Wharton
University of Pennsylvania

The Global Standard for Business Research
wrds

I/B/E/S @WRDS 101

Introduction and Research Guide

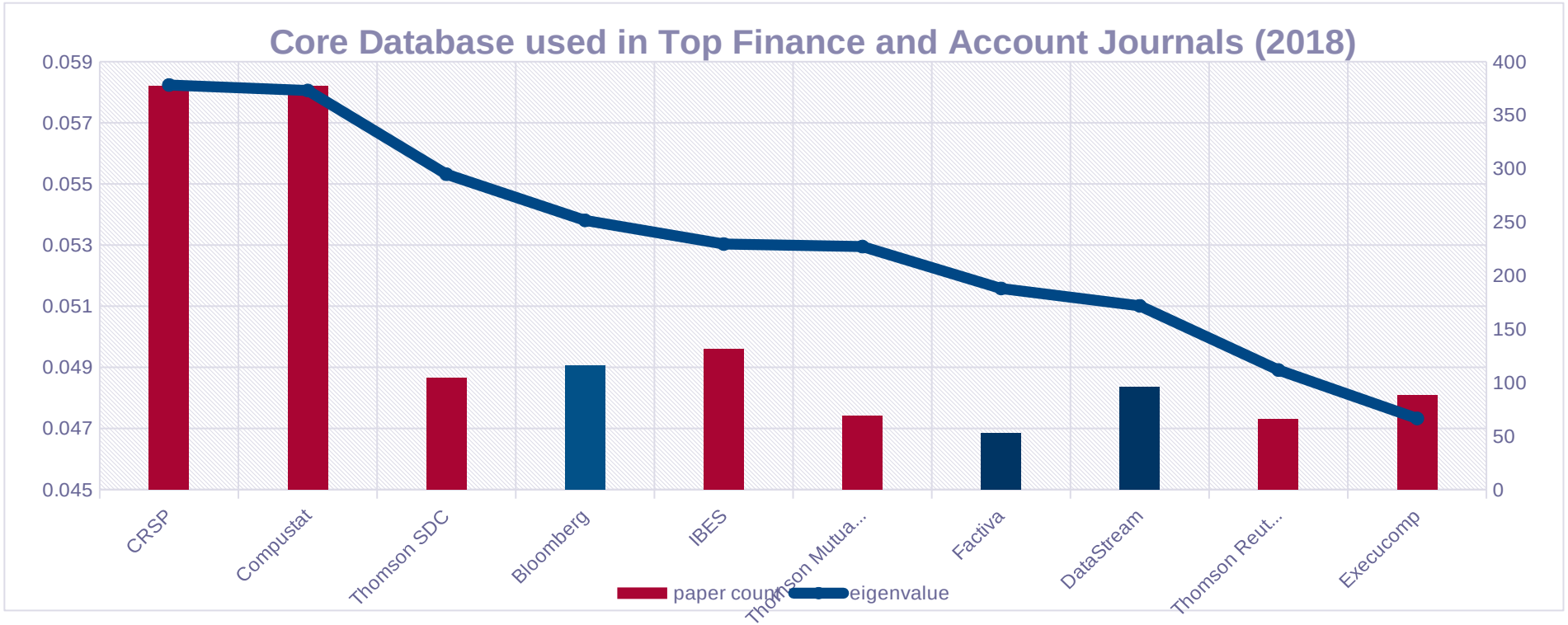
Rui Dai Ph.D. CFA

> “Before I/B/E/S collected such data, consensus earnings estimates were difficult to obtain and highly ambiguous.”
>
> — WILLIAM SHARPE

Part I: Introduction

Institutional Brokers' Estimate System (I/B/E/S)

- I/B/E/S is recognized as the conventional analyst forecast data in academia
- Broker houses contribute to I/B/E/S with US data back to 1975 and International data back to 1987.



