

Maritime Transportation

How Much Does Employment Strategy Matter?

Shipping

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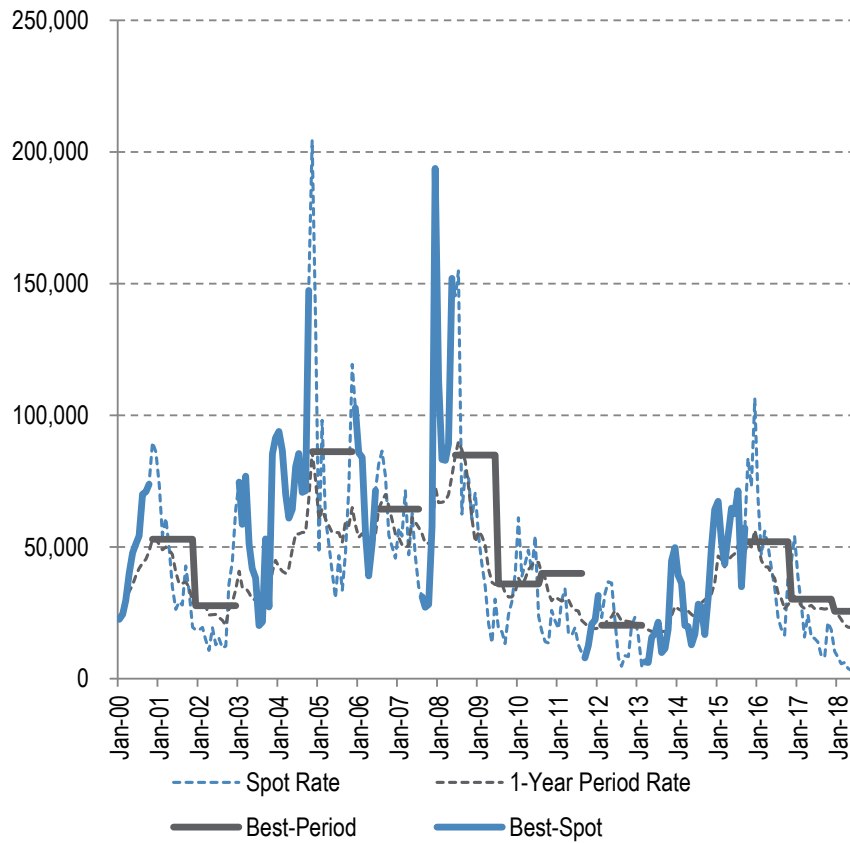
Analysis Framework

- We looked historically at Clarkson rate data going back to 2000
 - Tankers (VLCC, Suezmax, Aframax and MR)
 - Dry bulk (Capesize, Panamax, Handymax)
- Owner has choice between employing on the spot market for the month or putting on a 1-year time charter
- “Best case” and “Worst case”
 - Assuming perfect foresight over the next 12 months
 - “Best case” is making the right choice on whether the spot market over the next 12 months underperforms or outperforms the current time charter rate.
 - “Worst case” is making the wrong decision
 - Ship put on time charter is out of the market for 12 months
- These scenarios are compared to
 - 100% spot employment
 - 100% 1-year period employment
 - Portfolio strategy (12 vessel fleet with one ship taking the current time charter rate each month)

