

# Financial Instrument Global Identifier – Initial Specification

## *Discussion Paper*

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# Table of Contents

Preface.....	8
0 Submission-Specific Material.....	10
0.1 Submission Preface.....	10
0.2 Copyright Waiver.....	10
0.3 Submission Team.....	10
0.4 Future Changes to this Specification.....	10
1 Scope.....	11
1.1 Overview.....	11
2 Conformance.....	13
2.1 Conformance as a Provider of Identifiers.....	14
2.2 Conformance as a Consuming Application.....	14
3 References.....	15
3.1 Normative References.....	15
3.2 Non Normative References.....	16
3.3 Changes to Adopted OMG Specifications.....	16
4 Terms and Definitions.....	17
4.1 Specific Terminology.....	17
4.2 Financial Terms.....	17
4.3 Identifier.....	17
5 Symbols and Abbreviations.....	18
5.1 Symbols.....	18
5.2 Abbreviations.....	18
6 Architecture.....	19
6.1 Global Identifier structure.....	19
6.1.1 Introduction.....	19
6.1.2 Syntax.....	19
6.2 Global Identifier Associated Data.....	21
6.2.1 Introduction.....	21
6.2.2 Exchange Code.....	21
6.2.3 Market Sector.....	21

6.2.4	Name .....	23
6.2.5	Pricing Source .....	23
6.2.6	Security Type .....	23
6.2.7	Ticker .....	23
6.3	Relationships Amongst Data Elements .....	23
6.3.1	Global Identifier .....	23
6.3.2	Composite Global Identifier .....	24
6.3.3	Share Class Global Identifier .....	24
6.3.4	Exchange Code .....	24
6.3.5	Market Sector .....	24
6.3.6	Name .....	25
6.3.7	Pricing Source .....	25
6.3.8	Security Type .....	25
6.3.9	Ticker .....	25
7	Controlled Vocabularies .....	26
7.1	Introduction .....	26
7.2	Security Types .....	26
7.3	Pricing Sources .....	26
8	FIGI Ontology .....	27
8.1	Ontology Architecture and Namespaces .....	27
8.2	Global Instrument Identifiers Ontology .....	29
8.2.1	Top-Level Class Hierarchy .....	29
8.2.2	Financial Instruments .....	30
8.2.3	Identifiers .....	32
8.2.4	Market Sectors .....	33
8.2.5	Security Types .....	34
Appendix A: Machine Readable Files as Part of This Specification .....		35
Appendix B: Shared Semantics Treatments .....		36
Appendix C: Creation of New Identifiers .....		37
C.1	Registration Service .....	37
C.2	Certified Provider (CP) .....	38
C.2.1.	Registration Authority (RA) role .....	38

C.2.2. Certified Provider (CP) role .....	38
Appendix D: Allocation of Identifier Prefixes.....	40

# Preface

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#### Platform Specific Model and Interface Specifications

- CORBA services



- CORBA facilities
- OMG Domain specifications
- OMG Embedded Intelligence specifications
- OMG Security specifications

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NOTE: Terms that appear in italics are defined in the glossary. Italic text also represents the name of a document, specification, or other publication.

# 0 Submission-Specific Material

## 0.1 Submission Preface

Bloomberg LP is pleased to present a standard by which financial instruments can be consistent and persistently identified. This document specifies both the structure of the Financial Instrument Global Identifier (Global Identifier) itself as well as the relationships that the Global Identifier has with other data fields. Supplementation documentation also specified these entities and relationships in OWL format so as to enable simple systems integration.

Chapter 0 of this document contains information specific to the OMG submission process and is not part of the proposed specification. The proposed specification starts with Clause 1 “Scope”. All clauses are normative unless explicitly marked as informative. The section numbering scheme, starting with Clause 1, represents the final numbering scheme and will remain stable throughout the submission process.

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## 0.3 Submission Team

The Global Identifier RFC is being submitted by Bloomberg LP, a membership organization in the financial sector. The key contacts are all Bloomberg LP employees:

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## 0.4 Future Changes to this Specification

It is anticipated that aspects of this specification may need to be updated on an ongoing basis, while others may not:

- Some aspects of this specification, as well as the accompanying OWL files, make reference to other standards which are themselves changing over time. Of note in this regard is FIBO. The model we present of a Financial Instrument Identifier refers to, in a very strict sense, Financial Instruments. As these are defined in FIBO and that specification is expected to change over time, these references must also change. As such, this will be an evolving standard.

# 1 Scope

## 1.1 Overview

The efforts around the development of a Financial Instrument Global Identifier started out as an internal project within Bloomberg aimed at addressing a range of business needs, both internal and on the part of our client organizations. The project originated out of the recognition that chaos theory has nothing on the complexity generated everyday by the millions-perhaps billions-of security transactions that cross trading floors, clearinghouses and exchanges all over the world. Almost every aspect of securities management is based on closed systems that use proprietary identifiers that are privately owned and licensed. Closing each deal is as much an exercise in translation as it is in transaction processing, as traders, investors and brokers wrestle with multiple proprietary formats to determine what a security is, who owns it, how much it is worth, and when the deal should be closed. It introduces a tremendous amount of friction into the trade lifecycle and creates opaqueness where clarity is sought. In addition, the use of proprietary identifiers adds significant cost and overhead when users wish to integrate data from disparate sources or migrate to a different market data system.

The evolution of advanced symbolologies has helped the securities industry grow, but the limitations and costs imposed by the closed systems have become more apparent as companies and institutions continue to integrate operations on a global scale. Proprietary symbology now stands as one of the most significant barriers to increased efficiency and innovation in an industry that sorely needs it. Moreover, the lack of common identifiers is a key roadblock to achieving the holy grail of straight-through processing (STP).

Points of Note:

- Licensing fees require firms to pay for each symbol system they use. International firms bear an especially heavy burden, because they often have to license several symbolologies in order to manage trading operations in several countries.
- Restrictions imposed by proprietary symbolologies prevent companies from easily mapping one set of codes to another. This hinders integration of market data from diverse sources as well as efforts to automate trade and settlement activities.
- Market data consumers who adopt proprietary symbols for use in their own systems must not only pay licensing fees, but such symbols also lead to significant future costs associated with efforts to connect to emerging trading systems.
- Proprietary trading environments may have worked well for years; but they are a byproduct of a time when data systems operated largely as islands that did not have to interoperate with other systems.

Current trends dictate a different approach. Markets, customers and governments are demanding greater connectivity, transparency and efficiency. What's more, the openness of Internet-based systems has profoundly altered the way businesses-and individuals-collect, manage and share information. Thus, in addition to new regulations that demand clarity and accountability, the move to open symbology is being driven by growing investor and institutional demands.

Adopting an open system of shared symbology establishes the foundation for a tremendous leap forward in the efficient trade and settlement of securities as well as data management and reporting of financial instruments more generally. Such a system will allow firms and technology service providers to shift resources from laborious, inefficient processes to new investments in tools and products that will better serve clients.

An open system answers the call for greater transparency. Eliminating the need to remove proprietary IDs and re-map financial instruments will greatly simplify the steps needed to migrate between market data platforms and trading systems. Availability of a central symbology reference will facilitate mapping between users' internal systems and create opportunities for integration and automation of the global enterprise.

This specification lays out the details of the Financial Instrument Global Identifier across two dimensions:

1. The specification of the structure of the Global Identifier itself—what is/is not valid as a Global Identifier and how a Global Identifier is constructed and validated.

2. An ontological model specifying the relationship between the Global Identifier and other closely related classes of data.

Global Identifier concepts are documented using two forms of definition:

1. A structured ontology specification of the concept, and its relationships to others, represented using the Web Ontology Language (OWL).
2. Natural language definitions which represent the concepts in natural language using the vocabulary of the finance industry.
3. Two controlled vocabulary lists, one specifying the list of possible values for security types, one specifying the list of possible values for pricing sources. These lists are subject to grow over time as new security types are either invented or incorporated into FIGI and as new pricing sources are taken into account.

This specification covers both the content of the models, and the underlying architecture employed for producing and presenting the model.

