APPLICATION OF TEXT MINING TO THE ANALYSIS OF CLIMATE-RELATED DISCLOSURES.
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Banco de España
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INTRODUCTION

The TCFD
INTRODUCTION
The TCFD

Minsky Moment?

Time
INTRODUCTION
The TCFD

TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES
“Better information – about the costs, opportunities and risks created by climate change – can promote timely responses.”

Mark Carney
INTRODUCTION
Scope

Scope of study

- 2014: Mark Carney’s Speech
- 2015: European Directive 2014/95/UE
- 2016: European Directive 2014/95/UE
- 2017: TCFD Recommendations
- 2018: Spanish Transposition of 2014/95/UE
INTRODUCTION
The TCFD approach

2018 Status Report
Task Force on Climate-Related Financial Disclosures: Status Report

• Technique?
• English
• Mainly Annual Reports and ESG Reports
Our approach

• Spanish

• Banks
  • Sector-specific (Pillar 3)
  • Country-specific (Report on Remuneration of Directors)

• Flexible and interpretable method
THE WORKFLOW
Preprocessing

Corporate reports

Conversion through Kofax Power PDF

Word formatted reports

Extraction of textual content in excerpts

Text excerpts

Tokenization and indexing

DataStore

GUI Search tool

Domain expert

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Textual content in excerpts

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THE TCFD RECOMMENDATIONS
Distribution of the 11 recommended disclosures

- Governance: 2 disclosures
- Strategy: 3 disclosures
- Risk Management: 3 disclosures
- Metrics And Targets: 3 disclosures
THE TCFD RECOMMENDATIONS
Fine-grained disclosures

TCFD’s 11 recommended disclosures

91 fine-grained disclosures
The TCFD recommendations: Fine-grained disclosures

**Governance**

a) Describe the board’s oversight on climate-related risks and opportunities

- Describe the **frequency** of the board’s meetings with a **sustainability committee**
The Board meets monthly with…

NER Model

Rule-based
- Lexicons
- Regular Expressions
- Rules

Machine Learning

The Board meets monthly with…
**THE RULE-BASED MODEL**

- **Corporate reports**
  - Conversion through Kofax Power PDF

- **Word formatted reports**
  - Extraction of textual content in excerpts

- **Text excerpts**
  - Tokenization, NER and indexing

- **Lexicon and rules**

- **DataStore**

- **GUI Search tool**

- **Domain expert**

**Conversion through Kofax Power PDF**

**Extraction of textual content in excerpts**

**Tokenization, NER and indexing**

**Lexicon and rules**
THE QUERIES

91 fine-grained disclosures

205 queries
(up to 3 queries per fine-grained disclosure)
SCORING

climate-change

sustainability
CONCLUSIONS

Rule-based model

Machine Learning model
THANK YOU