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Quality Incentives Pay-off?

by

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Abstract

Intermediaries ascertain vessel quality in shipping markets. Thus, the classification societies set minimum quality requirements for trading vessels. Minimum class requirements do not differentiate between high quality and normal quality vessels. This reduces shippers' willingness to offer higher freight rates for high quality vessels since they cannot identify these vessels.

In this paper, we exploit theories on asymmetric information and incentive contracts to induce "flagging" of vessel quality. We analyse how both self-selection and credible signalling of vessel quality may be used to overcome asymmetric information.

The object of this paper, is to identify contract requirements that may induce owners to increase vessel quality. We suggest charter contracts that allow shipowners to implicitly signal vessel quality. Shippers may use contracts that induce self-selection by operators in charter markets. Ports also may use pricing strategies to induce self-selection among ship operators.

Key words: quality vessels, contracts, incentives, asymmetric information, and environment

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1.3.

Introduction

Spectacular accidents like "Exxon Valdez" and the recent "Erika" have increased the focus on vessel quality and environmental risk. Therefore, more agents now request data on vessel quality. The result is that the number and costs of vessel inspections have risen dramatically. In addition to regular class surveys, inspectors representing marine insurers, seaports finance institutions and cargo owners inspect the vessels. Their objective is to identify low standard and substandard vessels. Two questions are natural, (1) whether the current method is efficient in ascertaining that vessels in operation have adequate quality, and (2) whether the inspections really identify substandard vessels and operators.

The high average age of the world fleet has induced regulations by international bodies (e.g. International Maritime Organisation, IMO) and port states (e.g. US Oil Pollution Act, OPA - 90) in order to speed up fleet renewal. The requirements will take long before they give full effect, though. Policy makers tend to use age as a proxy for vessel quality in regulatory statutes, although operations and maintenance seem more critical to vessel quality than age.

Shipping traditionally uses intermediaries (classification societies and shipbrokers) to ascertain vessel quality. The classification societies enforce minimum quality requirements for trading vessels. Impartial and independent surveyors secure the functionality of the class institution. Since they use minimum requirements, classification societies do not differentiate between high quality and normal quality vessels. Thus, high quality vessels cannot be identified from the class certificate. Agents in shipping also use reputation to reduce inefficiencies caused by inadequate information on quality above the minimum requirements in charter and second-hand markets.

In this paper, we exploit theories on asymmetric information and incentive contracts to find ways to induce "flagging" of vessel quality. Asymmetric information arises in shipping when shippers have less information than do shipowners, about the technical and operational quality of the vessel they hire. Similarly, sellers of second hand vessels have more information on the vessel quality than do buyers.

We analyse both how credible signalling and self-selection may overcome asymmetric information on vessel quality. We discuss what charter conditions shipowners may offer to signal vessel quality implicitly. How may a shipowner use the contract to signal the quality of his service? Shippers, on the other hand, may induce self-selection among operators of high and normal quality vessels by exploiting different contract requirements. We discuss kinds of contract requirements that induce such self-selection. In addition, we analyse how ports pricing strategies can induce self-selection among ship operators.

The object of this paper is to identify contract requirements that may induce owners to optimise vessel quality. Incentives may follow from either higher revenue or lower costs gained by operating vessels with higher than minimum quality. By this, we try to identify sources of value added from operating high quality vessels. We also look for ways to employ such knowledge in charter and second-hand markets.

The next section of this paper discusses today's effort to identify low quality vessels. The third section analyses problems and effects of asymmetric information in shipping markets. In the fourth section, we discuss what agents currently do to circumvent asymmetric information. The rest of the paper discusses alternative contracts with incentives to "flag" quality offered in order to differentiate from the services offered.

Strong efforts to identify low quality vessels

The shipping industry tries to overcome the problems with diverse quality of vessels by increasing their effort to identify low standard and sub standard vessels. The class requires regular survey only every fourth or fifth year, while other institutions demand more frequent feed back on quality changes, maintenance and operation standards. This results in a high number of inspections. Inspectors representing both the classification society and other institutions board the vessel. Ports have increased their inspection of vessels calling on the port. They do this to enable the coast state to control the quality of the vessel, reflecting their opinion that flag states do not set or enforce sufficient quality requirements for vessels in their registers. Insurers and financing firms arrange inspections. This development partly reflects the recent questioning of the class surveys.

