

Ad Hoc Expert Meeting on

**Addressing the Transport and Trade
Logistics Challenges of the
Small Island Developing States (SIDS):
Samoa Conference and Beyond**

11 July 2014

**Liner shipping connectivity and transport
costs in SIDS**

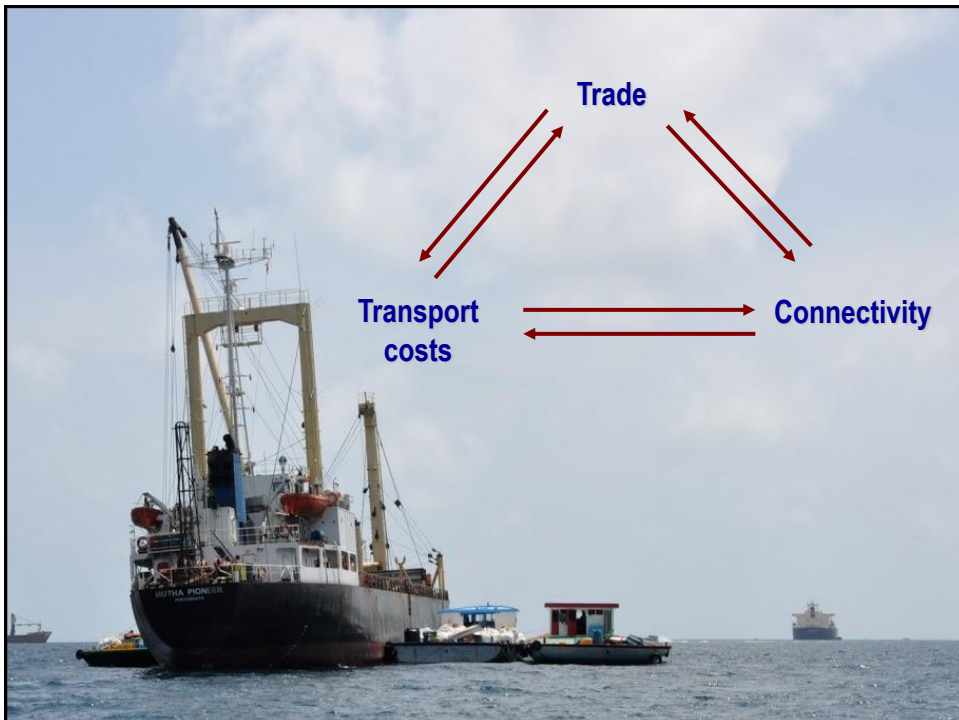
Presentation by

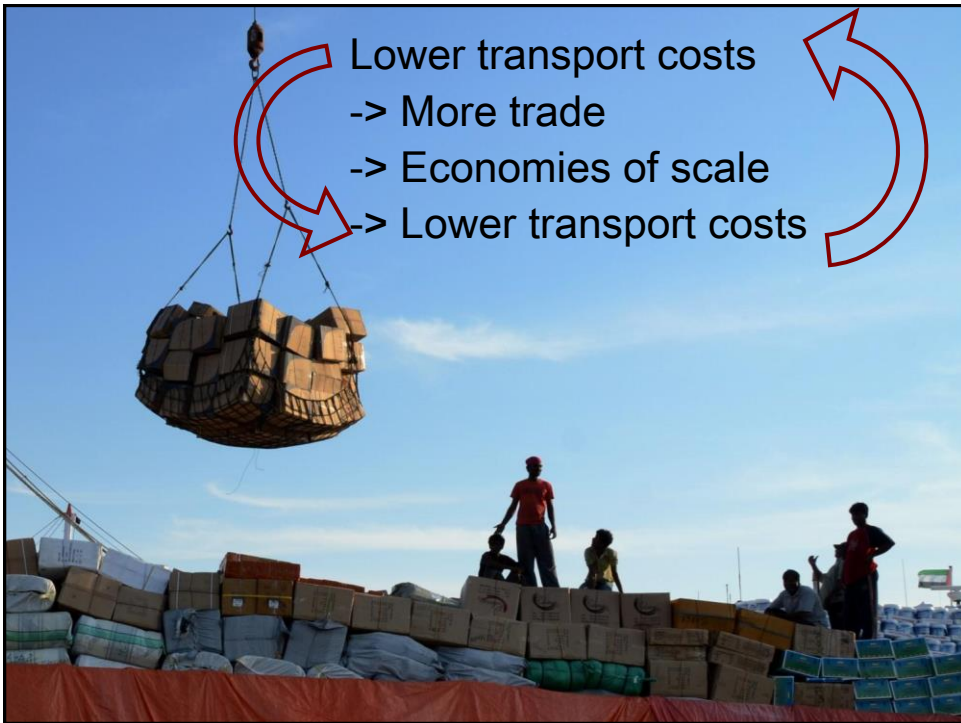
Mr. Jan Hoffmann

Chief, Trade Facilitation Section, Trade Logistics Branch
Division on Technology and Logistics, UNCTAD

