weARE webinar series on Accounting Research + Education

March 26, 2021
Bringing Scholarly Data Analytics Knowledge Using Emerging Technology Tools in Accounting into Classrooms: A Bibliometric Approach

Moderator
Karen Osterheld, Bentley University

Speaker
Brigitte Muehlmann, Babson College

with contributions from:
Qi Liu, University of Rhode Island
Victoria Chiu, SUNY Oswego
Amelia Baldwin, University of South Alabama
LEARNING OBJECTIVES

Participants will understand how...
- **SEC interactive data** can be used from entry-level financial reporting on
- **Tableau** can be applied to full population audit
- **Celonis** can be used for process mining

Participants will also take away...
- **Related key research insights**
- **First-hand experience using the open-access SEC interactive Data in the classroom**
  - Covid-19-inspired demonstration
  - Lessons learned
  - Useful tips
Accounting tends to be appreciated when it is in sync with current business practice, but less when it falls behind. I aim to instill in my students an enthusiasm for:

- Timeless key elements of the system
- Contemporary implementation
- Opportunities for innovation

- To assist accounting faculty with data analytics contents adoption in all their courses.
- Push for education from industry and AACSB requirements.
- Started as member of the SET Section’s Continuing Education Committee in 2017.
- Resources are current AAA events, plus much research has been published, which is not widely known in the accounting academy.
MOTIVATION

- **Research is available mainly in six journals:**
  - AAA: *Journal of Emerging Technologies in Accounting (JETA)*, *Journal of Information Systems (JIS)*
  - Wiley: *Intelligent Systems in Accounting, Finance and Management (ISAFM)*

- **Co-authored article in Issues in Accounting Education (online early)**
  - **Classroom applications by accounting area**
  - **Introductory articles by analytical method**
  - **Description and Download Link of Disclosed DA Tools**
FULL POPULATION AUDIT
Identify data outliers and patterns through visualization

Weekend Invoice Postings
Value of Invoices at Exact Date Level
Points are coloured by year.

12,346
Invoices Created on a Saturday or Sunday
This paper details the implementation of continuous audit at Cia. Hering, a large Brazilian clothing retailer.

The Brazilian tax authority collects sales tax in real time. Overpayments constrain cash flow while the company is waiting for a refund. Visualization of daily invoices protects from overpayments.
PROCESS MINING
Discover processes as they actually operate.

Source: www.celonis.com
Reducing false positives in fraud detection: 
Combining the red flag approach with process mining. 
*Baader, G. and Krcmar, H.* 

Applied the processes to the purchase-to-pay business process.

**RED FLAGS** visualize hints for unusual behavior

**PROCESS MINING** visualizes the as-is business process from the underlying dataset

Identified 15* of 31 fraud cases in the dataset 
False positive rate: 0.37%, considerably lower than in similar research papers

* include bid rigging, redirected payments, uses of shell companies, overpriced product and non-received discount kick-back
## SEC Interactive Data

### Cheesecake Factory Inc CIK: 0000887596 (see all company filings)

**SIC:** 5812 - Retail-Eating Places  
*State location:* CA | *State of Inc.:* DE | *Fiscal Year End:* 1229  
*Former:* Cheesecake Factory Incorporated (filings through 2007-03-01)  
*(Office of Trade & Services)*  
Get insider transactions for this issuer.

### Filter Results

**Filing Type:** 10-k  
**Prior to:** (YYYYMMDD)  
**Ownership:** include/exclude/only  
**Limit Results Per Page:** 40 Entries  

<table>
<thead>
<tr>
<th>Filing Type</th>
<th>Format</th>
<th>Description</th>
<th>Filing Date</th>
<th>File/Film Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-K</td>
<td>Documents</td>
<td>Annual report [Section 13 and 15(d), not S-K Item 405]</td>
<td>2021-02-24</td>
<td>000-20574</td>
</tr>
<tr>
<td>10-K</td>
<td>Documents</td>
<td>Annual report [Section 13 and 15(d), not S-K Item 405]</td>
<td>2017-03-02</td>
<td>000-20574</td>
</tr>
<tr>
<td>10-K</td>
<td>Documents</td>
<td>Annual report [Section 13 and 15(d), not S-K Item 405]</td>
<td>2016-02-25</td>
<td>000-20574</td>
</tr>
<tr>
<td>10-K</td>
<td>Documents</td>
<td>Annual report [Section 13 and 15(d), not S-K Item 405]</td>
<td>2011-02-23</td>
<td>000-20574</td>
</tr>
<tr>
<td>10-K</td>
<td>Documents</td>
<td>Annual report [Section 13 and 15(d), not S-K Item 405]</td>
<td>2010-04-02</td>
<td>000-20574</td>
</tr>
<tr>
<td>10-K</td>
<td>Documents</td>
<td>Annual report [Section 13 and 15(d), not S-K Item 405]</td>
<td>2010-03-02</td>
<td>000-20574</td>
</tr>
</tbody>
</table>