Identification problems arise when one tries to identify substandard vessels by inspection. This raises a need for more thorough inspections. These take time, are costly, and may be impossible to perform when the vessel trades. The result is intense inspection programmes when vessels arrive in ports. This is not always a suitable time to perform inspections.

In an effort to increase fleet standards, politicians started to use age as a proxy for quality. Both the OPA 90 and the IMO regulations link requirements on separate ballast tanks and double hull to vessel age. Implicitly this means that a vessel of 25 (OPA) or 30 (IMO) years will stop trading. They use age, although several examples show that age is a poor indicator of vessel quality. Maintenance turns out to be more important for quality than vessel age. Clarkson (1991) confirmed this in a study where they report results on quality for VLCC of different ages. Their figures show that of 449 tankers 46 were substandard vessels preferably scrapped or upgraded.

The fleet surveyed by Clarkson can illustrate the effects of a requirement to scrap vessels above 15 years. Using such a rule, 197 vessels at average or above average quality needed replacement. At an average new-building cost of 65 mill USD per vessel, such premature scrapping implies a re-investment of 12 bill USD.

Asymmetric information in shipping markets

Asymmetric information implies that agents in shipping markets, shipowners, shippers, port authorities, insurers etc., have different information on vessel quality and management practises. Shipowners and classification societies have more information than other agents do. Class requirements concentrate on the technical conditions of the vessels. The classification societies obtain their knowledge by surveying both the building process and by regular surveys during the vessel's lifetime. Shipowners get all the information gathered by the classification society and their evaluation of this information. In addition, the shipowner knows best the quality of the operation, both the level of maintenance and the quality of operations at sea. The shipowner does not have full information, but he has better information than other agents in the shipping markets.

Other agents have only indirect information on vessel quality. The shippers hiring a vessel know the reputation of the ship-owning firm. They may get a recommendation from the broker and the assurance that the vessel is classed by a renowned classification society and insured by an underwriter and a P&I club. The shipper has no direct information on the vessel quality, however, and may not see the results from class surveys, unless the shipowner makes such information available to the shipper. Nor do brokers have access to all information. They may assess the quality from

frequent fixing of the vessels owned by the same ship-owning firm, however. Ports face similar information problems, as do shippers. Ports may, however, gain more information on vessels that use the port regularly such as container-, liner- and car carriers and passenger lines.

The result is that the shippers know that vessels differ in quality, but they do not have detailed knowledge on the quality of specific vessels open for hire. Marine insurers know that quality varies, but they do not have detailed information about the quality of the vessels that they insure. Such asymmetric information on vessel quality in charter markets and second- hand markets may cause moral hazard and adverse selection.

Moral hazard may come forth in markets with asymmetric information. Moral hazard exists when suppliers put less effort into supplying quality service than expected by the shipper, knowing that the buyer cannot monitor his level of effort. Even if shippers gained full knowledge of vessel quality upon fixing a vessel, moral hazard may be a problem unless the shipper can monitor shipowners' operations during the hire period. This is especially relevant in long time charters where the shipowner operates the vessels and the shipper directs the particular transport assignments. In spot shipping the shipper employs the vessel for one trip only and may easily change to another operator for the next fixture if he is not satisfied by the performance. Although there are ample challenges in controlling for moral hazard, we will concentrate on adverse selection in this paper.

Adverse selection exists when high quality suppliers withdraw from the market because they do not get paid for supplying above average quality services or goods. Since shippers cannot know to what degree the quality of the vessel they hire exceeds minimum quality, they will not be willing to pay more than the going freight rate.

There will be little differentiation of freight rates for vessels of different quality until shippers get more information on the quality of the specific vessel they hire. Similarly, insurers will not have full knowledge of the vessel quality. Thus, they cannot differentiate the premium with differences in vessel quality in an efficient way.

In the second-hand market the buyers inspect the short listed vessels to find vessel specific differences. Still, buyers may remain uncertain as to the real quality of the vessel they consider. If so, they will only pay a price corresponding to the average quality vessels.