## 2 Conformance

An identifier is in conformance with this standard if, and only if, all of the following conditions are met:

Requirement	Description	Reference
Syntax of identifier.	<p>The identifier must be a twelve (12) character string as follows:</p> <p>Position 1: any upper case alphabetical character excluding vowels.</p> <p>Position 2: any upper case alphabetical character excluding vowels.</p> <p>Position 3: the letter “G”.</p> <p>Positions 4-11: any alpha numeric character excluding vowels that, in combination with positions 1 and 2 does not constitute a duplicate of an existing string.</p> <p>Position 12: check digit (see section 7.1.2 for algorithm).</p> <p>Qualification: positions 1 and 2 cannot be the following sequences: BS, BM, GG, GB, VG.</p>	Section 6.1.2
Uniqueness of identifier.	The identifier must be a twelve character string, as specified above, that has never been assigned as a Financial Instrument Global Identifier.	Section 6.1.1
Composite Global Identifier	If a global identifier is to be designated as a Composite Global Identifier, it must have at least one Global identifier associated with it.	Section 6.1.1
Share Class Global Identifier	If a global identifier is to be designated as a Share Class Global Identifier, it must have at least one Composite Global identifier associated with it.	Section 6.1.1
Exchange Code	A global identifier will have either zero (0) or one (1) exchange code associated with it.	Section 6.2.2
Market Sector	Each global identifier will have at least one Market Sector associated with it.	Section 6.2.3
Name	Each global identifier will have at least one name, which need not be unique to the identifier.	Section 6.2.4
Pricing Source	A global identifier will have any finite number of pricing sources, including zero (0) associated with it.	Section 6.2.5
Security Type	A global identifier will be associated with at least one (1) Security Type.	Section 6.2.6
Ticker	A global identifier will have at least one ticker associated with it. That ticker need not be unique to the identifier.	Section 6.2.7

There are no degrees of conformance.

## 2.1 Conformance as a Provider of Identifiers

In order to support the accurate assignment of identifiers it is vital that a single financial instrument, appropriately understood, be identified by exactly one identifier. Further, it must be the case that a particular identifier, unless it is a composite or share class Identifier (see section 6 below), identifies exactly one financial instrument. In order to support this, then, it is necessary that when an Identifier is created two conditions are met:

- Uniqueness of Identifier: the twelve character string (see section 6 for details) is unique and has never been used at any time for a FIGI.
- Uniqueness of the Financial Instrument: the financial instrument being identified does not already have a FIGI associated with it.

In order to ensure that these two conditions are met there either needs to be one comprehensive system of record (perhaps with non-official copies embedded in other organizations) that can serve as the single point of reference against which to check Financial Instruments and Identifiers or there needs to be some consistently applied mechanism by which both Identifiers and Financial Instruments are partitioned and distributed amongst multiple systems. Given that at the time of this writing there already exists a system with over 170 Million identifiers that spans across a broad range of Financial Instruments, doing the latter would require extensive unravelling of existing technology stacks. Therefore, the single system of record approach is preferred. To that end, the following distinction needs to be made:

- Registration Authority (RA): the Registration authority serves as both an issuer of Identifiers and as a comprehensive system of record of the registered Identifiers.
  - Owing to its legacy status as a provider of FIGIs, Bloomberg LP will serve as the RA with processes supported by and in concert with the OMG.
  - As a provider of Identifiers, Bloomberg will continue to issue Identifiers beginning with the two consonants “BB” until such a time as the available inventory of Identifiers with that prefix nears exhaustion.
- Certified Provider (CP): a Certified Provider (there can potentially be many) serves as an issuer of Identifiers and can elect to maintain a comprehensive inventory of Identifiers for their own purposes.
  - Each CP will elect an unused two consonant prefix to be used as the first two characters of the identifiers that they create.

The details of how two letter prefixes are assigned is documented in Appendix D. The details of how new Identifiers are created, either by a CP or through a request service is documented in Appendix C.

## 2.2 Conformance as a Consuming Application

A consuming application is in conformance with this standard provided that it is configured to accept a syntactically correct Financial Instrument Global Identifier, a Composite Global Identifier, and a Share Class Global Identifier. Optionally, a consuming application may, but is not required to, accept any or all of the remaining conditions.

There are no restrictions on additional syntax, e.g., xml tags, that might be used in concert with the identifier or the associated data. Nor are there any restrictions on the environment(s) in which a Financial Instrument Global Identifier can be used or displayed.

## 3 References

### 3.1 Normative References

The following normative documents contain provisions which, through reference in this text, constitute provisions of this specification. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply.

Reference	Description
[OWL 2]	OWL 2 Web Ontology Language Quick Reference Guide (Second Edition), W3C Recommendation 11 December 2012. Available at <a href="http://www.w3.org/TR/2012/REC-owl2-quick-reference-20121211/">http://www.w3.org/TR/2012/REC-owl2-quick-reference-20121211/</a> .
[RDF 1.1]	RDF 1.1 Concepts and Abstract Syntax, W3C Last Call Working Draft. Latest version Available at <a href="http://www.w3.org/TR/2013/WD-rdf11-concepts-20130723/">http://www.w3.org/TR/2013/WD-rdf11-concepts-20130723/</a>
[RDF Concepts]	Resource Description Framework (RDF): Concepts and Abstract Syntax. Graham Klyne and Jeremy J. Carroll, Editors. W3C Recommendation, 10 February 2004. Latest version is available at <a href="http://www.w3.org/TR/rdf-concepts/">http://www.w3.org/TR/rdf-concepts/</a> .
[RDF Schema]	RDF Vocabulary Description Language 1.0: RDF Schema. Dan Brickley and R.V. Guha, Editors. W3C Recommendation, 10 February 2004. Latest version is available at <a href="http://www.w3.org/TR/rdf-schema/">http://www.w3.org/TR/rdf-schema/</a> .
[SKOS]	SKOS Simple Knowledge Organization System Reference, W3C Recommendation 18 August 2009. Available at <a href="http://www.w3.org/TR/2009/REC-skos-reference-20090818/">http://www.w3.org/TR/2009/REC-skos-reference-20090818/</a> .
[W3C Datatypes in RDF and OWL]	XML Schema Datatypes in RDF and OWL, W3C Working Group Note 14 March 2006, Available at <a href="http://www.w3.org/TR/2006/NOTE-swbp-xsch-datatypes-20060314/">http://www.w3.org/TR/2006/NOTE-swbp-xsch-datatypes-20060314/</a> .
[XML Schema Datatypes]	XML Schema Part 2: Datatypes. W3C Recommendation 02 May 2000. Latest version is available at <a href="http://www.w3.org/TR/xmlschema-2/">http://www.w3.org/TR/xmlschema-2/</a> .
[Dublin Core]	DCMI Metadata Terms, Issued 2013-06-14 by the Dublin Core Metadata Initiative. Available at <a href="http://www.dublincore.org/documents/dcmi-terms/">http://www.dublincore.org/documents/dcmi-terms/</a> .
[MOF]	Meta Object Facility (MOF™) Core, v2.4.1. OMG Available Specification, formal/2011-08-07. Available at <a href="http://www.omg.org/spec/MOF/2.4.1/">http://www.omg.org/spec/MOF/2.4.1/</a> .
[MOF XMI]	MOF 2/XMI (XML Metadata Interchange) Mapping Specification, v2.4.1. OMG Available Specification, formal/2011-08-09. Available at <a href="http://www.omg.org/spec/XMI/2.4.1/">http://www.omg.org/spec/XMI/2.4.1/</a> .
[ODM 1.0]	Ontology Definition Metamodel (ODM), v1.0. Available Specification, formal/2009-05-01. Available at <a href="http://www.omg.org/spec/ODM/1.0/">http://www.omg.org/spec/ODM/1.0/</a> .
[ODM 1.1]	Ontology Definition Metamodel (ODM), v1.1, RTF Report, ptc/2013-08-01.
[OMG AB Specification Metadata]	OMG Architecture Board recommendations for specification of ontology metadata, Available at <a href="http://www.omg.org/techprocess/ab/SpecificationMetadata/">http://www.omg.org/techprocess/ab/SpecificationMetadata/</a> .
[UML2]	Unified Modeling Language™ (UML®), version 2.4.1. OMG Specification, formal/2011-08-06. Available at <a href="http://www.omg.org/spec/UML/2.4.1/">http://www.omg.org/spec/UML/2.4.1/</a> .

## 3.2 Non Normative References

The following informative documents are referenced throughout this text or in parts of the Annexes:

Reference	Description
[W3C Organization Ontology]	W3C Organization Ontology. Available at: <a href="http://www.w3.org/TR/vocab-org/">http://www.w3.org/TR/vocab-org/</a>
[ISO Common Logic]	Information Technology - Common Logic ISO/IEC 24707:2007 <a href="http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=39175">http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=39175</a>
[Knowledge Representation]	<i>Knowledge Representation: Logical, Philosophical and Computational Foundations</i> , Sowa, John F., Brooks/Cole. 2000
[Model Theory]	<i>Mathematical Logic: An Introduction to Model Theory</i> , Lightstone, A. H., New York: Plenum Press, 1978, H. B. Enderton (ed).
[OMV]	Ontology Metadata Vocabulary (OMV) - <a href="http://omv2.sourceforge.net/">http://omv2.sourceforge.net/</a> (a standard giving metadata for ontology-level information)

## 3.3 Changes to Adopted OMG Specifications

This specification does not change or replace any OMG specifications. It does, however, depend on pending changes to the W3C Datatypes in RDF and OWL as they pertain to OWL 2 and RDF 1.1. and on having those changes available in ODM 1.1.



## 4 Terms and Definitions

The human readable definitions have been constructed by and with the input of business subject matter experts. In cases where there are FIBO definitions available either the FIBO definitions were used (with explicit citation) or they were incorporated into the formal definitions.

