Interpreting Regulations Using SBVR

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Why is Consuming Regulations difficult?
"A person that is a money services business solely because it is an agent for another money services business as set forth in § 1022.380(a)(3), and the money ..."
Different references describing the same thing?

[...] “A person that is a money services business solely because it is an agent for another money services business as set forth in § 1022.380(a)(3), and the money...

[...]

A person that is a money services business solely because that person serves as an agent of another money services business, see § 1010.100(ff) of this chapter...” [...]

[...]

A person that is a money services business solely because it is an agent of another money services business, see § 1010.100(ff) of this chapter, is not required to register under this section. For example, a supermarket corporation, in addition to acting as an agent of an issuer of money orders and performs no other services of a nature and as set forth in § 1010.100(ff) agent for others must register under this section.

(D) Responding to law enforcement requests.

(ii) Money services businesses that have automated procedures with such systems.

(iii) A person that is a money services business solely because it is an agent for another money services business as set forth in § 1010.100(ff) of this chapter, and the money services business fails to maintain an effective anti-money laundering program.
Financial institution. Each agent, agency, branch, or office within the United States of any person doing business, whether or not on a regular basis or as an organized business concern, in one or more of the capacities listed below: ...

(4) A telegraph company
Definition elements need to be defined

(...) “or other unincorporated organization or group, an Indian Tribe” [...]
Complex sentences

Excerpt from Money Services Businesses : Report of suspicious transactions (31 CFR Chapter X)
(Deliberate) Ambiguous regulatory intent

- [...] Matter of “Facts and Circumstances” [...] 
- [...] unless the context otherwise requires 
- [...] or other similar items [...] 

31 CFR Chapter X subpart A § 1010.100 (ccc)

Explained sometimes But not always
How do people consume regulations today?
Current techniques

- SMEs (both Business and Legal)
  - Handcraft guidance
    - Partial Coverage often limited to recurrent activities
    - Based on non-documented/non-formalised process
    - Accuracy, thoroughness, diligence at the discretion of the SMEs
    - Lacks transparency, disconnected… reusability?
- More problems when the rule is complex
  - Lacks structure i.e. vocabulary of transaction types, exemptions, collaterals, etc.
  - Link to other regulations, new spreadsheets?
  - Traceability? Reusability? Can share?

Definition of Covered Transaction:

Under section 223.3(h) of Regulation W, a covered transaction includes:

- An extension of credit to an affiliate;
- A purchase of, or investment in, a security issued by an affiliate;
- A purchase of an asset from an affiliate, including an asset subject to recourse or an agreement to repurchase;
- The acceptance of a security issued by an affiliate as collateral for an extension of credit to any person or company; and
- The issuance of a guarantee [See Footnote 6], acceptance, or letter of credit, including: an endorsement or standby letter of credit, on behalf of an affiliate [See Footnote 7]; a confirmation of a letter of credit issued by an affiliate; and a cross-affiliate netting arrangement.

An extension of credit to an affiliate is broadly defined in section 223.3(o) of Regulation W as the making or renewal of a loan, the granting of a line of credit, or the extending of credit in any manner whatsoever [See Footnote 8], including on an intraday basis, to an affiliate. A bank’s purchase of

Footnote 6

-- A guarantee by a bank on behalf of an affiliate does not include a bank’s issuance of a guarantee in support of securities issued by a third party and underwritten by a securities affiliate of the bank. [End of Footnote 6]

Footnote 7

-- Regulation W clarifies that the section 23B prohibition on a bank publishing an advertisement or entering into an agreement stating or suggesting that the bank will be in any way responsible for the obligations of affiliates does not preclude the bank from issuing a guarantee, acceptance, or letter of credit on behalf of an affiliate in accordance with section 23A. [End of Footnote 7]
Alternative solutions?

- **Need To**
  - Consolidate
  - Disambiguate the meaning
    - Delimit the coverage of a definition
    - Identity demarcation issues while classifying things
    - Identify Obligations and Possibilities
  - Interpret
    - The regulatory intent when not accurate
      - Based on previous experience? Jurisprudence?
      - Maybe prioritize the obligations

- To do this properly SMEs have a major role to play

- Difficult for SMEs to master formal logic (availability, overhead, etc.)
  - Need an alternative way to create these ontologies
Why not use natural language?

