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The Usefulness of Analyst Forecasts to Investors

Deutsche Bank 2nd Annual Global Quantitative Strategy Conference

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 sth **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 **naive 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** $= -\frac{|actual\ EPS - EPS\ forecast|}{Price}$
- Walkdawn to beatable forecasts

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, analysts underreact to negative information and overreact to positive information resulting in overoptimistic forecasts, fail to differentiate between lower persistence of accruals vs. cash flows

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

- $\boldsymbol{return} = \frac{Price_{t+1}+Dividend_{t+1}-Price_t}{Price_t}$
- $\boldsymbol{return} = \frac{Price_{t+1}}{Price_t} - 1 + \frac{Dividend_{t+1}}{Price_t}$

Capital gain | Dividend yield

- $\mathrm{E}(return_{12}) = \frac{TP_{12}}{Price_t} - 1 + \frac{F(DPS_{t+1})}{Price_t}$

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- $\mathrm{E}(return_{12}) = \frac{TP_{12}}{Price_t} - 1 + \frac{\text{annualized } DPS_{t+1}}{Price_t}$

- Stock recommendations = f(TPs)
- Subsumes forecasts of accounting numbers, e.g. EPS, growth

99% of published research is US focused, where historically few firms paid dividends

- 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: *$9 billion* vs. a net outflow of *$7.3 billion* for all other US stock funds)
- dividend yield accounted for 90% of the real return from global equities over the period 1900–2005 (Dimson et al. 2008)
- Some investors invest only in dividend paying stocks
- Tax incentives
- Dividend arbitrage

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Research on target prices and dividend estimates

- 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:
  - Bilinski et al. (2013)-TP accuracy in a sample of 16 countries, incl. US & UK
  - Brav and Lehavy (2003) and Asquith et al. (2005), Bilinski (2014a) and Bilinski and Eames (2014): short-term price impact of TPs
- DPS
  - Brown et al. (2002, 2006)-accuracy of consensus dividend forecasts
  - Bilinski (2014b)-accuracy of individual dividend forecasts in a sample of 16 countries

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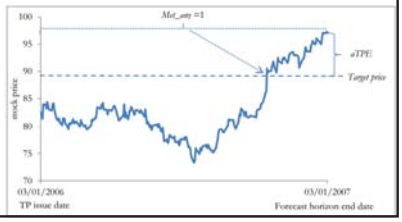
Three measures of usefulness

- **Accuracy**:

forecast error= $\frac{|actual\ value - forecasted\ value\ |}{Price}$

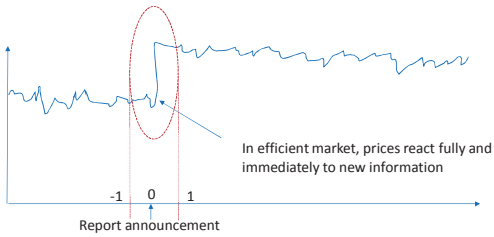
e.g. TP error= $\frac{|actual\ price_{12} - TP\ |}{Price_0}$

Indicator variable for whether the TP has been meet at any point over the 12-moths



short-term price reactions

- Forecasts that "move" the market convey new information



$Price\ reaction = f(revisions)$

$= \Delta TP + \Delta DPS + \Delta other\ information$

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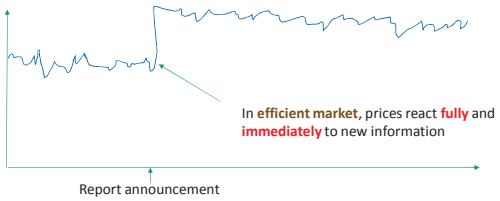
Investment value

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



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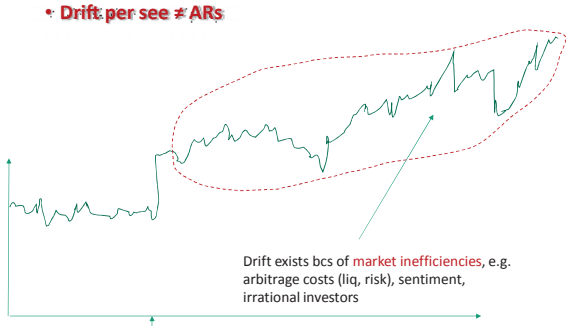
- **Investment value** means **drift**, i.e. prices move away from fundamentals
  - **Drift per see ≠ ARs**