VLCC Employment Strategies

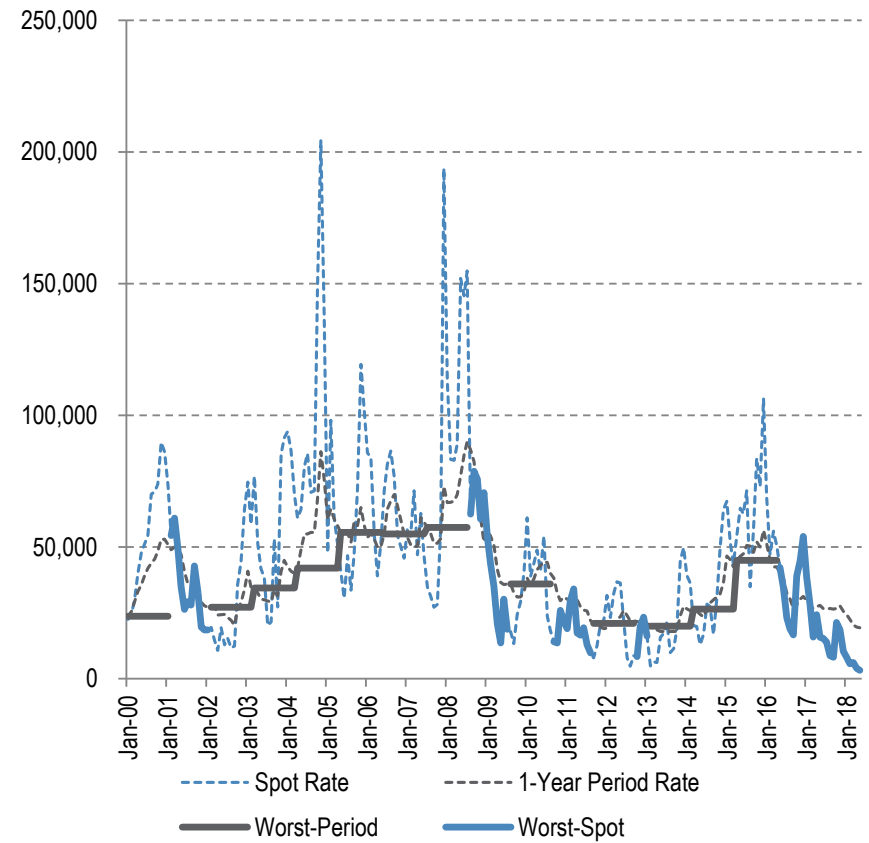
VLCC employment strategy – best choice

\$ per vessel/day



VLCC employment strategy – worst choice

\$ per vessel/day



VLCC Takeaways

VLCC employment optimization

\$ per vessel/day

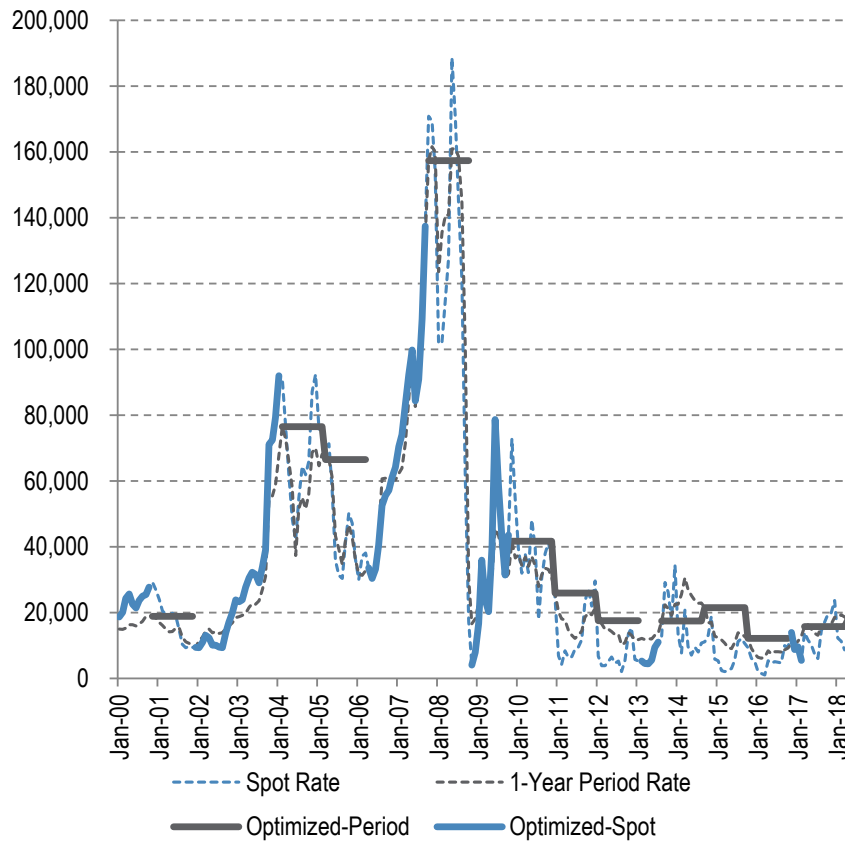
	Average	Standard deviation	Coefficient of variation	Rate vs. Spot	Rate vs. Period	EBITDA vs. Spot	EBITDA vs. Period	% Spot employment	% Period employment
VLCC									
Spot	45,087	33,312	74%	-	11%	-	16%		
Period	40,669	14,334	35%	-10%	-	-14%	-		
Best	50,054	27,290	55%	11%	23%	15%	33%	38%	62%
Worst	34,274	15,472	45%	-24%	-16%	-33%	-23%	29%	71%
Portfolio	39,977	14,659	37%	-11%	-2%	-16%	-2%		

