1. Fundamental Accounting Concepts and Reporting Styles

The purpose of this section is to further explain the notions of fundamental accounting concepts, the relations between those fundamental concepts, and reporting styles.

Economic entities report information in their financial reports. That information is not random. Relations exist between reported information. Some of those relations are universal to every economic entity that reports, such as the accounting equation (Assets = Liabilities and Equity)[1]. Other relations are universal to sets of entities that use a specific style of reporting. For example, depository institutions all follow the interest-based revenues income statement reporting style. Whether economic entities explicitly report information or users of a financial report need to impute a fundamental accounting concept value, these universal relations are at play. These universal relations are important to safely, reliably, and predictably using reported financial information and can be leveraged for things such as querying information within a report.

The fundamental accounting concept relations is a set of continuity cross-checks that helps make sure XBRL-based reports are created correctly. Financial reports contain a "skeleton" which forms a frame for a financial report. Another metaphor is that the relations between these fundamental accounting concepts form the "keystones" of a financial report. They can be thought of as continuity equations to cross-verify information in XBRL-based digital financial reports.

1.1. Overview

The following section provides a quick overview of fundamental accounting concepts, the relations between those concepts, the notion of consistency cross checks, and reporting styles.

1.1.1.Fundamental Accounting Concepts

Accounting has common, fundamental accounting concepts that have specific relations that form the key stones of a financial report. For example, "Assets", "Liabilities", "Equity", "Current Assets", "Current Liabilities", "Equity Attributable to Parent" are fundamental concepts related to the balance sheet. There are specific relations between those concepts, for example "Assets = Liabilities + Equity".

1.1.2.Consistency Crosscheck Rules

Consistency cross check rules are used to make sure there are no logical conflicts, contradictions, or other such anomalies existing within high-level reported facts in a financial report[2].

[1] Wikipedia, *Accounting Equation*, retrieved December 27, 2016, https://en.wikipedia.org/wiki/Accounting_equation

[2] Quarterly XBRL-based Public Company Financial Report Quality Measurement (September 2018), http://xbrl.squarespace.com/journal/2018/9/29/quarterly-xbrl-based-public-company-financial-report-quality.html

Common errors[3] include reversing the concepts equity attributable to parent and total equity; contradictory net income (loss), net income (loss) attributable to parent, and net income (loss) attributable to noncontrolling interest; reversing the polarity of a fact entering a positive as a negative or a negative as a positive fact.

If a reported fact in one area of a report contradicts, conflicts with, or is otherwise inconsistent with other reported fact then the financial report is illogical. For example, "Assets = Current assets + Noncurrent assets" is a universally applicable rule for a classified balance sheet.

Machine readable example[4]:

```
</link:documentation>
- <generic:link xlink:role="http://www.xbrl.org/2003/role/link" xlink:type="extended">
    <va:valueAssertion xlink:type="resource" xlink:label="ASSERTION" test="$Equity = ($EquityAttributableToParent +
      $EquityAttributableToNoncontrollingInterest)" implicitFiltering="true" aspectModel="dimensional"
      id="FAC_CONSISTENCY_1"/>
    <generic:arc xlink:type="arc" order="1.0" xlink:to="ASSERTION_Label" xlink:from="ASSERTION"
      xlink:arcrole="http://xbrl.org/arcrole/2008/element-label"/>
    <label:label xlink:role="http://www.xbrl.org/2008/role/label" xml:lang="en" xlink:type="resource"
```

Human readable example[5]:

Comprehensive Income (Loss) [Roll Up]		
Net Income (Loss) Attributable to Parent	97,905,000	fac:NetIncomeLossAttributableToParent[us-gaap:NetIncomeLoss [97,905,000]]
Other Comprehensive Income (Loss)	79,000	fac:OtherComprehensiveIncomeLoss[us-gaap:OtherComprehensiveIncomeLossNetOfTax[79,000]]
Comprehensive Income (Loss)	97,826,000	fac:ComprehensiveIncomeLoss[97,826,000] = fac:ComprehensiveIncomeLossAttributableToParent[us-gaap:ComprehensiveIncomeNetOfTax[97,826,000]]
Validation Results [Hierarchy]		
IS10	(158,000)	fac:ComprehensiveIncomeLoss[97,826,000] = (fac:NetIncomeLossAttributableToParent[us-gaap:NetIncomeLoss [97,905,000]] + fac:OtherComprehensiveIncomeLoss[us-gaap:OtherComprehensiveIncomeLossNetOfTax[79,000]])

1.1.3.Reporting Styles

A reporting style is a pattern of how an economic entity creates their report. Reporting styles are determined by statutory and regulatory reporting rules, policies set by a company, and preferences of those involved in creating the report.

Reporting styles are used to adjust for the variability allowed by a financial report. A reporting style follows a set of fundamental accounting concepts and the specific relations between those concepts as specified by a reporting economic entity.

[3] High Quality Examples of Errors in XBRL-based Financial Reports, http://xbrl.squarespace.com/journal/2017/4/29/high-quality-examples-of-errors-in-xbrl-based-financial-repo.html

[4] Consistency cross check rules, machine readable, http://xbrlsite.azurewebsites.net/2016/conceptual-model/reporting-scheme/us-gaap/fac/ReportingStyles/COMID-BSC-CF1-ISM-IEMIB-OILY-SPEC6_schema.xsd

[5] In this example the fact value for the line item "Other Comprehensive Income (Loss)" was entered as a positive but should have been entered as a negative as can be seen by the fact that the amount of the error is exactly twice the amount of the reported fact value.

While the US GAAP and XASB implementations of reporting styles uses a set of codes which identify the reporting style of a report, an automated process for using reporting styles is possible.

The US GAAP implementation of reporting styles[6] provides a web service[7] which provides the reporting style for a specific economic entity. Each reporting style provides:

- An XBRL taxonomy schema which is used to provide the list of fundamental accounting concepts and link information for a reporting style together.
- Mapping relations which indicate which base taxonomy concept could be used to represent a fundamental accounting concept.
- Presentation, calculation, and definition relations that define human-readable relations for a reporting style and rendering information when software generates human-readable output.
- XBRL Formulas impute rules for deriving fundamental accounting concept information when such a concept is not explicitly reported.
- XBRL Formula consistency check rules that perform the testing of the fundamental accounting concept relations for a reporting style.

A number of working proof of concept Excel-based extraction tools can be helpful in understanding how reporting styles are used[8].

1.2. Deriving Fundamental Accounting Concepts and Reporting Styles

Each public company that reports to the SEC has a reporting style. Each reporting style has a unique set of fundamental accounting concept relations which make up that reporting style.

The notion of a reporting style is not unique to the primary financial statement of a financial report. However, I am going to use the primary financial statements to explain the notion of a reporting style. Reporting styles also relate to every other disclosure contained within a financial report[9]. Patterns can be universally applicable to every public company or patterns can be completely unique to one specific economic entity creating a report. Every report can be distilled down to a reporting style.