Liner shipping connectivity and transport costs in SIDS

Jan.Hoffmann@UNCTAD.org, Geneva, July 2014

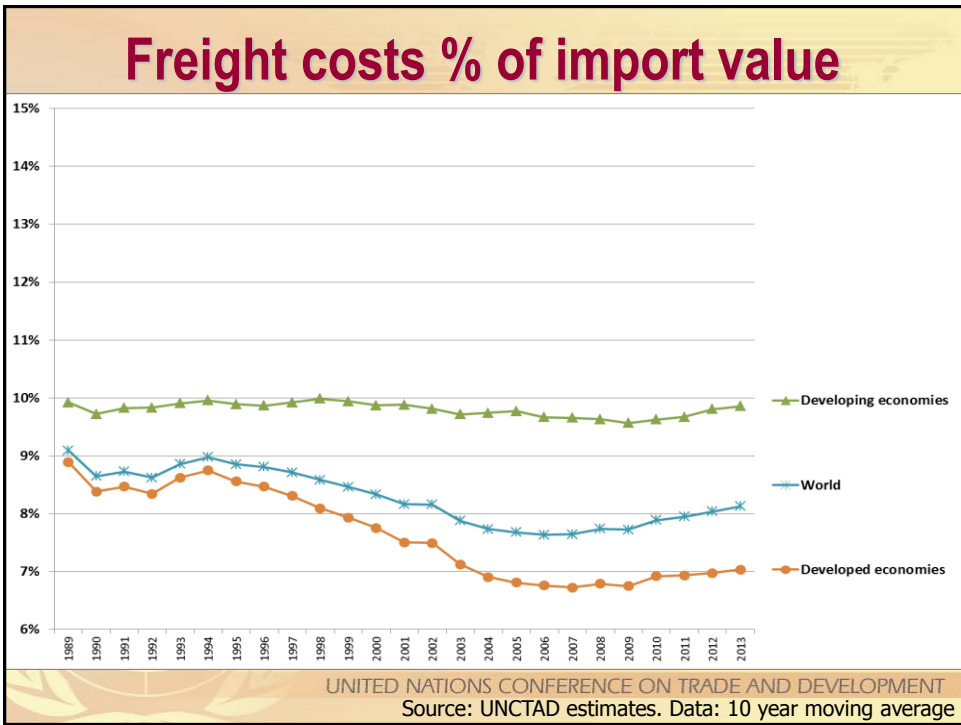
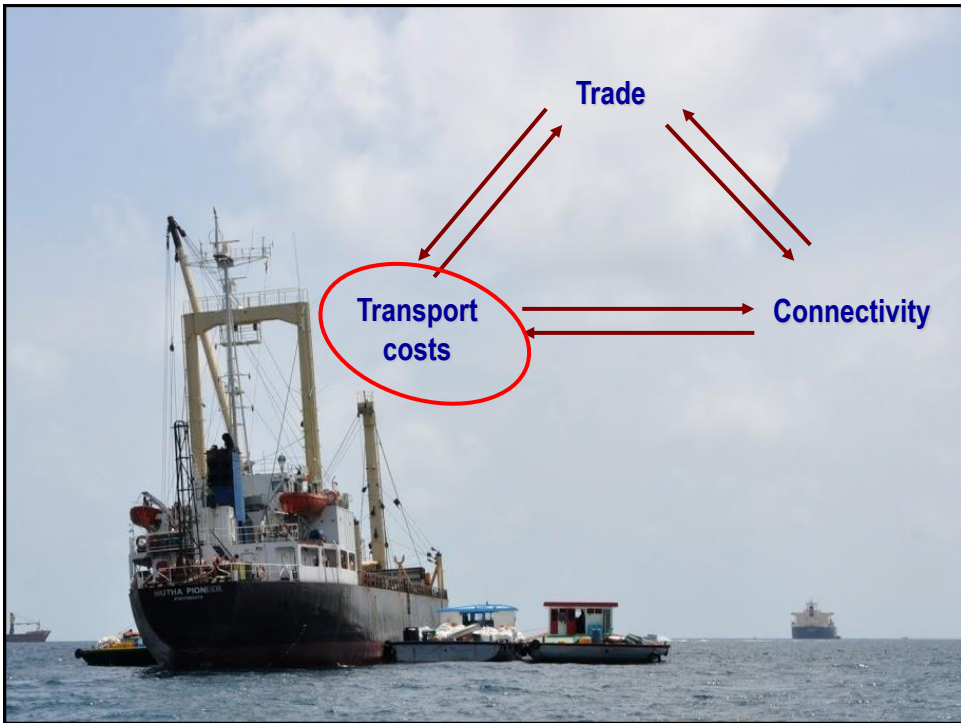




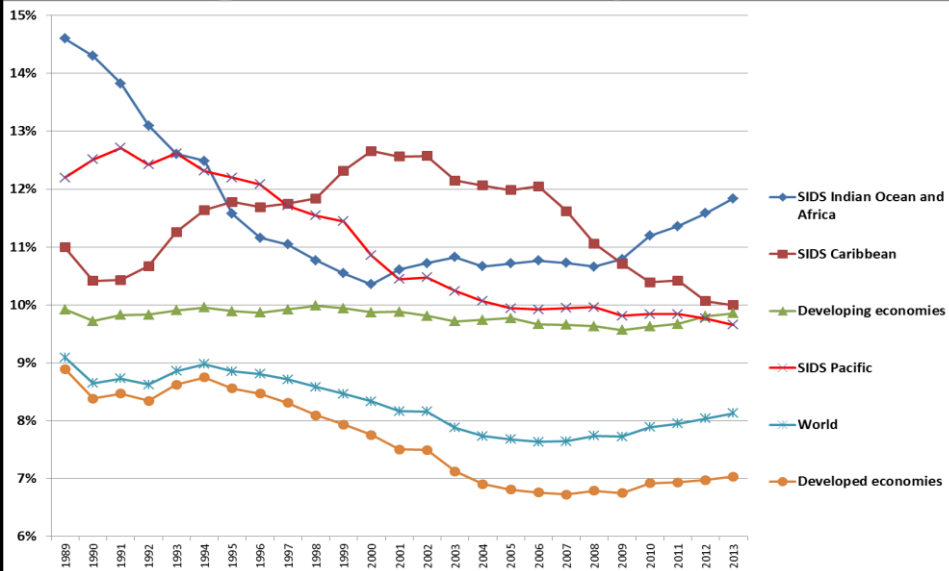


The challenge for SIDS:

- Avoid a **vicious** circle, where high transport costs and low service levels discourage trade, which will further endear transport and reduce connectivity...
- Instead: Initiate a **virtuous** circle



Freight costs % of import value



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Source: UNCTAD estimates. Data: 10 year moving average. Note: unweighted average for SIDS groupings

Differences in maritime freights depend on...