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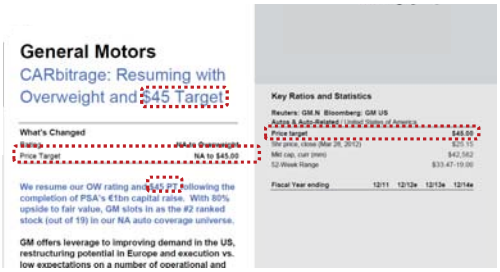
The *usefulness* of sell-side analysts target prices (I/B/E/S): measure #1

- Target prices often feature prominently in analyst reports



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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**

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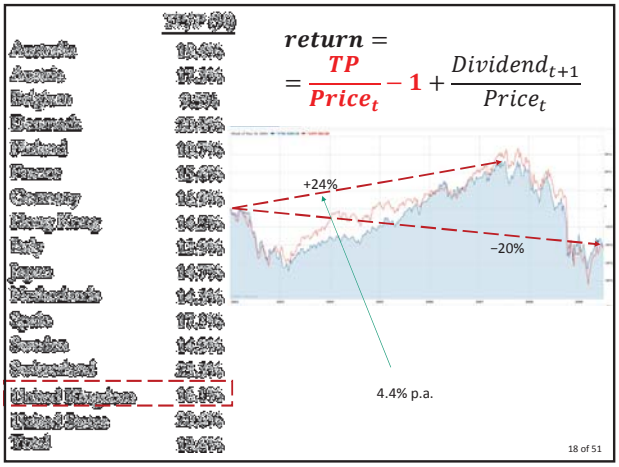

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TABLE 3
Summary statistics of target price accuracy measures

Panel A: Mean values of TP forecast accuracy measures

		Main TP forecast accuracy measures	
	N	*Met_any* (%)	*aTPE* (%)
Australia	24852	66.1%	47.4%
Austria	2546	59.8%	50.6%
Belgium	4407	59.1%	40.6%
Denmark	5036	56.1%	58.2%
Finland	8649	62.2%	44.1%
France	26103	58.3%	38.7%
Germany	24239	60.8%	44.3%
Hong Kong	22729	64.3%	48.4%
Italy	10711	54.0%	38.3%
Japan	41316	59.1%	37.3%
Netherlands	11994	59.1%	37.9%
Spain	9252	60.2%	39.4%
Sweden	12953	58.6%	47.5%
Switzerland	12593	55.8%	45.4%
United Kingdom	44996	57.5%	47.8%
United States	323342	54.7%	49.5%
Average		59.1%	44.7%

TP error=

$$=\frac{|actual\ price_{12} - TP|}{Price_0}$$

$$=\frac{|155-200|}{100}$$

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+ $\hat{a} + \hat{b} *$RM)
- **Naïve TP** = industry mean P/E ratio & analyst EPS estimate

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Analysts TPs. vs simple models

Analysts TPs are more accurate than the 3 naïve TPs

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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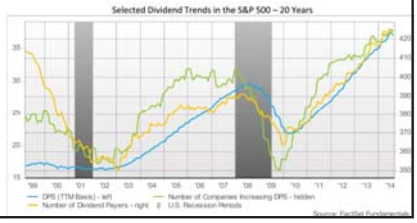
The usefulness of sell-side analysts dividend forecasts: measure #1

Analyst dividend forecasts, Bilinski 2014

$$\textbf{return} = \frac{\text{TP}}{\text{Price}_t} - 1 + \frac{\boldsymbol{Dividend_{t+1}}}{\boldsymbol{Price_t}}$$

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



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 = $\frac{|actual\ DPS - annualized\ DPS\ forecast|}{Price}$

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DPS/P and DPS error vs. EPS error

	N	DPS/P
Australia	38323	5.25%
Austria	2938	2.62%
Belgium	5764	2.62%
Denmark	4208	1.75%
Finland	15316	3.26%
France	37135	2.08%
Germany	27383	2.27%
Hong Kong	21214	3.69%
Italy	10664	3.38%
Japan	54787	1.27%
Netherlands	10973	3.29%
Spain	10251	2.95%
Sweden	12789	4.92%
Switzerland	11680	1.81%
United Kingdom	47502	3.27%
United States	62551	3.58%
Average		**3.00%**