Many definitions have been derived from definitions of data elements corresponding to those terms in industry. In every instance, those definitions have been reviewed by industry subject matter experts both within and outside of Bloomberg LP to ensure that the definitions accurately capture the sense of the business concepts.

For the purposes of this specification, the following terms and definitions apply.

### 4.1 Specific Terminology

#### Ontology

**Definition:** A formalization of a conceptualization. For the purposes of this specification the formalization is in OWL and the conceptualization is that of business subject matter.

#### Taxonomy

**Definition:** A set of terms which stand in some classification relation to one another.

#### Vocabulary

**Definition:** A set of words, each giving one or more formal definitions which apply to a meaningful concept that is referred to by that word.

### 4.2 Financial Terms

#### Financial Instrument

**Definition:** Financial instruments are cash, evidence of an ownership interest in an entity, or a contractual right to receive, or deliver, cash or another financial instrument. (Source: FIBO)

### 4.3 Identifier

For the purposes of this specification an identifier is understood as:

**Definition:** A unique string of characters which is semantically meaningless, but adheres to specific syntax restrictions.

Unpacking this:

#### Unique

**Definition:** An item is unique if, and only if, within its domain, it does not duplicate any other item either currently or historically specified as an identifier within the domain.

Uniqueness does not apply across domains. That is to say, that there is no guarantee that a given string may not be used as an identifier within another domain, be that domain with the financial sector or within another sector. That said, considerable effort was employed to reduce the chances that a given identifier would not be a duplicate of another identifier within the financial domain. Other domains, e.g., the scientific domain, have not been taken into account.

To say that the identifier is semantically meaningless is to say that, beyond syntax restrictions, the assignment of characters to given positions within the twelve character string is entirely random. The only exceptions to the randomness clause are slight restrictions to which two letters can occupy the first two positions, the letter that must occupy the third position, and the value of the last character, which is a calculated, though still meaningless, check digit.

## **5 Symbols and Abbreviations**

### **5.1 Symbols**

There are no symbols introduced by this specification.

### **5.2 Abbreviations**

The following abbreviations are used throughout this specification:

- OWL – Web Ontology Language
- RDF – Resource Definition Framework
- SME – Subject Matter Expert
- URL – Uniform Resource Locator
- XML – eXtensible Markup Language
- XMI – XML Metadata Interchange
- ODM – Ontology Definition Metamodel
- UML – Unified Modeling Language

Additional symbols and abbreviations that are used only in annexes to this specification are given in those annexes.

# 6 Architecture

## 6.1 Global Identifier structure

### 6.1.1 Introduction

A Financial Instrument Global Identifier is structured as a twelve (12) character string which is semantically meaningless. As the string is intended to remain attached to a given financial instrument throughout the life of that instrument in addition to serving as a historical reference for retired/obsolete financial instruments, it is vital that the string be structured in such a way as to be semantically neutral.

Owing to the granularity of the Financial Instrument Identifier, there is a need for multiple types of identifiers so as to provide groupings of Financial Instruments. The three types of Financial Instrument Global Identifiers are as follows:

- **Global Identifier:** this is the most basic type of identifier that applies to exactly and only one Financial Instrument at the most granular level.
- **Composite Global Identifier:** The Composite Global Identifier is itself a Global Identifier which is differentiated from a “normal” Global Identifier in that it serves as a parent in a hierarchy of individual Global Identifiers.

The Composite Global Identifier only applies to a limited subset of Global Identifiers. In particular, it only applies to those Global Identifiers that can be differentiated based on either the exchange on which the asset is traded or on the pricing source of the asset. These conditions only obtain in the case of Equities. As such, the Composite Global Identifier is only used in grouping equities.

- **Share Class Global Identifier:** The Share Class Global Identifier is itself a Global Identifier which is differentiated from a “normal” Global Identifier and a Composite Global Identifier in that it serves as a parent in a hierarchy of individual Composite Global Identifiers.

Like the Composite Global Identifier, the Share Class Global Identifier only applies to a limited subset of Global Identifiers. As a grouping mechanism for Composite Global Identifiers, the Share Class Global Identifier is only used in grouping equities.

All three types of Financial Instrument Identifiers have exactly the same structure and syntax restrictions as specified below.

### 6.1.2 Syntax

While the string itself is semantically meaningless, there is a specific structure that is used. The syntax rules for the twelve characters are as follows:

- Characters 1 and 2:
  - Any combination of upper case consonants with the following exceptions:
    - BS, BM, GG, GB, VG

The purpose of the restriction is to reduce the chances that the resulting identifier may be identical to an ISIN string. (Strictly speaking, a duplicate is not a problem as the strings designate different things, but care has been taken to reduce ambiguity.) The way that ISIN is constructed is that the first two characters correspond to the country of issuance. The third character, depending on the issuing organization is typically a numeral. However, in the case of the United Kingdom, the letter “G” is assigned. As we are using the letter “G” as our third character (see below), the only combinations that may come up within ISIN that only incorporates consonants are BSG (Bahamas), BMG (Bermuda), GGG (Guernsey), GBG (United Kingdom) and VGG (British Virgin Islands). The reason for this is that the United Kingdom issues ISIN numbers for entities within its broader jurisdiction.

The allocation of the prefixes for different Certified Providers (CPs) is specified in Appendix D below.

- Character 3:
  - The upper case letter G (for “global”)
- Characters 4 – 11:
  - Any combination of upper case consonants and the numerals 0 – 9
- Character 12:
  - A check digit (0 – 9) which is calculated as follows:
    - Using the first 11 digits and beginning at the last digit and working right to left, every second digit is multiplied by two. Letters are converted to numbers as illustrated below. The resulting string of digits (numbers greater than 10 become two separate digits) are added up. Subtract the total from the next higher number ending in zero. If the total obtained when summing up the digits is a number ending in zero, then the check digit is zero.

Alphabetical characters are assigned a numeric value according to the following table:

B = 11	H = 17	N = 23	T = 29
C = 12	J = 19	P = 25	V = 31
D = 13	K = 20	Q = 26	W = 32
F = 15	L = 21	R = 27	X = 33
G = 16	M = 22	S = 28	Z = 35

For example, for the string BBG000BLNQ1 the calculation of the check digit would be as follows:

B	B	G	0	0	0	B	L	N	Q	1	
11	11	16	0	0	0	11	21	23	26	1	convert letters to numeric value here
1	2	1	2	1	2	1	2	1	2	1	multiply every other value by 2
11	22	16	0	0	0	11	42	23	52	1	the resulting values after multiplying in above step

Add up the resulting values above :

$$1+1+2+2+1+6+0+0+0+1+1+4+2+2+3+5+2+1 = 34$$

Check digit 6

40 the next highest number ending in zero

The string with check digit would be BBG000BLNQ16

Similarly:

N	R	G	9	2	C	8	4	S	B	3	
23	27	16	9	2	12	8	4	28	11	3	convert letters to numeric value here
1	2	1	2	1	2	1	2	1	2	1	multiply every other value by 2
23	54	16	18	2	24	8	8	28	22	3	the resulting values after multiplying in above step

Add up the resulting values above :

$2+3+5+4+1+6+1+8+2+2+4+8+8+2+8+2+2+3 = 71$

Check digit 9

80 the next highest number ending in zero

The string with check digit would be NRG92C84SB39

## 6.2 Global Identifier Associated Data

### 6.2.1 Introduction

While the Global Identifier is at the heart of this specification, it does not exist in a vacuum. Rather, a set of complimentary fields are associated with the Identifier, two of which are special instances of the identifier itself. The need for the additional data points is largely a function of the granularity of the Global Identifier. Since the Global Identifier serves to identify financial instruments at the most granular possible level, it is very helpful to clearly specify the differentiators that constitute the granularly. To that end, a number of key data elements are associated with each Global Identifier that serve to highlight the differentiating features as well as provide additional information about the financial instrument, e.g., its name.

The following sections outline the various data elements associated with the Global Identifier. The relationships between the various types are explicated in later sections.

### 6.2.2 Exchange Code

Financial instruments are, by their nature, things which can be bought or sold. The financial instruments to which this standard speaks are bought or sold on an individual exchange. Since the Global Identifier assigns unique identifiers to financial instruments at the most granular level possible, specifying the exchange on which the individual financial instrument is traded is valuable. It is grouped, along with Pricing Source, as an associated Code.

### 6.2.3 Market Sector

Financial instruments exist across a range of types. These types are captured in the FIBO ontology and parallel the breakdown we present below. Beyond the FIBO breakdown, which is far more granular than is typically reflected in regular industry distinctions, we present a fairly basic breakdown of the market sectors that reflect accepted industry distinctions. It is important to note that while these sectors do parallel specific types of financial instruments as represented in FIBO, they are no types of financial instruments strictly speaking. Rather, they are sectors within the financial markets that represent marketing distinctions.

The definitions of each market sector are presented below. In each case, the definitions are either directly taken from or adapted from the definitions offered either within FIBO or from Bloomberg LP.

