared for many companies, while the stocks of Wall Street firms like Goldman Sachs and Morgan Stanley that only a couple of weeks ago were considered relatively strong came under assault by waves of selling. Investors were so worried that they snapped up ultra-safe Treasury bills with virtually no yield and they pushed yield on six-month one-day yield in nearly 16 years. Stocks fell by nearly 1 percent in New York.

The seeming flight to safety, away from other kinds of debt as well as stocks, could cause serious damage to an already weakened economy by making it more expensive for businesses to finance their daily operations.

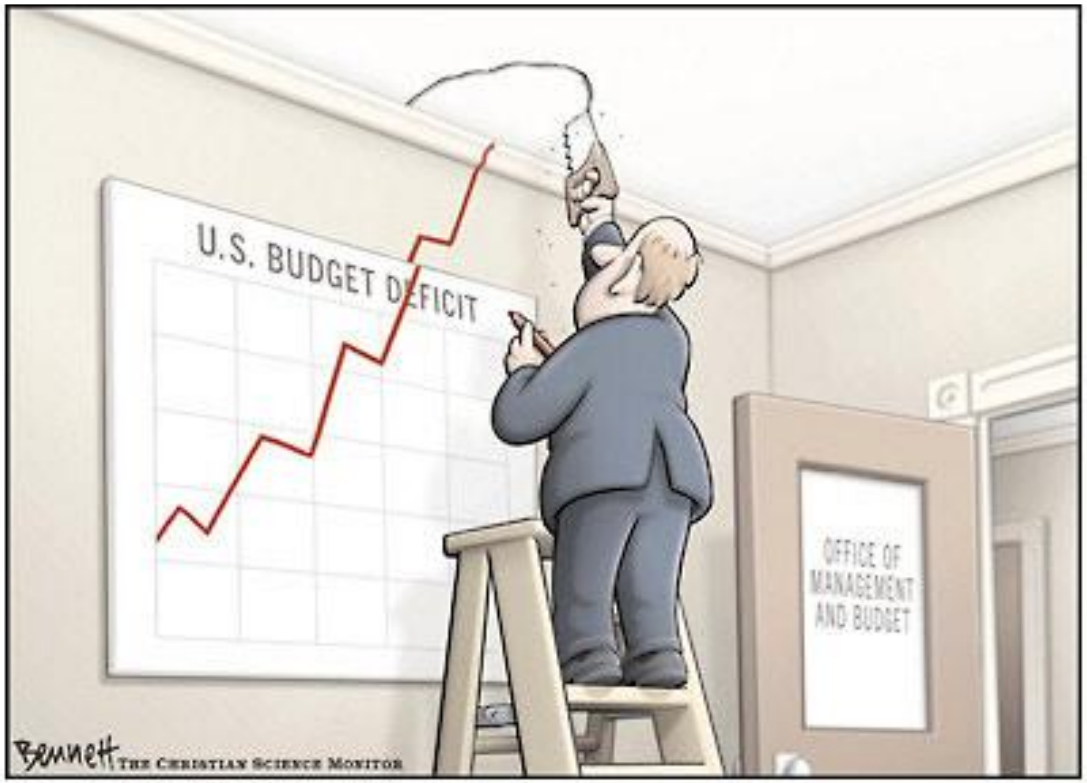
Some economists worry that a psychology of fear has gripped investors, not only in the United States but also in Europe and Asia. While investors' decisions to prevent themselves may be perfectly reasonal, the crowd behavior could cause a downward spiral with broader ramifications.

"It's like having a fire in a cinema," said Hyun Song Shin, an economics professor at Princeton. "Everybody is rushing to the door. You are rushing to the door because everyone is rushing to

and recoveries



or not...


U.S. BUDGET DEFICIT
OFFICE OF MANAGEMENT AND BUDGET
Bennett
The Christian Science Monitor

David Wignall Associates

Forecast Methods

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Basic Methods

- Top down from Global economy
- Comparators
  - Similar countries/economies
  - What do they produce
  - How do we see Indonesia in the future
- Trends projections
  - Organic
  - Substitution
  - Induced
- Bottom up from real producers
  - Who creates the traffic
  - Where will this traffic go

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A few complications…

- Forecasts for traffic generated by
  - Defined cities/regions
  - Islands/groups of islands
- Modal competition
  - rail – road – coastal
  - bulk – container – general cargo
- Possible logistics routes
  - Maintaining minimum (sea) freight costs
  - The hub effect
  - Developing agglomerations of forecasts

Top Down

- Advantages
  - Low data requirement
  - Quick
  - Reasonable results possible
- Disadvantages
  - Run risk of being very wrong
  - Validity can be challenged
  - Easy to twist to suit specific political ends

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Comparators

- Advantages
  - Moderate data requirement
  - Relatively quick
  - Easy to explain to politicians/public
- Disadvantages
  - Are there any really similar countries?
  - Questionable on accuracy
  - Run risk of being very wrong
  - Validity can be challenged

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Trend Projections

- Advantages
  - Can be accurate if carefully done
  - Is based on real life in the forecast area
  - Easy to explain to politicians/public
- Disadvantages
  - Only considers existing ports
  - Limits consideration of regions
  - Does history tell you about the future
  - Data requirement?
  - Takes time to do properly?