As I will explain them here, a reporting style is the approach that is used to represent information on the balance sheet, income statement, statement of comprehensive income, and cash flow statement used by a public company. The graphic below shows the top 15 reporting styles and then the bottom 5 reporting styles with the middle reporting styles cut out.

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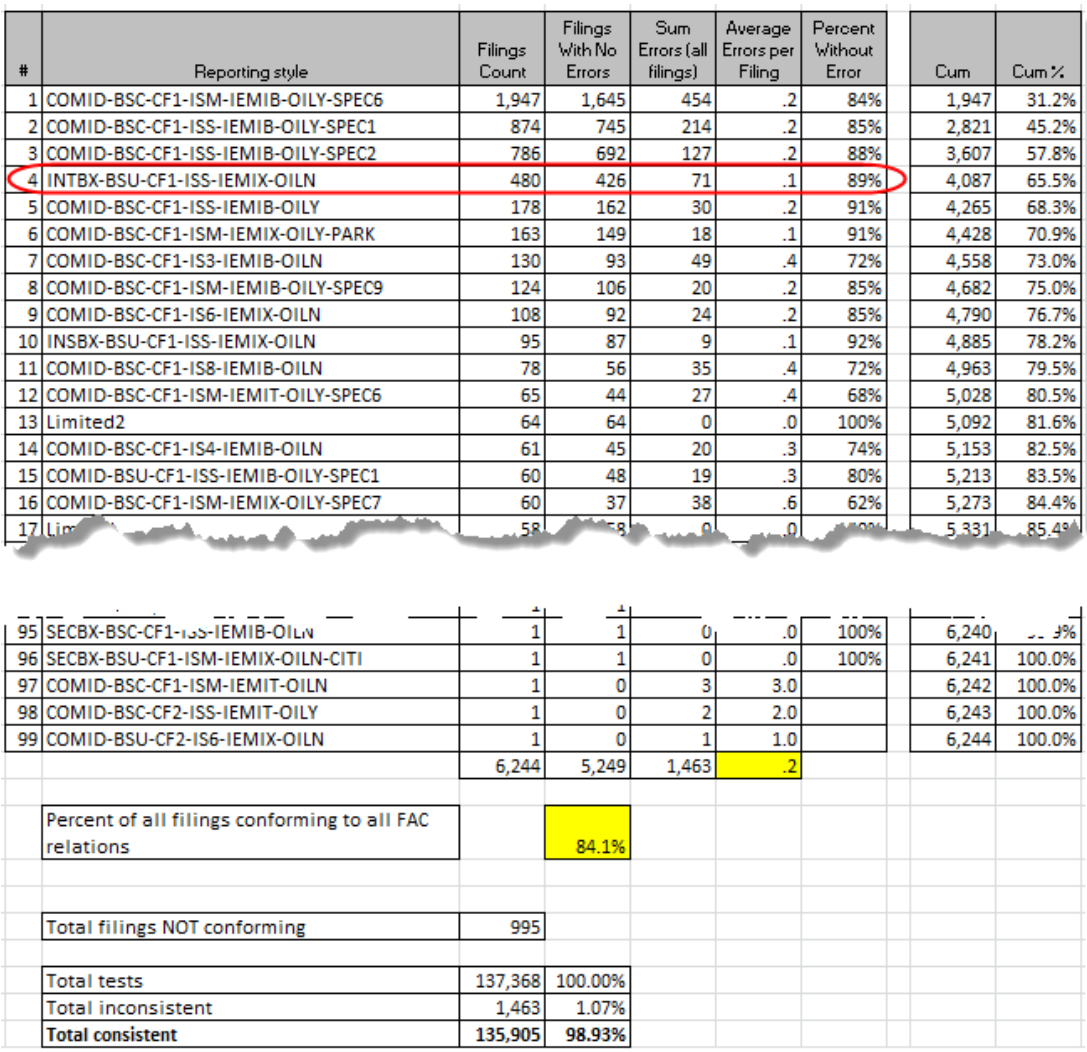
[6] US GAAP reporting styles, http://xbrlsite-app.azurewebsites.net/ReportFrameCodeService/ListCIKToReportFrameCodeMapping.aspx?ReportFrameCode=COMID-BSC-CF1-ISM-IEMIB-OILY-SPEC6

[7] US GAAP reporting styles web service, http://xbrlsite-app.azurewebsites.net/ReportFrameCodeService/GetReportFrameCodeForCIK.aspx?CIK=0001084869

[8] Further Updated and Expanded XBRL-based Financial Report Extraction Tools, http://xbrl.squarespace.com/journal/2018/1/11/further-updated-and-expanded-xbrl-based-financial-report-ext.html

[9] *Disclosure Best Practices*, http://www.xbrlsite.com/2017/Prototypes/DisclosureAnalysis/DisclosureBestPractices.pdf



#	Reporting style	Filings Count	Filings With No Errors	Sum Errors (all filings)	Average Errors per Filing	Percent Without Error	Cum	Cum %
1	COMID-BSC-CF1-ISM-IEMIB-OILY-SPEC6	1,947	1,645	454	.2	84%	1,947	31.2%
2	COMID-BSC-CF1-ISS-IEMIB-OILY-SPEC1	874	745	214	.2	85%	2,821	45.2%
3	COMID-BSC-CF1-ISS-IEMIB-OILY-SPEC2	786	692	127	.2	88%	3,607	57.8%
4	INTBX-BSU-CF1-ISS-IEMIX-OILN	480	426	71	.1	89%	4,087	65.5%
5	COMID-BSC-CF1-ISS-IEMIB-OILY	178	162	30	.2	91%	4,265	68.3%
6	COMID-BSC-CF1-ISM-IEMIX-OILY-PARK	163	149	18	.1	91%	4,428	70.9%
7	COMID-BSC-CF1-IS3-IEMIB-OILN	130	93	49	.4	72%	4,558	73.0%
8	COMID-BSC-CF1-ISM-IEMIB-OILY-SPEC9	124	106	20	.2	85%	4,682	75.0%
9	COMID-BSC-CF1-IS6-IEMIX-OILN	108	92	24	.2	85%	4,790	76.7%
10	INSBX-BSU-CF1-ISS-IEMIX-OILN	95	87	9	.1	92%	4,885	78.2%
11	COMID-BSC-CF1-IS8-IEMIB-OILN	78	56	35	.4	72%	4,963	79.5%
12	COMID-BSC-CF1-ISM-IEMIT-OILY-SPEC6	65	44	27	.4	68%	5,028	80.5%
13	Limited2	64	64	0	.0	100%	5,092	81.6%
14	COMID-BSC-CF1-IS4-IEMIB-OILN	61	45	20	.3	74%	5,153	82.5%
15	COMID-BSU-CF1-ISS-IEMIB-OILY-SPEC1	60	48	19	.3	80%	5,213	83.5%
16	COMID-BSC-CF1-ISM-IEMIX-OILY-SPEC7	60	37	38	.6	62%	5,273	84.4%
17	Lim	58	58	0	.0	100%	5,331	85.4%
95	SECBX-BSC-CF1-ISS-IEMIB-OILN	1	1	0	.0	100%	6,240	99.9%
96	SECBX-BSU-CF1-ISM-IEMIX-OILN-CITI	1	1	0	.0	100%	6,241	100.0%
97	COMID-BSC-CF1-ISM-IEMIT-OILN	1	0	3	3.0		6,242	100.0%
98	COMID-BSC-CF2-ISS-IEMIT-OILY	1	0	2	2.0		6,243	100.0%
99	COMID-BSU-CF2-IS6-IEMIX-OILN	1	0	1	1.0		6,244	100.0%
		6,244	5,249	1,463	.2			

