Grit, GIT and granularity

RABO -- AI Augmented Development

February 10th 2021

Iman van Lelyveld - DNB Data Science Hub

DeNederlandscheBank

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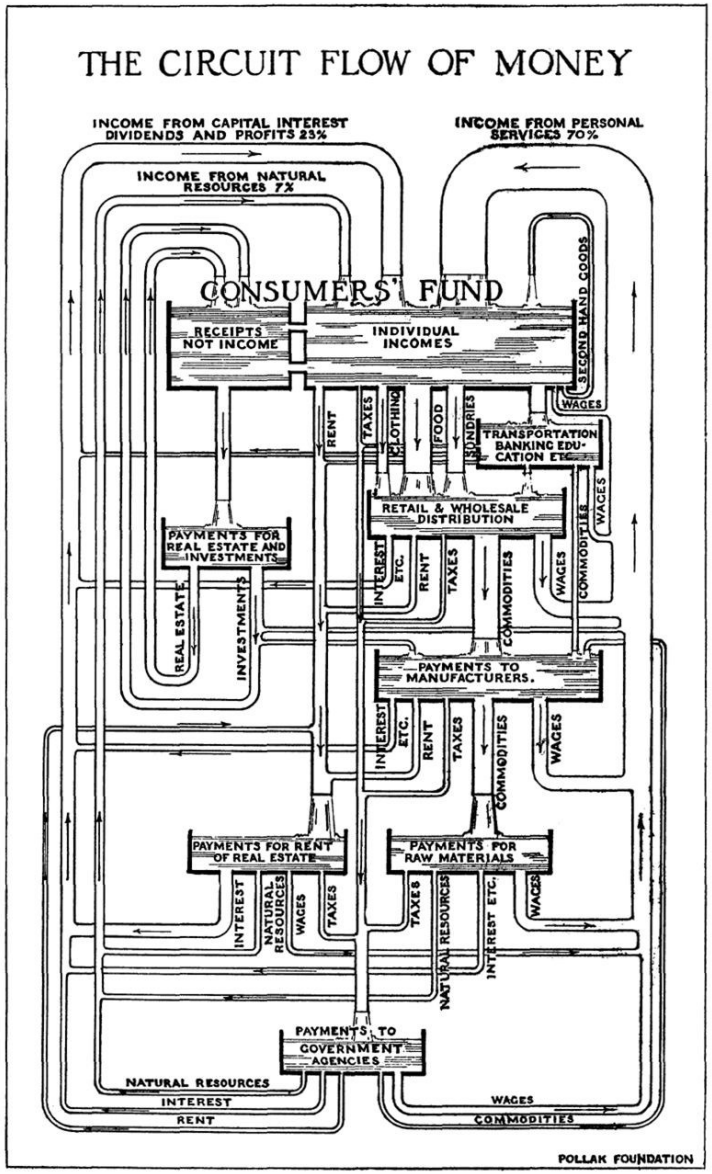
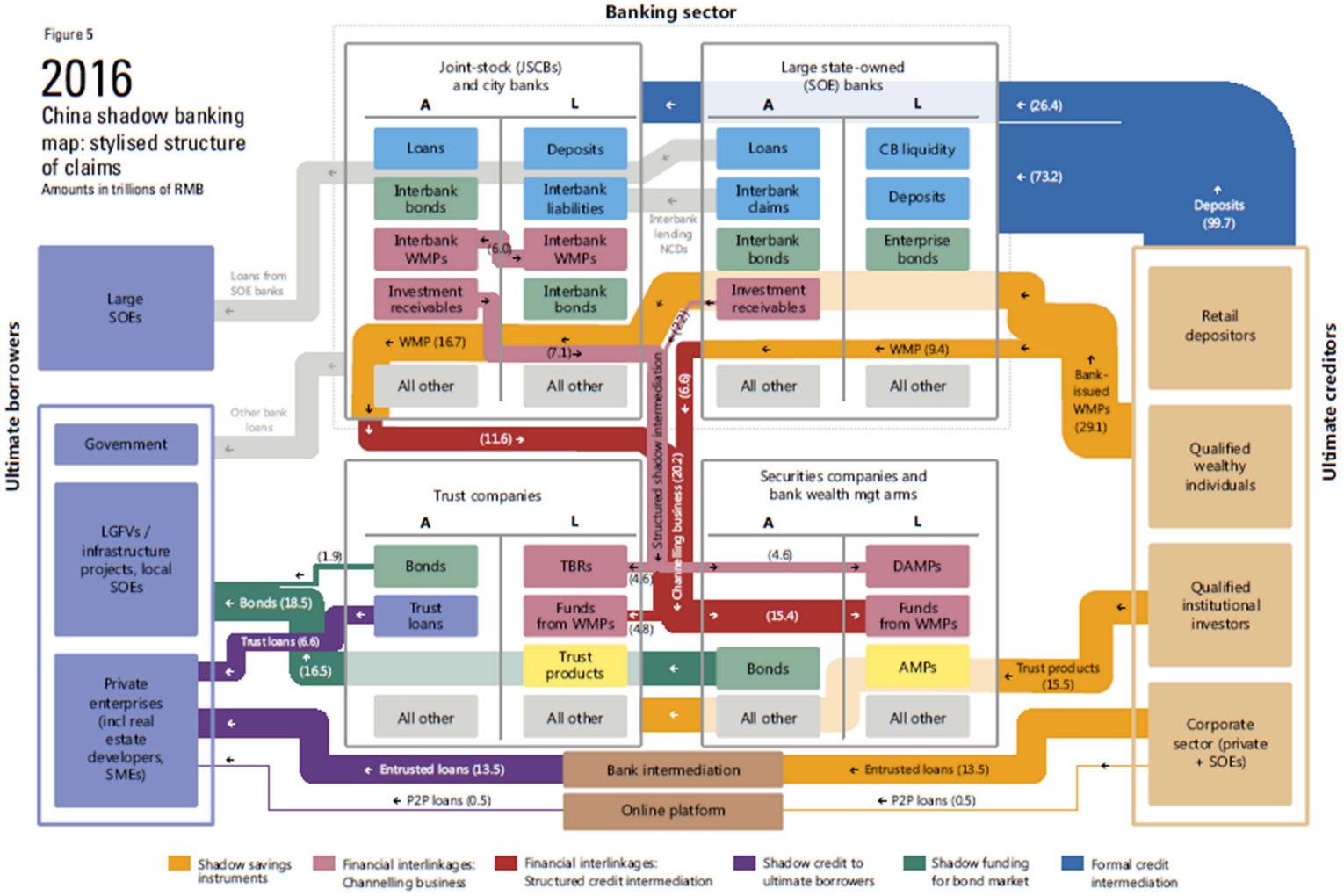
The usual disclaimer applies



