Financial Markets Law Committee ("FMLC")

Finance and Technology Scoping Forum

Date: Thursday 8 February 2018

Time: 2.00pm to 3.20pm

Location: Bank of England, Threadneedle Street, London, EC2R 8AH

In Attendance:

Nina Moffatt (Chair)	Baker McKenzie LLP
Antony Beaves	Bank of England
Cat Dankos	Herbert Smith Freehills LLP
Jonathan Gilmour	Travers Smith LLP
Andrew Harvey	Global Financial Markets Association
Carolyn Jackson	Katten Muchin Rosenman UK LLP
Sarah Lewis	Cleary Gottlieb Steen & Hamilton LLP
Lewis Liu	Eigen Technologies
Matthew Nyman	Clear Funding
Barnabas Reynolds	Shearman & Sterling LLP
Ian Stevens	CMS Cameron McKenna Nabarro Olswang LLP
Simon Wright	Dechert LLP
Oliver Yaros	Mayer Brown International LLP
Juliana Franco	FMLC
Venessa Parekh	FMLC
Thomas Willett	FMLC

Guest Speakers:

Gavin Lee	CME Group

Regrets:

John Casanova	Sidley Austin LLP
Peter Chapman	Clifford Chance LLP
Simon Evers	Crowell & Moring
Scott Farrell	King & Wood Mallesons
Monica Gogna	Dechert LLP
Richard Hay	Linklaters LLP

Mark Kalderon	Freshfields Bruckhaus Deringer LLP
Lewis Lee	CLS Services Ltd.
Helen McGrath	Davis Polk & Wardwell LLP
Penny Miller	Simmons & Simmons LLP
Simon Puleston Jones	FIA
Deborah Sabalot	Deborah A. Sabalot Regulatory Consulting
John Salmon	Hogan Lovells International LLP
Adam Sanitt	Norton Rose Fulbright LLP
Phillip Smith	Allen & Overy LLP
John Taylor	Queen Mary University of London
Simon Toms	Allen & Overy LLP
Jeremy Walter	Clifford Chance LLP
Sanjev Warna-kula-suriya	Latham & Watkins

Minutes:

1. Introduction.

1.1. Nina Moffatt opened the meeting and delivered a brief introduction.

2. Administration: a short presentation on the FMLC Radar Function—Revisited (Venessa Parekh)[1]

2.1. Venessa Parekh outlined the remit of the FMLC and its radar function, defined as the manner in which the FMLC identifies appropriate issues to analyse. The function can be broken down into three initiatives: (i) scoping forums; (ii) the relationship management programme; and (iii) radar meetings. She explained that the radar programme guarantees that the FMLC addresses those issues that are of most concern to stakeholders in the financial markets, ensuring that the FMLC's work is current and has impact.[2]

[1] Please see Appendix I below.

[2] If you would like to learn more about the FMLC radar programme, or become involved in one of the three initiatives, please contact Debbie Steen at secretarial@fmlc.org.

3. CME Bitcoin Futures (Gavin Lee)

3.1. Gavin Lee began his talk on CME Bitcoin futures by introducing CME as the largest, most diverse global derivatives exchange that offers a wide range of benchmark products.

3.2. Mr Lee drew attention to the size of the digital asset landscape made up of more than 1500 cryptocurrencies. CME launched its virtual currency reference rate using Bitcoin because Bitcoin represents 34% of the total cryptocurrency market capitalisation, is traded across a variety of fragmented exchanges leading to a holistic market picture and trades against the U.S. dollar.

3.3. Mr Lee also highlighted that Bitcoin is highly attractive to investors because of the following factors:

i. Bitcoin is decentralised, portable, divisible and resistant to counterfeiting;

ii. it is the most liquid of all cryptocurrencies;

iii. the evolving adoption of Bitcoin by institutions; and

iv. exchange between Bitcoin and fiat currency is becoming increasingly liquid.

3.4. In what is currently a fragmented market, Mr Lee articulated that CME looked to create an index where a reliable price for Bitcoin can be found. Its first priority was to establish a reliable source of pricing by creating a Bitcoin reference rate ("**BRR**") in November 2016 in partnership with Crypto Facilities Ltd. The BRR represents the aggregate trade flow of major Bitcoin spot exchanges during a specific calculation window into a once per day reference rate of the U.S. dollar price of Bitcoin.