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Bottoms up…

- Advantages
  - Tells you about industry and can support other forecast methods
- Disadvantages
  - Can be hopelessly wrong
  - Lots of work
  - Lots of data

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Example

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Tanjung Priok

Container Liner Services:

- 1 Middle East
- 1 Australia
- 15 Intra Asia
- 15 Feeder shuttles

- 55% transshipped
- 40% Intra Asia
- 5% others

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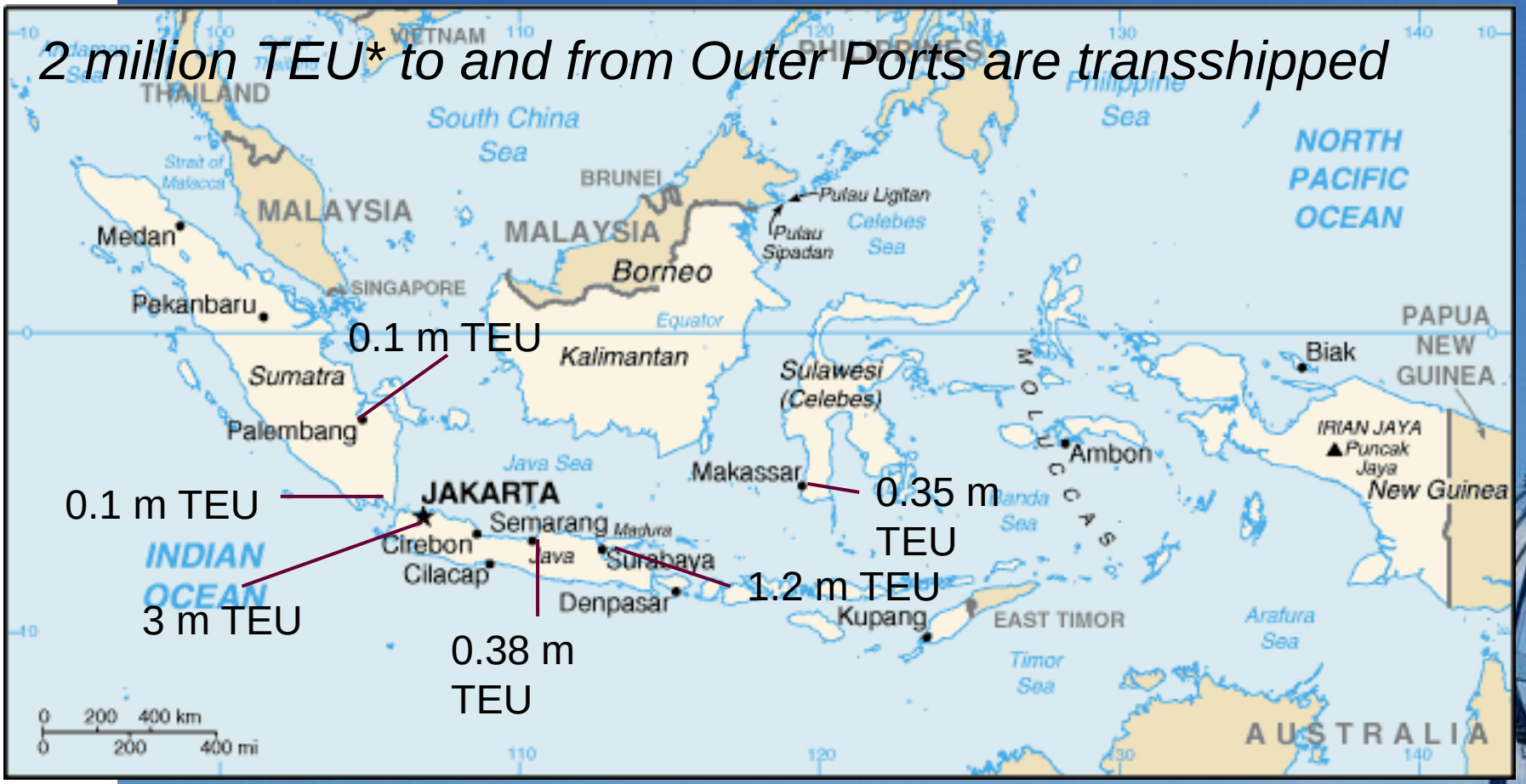
Potential…



