VESSEL CASUALTY TRENDS & THE FIRE CHALLENGE

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28 April 2020  astrid.seltmann@cefor.no
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• Claims frequency versus vessel speed

• The geography of claims

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NORDIC MARINE INSURANCE STATISTICS – THE DATA

Reported by Nordic marine insurers into the NoMIS database:

Quarterly updates
All vessels covered under Hull & Machinery (H&M) insurance
- Lead and follower business
- Underwriting years from 1995 updated electronically
- Portfolio and claims data (vessel values, deductibles, paid+outstanding claims development)
- For comparability are other hull-related insurance types (LOH, increased interest etc.) excluded.

Additional data:

World fleet details (subscription data), linked to insurance data via IMO number.
Exchange rates, oil price, ship operating costs, steel price etc.

Data in this presentation represents

100% of each vessel (values, claims).
Claims trends by accident year (= calendar year in which claims occurred)
50% of world fleet > 10,000 gt (32% of total commercial world fleet)
Trends as of 31 December 2019.
NORDIC MARINE INSURANCE STATISTICS – THE TEAM

The Cefor Statistics Forum dream team 2020:

- Alandia – Jonas Svartström
- Codan – Roald Osland
- Gard – Jun Lin
- Gjensidige – Tobias Abrahamsen
- If – Oskar Tufvesson
- Norwegian Hull Club – Christian Irgens
- Skuld – Otto Rendedal
- The Swedish Club – Anders Hultman
- The Nordic Association of Marine Insurers (Cefor) – Astrid Seltmann

Combining the intellectual power of marine insurance analysts / actuaries / mathematicians / business intelligence director / insurance risk coordinator / underwriter.
THE CONTEXT:
WORLD FLEET & VESSEL VALUES

Foto: Astrid Seltmann
WORLD FLEET – LESS & LARGER NEWBUILDS
NUMBER OF NEWBUILDS PER YEAR LESS THAN AND ABOVE 5,000 GROSS TONS

Source: Lloyds List Intelligence, World Fleet Update, as of January 2020; Graph: Cefor Annual Report 2019
NOMIS FLEET – SHARE OF NEWBUILDS AS % OF FLEET DOWN & AVERAGE FLEET AGE INCREASES
NOMIS FLEET – AGING IN LINE WITH THE WORLD FLEET

NUMBER OF VESSELS BY AGE GROUP AS % OF TOTAL FLEET
INCREASING GAP BETWEEN VESSEL SIZE & VALUE
INDEX OF AV. VESSEL VALUES, GROSS TONS & AGE, 2005 = 100%

Average vessels size increasing since 2007.

Average vessel value decreasing since 2010.

Instead of correlation, adverse development last ten years.
ANNUAL CHANGE IN VESSEL VALUES ON RENEWAL
COMPARING INS. VALUE OF SAME VESSELS IN TWO CONSECUTIVE YEARS

Strong reduction 2015/16 mainly connected to bulk & supply/offshore market challenges.

Bulk signs of recovery in 2017.

2019: new reduction mainly due to supply/offshore vessels

Annual reduction in vessel values since 2009.
SUPPLY/OFFSHORE: ANNUAL CHANGE IN VESSEL VALUES VERSUS OIL PRICE

Waiting for recovery of the offshore market...

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SUMMARY WORLD FLEET & VESSEL VALUES

- Less newbuilds
- Average age of world fleet is increasing
- Newbuilds have been increasing in size, but
- Vessel values have been decreasing since 2010

How does that impact casualty trends?

- Claims frequency and cost differ by vessel age.
- The cost of total losses is related to vessel values.
  (reduced vessel values may reduce the maximum cost of a total loss,
  but increase the probability of incurring a total loss under insurance).
- Larger and more complex vessels increase the probability of new record costly claims
  (higher repair cost, not necessary total losses).
- Larger container vessels have a higher probability of severe damage by fires (p. 33ff)
CLAIMS BY TYPE OF CASUALTY
BREAKDOWN OF NUMBER OF CLAIMS BY TYPE OF CASUALTY

2014-2018:
- Machinery: 42.7%
- Fire/Explosion: 10.6%
- Collision: 19.2%
- Contact: 8.5%
- Grounding: 1.8%
- Heavy weather: 15.1%
- Other / unknown: 2.2%

Total number of claims: 2014-2018: 17,507

2019:
- Machinery: 42.3%
- Fire/Explosion: 11.3%
- Collision: 2.8%
- Contact: 19.9%
- Grounding: 1.5%
- Heavy weather: 8.3%
- Other / unknown: 14.3%