Source: Foster (1922), "The Circuit Flow of Money", AER



Source: Ehlers et al (2018), "Mapping shadow banking in China: structure and dynamics", BIS WP

Main messages

- Granular data: allows for a mapping of financial eco system
  - For example, data on stocks (balance sheets) and flows (transactions) available more widely

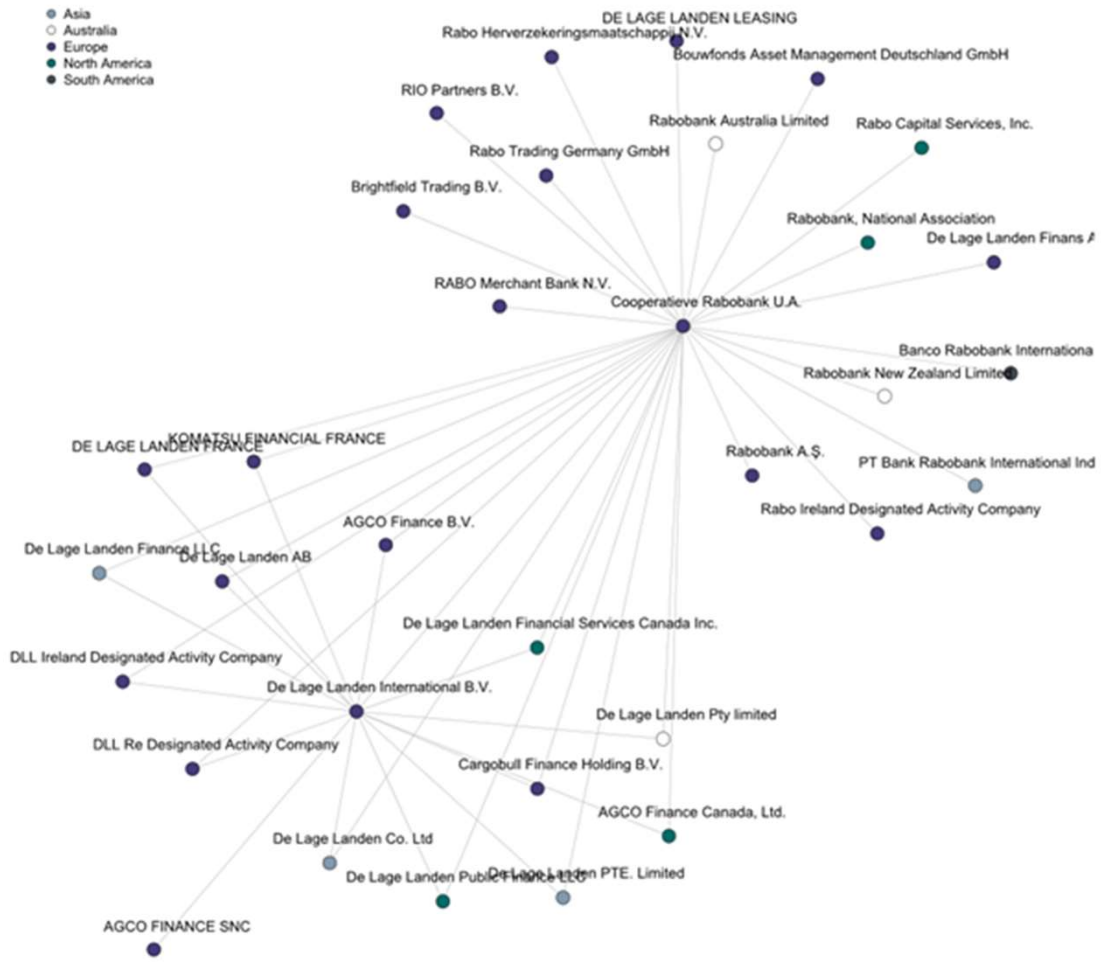
- New opportunities for analysis of shocks with your data
  - Identifying troubled firms, sectors, and markets
  - Trace propagation of shocks through system

- For progress we need to open source!
  - GIT [DNB Github]
  - Resp  coding [Data Science Manifest]

Excellent starting position

- Availability of granular data
  - Securities Holding Statistics (SHS)
  - Data Gaps → International Data Hub at the BIS
- New OTC reporting
  - Derivatives (EMIR)
  - Money markets (MMSR)
  - Repo (SFTR)
- Key competence of central banks and supervisors

The importance of the Legal Entity Identifier (LEI) – Rabobank example



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What do we do with your data?

