# Through Rose-Tinted or Dark Lenses: How Bank Manager Sentiment Affects Lending and Risk

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Why is it important to study bank managers' sentiment?

- Overly optimistic managers $\Rightarrow$ **Financial stability** implications
- Overly pessimistic managers $\Rightarrow$ **Under-financing the economy**

**Research question:** Is there evidence for over-optimism/over-pessimism of bank managers and is it related to banks' lending policy?

# Data - Textual tone score

Based on earnings press releases of more than 200 banks from developed European markets between 2006H1 and 2019H2 (source: S&P Capital IQ).

Example of press release

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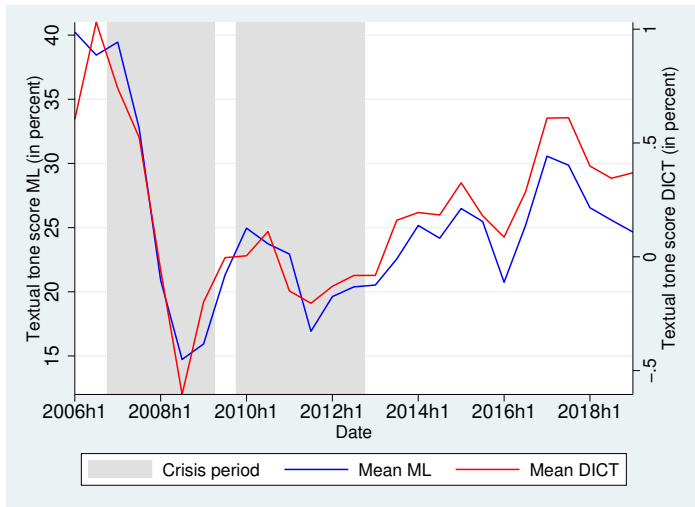
**Two alternative approaches to calculate it:**

- The dictionary (**DICT**) approach (Loughran and McDonald, 2011)
  ⇒ Counting the share of positive and negative words in the press releases

- The machine-learning (**ML**) approach (Yang et al., 2020)
  ⇒ Use of an AI algorithm to determine how positive or negative are the different press releases

Example of press release

Figure 1: Textual tone score averaged over time

In the next slides, we study the tone score while controlling for macroeconomic and banks' fundamentals $\Rightarrow$ interpretation of the orthogonal part ($ORT$) = **bank manager sentiment or private information?**

# Bank manager sentiment or private information?

In the next slides, we study the tone score while controlling for macroeconomic and banks' fundamentals $\Rightarrow$ interpretation of the orthogonal part ($ORT$) = **bank manager sentiment or private information?**

To answer this question, we focus on $ORT$ and test whether:

- it is **backward-looking**.
- it predicts better future bank **financial performance**.

# Bank manager sentiment or private information?

**Test 1 (Sentiment)**: Is *ORT* **backward-looking**, i.e. associated with past realizations of economic and financial fundamentals?

**Result**: Current *ORT* can be predicted positively by its own lags as well as past GDP growth rates. ⇒ **Confirms bank manager sentiment interpretation of** *ORT*.

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**Test 2 (Private information)**: Does *ORT* predict better future financial performance of the banks?

**Result**: Current *ORT* is neutral for predicting subsequent bank reserves, net interest income, ROA and EPS, and is actually predicting a subsequent increase in NPL ratios. ⇒ **Contradicts private information interpretation of** *ORT*.

# The real economic implications of bank manager sentiment

We then study the implications of bank manager sentiment on:

- subsequent **loan growth**.
- subsequent **systemic risk (SRISK)**, i.e. how equity investors perceive the riskiness of a bank (Brownlees and Engle, 2016).

# The real economic implications of bank manager sentiment

**Loan growth prediction**: Is a higher bank manager sentiment associated with future bank loan growth?

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**Result**: **Yes!** A **one pp increase in bank manager sentiment** is associated with an **increase in loans by 0.59%** in the next six months.

**Systemic risk**: Is a higher bank manager sentiment associated with future bank SRISK?

**Result**: **Yes!** A **one pp increase in bank manager sentiment** is associated a **decrease in the SRISK by 0.12 pp** in the next six months.

**Main results**

- Bank manager sentiment backward-looking and not related with subsequent financial performance of the bank.

- Bank manager sentiment positively associated with loan growth rates and negatively with SRISK over the subsequent six months.

- Implications in terms of financial stability / economy financing.

