SUPERVISION ALLOCATION REPORT

Which Insurance Firms require more supervision.

APRIL 16, 2023

BANK OF ENGLAND

Introduction:

The insurance industry provides protection against a wide range of risks for individuals and businesses alike. The purpose of this report is to analyze data from 350 insurance companies between 2016 and 2020 and determine which firms require additional supervision based on their size, growth, risk, and outliers. To achieve this, we will use a range of metrics for each firm, including NWP, SCR, SCR coverage ratio, GWP, equity, Best Estimate Liability and other metrics related to underwriting insurance policies.

Through our analysis of this data, we aim to identify key trends and patterns that can help our Supervision manager make informed decisions about which firms require additional supervision. By doing so, we hope to contribute to a more stable and sustainable insurance industry that benefits both consumers and insurers.

Pre-processing:

To begin with I used the rule that if a firm didn't write any policies, The Gross expense ratio was 0 and no claims were incurred in between 2018 and 2020, it is safe to assume that these Firms are no longer active. The following firms lie under this category and were removed from further analysis:

Firm 1	Firm 103	Firm 109	Firm 117	Firm 119	Firm 128	Firm 140	Firm 147	Firm 16	Firm 168
Firm 172	Firm 176	Firm 20	Firm 232	Firm 252	Firm 257	Firm 269	Firm 271	Firm 293	Firm 310
Firm 312	Firm 320	Firm 323	Firm 43	Firm 67	Firm 98				

Methodology:

As instructed supervisory resources must be allocated based on the following factors:

1. **<u>Firm Size:</u>** As bigger firms need more attention. We have assessed how much of the **<u>market share</u>** each firm is responsible for. This was <u>measured using the Gross Written Premium of all firms between 2016 and 2020</u>. This allows us to understand which firms may need more supervision.

2. **<u>Measures of Risk:</u>**
   a. **<u>Underwriting Risk:</u>** Refers to the risk that an insurer will experience losses due to the pricing and selection of insurance policies. For this we used the 'Net Combined Ratio' which is derived using 'Pure Net Claims ratio' and 'Net Expense Ratio.'
      i. <u>A combined ratio above 100% indicates that a firm is paying out more in claims and expenses than it is earning in premiums.</u>

b. **Liquidity Risk:** Inadequate liquidity can lead to financial distress, reduced investor confidence, and even bankruptcy. 'Eligible Own Funds for SCR' is divided by the 'Solvency Capital requirement' to get a 'SCR coverage ratio.'
   i. If the 'SCR coverage ratio' is less than 100% that means the company may not be able to meet its obligations due to a lack of cash or easily sellable assets.

3. **Changing business profile:** We calculated the year-on-year percent change of various metrics such as 'NWP', 'SCR', 'Net BEL'. These percentages can be compared across all firms to identify which firms are experiencing the largest changes in their business.

Results:

Firm Size:

In the ipynb I have given each firm a rank based on its market share. 25 of the 299 firms marked account for 81.7% of the total Market share. These are shown below with Firms mentioned in the Legend of Figure1.

