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# Owners' Dilemma

Shipping

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Imagine walking into a car rental company in order to take delivery of a car you booked for your holidays. The employee greets you, takes you to the parking space, shows you two identical cars and lets you know that one car burns normal fuel while the other a special type of fuel that not only is it more expensive but also harder to find. Which car would you take if you had the choice?

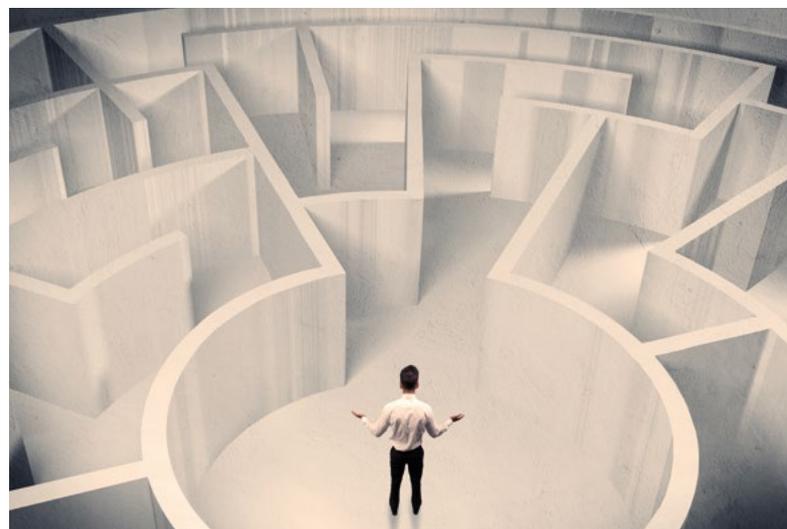
And wouldn't you be willing to pay more for the conventional fuel car? If choosing the conventional car appears reasonable, why should charterers behave any differently when they are faced with a similar choice after the implementation of IMO's regulation for reduced Sulphur emissions in two years' time?

Compliance with this regulation can be achieved in two ways –either by switching to Low Sulphur content fuel or by installing a system of pollution control devices that removes Sulphur from the exhaust fumes and therefore enables the vessel to continue consuming normal Sulphur fuel. The first choice is expensive as the price of this new type of fuel is currently approximately \$250 per ton higher than that of conventional fuel and the second needs substantial capital investment and is also disruptive as the vessel will need to go into a shipyard for major retrofit works. With this kind of price differential however, the additional total fuel bill is not going to be an immaterial amount and because fuel costs are borne by Charterers the answer to their question “do I charter a vessel burning expensive and hard to find Low Sulphur Fuel or should I charter one with a Scrubber installed?” seems to be quite obvious.

From the Owners' perspective however, the decision of how to comply with the regulation is not as straight forward. Firstly, the potential benefit cannot be safely quantified as it depends on the price differential between the two fuel types in the future which is currently unknown and unpredictable. At the moment nobody can say with certainty what will happen to this differential, not just immediately after the implementation of the regulation but in the medium term after that, as this will depend on the future supply and demand curves of the two different fuel types. Due to the nature of the fuel market, there is a long lead time for supply to adjust to demand and also for demand to find a new equilibrium following the decisions that will be made by thousands of owners around the globe. So even if in the long-term supply will match demand, the short and medium term are most probably going to be volatile.

In addition, in contrast with the other environmental regulations Owners had to comply with, the impact of this decision is greater on the profitability, and therefore behavior, of their counterparty, the Charterer, rather their own. It appears that the Owners need to take on the business risk of the decision, for the Charterer to benefit and whereas Charterers have the luxury of waiting to see how the price differential will move and then make their choice, the owners must act a lot sooner as retrofitting a scrubber is not something that can be done quickly, making this difficult choice even harder.

I set out below my personal thoughts on the issue and try to apply some “mathematical logic” to this difficult problem hoping that this process will enlighten this complicated issue and help owners make an appropriate decision.



**The Owner has to make one of the following choices:**

- A) Install a Scrubber or
- B) Do nothing,

the financial outcome of which will depend on the future movement of the bunker price differential which may

- 1) Stay the same or
- 2) Equalize,

giving us four different outcomes A1, A2, B1 and B2 as follows:

**A1-Scrubbers are installed and the differential does not fall**

Vessels equipped with a scrubber will be able to consume the cheaper high Sulphur fuel and will have a substantial competitive advantage compared to vessels that will need to buy the more expensive fuel. Charterers would be willing to pay a premium to charter a vessel that will save them money and therefore demand and surely charter rates are bound to increase for these vessels.

**A2-Scrubbers are installed and the differential equalizes**

The owner will lose as he will be unable to take advantage of his vessels ability to burn low cost fuel. The investment he made will be worthless as he will be in no better position to the owner that chose to do nothing. His losses will be equal to the cost of the investment (capital and financial).

**B1-Scrubbers are not installed and the differential does not fall**

The owner will have to buy the more expensive low Sulphur fuel making his vessel quite unattractive to charterers who would not prefer to charter a vessel that has to burn expensive fuel. Charterers are likely to push back part of their costs to the owner by way of reduced charter rates or select ships with scrubbers.