DPS/P and DPS error vs. EPS error

	N	DPS/P	*DPS forecast error*	*EPS forecast error*	*DPS error/EPS error*
Australia	38323	5.25%	1.27%	2.80%	-54.8%
Austria	2938	2.62%	0.59%	1.84%	-68.2%
Belgium	5764	2.62%	0.64%	1.52%	-58.0%
Denmark	4208	1.75%	0.60%	1.58%	[illegible]
Finland	15316	3.26%	1.20%	2.26%	[illegible]
France	37135	2.08%	0.44%	[illegible]	[illegible]
Germany	27383	2.27%	0.60%	[illegible]	[illegible]
Hong Kong	21214	3.69%	1.24%	[illegible]	[illegible]
Italy	10664	3.38%	1.04%	[illegible]	[illegible]
Japan	54787	1.27%	0.17%	[illegible]	[illegible]
Netherlands	10973	3.29%	0.72%	[illegible]	[illegible]
Spain	10251	2.95%	0.83%	[illegible]	-46.0%
Sweden	12789	4.92%	1.37%	2.72%	-49.6%
Switzerland	11680	1.81%	0.48%	1.51%	-68.5%
United Kingdom	47502	3.27%	0.45%	1.62%	-72.1%
United States	62551	3.58%	0.42%	2.50%	-83.1%
Average		**3.00%**	**0.75%**	**2.13%**	**-64.60%**

100 times more accurate than TPs

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Analyst dividend forecasts vs. simple dividend estimates

- **Past DPS**: a martingale dividend forecast where the next year dividend equals the past dividend
- **Mean Payout*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

$$d_t = d_{t-1} + c\left(d^T - d_{t-1}\right) + v_t \qquad d^T = k^T * e_t$$

- **Target payout*NI**: target payout ratio and net income for the previous fiscal year
- **Target payout*EPS**: target payout ratio estimated from equation (6) and the analyst EPS forecast
- **Lintner**: dividend forecast from the Lintner model

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The difference: accuracy of analyst DPS - simple DPS

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

	past							Lintner
	diff							
Australia	-0.839							
Austria	[illegible]							
Belgium	[illegible]							0.000
Denmark	[illegible]							[illegible]
Finland	[illegible]							[illegible]
France	[illegible]							0.000
Germany	[illegible]							0.000
Hong Kong	[illegible]							[illegible]
Italy	[illegible]							[illegible]
Japan	[illegible]							[illegible]
Netherlands	[illegible]							[illegible]
Spain	[illegible]							0.000
Sweden	[illegible]							0.000
Switzerland	[illegible]							0.000
United Kingdom	-2.73%							0.000
United States	-0.94%							0.000
Average	**-0.78%**							0.000

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,

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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*

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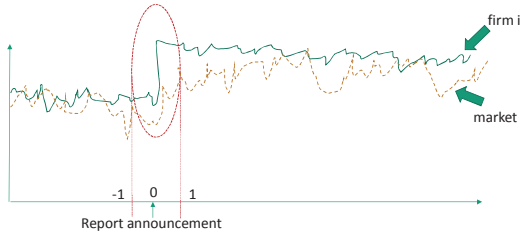
Short-term price reactions

short-term price reactions



$CARs = f(revisions)$
= ΔTP +ΔDPS + Δother information

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$CARs = f(revisions)$
= ΔEPS+ΔTP +ΔDPS + Δstock recommendations

	Model 1		Model 2		Model 3	
	Estimate	p	Estimate	p	Estimate	p
Intercept	0.001	0.000	0.001	0.005	0.001	0.000
ΔEPS	0.318	0.000	0.307	0.000	0.247	0.000
ΔDPS	0.268	0.000			0.212	0.000
Upgrade					0.011	0.000
Downgrade					-0.015	0.000
ΔTP			0.050	0.000	0.044	0.000
N	152415		152415		152415	
F-test	609.70		854.71		522.95	
p	0.000		0.000		0.000	
R	1.91%		3.06%		3.87%	

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

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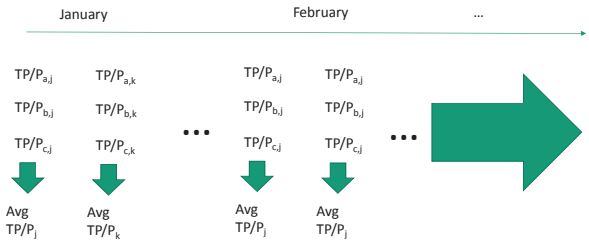
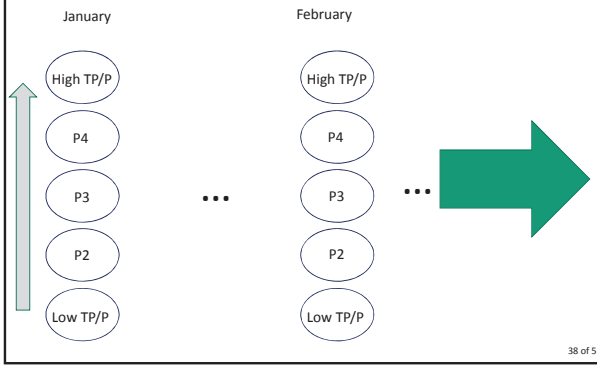
Investment value of TPs and DPS