Percent of all filings conforming to all FAC relations		84.1%
Total filings NOT conforming	995	
Total tests	137,368	100.00%
Total inconsistent	1,463	1.07%
Total consistent	**135,905**	**98.93%**

There are approximately 100 different reporting styles that have been identified that public companies use to create their financial reports[10]. Each reporting style is assigned a code. For example, the graphic above highlights the reporting style with the code "INTBX-BSU-CF1-ISS-IEMIX-OILN" reporting style used by the 480 public companies that are depository institutions that use an interest-based revenues reporting style.

Note that about 12 different reporting styles are used by 80% of public companies.

The following is a list of fundamental accounting concept relations business rules identified in this specific reporting style which was given the code "INTBX-BSU-CF1-ISS-IEMIX-OILN":

BS1	Equity = Equity Attributable to Parent + Equity Attributable to Noncontrolling Interest
BS2	Assets = Liabilities and Equity
BS3	Assets = Current Assets + Noncurrent Assets (classified balance sheet)
BS4	Liabilities = Current Liabilities + Noncurrent Liabilities (classified balance sheet)
BS5	Liabilities and Equity = Liabilities + Commitments and Contingencies + Temporary Equity + Redeemable Noncontrolling Interest + Equity
IS1	InterestIncomeExpenseOperatingNet = InterestAndDividendIncomeOperating - InterestExpenseOperating

[10] Note that this information is from the 10-Ks of public companies for fiscal years ended 2016.

IS2	InterestIncomeExpenseAfterProvisionForLosses = InterestIncomeExpenseOperatingNet - ProvisionForLoanLeaseAndOtherLosses
IS4	IncomeLossFromContinuingOperationsBeforeTax = InterestIncomeExpenseAfterProvisionForLosses + NoninterestIncome - NoninterestExpense
IS5	Income (Loss) from Continuing Operations after Tax = Income (Loss) from Continuing Operations Before Tax - Income Tax Expense (Benefit)
IS6	Net Income (Loss) = Income (Loss) from Continuing Operations After Tax + Income (Loss) from Discontinued Operations, Net of Tax + Extraordinary Items, Gain (Loss)
IS7	Net Income (Loss) = Net Income (Loss) Attributable to Parent + Net Income (Loss) Attributable to Noncontrolling Interest
IS8	Net Income (Loss) Available to Common Stockholders, Basic = Net Income (Loss) Attributable to Parent - Preferred Stock Dividends and Other Adjustments
IS9	Comprehensive Income (Loss) = Comprehensive Income (Loss) Attributable to Parent + Comprehensive Income (Loss) Attributable to Noncontrolling Interest
IS10	Comprehensive Income (Loss) = Net Income (Loss) + Other Comprehensive Income (Loss)
CF1	Net Cash Flow = Net Cash Flows, Operating + Net Cash Flows, Investing + Net Cash Flows, Financing + Exchange Gains (Losses)
CF2	Net Cash Flows, Continuing = Net Cash Flows, Operating, Continuing + Net Cash Flows, Investing, Continuing + Net Cash Flows, Financing, Continuing
CF3	Net Cash Flows, Discontinued = Net Cash Flows, Operating, Discontinued + Net Cash Flows, Investing, Discontinued + Net Cash Flows, Financing, Discontinued
CF4	Net Cash Flows, Operating = Net Cash Flows, Operating, Continuing + Net Cash Flows, Operating, Discontinued
CF5	Net Cash Flows, Investing = Net Cash Flows, Investing, Continuing + Net Cash Flows, Investing, Discontinued
CF6	Net Cash Flows, Financing = Net Cash Flows, Financing, Continuing + Net Cash Flows, Financing, Discontinued

Note that there are only three fundamental accounting concept relations that are unique to this reporting style: IS1, IS2, and IS4.

The best way to understand reporting styles and the fundamental accounting concept relations that make up each reporting style in general terms is to use the *Crash Course in the Fundamental Accounting Concept Relations*[11]. In order to understand a specific reporting style, use the Fundamental Accounting Concept Relations (Working Prototype 3)[12] metadata.

1.3. Working with the fundamental accounting concepts

There are several moving pieces which relate to working with fundamental accounting concepts and relations between those concepts which must be understood. Not understanding these ideas can make it hard to interpret the dynamics of situations which are encountered[13]. There are two reasons reporting styles and fundamental accounting concept relations of each reporting style are critically important:

1. They *describe* to a machine such as a computer how these primary financial statements are represented.
2. They can be used to *verify* that the primary financial reports have been created correctly, according to what was expected from the description.

1.3.1. Understanding the notion of type or class

When a concept is expressed in a conceptual model it is defined to be one specific type or class of thing. Other terms used for this type of association is "wider-narrower" as

[11] *Crash Course in Fundamental Accounting Concept Relations*, http://www.xbrlsite.com/2016/Prototype/FundamentalAccountingConceptsPureXBRL/Documentation/FundamentalAccountingConcepts.html

[12] Fundamental Accounting Concept Relations (Working Prototype 3), http://www.xbrlsite.com/2016/fac/v3/Documentation/

[13] See *Interpretation of Fundamental Accounting Concept Test Results*, http://www.xbrlsite.com/2014/Reference/InterpretationOfFundamentalAccountingConceptTestResults.pdf

ESEF reporting refers to it or "general-special" as the XBRL specification refers to it or "type-subtype" as the Seattle Method refers to it.

That one concept cannot be some other type/class of thing, something that it is not. Likewise, a concept cannot be two things at the same time. For example, the concept *Assets* is something that is completely distinct from the concept *Equity*.

One concept can be a sub-type of some other concept. For example, *Cash and cash equivalents* can be a sub-type of *Current asset*. By defining *Cash and cash equivalents* as a type of *Current asset*, you are implying that it is not a sub-type of *Equity*.

