The Usefulness of Analyst Forecasts to Investors

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Outline of the presentation

- When are forecasts useful?
- What we know about the “usefulness” of analyst forecasts
- Measures of “usefulness”: accuracy, short-term price impact and long-term investment value
- International evidence on the three “usefulness” measures for DPS and TPs

Usefulness of forecasts

- Forecasts are useful when they tell something new

  Three conditions:
  1. Analyst forecasts are more accurate than “home made” forecasts
     - If you can do it yourself, why pay someone else?
  2. Forecasts “move markets”
     - Forecasts that “move markets” reveal new information
     - Forecasts that reiterate what the market knows are of limited usefulness
  3. Forecasts have investment value (EFM?)

What do we know about sell-side analyst forecasts?

- There is over 1000 research papers on analyst EPS forecasts (I/B/E/S, Zacks, Value Line, First Call, etc).
- Focus: sell-side analyst forecasts available through public sources
- Early evidence:
  - Accuracy of annual forecasts by analysts from pension funds, investment advisors, investment bank analysts no different compared to naïve time-series model (Elton and Gruber 1972)
  - Analyst five-year growth forecasts as accurate as simple algebraic extrapolations (Cragg and Malkiel 1968)
    - Caveat: Very small sample sizes

Then “large” sample research:

- Using 100 EPS forecasts per year for 1969-1979, Fried and Givoly (1982) find analysts’ forecasts were more accurate than forecasts from various time-series models.
  - Virtually every research paper uses analyst EPS to measure earnings expectations
- Some analysts better at forecasting than others (i.e. more accurate ESP):
  - All-Star analysts, more experienced, analysts with access to more resources, etc.

Caveat when comparing accuracy of analyst forecasts to “home made” forecasts

- how you measure EPS accuracy?
- EPS accuracy = \frac{|actual\ EPS - EPS\ forecast|}{Price}
- Walkdown to beatable forecasts

Dr Pawel Bilinski
More recent research

- in around 40% of cases, ARIMA forecasts of quarterly EPS are more accurate than analyst estimates, Lorek and Pagrach (2014)

- Simple random-walk EPS forecasts are more accurate than analysts’ forecasts over longer horizons, for smaller or younger firms, Bradshaw et al. (2012)

- Other issues: investment banking (Global Settlement, NASD 2711 and NYSE 472 rules), catering to managers, overreact or overoptimistic forecasts, result in overoptimistic forecasts, fail to differentiate between lower persistence of accruals vs. cash flows

\[ \text{E(\text{return}_{12})} = \frac{\text{TP}_{12} - \text{Price}_{12}}{\text{Price}_{12}} = 1 + \frac{\text{annualized DPS}_{12}}{\text{Price}_{12}} \]

- Stock recommendations + TPs
- Subsumes forecasts of accounting numbers, e.g. EPS, growth
- Increasing # of dividend paying firms
  - E.g. around 81% of the S&P500 firms paid dividend in 2013
  - Historically, total dividend payments FAR exceeded net buybacks
- Increasing importance of dividends to investors (e.g. in 2012: net inflows into mutual funds and exchange-traded funds focused on dividend paying stocks: $59 billion vs. a net outflow of $7.3 billion for all other US stock funds)

Target prices and dividend forecasts: estimates of the total shareholder return

\[ \text{return} = \frac{\text{Price}_{t+1} + \text{Dividends}_{t+1} - \text{Price}_{t}}{\text{Price}_{t}} \]

\[ \text{return} = \frac{\text{Price}_{t+1}}{\text{Price}_{t}} - 1 + \frac{\text{Dividends}_{t+1}}{\text{Price}_{t}} \]

\[ \text{E(\text{return}_{12})} = \frac{\text{TP}_{12}}{\text{Price}_{12}} - 1 + \frac{F(\text{DPS}_{t+1})}{\text{Price}_{t}} \]

Research on target prices and dividend forecasts

- Research on the accuracy, price-impact and investment value almost non-existent
  - Bradshaw’s 2011 review of analyst forecasting lit: only 3 papers that look at EPS and TPs