#### 6.2.3.1 Commodity Market Sector

A commodity is an agriculture product, mineral, or other tangible asset that investors trade on a commodity exchange or Spot Market on a cash or future basis. (Source: Bloomberg) The Commodity Market Sector is the market sector that supports the sale and exchange of commodities.

#### 6.2.3.2 Corporate Bond Market Sector

A corporate bond is a debt security issued by a corporation, as opposed to those issued by a government or municipality. (Source: FIBO) The Corporate Bond Market Sector is the market sector that supports the sale and exchange of corporate bonds. Within the ontology, the Corporate Bond Sector is a sibling to Government Bond Sector and Municipal Bond Sector under a parent class of Bond Market Sector and with a rule specifying that the three child classes are disjoint.

### **6.2.3.3 Currency Market Sector**

A currency is a generally accepted form of money, including coins and paper notes, which is issued by a government and circulated within an economy. Used as a medium of exchange for goods and services, currency is the basis for trade. (Source: Bloomberg LP) The Currency Market Sector is the market sector that supports the sale and exchange of currencies.

### **6.2.3.4 Equity Market Sector**

An Equity is:

1. A stock or any other security representing an ownership interest. (Primary Definition)
2. On a company's balance sheet, the amount of the funds contributed by the owners (the stockholders) plus the retained earnings (or losses). Also referred to as "shareholders' equity".
3. In the context of margin trading, the value of securities in a margin account minus what has been borrowed from the brokerage.
4. In the context of real estate, the difference between the current market value of the property and the amount the owner still owes on the mortgage. It is the amount that the owner would receive after selling a property and paying off the mortgage
5. In terms of investment strategies, equity (stocks) is one of the principal asset classes. The other two are fixed-income (bonds) and cash/cash-equivalents. These are used in asset allocation planning to structure a desired risk and return profile for an investor's portfolio.

(Source: Bloomberg LP) The Commodity Market Sector is the market sector that supports the sale and exchange of commodities. ) The Equity Market Sector is the market sector that supports the sale and exchange of equities.

### **6.2.3.5 Government Bond Market Sector**

A Government Bond is a government debt obligation (local or national) backed by the credit and taxing power of a country with very little risk of default. (Source: FIBO) The Government Bond Market Sector is the market sector that supports the sale and exchange of government bonds. Within the ontology, the Government Bond Sector is a sibling to Corporate Bond Sector and Municipal Bond Sector under a parent class of Bond Market Sector and with a rule specifying that the three child classes are disjoint.

### **6.2.3.6 Index Fund Market Sector**

An Index is a compilation of statistical data that tracks changes in the economy or in financial markets. (Source: Bloomberg LP) ) The Index Fund Market Sector is the market sector that supports the sale and exchange of index funds.

### **6.2.3.7 Money Market Fund Market Sector**

A Money Market is an international market for dealers who trade short- term government and corporate financial instruments like banker's acceptances, commercial paper, negotiable certificates of deposit, or Treasury bills. These instruments are considered the safest and most liquid of investments. (Source: Bloomberg LP) The Money Market Fund Market Sector is the market sector that supports the sale and exchange of money market funds.

### **6.2.3.8 Mortgage Market Sector**

From the investment perspective, a Mortgage is a debt instrument that is secured by the collateral of specified real estate property and that the borrower is obliged to pay back with a predetermined set of payments. Mortgages are used by individuals and businesses to make large purchases of real estate without paying the entire value of the purchase up front. (Source: Bloomberg LP) The Mortgage Market Sector is the market sector that supports the sale and exchange of mortgages.

### **6.2.3.9 Municipal Bond Market Sector**

A Municipal Bond is a city or state-issued debt instrument. Interest on such instruments is usually exempt from federal income tax. If the bond was issued in the bondholder's state of residence, interest is also usually state and local tax exempt. (Source: Bloomberg LP) The Municipal Bond Market Sector is the market sector that supports the sale and exchange of municipal bonds. Within the ontology, the Municipal Bond Sector is a sibling to Government Bond Sector and Corporate Bond Sector under a parent class of Bond Market Sector and with a rule specifying that the three child classes are disjoint.

### **6.2.3.10 Preferred Stock Market Sector**

A Preferred Stock is an equity share in a company that has priority over other stock of the same company in dividends and claims. (Source: Bloomberg LP) ) The Preferred Stock Market Sector is the market sector that supports the sale and exchange of preferred stocks.

## **6.2.4 Name**

Name is the name of the company, and sometimes including a brief description of the security. The name of an instrument may change in conjunction with corporate actions. (Source: Bloomberg LP) As noted above, the Identifier associated with the instrument will not change in response to such an event.

## **6.2.5 Pricing Source**

The pricing source for a financial instrument is the organization or company that supplies the pricing data for the particular vehicle within the particular market, e.g., on a given exchange. It is grouped, along with Exchange Code, as an associated code.

## **6.2.6 Security Type**

A security type is a specific category of a financial instrument that further clarifies the nature of the instrument. For example, an Equity might be a American Depositary Receipt as opposed to a Common Stock. The list of Security types is dynamic and is not captured as part of the class model; it is, rather, an enumerated list which may change over time.

## **6.2.7 Ticker**

A ticker is a specific identifier for a financial instrument that reflects common usage. Tickers are not, however, unique to specific exchanges or specific pricing sources. Rather, a given ticker might be associated with multiple Global Identifiers, e.g., an October 13 Put on AAPL US (Name) might have a ticker value of AAPL10/19/13 P210 yet be associated with multiple Global Identifiers owing to the diversity of exchanges on which the asset can be traded.

# **6.3 Relationships Amongst Data Elements**

As outlined above, there are multiple data points that are associated with a given Global Identifier. These serve to provide either context for the financial instrument or a user-friendly reference. In order to serve in these functions, however, the various classes need to stand in specific relationships with the Global Identifier. The exact natures of the relationships are specified in the associated OWL file; below is the description of those relationships.

## **6.3.1 Global Identifier**

At the heart of this model are two things: a financial instrument and a global identifier. The Global Identifier itself is part of group of three different types of financial instrument identifiers. As such, the Global Identifier stands in relationships to both Financial Instruments and to the other identifiers.

- Relationship to Financial Instruments:
  - A Global Identifier identifies exactly one Financial Instrument.

- A Financial Instrument is identified by exactly one Financial Instrument Identifier (the parent class of the Global Identifier).
- Relationship to other Financial Instrument Identifiers
  - A Global Identifier may have up to, but not exceeding, one Composite Global Identifier as a parent.

### 6.3.2 Composite Global Identifier

As noted above, a Composite Global Identifier is, essentially, a special instance of a Global Identifier. The key differentiator is that a Composite Global Identifier has at least one “child” global identifier. As such the relationship between a Global Identifier and a Composite Global identifier is:

- Relationship to Financial Instruments:
  - A Global Identifier identifies exactly one Financial Instrument.
  - A Financial Instrument is identified by exactly one Financial Instrument Identifier (the parent class of the Global Identifier).
- Relationship to other Financial Instrument Identifiers
  - A Composite Global Identifier must have at least one Global identifier as a child.
  - A Composite Global Identifier may have up to, but not exceeding, one Share Class Global Identifier as a parent.

### 6.3.3 Share Class Global Identifier

The relationship between a Composite Global Identifier and a Share Class Global Identifier is as follows:

- Relationship to Financial Instruments:
  - A Global Identifier identifies exactly one Financial Instrument.
  - A Financial Instrument is identified by exactly one Financial Instrument Identifier (the parent class of the Global Identifier).
- Relationship to other Financial Instrument Identifiers
  - A Share Class Global Identifier must have at least one Composite Global Identifier.

### 6.3.4 Exchange Code

The relationship between a Financial Instrument and an Exchange Code is as follows:

- A Financial Instrument may have up to, but not exceeding, one Exchange Code.
  - Note: the vast majority of Financial Instruments have, as a matter of practice, one Exchange Code.
- An Exchange Code has at least one Financial Instrument.

### 6.3.5 Market Sector

The relationship between a Financial Instrument and a Market Sector is as follows:

- A Financial Instrument is classified by at least one, but no more than two Market Sectors.
  - Note: there are only a handful of Financial Instruments with more than one Market Sector associated with them. This is owing to the peculiarities of the Bond issue in each case.
- A Market Sector classifies at least one Financial Instrument.



### **6.3.6 Name**

The relationship between a Financial Instrument and a Name is as follows:

- A Financial Instrument is identified by at least one Name.
- A Name identifies at least one Financial Instrument.

Multiple Financial Instruments can be associated with a single name as there is no requirement that the name of a Financial Instrument specify all of the individuating characteristics of a Financial Instrument, e.g., the pricing source. There is, however, nothing precluding such specificity either.

### **6.3.7 Pricing Source**

The relationship between a Financial Instrument and a Pricing Source is as follows:

- A Financial Instrument may have any number of Pricing Sources, including zero.
- A Pricing Source has at least one Financial Instrument.