When a new concept is created, it must be created based on a previously defined concept. It is not just placed into a conceptual model and not associated with anything at all. For example, when a public company creates an extension concept, that extension concept needs to be associated with something else for a machine-based process to understand what that extension means.

Public companies creating XBRL-based financial filings sometimes move a fundamental accounting concept to be part of some other fundamental accounting concept, "**crossing types**", causing confusion when information is interpreted by users of the information from the financial report.

Also, when an extension concept is created by a public company and no machine-readable information exists which relates an extension concept to some existing US GAAP XBRL Taxonomy concept or concept type/class, the machine using the information cannot possibly know the nature of the extension concept, the **extension concept is unknowable**. For example, if a filer reports the concept *my:SomeTypeOfOperatingExpense* and they intended that to be an operating expense, while a human can figure out the nature of the extension concept by reading the documentation, but a machine cannot understand that the extension is an operating expense. However, if the public company created a machine-readable relation using the provided XBRL "general-special" relation, then computers attempting to make use of this information could decipher the nature of the extension concept.

While in many cases the intent of the reporting entity can be implied from perhaps roll up relations which have been expressed, in many other cases the intent cannot be interpreted. Neither the FASB nor SEC provides explicit guidance and therefore many different arbitrary interpretations could result. The best-case scenario is for intent of reporting entities to be explicitly stated.

1.3.2.Understanding the notion of WHOLE and PART

Concepts in a conceptual model can be a WHOLE and/or they can be a PART of some WHOLE. For example, *Cash and cash equivalents* is PART of the WHOLE *Current assets*. Using PARTS and WHOLES correctly and consistently with the intensions of the US GAAP XBRL Taxonomy is important. Further, it is important that the US GAAP XBRL Taxonomy be clear when it defines such WHOLES and PARTS.

1.3.3.Deriving information as compared to explicitly reported information

If a reporting entity explicitly reports the concept *Noncurrent assets*, an analyst using a financial report can always be 100% sure of the value of *Noncurrent assets*. If, however, a reporting entity does not explicitly report the concept *Noncurrent assets*; but does report explicit values for *Current assets* and *Assets* (total assets), and the relation *Assets = Current assets + Noncurrent assets* is known to always be true; then an analyst can always safely and reliably use the rules of logic and math to derive or

impute the value of *Noncurrent assets* using the known business rule relation between *Assets*, *Current assets*, and *Noncurrent assets*.

Using explicitly reported information is always safer but using the rules of logic and math to derive a value is likewise very safe if certain relations are always known to be true. With explicitly reported information you can also check relations in numerous ways to be ultra-sure that you are using the reported information correctly, somewhat like a parity check or check sum. But parity checks are not as useful if information is derived because you cannot really double-check values to be sure they are correct.

1.3.4.Mapping reported concepts

Sometimes, creators of a financial report have several different alternative concepts which they might use to report what amounts to the same fact. For example, consider the concept *Equity*. The US GAAP XBRL Taxonomy provides numerous concepts which could be used to report the fundamental accounting concept *Equity*:

Fundamental Concept Name	US GAAP XBRL Taxonomy Concept Name
fac:Equity	us-gaap:StockholdersEquityIncludingPortionAttributableToNoncontrollingInterest
fac:Equity	us-gaap:StockholdersEquity
fac:Equity	us-gaap:PartnersCapitalIncludingPortionAttributableToNoncontrollingInterest
fac:Equity	us-gaap:PartnersCapital
fac:Equity	us-gaap:CommonStockholdersEquity
fac:Equity	us-gaap:MembersEquity

Part of the reason multiple concepts exist has to do with inconsistencies in the US GAAP XBRL Taxonomy. One type of inconsistency is interpreting what is an entirely different concept and what is really only different preferred labeling of what amounts to really be the same concept. For example, stockholders' equity, partner capital, and member equity are all really one concept Equity (defined by SFAS 6) with three different preferred labels for the one concept.

Another reason different concepts are used is due to differences in interpretation of the meaning of certain line items. For example, if an economic entity reports *Equity attributable to parent*, *Equity attributable to noncontrolling interest*, and *Equity* (total equity, parent + noncontrolling interest); it is easy to sort out which concept is being used to report *Equity*. However, many times a reporting entity reports the line item labeled *Equity* and implies the meaning *Equity attributable to parent*; or report the line item labeled *Equity* and imply the meaning *Equity* (total equity). This can take some sorting out. If completely incorrect concepts are used, this can be sorted out by machines such as computers.

1.3.5.Importance of coordination and cooperation in achieving system harmony

There are exactly three possible reasons why a relation between the high-level fundamental accounting concepts expressed within XBRL-based public company financial reports do not conform to these fundamental accounting concept relations:

- **Filer reporting error**: The XBRL-based public company financial report to the SEC which reports some fact or facts does so incorrectly; a fact is wrong or a relation between facts is wrong or is interpreted differently than was expected. Basically, there is some inconsistency between the description of the information and what is reported.

- **Base taxonomy error**: The US GAAP XBRL Taxonomy expresses a concept which would be used to report a fact is unclear, inconsistent, logically inconsistent, or otherwise ambiguous and therefore there are different possible interpretations by those using that taxonomy or some important or common concept is missing altogether. Basically, there is some inconsistency between how reporting entities interpret the concept defined in the base taxonomy.
- **Test business rule error**: The business rules used by the software algorithm to compute or otherwise interpret the fundamental accounting concepts or the relations between those concepts are in error or are interpreted differently by different software creators. Basically, software used to leverage fundamental accounting concepts is not consistent with the definition provided by the US GAAP XBRL Taxonomy.

Coordination and cooperation in arriving at the description of concepts and relations between concepts is crucial. Idiosyncrasies in interpretations cause the system to not work as anticipated. Fundamental accounting concepts and relations between concepts is a control mechanism to help coordinate consistent understanding. The notion of all stakeholders being in harmony as contrast to stakeholder dissonance is used to explain system function.

1.4. Notion of fundamental accounting concepts

Fundamental accounting concepts and the relations between those concepts simply is a recognition that financial reports follow some financial reporting scheme and that the high-level concepts and the relations between those financial concepts have patterns. Every financial reporting scheme[14]

- follows the double entry accounting model
- follows some form of the accounting equation[15]
- defines a set of elements that a financial report is made of[16].

All of this information can be observed and measured from the financial reports of public companies[17].

While not all financial reports have 100% of all facts in common and while different industries or accounting activities can even use some different concepts to report key facts, there are core concepts which all accounting entities have. At the highest level is the accounting equation: Assets = Liabilities and Equity. These fundamental concepts can be thought of as "key stones" or "corner stones" which hold a financial report together or provide somewhat of a "skeleton" for a financial report. Note that this is not to say that all accounting entities report each of these accounting concepts; if a concept is not reported it can be logically derived leveraging information that was reported and known business rules which describe relations between these key concepts.