3.5. Mr Lee then provided an overview of the methodology behind the BRR. He emphasised that the methodology and rules are focused on maximising transparency in accordance with International Organisation of Securities Commissions ("**IOSCO**") principles and that the methodology was designed to be robust and resistant to manipulation. In particular, Mr Lee articulated how using a volume-weighted median price reduces the effect of outlier prices on one or more exchanges and filters out high numbers of small trades. Similarly, employing five-minute intervals when consolidating the trade book helps combat manipulation.

3.6. At this point, one Forum member asked for the reason behind the time frame of 3.00pm to 4.00pm for partitioning the consolidated trade book. Mr Lee explained that different

times were originally considered, and that the chosen time period presented a reasonable time based on the flow of transactions.

3.7. A second question was asked about whether the Bitcoin futures mimicked the language of "spot" futures. A short discussion ensued on the classification of Bitcoin as an asset, a commodity or a financial instrument.

3.8. Mr Lee continued by drawing attention to a frequently asked question about why CME had chosen to launch Bitcoin futures. He explained that regulated exchange-traded Bitcoin futures are attractive to digital asset traders and hedgers because they offer the ability to manage risk more efficiently. While concentrating on a target market of institutional investors, CME found that the demand to gain exposure to Bitcoin was evident, but institutions were not confident to begin trading in an unregulated market. In addition, a multi-billion dollar ecosystem has started to grow in Bitcoin with companies accepting the virtual currency as a form of payment. A futures contract could help manage risk of a volatile spot market.

3.9. Here, one participant asked whether a Bitcoin price drop will change the composition of the target market. Mr Lee responded by stating that five Bitcoin contract unit currently is in place based on our target market.

3.10. Mr Lee concluded his talk by outlining some of the CME Bitcoin futures contract specifications. One particular aspect discussed was the price limits, wherein there is a price limit of 20% above or below the reference price, in addition to circuit breaker limits equal to 7% above or below the reference price and 13% above or below the reference price apply. Trading will not be permitted outside of the 20% range above or below the reference price.

3.11. When opened to questions, one Forum member asked if the customers differ from that of regular currency futures. Mr Lee responded by stating that they did not; although, some firms are more cautious when it comes to Bitcoin futures and may decide not to participate.

3.12. Lastly, one participant queried the effect on the market of a reduction in the supply of Bitcoin as mining the cryptocurrency becomes increasingly difficult. Mr Lee explained that only 21 million coins can be in circulation. Mining is one aspect of how the "validators" are compensated. As coins become difficult to mine, the underlying price of the bitcoin will reflect this.

4. AI and the Qualitative Data Revolution (Lewis Liu)[3]

4.1. Lewis Liu began his talk by introducing Eigen Technologies, a research-led artificial intelligence ("**AI**") company which provides products that make qualitative data as easy to analyse and deploy as numerical data.

4.2. Mr Liu then defined the concept of big data AI as AI that takes massive amounts of data input and formulates deductive references and patterns of logic. At present, such technology is able to process extremely large data sets and analyse quantitative data to provide services such as language translation, speech recognition, image tagging, targeted online advertising and some types of digital security. This technology, however, struggles with the analysis of qualitative data, understanding of language, recognising similarities, training on limited data sets, dealing with poor quality inputs, ease of use by non-technical people and identifying subtle, nuanced differences. Mr Liu stressed that we are still a very long way from general AI.

4.3. Despite this, Mr Liu explained that improvements in AI are being made, with companies focusing on creating better data, new mathematics, more powerful computing and better algorithms. Next, he emphasised that the amount of data being created roughly doubles every two years; only 0.5% of this data, however, has been analysed owing to the difficulty in analysing qualitative data. Mr Liu articulated that finding a way to analyse text in a manner similar to numbers would precipitate a powerful data revolution which will increase transparency and decrease costs.

4.4. Mr Liu then drew attention to the collapse of Lehman Brothers in 2008. The Lehman's bankruptcy filing was the largest in history with $639 billion in assets and $619 billion in debt. At this juncture, data analysis could not help predict the domino effect of bailing out the investment bank. Ten years later, if the qualitative data revolution is successful, a regulator will have complete transparency from an institution and will be able to analyse qualitative data like contract terms so as to quickly and accurately inform their decisions.