As a matter of practice, almost all Financial Instruments have an associated Pricing Source, but there are cases, e.g., some corporate bonds, where this is not the case.

### **6.3.8 Security Type**

The relationship between a Financial Instrument and a Security Type is as follows:

- A Financial Instrument is classified by at least one Security Type.
- A Security type classifies at least one Financial Instrument.

### **6.3.9 Ticker**

The relationship between a Financial Instrument and a Ticker is as follows:

- A Financial Instrument is identified by at least one Ticker.
- A Ticker identifies at least one Financial Instrument.

## 7 Controlled Vocabularies

### 7.1 Introduction

In addition to the basic classes outlined above, there are two sets of named individuals that serve as controlled vocabularies for the associated fields. While the vocabularies described below and included as a part of the specification are current as of the writing of this document, they are subject to change, primarily through growth, over time.

### 7.2 Security Types

As specified above, each Global Identifier has at least one Security Type associated with it. In a sense, the security type refines the Market Sector, although a few Security Types apply to multiple Market Sectors. The Security Types are specified in the associated SecurityTypes.rdf vocabulary.

Over time, the set of available security types is subject to change. Two events can trigger such a change:

- New security types are invented.

The financial sector is dynamic and new financial instruments are constantly being created. Some are simply variations on existing instruments, *e.g.*, a new mutual fund, but some are genuinely novel. Given the granularity of the security types currently inventoried in this controlled vocabulary (375 unique named individuals), it is likely that new financial instruments will emerge that require a new label.

- The coverage of FIGI expands.

Currently FIGI covers over 1.65 million financial instruments. A large number to be sure, but given the granularity of FIGI, *e.g.*, differentiating between AAPL being traded on one exchange as opposed to another, this list is certainly incomplete. Over time, additional financial instruments that simply are not covered at present will be incorporated into FIGI at which point the security type list will need to be expanded.

### 7.3 Pricing Sources

Like Security Types, there is a known set of individuals that can be used to specify the Pricing Source, as defined in PricingSources.rdf. The pricing sources, while not applicable to all financial instruments, specify the organization that has issued the pricing data for a particular Financial Instrument. Frequently, the organization is a financial services organization such as a Bank. As the pricing source is one of the elements that can serve to differentiate one Financial Instrument from another for the purposes of FIGI, it is vital that this information is specified. However, the potential list of pricing sources is subject to grow over time as new organizations enter the business space.

Note, because FIGI also applies to historical data and “retired” financial instruments, there will be no instances where pricing sources specified will drop off of the list.

## 8 FIGI Ontology

### 8.1 Ontology Architecture and Namespaces

The ontology architecture for FIGI is designed to facilitate ontology extension, evolution, mapping, and reuse to the degree possible. It depends on (1) basic terminology and ontology metadata, such as the OMG Architecture Board's Specification Metadata recommendation, and (2) may ultimately be mapped to other ontologies such as parts of the Financial Industry Business Ontology (FIBO). The FIGI specification includes two subordinate vocabularies:

- SecurityTypes.rdf, which contains all of the named individuals for security types as of the date of publication, and
- PricingSources.rdf, which contains all of the named individuals for pricing sources as of the date of publication

The namespaces and their well-known prefixes corresponding to external elements required for use of the FIGI Global Instrument Identifier ontology include all of those listed in Table 8-1, below.

**Table 8-1. Prefix and Namespaces for referenced/external vocabularies**

Namespace Prefix	Namespace
<b>rdf</b>	<a href="http://www.w3.org/1999/02/22-rdf-syntax-ns#">http://www.w3.org/1999/02/22-rdf-syntax-ns#</a>
<b>rdfs</b>	<a href="http://www.w3.org/2000/01/rdf-schema#">http://www.w3.org/2000/01/rdf-schema#</a>
<b>owl</b>	<a href="http://www.w3.org/2002/07/owl#">http://www.w3.org/2002/07/owl#</a>
<b>xsd</b>	<a href="http://www.w3.org/2001/XMLSchema#">http://www.w3.org/2001/XMLSchema#</a>
<b>dct</b>	<a href="http://purl.org/dc/terms/">http://purl.org/dc/terms/</a>
<b>skos</b>	<a href="http://www.w3.org/2004/02/skos/core#">http://www.w3.org/2004/02/skos/core#</a>
<b>sm</b>	<a href="http://www.omg.org/techprocess/ab/SpecificationMetadata/">http://www.omg.org/techprocess/ab/SpecificationMetadata/</a>

The namespace approach taken for FIGI is based on OMG guidelines and is constructed as follows:

- A standard OMG prefix, <http://www.omg.org/spec/>
- The abbreviation for the specification: FIGI
- The ontology or vocabulary name: GlobalInstrumentIdentifiers, SecurityTypes, and PricingSources

Note that the URI/IRI strategy for the ontology and two related vocabularies takes a “slash” rather than “hash” approach, in order to accommodate server-side applications. Though not technically necessary, this specification does mandate namespace prefixes to be used. These are constructed as follows with the components separate by “-”:

- The specification abbreviation: `figi`
- The ontology or vocabulary abbreviation: `gii`, `st`, and `ps`, respectively.

The namespace itself for this specification is:

<http://www.omg.org/spec/FIGI/GlobalInstrumentIdentifiers/>, and corresponding namespace prefix is `figi-gii`. The version IRI for the specification is <http://www.omg.org/spec/FIGI/20140201/GlobalInstrumentIdentifiers/>.

The namespaces for the subordinate vocabularies are:

- <http://www.omg.org/spec/FIGI/SecurityTypes/>
- <http://www.omg.org/spec/FIGI/PricingSources/>

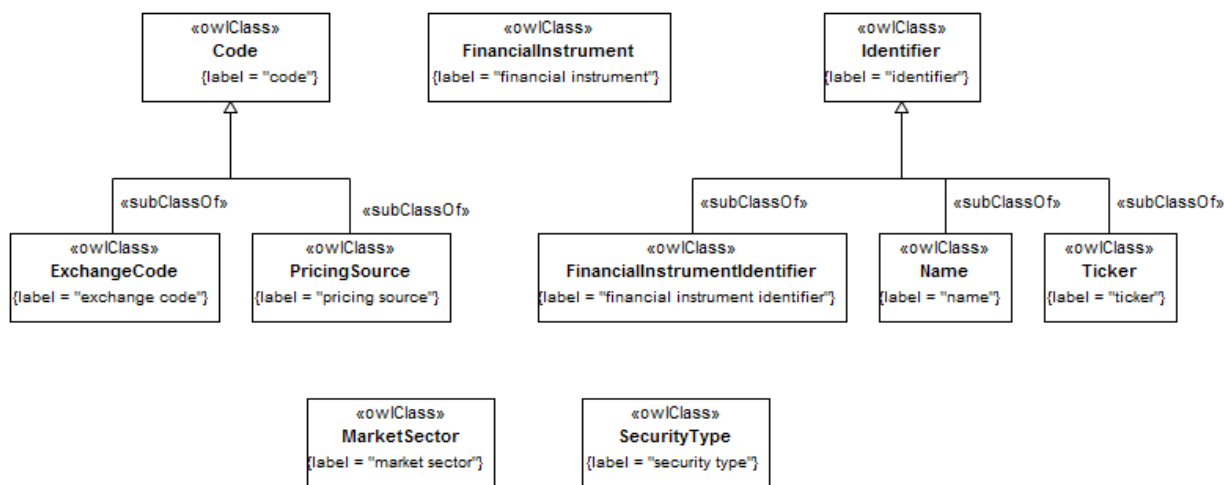
and their corresponding version IRIs are:

- <http://www.omg.org/spec/FIGI/20140201/SecurityTypes/>
- <http://www.omg.org/spec/FIGI/20140201/PricingSources/>

## 8.2 Global Instrument Identifiers Ontology

### 8.2.1 Top-Level Class Hierarchy

In addition to this specification, FIGI is provided as an ODM/OWL 2 compliant ontology with two supporting OWL 2 vocabularies. Below the ontology is presented as a series of UML diagrams (the source for which is included as part of this specification in a separate document). We begin with an overview to illustrate the basic structure:



**Figure 8.1 Top-Level Class Hierarchy**

Each of the classes specified here are direct reflections of the concepts defined in 6.1 and 6.2 with the single exception of Financial Instrument which is defined as follows:

Financial instruments are cash, evidence of an ownership interest in an entity, or a contractual right to receive, or deliver, cash or another financial instrument.

A clarification of this is as follows:

Financial instruments can be categorized by form depending on whether they are cash instruments or derivative instruments:

Cash instruments are financial instruments whose value is determined directly by markets. They can be divided into securities, which are readily transferable, and other cash instruments such as loans and deposits, where both borrower and lender have to agree on a transfer.

Derivative instruments are financial instruments which derive their value from the value and characteristics of one or more underlying assets. They can be divided into exchange-traded derivatives and over-the-counter (OTC) derivatives.

Alternatively, financial instruments can be categorized by "asset class" depending on whether they are equity based (reflecting ownership of the issuing entity) or debt based (reflecting a loan the investor has made to the issuing entity). If it is debt, it can be further categorized into short term (less than one year) or long term.