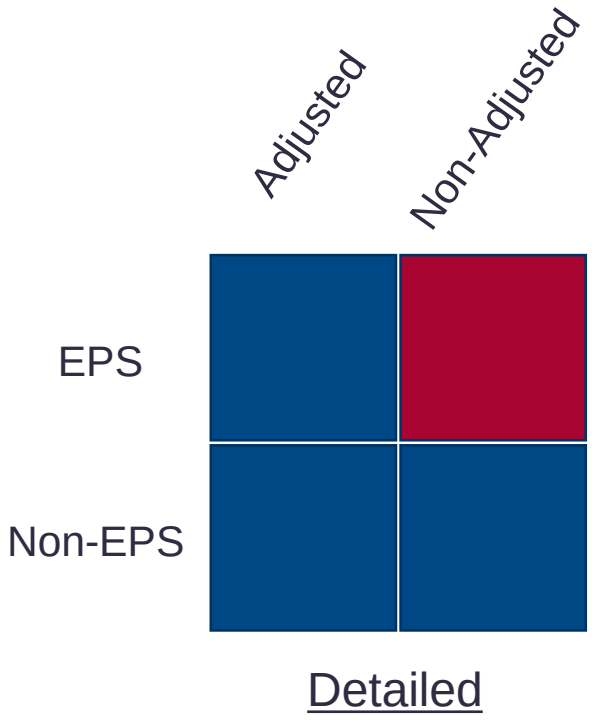
Frequently used I/B/E/S data

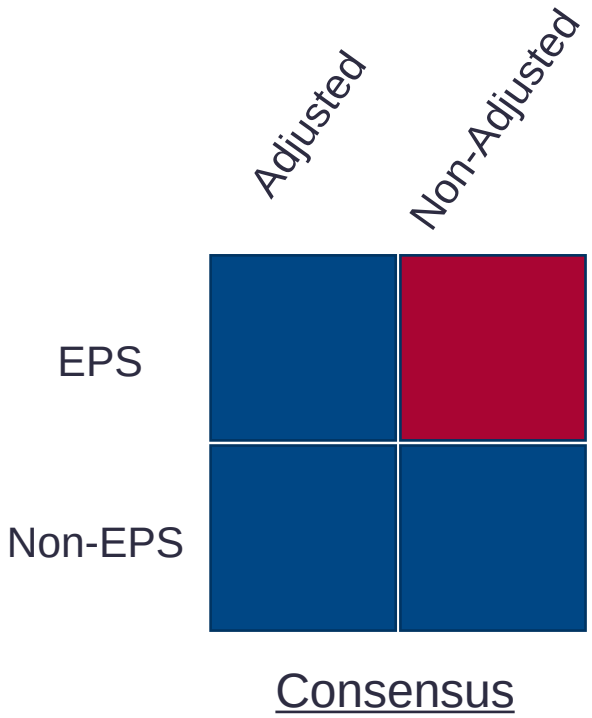
- I/B/E/S Estimates
  - It is an historical earnings estimate database containing analyst estimates.
  - It includes more than 20 forecast measures - including EPS (earnings per share), revenue, price targets, EBITDA and pre-tax profits.
  - The data available on both consensus and detailed levels, covering both U.S. and international companies.

- I/B/E/S Guidance
  - It includes management's predictions about their own company
  - It combines information previously available in the Company Issued Guidance (CIG) file in base I/B/E/S and information from the defunct First Call database

I/B/E/S Estimates Data Categories

- Data Dimensions
  - Detailed vs Consensus
  - EPS vs No-EPS
  - Adjusted vs Non-Adjusted
  - US vs Non-US





I/B/E/S Estimates Data Collection

- 3,000+ estimators(brokers) contribute data to I/B/E/S from the largest global houses to regional and local brokers, totaling over 30,000 individual analysts.
- Company actuals are collected from multiple newswire feeds, press releases, company websites and public filings.
- Detailed estimates are collected each day as they are released by analysts. Summary history consists of chronological snapshots of consensus level data taken on a monthly basis.