Source: [https://www.sec.gov/cgi-bin/browse-edgar?action=getcompany&CIK=0000887596&type=10-k&dateb=&owner=exclude&count=40&search_text=](https://www.sec.gov/cgi-bin/browse-edgar?action=getcompany&CIK=0000887596&type=10-k&dateb=&owner=exclude&count=40&search_text=)
SEC INTERACTIVE DATA
HOW I BECAME INTERESTED

• Presented by Mike Willis, SEC Office of Structured Disclosure, at AAA’s Transformative Technologies Workshop (TTW) in August 2018

• Tried a demonstration to students in Fall 2018
• Never looked back
SEC INTERACTIVE DATA DEMONSTRATION (I)

SEC Charges The Cheesecake Factory For Misleading COVID-19 Disclosures

As set forth in the SEC's order, in its SEC filings on March 23 and April 3, 2020, The Cheesecake Factory stated that its restaurants were "operating sustainably" during the COVID-19 pandemic.

December 4, 2020

• Was the company able to sustain its revenue in FY2020?

• Does their cash flow support their assertion that they were “operating sustainably”?
How much COVID-19 vaccine financing did the company receive in 2020?
When did the money come in?
How much revenue did the company earn in 2020?

All in all, U.S. agencies committed about $2.5 billion to help develop Moderna’s vaccine and buy doses, according to the New York Times.

November 24, 2020
SEC INTERACTIVE DATA

LESSONS LEARNED

• All public companies covered, including small caps, not only those selected by database provider
• Available to students any time during and after studying, access from anywhere in the world
• No subscription, no cost
• Financial statements as filed, available on screen, as pdf, and in Excel
  Line item definitions & reference to FASB codification
  Notes, plus: Notes tables & details
  Full 10-K, searchable right there, too
Cong, Y., Du, H. and Vasarhelyi, M.A.

Are XBRL files being accessed?
Evidence from the SEC EDGAR log file dataset.

**Q3/2012 – Q1/2015**

**880 small companies**, user accesses to 5,016 unique XBRL filings

**61% accessed XBRL files**, 39% accessed conventional files
Chychyla, R. and Kogan, A.

**Using XBRL to conduct a large-scale study of discrepancies between the accounting numbers in Compustat and SEC 10-K filings.**


Research insights

**XBRL filings vs. Compustat data** for 30 accounting items

- **13 items** – no differences, e.g., Total Assets, Total Liabilities, Net Income
- **17 items** – significantly changed, e.g., COGS, gross profit

Compustat data standardized to improve data comparability across companies

Studied 5,000+ domestic US-GAAP companies, 10/2011 – 9/2012

Incremental additional research insights

Compared to 10-K filings, *variances in Compustat < Yahoo! Finance < Google Finance* Widely used bankruptcy prediction and earnings quality models affected by the differences
## SEC INTERACTIVE DATA

### TIPS: For the syllabus and/or LMS

Obtaining reports of public companies from the SEC website:

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Go to <a href="https://www.sec.gov/edgar/searchedgar/companysearch.html">https://www.sec.gov/edgar/searchedgar/companysearch.html</a>, and bookmark it.</td>
</tr>
<tr>
<td>2</td>
<td>Enter the company name, e.g., “moderna”, in the search box.</td>
</tr>
<tr>
<td>3</td>
<td>Click on “Classic version” in the upper right-hand corner.</td>
</tr>
<tr>
<td>4</td>
<td>Enter the form under “Filter results, Filing type”, e.g., 10-K, 10-Q, 20-F, 40-F</td>
</tr>
<tr>
<td>5</td>
<td>Click on <a href="https://www.sec.gov/edgar/searchedgar/companysearch.html">Interactive Data</a>.</td>
</tr>
<tr>
<td>6</td>
<td>Click on what you are looking for, e.g., <a href="https://www.sec.gov/edgar/searchedgar/companysearch.html">Financial Statements</a>, <a href="https://www.sec.gov/edgar/searchedgar/companysearch.html">Notes to Financial Statements</a>, <a href="https://www.sec.gov/edgar/searchedgar/companysearch.html">Notes Details</a>. Note: The &quot;Notes Details&quot; and other items offer useful additional details.</td>
</tr>
</tbody>
</table>

You can view the information on the screen, print a pdf (“Print Document”), or download an Excel file (“View Excel Document”).

A noteworthy feature: If you want to understand what a financial statement line item means, or see the reference to the FASB Codification, simply click on it on the screen, and a box appears with an explanation.
SEC INTERACTIVE DATA

TIPS: For locating interesting examples efficiently

10-K financials “hot off the press”

E.g., impairment in the last xx days

LINK: HTTPS://WWW.SEC.GOV/EDGAR/SEARCHEDGAR/COMPANYSEARCH.HTML