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[14] Comparison of Elements of Financial Statement, http://xbrlsite.azurewebsites.net/2019/Core/ElementsOfFinancialStatements.pdf

[15] Accounting Equation, http://xbrlsite.azurewebsites.net/2019/Core/master-ae/

[16] FASB's SFAC 6, Elements of Financial Statement, http://xbrlsite.azurewebsites.net/2019/Core/core-sfac6/

[17] Quarterly XBRL-based Public Company Financial Report Quality Measurement (March 2019), http://xbrl.squarespace.com/journal/2019/3/29/quarterly-xbrl-based-public-company-financial-report-quality.html

For example, below are fundamental accounting concepts which are common to most commercial and industrial reporting entities in all industries and relations which exist between these fundamental concepts which can never change:

- Assets = Liabilities and Equity
- Assets = Current Assets + Noncurrent Assets (classified balance sheet)
- Equity = Equity Attributable to Parent + Equity Attributable to Noncontrolling Interest
- Liabilities = Current Liabilities + Noncurrent Liabilities (classified balance sheet)
- Liabilities and Equity = Liabilities + Commitments and Contingencies + Temporary Equity + Equity
- Current Liabilities = Liabilities - Noncurrent Liabilities (classified balance sheet)
- Gross Profit = Revenues - Cost of Revenue (Multi-step approach)
- Operating Income (Loss) = Gross Profit - Operating Expenses + Other Operating Income (Multi-step approach)
- Operating Income (Loss) = Revenues - Costs and Expenses + Other Operating Income (Single-step approach)
- Costs and Expenses = Cost of Revenue + Operating Expenses (Single-step approach)
- Income (Loss) from Continuing Operations after Tax = Income (Loss) from Continuing Operations Before Tax - Income Tax Expense (Benefit)
- Net Income (Loss) = Income (Loss) from Continuing Operations After Tax + Income (Loss) from Discontinued Operations, Net of Tax + Extraordinary Items, Gain (Loss)
- Net Income (Loss) = Net Income (Loss) Attributable to Parent + Net Income (Loss) Attributable to Noncontrolling Interest
- Net Income (Loss) Available to Common Stockholders, Basic = Net Income (Loss) Attributable to Parent - Preferred Stock Dividends and Other Adjustments
- Comprehensive Income (Loss) = Comprehensive Income (Loss) Attributable to Parent + Comprehensive Income (Loss) Attributable to Noncontrolling Interest
- Comprehensive Income (Loss) = Net Income (Loss) + Other Comprehensive Income (Loss)
- Net Cash Flow = Net Cash Flows, Operating + Net Cash Flows, Investing + Net Cash Flows, Financing + Exchange Gains (Losses)
- Net Cash Flows, Continuing = Net Cash Flows, Operating, Continuing + Net Cash Flows, Investing, Continuing + Net Cash Flows, Financing, Continuing
- Net Cash Flows, Discontinued = Net Cash Flows, Operating, Discontinued + Net Cash Flows, Investing, Discontinued + Net Cash Flows, Financing, Discontinued
- Net Cash Flows, Operating = Net Cash Flows, Operating, Continuing + Net Cash Flows, Operating, Discontinued

- Net Cash Flows, Investing = Net Cash Flows, Investing, Continuing + Net Cash Flows, Investing, Discontinued
- Net Cash Flows, Financing = Net Cash Flows, Financing, Continuing + Net Cash Flows, Financing, Discontinued

However, there is some variability in how a handful of these fundamental accounting concepts are reported by economic entities. This brings us to the notion of reporting styles.

1.5. Notion of reporting styles

Reporting styles is the notion that different economic entities report different high-level fundamental accounting concepts and organize the fundamental accounting concepts they report differently but following patterns[18].

Economic entities report using different reporting styles (or reporting pallets or report frames). For example, consider the variability in where public companies report the line-item captioned, *Income (Loss) from Equity Method Investments*[19]:

- 624 entities (60%) reported the line item before tax directly as part of income (loss) from continuing operations before tax
- 132 entities (12%) reported the line item between income (loss) from continuing operations before and after tax
- 128 entities (12%) reported the line item as part of nonoperating income (expense)
- 20 entities (2%) reported the line item as part of revenues
- 10 entities (less than 1%) reported the line item as part of costs and expenses
- 8 entities (less than 1%) reported the line item as part of operating expenses
- 126 entities (11%) did something else which was not directly analyzed so exact placement is unknown

Comprehensive testing of all XBRL-based financial reports submitted to the SEC at this very high level revealed a very limited amount of variability most of which occurs on the income statement. This variability is not random. Most variability relates to the reporting practices of different industries which account for different activities. The following is a summary of and a complete inventory of this variability[20] at this high-level of a financial report:

- Entities report using some accounting industry or activity
    - Commercial and industrial (standard approach)
    - Interest based revenues
    - Insurance based revenues

[18] *Making the Case for Reporting Styles*, http://xbrl.squarespace.com/journal/2017/12/9/making-the-case-for-reporting-styles.html

[19] See a detailed analysis of this topic here, http://xbrl.squarespace.com/journal/2014/10/14/options-for-dealing-with-line-items-that-bounce-around-incom.html

[20] This Excel spreadsheet is helpful in understanding reporting variability, http://xbrl.squarespace.com/journal/2014/9/15/wonderful-things-xbrl-based-structured-information-enables.html

    - Securities based revenues
    - REIT (real estate investment trust)
    - Utility
- Balance sheets can be
    - Classified and report current and noncurrent assets and liabilities
    - Unclassified
    - Regulated utility which reports capitalization
    - Report using liquidity-based reporting
- Income statements can be
    - Multi-step and report gross profit
    - Single-step and does not report gross profit
- Income statements can
    - Report operating income (loss)
    - Do not report operating income (loss)
- Income (loss) from equity method investments can be reported on the income statement
    - As part of revenues
    - As part of nonoperating income (loss)
    - Before taxes as a separate line item
    - Between income (loss) from continuing operations before and after taxes
- Cash flow statements can report net cash flow as
    - Including exchange gains (losses)
    - Not including exchange gains (losses)

This is a comprehensive and complete inventory of the high-level variability in public company financial filings. This information is not a statistical analysis or speculation. This is observable empirical evidence provided by the XBRL-based public company financial filings submitted to the SEC.

A coding scheme was developed to articulate this information in both human readable and machine-readable form. Below is a brief description of that coding scheme. Each code has approximately six parts[21]: "COMID-BSC-CF1-ISS-IEMIB-OILY". This explains each part and the codes used for each part and shows the number of entities which have that characteristic (note that the totals add up to 6,943 and not 6,947; this relates to an issue with CIK numbers):

- **Part 1: Industry codes**: (Total 6,943)
    - COMID=Commercial and Industrial (5,985)

[21] I did unfortunately break this pattern, but the number of parts really is meaningless.

