Aalto University

School of Science

MS-E2177
Seminar on Case Studies in Operations Research

**Interim Report**

# Expert Judgements in Commercial Real Estate Loan Collateral Valuation

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# 1 Changes in scope and objectives

## 1.1 Elicitation methods

We initially considered either Cooke's method or the Delphi method. We were leaning toward Cooke's method, as we felt it was the most scientifically rigorous in testing how well experts make predictions before assigning weights to their estimates. Our second preference was the Delphi method. However, we did not to commit early and instead searched for additional elicitation methods.

The Delphi method is comprehensive and aims to have a panel of experts reach a consensus on their estimates. It involves several rounds of elicitation, where experts discuss their estimates and the reasoning behind them after each round. The method is fairly effective—in 11 out of 15 studies using it, experts produced accurate estimates [2]. However, it is also time-consuming. Since our client expressed a preference for a method that does not take up too much time, we concluded that the Delphi method was not suitable for the task.

Cooke's method is considered the most statistically advanced approach. Typical panel sizes range from 5 to 20 experts, and we were told our panel would consist of 5 experts, which is on the lower end of that range. A review of 33 studies using Cooke's method found that only 87 out of 322 experts had statistical accuracy greater than 0.05, and 20 percent of the studies had no statistically accurate experts at all. Given our relatively small panel size, we considered it possible that we might end up with no statistically accurate experts.

The third method we examined was the IDEA protocol [1], which we ultimately decided to use. It is similar to the Delphi method but involves only two elicitation rounds. Unlike the Delphi method, the IDEA protocol does not require experts to reach a consensus. In the first round, experts provide their estimates and possibly their reasoning. This is followed by a discussion phase. In the final round, experts may revise their estimates based on the discussion or keep them unchanged. The estimates are then aggregated using simple or weighted averages.

## 1.2 Simulated data

Throughout the project, the simulated dataset is central in identifying the relationships between risk drivers and their respective influence on the liquidation value of CRE collateral. Because the recovery ratio is sensitive to how risk drivers are varied jointly, not just individually, the combinatorial structure of the scenario design has a direct bearing on the reliability of the elicited haircut estimates. A rigorous and defensible process for risk drivers across scenarios is therefore required additional research and consultation with the client. Following these discussions, the construction of the simulated dataset has been deferred until a structured scenario design, one that controls for factor covariation and supports the identification of individual driver effects, has been established and agreed upon.

# 2 Updated schedule

Figure 1 shows the updated project schedule. Creating the questionnaire is more difficult than anticipated, delaying the testing phase. It was also noted by the client that the project can be done without data, and no real estate portfolio data is given for the project.

Overall, only minor changes were made to the schedule, mainly to better correspond with the fact that we split responsibilities to elicitation method and risk driver teams. The former is responsible for coming up with testing methodologies and the latter determines the variables which need to be tested.