The charter and second hand markets resemble the used car market. (Akerlof, 1970). In shipping markets shipbrokers function as car dealers do in Akerlof's second-hand car market. This is also the case in markets for transport services and is not limited to buying and selling used vessels. Akerlof named this situation the "market for lemons". In this situation, units with high quality are withdrawn from the market, i.e. the adverse selection effect. Hence, the average quality offered in the market falls and so does the average price. In the end, all vessels obtain the same freight rate and the rate reflects what the market is willing to pay for any vessel that fulfils minimum requirements for seaworthiness. High quality vessels do not obtain higher revenue and owners have few incentives to invest in maintenance to secure above minimum vessel quality.

How do agents currently try to circumvent asymmetric information in shipping markets?

Agents use different means to reduce the problem of asymmetric information in shipping markets. Important parts of the shipping industry employ brokers to reduce the effects of asymmetric information both in transport markets and markets for vessels. Shipowners use classification of vessels to inform on the seaworthiness. Reputation is also important in shipping.

Brokers are middlemen and may function as guarantors for quality. Biglaiser (1993), Biglaiser, and Friedman (1994) emphasise that the intermediary may function as an expert in determining quality. The broker enters the market more often than the average shipowner or shipper and has higher incentives to give accurate assessment of quality. They have more to lose from wrong assessment than do agents who are more seldom in the market do. Competition between brokers also increases their awareness of the importance of credibility in giving correct information on vessel quality.

To build a reputation of high quality both technically and in operations, is another method that agents currently use in shipping and in other markets with asymmetric information. Bergesen ASA is a Norwegian example of a firm that invests to secure a reputation for high quality. Another Norwegian example is the cruise industry in Miami. The companies have kept Norwegian flag as a signal of high quality operations. Thus, they exploited the image of Norwegian shipping.

Signalling may reduce the problems caused by asymmetric information. In shipping classification, societies are relevant examples. The insurers and authorities initiated the classification instrument. Shipping insurance companies needed to survey the

vessel quality; both the qualities built into the vessels and the standard chosen for maintenance. For vessels built locally and insured by a club of local shipowners, the insurers had ample information on the quality built into the vessel. As long as the vessel regularly visited its hometown, the club could inspect the vessel. Economies of scale in shipbuilding resulting from the higher capital requirements for building steel vessels, relocated and concentrated the shipbuilding industry. For vessels built far from the home city, the local insurers could no longer survey the construction of the vessel. Deep-sea operations between third countries furthermore meant that the vessel visited its hometown only seldom or not at all. Thus, the insurers needed someone to ascertain the quality built into the vessels and someone to inspect vessels operating mostly outside their home region. They established classification societies to ascertain quality of new-buildings and to oversee the development of vessel quality in the fleet.

For class to function as a signal, the classification society must be trustworthy and independent from the shipbuilder and shipowner. The classification society is the "shipowner's inspector" on the building site and during the lifetime of the vessel. The shipowner is the customer of the classification society and is in control of the survey data provided. Class societies are regarded as impartial surveyors disregarding shipowners' control over the information gathered during surveys. Periodically, this is challenged. At one stage, the major classification societies set up an organisation IACS - International Association of Class Societies - to separate themselves from the non-members and presumably lower quality societies. Vessels classed by IACS members have caused some of the more spectacular accidents in later years. This reduces the quality effect signalled by IACS membership.

Here the fact that the class only requires the vessel to comply with a set of specified minimum standard requirements is more important. The real quality of a vessel

accepted by the class may lie between "new vessel quality" and the minimum requirements for operating older vessels of the same type. Hence, the signal does not differentiate between vessels with quality well above minimum requirements and a vessel just passing the minimum requirements. To overcome this, the classification society might publish survey results and recommendations issued to owners to maintain the class. Since the information from the survey is private to the shipowner, the class offers limited information on vessel quality to shippers, insurers, flag states and ports. This limits the signalling effect of ship classification.

The current system defining minimum standards only, was not the traditional class system. Upon introducing classification in the latter half of the 19th century, classification societies defined different quality classes (Andersen and Collett (1989), Barlaup (1964), and DNV (1914)). They divided the wooden sailing ships into different classes reflecting construction and maintenance. Criteria for class were, (1) hull dimensions and building methods and (2) cargo limitations and trading area restrictions. The different classes specified what trades the sailing ship might operate in and what range of cargoes she could carry. The restrictions reflected the actual quality of a vessel. When maintenance no longer compensated for the ageing of the vessel, the classification society downgraded the ship. A ship built to carry heavy cargo world-wide was later restricted to carry lighter cargoes and narrower waters. Certificates for older sailing ships often specified that they could only carry clogs in coastal waters. This cargo helped keeping them afloat. To give some examples; DNV divided wooden sailing ships into 6 classes, whereas Bureau Veritas at one stage used 18 different classes (Bureau Veritas, 1928). Buvik comments that the former practice enabled underwriters to adjust the premium depending on the condition of the ship.