  - INTBX=Interest based revenues (632)
  - INSBX=Insurance based revenues (50)
  - SECBX=Securities based revenues (93)
  - REITX=Real estate investment trust (158)
  - UTILX=Utility (25)
- **Part 2: Balance sheet form codes**: (Total 6,943)
  - BSC=Classified balance sheet (5,527)
  - BSU=Unclassified balance sheet (1,412)
  - BSR=Regulated utility
  - BSL=Liquidity based balance sheet (4)
- **Part 3: Cash flow statement exchange gains codes**: (Total 6,943)
  - CF1=Exchange gains (losses) part of net cash flow or does not report line item (6,845)
  - CF2=Exchange gains (losses) part of cash roll forward (98)
- **Part 4: Income statement form codes**: (Total 6,943)
  - ISS=Single step income statement (4,255)
  - ISM=Multi step income statement (2,688)
- **Part 5: Income (loss) from equity method investments location codes**: (Total 6,943)
  - IEMIX=Income (loss) from equity method investments not reported (5,290)
  - IEMIB=Income (loss) from equity method investments reported BEFORE tax (1,402)
  - IEMIN=Income (loss) from equity method investments reported within nonoperating income (loss) (122)
  - IEMIT=Income (loss) from equity method investments reported between income (loss) from continuing operations before and after taxes (113)
  - IEMIR=Income (loss) from equity method investments reported within revenues (16)
- **Part 6: Operating income (loss) codes**: (Total 6,943)
  - OILY=Operating income (loss) reported (5,120)
  - OILN=Operating income (loss) not reported (1,823)

While the complete set of codes and reporting styles cannot be identified until the process of breaking down public company filings into these sets, testing the conformance of each filing and set against the underlying fundamental accounting concepts and relations within the set and the success of this process is verified by 100% conformance by each reporting entity to 100% of the fundamental accounting concepts and relations between those concepts within each set; this is achievable.

In fact, testing shows that this objective has already been achieved for 99.0% of relations and 81.0% of all public company financial reports submitted to the SEC using the XBRL format. Further, which reporting entities do not conform to these concepts and relations and why they do not conform is easy to observe[22].

1.6. Measuring public company financial reports using fundamental accounting concept relations

Measurements are taken periodically, in order to tune the filings of public companies, the US GAAP XBRL Taxonomy, and the tests uses to describe and evaluate the fundamental accounting concept relations.

The most current[23] measurement of the fundamental accounting concept relations is shown below for the 480 public companies that report using the "INTBX-BSU-CF1-ISS-IEMIX-OILN" reporting style:

December 20, 2016					
Generator	Filings Count	Filings With No Errors	Sum Errors (all filings)	Average Errors per Filing	Percent Without Error
Thunderdome	50	50	0	.0	100%
P3 Data Systems	1	1	0	.0	100%
Merrill	33	33	0	.0	100%
EDGARfilings PROfile	26	26	0	.0	100%
DataTracks	32	32	0	.0	100%
CompSci	1	1	0	.0	100%
RR Donnelley	68	67	1	.0	99%
Certent (was Rivet)	28	27	1	.0	96%
Ez-XBRL	26	25	2	.1	96%
GoXBRL	12	11	1	.1	92%
Workiva (WebFilings)	173	141	39	.2	82%
IBM Cognos	10	8	3	.3	80%
Novaworks Software	16	11	8	.5	69%
Advanced Computer Innovations	3	1	4	1.3	33%
S2 Filings	1	0	3	3.0	0%
	480	434	62	.1	
Percent of all filings conforming to all FAC relations		90.4%			
Total filings NOT conforming	46				
Total tests	9,600	100.000%			
Total inconsistent	62	0.646%			
Total consistent	**9,538**	**99.354%**			
Target (Six Sigma)		**99.99966%**			
Difference from target		0.6454933%			

A generator is any software application or filing agent that generates an XBRL-based financial report. The graphic above shows the 480 XBRL-based financial reports

[22] Understanding Logical, Mechanical, and Mathematical Accounting Relations in XBRL-based Digital Financial Reports, http://xbrl.squarespace.com/journal/2016/12/15/understanding-logical-mechanical-and-mathematical-accounting.html

[23] For updated results, please see my blog, http://xbrl.squarespace.com/journal/2016/11/28/public-company-quality-continues-to-improve-9-quality-leader.html

summarized by generator of that report. What is shown is the "Filing Count" which shows the total number of reports for that generator; "Filings With No Errors" indicating the number of those reports that have an error, "Sum Errors (all filings)" which shows the count of errors for all those filings; "Average Errors per Filing" which is the number of errors per report; and "Percent without Error" which indicates the number of reports for a generator which the fundamental accounting concepts are analyzed are 100% consistent with expectation.

Each quarter for the past several years I have provided a measurement of the consistency of XBRL-based financial reports of public companies to the set of fundamental accounting concept relations[24]. Each quarter the overall consistency has increased.

1.7. Comparative periods show public company fixing inconsistency

This graphic below shows that the filer "PINNACLE FINANCIAL PARTNERS INC" whose XBRL-based financial report was created using the assistance of "EDGARfilings PROfile" had an income statement related inconsistency for a number of periods but then the issue was created once the filing agent/software vendor was made aware of the error.

[24] Quarterly XBRL-based Public Company Financial Report Quality Measurement (Nov 2017), http://xbrl.squarespace.com/journal/2017/12/1/quarterly-xbrl-based-public-company-financial-report-quality.html