Identifier System

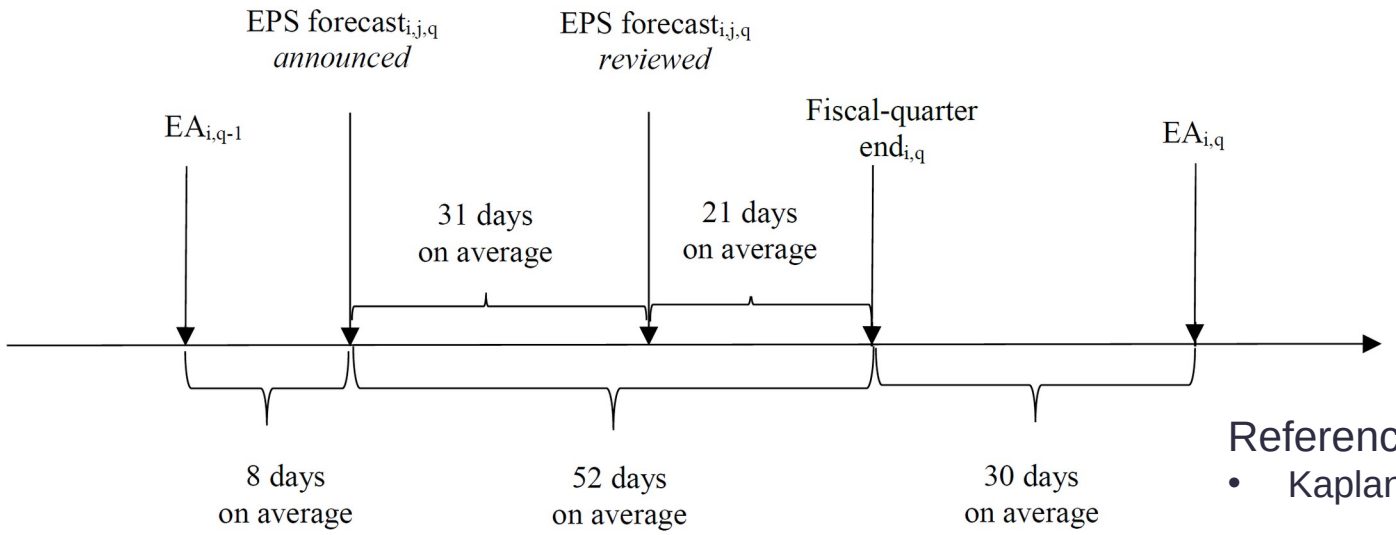
- Permanent ID:
  - I/B/E/S ticker, denoted as 'TICKER', is a unique identifier assigned to each security that is consistent throughout I/B/E/S History.
- Security ID:
  - CUSIP/SEDOL data field contain historical CUSIP, or SEDOL when CUSIP is not available.
- Link I/B/E/S and Other databases
  - See the programing guide on *linking I/B/E/S with CRSP and Compustat*

I/B/E/S Jargon

- Parties:
  - Estimator: Sell-side institution or contributor (mostly broker house)
  - Analyst: analyst who makes the forecast and work for sell-side institution
- Indicators:
  - Forecast Period Indicator (FPI): a code to identify estimates for forecasting period
    - e.g. 6: Next Fiscal Quarter and 1: Next Fiscal Year
  - Primary/Diluted Indicator (PDI): share base selected for a company
  - Primary/Diluted Flag (PDF): share base selected for an estimate

Forecasting Time Lines

- Dates:
  - Announce date(ANNDATS): the date that the **forecast/actual** was reported
  - Activation date(ACTDATS): the date that the **forecast/actual** was recorded by the data vendor
  - Forecast Period End Date (FPEDATS): the date to which the estimate applies
  - Review Date (REVDATS): most recent date that an estimate was confirmed as accurate
  - Statistical Period (STATPERS): the date in a month summary statistics of estimates are calculated