Create 5 portfolios on TP/P

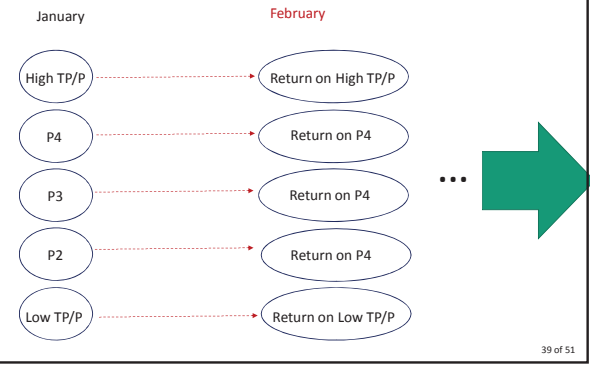
- For each firm-month

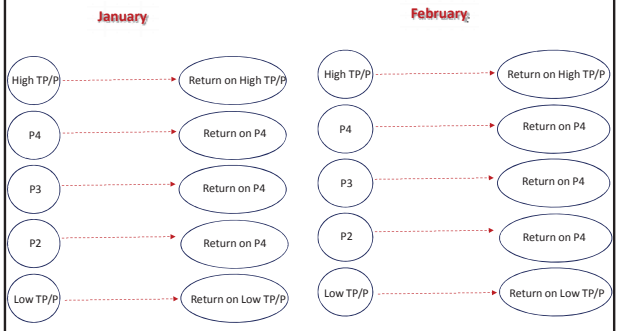


- Each month, **rank** stocks by average TP/P into five portfolios



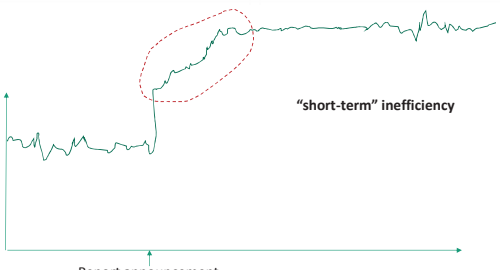
- Calculate returns for the next month (1 month holding period)



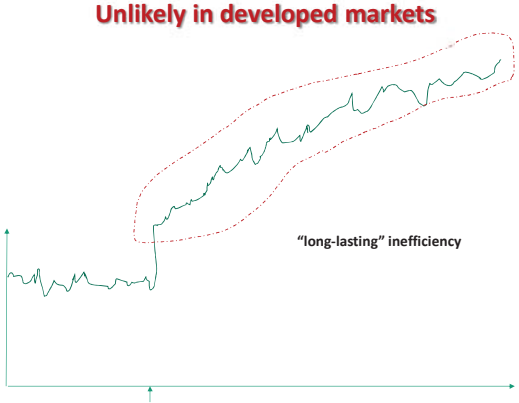


- **Time-series of portfolio returns** for each portfolio: $R_{pt} = \sum R_{it}$

- In efficient markets, drift should be short-term
- **You try to maximize the signal, then worry about the rest**



Unlikely in developed markets



Statistics

- **Raw return** for each portfolio
- $R_{pt} = alpha + \beta_1 * Mkt\_rf + \beta_1 * SMB + \beta_1 * HML + \beta_1 * Mom$

Risk adjusted return

Portfolio's risk

- Sample of US stocks over 2002-2011

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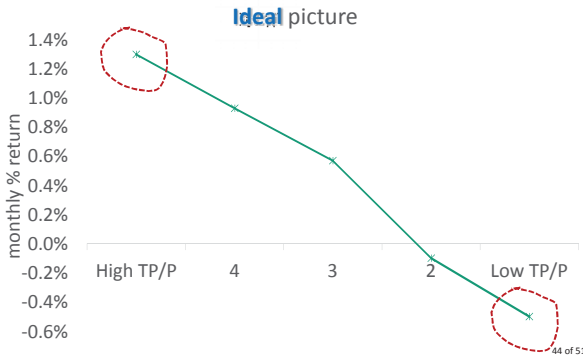
Expectations