Some examples

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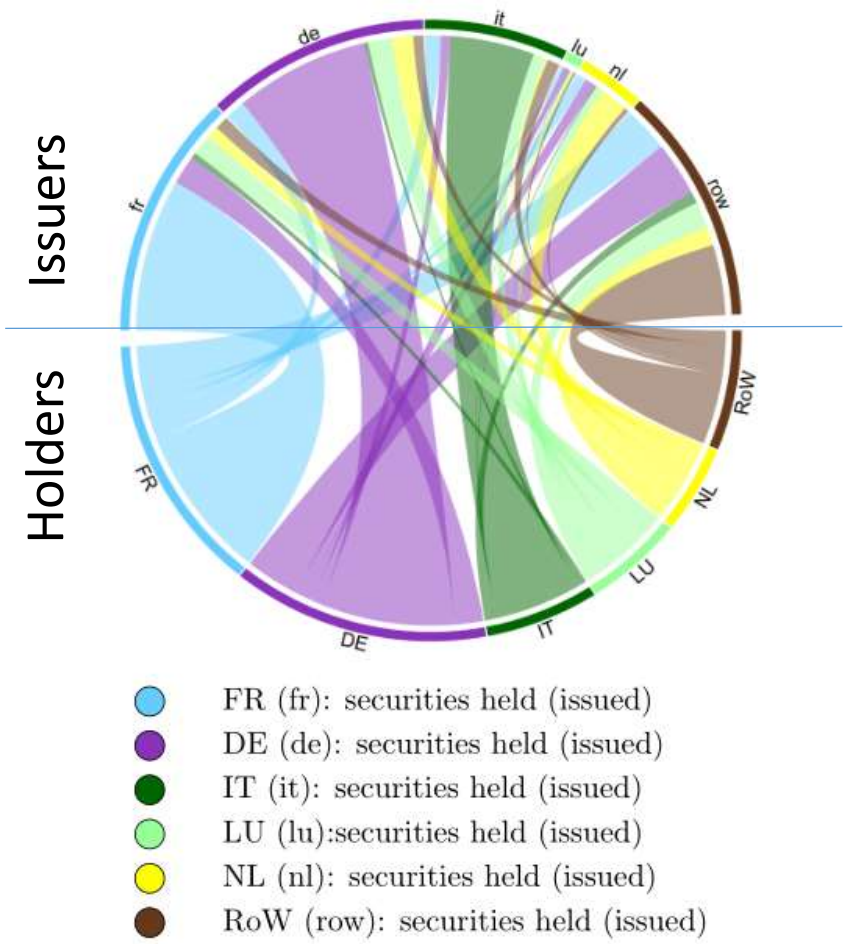
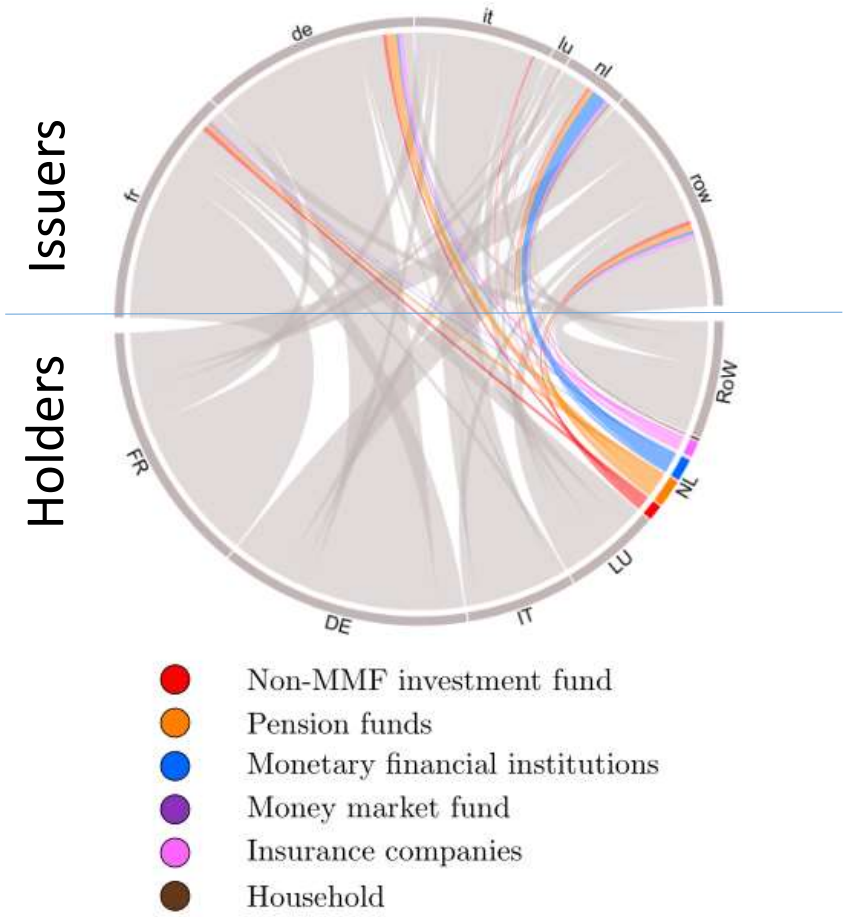
The same granular SHS data, multiple goals [1/3]



ISIN level exposures on a sector or firm level

- Allows us to see sector-to-sector linkage
- Given security meta data views can extend to focus on:
  - Different securities (eg equity, bonds, …)
  - Maturity
  - Green footprint --> carbon stress test
  - Bond type (eg. CoCo bonds)
- Linkage with country and sector level information
- Macro prudential stress tests