Differences in maritime freights depend on...

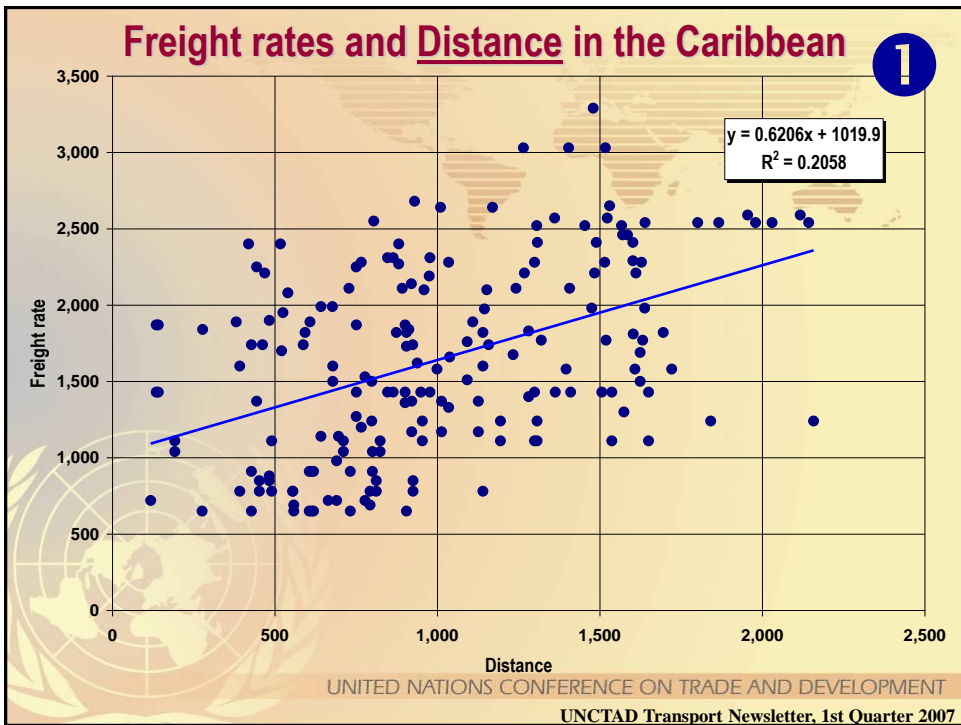
- 1) Distances
- 2) Economies of scale
- 3) Imbalances
- 4) Type & value of goods
- 5) Competition
- 6) Port characteristics



Differences in maritime freights depend on...

- 1) Distances
- 2) Economies of scale
- 3) Imbalances
- 4) Type & value of goods
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Differences in maritime freights depend on...

- | | |
|------------------------------|--------------------------|
| 1) Distances | 4) Type & value of goods |
| 2) Economies of scale | 5) Competition |
| 3) Imbalances | 6) Port characteristics |





2

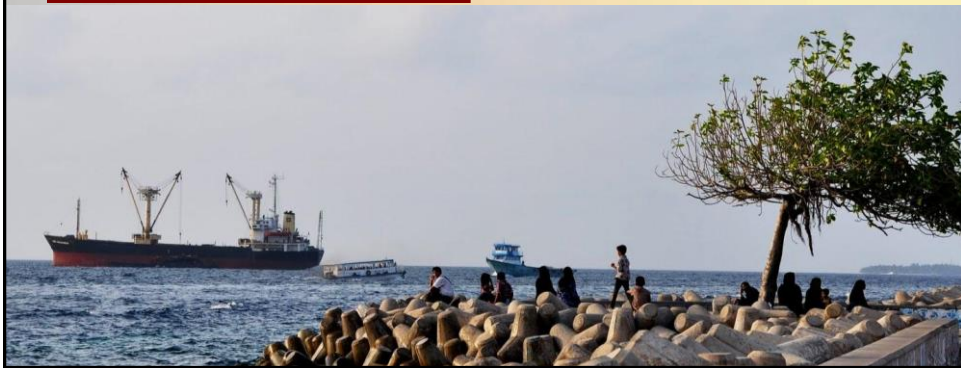
Sample costs	1100 TEU	4250 TEU	8750 TEU	13000 TEU
Construction costs million USD	28	77	135	167
Construction costs USD per TEU	25 000	18 117	15 430	12 850
Crew	15 to 17	15 to 17	15 to 17	15 to 17

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Source: Dynamar, 2008

Differences in maritime freights depend on...