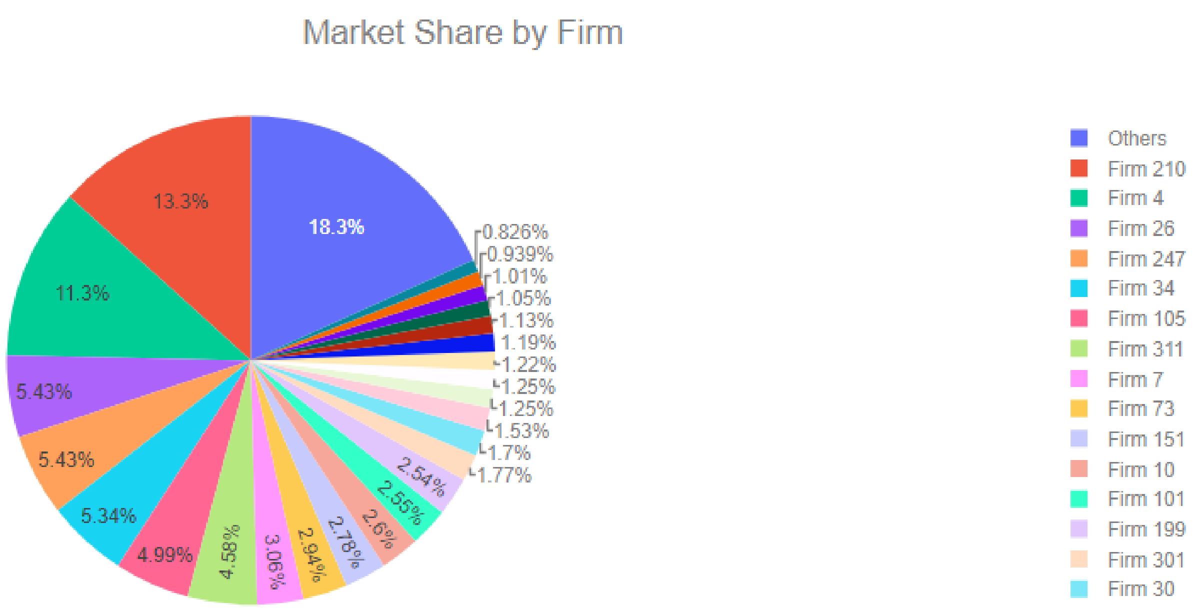

Figure 1 Firm Market Share

Underwriting Risk:

For each Year we look at each firm to see if the 'Net Combined Ratio' is greater than 1. I also aggregated the sum for when the NCR is higher than 1. This allows us to see how consistently a firm has had Underwriting Risk.

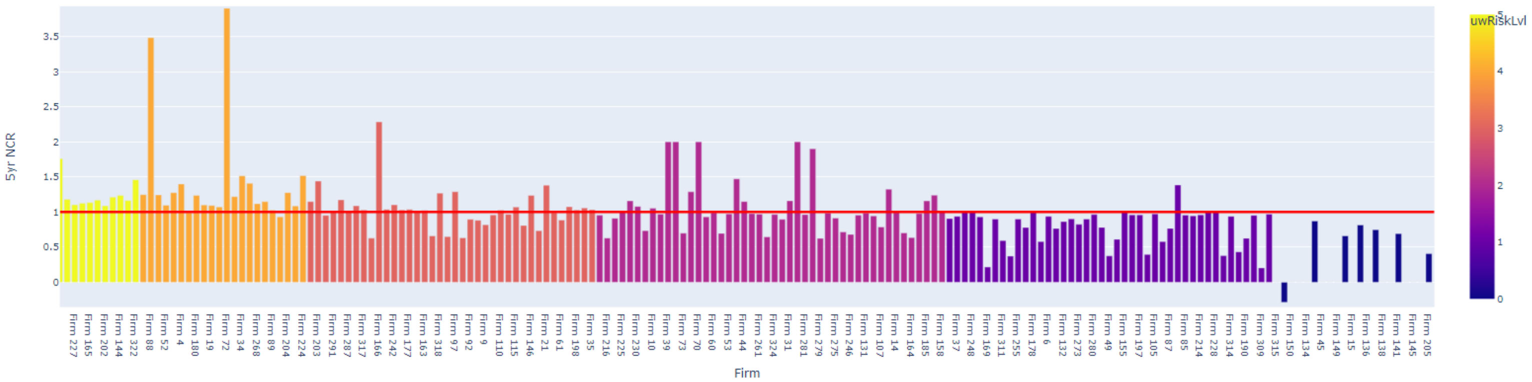

Figure 2: Mean NCR colour coded by how consistently the Firm has had Underwriting Risk

We can see from the graph above that all firms that have had consistent 5-year Underwriting risk have their mean NCR over 100%. We observed that these firms are at a higher risk.

Table 1: Firms with consistent 5-year Underwriting Risk and 4-years of risk respectively

Firm	5yr NCR	years at Risk
Firm 316	1.758409	5
Firm 114	1.178485	5
Firm 227	1.101359	5
Firm 241	1.125222	5
Firm 165	1.132607	5
Firm 75	1.1681	5
Firm 202	1.087082	5
Firm 40	1.211135	5
Firm 144	1.235389	5
Firm 118	1.162754	5
Firm 322	1.459234	5

Firm	5yr NCR	years at Risk
Firm 183	1.246272	4
Firm 88	3.482933	4
Firm 5	1.243724	4
Firm 52	1.095221	4
Firm 137	1.275076	4
Firm 4	1.39856	4
Firm 249	0.988729	4
Firm 180	1.236096	4
Firm 286	1.100351	4
Firm 19	1.092254	4
Firm 305	1.071922	4
Firm 72	3.9	4
Firm 94	1.219115	4
Firm 34	1.514595	4
Firm 239	1.407303	4
Firm 268	1.117899	4
Firm 116	1.147048	4
Firm 89	1.023551	4
Firm 171	0.930768	4
Firm 204	1.27644	4
Firm 86	1.086111	4
Firm 224	1.516971	4

These firms would need more supervision regarding pricing of the policies that they are offering and their expenses could be audited to see if they could be reduced.

