FIBO and Units of Measure

The Case for a "Quantities and Units of Measure" Ontology Standard

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Overview

- Conventional Measurements and Units
- Financial Measurements
- Concrete amounts versus abstract measures

Conventional

- Commodities Derivatives
  - Contracts based on commodities
  - Metals (Gold etc..)
  - Agricultural products (wheat, soybeans etc.)
- The underlying value for a given contract is specified in terms of some amount of some commodity
- These typically have specific types of unit in which they are measured for the commodities markets
  - Troy ounces etc.
  - Instruments are quoted in these terms, so being able to talk about the equivalent in SI units is not sufficient to be able to render the precise semantics of the contract

Monetary

- Money is measured in currency units (usually!)
  - These are not based in physics
  - This means that the concept of an amount of something denominated in some unit, is more general than an amount of something physical and also more general than an amount of money
- Any physical units of measure ontology should therefore have a more abstract set of parent classes and properties which may be specialized both into the physical and non physical realms
  - We can't frame the meanings of monetary amounts with reference to units of measure abstractions if these are not abstract enough
  - At the same time, the meanings are obviously parallel so it would be a loss of meaning if we were to pretend that the word "amount" has two entirely disjoint meanings when applied to physical variables and to money.

Concrete v Abstract

- In FIBO we distinguish between:
  - An amount of money (concrete)
  - The monetary amount which is the measure of something
    - Price
    - Nominal amount in a derivative contract
- The abstract “Nominal Amount” is never realized – it doesn’t exist as a thing
  - Compare with Matthew’s “Maximum temperature”
- We make this distinction by using a Concrete Thing and Abstract Thing pair of partitions.

Pricing, Analytics etc.

- Some ‘amounts’ such as prices may be measured in more than one way
  - Debt instrument prices are typically quoted as percentage, not monetary amounts
    - This is equivalent to a monetary amount (it is the percentage of the face value of the contract)
  - Sometimes the same price may be quoted a third way, as a yield rather than a price
    - Yield is also a percentage
  - If the markets quote a figure in percentage, then any ontology which is an ontology OF those data sources should be able to talk about the same numbers denominated in the same way and meaning whichever of these things it ‘means’ in the data source
    - In an application you can choose a simpler way to represent a price for calculation purposes
    - but the function of a business ontology ‘of’ some data source is to represent the meanings of the data so it must cover them all

Pricing, Analytics etc. (cont'd)

- Similar considerations apply to analytics (convexity, duration etc.)
- Not all units are as they seem…
  - “Modified Duration” (a measure of debt instrument performance) is denominated in days but does not represent a number of actual days
- Analysts may consider the relationships between several measures, as curves, planes etc. i.e. in Cartesian spaces.
- And of course these analytical measures vary over time, itself another dimension
  - With differing granularity e.g. ‘real time’; days; years etc.