

# Not all words are equal: Sentiment dynamics and information content within CEO letters

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# Define a more optimal measure of sentiment within financial disclosures

## Two key ideas

- 1 How to measure the sentiment in corporate disclosures?  
**A weighted measure of CEO sentiment, where the weight is function of the place of a word in a text**
- 2 Does it matter for forecasting corporate performance?  
**Yes. Traditional metrics of sentiment within financial disclosures are inefficient**

# Finance is not only about numbers but also about WORDS and their LOCATION

- Sentiment in financial disclosures is **informative** of a firm's future performance
  - Abrahamson and Amir (1996) – Negative sentiment contains predictive value
  - Patelli and Pedrini (2013) – Net sentiment predicts future return on assets
- **Traditional metrics:** spread between positive and negative words
- Common element : **All words hold equal information value, irrespective of their position within the text**
- **Does the position of a word in a text have information value?**

# Boeing CEO letter 2006

Message From Our Chairman



## Beginning

*To the Shareholders and Employees of The Boeing Company:* This was an important year for Boeing. Not only did we observe our 90th year in business, but I also believe that, when we look back on 2006, we will see it as a pivotal year in the company's history. It will be viewed as a year in which we turned the corner and positioned ourselves for what promises to be an exciting future and a period of accelerated and exhilarating growth.

W. James McNerney, Jr., Chairman,  
President and Chief Executive Officer

The great progress we made in 2006 provides the foundation for even better performance in 2007 and beyond. The challenge before us now is to unleash the full potential of The Boeing Company.

## Middle

In one of our principal businesses, our customers include the world's airlines and the traveling public. In the other, our customers include U.S. and allied military services and governmental agencies responsible for protecting people in countries around the globe. We have wonderful customers with a huge ongoing requirement for innovation and precise program execution. Without a doubt, if we do a great job of listening to them and finding the best way to satisfy their needs, Boeing will grow—and continue to grow—for many years to come.

Based on listening to our customers, we have built our commercial airplane strategy

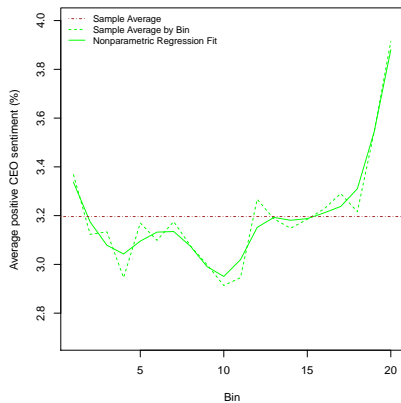
## End

In looking to the future, we have the confidence that comes from knowing that our businesses are well positioned with leading-edge products in healthy markets, with every expectation of strong growth in the years immediately ahead. With the launch of our growth and productivity initiatives, we are more intense focused than ever on driving performance to new levels. We aim to elevate our financial performance—and we will

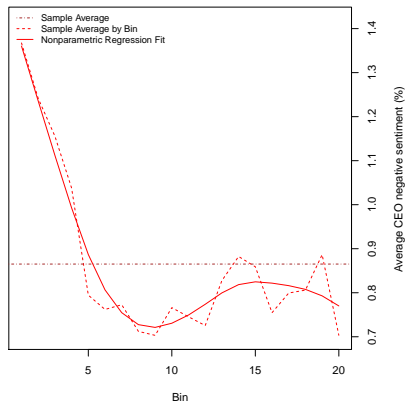
Beyond that, we are excited at our long term prospects. To be sure, we have a lot of work ahead of us—this year and next in particular—but because of what we've done over the course of 2006, and all that our employees continue to do to increase growth and improve productivity, we are in a very strong position as we begin that work.

# Intratextual dynamics

## Positive words



## Negative words



## Measures of sentiment

- **Traditional measure:** spread in positive negative words
- **Weighted measure of sentiment**

$$NetSent_{j,t}(w) = \sum_{b=1}^B w_b NetSent_{b,j,t}, \quad (1)$$

where

$$w^{EW} = (1/B, \dots, 1/B)'$$

$$w_b(\theta) = \theta_1 + \sum_{c=1}^3 \theta_{1+c} P_c(b/B) + \sum_{c=1}^3 \theta_{3+c} P_c((B-b)/B), \quad (2)$$

where  $P_c(u) = (1 - u^c)u^{3-c}$  is a  $c^{th}$  order Almon polynomial of  $u$ .

# Increase in prediction accuracy

$$ROA_{j,t+1} = \alpha + \beta \cdot Sent_{j,t}(w) + \epsilon_{j,t+1}, \quad (3)$$

<i>Sent</i>	Loughran and McDonald			DICTION 7.0			Abrahamson
	<i>Pos</i>	<i>Neg</i>	<i>Net</i>	<i>Pos</i>	<i>Neg</i>	<i>Net</i>	<i>Neg</i>
(Intercept)	<b>0.034***</b> (0.012)	<b>0.120***</b> (0.006)	<b>0.036***</b> (0.007)	<b>0.047***</b> (0.013)	<b>0.092***</b> (0.006)	<b>0.039***</b> (0.008)	<b>0.107***</b> (0.004)
$Sent_{j,t}(w^{EW}) \cdot (1 - I[SD_{j,t} > \kappa])$	0.234 (0.440)	<b>-11.154***</b> (1.848)	<b>0.896***</b> (0.294)	<b>0.569*</b> (0.330)	<b>2.919*</b> (1.686)	-0.065 (0.310)	<b>-16.516***</b> (2.039)
$Sent_{j,t}(w) \cdot I[SD_{j,t} > \kappa]$	<b>1.739***</b> (0.341)	<b>-4.101***</b> (0.551)	<b>2.267***</b> (0.267)	<b>1.568***</b> (0.325)	<b>-2.442***</b> (0.500)	<b>1.473***</b> (0.226)	<b>-8.492***</b> (1.325)
$\kappa$	0.016	0.007	0.021	0.037	0.006	0.019	0.007
SSE	1.007	1.065	0.969	1.095	1.068	1.036	1.004
R <sup>2</sup>	18.8	14.1	21.8	11.7	10.4	16.5	19.0
Adj.R <sup>2</sup>	<b>18.3</b>	<b>13.5</b>	<b>21.4</b>	<b>11.1</b>	<b>9.9</b>	<b>16.0</b>	<b>18.5</b>
F-test	3.582	1.463	2.811	2.646	2.294	2.876	1.727
<i>pvalue</i>	0.000	0.144	0.002	0.003	0.010	0.001	0.066
Equally-weighted measure of sentiment							
Adj.R <sup>2</sup>	<b>8.8</b>	<b>9.6</b>	<b>14.2</b>	<b>3.6</b>	<b>7.0</b>	<b>8.2</b>	<b>14.1</b>

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$