ISO certification acts as a signal of management quality based on the ISM code. However, this code and certification also require the shipping firm and the vessel to fulfil only a minimum standard. Although the code is an extension relative to traditional classification, it does not differentiate vessels or firms according to their individual qualities above the minimum requirements. ISO thus is another rough signal sent to the shippers, ports and insurers on the quality level of vessel and operation.

DNV some years ago introduced their Condition assessment programme (CAP). This programme introduces classification of management quality supplementing the traditional class. This traditional class set construction requirements and technical standards. DNV have also introduced different levels of CAP. That is, the shipowner may choose to comply with stronger or less strong requirements and thereby obtain different grading of CAP. Hence, CAP is a step towards differentiated signal of vessel operation quality.

Create incentives for owners to “flag” quality of their vessel

The focus on minimum standards does not overcome asymmetric information in shipping. The current classification with minimum standard requirements does not identify vessel quality above the minimum. A shipowner therefore cannot use class to signal a higher than acceptable quality for his vessel. Nor can shippers identify the high quality vessel from the average quality vessels and thus the situation of adverse selection in the freight market remains. Similarly, a buyer evaluating a second-hand vessel cannot be sure that the vessel has above average quality. To overcome this asymmetric information agents need more information on quality. Classification societies may provide such information if they introduce quality classes between a

high or “new vessel” quality and the minimum for seaworthiness. Of course, a theoretical solution is to require “new vessel” standard for older operating vessels. This is very costly, however, as vessels are built to last for several years and thus initially have a higher quality than needed in all trade types.

Why create incentives for shipowners? Theoretically, incentives established to identify quality levels might apply either to the shipowner or to the shipper employing the vessel. The main reason for focusing on the shipowner and not the shippers is that shipowners are closest to monitor vessel quality. Owners furthermore know their level of operating and maintenance quality. Not even the shipowner has perfect information on the technical or operational quality of the vessels. He has, however, more information than other agents in the shipping markets.

In a setting where shipowners get the incentives to “flag” vessel –and management – quality, their credibility when sending this signal will be essential. Hence, we have to look for incentives that allow shipowners to send creditable signals on the quality of the vessels they offer in the markets. Incentives are necessary in both the freight market and the second-hand market.

Higher profit for above minimum standard vessels may give such incentives. Economic incentives to maintain and flag quality above minimum level both for vessels and operations require economic gains from quality. It is essential that the shipowner obtains at least the same profit level after having incurred the extra cost of sending such creditable signals of higher quality.

Potential sources for economic incentives to flag shipping quality

The challenge is to create sources for higher income for owners or operators of higher than minimum quality vessels. In periods with excess supply, when vessels wait for fixtures, shippers may choose among several open vessels for their transport assignment. Even at the going undifferentiated freight rate, they choose vessels of higher quality first. Thus, if an owner can “flag” that his vessel is above average quality, the vessel tends to be among the first to be chosen. The result is that quality vessels have fewer inactive days than lower quality vessels and thus obtain a higher income per period.

Another source for gain that also accrues with indifferent freight rates, arises when the best crew systematically chooses quality vessels. For a given wage, the best crew will tend to choose higher quality vessels. This they do for safety reasons and to secure a reputation as a well qualified crew. A shipowner operating with a high quality crew may operate at lower average operating costs and face fewer accidents than owners of vessels manned by crews with average or below average competence, because of less off-hire and irregularities.

The income differences remain small, however, in markets with the same freight rates for high and lower quality vessel. Thus, the market should induce shippers to pay higher freight rates for quality vessels. Consequently, shippers must be sure that the vessels they fix are of good and above average quality. Firstly, practises in cargo insurance influence shippers’ willingness to pay higher freight rates for quality. Today cargo owners may get insurance that exceeds the value of the goods. This is due to insurance covering time costs that arise from delayed delivery of the cargo. If it is necessary to replace the cargo or the original load requires repair because of damages, time costs arise. When remuneration comprises both value of cargo and

delay cost, shippers have lower incentives to reduce the risk of delay or non-delivery by hiring high quality vessels. Hence, they have limited willingness to pay a higher freight rate for such vessels.