- 1) Distances
- 2) Economies of scale
- 3) Imbalances**
- 4) Type & value of goods
- 5) Competition
- 6) Port characteristics



Cargo imbalances

3

Merchandise Imports and Exports as % GDP

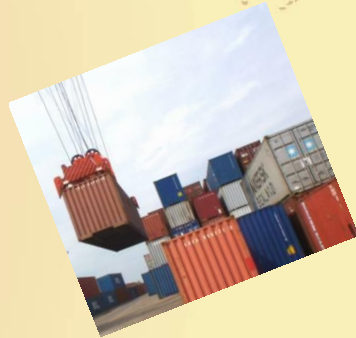
Region/Country	Imports	Exports	Region/Country	Imports	Exports
Caribbean			Pacific		
Antigua and Barbuda	45.8	5.7	Fiji	62.7	24.1
Bahamas	42.3	12.3	Kiribati	57.1	5.7
Barbados	41.9	13.5	Marshall Islands	76.8	19.2
Dominica	41.7	7.3	Micronesia (Federated States of)	64.4	10.7
Grenada	43.7	4.6	Nauru	na	na
Jamaica	45.4	10.8	Palau	61.3	3.1
Saint Kitts and Nevis	30.0	5.9	Papua New Guinea	35.1	41.5
Saint Lucia	56.5	15.3	Samoa	50.5	11.1
Saint Vincent and the Grenadines	49.1	6.2	Solomon Islands	49.6	46.6
Trinidad and Tobago	40.3	56.2	Timor-Leste	28.6	0.9
Indian Ocean			West Africa		
Comoros	50.3	4.2	Tonga	44.5	3.4
Maldives	69.9	14.1	Tuvalu	62.7	0.8
Mauritius	49.6	25.3	Vanuatu	37.5	7
Seychelles	70.9	44.0	Cape Verde	41.9	2.9
			Sao Tome and Principe	53.2	4.2

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Source: World Bank, World Development Indicators

Cargo imbalances

3



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Differences in maritime freights depend on...

- 1) Distances
- 2) Economies of scale
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- 4) Type & value of goods**
- 5) Competition
- 6) Port characteristics



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Merchandize type and value

High value, perishable goods...



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Differences in maritime freights depend on...

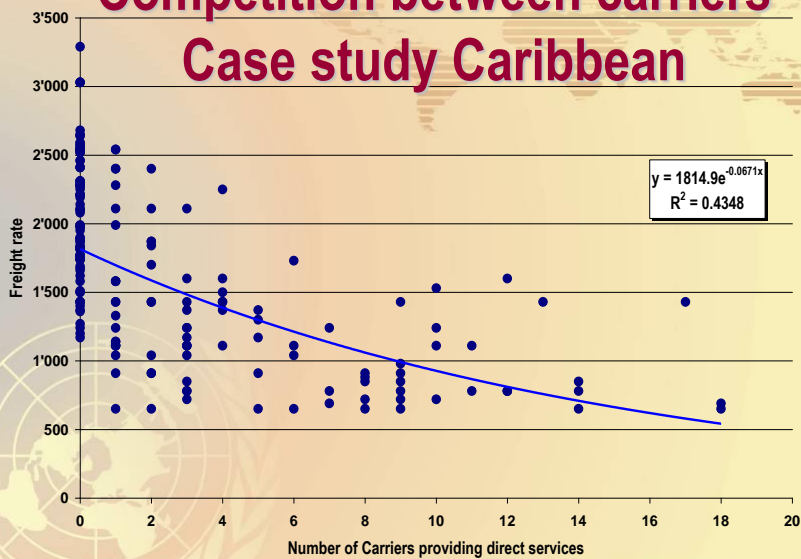
- 1) Distances
- 2) Economies of scale
- 3) Imbalances
- 4) Type & value of goods
- 5) Competition**
- 6) Port characteristics



Competition between carriers

Case study Caribbean

5



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UNCTAD Transport Newsletter, 1st Quarter 2007

Differences in maritime freights depend on...

- 1) Distances
- 2) Economies of scale
- 3) Imbalances
- 4) Type & value of goods
- 5) Competition
- 6) **Port characteristics**



Dependent variable:
maritime transport costs per tonne of containerizable cargo

6

Variable	Model 7	Model 8
Observations	N = 75 928	N = 75 928
TONS _k	-0.0863 (-57.65)	-0.0863 (-57.67)
VALUEPERTON _k	0.3422 (128.74)	0.3416 (128.82)
DISTANCE _{ij}	0.3716 (95.80)	0.3698 (97.26)
BILATERALVOLUME _{ij}	-0.0100 (-4.46)	-0.0109 (-5.53)
BALANCROUTE _{ij}	0.00020 (1.73)	0.00027 (2.40)
PORTINFRA _i	-0.0333 (-9.92)	
PORTINFRA _j	-0.0497 (-10.76)	
PORTINFRA _{ij}		-0.2444 (-13.51)



Better port infrastructure
reduces maritime transport costs

Dependent variable:
maritime transport costs per tonne of containerizable cargo

6

Variable	Model 7	Model 8	Model 9
Observations	N = 75 928	N = 75 928	N = 75 928
TONS _{it}	-0.0863 (-57.65)	-0.0863 (-57.67)	-0.0869 (-58.11)
VALUEPERTON _{it}	0.3422 (128.74)	0.3416 (128.82)	0.3416 (128.94)
DISTANCE _{it}	0.3716 (95.80)	0.3698 (97.26)	0.3542 (90.31)
BILATERALVOLUME _{it}	-0.0100 (-4.46)	-0.0109 (-5.53)	-0.0161 (-7.97)
BALANCEROUTE _{it}	0.00020 (1.73)	0.00027 (2.40)	0.00047 (4.25)
PORTEFIC _{it}			-0.3835 (-17.65)



