



**Sampo Pankki**

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# **Optimization of variable proportion portfolio insurance strategy**

**Interim Report**

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## 1. Project Status

The project is proceeding with a decent speed, but little bit behind the planned schedule. The literature review is almost completed and took more man hours than was predicted because it was necessary to include much more research than it was planned. The literature review now consists of overview of few relevant insurance strategies that provides a good starting-point for further research and a theoretical framework for VPPI and also review of a gap risk. The gap risk is a risk that an investment's price will change from one level to another with no trading in between. Usually such movements occur when there are adverse news announcements, which can cause a stock price to drop substantially from the previous day's closing price [1]. Updated project schedule is presented in table 1.

**Table 1:** Updated project schedule.

Phase #	Activity	Week													
		5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Project Planning	█													
	Project Definition	█													
2	Literature Familiarization	█													
	Literature Discussions	█													
3	Problem Identification	█													
	Model Development								█						
	Model Testing								█						
	Conclusions								█						
4	Interim Reporting	█													
	Final Reporting	█													

In table 1 the red crosses indicates no development and the darkened/softened areas indicate rescheduling. Because of the delay of the literature research the model development and testing is behind the schedule. Despite the delays, the project can be assumed to be concluded in time but there is no excess time buffer available for unexpected future delays. The literature review was delayed because of the underestimated work load and inefficient distribution of tasks.

In model development we have completed first version. Next tasks are to find out what kind of results is preferred and how the performance of the strategy is measured.

The model development activity can be divided into following problems:

- *What kind of data should be used, simulated/real data?*
  - *What parameters,  $\mu$  &  $\sigma$ , should be used to simulate data?*
- *How the performance of the strategy should be measured?*
- *How to apply multiplier and rebalancing restrictions?*

## **2. Project Goals**

The project main target is to maximize the expected return by optimizing the multiplier and the rebalancing frequency. As it might be difficult to optimize those simultaneously we first focus on the multiplier. The multiplier is planned to optimize with simulated data, normally distributed stock returns with reasonable  $\mu$  &  $\sigma$ . Model back testing will be done with real data provided by assignment company Sampo Pankki.

Because of the lack of available literature concerning variable multiplier strategy, the outcome of the optimization is almost entirely dependent on project team's competence. Therefore it is reasonable to keep the optimization relatively simple in order to acquire sensible results.

## **3. Updated Risk Assessment**

Project planning can be seen as not realizing as expected. Time has been spent more than planned on all the tasks. Especially, the model development is lacking behind from scheduled. Therefore, time available for model testing and analysis will be the main limiting factor during the latter half of the project. This will be further enhanced due to vacations and new commitments of team members.

Preventive actions will be taken and available man hours will be fully utilized. To avoid future delays the tasks should be divided more evenly. Some of the tasks will be re-allocated to vacant project team members. As the model is still unfinished, a question remains on how long it will take to run enough test data and assess the model's robustness. Updated risk matrix is presented in table 2. The risk "the project outcome doesn't satisfy the case company" is updated to have "low" probability.

**Table 2:** Updated project risk matrix

Risk	Probability	Impact	Preventive action
The scope of the project becomes unmanageable.			- Clear formulation of the project objective and monitoring of the mile stones reached.
Shortage of resources (Time and special skills).			- Jointly agreed allocation of resources and careful planning. - Monitoring of progress.
The model is poorly chosen.			- Continuous communication with the case company at and between the project mile stones. - Extensive literature study and communication with the course personnel.
The data is analyzed faultily.			- Continuous communication with the case company at and between the project mile stones. - Extensive literature study.
The project outcome doesn't satisfy the case company.			- Continuous communication with the case company to identify deviations from the objectives early on.

○ None    ◐ Low    ◑ Medium    ◒ High    ● Very High

## 4. References

[1] Investopedia, "Gap risk"

<http://www.investopedia.com/terms/g/gaprisk.asp>