



Detentions - Indicator of future casualties

Based on the data as of 31 December 2018, Cefor carried out a special analysis to shed some light on the relationship between detentions and casualties. The analysis reveals that the total loss frequency for vessels below 10,000 gross ton is 7 to 9 times higher for vessels which were detained in a 3-year period prior to the year in which the total loss incurred, than for vessels without detentions. The results of the analysis clearly demonstrate the importance of global detention data and its availability in an easily accessible format for the sake of safety at sea, the control of environmental hazards and insurers' risk assessment of a fleet.

Insurance is about risk transfer, and typical risk evaluation methods are based on the law of large numbers. Insurers need to provide cover for all claims expected to incur in their portfolio. This requires an understanding of the underlying risk inherent in the vessels and fleets they insure.

Scope and design of the analysis

Port State Control detention data was compared to the NoMIS claim (casualty) data as follows: The casualty data analysed consists of all claims reported into the NoMIS database by Cefor members for underwriting years¹ 2009 to 2018. 'Vessels with detentions' are defined as vessels with at least one detention during the three calendar years prior to the respective underwriting year.

In the analysis, we concentrate on the difference between vessels with at least one detention and vessels with no detentions at all. In parts of the analysis, vessels with more than one detention had even higher claims frequency than vessels with only one detention, but due to the low sample size the results for these vessels were more erratic. Overall, the general conclusions presented here are the same independent of how often a vessel was detained. About 7% of the vessels covered each year were detained at least once (1% detained more than once). The other 93% of the covered vessels did not have any detentions.

In the analysis, we compared the claims frequency, the total loss frequency and the claim cost per vessel across age groups. The results are shown both for all vessels and for vessels of less than 10,000 gross ton in size. As smaller and older vessels are more likely to experience total losses, this group is of particular interest when analysing the correlation between total losses and detentions.

¹ Underwriting year = year of inception of the insurance coverage period to which the claims attach.

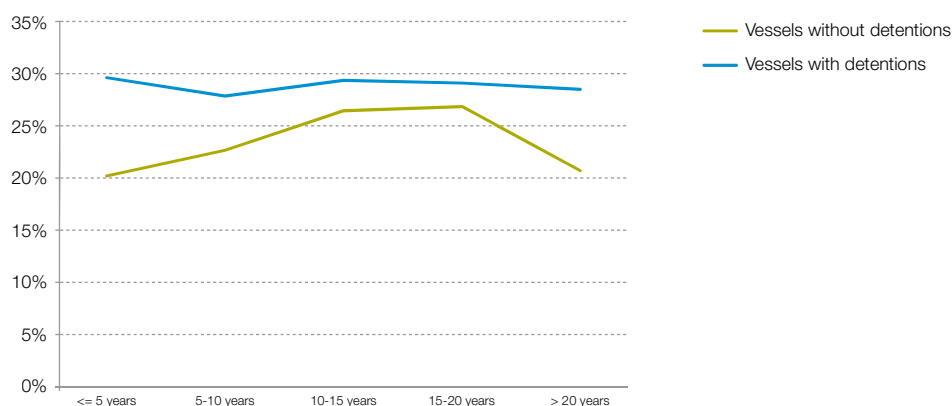
Overall claims frequency

Old vessels are more likely to be detained and they usually have a higher claims frequency. To avoid such a potential spurious correlation, the analysis is split by age group. The overall claims frequency differs clearly in all age groups between vessels with at least one detention compared to vessels without any detentions. In the age group with the youngest vessels, the claims frequency for vessels with detentions is almost 50% higher than for those without.

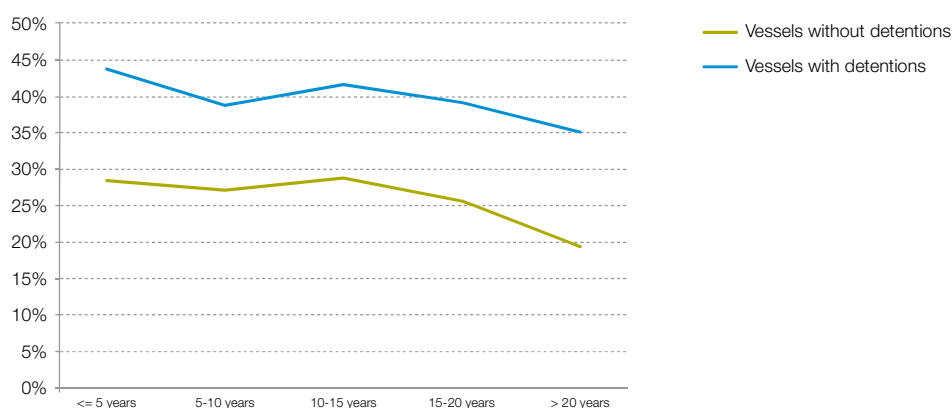
The difference in claims frequency between vessels with and without detentions is equally visible across all types of casualties. Judging from this, detentions are not only an indicator of the condition of a vessel but also of the culture under which a vessel is managed.