Better (perceived) port efficiency
reduces maritime transport costs

Dependent variable:
maritime transport costs per tonne of containerizable cargo

6

Variable	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
Observations	N = 75 928	N = 75 928	N = 75 928	N = 75 928	N = 75 928	N = 35 438	N = 73 818
TONS _{it}				-0.0846 (-56.51)	-0.0874 (-58.85)	-0.0632 (-29.15)	-0.0857 (-57.00)
VALUEPERTON _{it}				0.3408 (128.38)	0.3374 (127.73)	0.4665 (113.19)	0.3447 (129.16)
DISTANCE _{it}				0.3716 (92.47)	0.3690 (96.81)	0.3380 (55.36)	0.1769 (30.28)
BILATERALVOLUME _{it}				-0.0075 (-3.31)	-0.0322 (-13.70)	-0.0794 (-23.74)	0.0256 (10.91)
BALANCEROUTE _{it}				0.00051 (4.31)	0.00022 (-1.80)	0.00082 (5.06)	0.00228 (14.31)
PORTPRIVAT _{it}					0.0038 (2.00)		
					-0.0562 (-32.00)		



Port privatization in the EXPORTING country
reduces maritime transport costs

Dependent variable:
maritime transport costs per tonne of containerizable cargo

6



	Model 11	Model 12	Model 13
N = 75 928	N = 35 438	N = 73 818	
	-0.0674 (-58.85)	-0.0632 (-29.15)	-0.0657 (-57.00)
	0.3374 (127.73)	0.4665 (113.19)	0.3447 (129.16)
	0.3690	0.3380 (55.36)	0.1769 (30.28)
		-0.0794 (-23.74)	0.0256 (10.91)
		0.00082 (5.06)	0.00228 (14.31)
		0.0512 (4.32)	
		0.0074 (0.80)	

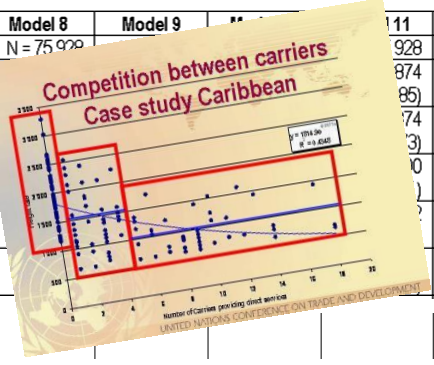
Trade facilitation in the **IMPORTING** country reduces maritime transport costs




Dependent variable:
maritime transport costs per tonne of containerizable cargo

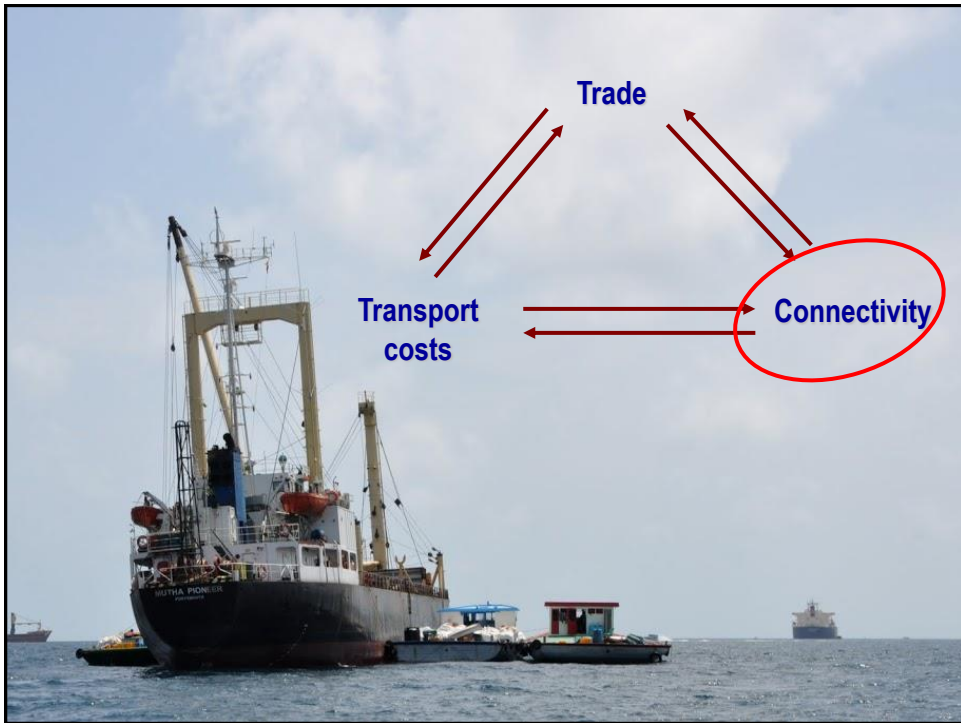
6

Variable	Model 7	Model 8	Model 9	Model 11	Model 12	Model 13
Observations	N = 75 928	N = 75 928		N = 75 928	N = 35 438	N = 73 818
TONS _{it}	-0.0863 (-57.65)			0.874 (85)	-0.0632 (-29.15)	-0.0657 (-57.00)
VALUEPERTON _{it}	0.3422 (128.74)			0.74 (3)	0.4665 (113.19)	0.3447 (129.16)
DISTANCE _{ij}	0.3716 (95.80)			0.00	0.3380 (55.36)	0.1769 (30.28)
BILATERALVOLUME _{ij}	-0.0100 (-4.46)			0.00	-0.0794 (-23.74)	0.0256 (10.91)
BALANCROUTE _{ij}	0.00020 (1.73)			0.00	0.00082 (5.06)	0.00228 (14.31)
LINERSERVICES _{ij}						-0.1129 (-32.60)

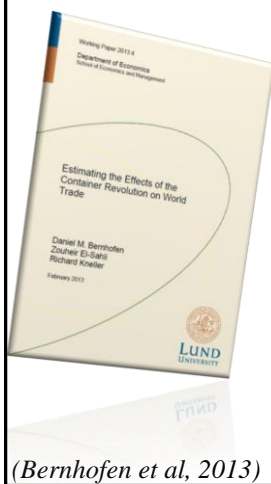


Better connectivity between ports/
more competition among carriers
reduces maritime transport costs





Introducing containerization leads to more trade



(Bernhofen et al., 2013)

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Free exchange

The humble hero

Containers have been more important for globalisation than freer trade

**Containerization of trade, and
access to containerized transport
services are important determinants
of SIDS's trade competitiveness**

How can we measure this?