Reference:
- Kaplan, et al (2019): Truncating optimism

Data Example

- Detailed adjusted EPS estimate table

TICKER	CUSIP	ACTDATS	ANNDATS	FPEDATS	ESTIMATOR	ANALYS	FPI	MEASURE	VALUE	ANNDATS_ACT	ACTUAL
IBM	45920010	18-Jan-06	17-Jan-06	31-Dec-06	85	49595	1	EPS	5.8	18-Jan-07	6.06
IBM	45920010	18-Jan-06	18-Jan-06	31-Dec-06	2191	1032	1	EPS	5.9	18-Jan-07	6.06
IBM	45920010	18-Jan-06	18-Jan-06	31-Dec-06	…	…	…	…	…	…	…
IBM	45920010	18-Jan-06	18-Jan-06	31-Dec-06	16	10014	1	EPS	5.8	18-Jan-07	**6.06**

  - On **17-Jan-06** (ANNDATS), analyst 49595 (ANALYS) at Estimator 85 (ESTIMATOR) predicts that the EPS for IBM with fiscal period ending **31-Dec-06** (FPEDATS) is $5.8 (VALUE) . This estimates was entered into the I/B/E/S database on **18-Jan-06** (ACTDATS). On **18-Jan-07**(ANNDATS_ACT), IBM announced an actual EPS of $6.06 (ACTUAL) for this fiscal period.

- Consensus adjusted EPS estimate table

TICKER	CUSIP	STATPERS	MEASURE	FPI	NUMEST	MEDEST	MEANEST	STDEV	FPEDATS	ACTUAL	ANNDATS_ACT
IBM	45920010	19-Jan-06	EPS	1	23	5.8	5.79	0.08	31-Dec-06	6.06	18-Jan-07
IBM	45920010	16-Feb-06	EPS	1	23	5.8	5.81	0.07	31-Dec-06	6.06	18-Jan-07
IBM	45920010	16-Mar-06	EPS	1	22	5.8	5.8	0.07	31-Dec-06	6.06	**18-Jan-07**

  - The Summary statistics calculated on **19-Jan-06** (STATPERS) shows that for forecast period ending **31-Dec-06** (FPEDATS), forecasted earnings per share has a median of $5.8, mean of $5.79 with standard deviation of 0.08, which is calculated from 23 esitmates.

Accounting Background: Street Numbers

- Generally Accepted Accounting Principals define the earnings reported on financial statements, commonly referred to as "GAAP earnings“
- However, in press releases and conference calls, managers and analysts often report earnings excluding items that appear in GAAP earnings (e.g., special items, stock-based compensation expense, etc.)
- The use and definition of these non-GAAP earnings numbers, popularly referred to as “pro forma earnings" or “Street earnings” varies by firm
- So be aware that earnings on Compustat are GAAP, while I/B/E/S tracks “Street Earnings”

Reference:

- Bradshaw and Sloan (JAR, 2002) “GAAP vs. The Street: an Empirical Assessment of Two Alternative Definitions of Earnings”

Street Numbers v.s. GAAP

- Intuit reports the performance metrics in its 2006 earnings announcement:

	Q3 FY06	Q3 FY05	Difference
Revenue	952.6	834.9	+14%
GAAP net income	**298.6**	300.5	-1%
NonGAAP net income	**318.3**	287.5	**+11%**
GAAP diluted EPS	1.68	1.61	+4%
Non-GAAP diluted EPS	1.79	1.54	+16%