Secondly, an incentive to pay for higher quality transport may arise if cargo owners must share costs from spill into the sea. Again, for such a scheme to be efficient, the shippers must be able to assess the quality of the vessels they hire. This brings us back to the initial problem, how to provide reliable information on vessel quality for shippers. Mæstad (1996) discusses the potential gain from introducing liability for spills to shippers. He points out that this requires open information on vessel qualities.

Thirdly, reliable information on vessel quality may induce buyers of second hand vessels to pay a higher price for quality vessels. Hence, potential sellers of vessels will gain by investing in above minimum quality. Again, this requires that the buyer can assess the quality of the vessels in a reliable way.

Shipowners may gain by increasing the quality of the vessels, if this results in lower costs. Several sources for lower costs exist. One is a quality adjusted insurance premium. If the insurance company or the club, differentiates the premium according to the quality of the vessel or its management, this may open up for lower premium for quality operators. The reason must be that one recognises that higher quality vessels tend to have fewer accidents or casualties. Hence, shipowners have economic gains from higher quality. If reliable information on vessel quality resulted in fewer inspections by ports, insurers and banks, costs may also fall. Agents that get reliable information of vessel quality by other means need fewer inspections. Better co-ordination of inspections also reduces the costs for the ship-owning firm. Based on better information on quality, ports will possibly offer lower harbour dues for quality

vessels. The reason may be to attract quality vessels to the port, since these vessels on average cause fewer spills and other irregularities in the port. The Rotterdam Port “Green award” manifests that ports are willing to use economic incentives to attract higher quality vessels. As seen from Figure 1, the Green award specifies minimum requirements, stating that vessels must fulfil specific technical and management criteria. This reduces its efficiency in creating incentives since shipowners need only fulfil a set of minimum requirements. Although the award offers a positive incentive, it has similar limitations as the traditional class system. Hubbart (1997) points out that inspection programmes for cars must provide car owners with incentives to maintain their cars so that they have low emissions.

Figure 1 Rotterdam Green award

INCENTIVE SCHEMES

In order to increase the standard of safety and environment on board sea-going ships, the Port Management took the initiative for the 'Green Award' quality certificate, which can be awarded by an independent bureau to tankers over 20,000 dwt. In order to obtain this, they have to fulfil specific technical and management criteria. The Port Management allows ships with this 'Green Award' a 6% discount on port dues and a number of Rotterdam service companies offer them all kinds of benefits. South African and Spanish ports now also give a discount on port dues for the 'Green Award'. It is currently being considered whether to widen the category of ships, which can obtain a certificate.

The owners of crude oil tankers with segregated ballast tanks, SBT tankers, and ships with a double hull receive 10% of the seaport dues back from the Port Management. SBT tankers are ships where the tanks for the ballast water are separated from the cargo tanks, so that this water remains clean. This is to the advantage of both the port and the shipping company. Since the tanks increase the ship's GRT, the Port Management has adapted this levying basis for seaport dues where SBT tankers are concerned.

Source: <http://www.port.rotterdam.nl/>

Incentive contracts to overcome adverse selection

Incentive contracts may reduce adverse selection. The agent with least information may offer them to induce self-selection from the counterparts with private information. In this case, the agent with most information selects the contract that suits his profile best. The alternative strategy is signalling. Signalling happens when the agent with the most information offers a contract. The conditions in the contract show his willingness to carry any costs of non-fulfilment. If he is willing to cover any cost caused by delay or sub-quality service, the shipowner signals high quality. Before we look closer at the alternatives open to shippers and shipowners who use incentive contracts, we will illustrate how other markets exploit such opportunities, i.e. car insurance and the airline business.

Incentive contracts in car insurance

In several countries insurance companies use incentive contracts in insuring vehicles. They offer a menu of contracts for the car owner to choose from. They design contracts to induce accident-prone drivers to choose different contracts from those that drivers with a lower risk of incident choose. Car insurers offer contracts with different combinations of premium and self-pay. A driver that accepts a higher self-pay in case of an incident, will face a lower premium than a driver who chooses a low self-pay clause. The idea is of course, that the driver who knows that he or she has an above average risk of accidents will choose full insurance and thus low self-pay. The low risk driver on the other hand, typically prefers high self-pay combined with a relatively low premium. By offering such a menu of contracts for car owners, the insurance companies induce their customers to disguise their type; high or low risk for accidents. Hence, the contract alternatives offered induce self-selection among

the agents with private information on their type. By choosing a specific combination of self-pay and premium, they divulge this information to the agent with less information.