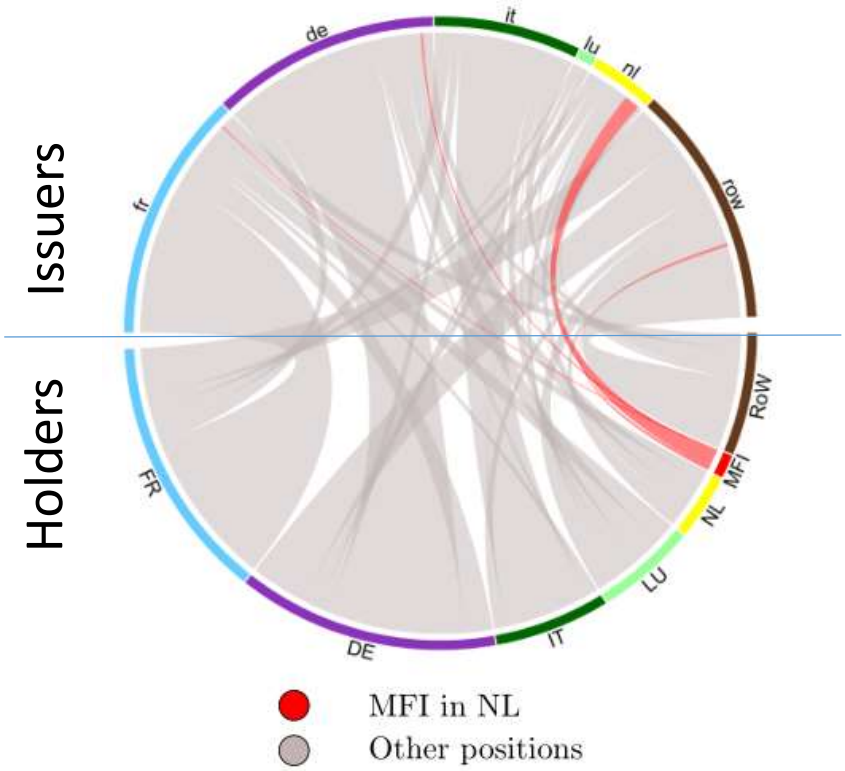
The same granular SHS data, multiple goals [2/3]



Same data, but now identifying granular sectors

- Allows to analyse the relative risk for different sectors
- Meso stress test

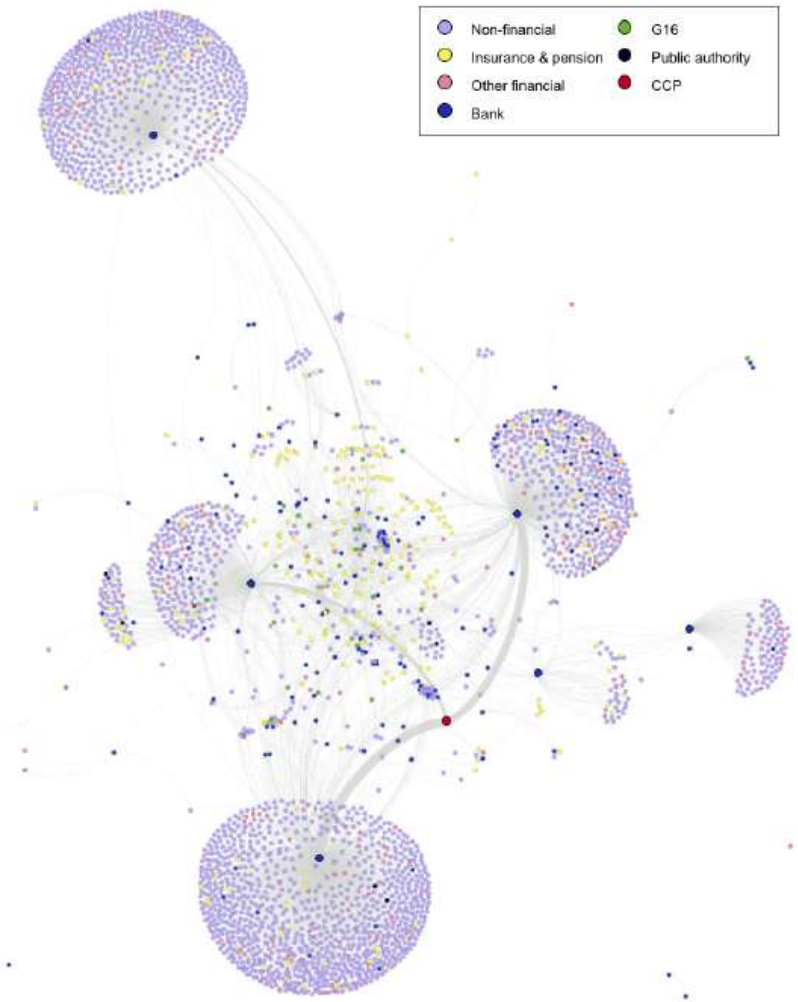
The same granular SHS data, multiple goals [3/3]



Same data, but drilling further into one sector

- Granularity available but confidentiality precludes showing this detail
- Easy linking to prudential information such as balance sheet or risk information
- Here we could do micro prudential stress tests

Using EMIR data for stress testing



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How to cooperate?