Foreign Exchange instruments and transactions are neither debt nor equity based and belong in their own category.

The grouping of Financial Instrument Identifier along with Name and Ticker into a broader class named Identifier is a reflection of the fact that all three classes contain as individuals things which serve to identify, perhaps not uniquely in some cases, other things, in this case, financial instruments. The other top level categories are not, strictly speaking identifiers; they refer to things in the world (provided we view 'Exchange Code' as a proxy for 'Exchange').

## 8.2.2 Financial Instruments

As noted in section 6.3 above, Financial Instruments, which are at the heart of this specification, stand in a number of relationships to the other classes and subclasses defined in the model. Figure 8.2 outlines these relationships in detail.

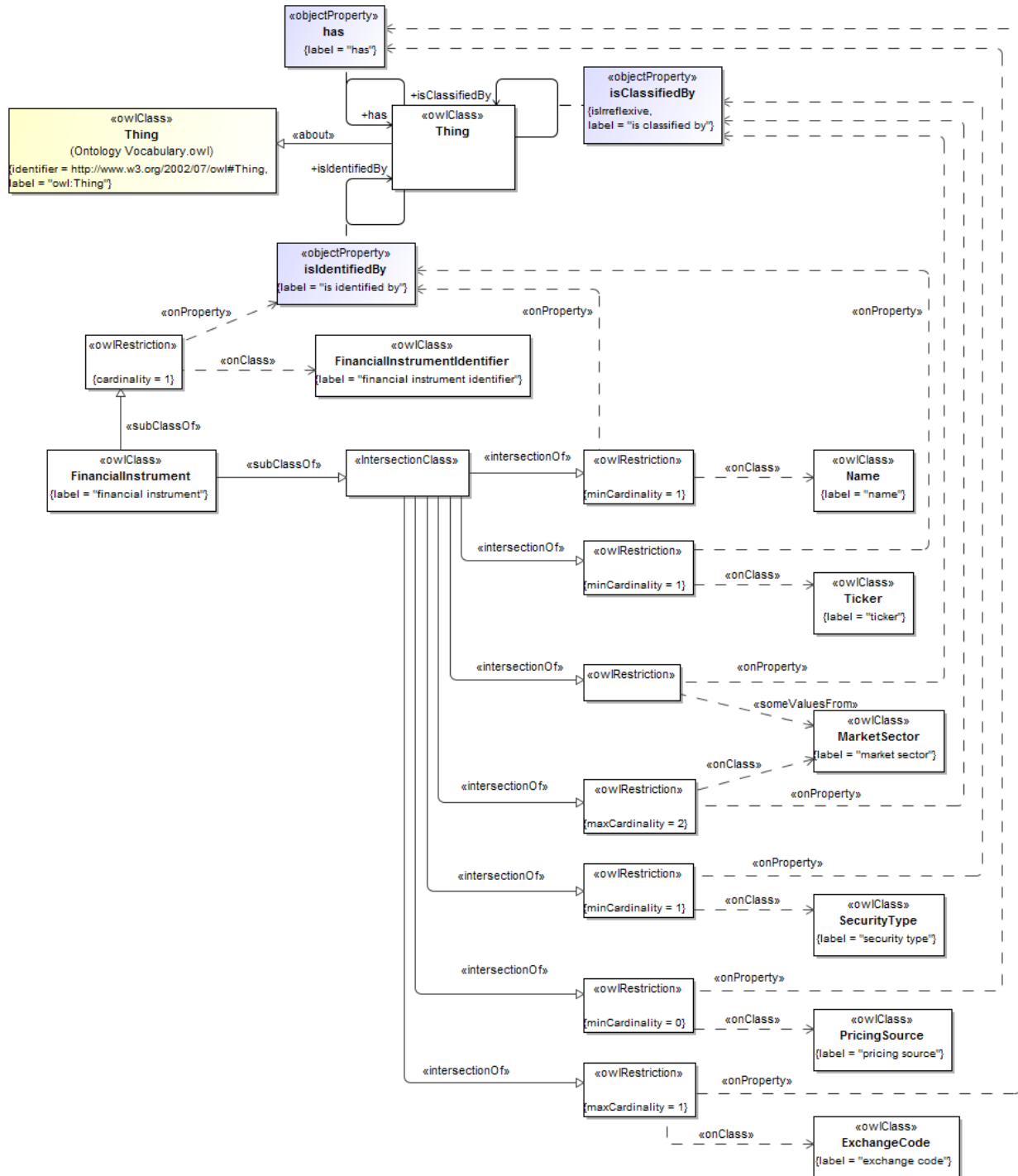


Figure 8.2 Financial Instruments

Of note in the above diagram, we can see that Financial Instruments participate in three types of relationships:

- ‘has’: indicates that someone (or something) possesses something, as a characteristic, attribute, feature, capability, and so forth.
- ‘is classified by’: indicates the category or classifier used to classify an entity, in this case, a financial instrument.
- ‘is identified by’: relates an entity, in this case a financial instrument, to an identifier or key that identifies it (perhaps not uniquely).

The diagram illustrates the following, again as outlined in 6.3.3:

- ‘has’ applies to:
  - financial instrument → exchange code
  - financial instrument → pricing source
- ‘is classified by’ applies to:
  - financial instrument → market sector
  - financial instrument → security type
- ‘is identified by’ applies to:
  - financial instrument → name
  - financial instrument → ticker
  - financial instrument → financial instrument identifier

## 8.2.3 Identifiers

Figure 8.3 specifies the ontological relationships between the three varieties of Financial Instrument Identifiers as well as their relationship to Financial Instruments. In every case, the relationships are as specified in 6.3.1 – 6.3.3.

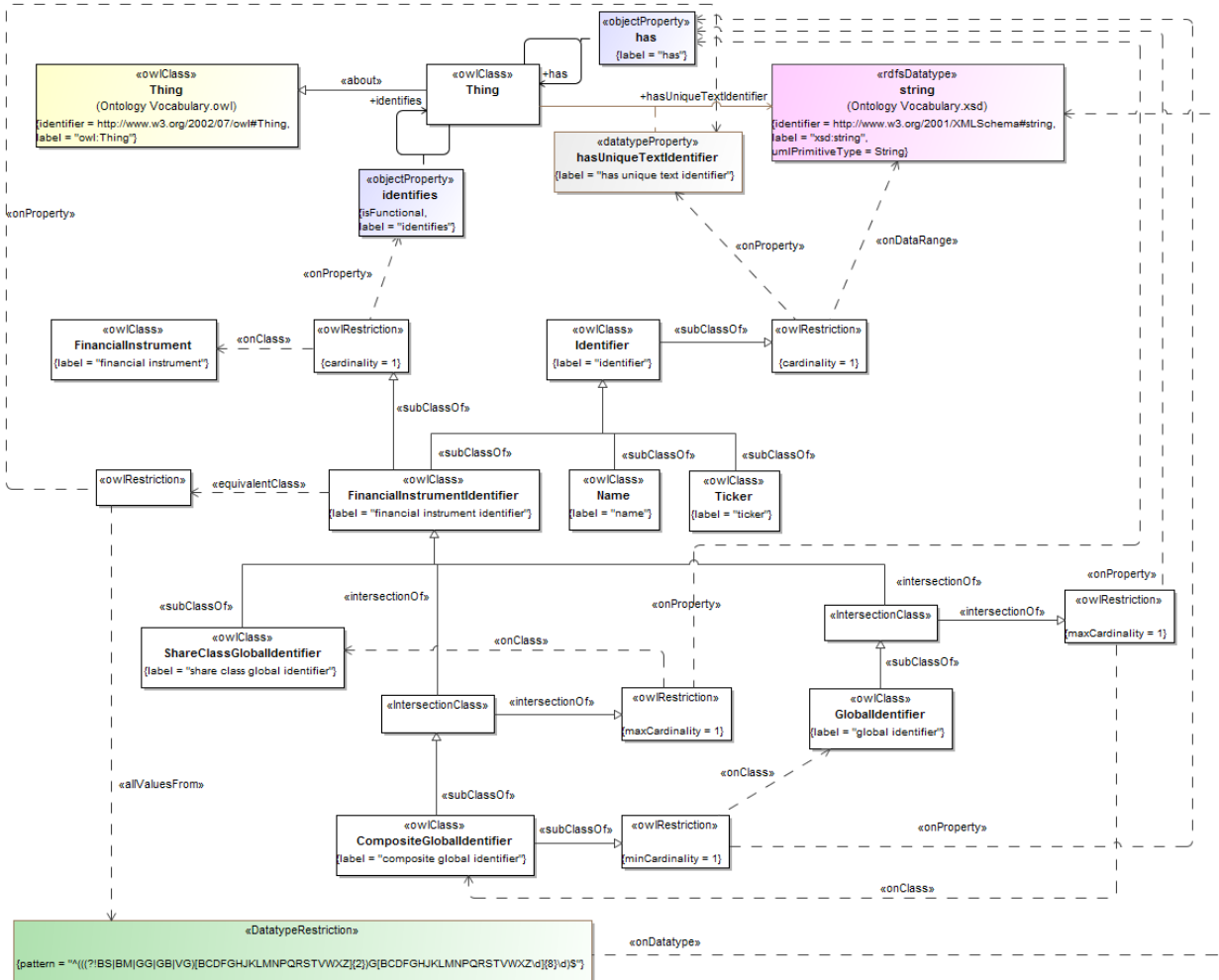


Figure 8.3 Identifiers

Of note in this diagram is the additional DataTypeRestriction placed on the Financial Instrument Identifier, in particular:

```

"^(?!BS|BM|GG|GB|VG)[BCDFGHJKLMNPQRSTVWXYZ]{2}G[BCDFGHJKLMNPQRSTVWXYZ\\d]{8}\\d$"^^string