- Spot employment results in **11%** increase in earnings vs. period at the cost of substantial volatility
- Optimal employment would generate **11%** premium to spot and **23%** to period with volatility somewhere between the two, with employment breakdown of **38%/62%** spot/period
- Making the wrong employment choices causes significant underperformance of **24%** of spot and **16%** of period
- Portfolio employment offers no real advantages
- **Optimal employment** during most recent cycle would have been spot for most of 2015, fix in October 2015, and to re-fix again in November 2016 and December 2017
 - Almost no one did this as the spot market spiked to \$100,000 briefly in December 2016
 - Difference between optimal and remaining spot completely to today would be \$6.5 million (**14%**)
- **Worst employment** path during most recent cycle would have been fixed on time charter from Feb-13 to April-16, missing all of the spot market strength, and being spot since May-16
 - Difference between worst employment and remaining spot completely to today would be \$9.9 million (**22%**)

Capesize Employment Strategies

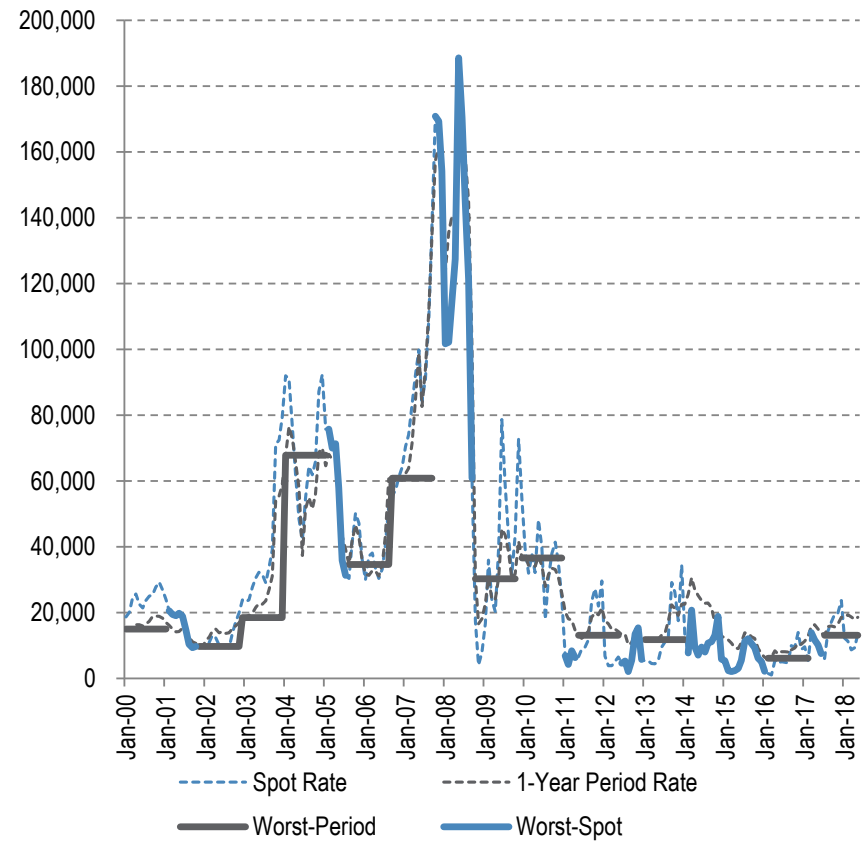
Capesize employment strategy – best choice

\$ per vessel/day



Capesize employment strategy – worst choice

\$ per vessel/day



Capesize Takeaways

Capesize employment optimization

\$ per vessel/day

	Median	Median absolute deviation	Coefficient of Median deviation	Rate vs. Spot	Rate vs. Period	EBITDA vs. Spot	EBITDA vs. Period	% Spot employment	% Period employment
Capesize									
Spot	20,777	13,623	66%	-	11%	-	16%		
Period	18,775	6,963	37%	-10%	-	-14%	-		
Best	23,288	10,669	46%	12%	24%	17%	35%	34%	66%
Worst	14,990	8,859	59%	-28%	-20%	-39%	-30%	30%	70%
Portfolio	19,076	7,516	39%	-8%	2%	-12%	2%		