# Example of earnings press release

**CRÉDIT AGRICOLE S.A.** PRESS RELEASE

**Fourth quarter and full year 2018 results**
## Very good results, solid and balanced

### Crédit Agricole S.A.

| Stated net income[1] | Stated net revenues | Fully-loaded CET1 ratio |
|---|---|---|
| Q4: €1,008m | Q4: €4,853m | 11.5% |
| x2.6 Q4/Q4 | +4.3% Q4/Q4 | stable in Q4, well above |
| 2018: €4,400m | 2018: €19,736m | the MTP target (11%) |
| +20.6% 2018/2017 | +5.9% 2018/2017 | |

- Less favourable environment in Q4, primarily for activities related to financial markets
- High underlying net income[2] with further strong growth: Q4 €1,067m, +21.6% Q4/Q4; 2018 €4,405m, +12.2% 2018/2017
- 2018 ROTE[3] 12.7%; earnings per share[4]: Q4 €0.33, +24.2% Q4/Q4; 2018 €1.39, +13.8% 2018/2017;
- Dividend proposed at the Shareholders' Meeting increased by +9.5% 2018/2017 to €0.69
- High level of activity and income for all the Group's business divisions in 2018, despite the unfavourable market impact in Q4 on asset management and market activities
- Good cost control: positive jaws effect excluding SRF[5] > 1pp 2018/2017, in most business lines; C/I ratio[6] improved by 0.7pp 2018/2017 to 62.1%
- Cost of credit risk still very low and declining: 23bp[6] (-8bp Q4/Q4); provision for non-specific legal risk of €75m in Q4
- 2019 MTP objectives already reached for NI, ROTE and CET1; new 2022 MTP to be presented on 6 June 2019

### Crédit Agricole Group*

| Stated net income[1] | Stated net revenues | Fully-loaded CET1 ratio |
|---|---|---|
| Q4: €1,571m | Q4: €8,110m | 15.0% |
| +70.3% Q4/Q4 | +0.8% Q4/Q4 | up 10bp in Q4 |
| 2018: €6,844m | 2018: €32,839m | 550bp above the P2R[6] |
| +4.7% 2018/2017 | +2.3% 2018/2017 | |

- Sharp increase in stated net income linked to a favourable base effect, in particular the tax surcharge in Q4-17
- 2018 underlying[2] net income[1]: €6,849m, -3.0% 2018/2017 after a sharp increase in the SRF[5], a negative scope effect and a slight increase in the cost of risk ; Q4 : €1,626m, -3.9% Q4/Q4
- Cost of risk still at a very low level, at 18 bp[6]
- Regional Banks (RBS): negative impact of portfolio valuations in Q4 and a sharp rise in the cost of risk due to collective provision write-backs in 2017, but increase in business revenues and stabilisation of interest revenues

* Crédit Agricole S.A. and Regional banks at 100%

This press release comments on the results of Crédit Agricole S.A. and those of Crédit Agricole Group, which comprises the Crédit Agricole S.A. entities and the Crédit Agricole Regional banks, which own 56.3% of Crédit Agricole S.A. Please see from p. 16 onwards for details of specific items which, after restatement for the various related intermediary balances, are used to calculate underlying results. A reconciliation between the stated income statement and the underlying income statement can be found from p. 21 onwards for Crédit Agricole Group and from p. 18 onwards for Crédit Agricole S.A.

Back to textual tone score

**Main steps:**

1. Transform each press release into a **"bag of words"**.
2. Obtain the **polarity of each word** (positive, neutral or negative) thanks to the financial dictionary from Loughran and McDonald (2011).
3. For each press release from bank $i$ at time $t$, calculate the following **textual tone score**:

$$tone_{i,t} = \frac{(\# \text{ of positive words}_{i,t}) - (\# \text{ of negative words}_{i,t})}{Total \# \text{ of words}_{i,t}}$$

$$tone_{i,t} = pos_{i,t} - neg_{i,t}$$

4. In addition, we take **negations** into account.

Example - DICT approach

**Example:**

Overall, the first quarter was a ==good== start to the year ==but== we ==caution== not to extrapolate this result as is traditionally the ==best== quarter of the year.

| Negations | Conjunctions |
|:---:|:---:|
| Positive words | Negative words |
| Positive words negated | Negative words negated |

In the example above, $N_{i,t}^{pos} = 1$, $N_{i,t}^{neg} = 2$, and $N_{i,t} = 28$. Hence, $tone_{i,t} = -\frac{1}{28}$.