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Example: Dataloop to improve data quality

Loop = feedback loop between …

Parties within DNB

Feedback loop between data (quality) analists and supervisors

-

Knowing what others have observed

People & systems

Feedback loop between analists and machine learning models

-

Training the model to automatically detect data quality issues

DNB and third parties

Feedback loop between DNB and other supervisors and the industry

-

Learning from each other via open source coding.

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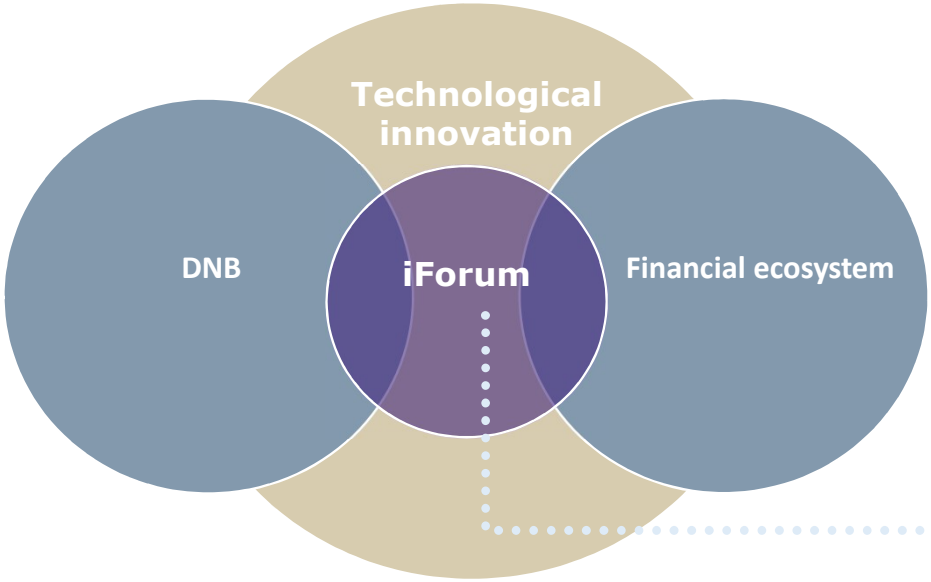
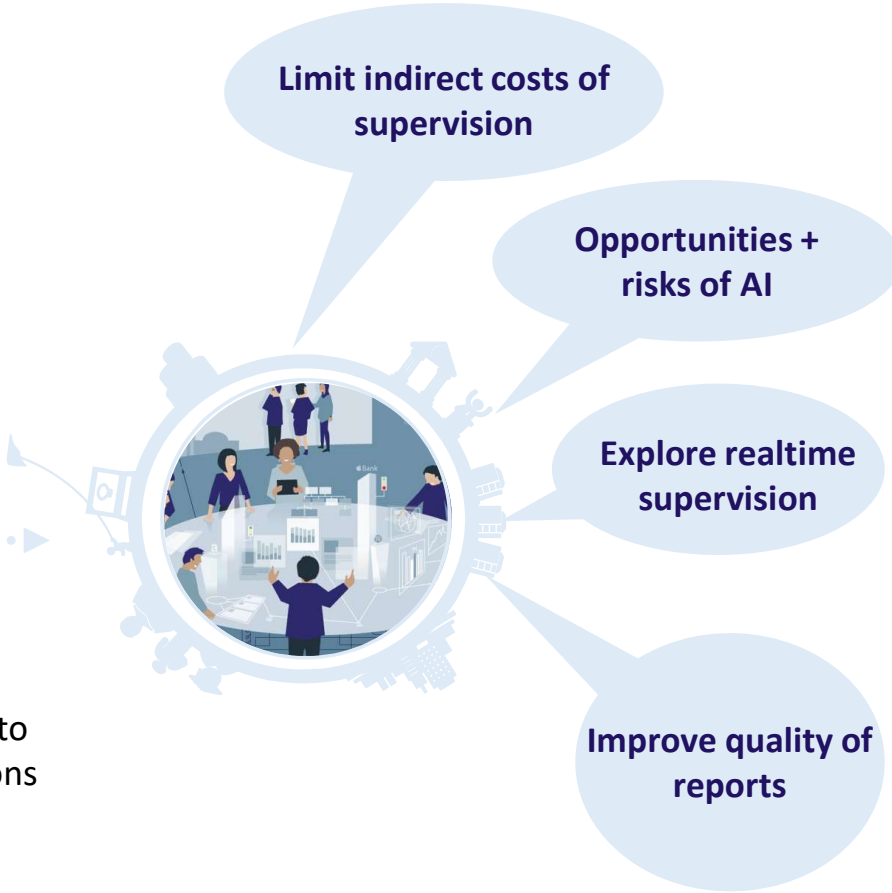
iForum connects DNB and the financial sector