Liquidity Risk:

The mean SCR ratio of each firm was calculated for the period between 2016 to 2020. A firm faces liquidity risk when the SCR ratio is less than 100%. Firms were categorized as ‘High Risk’ if the SCR ratio is under 100%. ‘Low Risk’ if the SCR ratio is between 100 and 140% and ‘Safe’ if the ratio is higher.

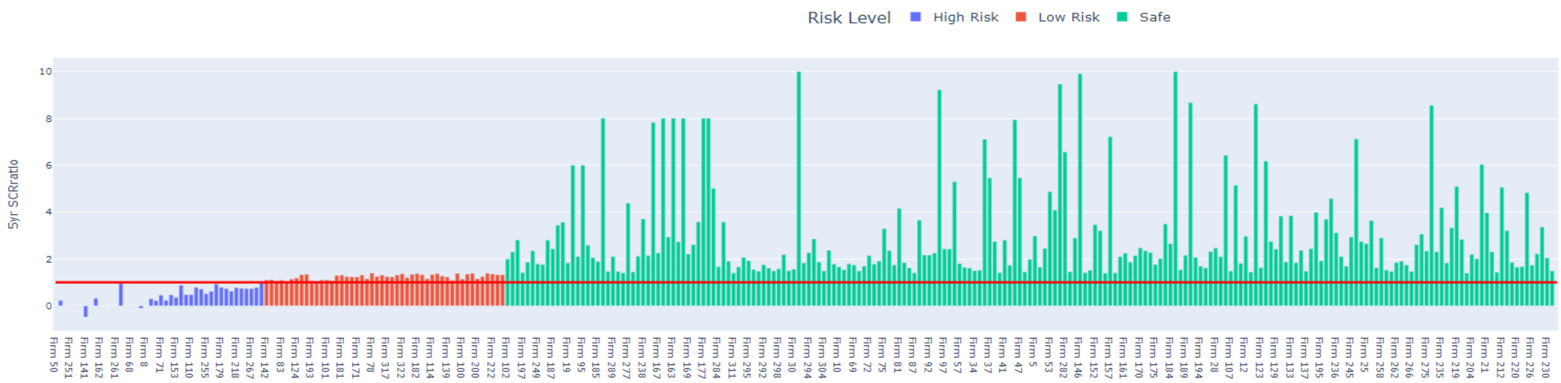

Figure 3: 5-year mean Solvency Capital Requirement coverage ratio by Firm with Risk Level identified by colour.

Table 2 List of Firms that have High Liquidity Risk

Firm	5yr SCRratic	Risk Leve
Firm 64	0.230486712	High Risk
Firm 141	-0.475162757	High Risk
Firm 213	0.323304596	High Risk
Firm 148	0.963128141	High Risk
Firm 225	-0.098014498	High Risk
Firm 160	0.300527502	High Risk
Firm 84	0.21946673	High Risk
Firm 71	0.458874721	High Risk
Firm 79	0.23586235	High Risk
Firm 256	0.468344635	High Risk
Firm 153	0.360635505	High Risk
Firm 215	0.879994056	High Risk
Firm 202	0.481380298	High Risk
Firm 110	0.480715215	High Risk
Firm 90	0.791602061	High Risk
Firm 207	0.715294437	High Risk
Firm 255	0.516962166	High Risk
Firm 60	0.622820028	High Risk
Firm 154	0.936494216	High Risk
Firm 179	0.791386814	High Risk
Firm 38	0.738920358	High Risk
Firm 183	0.624150502	High Risk
Firm 218	0.778154073	High Risk
Firm 32	0.747665718	High Risk
Firm 91	0.73569451	High Risk
Firm 267	0.741475623	High Risk
Firm 132	0.777691995	High Risk
Firm 121	0.992653119	High Risk

Table 2 has list of all firms that have had a consistently high liquidity Risk and may require more supervision to improve the situation.

Upon inspection those Firms that had zero ‘5yr SCR ratio’ it seems that these firms don’t have any GWP or SCR numbers however they still have Gross claims incurred in the time period therefore these firms are still being considered active and further investigation is required to determine the status of these firms.

Changing Business profile:

The change in Equity and SCR for each firm was calculated year on year. This was to observe which firms have a volatile business profile. This is hard to visualize on one graph for all firms so the firms with some of the largest percentage change are visualized in the Line Charts below.