Differentiating contracts in Airline ticketing

Airlines also use menus of contracts, when they offer different classes for travelling a specific route. Passengers choose between different fare classes, thereby divulging their relative assessment of low price and schedule flexibility. Passengers, who need full flexibility or the option to change their travel arrangements at short notice, have to pay higher fares than passengers who are willing to fix the schedule at an early date and to prepay the fare. By offering this spectre of fare classes airlines obtain passengers' private information by observing how they choose between business and leisure class tickets. Airlines combine this price differentiation within advanced yield management systems. These systems have enabled airlines to raise the average load factor and average fare on their flights.

Self-selection and differentiated contracts in shipping

There seem to be several alternatives for using menus of contracts in shipping markets. Firstly, in the charter markets shippers may offer different contracts for the shipowners to choose from. One alternative is for shippers to offer higher freight rates to owners who accept no payments in case of off-hire and lower rate against (partial) payment during off-hire. The idea is that shipowners of high quality vessels will have fewer incidents and thus a lower chance of off-hire. Owners of vessels of

lower quality may on average obtain better payment by choosing a contract that includes payment also in case of off-hire.

Secondly, shipowners with high quality vessels may offer contracts guaranteeing delivery of the cargo on time and in good condition. As long as this costs them more than offering a standard contract and the guarantee is of economic value to the shipper, shippers have incentives to choose the vessels offered on these contracts first. Depending on their potential gain shippers may also accept to pay a higher freight rate. Higher cost is a necessary condition. If not, every shipowner would offer the guarantee and the contract lose its signalling effect. Since most of the current standard contracts include full insurance of the cargo and the time loss plus demurrage, there seems to be little reason for shippers to be willing to pay for such guarantees. There seems to be more realism in the first type of incentive contracts described here. Today most standard contracts cover off-hire, however. Owners of above average quality vessels may be willing to take the risk of off-hire to gain a freight rate above the market rate for standard contracts.

Thirdly, there is a potential for incentive contracts outside the charter markets. Ports may offer reduced charges to owners who are willing to pay cleaning costs in case of toxic spills. The Rotterdam Green award indicates this. There is a difference between incentive contracts and the Green award, however. When a vessel first has obtained the Green award certificate, it runs no risk of having to pay extra in case of spills or other damages caused by the vessel when in port for as long as the certificate lasts. Hence, the incentives to continuously maintain high technical and operational quality are higher under the incentive scheme than with the Green award system.

When shippers or ports offer menus of contracts fixing freight charters or port dues to shipowners, this exemplifies that the party with less information induces the other

agent to disclose his type. That is to disclose whether he is a high or low quality operator. In the second example, where the shipowner guarantees for on-time delivery, the party with private information offers incentive contracts to signal his type. For the solution to be efficient, it must be costly to signal high quality. If not, it would be profitable for owners to signal high quality, irrespective of the quality of their specific vessel. Then the signal does discriminate between higher and lower quality operators. To work, the contracts must offer creditable signals of quality.

Signals are used in today's markets. One example is the Green award mentioned above. Shipowners apply for Green award status in order to gain when they visit the port of Rotterdam. The CAP certificate offered by DNV is another example. In this case, the shipowner fulfils the requirements for Cap status as a signal to potential shippers. The difference between these examples and the signal type described above is that these require the shipowner to signal quality by actions performed before signing the contract. In case of offering charter parties guaranteeing time of delivery and quality of cargo, the shipowner signals quality each time he offers a contract and the economic cost of not fulfilling the contract is part of the specific contract.

Pricing of incentive contracts

To formulate incentive contracts we have to discuss the pricing of these contracts. We will illustrate potential incentive contracts in shipping, by discussing how shippers can implement offers of charter parties where freight rates reflect the payment guarantee in case of off-hire. In other words, offering "Higher freight rates to owners who accept no payments in case of off-hire"; and "Lower freight rates to owners against (partial) payment during off-hire", only functions when such contracts give the shipowner incentives to invest in quality (vessel and management) to

minimise off-hire. The willingness of shippers to pay a higher freight rate, when the contract includes a clause of no cure no pay for off-hire, follows from the value added for shippers by reducing the risk of having to wait for the cargo or of the cargo being damaged. Such willingness to pay reflects a higher focus on just in time aspects of delivery of goods. Although prompt delivery is not a typical characteristic of bulk cargoes, cargo owners may find it cost efficient to reduce the time span within which the cargo may arrive. This may be due to charges for services in the port or the necessary size of storage.

