Motivation

Supplier-customer relationship
• Returns of customer firms predict subsequent suppliers’ returns
  - Company level (Cohen and Frazzini, 2008)
  - Industry level (Menzly and Ozbas, 2010)
• Investors and analysts tend to underreact to information from customer industries to supplier industries

The role of media in the stock market
• Information embedded in negative words induces downward pressure on stock prices followed by a reversion to fundamentals (Tetlock, 2007)
• Negative words predict returns more effectively than other news’ tones

This study: How does news sentiment affect firm values along the supply chain?
Investor sentiment theory

- Media pessimism is a proxy for investor sentiment
- High media pessimism predicts
  - Low returns at short horizons
  - Reversion to fundamentals at longer horizons

Digitimes report
- Apple placed orders with Elpida (Micron) to buy mobile DRAM chips amounting to about half the volume produced

BofA-ML:
- Digitimes report contained nothing new
- Only 18,000 wafers per month vs ~100,000 Hynix/Samsung

<table>
<thead>
<tr>
<th>Stock return</th>
<th>Micron</th>
<th>Hynix</th>
<th>Samsung</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/16/12</td>
<td>-10.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/17/12</td>
<td>-7.5%</td>
<td>-7.5%</td>
<td>-7.5%</td>
</tr>
<tr>
<td>5/18/12</td>
<td>-5.0%</td>
<td>-5.0%</td>
<td>-5.0%</td>
</tr>
</tbody>
</table>
Information Theory

- Media pessimism is a proxy for negative information about company fundamentals not yet incorporated into stock prices
- Negative and persistence relationship between media pessimism and stock returns

ANADIGICS (Supplier to RIM)

Q1 results in line
Q2 guidance below expectations
May 3rd, 2011
This study

- We study cross-industry return predictability at long-horizon that arises from negative news along the supply chain
- Aggregating news sentiment at industry level
- We use a direct measure of news instead of one month stock returns
Data

- Flow of goods and services across 65 industry accounts
- Conversion table to link industry accounts to Dow Jones industry classification

**Dow Jones News**
- Both economic and corporate news in a computer readable format
- October 1986 - February 2011

**Harvard IV-4 dictionary**
- 1,915 words of positive outlook
- 2,291 words of negative outlook

**US industry returns from Datastream**
- ICB/FTSE classification
Credit Suisse **Cuts** Alcatel-Lucent Target Price

Dow Jones Newswires, May 07, 2010 09:47 GMT

Credit Suisse **lowers** Alcatel-Lucent (ALU) target price to EUR 2.25 from EUR3 after **lowering** estimates following **weak** 1Q results. **Cuts** EPS estimate for 2010 to EUR 0.05 from EUR 0.11, and for 2011 to EUR 0.18 from EUR 0.21. Says Alcatel reaching the mid-point of its 1%-5% margin target in 2010 could prove **challenging** given the **weak** 1Q results, **even** if there is a **strong** ramp in sales and margins through the rest of the year. Adds, the group’s target to be **close** to free cash flow breakeven in 2010 also looks ambitious. Keeps neutral rating. Shares -3.9% to EUR 2.03.

# Negative = 9  # Positive = 1  # Total = 128
Dow Jones News

- 28,728,411 news items
- 6,546,704,024 words
- Dow Jones Newswires, The Wall Street Journal, Barron’s

# words per month

- # words (million)
- # negative
- # other
Methodology – Industry news sentiment

Simple and rudimentary rule to convert news items into a numeric value

- Count the number of words that fall within the Harvard IV Negative word list
- Assume that all negative words are equally important

\[ \text{Neg}_{\text{Industry}}^i = \frac{\text{No. of negative words industry } i}{\text{No. of total words industry } i} \]

Following Tetlock et al. (2008) we use the standardized number of negative words as Industry News Sentiment measure:

\[ \text{Industry} – \text{NewsSent}_{\text{Industry}}^i = \frac{\text{Neg}_{\text{Industry}}^i - \mu(\text{Neg}_{\text{Industry}}^i)}{\sigma(\text{Neg}_{\text{Industry}}^i)} \]
Industry news sentiment

Trading strategy based on Industry News Sentiment

- Buy industries with highest score
- Sell industries with lowest score

Wealth curve: Long-Short industry news sentiment portfolio

Long-short portfolio statistics

- Average annual ret.: 3.80%
- Standard deviation: 7.50%
- Information ratio: 0.51
- t-stat.: 2.38

Methodology – Cross-industry news sentiment

Cross – Industry NewsSent\text{\textsubscript{Industry\textit{i}}} = \sum_{k1\neq i}^{GS_{k1,i}} I - NewsSent\text{\textsubscript{Industry\textit{k1}}} - \sum_{k2\neq i}^{GS_{k2,i}}

where GS\textsubscript{k1,i} is the value of the flow of goods and services from supplier industry \textit{i} to customer industries \textit{k}
Main results cross-industry return predictability