- In a more structured way...
  - To consolidate references in regulations
  - To clarify ambiguity in definitions and obligations
  - To interpret collaboratively the regulatory intent

- Benefits:
  - Overcome the consumption challenges
  - And “seamlessly” represent the ontology building blocks in natural language (simple, no need to learn new technical languages)

- How:
  - Develop a shared vocabulary and shared guidance based on the regulatory text
Semantics of Business Vocabulary and business Rules (SBVR)

• OMG Specification
• Business Natural Language
  ▪ Used in a regulatory context
• Grounded in ISO Common Logic
• While capturing the interpretation in SBVR, we identify
  ▪ General Noun Concepts
  ▪ Individual Noun Concepts
  ▪ Verb concepts
  ▪ Keywords
  ▪ Definitional Rules and Behavioral Rules
credit union

Definition: is a union chartered under the Federal Credit Union Act or [...]
SBVR features

Noun concepts:
- Car, dog, securities, bonds, etc.
- Definitions, Synonyms
- Abbreviations, Acronyms

Verb concepts:
- Relationships among concepts
  - General <-> Specific:
    - Securities <-> Bonds
  - Composition, aggregation, etc.
- Characteristics:
  - Loan has issuingEntity

Individuals
- Joseph, UCC, AIB, BoI, etc.

Structural Rules
- It is necessary that each Loan has exactly one issuingEntity

Behavioural Business Guidance
- Policies and rules expressed based on obligation, possibility, prohibition, etc.
- Composed from vocabulary elements

e.g.

Rule: It is obligatory that a customer applying for a loan has a valid ID
What can we do with all this?
The Federal Reserve Board’s ("FRB") Regulation W (Transactions Between Member Banks and their Affiliates) implements Sections 23A and 23B of the Federal Reserve Act ("FRA").

1) Is counterparty an Affiliate?
2) Is transaction Covered?
3) Is Amount permitted?
Case of Regulation W

Affiliate is

Definition: parent company or company under common control by a parent company or company under other common control or company with interlocking directorates or sponsored and advised company or investment company

Synonym: Affiliate of the Bank, Affiliate of the Bank

Concept Type: General Noun Concept

General Concept: Body Corporate

Source: 12 CFR II § 223.2

Each is defined

Investment company

Any registered investment company for which the bank or any affiliate of the bank serves as an investment adviser

Or

Any unregistered investment company for which the bank or any affiliate of the bank serves as an investment adviser, if the bank and any or all of affiliate of the bank own or control in the aggregate more than 5 percent of any class of voting securities or more than 5 percent of the equity capital of the unregistered investment company
covered transaction is

Definition: An extension of credit to an affiliate of the bank

Or a purchase of a security issued by an affiliate of the bank

Or an investment in a security issued by an affiliate of the bank

Or a purchase of an asset from an affiliate of the bank, including an asset subject to recourse or an agreement to repurchase

Or an acceptance of (a security issued by an affiliate of the bank) as collateral for an extension of credit to any person or company

Or the issuance of a guarantee, acceptance, or letter of credit, including an endorsement or standby letter of credit, on behalf of the affiliate, a confirmation of a letter of credit issued by the affiliate, and a cross-affiliate netting arrangement

Source: 12 CFR II § 223.2(h)
Case of Regulation W

**Company}_1 controls **Company}_2

Definition: **Company}_1 or a **shareholder** of **Company}_1, **directly or indirectly, owns, controls, or has power to vote **25 percent** or more of any **class** of **voting securities** of **Company}_2**;

Source: 12 CFR II § 223.3(g)

Not only terms but relationships too...Fleshing out the links between concepts
Case of Regulation W

Section 23 A
It is prohibited that a bank initiates a covered transaction with an affiliate if, after the covered transaction:

- the total aggregate amount of covered transactions of the bank with the affiliate exceeds 10 percent of the capital stock and surplus of the bank

or

- the total aggregate amount of covered transactions of the bank with all affiliates exceeds 20 percent of the capital stock and surplus of the bank

Reconstruct the rule from previously defined “building blocks” to ensure confusion is removed
Case of Regulation W

Section 23 B
It is obligatory that all covered transactions are on market terms requirement