- TPs:
  - Biilinski et al. (2013)-TP accuracy in a sample of 16 countries, incl. US & UK
  - Brav and Lehavy (2003) and Asquith et al. (2005), Biilinski (2014a) and Biilinski and Eames (2014): short-term price impact of TPs

- DPS
  - Brown et al. (2002, 2006)-accuracy of consensus dividend forecasts
  - Biilinski (2014b)-accuracy of individual dividend forecasts in a sample of 16 countries

Three measures of usefulness

- Accuracy:
  \[ \text{forecast error} = \frac{|\text{actual value} - \text{forecasted value}|}{\text{Price}} \]
  e.g. \( TP \) error = \[ \frac{|\text{actual price}_{t} - \text{TP}|}{\text{Price}_{t}} \]

Indicator variable for whether the TP has been met at any point over the 12-months

short-term price reactions

- Forecasts that “move” the market convey new information

\[ \text{Price reaction} = f(\text{revisions}) = \Delta \text{TP} + \Delta \text{DPS} + \Delta \text{other information} \]

In efficient market, prices react fully and immediately to new information

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<thead>
<tr>
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<tbody>
<tr>
<td>{\text{Report announcement}}</td>
<td>{\text{TP}}</td>
<td>{\text{Trend line}}</td>
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<td>( \Delta \text{TP} )</td>
<td>( \Delta \text{DPS} )</td>
<td>( \Delta \text{other information} )</td>
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</table>
**Investment value**

- Do abnormal returns (ARs) exist in efficient markets?

In efficient market, prices react fully and immediately to new information

**Report announcement**

- Drift exists because of market inefficiencies, e.g., arbitrage costs (liquidity, risk), sentiment, irrational investors

**Report announcement**

**The usefulness of sell-side analysts target prices (I/B/E/S): measure #1**

**Research questions:**

- **Bilinski et al. (2014)** ask the following Qs:
  1. Do analyst TPs beat simple TP forecasts?
  2. Which analysts issue more accurate TPs?
  3. How institutional and regulatory differences across countries affect TP forecast accuracy?

- the US, 12 European countries, Japan, Australia and Hong Kong, from January 1, 2002 to July 1, 2009

- 585,718 target price forecasts for 9,982 firms issued by 12,792 analysts employed by 621 brokers

**Target prices often feature prominently in analyst reports**

**return** = \[ \frac{TP_{i+1}}{Price_{i}} - 1 + \frac{Dividend_{i+1}}{Price_{i}} \]
TABLE 3
Summary statistics of target price accuracy measures

<table>
<thead>
<tr>
<th>Panel A: Mean values of TP forecast accuracy measures</th>
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<tbody>
<tr>
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<tr>
<td><strong>Australia</strong></td>
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<td><strong>Germany</strong></td>
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<td><strong>Greece</strong></td>
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<td><strong>Hong Kong</strong></td>
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<td><strong>Italy</strong></td>
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<td><strong>Sweden</strong></td>
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<td><strong>Switzerland</strong></td>
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<td><strong>United Kingdom</strong></td>
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<tr>
<td><strong>United States</strong></td>
</tr>
</tbody>
</table>

TP error = \[
\frac{\text{actual price}_{i,t} - \text{TP}_i}{\text{Price}_{i,t}}
\]

Analysts TPs. vs simple models

- Analyst TPs do not have to be perfectly accurate to be useful: as long as analyst TPs are more accurate compared to forecasts investors could make themselves.

- Naïve TP = stock price on the forecast issue date * (1 + the previous 12-month firm buy-and-hold return).

- Naïve TP = stock price on the forecast issue date * (1 + \(\hat{\alpha} + \hat{\beta} \cdot \text{RM}\)).

- Naïve TP = industry mean P/E ratio & analyst EPS estimate.