Total number of claims: 2019: 3,323
BREAKDOWN OF CLAIMS COST BY TYPE OF CASUALTY

2014-2018

- Machinery: 39.6%
- Fire/Explosion: 12.6%
- Collision: 10.7%
- Contact: 8.1%
- Grounding: 15.7%
- Heavy weather: 2.3%
- Other / unknown: 11.0%

2019

- Machinery: 31.8%
- Fire/Explosion: 23.4%
- Collision: 20.9%
- Contact: 11.4%
- Grounding: 6.3%
- Heavy weather: 1.2%
- Other / unknown: 5.1%

Total cost of claims in USD million:

2014-2018: 4,489.0
2019: 1,037.9

2019: Fire/explosion claims and collisions with strong impact on cost.
CLAIMS FREQUENCY TRENDS
CLAIMS FREQUENCY* – LONG-TERM POSITIVE TREND

* = No. of claims divided by no. of insured vessels

- **Total loss frequency:** down to minimum level between 0.05% and 0.10%
- **Partial loss frequency:** stabilising >= 20%

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**Pre-financial crisis peak:**
- Partial claims (< 75% SI, left axis)
- TLO claims (>75% SI, right axis)

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* = No. of claims divided by no. of insured vessels
CLAIMS > USD 500,000: MACHINERY & NAUTICAL-RELATED CLAIMS FREQUENCY BACK TO PRE-2008 LEVEL

- Machinery
- Collision, Contact, Grounding
- Other
- Fire/Explosion
- Heavy weather

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CLAIM COST TRENDS
MAJOR LOSS IMPACT RETURNING TO NORMAL LEVEL AFTER THREE BENIGN YEARS
CLAIM COST PER VESSEL, INCLUDING/EXCLUDING TOTAL LOSSES

- **2003-08:** Strong increase in repair cost per vessel.
- **Since 2009:** Repair cost stable; Volatility by major claims impact.
- **16-18:** Little major/total loss impact
- **2019:** Normalisation of major loss impact

Strong total loss impact

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In 2019, after years with little impact, major claims account for an increasing share of the total claims cost again.
MAJOR LOSSES RETURN AFTER THREE YEARS WITHOUT CLAIMS > USD 30 MILLION
CLAIM COST PER VESSEL, INCLUDING/EXCLUDING TOTAL LOSSES

16-18: Extraordinary absence of costly claims

19: Return of major claims to expectable level

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NUMBER OF CLAIMS > USD 30 MILLION
BY ACCIDENT YEAR

2019: No. of claims > USD 30 million reflects average level to be expected.

2016-18: Extraordinary absence of major losses

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SUMMARY CASUALTY TRENDS – FREQUENCY

- **Total loss frequency**
  - Long-term positive trend
  - Stabilizing around the probably minimum achievable level.
  - Result of increased focus on safety measures?

- **Overall claims frequency**
  - Long-term positive trend. Low volatility since 2012, stabilizing around 23%.

- **Major loss frequency (costly casualties)**
  - In 2019 back to ‘normal’ level after three years with extraordinary few major losses

- **Influencing factors**
  - Vessel utilization (type of trade, overcapacity, maintenance, lay-ups, activity in ports /congested areas
  - Vessel age and size
  - Changes in underlying risk
  - Insurer deductibles (higher deductibles = less claims reported)
  - Cost of repairs and exchange rates (repairs often paid in other currencies than USD)
SUMMARY CASUALTY TRENDS – COST

• Major losses (= costly casualties)
  - Impact in 2019 back to expected average level after three extraordinary benign years
  - Increasing volatility (random occurrence in any one year) and increasing cost of single casualties (increasing vessel sizes, more complex high-value objects)
  - Strong influence on the cost also in years with few major losses: The 1% most expensive claims account for minimum 30% of the claim cost in any year.

• Claim cost per vessel / repair cost:
  - Stabilization at modest level in recent years.
  - Some increase in 2019 compared to previous three years due to major loss impact

• Cost drivers
  - Steel price, USD exchange rate impacts statistics (repairs often paid in other currencies than USD), Labour cost, Maintenance routines, …

Check all hull claims trends at cefor.no/statistics/nomis/2019/nomis-as-of-31-december-2019/
CLAIMS FREQUENCY VERSUS VESSEL SPEED
CLAIMS FREQUENCY AND AVERAGE VESSEL SPEED SHOW PARALLEL DEVELOPMENT SINCE 2008
BULK, CONTAINER, TANK, INDEX 2008 = 100%, CLAIMS FREQUENCY = 2-YEAR AVERAGE

The parallel development is no proof of a causal relation, but a strong indicator of a possible correlation between vessel speed and claims frequency.