4.5. When opened to the Forum members for questions, one participant emphasised that many financial institutions are aware that their data is out of date, and queried whether big data AI will give the right answer and if the regulators will accept that answer. Mr Liu responded by stating that there is currently lot of scepticism when it comes to data and AI, with machines penalised a lot more for small mistakes compared to humans.

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[3] Please see Appendix II below.

4.6. Another member asked how words can be translated into quantitative data. Mr Liu explained the process in three stages:

i. in the first instance, the basic word features are analysed by the computer to deduce whether the words used are nouns, verbs etc;

ii. the next level requires the computer to build out meanings from these words as mandatory;

iii. then, if the sentence sits within a broader context, shifted meaning systems can be constructed: for example, systems of language in a legal contract, to make sense of the sentence.

4.7. Lastly, one participant asked what kinds of data are more susceptible to being analysed. Mr Liu stated that it depends on how accurate you want the answers to be. The more homogenous the data, the more learning is needed for the system to make accurate conclusions.

5. Update on FMLC Working Groups

5.1. A brief update of current FMLC Working Groups was delivered to the group. Ms Parekh explained how the DLT Governing Law and Jurisdiction paper was being reviewed by the Secretariat and would soon be sent to the Working Group for their review and sign off. She also mentioned that a new Working Group exploring the legal characterisation of initial coin offerings ("**ICOs**") has been established and Forum members were asked to express their interest if they wish to join.[4]

5.2. Juliana Franco then provided an update on the Execution of Documents Working Group for which a preliminary draft paper has been put together. A meeting has been organised to agree next steps and to distribute work.[5]

6. Any other business.

6.1. No other business was raised.

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[4] For further information regarding the ICOs Working Group, please contact Jennifer Enwezor at projects@fmlc.org.

[5] For further information regarding the Execution of Documents Working Group, please contact Juliana Franco at legalanalysis@fmlc.org.

The FMLC Radar Function: *revisited*

Venessa Parekh, Research Manager

FMLC Remit

"The role of the Financial Markets Law Committee (the "FMLC" or the "Committee") is to identify issues of legal uncertainty, or misunderstanding, present and future, in the framework of the wholesale financial markets which might give rise to material risks, and to consider how such issues should be addressed."

FMLC Foundational Documents, September 2002

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FMLC Mission

- According to the remit, the FMLC has a tripartite mission:
  - to identify relevant issues (the **radar** function);
  - to consider such issues (the **research** function); and
  - to address such issues (the **public education** function).
- The **radar function** relies on the FMLC's **scoping forums** and other horizon-scanning, advisory bodies. It also relies on a **relationship management programme** which the FMLC Secretariat maintains with Patrons and Stakeholders.
- The **research function** is addressed by the FMLC Secretariat and by highly-focused working groups who work to draft papers and correspondence on behalf of the FMLC.
- The **public education function** is furthered when the FMLC publishes these letters and papers. It is also addressed by the regular programme of events organised by the FMLC Secretariat, including: roundtables, seminars and conferences. These feature high-profile guest speakers.

Breaking down the radar function

The FMLC's radar function is (broadly) broken down into three initiatives:

1. **Scoping forums**
2. **Relationship management programme;** and
3. **Radar meetings**

Scoping Forums

"Scoping forums serve as an avenue for the FMLC to engage with focus groups on legal issues affecting specific segments of the financial markets.

The forums serve as spaces for discussion of broader issues of legal uncertainty. Members formulate and propose to the FMLC issues considered by them to cause substantive legal uncertainty to their industry."

FMLC Brochure, January 2017

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Scoping forums in practice

- A scoping forum establishes a **pool of expertise** available to the FMLC. That pool can guide the FMLC by **recommending specific issue to the FMLC for analysis**.
- Scoping forum members can make non-binding suggestions as to the manner of the FMLC's engagement and nominate experts for working groups.
- Meetings include presentations from industry experts, individuals with first-hand experience of legal uncertainty and those at the cutting edge of their respective fields.
- Scoping forums discuss all manner of topics, issues and solutions within their sector.
- Not every issue discussed will go on to become an issue adopted by the FMLC. Scoping forums are horizon-scanning bodies and places to share and compare knowledge. They are about **learning and discovery** as much as they are about **identifying specific issues for further consideration.**
- Information about the FMLC's scoping forums—as well as the agenda and minutes of all 2017 meetings—can be found on our website at: **http://www.fmlc.org/scoping-forums.html**