```

This regex expression is in place to specify the syntactic restrictions on FIGI as specified in section 6.1. The breakdown is as follows:

- `(?!BS|BM|GG|GB|VG)`: the first two characters cannot be any of the following strings:
  - 'BS'
  - 'BM'
  - 'GG'
  - 'GB'
  - 'VG'



- [BCDFGHJKLMNPQRSTVWXYZ]{2}: the above condition not-with-standing, the first two characters can be any combination of upper case consonants.
- G: the third character must be an upper case 'G'.
- [BCDFGHJKLMNPQRSTVWXYZ\\d]{8}: the next eight characters (positions 4 – 11) can be any upper case consonant or any single digit (trivially 0 – 9) numeral.
- \\d: the last character must be a single digit (trivially 0 – 9) numeral.

What is absent from this DataTypeRestriction is the logic which dictates the calculation of the last character. This is specified in 6.2.2 but is not included in the OWL file as the calculation of the check digit would require an algorithm which is beyond the scope of regular expressions, e.g., javascript. At this point OWL 2.0 cannot support such code.

## 8.2.4 Market Sectors

As noted in both 6.3.5 and 8.2.2, Financial Instruments are classified by Market Sector. The subclasses that constitute Market Sector are specified in figure 8.4 below. Owing to the class hierarchy, they each inherit the following rule:

- market sector classifies a financial instrument

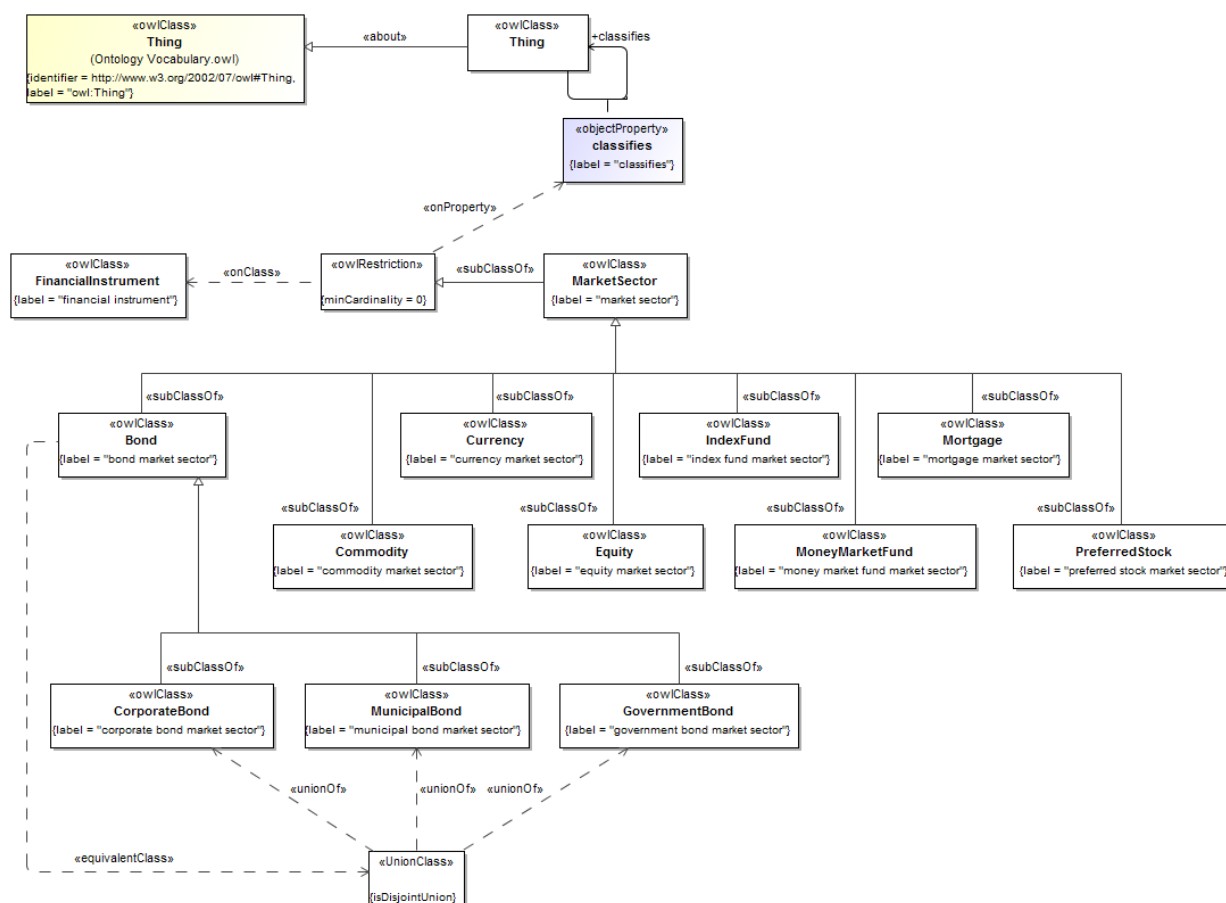


Figure 8.4 Market Sectors

## 8.2.5 Security Types

As discussed in 6.2.6, 6.3.8, and 7.2, Financial Instruments are further classified by specific Security types which function as refinements of Market Sectors through the object property of “isConstituentOf”. Security types and their relationships are specified below in figure 8.5:

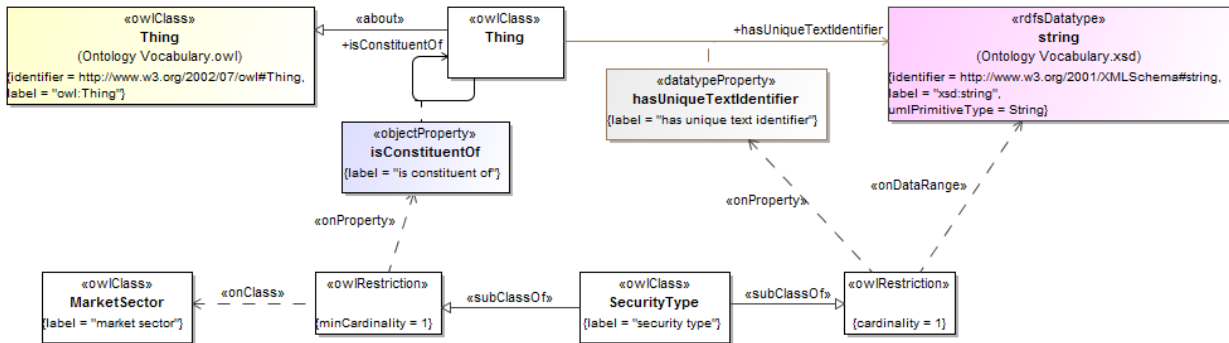


Figure 8.5 Security Types

# Appendix A: Machine Readable Files as Part of This Specification

(Normative)

The machine-readable files associated with this specification include (1) the FIGI GlobalInstrumentIdentifiers ontology, which is provided as an RDF/XML serialized OWL 2 file, as ODM/XMI, and as UML/XMI with the ODM 1.1 stereotypes for RDF and OWL applied, (2) the SecurityTypes vocabulary, provided as an RDF/XML serialized OWL 2 file, and (3) the FIGI PricingSources vocabulary, also provided as an RDF/XML serialized OWL 2 file.

## Appendix B: Shared Semantics Treatments

### (Normative)

The Financial Instrument Global Identifier is, in many ways, a complement to FIBO. The objective of FIBO includes providing a model of financial instruments as part of the model of the financial industry. The Financial Instrument Global Identifier is not, properly speaking, a part of that. The FIGI model does not specify a conceptual model of the financial instruments themselves, after all. Rather, it provides a concrete model for references, both descriptive and technical, for those instruments. FIGI is also designed to be mapped to the relevant aspects of FIBO as the modules describing financial instruments at the conceptual level become available.

Since the scope of the Financial Instrument Global Identifier is exclusively focused on Financial Instruments, the only part of FIBO that needs careful attention is the treatment of Financial Instruments. Based on the latest ontology architecture information available for FIBO, definitions for financial instruments will span multiple specifications, each containing a number of modules and individual ontologies, none of which are available as OMG standards as of this writing. Because of this, the work on the Financial Instrument Global Identifier will continue to evolve over time through the OMG process so as to ensure that the mappings are captured properly on a going forward basis.