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“Maritime connectivity”

**UNCTAD's “Liner Shipping Connectivity Index” (LSCI):
An indicator for access to liner shipping services**

Components:

- Ships
- TEU capacity
- Shipping companies
- Services
- Maximum ship sizes

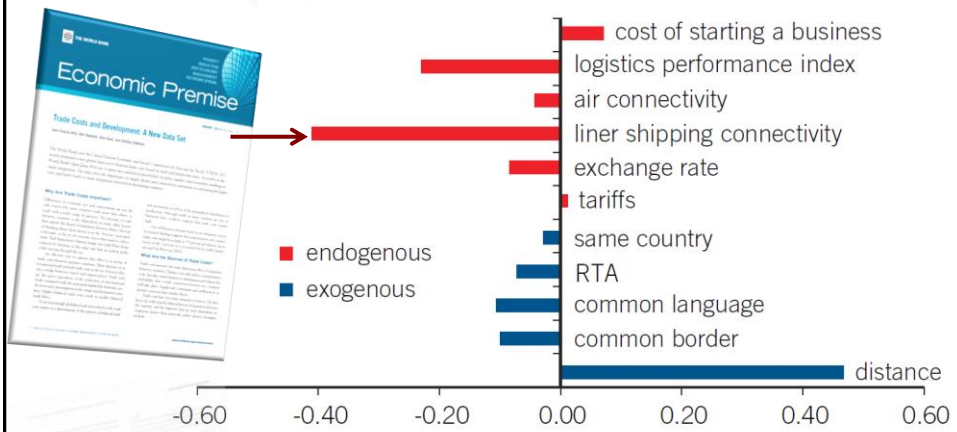


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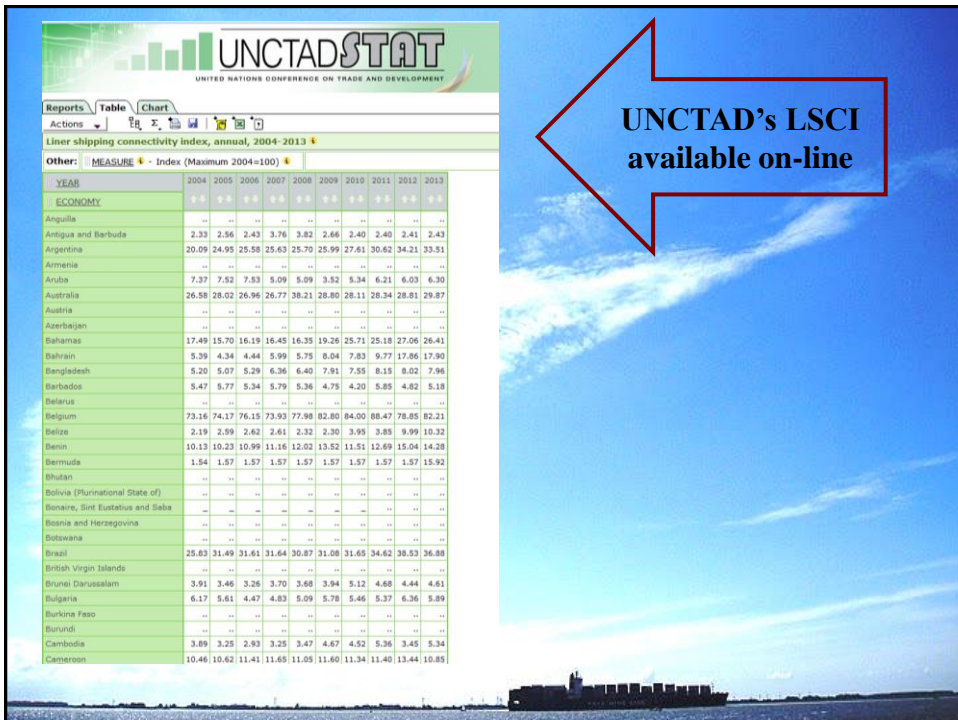
Higher Liner Shipping Connectivity leads to lower trade costs