Trading strategy based on cross-industry news sentiment generates significant profits
- Buy industries with highest cross-industry news sentiment
- Sell industries with lowest cross-industry news sentiment
- Monthly rebalancing

<table>
<thead>
<tr>
<th>Self-Financed sorted portfolios</th>
<th>High (1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>Low (5)</th>
<th>H - L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average annual ret.</td>
<td>18.89%</td>
<td>17.22%</td>
<td>13.16%</td>
<td>9.72%</td>
<td>10.41%</td>
<td>8.48%</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>17.16%</td>
<td>17.35%</td>
<td>17.70%</td>
<td>17.15%</td>
<td>16.86%</td>
<td>8.95%</td>
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<tr>
<td>Sharpe / Information ratio</td>
<td>1.10</td>
<td>0.99</td>
<td>0.74</td>
<td>0.57</td>
<td>0.62</td>
<td>0.95</td>
</tr>
<tr>
<td>t-stat.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.44</td>
<td></td>
</tr>
<tr>
<td>Fama and French Factor exposure</td>
<td>Exposure</td>
<td>t-stat.</td>
<td></td>
<td></td>
<td></td>
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<td>-------------------------------</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alpha</td>
<td>0.67%</td>
<td>(4.08)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R_{\text{market}} - R_f$</td>
<td>0.01</td>
<td>(0.28)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>SMB</td>
<td>0.10</td>
<td>(1.80)</td>
<td></td>
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<tr>
<td>HML</td>
<td>0.10</td>
<td>(1.88)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>$\text{MOM}$</td>
<td>-0.02</td>
<td>(-0.53)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$R^2$ 0.023

# monthly observations 263

*Period Apr. 1989 - Feb. 2011*
### Barra univariate factor exposures

<table>
<thead>
<tr>
<th>Style</th>
<th>Alpha</th>
<th>$t$-stat.</th>
<th>Style exposure</th>
<th>$t$-stat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>0.52%</td>
<td>2.47</td>
<td>-0.03</td>
<td>-0.68</td>
</tr>
<tr>
<td>Momentum</td>
<td>0.57%</td>
<td>2.73</td>
<td>-0.24</td>
<td>-1.67</td>
</tr>
<tr>
<td>Volatility</td>
<td>0.51%</td>
<td>2.43</td>
<td>-0.01</td>
<td>-0.08</td>
</tr>
<tr>
<td>Value</td>
<td>0.52%</td>
<td>2.07</td>
<td>-0.03</td>
<td>-0.10</td>
</tr>
<tr>
<td>Size</td>
<td>0.51%</td>
<td>2.44</td>
<td>-0.10</td>
<td>-0.35</td>
</tr>
<tr>
<td>Size NonLinear</td>
<td>0.57%</td>
<td>2.72</td>
<td>-0.98</td>
<td>-2.02</td>
</tr>
<tr>
<td>Growth</td>
<td>0.52%</td>
<td>2.48</td>
<td>-0.46</td>
<td>-0.83</td>
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<tr>
<td>Liquidity</td>
<td>0.42%</td>
<td>1.87</td>
<td>0.45</td>
<td>1.02</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.54%</td>
<td>2.57</td>
<td>0.71</td>
<td>1.28</td>
</tr>
</tbody>
</table>

Robustness

- Similar results for value weighted portfolios
- Similar but slightly weaker results for Loughran and McDonald dictionary

<table>
<thead>
<tr>
<th>Self-Financed sorted portfolios</th>
<th>Harvard</th>
<th>Loughran &amp; McDonald</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Equal w.</td>
<td>Value w.</td>
</tr>
<tr>
<td>Average annual ret.</td>
<td>8.48%</td>
<td>6.74%</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>8.95%</td>
<td>9.51%</td>
</tr>
<tr>
<td>Information ratio</td>
<td>0.95</td>
<td>0.71</td>
</tr>
<tr>
<td>t-stat.</td>
<td>4.44</td>
<td>3.32</td>
</tr>
</tbody>
</table>

*Period Apr. 1989 - Feb. 2011*
Momentum versus news

Other studies use one month stock returns as proxy for information flow

- Cross-industry news clearly captures a different type of information than cross-industry momentum
- L-S returns have a -1% correlation
Conclusions

• Trading strategies based on cross-industry news sentiment generate significant profits with an annual premium as high as 8.5%

• Findings consistent with investor sentiment theory in which media pessimism is a proxy for negative investor sentiment:
  – Low returns at short horizons and reversion to fundamentals at longer horizons
  – This result corroborates the findings of Tetlock (2007)

• Cross-Industry news as a superior strategy to Cross-Industry momentum
  – Linguistic communication impacts firm values industry wide
  – One month momentum captures different information
References

More information and contact

This presentation is based on a forthcoming working paper. Should you wish to get a copy, please do not hesitate to contact us.

Daniele Scognamiglio  
daniele.scognamiglio@apg-am.nl
Gerben de Zwart  
gerben.de.zwart@apg-am.nl

APG
Gustav Mahlerplein 3
1082 MS, Amsterdam