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Which analysts and when issue more accurate TPs

- Better past TP forecasters, analysts with higher forecasting experience, following more firms, country-specialized, and employed by a large broker issue more accurate TPs.

- For the country characteristics: the accounting disclosure quality, the origin of the legal system, cultural traits, and IFRS regulation.

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Overall conclusion

- Analyst TPs seem optimistic on average, e.g. TP/P of 16.1% for UK stocks over 2002-2009.

- Though relatively inaccurate, analyst TPs seem to beat simple benchmarks.

- Can be useful, particularly if you follow TPs issued by more skilled analysts.

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The usefulness of sell-side analysts dividend forecasts: measure #1
Analyst dividend forecasts, Bilinski 2014

return = \frac{TP}{Price} - 1 + \frac{Dividend_{t+1}}{Price_t}

- Dividend yield on the FTSE100/All share: around 3%
- SP500: 1.9%

DPS/P and DPS error vs. EPS error

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>DPS/P</th>
<th>DPS forecast error</th>
<th>EPS forecast error</th>
<th>DPS error/EPS</th>
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<tbody>
<tr>
<td>Australia</td>
<td>38323</td>
<td>5.23%</td>
<td>1.27%</td>
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<td>-54.8%</td>
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<tr>
<td>Austria</td>
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<td>0.59%</td>
<td>1.48%</td>
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<td>0.64%</td>
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<tr>
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<td>1.75%</td>
<td>0.60%</td>
<td>1.15%</td>
<td>-58.1%</td>
</tr>
<tr>
<td>Finland</td>
<td>13516</td>
<td>3.26%</td>
<td>1.20%</td>
<td>2.06%</td>
<td>-52.0%</td>
</tr>
<tr>
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<td>2.08%</td>
<td>0.44%</td>
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<tr>
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<td>-59.6%</td>
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<td>1.04%</td>
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<tr>
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</tr>
<tr>
<td>United States</td>
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<td>3.26%</td>
<td>0.82%</td>
<td>2.44%</td>
<td>-57.1%</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>3.00%</td>
<td>0.75%</td>
<td>2.13%</td>
<td>-44.6%</td>
</tr>
</tbody>
</table>

Bilinski 2014

- I/B/E/S dividend estimates over the fiscal years 2000–2010 for the US, 12 European countries, Australia, and two Asian countries
- 320,877 dividend forecasts for 9,090 firms issued by 15,682 analysts employed by 748 brokers.

DPS error = \frac{\text{actual DPS } - \text{annualized DPS forecast}}{\text{Price}}

Analyst dividend forecasts vs. simple dividend estimates

- **Past DPS**: a martingale dividend forecast where the next year dividend equals the past dividend
- **Mean Payout**\(\times\)NI: the product of the mean payout ratio calculated over the previous seven years and the net income for the previous fiscal year
- **Lintner’s partial-adjustment model** to forecast future dividends
  \[ d_t = d_{t-1} + \left( d_t - d_{t-1} \right) + V_t \]
  \[ d_T^n = k^T + e_t \]
- **Target payout**\(\times\)NI: target payout ratio and net income for the previous fiscal year
- **Target payout**\(\times\)EPS: target payout ratio estimated from equation (6) and the analyst EPS forecast
- **Lintner**: dividend forecast from the Lintner model

The difference: accuracy of analyst DPS - simple DPS forecasts

In %: in the UK analysts are 38% more accurate than simple DPS forecasts
Which DPS are more accurate

- More skilled analysts issue more accurate dividend forecasts
- Dividend forecasts are on average more accurate in countries where the tax code favors dividend income, where equity markets are more important,

To sum up

- Dividend forecasts very accurate
  - Since investors would attach more weight to more precise signals, we would expect a STRONGER price impact of DPS than TPs

Short-term price reactions

Investment value of TPs and DPS

\[
CARs = f(\text{revisions}) = \Delta\text{EPS} + \Delta\text{TP} + \Delta\text{DPS} + \Delta\text{stock recommendations}
\]