**B2-Scrubbers are not installed and the differential equalizes**

There will not be a change from what we have today and there will be no change for either charterer or owner.



The above outcomes need to be quantified and to do so we need to primarily consider:

1. Cost for retrofitting the Scrubber system (both direct and indirect)
2. Additional operating costs to operate the Scrubber system
3. Estimated annual consumption of fuel irrespective of whether the vessel is chartered on a voyage or time charter basis as illustrated by the car rental example.

Using data obtained from Clarksons (\*) for a Capesize vessel (as of March 2017):

Cost of Scrubber:	\$5,000,000
Additional Opex :	\$100,000
Annual consumption:	12,900mt
Current differential:	US\$250 per mt.
Difference in fuel costs:	3,225,000 p.a.

And assuming, for simplicity purposes, that the benefits fully accrue either to the owner or to the charterer, we get *table 1* (Amounts in US\$)

**Table 1:**

		Yr0	Yr1-Yr4	Yr1	Yr2	Yr3	Yr4	
	<b>Price differential</b>	<b>Investment</b>	<b>Opex p.a.</b>	<b>Additional Fuel cost</b>				<b>Total</b>
<b>Install Scrubber</b>	<b>Falls to Zero</b>	-5,000,000	-100,000	NIL	NIL	NIL	NIL	(5,400,000)
	<b>Difference remains</b>	-5,000,000	-100,000	3,225,000	3,225,000	3,225,000	3,225,000	7,500,000
<b>Do not install Scrubber</b>	<b>Falls to Zero</b>	NIL	NIL	NIL	NIL	NIL	NIL	NIL
	<b>Difference remains</b>	NIL	NIL	(3,225,000)	(3,225,000)	(3,225,000)	(3,225,000)	(12,900,000)

(\*) [http://www.clarksons.net/docdata/public/newsdownloads/SOx\\_Scrubber\\_Payback\\_Analysis.pdf](http://www.clarksons.net/docdata/public/newsdownloads/SOx_Scrubber_Payback_Analysis.pdf)

And plotting the above to a grid we get *table 2*.

**Table 2:**

		Fuel Price differential	
		Same	Falls to zero
Choices	A – Install Scrubber	7,500,000	-5,400,000
	B – Do nothing	-12,900,000	0

where we can see that by making Choice A, the owner could either gain US\$7.5million or lose US\$5.4million whereas with Choice B he could either lose US\$12.9million or gain nothing depending on what will happen to the current price differential.

Just by looking at the numbers we see that the installation of a Scrubber, caps the potential loss to a known amount, avoids the worst-case scenario of trading with an uncompetitive vessel and opens the possibility for substantial gains. Not doing anything on the other hand has a best-case scenario of zero, rules out the possibility of gains and makes the owner vulnerable to substantial losses.

The above looks a lot like the Prisoners Dilemma Game studied in Game Theory and like the game, the choice the owner will make will depend on his individual risk profile and game strategy.

Real life however is not a simple game and in order to make such an important decision the owners need to consider other factors such as:

1. Technical ability to install scrubber – Not all vessels are suited for the installation of scrubbers as these are physically quite substantial machines. There are many technical issues that need to be resolved.
2. Time into the future to perform the analysis. A newer vessel has more leeway to recover the cost than an older vessel approaching retirement age.
3. Individual to the Owner cost of capital to the company in order to discount the time series.
4. The above example, for simplicity purposes, assumes a 50:50 probability of the movement of the price differential. Best estimates on the probabilities and fuel prices must be ascertained as they materially affect the choice.
5. The opportunity to make financial profits or avoid making large losses depends on what the rest of the competitors do. On one extreme, if the owner of the example is the only one installing scrubbers and finds his vessels able to consume \$250 per ton less than the competition then he will be able to claim a large portion of the savings for his own account. If on the other hand all owners install scrubbers then this saving will probably benefit just the Charterers. Who the “competition” is must be clearly defined and examined.
6. Timing of the installation. The later this is left and the clearer the option of installing scrubbers becomes, the higher the probability that the shipyards that are able to perform this retrofit will not have the capacity to accommodate more vessels and therefore the cost of the installation may increase.
7. Geographical areas of operations in order to consider the possibility of non-availability of low Sulphur fuel meaning that bunkering will be for much larger quantities with a negative impact on cash flows and, perhaps more importantly, place serious limits on the readiness of the vessel to capitalize on good chartering opportunities. If the vessel is already trading in ECAs then benefits will accrue before the IMO deadline.

In conclusion, it is very important to note that every shipping company has different operations and strategies and therefore there is no “one size fits all” solution to this problem. Each owner must “play his own game” by estimating and quantifying all parameters, preparing cash flow projections based on those individual to the company parameters, enter them into mathematical decision theory models so that they can commit to a decision earlier than their competition and get into beneficial agreements with Bankers, Shipyards, Charterers and Fuel Suppliers in order to get out of the ‘Low Sulphur Fuel prison trap’ unscathed.

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## Contact information

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