- Spot employment results in **11%** increase in earnings vs. period at the cost of substantial volatility
- Optimal employment would generate **12%** premium to spot and **24%** to period with volatility somewhere between the two, with employment breakdown of **34%/66%** spot/period
- Making the wrong employment choices causes significant underperformance of **28%** of spot and **20%** of period
- Portfolio employment offers minor premium to period employment with slight increase in volatility
- **Optimal employment** during most recent cycle would have been spot for a few months early in the recovery (Nov-16 to Feb-17) and then fixing in Mar-17. Uncertain what the optimal strategy will be post this as recovery continues
 - Contrary to common belief that employing spot in a recovery is better. Perhaps period rate is efficient here
 - Difference between optimal and remaining spot completely to today would be \$3.4 million (**40%**)
- **Worst employment** during most recent cycle would have been spot until February 2016, fixing for a year at a low rate, and then being on the spot market from Mar-17 to Jun-17. Period charter since Jul-17 at \$13,188 per day appears worse than remaining spot for that time period
 - Worse case employment since Jan-16 is only **6%** worse than spot only

Full Tanker Results

Tanker employment optimization

\$ per vessel/day

	Average	Standard deviation	Coefficient of variation	Rate vs. Spot	Rate vs. Period	EBITDA vs. Spot	EBITDA vs. Period	% Spot employment	% Period employment
VLCC									
Spot	45,087	33,312	74%	-	11%	-	16%		
Period	40,669	14,334	35%	-10%	-	-14%	-		
Best	50,054	27,290	55%	11%	23%	15%	33%	38%	62%
Worst	34,274	15,472	45%	-24%	-16%	-33%	-23%	29%	71%
Portfolio	39,977	14,659	37%	-11%	-2%	-16%	-2%		
Suezmax									
Spot	36,197	23,389	65%	-	18%	-	26%		
Period	30,757	10,560	34%	-15%	-	-21%	-		
Best	38,035	21,017	55%	5%	24%	7%	35%	43%	57%
Worst	27,513	13,084	48%	-24%	-11%	-33%	-16%	29%	71%
Portfolio	29,991	10,113	34%	-17%	-2%	-24%	-4%		
Aframax									
Spot	27,654	16,244	59%	-	19%	-	30%		
Period	23,180	7,698	33%	-16%	-	-23%	-		
Best	29,019	14,139	49%	5%	25%	7%	40%	44%	56%
Worst	21,414	9,723	45%	-23%	-8%	-33%	-12%	35%	65%
Portfolio	22,803	7,458	33%	-18%	-2%	-25%	-3%		
MR									
Spot	16,711	7,745	46%	-	-5%	-	-7%		
Period	17,503	5,270	30%	5%	-	8%	-		
Best	19,036	6,331	33%	14%	9%	23%	14%	25%	75%
Worst	14,768	5,286	36%	-12%	-16%	-19%	-25%	53%	47%
Portfolio	17,263	4,821	28%	3%	-1%	5%	-2%		

Source: J.P. Morgan. Clarkson Research Services. EBITDA assumes cash costs of \$12,500 (VLCC)c, \$10,000 (Suezmax), \$8,500 (Aframax) and \$6,500 (MR).

Full Dry Bulk Results

Dry bulk employment optimization

\$ per vessel/day

	Median	Median absolute deviation	Coefficient of Median deviation	Rate vs. Spot	Rate vs. Period	EBITDA vs. Spot	EBITDA vs. Period	% Spot employment	% Period employment
Capesize									
Spot	20,777	13,623	66%	-	11%	-	16%		
Period	18,775	6,963	37%	-10%	-	-14%	-		
Best	23,288	10,669	46%	12%	24%	17%	35%	34%	66%
Worst	14,990	8,859	59%	-28%	-20%	-39%	-30%	30%	70%
Portfolio	19,076	7,516	39%	-8%	2%	-12%	2%		
Panamax									
Spot	11,571	4,401	38%	-	-3%	-	-6%		
Period	11,975	3,944	33%	3%	-	7%	-		
Best	13,344	5,531	41%	15%	11%	29%	21%	23%	77%
Worst	10,139	2,893	29%	-12%	-15%	-24%	-28%	41%	59%
Portfolio	12,611	4,649	37%	9%	5%	17%	10%		
Handymax									
Spot	12,213	4,538	37%	-	9%	-	15%		
Period	11,250	3,687	33%	-8%	-	-13%	-		
Best	12,725	4,445	35%	4%	13%	7%	24%	40%	58%
Worst	10,217	2,742	27%	-16%	-9%	-28%	-17%	28%	72%
Portfolio	11,670	3,983	34%	-4%	4%	-8%	7%		

Source: J.P. Morgan. Clarkson Research Services. EBITDA assumes cash costs of \$6,000 (Capesize), \$5,500 (Panamax) and \$5,000 (Handymax).

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