Figure 2: Average textual tone score taking or not into account negations

Figure 3: Textual tone score: effect of taking negations into account at the micro-level
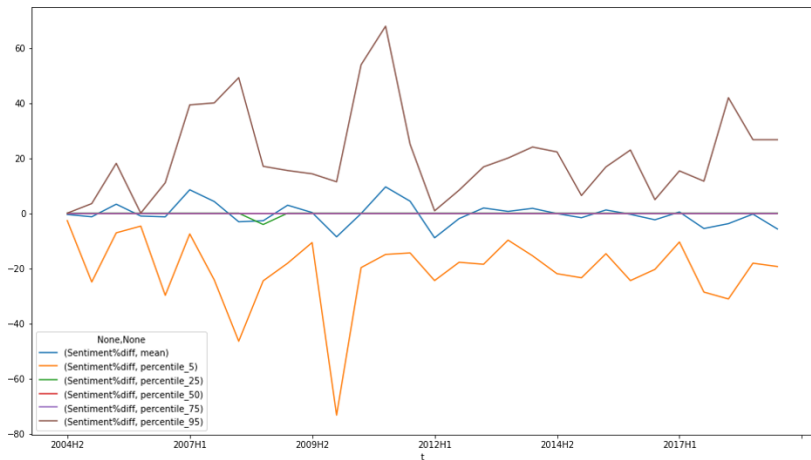
Figure 4: Distribution of the share of negations in the press release documents
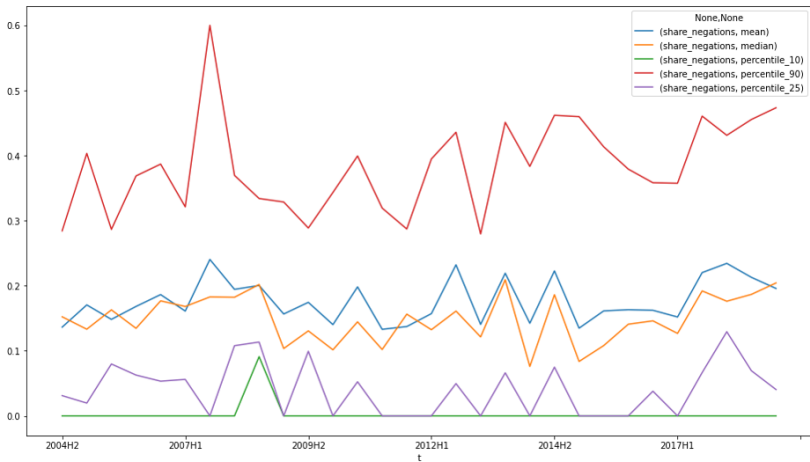
# Textual tone score - DICT vs ML approach

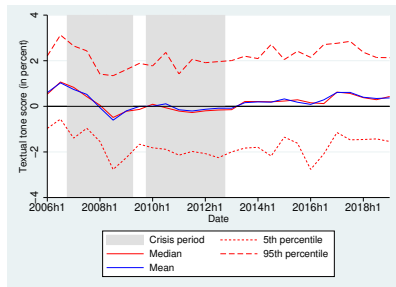Figure 5: Textual tone score distribution over time (DICT approach)



Figure 6: Textual tone score distribution over time (ML approach)
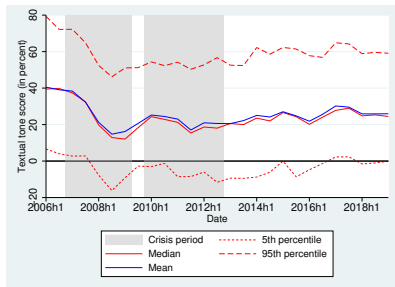


Back to tone score distribution

# Textual tone score - DICT vs ML approach

**Table 1:** Regression of the tone score (machine learning approach) over the tone score (dictionary approach)

|                        | $tone_t(ML)$ | $tone_t(ML)$ | $tone_t(ML)$ |
|------------------------|--------------|--------------|--------------|
| $tone_t(DICT)$         | 11.19***     | 10.23***     | 8.96***      |
|                        | (0.20)       | (0.24)       | (0.25)       |
| Constant               | 0.23***      | 0.38***      | 0.53***      |
|                        | (0.00)       | (0.09)       | (0.09)       |
| Bank fixed effects     | No           | Yes          | Yes          |
| Time fixed effects     | No           | No           | Yes          |
| N                      | 3316         | 3316         | 3316         |
| $R^2$                  | 0.50         | 0.64         | 0.67         |
| Adjusted $R^2$         | 0.49         | 0.61         | 0.64         |

# Textual tone score - DICT vs ML approach

**Table 2:** Spearman's rank correlation ($\rho$) between the tone score from the dictionary and from the machine learning approaches