Relationship management

- Another key aspect of the radar function, the FMLC's **relationship management programme**, ensures regular communication and information exchange between the FMLC Secretariat and Patrons, Members or other stakeholders.
- Relationship management calls provide a valuable opportunity for participants to highlight issues—both present and future—for the FMLC to investigate, providing the FMLC with up-to-date and market-relevant information. They also allow the FMLC Secretariat to update Patrons and stakeholders on the Committee's recent work.
- FMLC Patrons have calls monthly. We organise calls with a predetermined list of stakeholders according to their appetite for engagement.
- Monthly relationship management calls normally last around 15 minutes. If you're a Patron who'd like to participate in your firms' monthly call (as an alternate perhaps), or if you'd like to receive a stakeholder call, let us know!

Radar meetings

- FMLC Chief Executive Joanna Perkins regularly meets with financial markets participants to discuss issues of legal complexity.
- These meetings are an excellent opportunity for the exchange of information. Participants can:
  - raise issues of concern or interest in relation to legal complexity, and
  - learn about the FMLC's recent work and insights, get updates on forthcoming publications or—in the case of new contacts—learn more generally about the work and remit of the FMLC.
- Please speak to a member of the Secretariat if you are interested in arranging a meeting with your firm or organisation.

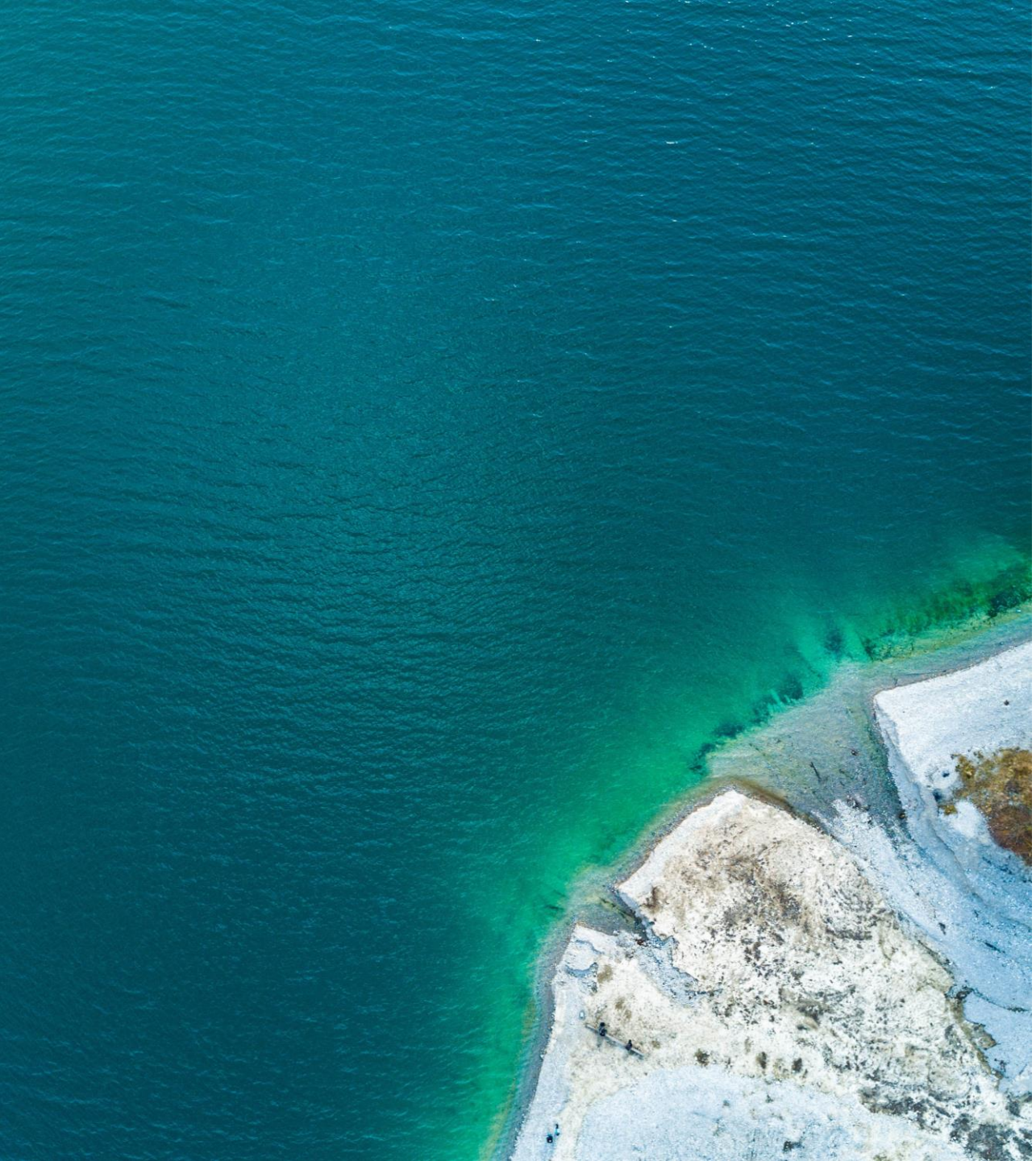
Information exchange

- The Radar programme guarantees that the FMLC addresses those issues that are of most concern to stakeholders in the financial markets, across the public and private sector.
- It also helps to ensure that the FMLC only addresses in depth issues that are material and may have an appreciable impact on the international wholesale financial markets.
- Together, these three Radar initiatives ensure our work is current and has impact.

Summary and Conclusion

To sum up…

- The FMLC is tasked with identifying, considering and addressing **legal uncertainty**…
- …which is sometimes better thought of as "legal risk".
- The **radar function** is the manner in which the FMLC identifies appropriate issues to analyse.
- The radar function is fulfilled through **scoping forums, relationship management calls,** and **radar meetings.**
- At this time, the FMLC Secretariat would be grateful for help with **assessing legal risks, identifying priorities** and **selecting issues for further work**.



