Capstone Workshop Program

Columbia University School of International and Public Affairs

Terms of Reference (TOR)

Between

*[Quaternion Risk Management Ltd.,] [Project Director –Donal Galligar]*

and

*[SIPA Capstone Workshop Faculty Advisor –Sharyn O’Halloran]*

**Project Title:**   
**Client Organization:** Quaternion Risk Management Ltd.,

**Client Website: https://www.quaternion.com/**

**Client Project Director and Contact Information:**

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**Background:**

Quaternion Risk Management Ltd was founded in 2010 by three senior banking professionals with extensive capital markets experience. It is an Irish registered company and incorporates Eudaemon Consulting Ltd which was founded in early 2008.

**Objective:**

*[Please briefly present a clear, concise statement of the problem/issue to be addressed.]*

* How much IM is currently posted in total in the world's finance system? What options do we have in principal to estimate this quantity?
* Can we forecast how this total IM is going to change in the future?
* Can we get an overview of the IM posted between the largest banks (bilaterally or through clearing houses)? Can we use this as a metric for systemic risk?
* If we can use this as a metric for systemic risk, can we find a way to reduce the total amount of IM without substantially increasing the risk measured in this metric?
* How would this picture of systemic risk in terms of IM differ from the picture we get by CVA?

**Tasks:**

*[To the extent known, please briefly outline the major steps of the project (e.g., research, field study, analysis) that will be required.]*

* run concrete examples of collateralized exposure calculations in ORE, for instance IR Swaps with/without collateral
* play a bit with the parameters to get a feeling for this
* A small implementation project around dashboard **(optional)**
* Programming languages: Python/Jupyter **(only necessary for previous item)**

**Deliverables and timetable:**

*[The basic deliverables usually include a detailed work plan; draft report outline; draft report; final report; and presentation of key findings and recommendations either at the Client’s office or at SIPA in April/May 2017. Please list these and any other deliverables with estimated due dates.]*

* Student learns about derivatives, collateral, counterparty exposure
* Student (if interested/capable) develops and adds to open source risk
* Start quantitative investigate of systemic linkages in the financial system

General Timeline:

• Detailed work plan: first week of February, 2017

• Draft report outline: First week of March, 2017

• Draft report: Mid-April, 2017

• Presentation of key findings: End of April, 2017

• Final report: First week of May, 2017

**Preferred Qualifications:**

*[Please list the preferred qualifications of the student team working on this assignment, including language proficiency, country or regional experience, technical expertise, research skills, or other specialized experience and knowledge]*

**Logistics:**

*[List the specific support and resources required, and responsibilities of each of the parties or agencies involved in the TOR. For example, what is the expected availability of the client (how frequently, via phone or in person)? Will students be required to travel outside of New York City for this project? If so, please contact Suzanne Hollmann, Capstone Program Director at* [*suzanne.hollmann@sipa.columbia.edu*](mailto:suzanne.hollmann@sipa.columbia.edu) *– in nearly all situations, SIPA will ask the client organization to cover travel expenses.]*