#	CIK	Accession	Entity Registrant Name	Creation Software	Document Type	Fiscal Year	Fiscal Period	BS	IS	SCI	CF	x-Ambiguous Entity or Period	x-Missing BS, IS, CF Roll Ups	z-Other
1	0001115055	0001115055-16-000164	PINNACLE FINANCIAL PARTNERS INC	EDGARfilings PROfile	10-Q	2016	Q3	0	0	0	0	0	0	0
2	0001115055	0001115055-16-000155	PINNACLE FINANCIAL PARTNERS INC	EDGARfilings PROfile	10-Q	2016	Q2	0	0	0	0	0	0	0
3	0001115055	0001115055-16-000112	PINNACLE FINANCIAL PARTNERS INC	EDGARfilings PROfile	10-Q	2016	Q1	0	0	0	0	0	0	0
4	0001115055	0001115055-16-000088	PINNACLE FINANCIAL PARTNERS INC	EDGARfilings PROfile	10-K	2015	FY	0	1	0	0	0	0	0
5	0001115055	0001115055-15-000077	PINNACLE FINANCIAL PARTNERS INC	EDGARfilings PROfile	10-Q	2015	Q3	0	1	0	0	0	0	0
6	0001115055	0001115055-15-000065	PINNACLE FINANCIAL PARTNERS INC	EDGARfilings PROfile	10-Q	2015	Q2	0	1	0	0	0	0	0
7	0001115055	0001115055-15-000032	PINNACLE FINANCIAL PARTNERS INC	Accelus	10-Q	2015	Q1	0	1	0	0	0	0	0
8	0001115055	0001115055-15-000017	PINNACLE FINANCIAL PARTNERS INC	Accelus	10-K	2014	FY	0	1	0	0	0	0	0
9	0001115055	0001115055-14-000044	PINNACLE FINANCIAL PARTNERS INC	Accelus	10-Q	2014	Q3	0	1	0	0	0	0	0
10	0001115055	0001115055-14-000037	PINNACLE FINANCIAL PARTNERS INC	Accelus	10-Q	2014	Q2	0	1	0	0	0	0	0
11	0001115055	0001115055-14-000024	PINNACLE FINANCIAL PARTNERS INC	Accelus	10-Q	2014	Q1	0	1	0	0	0	0	0
12	0001115055	0001115055-14-000015	PINNACLE FINANCIAL PARTNERS INC	Accelus	10-K	2013	FY	0	1	0	0	0	0	0
13	0001115055	0001115055-13-000016	PINNACLE FINANCIAL PARTNERS INC	Accelus	10-Q	2013	Q3	0	0	0	0	0	0	0
14	0001115055	0001140361-13-029733	PINNACLE FINANCIAL PARTNERS INC	Accelus	10-Q	2013	Q2	0	0	0	0	0	0	0
15	0001115055	0001140361-13-018625	PINNACLE FINANCIAL PARTNERS INC	Accelus	10-Q	2013	Q1	0	1	0	0	0	0	0
16	0001115055	0001140361-13-008936	PINNACLE FINANCIAL PARTNERS INC	Accelus	10-K	2012	FY	0	1	0	0	0	0	0
17	0001115055	0001140361-12-044659	PINNACLE FINANCIAL PARTNERS INC	Accelus	10-Q	2012	Q3	0	1	0	0	0	0	0
18	0001115055	0001140361-12-034072	PINNACLE FINANCIAL PARTNERS INC	Accelus	10-Q	2012	Q2	0	1	0	1	0	0	0
19	0001115055	0001140361-12-022993	PINNACLE FINANCIAL PARTNERS INC	Accelus	10-Q	2012	Q1	0	0	0	0	0	0	0
20	0001115055	0001140361-12-012791	PINNACLE FINANCIAL PARTNERS INC		10-K	2011	FY	0	0	0	0	0	0	0
21	0001115055	0001140361-11-050973	PINNACLE FINANCIAL PARTNERS INC		10-Q	2011	Q3	0	0	0	0	0	0	0
22	0001115055	0001140361-11-038595	PINNACLE FINANCIAL PARTNERS INC		10-Q	2011	Q2	0	0	0	0	0	0	0

1.8. US GAAP and IFRS Reporting Styles

A comprehensive analysis of XBRL-based financial reports submitted to the SEC prepared using US GAAP[25] and IFRS[26] reveal each of their fundamental accounting concept relations and reporting styles[27].

These reporting styles are fundamental metadata that can be leveraged for reporting under US GAAP[28] or IFRS[29] when using a modern financial reporting approach[30].

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[25] Overview of US GAAP Reporting Styles, http://www.xbrlsite.com/2018/10K/US-GAAP-Reporting-Styles.pdf

[26] Overview of IFRS Reporting Styles, http://www.xbrlsite.com/2018/IFRS/IFRS-Reporting-Styles.pdf

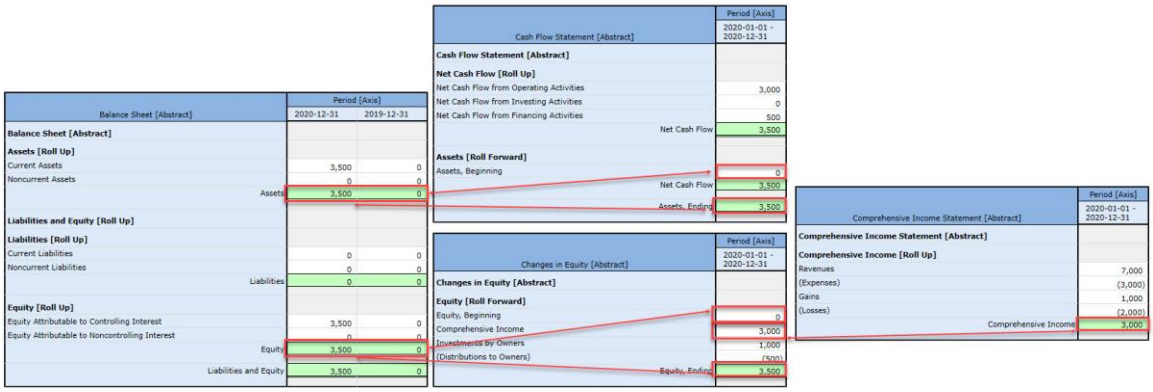
[27] *Campaign to Improve Disclosure Quality of XBRL-based Public Company Financial Reports Submitted to the SEC*, http://xbrl.squarespace.com/journal/2017/10/18/campaign-to-improve-disclosure-quality-of-xbrl-based-public.html

[28] US GAAP Reporting Styles Metadata, http://xbrlsite.azurewebsites.net/2020/reporting-scheme/us-gaap/documentation/ReportingStyles.html

[29] IFRS Reporting Styles Metadata, http://xbrlsite.azurewebsites.net/2020/reporting-scheme/ifrs/documentation/ReportingStyles.html

[30] Modern Approach to Creating a Financial Reporting Scheme, http://xbrl.squarespace.com/journal/2019/12/19/modern-approach-to-creating-a-financial-reporting-scheme.html

An excellent overview of reporting styles can be seen by creating a financial reporting scheme of your own that removes issues with the reporting schemes created by others. I created a prototype *Common Elements of a Financial Statement*[31] reporting scheme in machine-readable form to test these ideas. This explores the notions of articulation and intermediate components, or subtotals, the ideas that help you understand why fundamental accounting concept relations and reporting styles works.



Further, if you watch the video playlist Understanding the Financial Report Logical System[32], it will help you see how these ideas connect to the bigger picture of the financial report model.

Leveraging these ideas will help you create high-quality XBRL-based financial reports.

1.9. Disclosures have patterns also

To close off this introduction to the notion of the fundamental accounting concept relations and reporting styles I want to reiterate that disclosures have patterns also[33]. Patterns in disclosures can be measured also. This will be covered separately.