AI & the Qualitative Data Revolution

Dr. Lewis Z. Liu

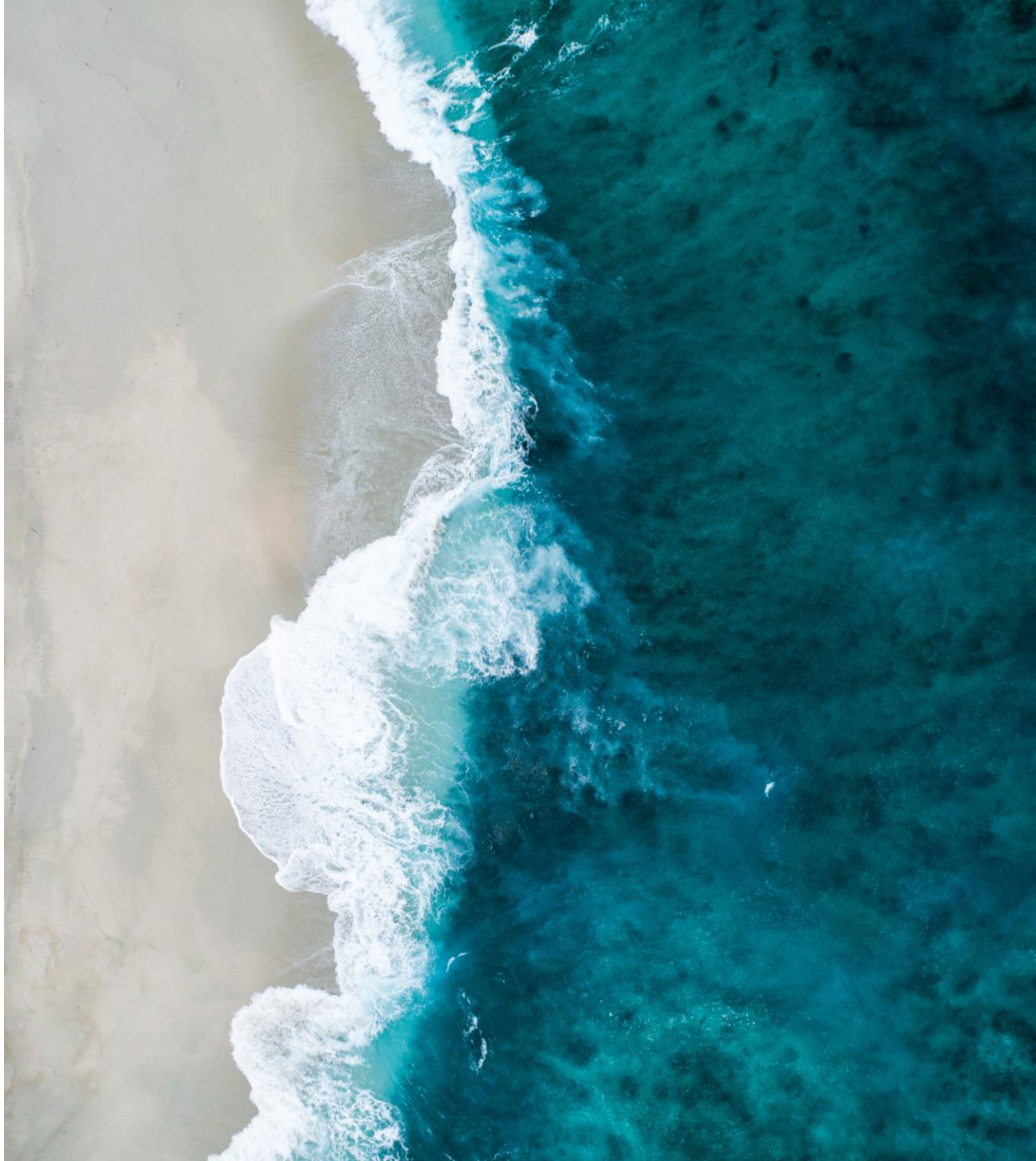
8 February 2018

FINANCIAL MARKETS LAW COMMITTEE

EigenTechnologies

Agenda

- AI hype vs. AI reality
- The current innovation landscape
- Qualitative data and its discontents
- The revolution in progress
- Q&A



AI hype vs. AI reality

What current technology does well	Where current technology struggles
▪ Process extremely large data sets	▪ Analysis of qualitative data