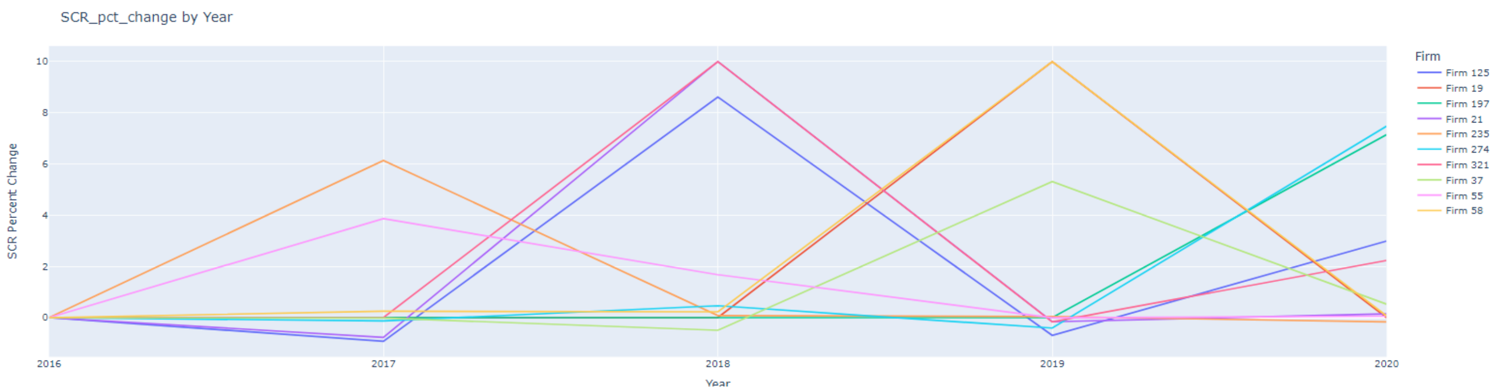

Figure 4: Percentage Change of Solvency Capital Requirement for firms that saw the most drastic year on year changes.

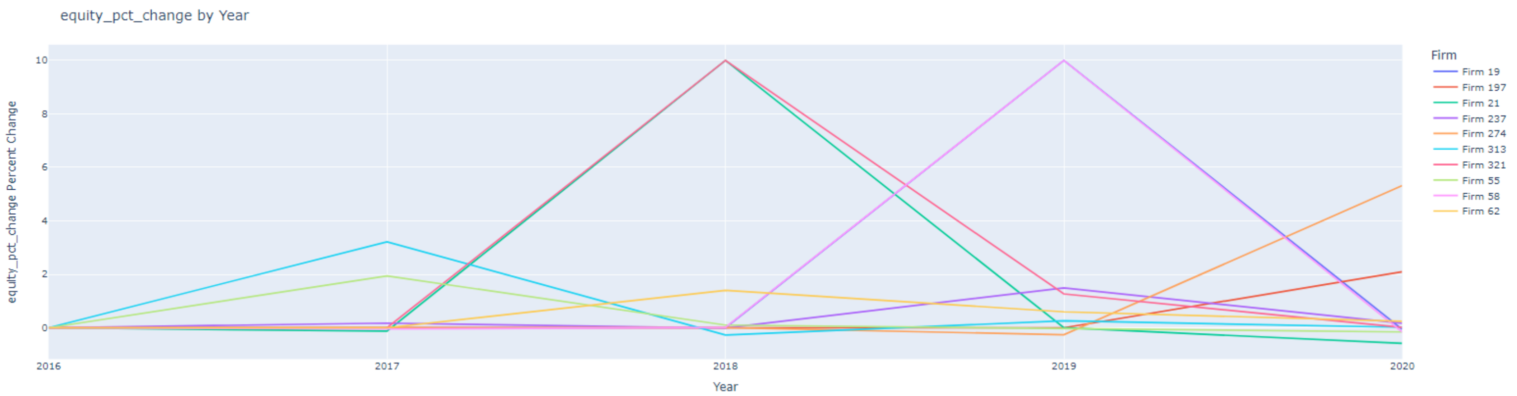

Figure 5: Percentage Change of Equity for firms that saw the most drastic year on year changes.

We can see from these graphs in Figure 4& 5 the top 10 firms which were most volatile to year-on-year change in terms of SCR and Equity. On top of this we can observe that out of the 14 unique Firms mentioned 6 of them were present in the top 10 of both. (42.8% of firms mentioned above.)

Discussion and Conclusion:

Allocation of supervisors is at the discretion of the Supervision Manager. It would depend on how many resources they would have available and on what criteria they would like to allocate them. We have identified the Firms that would need more resources in terms of Firm Size the top 25 Firms that make up 81.7% of the market share have been identified. Table 1 and 2 identify firms that have high rand consistent Underwriting and Liquidity Risks. The Legends from Figure 4 and 5 identify some of the most volatile Firms that may need more careful supervision.

It would be my recommendation to attach more experienced supervisors to such firms where the metrics need to be stabilized as this would be a more complicated matter to solve.

I have included an Excel with all my findings and Rankings for the Supervision Manager to go through.