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Concerns

Deviation from main shipping lane

Limited hinterland market

Inadequate feeder network

Institutional barriers

Facilities to meet industry changes

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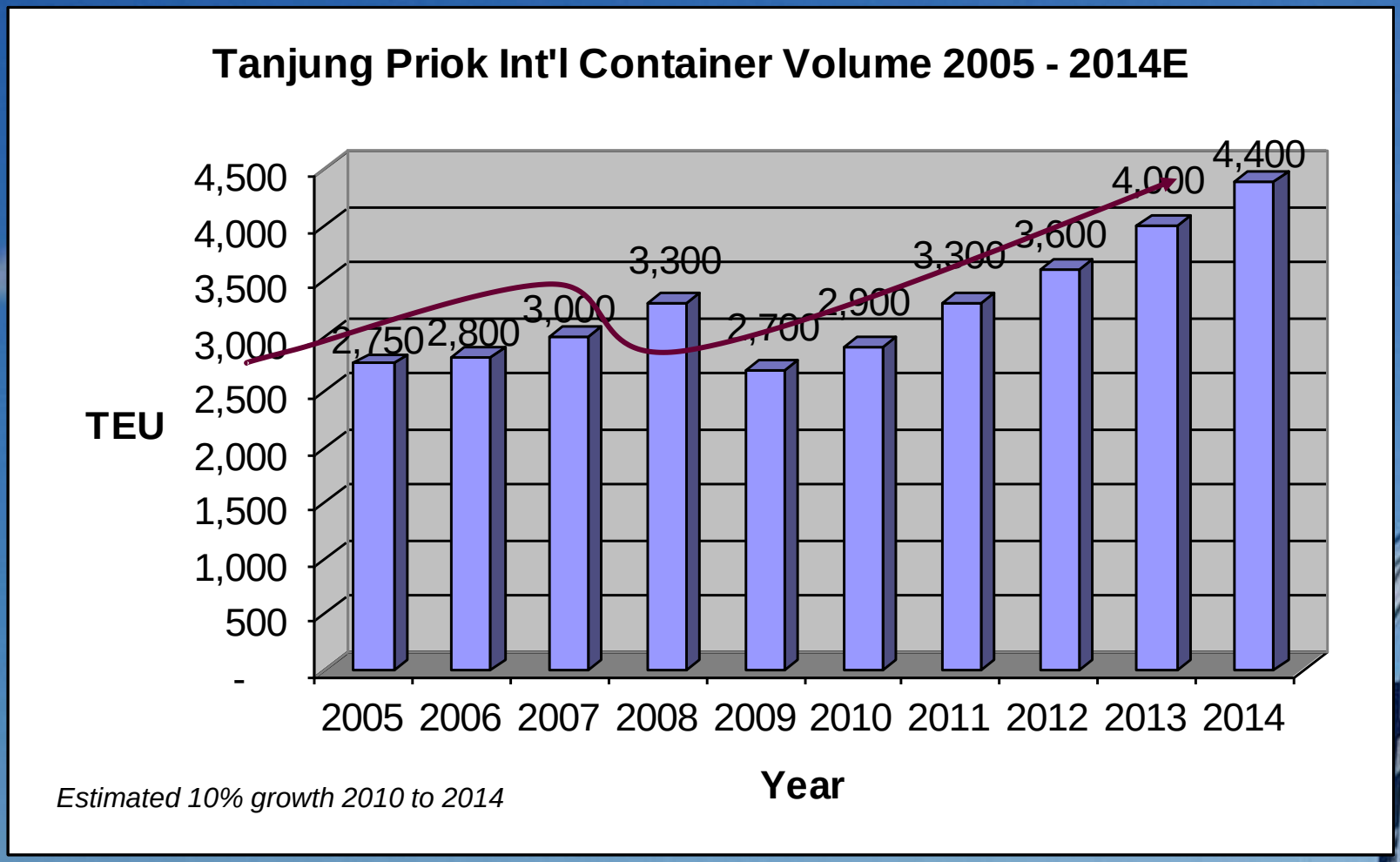
Outlook



Estimated 10% growth 2010 to 2014

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Mark to the Future

Mark to the future

- Scenario planning
  - Look at all possible futures
  - Black Swan events…
- Define “independent” driver
- Model independent driver impacts
- Develop multiple forecasts
  - 1,000s if not 10,000s
- Statistical analysis of all forecasts
  - Probability of forecast occurring?
  - Range of forecasts
  - Unexpected distributions

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Example

Traffic Growth Drivers

- Economic Growth
  - In line with existing trends
  - Accelerating to match Indian growth pattern
  - Accelerating to match Chinese growth pattern
- Competition
  - Market share based on “fair” competition
  - Terminal becomes dominant
  - New competitors
  - Transshipment
- SEZ benefits (impacts competition)
  - SEZ success
  - SEZ partial success

Traffic Growth Drivers

- SEZ benefits (impacts competition)
  - SEZ fails
- Conversion
  - General cargo volumes convert quickly
  - General cargo volumes convert slowly
  - No conversion
- Hinterland extension/reduction
  - No hinterland extension
  - Low % traffic diversion