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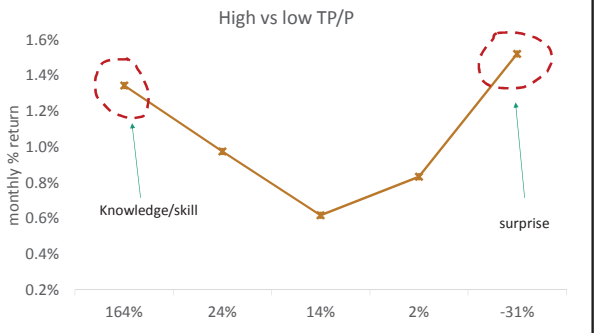
Raw % monthly returns



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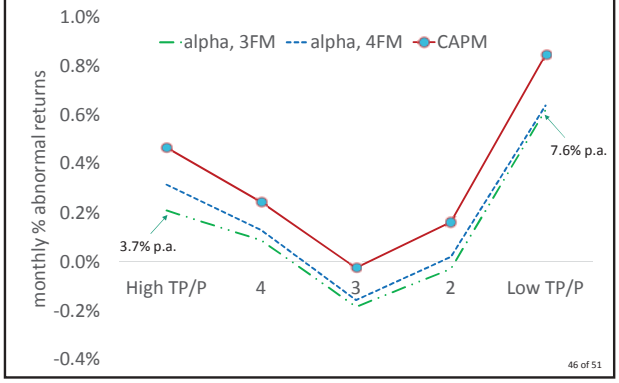
Alphas, CAPM, three- and four-factor models



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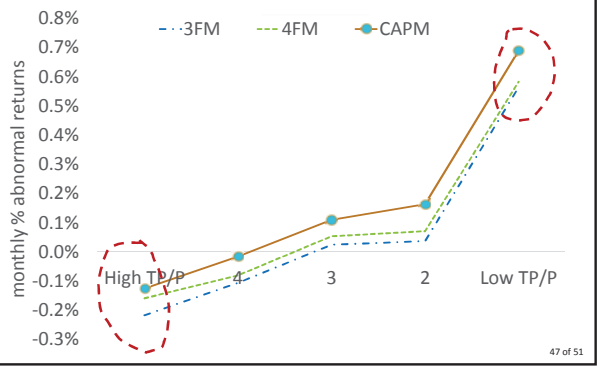
6-month holding period: surprise vs. skill



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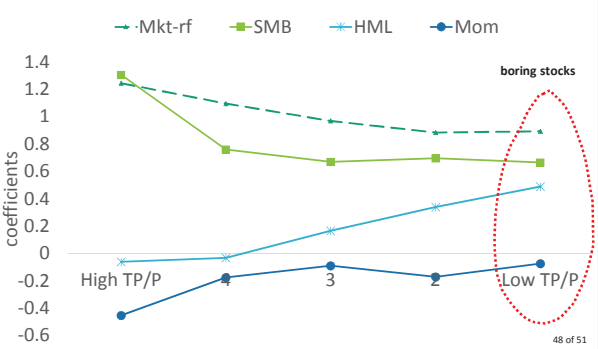
Arbitrage costs: risk factors from 4FM



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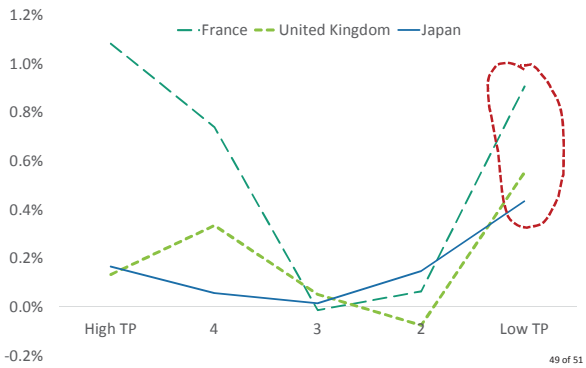
International sample



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Portfolios based on DPS forecasts and TP&DPS

Not much action

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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

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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
- Events organized by the **Centre for Financial Analysis and Reporting Research**:

http://www.cass.city.ac.uk/research-and-faculty/centres/cefarr

- email: Pawel.Bilinski.1@city.ac.uk

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