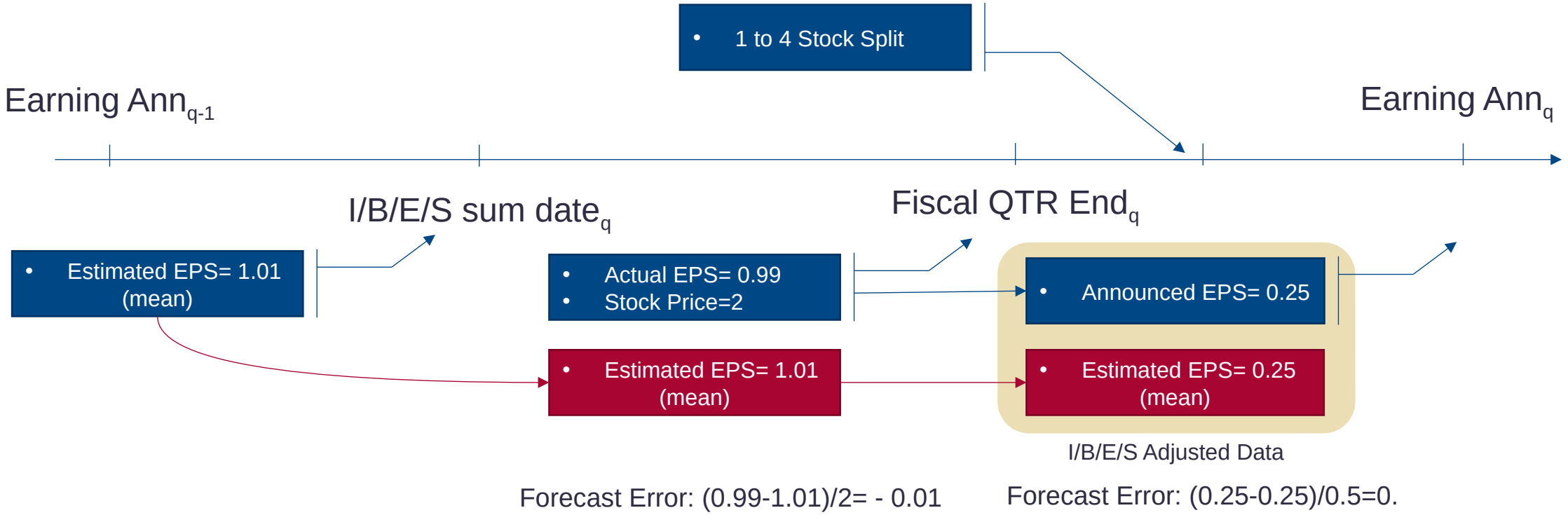
- Street earnings (I/B/E/S) could exclude various expenses required by GAAP

Note: there is another reason why Compustat reports different numbers from I/B/E/S: Compustat quarterly data reports restated values, while I/B/E/S includes the originally reported earnings.

Part II: Empirical Research Guide

Rounding Issues in I/B/E/S Adjusted Summary Data

- I/B/E/S Adjusted Consensus files (easiest-to-use) are rounded to 2 decimals
- Key Factor: Shares Outstanding



Rounding Issues Implication

- Payne and Thomas (2003) concludes rounding issues are pronounced among larger firms, higher M/B, better performers.
- Research implication: the proportion of zero forecast errors over time
  - Market reaction
  - Earning management
- The median of stock split is 1-to-2 among US common stocks, while the 95th (99th) percentile of same figure is 1-to-2.5 (1-to-4)
  - Based on CRSP Factor to Adjust (shares), 12,626 stock-split events for 6,045 stocks from 1980 to 2019

Reference:
- Payne and Thomas (TAR 2003) " The Implications of Using Stock-Split Adjusted IBES Data in Empirical Research."

Potential Solutions for Rounding Issue (Solution 1)

- Use I/B/E/S unadjusted consensus data and utilize cumulative factors to adjust data without rounding.
  - Unfortunately, I/B/E/S effective split date is NOT necessarily the true date of the stock split. In fact, it is the date when the split became “effective” within the IBES database. (e.g. see Microsoft Quarterly Stats from Dec 89 to Jun 90.)
  - The split date from other data source, such as CRSP, may be needed.