## Appendix C: Creation of New Identifiers

There will be two mechanisms by which an organization other than a designated Registration Authority (RA) can initiate the creation of new identifiers. It is recognized that no RA individual can anticipate all possible market needs for identifiers. And while an RA can certainly provide a broad coverage of the market, and Bloomberg, as an initial RA is committed to continuing to do so, there are inevitable market needs that will emerge over time. To this end, in addition to establishing additional RAs, two mechanisms for creation of new identifiers are proposed: 1. Request Service. 2. Certified Provider (CP) status. Each is explicated below.

### C.1 Registration Service

The simplest manner in which a new identifier or a set of new identifiers can be created is through the use of a request service whereby an organization interested in having an identifier or set of identifiers established simply issues a request to the RA which results in the RA creating a new identifier(s).

As has been noted throughout this document, the uniqueness of identifiers is vitally important. This applies not only to the actual twelve-character string used as an identifier, but also to the instrument(s) identified. Simply put, a single financial instrument, appropriately defined, can only have one identifier. So, in order to issue a new identifier, two things must be in place:

1. Uniqueness of the identifier: A mechanism by which it is ensured that the newly assigned twelve-character string(s) is unique.
2. Novelty of the financial instrument: A mechanism by which it is ensured that the financial instrument(s) being identified are not already identified by another twelve-character string.

Meeting condition 1 is trivial: since the RA serves as the system of record for all FIGIs, assigning a novel FIGI is merely a matter of creating a new identifier and checking against the existing inventory to ensure that the identifier is new. Exactly how the RA (or a CP, see below) might elect to do this is left open to the organization in question, provided that uniqueness obtains.

Meeting condition 2 is much more elaborate than was meeting condition 1. The conceptual model of a financial instrument that has been employed in this standard, however, is key to addressing this issue. As explicated in Section 6 of this standard, a financial instrument is identified by multiple things, is classified by multiple things, and is associated with multiple things. It is this collection of relationships that need to be understood so as to ensure that a given financial instrument has not already been assigned an identifier. So, the following data points need to be reviewed so as to ensure that no identifier is currently associated with the exact set of conditions exists:

- Name
- Ticker (if applicable)
- Exchange Code
- Market Sector
- Pricing Source (if applicable)
- Security Type

Owing to the diverse nature of financial instruments, it is expected that additional data points will be required, particularly as the coverage provided by FIGI expands, to provide decisive identification of financial instruments. In any event, once the uniqueness of the financial instrument is established, then condition 1 can be met by issuing a new identifier.

In order to request a new identifier, therefore, it is necessary that the requester provide the data points corresponding the the above six data points (where applicable) so as to identify the financial instrument as well as any additional data points that might be required moving forward. Further, it is incumbent upon the RA to provide a request mechanism that easily

accommodates the multi-faceted requests, both in one-off format and in bulk (perhaps with restrictions on the number per file), in a simple and easy to use manner, e.g., a web site or an ftp drop box.

## **C.2 Certified Provider (CP)**

It is recognized that some organizations may have an interest in the creation of such a volume of identifiers that utilizing a request service as outlined in C.1. is simply insufficient for their needs. This, coupled with the fact that the FIGI standard is an open standard, requires that a set of mechanisms and processes be defined so as to accommodate alternative issuers of identifiers.

The two conditions outlined above, 1. Uniqueness of the identifier and 2. Novelty of the financial instrument are both highly relevant and, as it happens, a bit more complex in the case of a CP. The complexity stems from the fact that there will only be one comprehensive system of record that can serve to ensure that conditions 1 and 2 are met: the inventory maintained by the RA. To address this complexity, the mechanism and processes by which CPs can create identifiers needs to be considered from both the perspective of the potential CP as well as from the perspective of the RA. We begin with the RA.

### **C.2.1. Registration Authority (RA) role**

The RA, as the keeper of the comprehensive inventory of identifiers needs to ensure that both conditions 1 and 2 are met prior to an identifier being issued. When the RA itself is issuing an identifier, this is relatively simple as outlined in C.1.. When an identifier is requested by a CP, however, the situation is different. Regarding condition 1: the uniqueness of the identifier, an allocation system for two letter prefixes as outlined below in Appendix D addresses that easily enough. Regarding condition 2: the uniqueness of the financial instrument requires a bit more effort.

Given the data points associated with a given financial instrument as discussed in C.1., determining if an instrument has already been assigned an identifier within the confines of the RA environment is not overly complex. In the case of a Certified Provider, however, there are two infrastructures at play: the RA infrastructure and the CP infrastructure. So, in order to ensure that condition 2 is met, the RA will need to provide an API that will permit each CP to check their proposed financial instrument against the existing inventory as part of the registration process. As it is possible that two CPs might elect to assign identifiers (trivially different twelve-character strings, see Appendix D) within a small window of time, it is necessary that this check occur at the time of registration, which will be after the time when the CP has assigned an identifier string, as opposed to a preliminary step prior to the assignment of the string. This way, at any given time there will be either zero (0) or one (1) twelve-character string assigned to any given financial instrument with no need to “hold” a spot.

As part of the process whereby this lookup is supported a clearly communicated service level agreement must be established. Exactly what that will be will be determined and communicated prior to the service being set into place and will depend, in part, on the architecture of the service as well as the security infrastructure through which the communications will need to pass.

### **C.2.2. Certified Provider (CP) role**

Like the RA, the CP will be responsible for ensuring that conditions 1 and 2 are met. In this case, however, the CP is not expected to check for conditions 1 and 2 against the entire inventory of financial instruments. Rather, they are only responsible for checking that conditions 1 and 2 are met against their own inventory. Once it is determined that a candidate financial instrument is not already present in the CPs inventory and that the identifier assigned to the instrument is unique within the CPs inventory (again, the uniqueness of identifiers across inventories is assured given the allocation rules specified in Appendix D), the CP issues a call to the API provided by the RA to register the financial instrument and the identifier assigned to it. There are three possible outcomes, all of which will be communicated back to the CP:

1. The registration is accepted and the financial instrument and identifier are inserted into the RAs comprehensive inventory thereby making it/them available for use.
2. The registration is rejected because:

- a. The instrument is already present in the comprehensive inventory, in which case the identifier will be communicated back.
  - b. The data points provided to describe the instrument was incomplete or otherwise non-computable, in which case the offending data elements will be specified in the communication back.
3. Manual review of the request is required owing to some ambiguity or other issue; in which case an estimated time of resolution will be communicated back (within the constraints of an established SLA). This is expected to be a very rare occurrence and is included here for the sake of logical completeness.

In the event that a registration is rejected because the instrument is already present in the comprehensive inventory, it is up to the CP whether they put the identifier string back into their unused inventory or not. Given that each CP will have an initial allotment of roughly 852 Billion identifiers, inventory control is not a high priority.

## Appendix D: Allocation of Identifier Prefixes

The total possible inventory of identifiers is in excess of 600 Trillion. Each two letter prefix can be associated with over 852 Billion identifiers given the logic by which the identifiers are governed. While these numbers are sufficient to give us comfort from a statistical perspective that duplicate identifiers will not be generated, a mechanism by which specific two character prefixes are allocated and managed is necessary to ensure that duplication does not occur across different providers. To this end, the following logic will be employed:

Given that all grandfathered identifiers (those specified prior to the adoption of this standard) have been generated by a single organization and all begin with the “BB” as the first two letters:

- Bloomberg, as the Registration Authority (RA), will continue to issue identifiers using the “BB” prefix until such time as the possible combinations are exhausted or are nearing exhaustion (threshold: 500 Million remaining identifiers) at which point Bloomberg will select another two letter prefix following the same process as other organizations.
- Other organizations that elect to create identifiers will have the opportunity to select a two letter prefix from the unused inventory of two letter prefixes. In order to secure a particular two letter prefix, the following conditions must be met:
  - The organization must demonstrate that they either currently have the capacity to deliver identifiers in accordance with the requirements specified concerning issuing authorities or have in place a funded project by which they will have the capacity to deliver identifiers in accordance with the requirements specified concerning issuing authorities within 18 months of approval.
  - The application for a new two letter prefix is presented in writing to both the relevant part of the OMG as well as the RA at least six (6) months prior to the anticipated approval date.
- If an issuing organization that has secured an identifier does not issue at least one identifier within six months of establishing the operational ability to create identifiers, the two letter prefix will be returned to the open inventory not withstanding any other written agreements between the issuing organization, OMG, and the RA to the contrary.

Once a two letter prefix is established and in use by a particular issuer, the issuer is restricted to issuing identifiers using only that prefix until such as time as all of the possible combinations are exhausted or are nearing exhaustion (threshold: 500 Million remaining identifiers) at which point they will select another two letter prefix following the same process as outlined above.