Complete analysis at: cefor.no/globalassets/documen
ts/statistics/nomis/2019/2020--
--claims-frequency-versus-
vessel-speed.pdf

Data sources:
Speed indices: Clarksons Research, annual time series
Claims frequency: Nordic Marine Insurance Statistics (Cefor)
THE GEOGRAPHY OF CLAIMS
MOST CASUALTIES HAPPEN WHERE YOU EXPECT THEM TO HAPPEN (SHORELINES, HIGH TRAFFIC AREAS)

Data analysed:

Geographic coordinates (longitude, latitude) of casualties reported into NoMIS database for the years 2017 to 2019.
SEASONALITY IMPACT:
MORE CASUALTIES IN NORTHERN LATITUDES IN WINTER

Few casualties in southern latitudes reflect that few vessels sail in extreme southern latitudes /Antarctica (summer only).
Restricted areas under Nordic Plan insurance conditions.

Legend:
- January-March
- April-June
- July-September
- October-December
INCREASE IN CASUALTIES ON MISSISSIPPI AND PARANÁ RIVER BETWEEN 2017 AND 2019

Red columns: Increase
Green columns: Reduction in number of casualties

New casualty on Mississippi also in 1st quarter 2020.
SUMMARY GEOGRAPHIC IMPACT ON CLAIMS

• Analysis of geographic coordinates (longitude, latitude) of claims reported into NoMIS database for years 2017 to 2019.

• Effect of seasonality verified:
  More claims in winter months in northern latitudes, especially January to March.

• Increase in number of claims on Mississippi and Parana river in 2019.
  - Exceptional high water levels (flooding) in Mississippi.
  - Exceptional low water levels in Parana.
  - Also in 1\textsuperscript{st} quarter 2020 new casualty on Mississippi river.

Check complete analysis at:
THE FIRE CHALLENGE – CONTAINERS ET AL.
FIRE FREQUENCY (ALL VESSEL TYPES):
NO DOWNWARD TREND AS FOR OTHER CASUALTY TYPES
CLAIMS FREQUENCY OF ALL CLAIMS VERSUS FIRES/EXPLOSIONS, CLAIMS > USD 500,000
HIGHEST FIRE FREQUENCY (CARGO VESSELS):
MEDIUM-SIZED CAR/RORO AND LARGE CONTAINER VESSELS

FIRE FREQUENCY BY VESSEL TYPE AND SIZE BANDS (GROSS TONS), 2010-2019

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CONTAINER VESSELS: INCREASING NUMBER OF FIRES ON LARGE VESSELS
(NB: SOME RELATION TO INCREASING NUMBER OF LARGE CONTAINER VESSELS IN WORLD FLEET)
CONTAINER VESSELS: UPWARD TREND IN FIRE FREQUENCY ON LARGE VESSELS
FIRE CLAIM COST PER VESSEL (USD)

All fires/explosions on container vessels (engine room and other areas)

Fires/explosions starting in the cargo area (in a container)

2019: Increased claim cost per vessel from fires starting in cargo area.
SUMMARY FIRES

• Fire frequency (all vessel types): No downward trend as for other types of casualties.

• Highest fire frequency on
  - Passenger vessels
  - Medium-sized Car carriers / RoRo vessels (NB: there are few large Car/RoRo vessels)
  - Large container vessels

• Container vessels:
  - Upward trend in fire frequency on large container vessels.
  - Increasing impact on claim cost by fires starting in cargo area (in a container).
  - The larger the container vessel, the higher the probability of a fire in the cargo area:
    The more containers on board, the higher the probability that at least one container contains
    dangerous cargo that may self-ignite.
  - Misdeclaration of cargo a concern (containers with dangerous cargo stored in wrong area)
  - Fires in cargo area difficult to extinguish. Fire-fighting in cargo area more challenging than for engine
    room fires and poses a high risk to the crew.
  - New fire on container vessel reported 1st quarter 2020.

TRENDS PUBLISHED BY CEFOR IN THE FOLLOWING PUBLICATIONS:

Published 2 April 2020
NOMIS HULL TRENDS @ CEFOR.NO/STATISTICS/NOMIS

NoMIS trends per Dec. 2019
THANK YOU
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