| Time window | $\rho$ | N | Time window | $\rho$ | N |
|---|---|---|---|---|---|
| Full period | 0.7242*** | 3316 | 2012h2 | 0.7228*** | 129 |
| 2006h1 | 0.5971*** | 83 | 2013h1 | 0.6862*** | 127 |
| 2006h2 | 0.7447*** | 97 | 2013h2 | 0.7281*** | 137 |
| 2007h1 | 0.6444*** | 101 | 2014h1 | 0.7713*** | 131 |
| 2007h2 | 0.7465*** | 112 | 2014h2 | 0.7510*** | 131 |
| 2008h1 | 0.6541*** | 112 | 2015h1 | 0.6739*** | 114 |
| 2008h2 | 0.6613*** | 123 | 2015h2 | 0.6948*** | 131 |
| 2009h1 | 0.7641*** | 122 | 2016h1 | 0.7757*** | 127 |
| 2009h2 | 0.6742*** | 141 | 2016h2 | 0.7454*** | 123 |
| 2010h1 | 0.5848*** | 127 | 2017h1 | 0.7781*** | 128 |
| 2010h2 | 0.7345*** | 144 | 2017h2 | 0.7124*** | 129 |
| 2011h1 | 0.6301*** | 133 | 2018h1 | 0.7077*** | 129 |
| 2011h2 | 0.6090*** | 142 | 2018h2 | 0.8184*** | 115 |
| 2012h1 | 0.6964*** | 117 | 2019h1 | 0.6265*** | 109 |

# Data - Control variables & summary statistics

**Table 3:** Summary statistics

| | Textual tone score sample | | | | | | No textual tone score available | | | | | |
| Variables | N | mean | std | p5 | p50 | p95 | N | mean | std | p5 | p50 | p95 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Panel A: Bank-level** | | | | | | | | | | | | |
| *1) Balance sheet and income* | | | | | | | | | | | | |
| ta (in billion Euros) | 3,033 | 228.26 | 428.94 | 1.45 | 45.33 | 1275.13 | 3,922 | 48.06 | 155.43 | 0.37 | 10.71 | 176.67 |
| loans (in %) | 3,022 | 59.38 | 18.21 | 23.71 | 62.03 | 84.17 | 3,896 | 65.22 | 20.11 | 19.44 | 69.80 | 87.40 |
| cash (in %) | 3,027 | 4.45 | 5.59 | 0.09 | 2.35 | 15.391 | 3,841 | 5.41 | 9.54 | 0.13 | 1.92 | 18.71 |
| secs (in %) | 3,006 | 22.29 | 14.15 | 4.93 | 19.33 | 51.40 | 3,867 | 17.70 | 13.48 | 1.24 | 14.88 | 40.73 |
| deposits (in %) | 3,021 | 51.16 | 19.39 | 18.55 | 51.84 | 81.96 | 3,892 | 50.72 | 24.16 | 0.00 | 55.95 | 82.27 |
| equity (in %) | 3,031 | 7.05 | 3.89 | 2.60 | 6.46 | 14.08 | 3,908 | 6 8.53 | 6.15 | 2.12 | 7.71 | 16.47 |
| intinc (in %) | 3,033 | 60.54 | 21.96 | 21.14 | 60.42 | 100.00 | 3,922 | 66.44 | 21.10 | 27.03 | 67.58 | 100.00 |
| loangrowth (in %) | 2,792 | 2.32 | 13.06 | -7.82 | 1.39 | 15.19 | 3,393 | 2.63 | 16.79 | -8.22 | 1.65 | 13.47 |
| *2) Profitability* | | | | | | | | | | | | |
| opinc (in %) | 3,016 | 1.33 | 0.88 | 0.34 | 1.23 | 2.64 | 3,815 | 1.45 | 1.44 | 0.15 | 1.19 | 3.21 |
| opexp (in %) | 3,020 | 0.85 | 0.55 | 0.21 | 0.76 | 1.71 | 3,812 | 0.92 | 1.20 | 0.07 | 0.70 | 2.06 |
| impair (in %) | 3,006 | 0.30 | 0.75 | -0.02 | 0.11 | 1.15 | 3,839 | 0.27 | 0.67 | -0.04 | 0.11 | 1.04 |
| **Panel B: Macro-level** | | | | | | | | | | | | |
| gdp (in %) | 3,033 | 1.22 | 1.92 | -2.08 | 1.33 | 3.77 | 3,886 | 1.28 | 1.93 | -2.04 | 1.39 | 3.82 |
| infl (in %) | 3,033 | 0.71 | 0.80 | -0.40 | 0.61 | 2.08 | 3,886 | 0.75 | 0.79 | -0.39 | 0.65 | 2.21 |
| interbank (in %) | 3,033 | 1.07 | 1.65 | -0.33 | 0.53 | 4.67 | 3,886 | 1.05 | 1.61 | -0.50 | 0.52 | 4.67 |
| term (in %) | 3,031 | 1.71 | 2.22 | -0.46 | 1.18 | 4.96 | 3,884 | 1.30 | 1.66 | -0.37 | 0.92 | 4.08 |
| ois (in %) | 2,852 | 0.26 | 0.30 | 0.02 | 0.14 | 0.76 | 3,753 | 0.27 | 0.30 | 0.01 | 0.20 | 0.84 |