CRSP

TICKER	STATPERS	MEANEST	FPEDATS	ANNDATS	VALUE	CFACSHR at Statistical Period	CFACSHR at Earning Announcement
ALK	15MAR2012	**0.71**	31MAR2012	19APR2012	**0.39**	4	2

Unadjusted Consensus Estimates + Unadjusted Actual Announcement

$$MEANEST_{Adj} = MEANEST \times \frac{CFACSHR\,at\,Earning\,Announcement}{CFACSHR\,at\,Statistical\,Period} = 0.355$$

Potential Solutions for Rounding Issue (Solution 2)

- Recalculate I/B/E/S consensus statistics using the detail IBES adjusted data, which has rounding to 4 decimals.
  - I/B/E/S consensus data includes only effective estimates while calculating the summary stats from detail, but provides no clear definition of what is considered an effective estimate. No way has been found to perfectly reconstruct I/B/E/S Summary data even in early years.
  - I/B/E/S may be “lumping” forecasts of different analysts from a same estimator. Shevorob (2006) suggests the latest estimate for a given estimator is included (Appendix I)
  - It is found that estimators and analysts have been removed from the estimate database, which may cause further data inconsistence in between detailed and consensus metrics.

Reference:

- Shvorob (WRDS 2006) “A Note on Recreating Summary Statistics from Detail History”

Rewriting History

- Ljungqvist, Malloy and Marston (JF, 2009) document widespread changes to the historical I/B/E/S analyst stock recommendations:
  - Across seven I/B/E/S downloads, obtained between 2000 and 2007, authors find between 1.6% and 21.7% of matched observations are different from one download to the next
  - Four types of changes: alterations, deletions, additions and anonymizations

- Non-trivial implications on research that analyzes
  - Profitability of trading signals and consensus recommendation changes
  - Persistence in individual analyst performance (analysts' track records).

Reference:

- Ljungqvist, Malloy, and Marston (JF 2009) "Rewriting History".
- Alpert (WSJ 2007) "Mysterious Changes in Key Wall Street Data".

Vanishing History

- The finding of Ljungqvist et al. (2009) does not extend to the *I/B/E/S earnings forecast data* (see Wu and Zang 2009).

- Call et al (2020) finds substantial differences in the contents of these two versions of the detailed file from 2009 and 2015.
  - 11.68% of detailed estimates in 2009 vintage is no long in 2015 vintage, and 6.01% vice versa.

- Call et al (2020) also finds changes made to the summary file are much less common than changes made to the detail file.
  - Only 0.11% of summary estimates in 2009 vintage is no long in 2015 vintage, and 1.49% vice versa.

Reference:
- Call et all (2020) “Analysts’ Annual Earnings Forecasts and Changes to the I/B/E/S Database”.
- Wu and Zang (2009) “What determine financial analysts’ career outcomes during mergers?”.

Institutional Background

- Through interviews with I/B/E/S high-end representatives, the authors learn that many brokerages have the contractual right to restrict access to their analyst forecast. Upon requests, I/B/E/S would cease or activate distribution of their forecasts, even retroactively.

- This could be confirmed by many correspondences between WRDS and I/B/E/S:

  "[T]he great majority of the records missing in the July 2007 vintage are for brokers Merrill Lynch (non-US and Canada) and Lehman Brothers (Europe and Global), due to requests from the two brokers that WRDS does not have access to their forecast data"

- The finding of Call et all. (2020) also is consistent to the conjecture that many brokerages, like Goldman Sachs, only supply estimates to the summary files but not the detail files

Encrypted History (Bad News for Academia)

- To better adapt regulatory compliance (such as MiFID II), I/B/E/S changed the identifiers of a large number of brokers and analysts as of October, 2018.
  - The estimator and analyst names from 88 contributors will be anonymized in detailed estimates data
  - The estimates from UBS will be removed from the I/B/E/S detailed estimates data

- Through a conference call, I/B/E/S further inform WRDS individual broker IDs (and all affected analysts) **have been** and **will continue** to be subject to **reshuffle without warning**.
  - The analyst id reshuffle may further complicate the inconsistent analyst code issue documented in Roger(2016).

Reference:
- Roger (2016) “Reporting errors in the I/B/E/S earnings forecast database: J. Doe vs. J. Doe”.