Figure 1. Relative Impact of Different Sources of Trade Costs

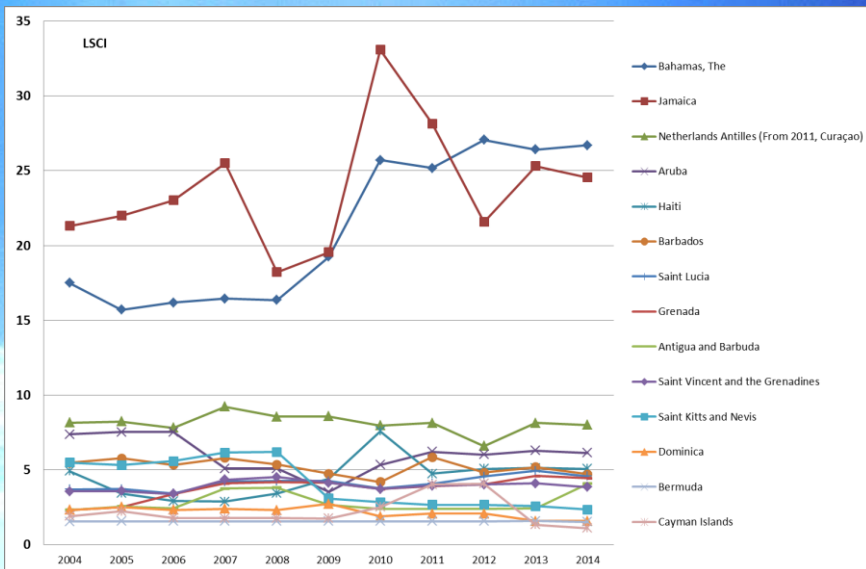
(normalized regression coefficients [“betas”] against the indicator measuring the cost component)



(Arvis et al, 2013)

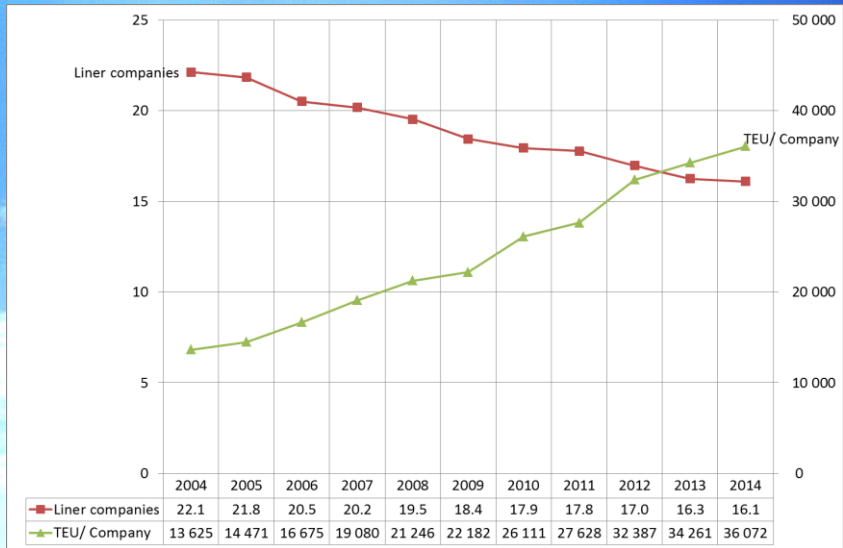


Rank 2014	Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
126	Suriname	4.77	4.16	3.90	4.29	4.26	4.16	4.12	4.16	4.48	4.91	5.03
127	Norway	9.23	8.31	7.34	7.80	7.91	7.93	7.93	7.32	5.31	5.28	4.99
128	Bulgaria	6.17	5.61	4.47	4.83	5.09	5.78	5.46	5.37	6.36	5.89	4.98
129	Barbados	5.47	5.77	5.34	5.79	5.36	4.75	4.20	5.85	4.82	5.18	4.71
130	Saint Lucia	3.70	3.72	3.43	4.21	4.25	4.25	3.77	4.08	4.55	4.93	4.57
131	Grenada	2.30	2.52	3.37	4.09	4.20	4.13	3.71	3.93	4.04	4.59	4.45
132	American Samoa	5.17	5.30	4.86	6.28	6.44	4.80	4.85	4.56	4.39	4.19	4.42
133	Samoa	5.44	5.33	5.09	6.50	6.66	4.62	5.18	4.56	4.39	4.19	4.42
134	Iceland	4.72	4.88	4.75	4.72	4.72	4.73	4.70	4.68	4.68	4.66	4.41
135	Brunei Darussalam	3.91	3.46	3.26	3.70	3.68	3.94	5.12	4.68	4.44	4.61	4.30
136	Faeroe Islands	4.22	4.40	4.43	4.45	4.20	4.20	4.21	4.20	4.21	4.21	4.18
137	Guyana	4.54	4.37	4.60	4.51	4.36	4.34	3.95	3.96	4.06	4.31	4.13
138	Albania	0.40	0.40	0.40	2.28	1.98	2.30	4.34	4.54	0.53	4.43	4.11
139	Congo, Dem. Rep.	3.05	3.03	2.66	2.68	3.36	3.80	5.24	3.73	4.05	4.01	4.11
140	Cape Verde	1.90	2.28	2.76	2.45	3.63	5.13	3.69	4.24	4.48	4.12	4.10
141	Antigua and Barbuda	2.33	2.56	2.43	3.76	3.82	2.66	2.40	2.40	2.41	2.43	4.07
142	Northern Mariana Islands	2.17	2.20	1.85	2.86	3.76	3.76	3.43	3.65	3.44	1.37	4.06
143	Eritrea	3.36	1.58	2.23	-	3.26	3.26	0.02	4.02	4.17	4.02	4.02
144	Guinea-Bissau	2.12	5.19	5.03	5.22	5.34	3.54	3.50	4.07	4.31	4.00	3.98
145	Qatar	2.64	4.23	3.90	3.59	3.21	2.10	7.67	3.60	6.53	3.35	3.86
146	Saint Vincent and the Grenadines	3.56	3.58	3.40	4.34	4.52	4.13	3.72	3.95	4.02	4.10	3.85
147	Latvia	6.37	5.82	5.10	5.87	5.52	5.18	5.98	5.51	5.45	4.07	3.62
148	Tonga	3.81	4.75	4.45	4.07	4.23	3.99	3.73	3.72	3.37	3.17	3.58
149	Virgin Islands (U.S.)	1.77	3.00	3.22	3.76	3.81	3.70	3.32	3.39	3.34	3.37	3.37
150	Marshall Islands	3.49	3.68	3.26	3.06	3.06	2.85	2.83	3.08	2.91	2.91	3.02
151	Kiribati	3.06	3.28	3.05	3.06	3.06	2.85	2.86	3.11	2.91	2.91	2.91
152	Serbia & Montenegro (From 2010, Montenegro)	2.92	2.92	2.96	2.96	3.20	0.02	4.48	4.04	1.35	2.35	2.90
153	Saint Kitts and Nevis	5.49	5.32	5.59	6.16	6.19	3.08	2.84	2.66	2.67	2.58	2.35
154	Greenland	2.32	2.32	2.27	2.27	2.36	2.27	2.27	2.30	2.30	2.30	2.30
155	Dominica	2.33	2.51	2.33	2.40	2.31	2.73	1.88	2.08	2.08	1.59	1.59
156	Bermuda	1.54	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.50	1.52
157	Micronesia, Fed. Sts.	2.80	2.87	1.94	3.13	3.85	3.85	3.43	3.62	3.58	2.17	1.32
158	Palau	1.04	1.04	1.87	3.07	3.79	3.79	3.43	3.62	3.58	2.17	1.32
159	Cayman Islands	1.90	2.23	1.79	1.78	1.78	1.76	2.51	4.03	4.07	1.34	1.11