1.10. Fundamental Accounting Concepts Prototype

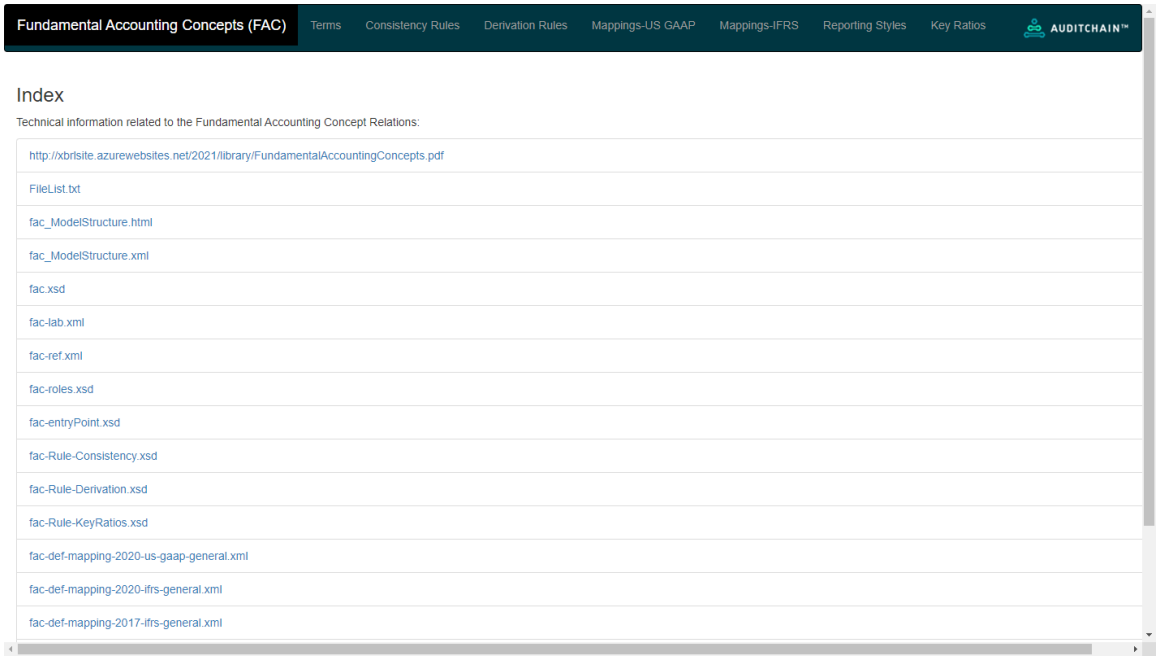
The following is a prototype/experimental organization of fundamental accounting concepts, relations, mappings, consistency rules, and derivation rules organization[34]:

[31] Common Elements of a Financial Statement, http://xbrlsite.azurewebsites.net/2019/core/master-elements/

[32] Understanding the Financial Report Logical System, https://www.youtube.com/playlist?list=PLqMZRUzQ64B7EWamzDP-WaYbS_W0RL9nt

[33] *Campaign to Improve Disclosure Quality of XBRL-based Public Company Financial Reports Submitted to the SEC*, http://xbrl.squarespace.com/journal/2017/10/18/campaign-to-improve-disclosure-quality-of-xbrl-based-public.html

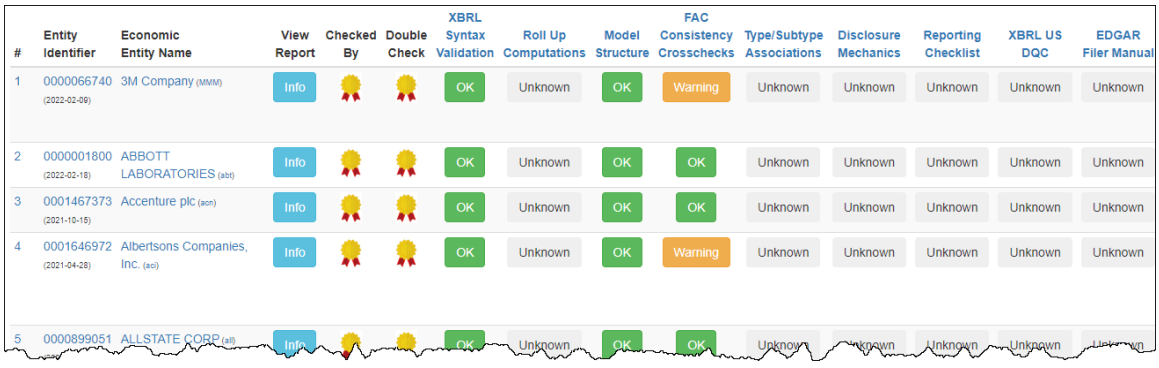
[34] Fundamental Accounting Concepts Hosted by Auditchain, http://accounting.auditchain.finance/fac/Index.html



This organization begs the question as to whether US GAAP and IFRS fundamental accounting concepts information should be combined or separated.

1.11. Learning about Fundamental Accounting Concepts

The following is a prototype dashboard of Fortune 100 companies that is an excellent way to understand fundamental accounting concept relations[35]:



That dashboard of Fortune 100 companies provides links to the actual report submitted to the SEC in both interactive data and Inline XBRL form, an analysis report that tests the fundamental accounting concept relations continuity cross checks, and commentary/analysis that explains any errors that exist in a public companies report, or the rules used to verify that the report is properly functioning in terms of the fundamental accounting concepts and relations between those concepts.

For that set of Fortune 100 companies:

- 70 of the 100, so 70%, are completely consistent with all of the FAC rules.

[35] Fortune 100 Dashboard, http://xbrlsite.azurewebsites.net/2022/Prototypes/fortune100/Dashboard.html

- 5 reports have rounding inconsistencies which should have been fixed prior to structuring the report as XBRL (This is a best practice, and most companies do).
- 5 have RULE ERRORS, meaning the rules are incorrect, and I need to adapt the rules to what is being reported, usually by creating a new reporting style.
- 8 reports have issues with extension concepts, there is a very high probability these high-level extension concepts should have the US GAAP XBRL Taxonomy provide the necessary concepts.
- 7 reports have UNRESOLVED INCONSISTENCIES; something is wrong but exactly what can be disputed (basically, requires discussion).

1.12. Bottom Line: Importance of Reporting Styles

Each different reporting style uses different:

- Fundamental accounting concepts
- Consistency crosscheck rules to make sure the relations between fundamental accounting concepts are adhered to
- Derivation rules to logically derive fundamental accounting concepts that are not explicitly reported
- Mapping rules that are used to determine which report line item is used to report a fundamental accounting concept
- Type-subtype rules (also known as "wider-narrower" associations or "general-special" associations) to make sure line items are reported with the proper mathematical relations
- Disclosure rules (also known as reporting checklist) because different reporting styles have different disclosure requirements
- Disclosure mechanics rules because different disclosures are constructed in different ways

But every financial report is required to follow the same fundamental rules of mathematics, the same rules of logic, and certain rules of accounting and reporting that are universally applicable to all financial reports.