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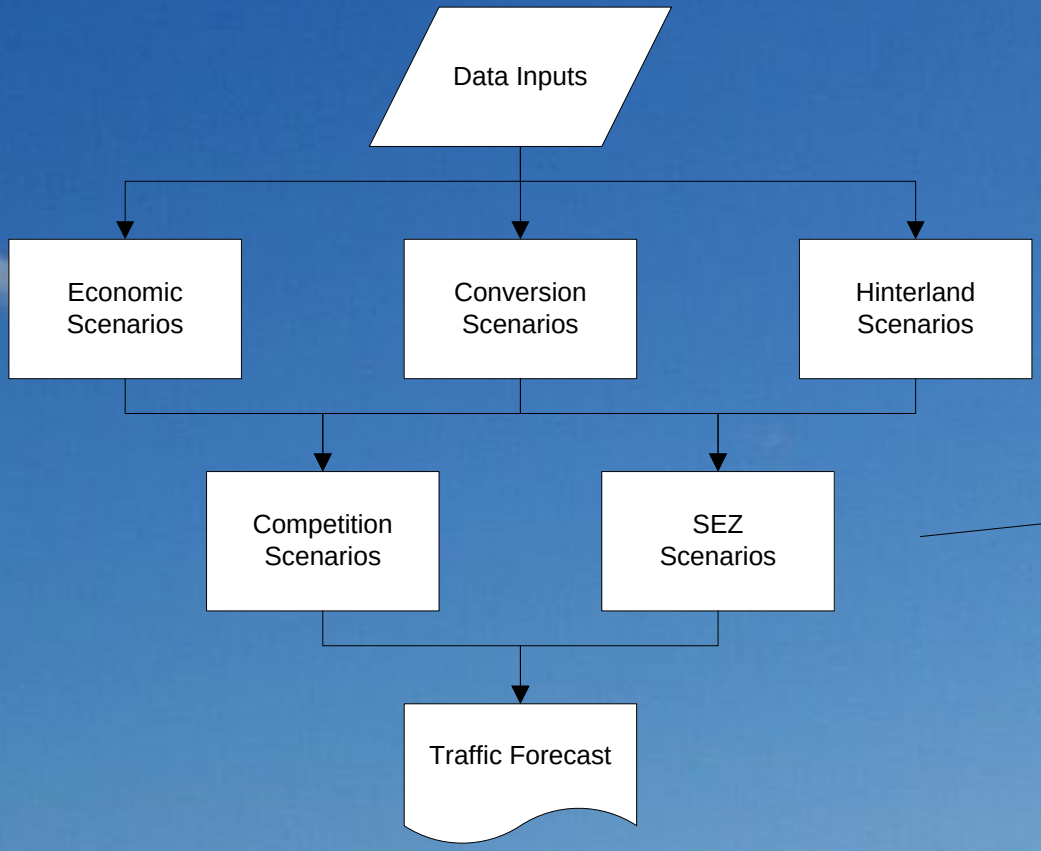
Forecast Model



Overall Hinterland Traffic Forecast Model

Local traffic distribution model

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Scenarios Within Model

Economic Development Scenarios	Containerisation Conversion Scenarios	Hinterland Expansion Scenarios	Competition Scenarios	SEZ Development Scenarios
E1 In line with existing trend	**V1** No conversion	**H1** No expansion or reduction	**C1** Fair Competition	**S1** SEZ fails
E2 Mirror Indian growth rate	**V2** Slow rate of conversion	**H2** Diversion of container traffic	**C2** One main competitor for container handling	**S2** Partially successful SEZ
E3 Mirror China growth rate	**V3** Medium rate of conversion	**H3** Reduction of area of hinterland	**C3** Dominant for container handling	**S3** Successful SEZ
E4 Economic recession	**V4** High rate of conversion		**C4** New deep water port emerges	