DNB has set up iForum to bring cooperation with the financial sector to the next level and create added value for both the supervised insitutions and DNB

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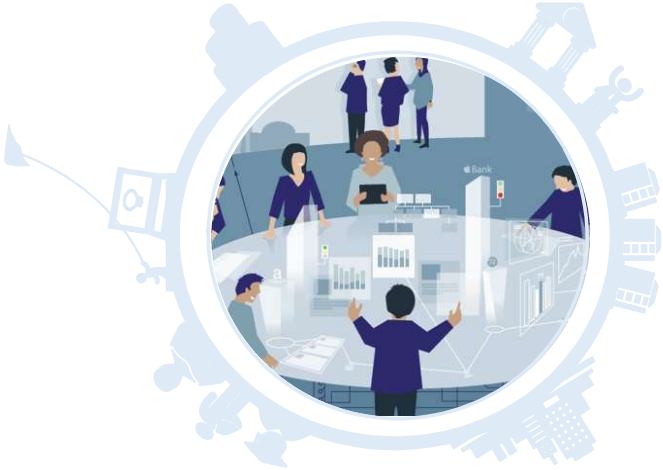
iForum: focus on 8 themes

- User experience supervised institution
- Limitation indirect costs of supervision
- Improve data quality of reports
- Improve risk management using data analysis



- Exploration of realtime supervision
- Improved understanding of laws and regulations
- DNB policy regarding AI
- Improve risk management by sharing benchmark info

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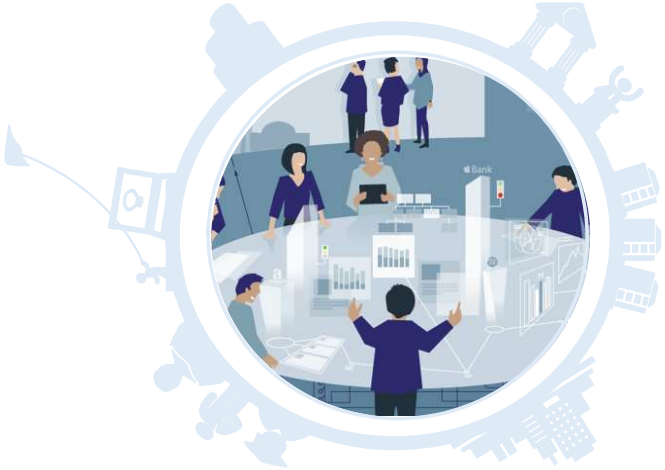

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Challenges and the way forward

Obstacles to data sharing

- Legal restrictions within and across jurisdiction
- Encrypted computation??

Homework for DNB

- Have the basics in place
  - LEI/UPI, meta data, data catalogue
- Adequate data governance
  - Data ownership and access should be well anchored

Open attitude to alternative ways of cooperating

GIT version control system	+ versioning allows to build on each other + easy to implement - central repo & malware check needs to be set up
Sharing files (eg. mailing code, Sharepoint) & versioning tedious	
Container technology	+ brings code to the data + already wide applied in eg. genome research - more complicated to set up

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Main take aways

- Reported data is being put to good use
- Opportunities abound to make reporting process more efficient
- In open sourcing our approach we can build a more resilient and sustainable financial sector

- However, we need **grit**!!! It's a marathon, not a sprint.