▪ Analysis of quantitative data	▪ Understanding language
▪ Language translation	▪ Recognising similarities
▪ Speech recognition	▪ Training on limited data sets
▪ Image tagging	▪ Dealing with poor quality inputs
▪ Targeted online advertising	▪ Ease of use by non-technical people
▪ Some types of digital security (e.g. retail banking systems)	▪ Identifying subtle, nuanced differences

This is mostly supervised learning

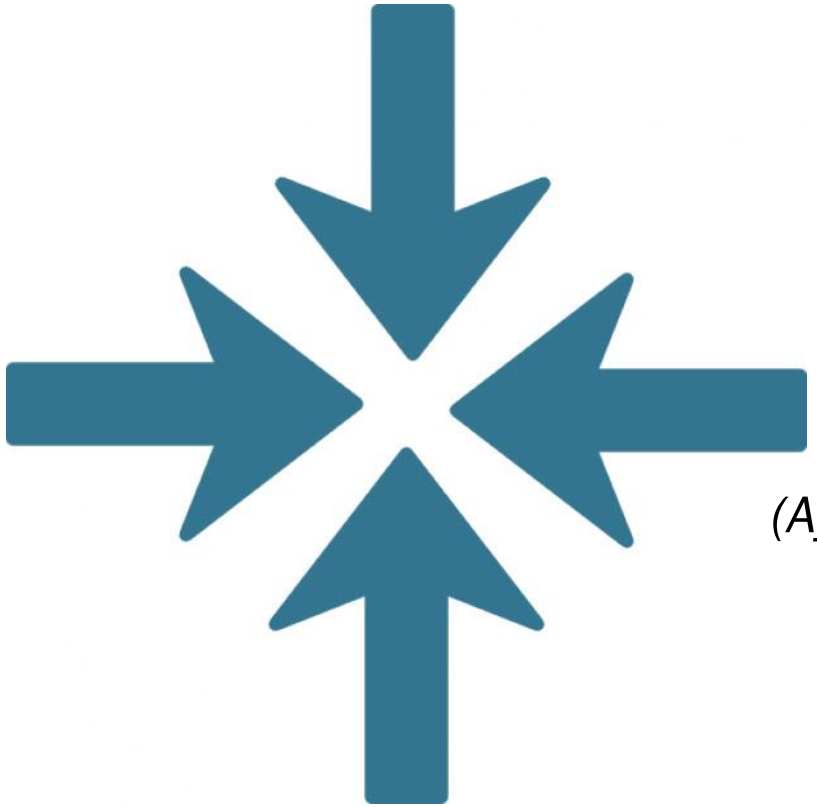
We are still a very long way from general AI