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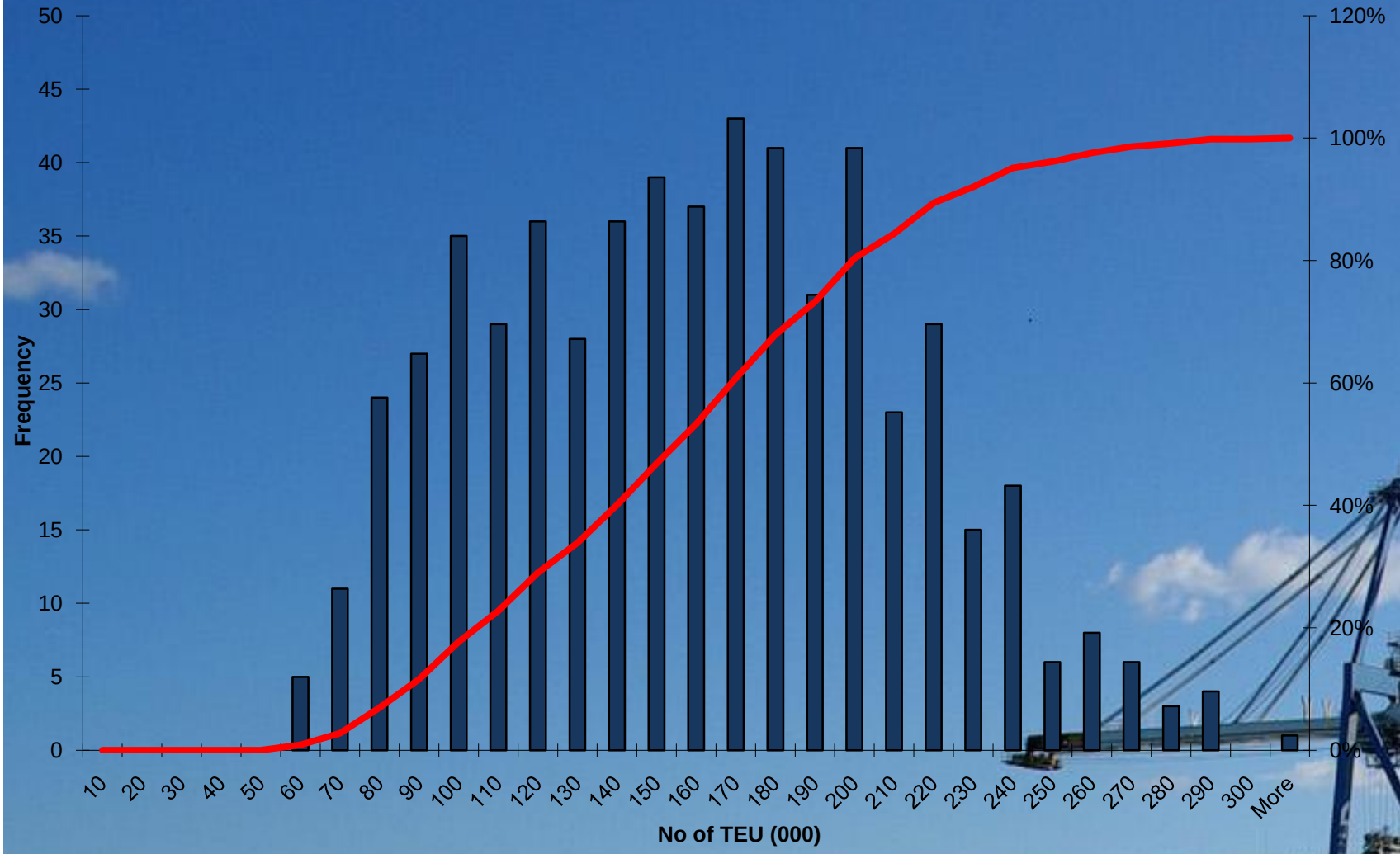
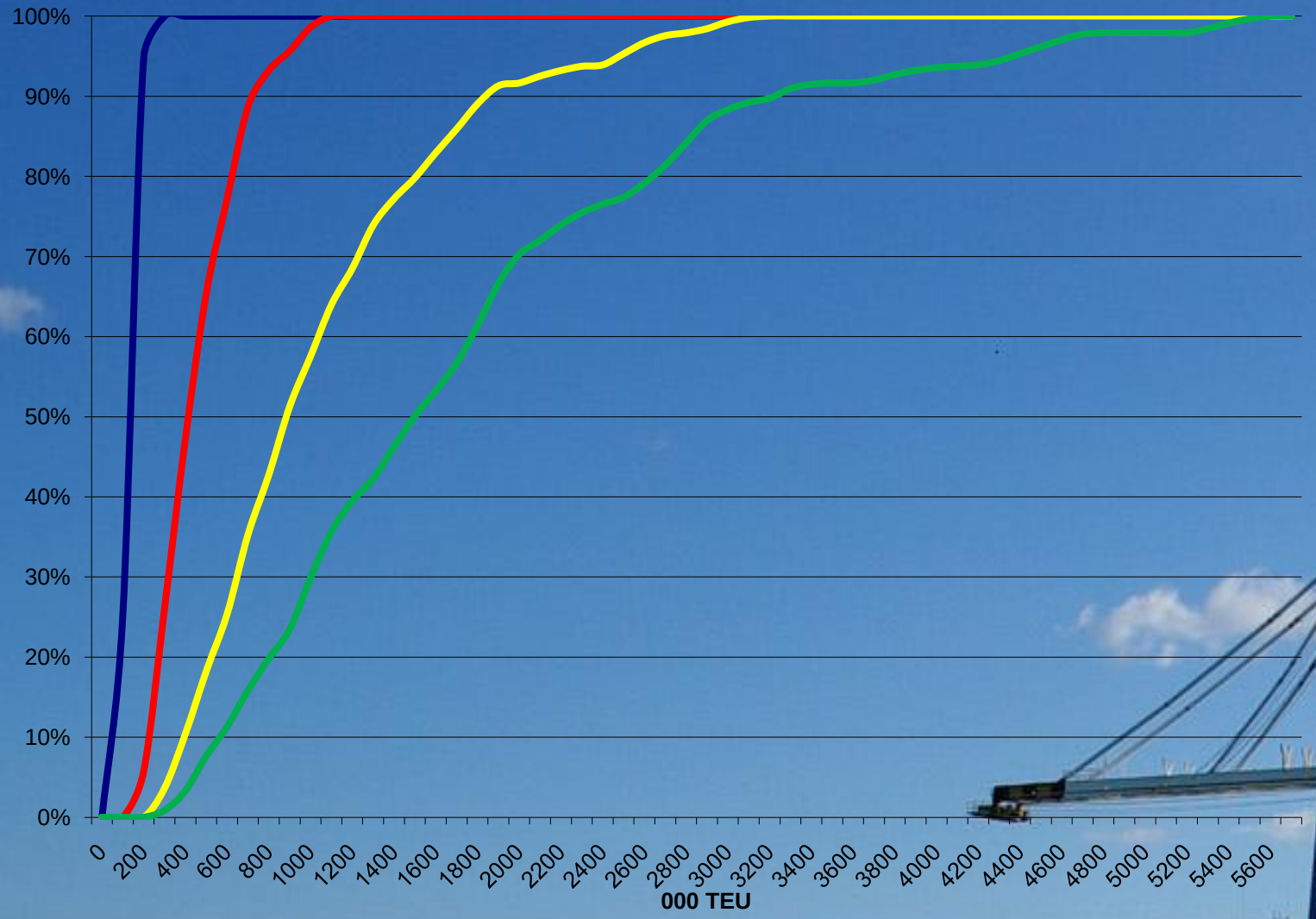
Forecast: 1st Year of Operation