Here differences in the probability for off-hire are used as an indicator of different vessel quality. For this to function, we must have that:

- (1) Off-hire must vary enough between vessels to enable freight rates that discriminate between high and low quality vessels
- (2) Shippers need information on distribution of off-hire in the current fleet to choose relevant price dispersion for their different contracts
- (3) Shipowners need information to assess how their vessel performs relative to competing vessels

The basis for pricing such incentive contracts must be knowledge of the off-hire in the fleet of relevant vessels. Neither shippers, nor the individual shipowner today have information on the distribution of vessel off-hire frequency. The shipper needs such information to be able to calculate the expected value of fixing a vessel with low frequency of off-hire, compared to accepting a vessel with a higher risk for off-hire. Similarly, the shipowner needs to know the relative position of his vessel compared to vessels operated by competitors to the fixture, before he can evaluate the pricing offered in the different contracts.

Classification societies with a large part of the vessels on their files may obtain information that enables them to calculate the distribution of off-hire in a specific fleet. If their base of vessel information is large enough, the distribution they find reflects the risk of off-hire in the fleet of vessels that may perform the transport. The resulting distribution may be like the one illustrated in Figure 2.

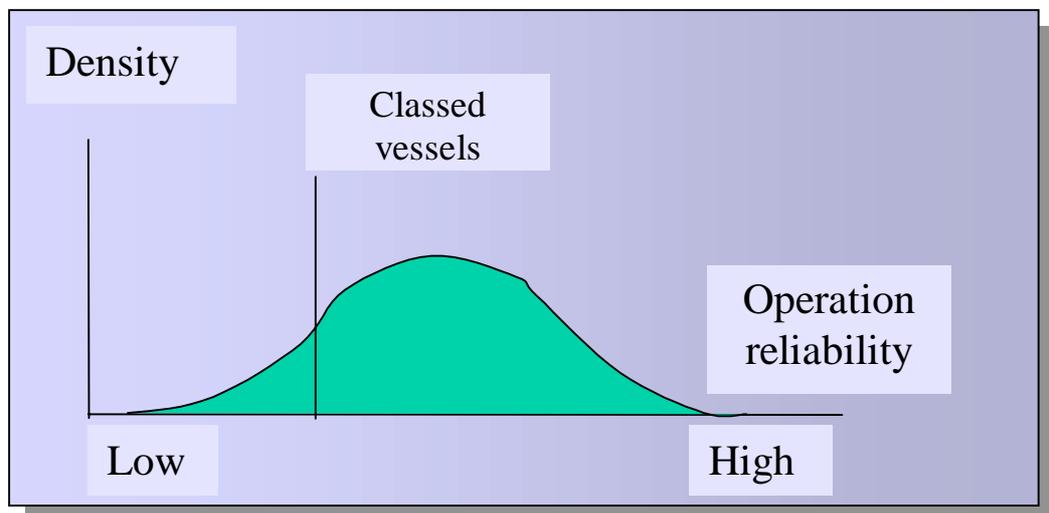


Fig2

A large classification society may also have credibility to ascertain the relevance of this distribution. Of course, off-hire is not the only indicator that may be used. An alternative is information on detention in port of vessels competing for fixtures. This requires that the detention rate of a specific vessel reflects the chance of this vessel being able to fulfil the transport assignment on time.

Summary

In this paper, we have sought after methods to create incentives for shipowners to flag quality of their vessel. The aim is to give shippers reliable information on vessel quality. Such information is necessary for shippers to be willing to pay for quality. We suggest incentive contracts to induce self-selection. That is, to let shipowners reveal the quality class of their vessel by self-selection

In the time charter, market shippers may offer a menu of charter parties with higher freight rates for shipowners who are willing to take a higher risk to obtain this. The pricing of time charter contracts requires information on the distribution of vessel quality. We have discussed potential sources for benchmarking the level and distribution of such prices.

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