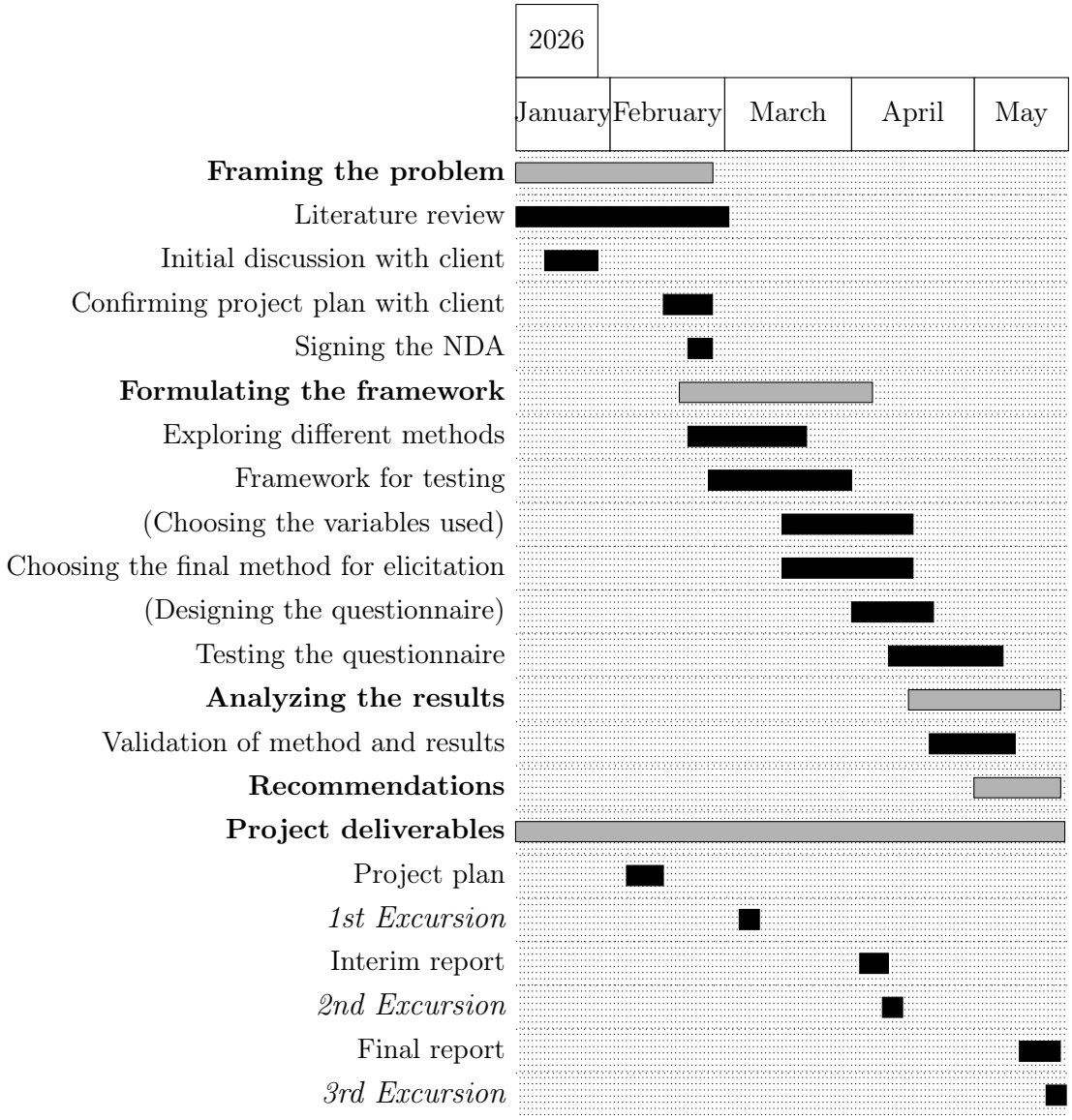


Figure 1: Updated project schedule, new tasks are in parenthesis ().

# 3 Risks

While the risk-profile of this project has not changed significantly, one correction is made to the previous. Through our discussions and meetings with the client, we now understand the problem with great precision. Therefore the likelihood of risk 1) from "medium" to "low" is made. Table 1 illustrates the updated risk-profile of this project.

| **Risk** | **Likelihood** | **Impact** | **Effect** | **Mitigation** |
|---|---|---|---|---|
| 1) Not understanding the actual problem or research question | Low | High | Outcome of our work does not meet the needs of the client. Our work is redundant. | In every meeting with the client, present our approach and validate that we approach the correct problem. |
| 2) Communication with the client is not sufficient. | Low | High | Increased risk of redundant work as by risk 1). | In addition to the project manager, all group members stay active in initiating conversation with the client. |
| 3) Falling behind schedule. | Low | High | Work is not submitted in time. | Collaborative responsibility within the group. Proper allocation of tasks and ownership on those tasks. |
| 4) Inactive or non-reliable project team members. | Low | Medium to High | Heavily increases the work load of the rest of the group. Decreased quality of work. | Truthful and continuous communication within the group. Fair allocation of work. |
| 5) Overly ambitious goals and scope | Medium | Medium | Overwhelming workload, resulting in chaotic and non-generalizable results. | Communication within the team and client. Analyzing the achievability of approaches. |

Table 1: Risk assessment table.

# References

[1] Victoria Hemming et al. "A practical guide to structured expert elicitation using the IDEA protocol". In: *Methods in Ecology and Evolution* 9.1 (2018), pp. 169–180.

[2] Gene Rowe and George Wright. "The Delphi technique as a forecasting tool: issues and analysis". In: *International Journal of Forecasting* 15.4 (1999), pp. 353–375. ISSN: 0169-2070. DOI: https://doi.org/10.1016/S0169-2070(99)00018-7. URL: https://www.sciencedirect.com/science/article/pii/S0169207099000187.