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
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<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>\Delta\text{EPS}</td>
<td>0.318</td>
<td>0.268</td>
<td>0.247</td>
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<td>\Delta\text{DPS}</td>
<td>0.268</td>
<td>0.212</td>
<td>0.212</td>
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<tr>
<td>Upgrade</td>
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<td>0.011</td>
<td>0.011</td>
</tr>
<tr>
<td>Downgrade</td>
<td>-0.015</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>\Delta\text{TP}</td>
<td>0.050</td>
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<td>0.044</td>
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<tr>
<td>N</td>
<td>152415</td>
<td>152415</td>
<td>152415</td>
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<tr>
<td>F-test</td>
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<td>854.71</td>
<td>522.95</td>
</tr>
<tr>
<td>p</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>R</td>
<td>1.91%</td>
<td>3.06%</td>
<td>3.87%</td>
</tr>
</tbody>
</table>

A 10% revision in DPS/Price (e.g. DPS/Price from 3% to 3.3%) will lead to a 2.12% Abnormal price reaction, e.g. FTSE100 up by 2%, the price will be 4.12% around the revision.

A 10% revision in TP/Price (e.g. TP/P from 10% to 11%) will lead to a 0.44% Abnormal price reaction.
Create 5 portfolios on TP/P

- For each firm-month

```
January  February ...
TP/P_{a,j}  TP/P_{b,j} ...
TP/P_{c,j}  Avg  TP/P_{j}
TP/P_{a,k}  TP/P_{b,k} ...
TP/P_{c,k}  Avg  TP/P_{k}
```

Each month, rank stocks by average TP/P into five portfolios

```
January  February
High TP/P  High TP/P
P4        P4
P3        P3
P2        P2
Low TP/P   Low TP/P
```

- Calculate returns for the next month (1 month holding period)

```
January  February
High TP/P  Return on High TP/P
P4          Return on P4
P3          Return on P4
P2          Return on P4
Low TP/P    Return on Low TP/P
```

- Time-series of portfolio returns for each portfolio:

\[ R_{pt} = \sum R_{it} \]

- In efficient markets, drift should be short-term

- You try to maximize the signal, then worry about the rest

Unlikely in developed markets

"short-term" inefficiency

"long-lasting" inefficiency
Statistics

- **Raw return** for each portfolio

  \[ r_{it} = \alpha + \beta_1 \cdot Mkt_rf + \beta_2 \cdot SMB + \beta_3 \cdot HML + \beta_4 \cdot Mom \]

- Sample of **US** stocks over 2002-2011

Expectations

**Ideal picture**

Risk adjusted return

**High TP/P** vs **Low TP/P**

- **Monthly % return**

  - Knowledge/skill
  - Surprise

Raw % monthly returns

**Alphas**, **CAPM**, three- and four-factor models

- **Monthly % abnormal returns**

  - High TP/P
  - Low TP/P

6-month holding period: **surprise** vs **skill**

**Arbitrage costs**: risk factors from 4FM

- **Monthly % abnormal returns**

  - High TP/P
  - Low TP/P
To sum up

- TP seem to have **some investment value**
- **High TP/P**: evidence of a drift and investment value
- **Low TP/P** surprise the market: a contrarian strategy may generate value
- **Caveats**: US evidence only, need to control for transaction costs, trends may change over time

Conclusions

- Analysts put effort to produce **accurate TP** and **dividend forecasts**
- These forecasts beat **simple estimates** from public data
- Evidence of **investment value**
- **Extensions** to samples outside the US can yield interesting insights since accuracy/information content/efficiency vary across countries
- My papers available at: [www.cass.city.ac.uk/experts/P.Bilinski](http://www.cass.city.ac.uk/experts/P.Bilinski)
- Events organized by the **Centre for Financial Analysis and Reporting Research**:
  - [http://www.cass.city.ac.uk/research-and-faculty/centres/cefarr](http://www.cass.city.ac.uk/research-and-faculty/centres/cefarr)
- email: **Pawel.Bilinski.1@city.ac.uk**