How Variable is the Forecast?



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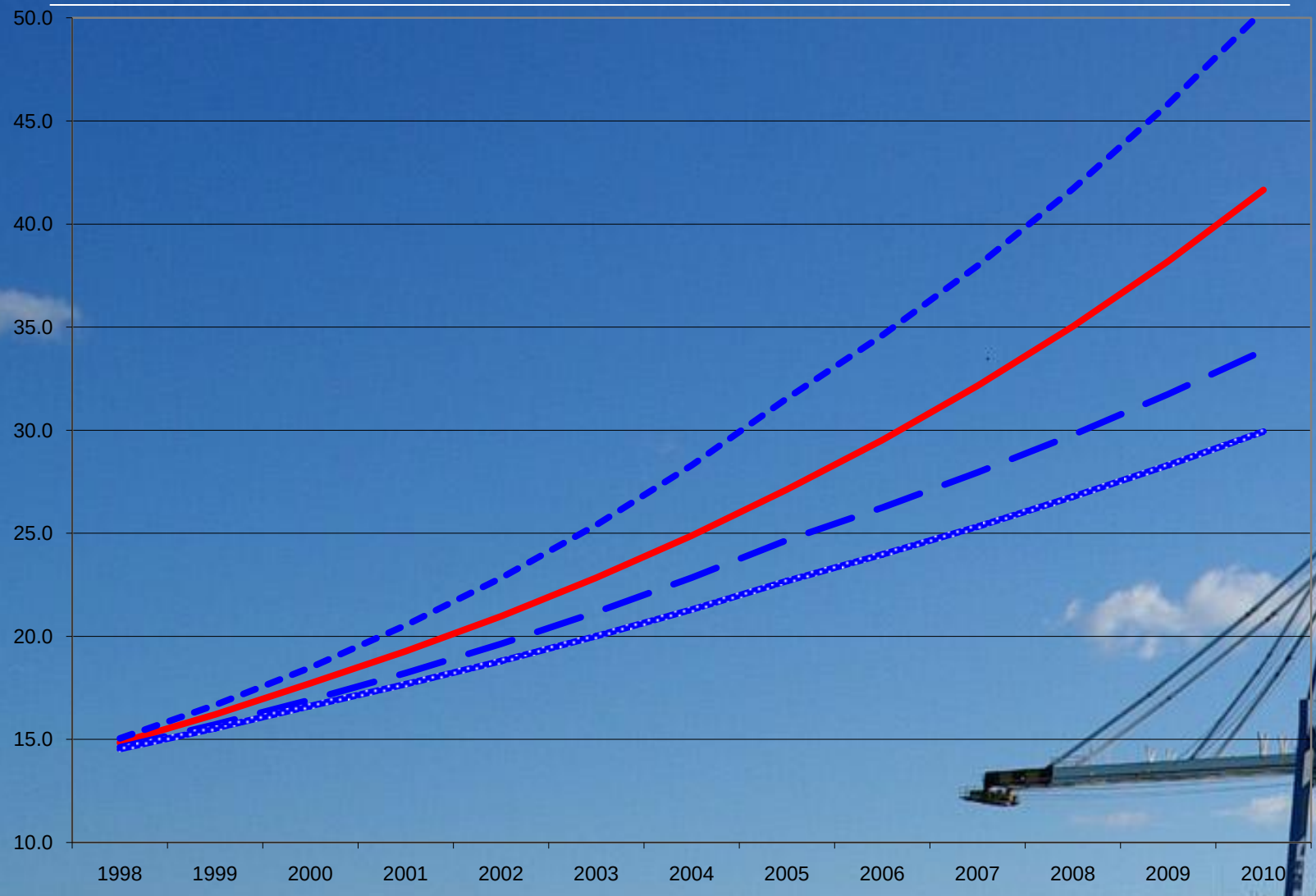
and it does work