One might speculate that the difference in claims frequency may be somehow related to trade or vessel types. Different vessel types typically have a very different claim frequency. The frequency of detentions equally depends on vessel type and trade. To reduce the effect of such influencing factors, the analysis was split by vessel size, as vessels below 10,000 gross ton represent a more homogenous subset. As graphs 1 and 2 illustrate, the difference in claims frequency is just as strong for vessels below 10,000 gross ton as for the portfolio as a whole.

1: Claims frequency – Vessels with/without detentions, all sizes



2: Claims frequency – Vessels < 10,000 gross ton, with/without detentions



Total loss frequency

In general, the total loss frequency increases with age. As far as detentions are concerned, there is a clear difference in the frequency of total losses for vessels with and without detentions (graphs 3 and 4). This holds true for all age groups except for the youngest vessels in the age group up to 5 years. This is due to the fact that vessels younger than 5 years only incur a total loss in exceptional cases. The older the vessels are, the more prone they are to total losses. Interestingly, not only the total loss frequency, but also the difference in the total loss frequency between vessels with and without detentions increases with age. This indicates that vessels with detentions are much more prone to incurring a total loss than those without.

When analysing the total losses by type of casualty, a significantly higher percentage of the total losses on vessels under 10,000 gross ton with detentions were machinery claims. A total loss resulting from a machinery claim is typically not an actual total loss, but a constructive total loss². Machinery claims are often related to maintenance conditions or the general operation of the vessel, but this does not necessarily explain why they become a constructive total loss. The probability of a claim turning into a constructive total loss increases the lower the insured value of the vessel is. Low insured values would typically reflect a poor shipping market. One might speculate that a low-value vessel in a poor shipping market is more prone to neglect in terms of maintenance, crewing, cargo and trade. Such a vessel would face a high risk of port state control detentions and, more seriously, a constructive total loss.

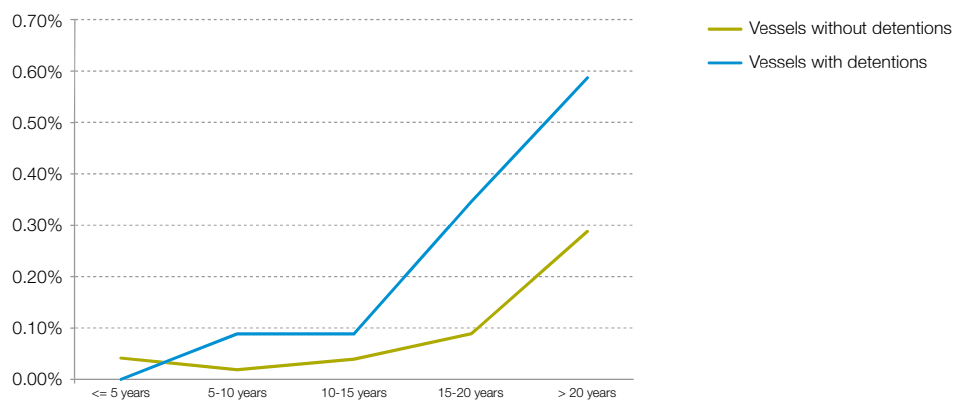
| Percent of total losses by type, vessels < 10,000 gross ton | | | |
|---|---------------------------|------------------------|---------------|
| Type of claim | Vessels without detention | Vessels with detention | All |
| Fire/Explosion | 23.1% | 8.3% | 20.3% |
| Contact | 5.8% | 16.7% | 7.8% |
| Collision | 11.5% | 0.0% | 9.4% |
| Grounding | 38.5% | 25.0% | 35.9% |
| Machinery | 3.8% | 33.3% | 9.4% |
| Heavy Weather | 1.9% | 8.3% | 3.1% |
| Other | 15.4% | 8.3% | 14.1% |
| All claims | 100.0% | 100.0% | 100.0% |

² Constructive total loss: The repair cost of the claim exceeds a certain percent of the insured value of the vessel.

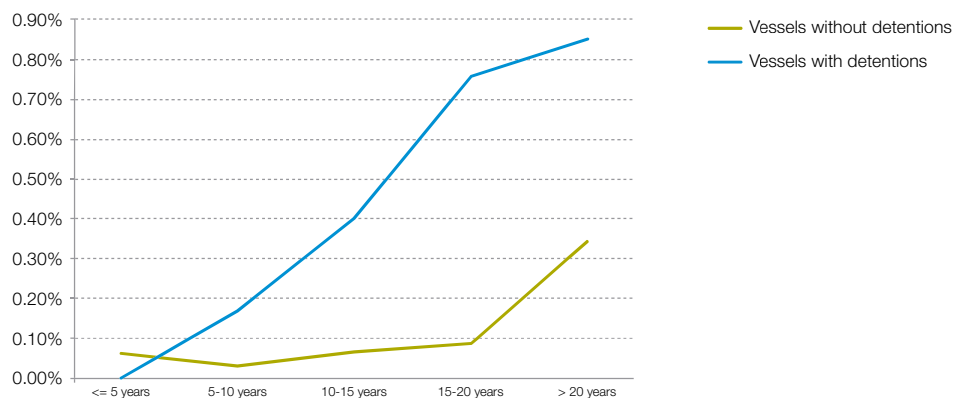
When checking the grounds for deficiencies that led to the detentions registered in the three years prior to the total loss, interesting possible causal connections show up:

On a vessel with a reported contact claim, insufficient power in the main engine was detected prior to the claim. Another vessel incurring a total loss in heavy weather, had deficiencies in structural conditions. Collisions incurred after vessels had a deficient Gyro compass or crew certificates. Groundings incurred on vessels with missing charts. Fire protection systems had deficiencies on a vessel which later became a total loss due to a fire/explosion. These are only a few of surely many more examples which could be found in the claims records. In general, vessels which had total losses also had a high number of registered deficiencies after inspections, even if these did not lead to actual detentions. Although not all claim details were available to verify all actual causal relations, these examples strongly indicate that the relationship between the causes for the detention and the type of claim incurred later is not purely coincidental.

3: Total loss frequency –Vessels all sizes, with/without detentions



4: Total loss frequency –Vessels < 10,000 gross ton, with/without detentions

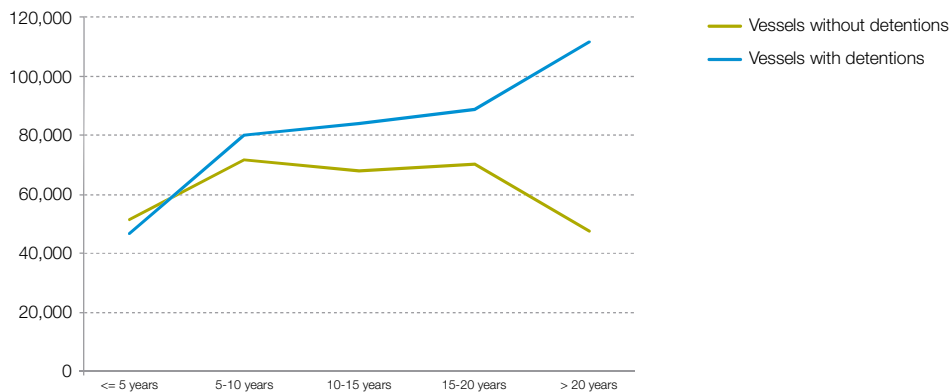


Claim cost per vessel

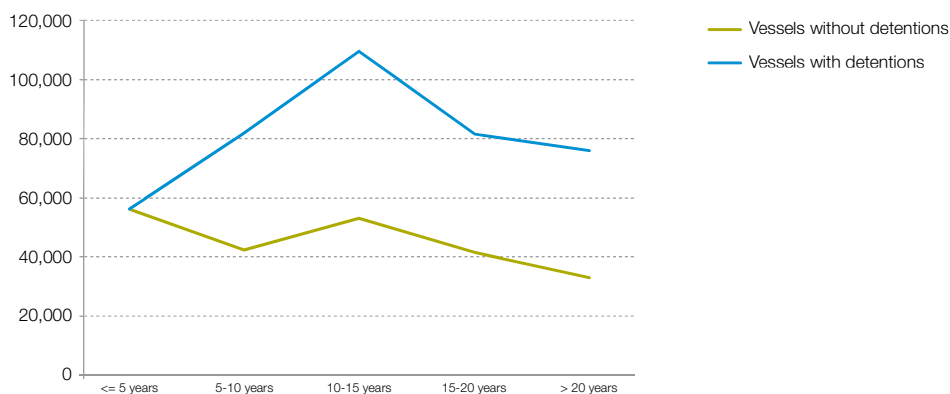
With higher claims frequency, one would also expect a higher claim cost per vessel. Graphs 5 and 6 equally show a clear difference in the claim cost per vessel for vessels older than 5 years, which were detained in the three-year period prior to the claim. As with claims frequency, the difference in the claim cost per vessel for vessels with and without detentions increases with age. For vessels in the age group 5 to 10 years, the difference is 11%, increasing to 25% for vessels between 15 and 20 years. For vessels older than 20 years, the claim cost per vessel is more than twice as high for vessels with detentions. Among the youngest vessels there is no major difference, which is mainly due to the fact that the frequency of detentions is generally very low in this group.

For vessels under 10,000 gross ton, the difference between the two groups is even more visible, with the gap between the two groups of vessels with and without detentions widening from young age. Already in the group of vessels between 5 and 10 years, the difference is 90%. The difference in cost is partly due to the high frequency of total losses shown above.

5: Claim cost per vessel (USD) – Vessels all sizes, with/without detentions



6: Claim cost per vessel (USD) – Vessels < 10,000 gross ton, with/without detentions



In summary, the above clearly shows that knowledge about a vessel's detentions, together with other vessel characteristics and parameters used in risk assessment, is an important indicator of the risk of a vessel incurring a casualty and to understand the cause of potential future casualties. Detention data in an easily accessible data format provides important information to shipowners, authorities, insurers and all other stakeholders engaged in safety at sea, with the aim of improving conditions on a vessel before they result in future casualties. For insurers, detention data strongly assists in the overall risk assessment of a fleet they insure and their loss prevention measures.