Valuation and Timing Rules
It is obligatory that a credit transaction with an affiliate of the bank is valued at the greater of:
- the principal amount of the credit transaction
- the amount owed by the affiliate of the bank to the bank under the credit transaction
- the sum of (the amount provided to, or on behalf of, the affiliate of the bank in the credit transaction) and (any additional amount the bank could be required to provide to, or on behalf of, the affiliate of the bank under the terms of the credit transaction)

Other examples of regulatory requirements captured in SBVR
Benefits of this approach

What’s under the hood?
Using the SBVR XML Metamodel
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XML Document Repository

<guidanceStatement>
  <originalText>
    General. (1) Every investment company (as defined in section 3 of the Investment Company Act of 1940 (15 U.S.C. 80a-3) (“Investment Company Act”) that is an open-end investment company shall file with the Financial Crimes Enforcement Network a report of each suspicious transaction with the Financial Crimes Enforcement Network to the extent and in the manner required by this section.
  </originalText>
  <ruleCitation>31 CFR § 103.15 (a)(1)</ruleCitation>
</guidanceStatement>

Note: Filing a report of a suspicious transaction does not relieve a mutual fund from the responsibility of complying with any other reporting requirements imposed by the Securities and Exchange Commission.

<expression>It is obligatory that each mutual fund complies with other reporting requirements imposed by the Securities and Exchange Commission.
</expression>

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</expression>

<ruleCitation>31 CFR § 103.15 (a)(1)</ruleCitation>
Query the SBVR XML Repository

List all SBVR interpretations of \textbf{31 CFR § 103.15 (a)(2)}
Query the SBVR XML Repository

Citation: 31 CFR § 103.15 (a)(2)

No of Obligation Statements: 4

- It is obligatory that a transaction is reported if it is conducted or attempted by or on behalf of a mutual fund knows or suspects or has reason to suspect that one or more than one transactions are involving assets derived from illegal activity as part of a plan to violate or evade any Federal law enforced by the department of the Treasury.

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Query the SBVR XML Repository

```
(: Question: What is the origional legislation for the citation x? )

declare variable $q = "31 CFR § 103.15 (b)(3)";
declare function local:show_origional_text()

{for $x in doc("Navigating 31 CFR X via 75 FR 75602 24_03_14 - V3.xml")/sbr:GRCTCRuleBook/rulebook/guidanceStatement/ruleStatement where $x/ruleCitation=$q
return $x/origionalText/text();}

<Result>
<h3><Citation> Citation: {$q}<Citation> </h3>
<OrigionalText>Origional Text: <br>{local:show_origional_text()}<OrigionalText>
</Result>
```

Show me the original regulatory text
Citation: 31 CFR § 103.15 (b)(3)

Original Text:
(3) When to file. A Form SAR-SF shall be filed no later than 30 SAR-SF under this section. If no suspect is identified on the date, but in no case shall reporting be delayed more than 60 calendar days.
Wrapping it all up...
Using the repository to create policies

Tabular views and Hyperlink-based navigation

Legal Subject Matter Experts

Compliance Practitioners

Use case 1

SBVR

Disambiguation and Interpretation of regulatory intent

Policy rules and guidance

Regulated companies

Compliance service providers

© Governance, Risk and Compliance Technology Centre
Using the repository to create formal ontologies

Legal Subject Matter Experts

Knowledge Engineers

Disambiguation and Interpretation of regulatory intent

Formal Ontologies

Use case 2

Compliance Reporting

Compliance Monitoring (BI)

Knowledge Mgmt. Systems
Conclusions

Immediate benefits
- Remove complexity/ambiguity from regulations and resulting policies and rules
- Improve communication using a shared vocabulary
- Increase immediate understanding

Intermediate benefits
- Build controls based on the guidance expressed in SBVR \(\rightarrow\) auditability and backward traceability

Ultimate goal
- Reached when SBVR vocabularies and rules are transformed into fully machine understandable models
How does it all fit together?

Integration using Vocabularies & Ontologies

Databases

Data feeds

Unstructured Data

Laws, Regulations, P&P's, etc.

Structured Regulations

Logic of rules & provisions

Semantic Rules Technology

- Answer Compliance questions and generate reports
- Navigate graph to reveal linked Facts
- Use reasoners to deduce new Facts
Thank you