Source: https://hbr.org/2016/11/what-artificial-intelligence-can-and-cant-do-right-now

Improvements are coming from four directions

More and better data
(Google DeepMind)

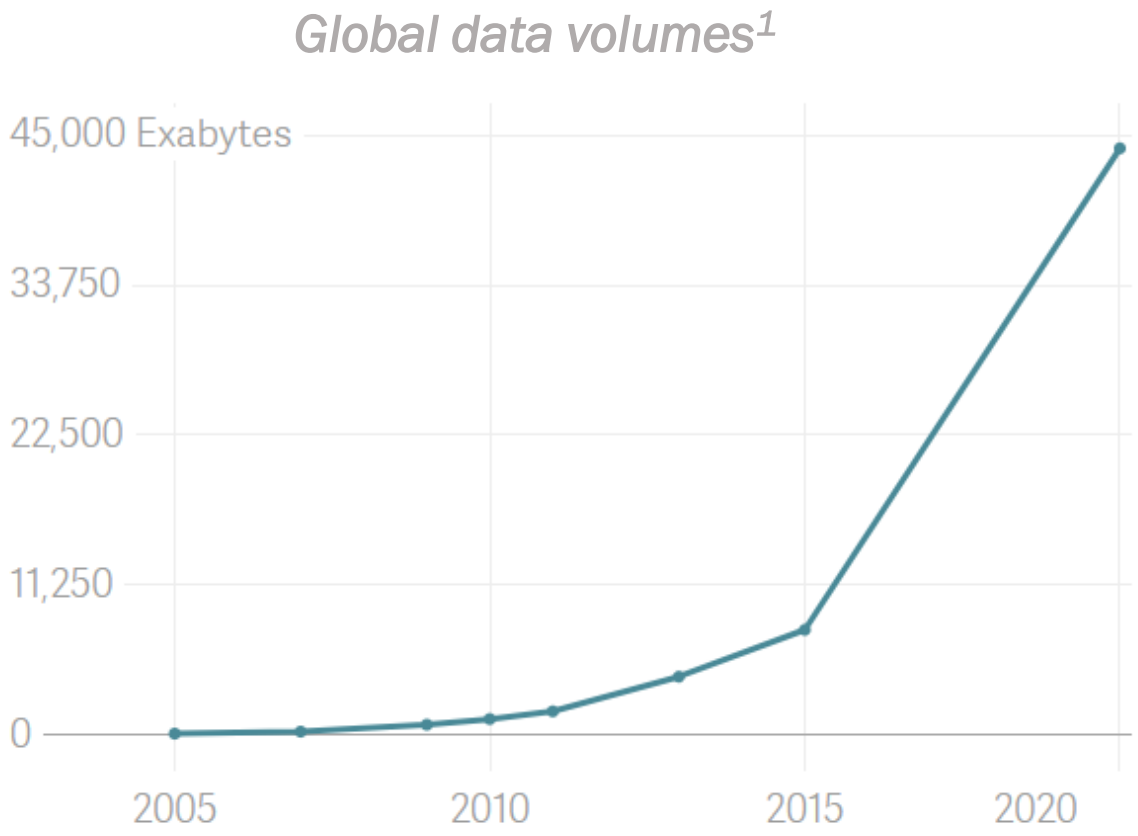
More powerful computing
(IBM Watson)



New mathematics
(Ayasdi, Eigen Technologies)

Optimisation of current algorithms
(Alibaba, Microsoft)

Qualitative data and its discontents



- The amount of data being created is roughly doubling every two years[2]
- But only 0.5% of that data has been analysed[2]
- Qualitative data is the hardest to analyse and use

(1) Source: IDC Digital Universe
(2) Source: MIT Technology Review, https://www.technologyreview.com/s/514346/the-data-made-me-do-it/

The qualitative data revolution: analysing text like numbers

Data as predictive power: a story

Q&A