Encrypted History (Cont.)

- Pierson (WRDS 2020) compares two I/B/E/S detailed files from 2014 and 2019 vintage to calibrate the impact made in Oct 2018.
  - The data from two vintage are matched based on estimated amount, announcement data, security, etc. except analyst and estimator codes.
  - It is likely that 13.8% of all broker IDs (ESTIMATOR) has been modified, consistent to the listed 89 brokers
  - Also I/B/E/S may have resigned up to 30.7% of all analyst IDs (ANALYS), many of whom are not necessarily associated with those 89 brokers

- Fortunately, the changes are only made to detailed estimate datasets, presumably due to regulatory concerns.

"There will be no change to the I/B/E/S Summary History estimates product (consensus). Detailed estimates from all Pre-Approval brokers, including UBS, will remain within all summary/consensus calculations in accordance with existing methodology."

Reference:

- Thomson Reuters Product Change Notification ref: CN 082718

Takeaways

- Working with I/B/E/S requires good understanding of some issues:
  - Be aware of rounding issues in Adjusted Consensus which may lead to biased estimates of earnings surprises
  - More recent version of the detail file does not reflect more comprehensive historical analyst estimates
  - Consensus estimates in the summary file may be the best proxy for the market's expectations

- Further Material
  - WRDS Research Application: Post-Earning Announcement Drift (PEAD)
  - Replication Tutorial: SUE and PEAD with Compustat and I/B/E/S data


Wharton
University of Pennsylvania

Appendix I: Recreating Summary Statistics from Detailed File

- Consensus File:

TICKER	MEASURE	FPEDATS	FPI	STATPERS	NUMEST	MEANEST	STDEV	ESTFLAG
BIT	EPS	12/31/2004	1	10/14/2004	2	0.14	0.01	P

- Detail Table:

TICKER	MEASURE	FPEDATS	FPI	ESTDATS	ESTIMATOR	ANALYS	VALUE	Drop Reason
BIT	EPS	12/31/2004	1	2/9/2004	2192	9479	0.14	Superseded
BIT	EPS	12/31/2004	1	5/7/2004	2192	72066	0.15	
BIT	EPS	12/31/2004	1	8/3/2004	1996	107152	0.14	
BIT	EPS	12/31/2004	2	7/8/2003	1876	7646	0.23	Stopped (In Stop Table)
BIT	EPS	12/31/2004	2	10/9/2003	1876	7646	0.19	Stopped (In Stop Table)
BIT	EPS	12/31/2004	2	2/9/2004	1876	7646	0.22	Excluded(In Exclusion Table)

- Exclude Table: Estimates removed from the consensus but still observable to clients

TICKER	MEASURE	FPEDATS	FPI	ESTDATS	BROKER	ANALYS	VALUE	EXCDATS
BIT	EPS	12/31/2004	2	12/10/2003	1876	7646	0.22	4/16/2004

- Stop Table: Estimates removed and no longer observable

TICKER	MEASURE	FPEDATS	PDICITY	BROKER	ESTPDATS
BIT	EPS	12/31/2004	A	1876	4/20/2004

Reference:

- Kaplan Martin and Xie (2019) “Truncating optimism. ”

Rounding Issues in I/B/E/S Adjusted Data

- Historically, I/B/E/S provides estimate data on an adjusted basis, rounded to 2 decimal on the Consensus files and to 4 decimals on the Detailed files.
- How would this be an issue?

		Unadjusted EPS	Adjusted EPS after a 4-for-1 Stock Split
Company A	Earnings	0.99	0.25
	Forecast	1.00	0.25
	Forecast error	**-0.01**	**0.00**
Company B	Earnings	1.01	0.25
	Forecast	1.00	0.25
	Forecast error	**0.01**	**0.00**

Reference:

- Payne and Thomas (TAR 2003) " The Implications of Using Stock-Split Adjusted IBES Data in Empirical Research."