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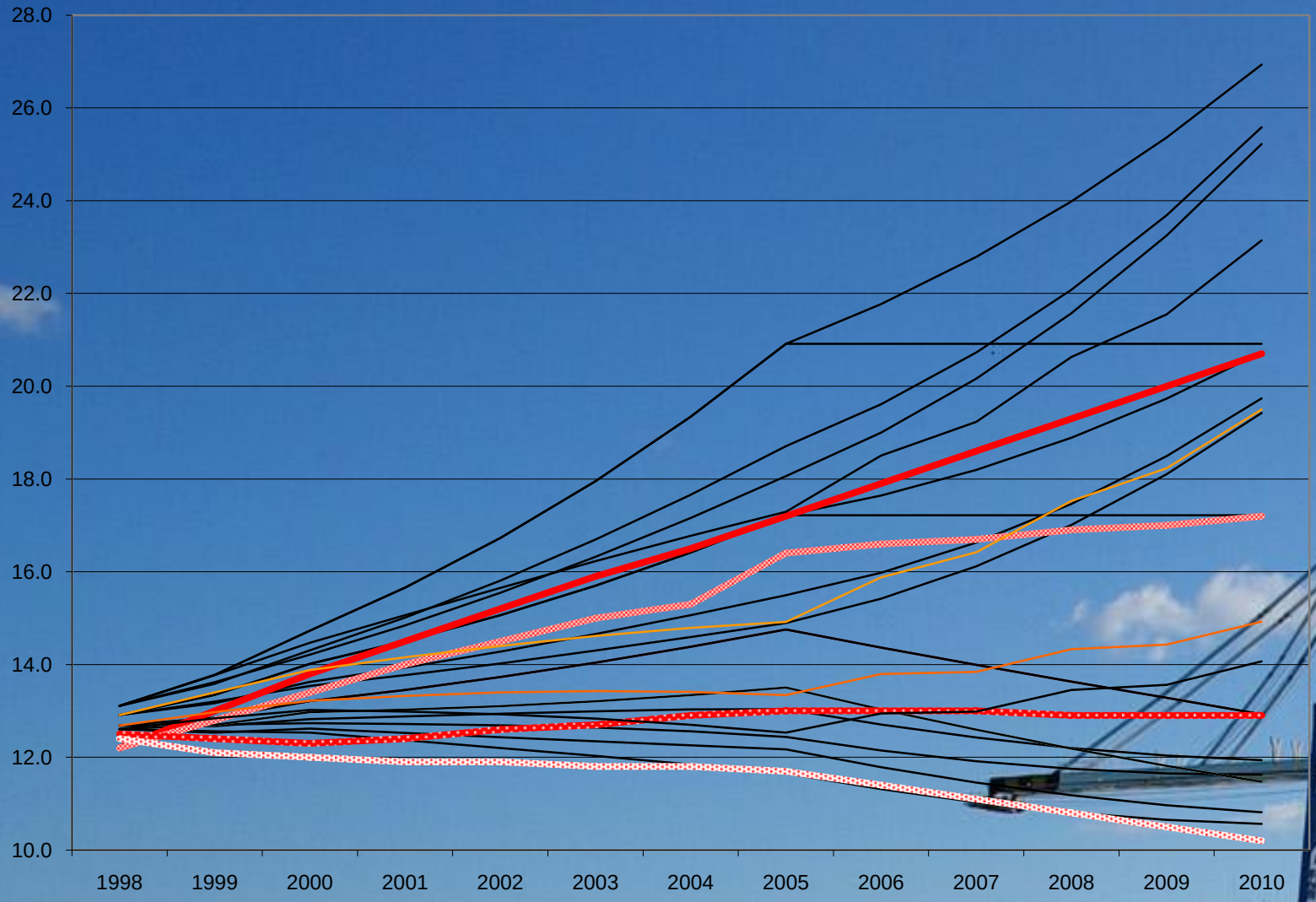
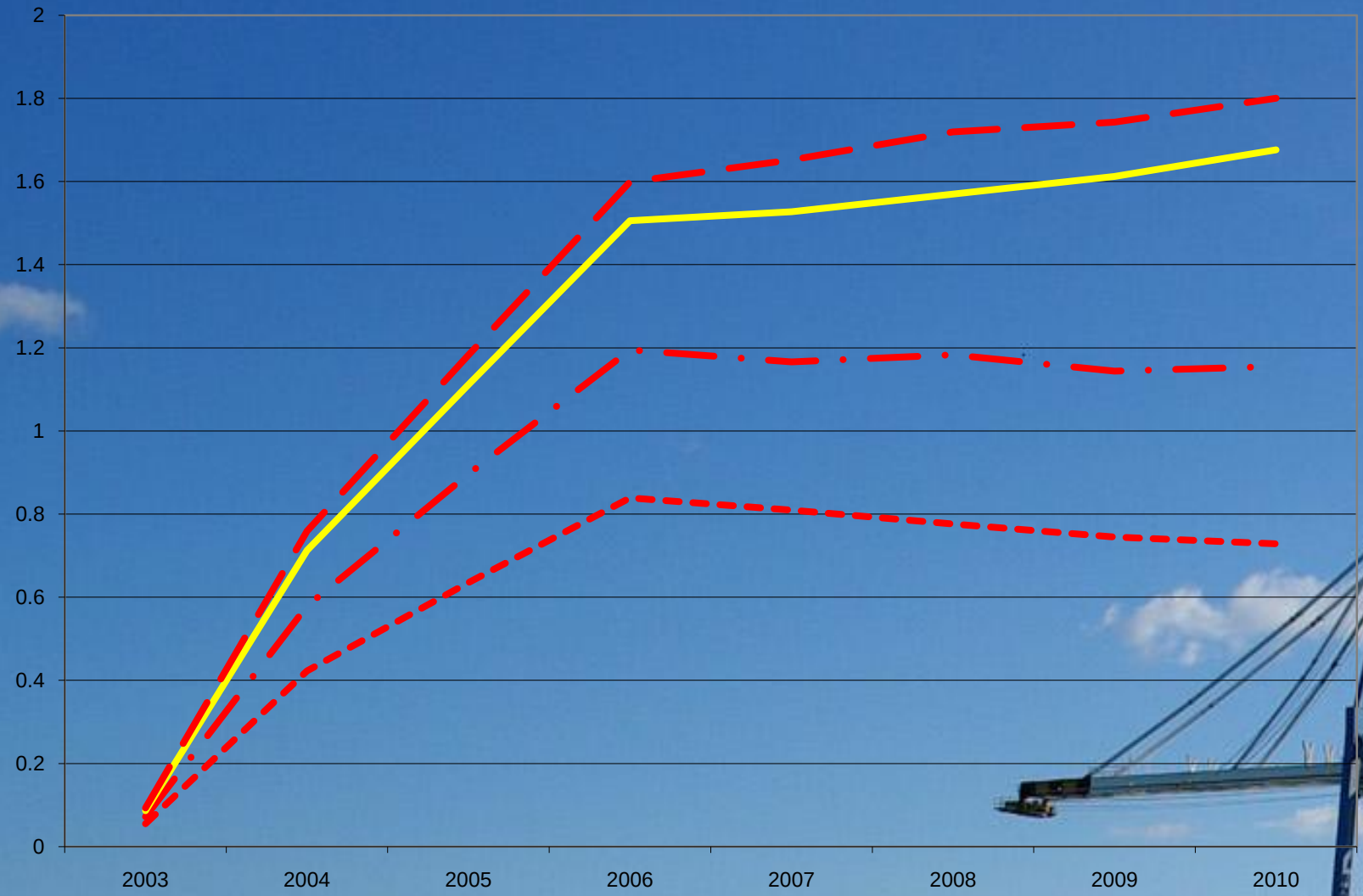
Hong Kong scenarios



Target terminal



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Real Options

What is a “real option”

A real option is the right — but not the obligation — to undertake some business decision; typically the option to make, abandon, expand, or shrink a capital investment.

For example, the opportunity to invest in the expansion of a firm's factory, or alternatively to sell the factory, is a real option.

The option and its value…

The option underlying is the port project is modeled in terms of a spot price: the starting or current value of the project is required (best guess as to NPV)

Volatility uncertainty as to the change in value over time is required the volatility in project NPV is derived via monte carlo simulation

Option characteristics

- Strike price/sunk costs. In general, management would proceed given the NPV of expected cash flows exceeds this
- Option term: the time horizon of the forecast, say length of a concession…
- Changes in value is modeled as options:
  - the option to contract the project (put)
  - the option to abandon the project (put)
  - the option to expand or extend the project (call)
  - switching options, composite options or rainbow options may also be applied

Reverse engineer the forecast

- The value of the option may be better than the forecasts sought…
- Cost are determined
  - Capex
  - Opex
  - Limited volatility
- Revenue
  - Key driver of volatility
  - Volume
  - Tariff
  - Service scope

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Example

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Thank you for your attention