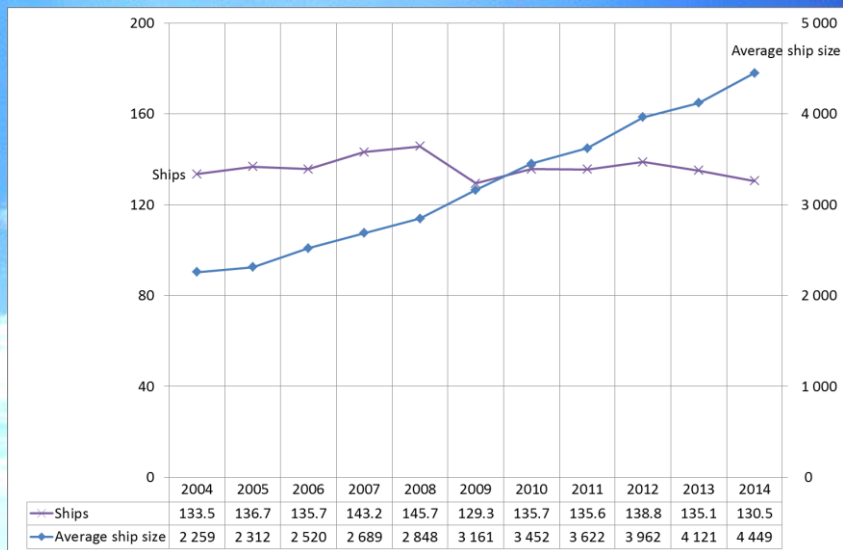




A global trend towards concentration



A global trend towards concentration



Determinants of maritime connectivity

- Geography
- Trade volumes
- Port characteristics

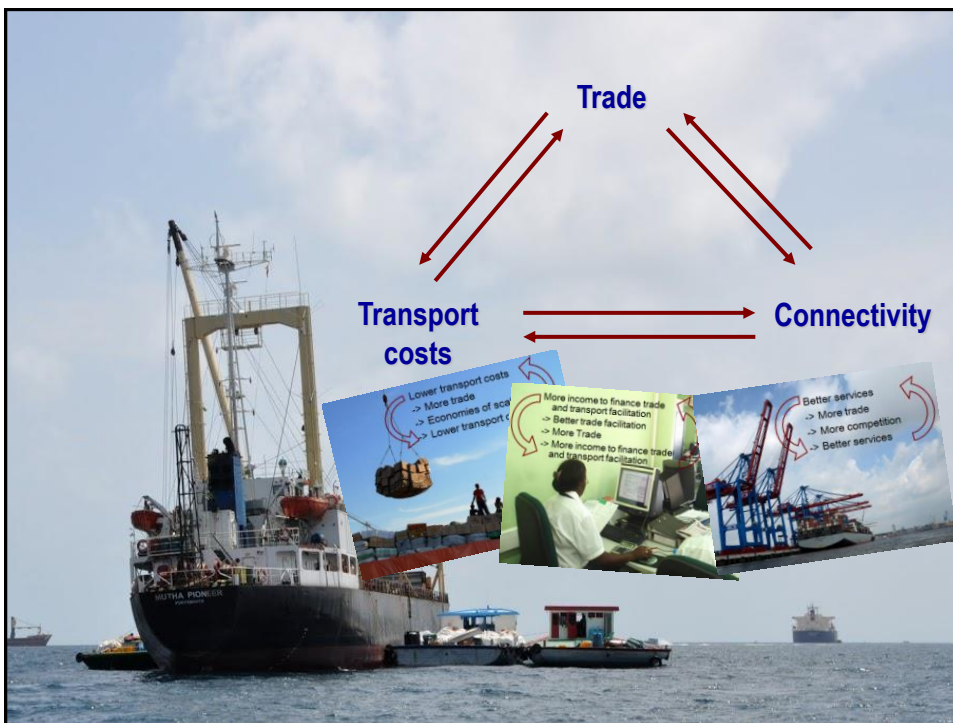
To sum up:

Differences in maritime freights depend on...

- Distances
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- Imbalances
- Competition
- Economies of scale
- Port characteristics



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Liner shipping connectivity and transport costs in SIDS



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