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FRE-GY 7831 Topics in Financial & Risk Engineering Financial Analysis & Big Data

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Market Data Explained

- Working with global capital markets can be bewildering experience. One of the bigger challenges analysts and other professionals encounter over the course of their career is:
 - The volume of traded securities
 - Complexity of the content (over 500 statistical facts at least)
- 3 characteristics of market data: *Entities*, *Attributes* and *Relationships*.

Thomson ONE | Market Views | **Company Views** | Screening & Analysis | Tools & Tips

Overviews | News & Corporate Events | Corporate Governance | Price Chart | Fundamentals | Estimates | Debt Overview | Deals | Share Ownership | Research | Filings | Officers & Directors

Symbol/Name: **TWTR-US** | Market: **ALL COUNTRIES**

Company Overview

Company Overview | TWITTER, INC. (New York:TWTR)

Public Profile | Private Profile

Suite 900 1355 Market Street, SAN FRANCISCO, California - CA 94103, UNITED STATES
+1 415 222-9670 | <http://twitter.com>

Sector (ICB): Software & Computer Services
Subsector (ICB): Internet

CUSIP: 90184L102
SEDOL: BFLR866

SIC Code: 7375
Auditor: PricewaterhouseCoopers LLP

Employees: 3,638
Fiscal Year End: 12/31/14

Financial Summary

	Last Twelve Months as of 12/31/14	12/31/14 (A)	12/31/15 (E)	12/31/16 (E)
Sales (MM)	1,403	1,403	2,378	3,622
Growth	111.0	111.0	69.5	52.4
Gross Profit (MM)	957	957	-	-
Margin	68.2	68.2	73.3	74.9
EBITDA (MM)	(336)	(336)	586	1,042
Margin	(24.0)	(24.0)	24.6	28.8
EBIT (MM)	(544)	(544)	309	679
Margin	(38.8)	(38.8)	13.0	18.7
Net Income (MM)	(578)	(578)	258	583
Margin	(41.2)	(41.2)	10.9	16.1
EPS	(0.96)	(0.96)	0.38	0.81
Growth	(72.0)	(72.0)	(139.7)	113.3
Free Cash Flow	82	82	-	-

Currency: USD | Source: Worldscope, IBES

Market Data

Price (04/02/15 04:00:00 PM*)	50.42	Change	▼ -0.05 (-0.10%)
Volume	13,423,909	52 Wk Range	55.99- 29.51
Consolidated Market Cap**	32.664 (MM)	Dividend Yield	0.00%

Business Description

Twitter, Inc. (Twitter) is a global platform for public self-expression and conversation in real time. It is a real-time platform, where any user can create a Tweet and any user can follow other users. Viewers can see photos, videos and conversations directly in Tweets to get the whole story at a glance, and all in one place. It offers Twitter apps for phones, tablets and computers. It generates its advertising revenue primarily from the sale of its three Promoted Products: Promoted Tweets, Promoted Accounts and Promoted Trends. Its users include millions of people from around the world, as well as influential individuals and organizations, such as government officials, celebrities, athletes, journalists, sports teams, media outlets and brands. In April 2014, it acquired Gnip Inc. In June 2014, Twitter Inc acquired Namo Media Inc. Effective August 1, 2014, Twitter Inc acquired Lectorius Inc. In August 2014, New York REIT Inc. announced the acquisition of Twitter's headquarters.

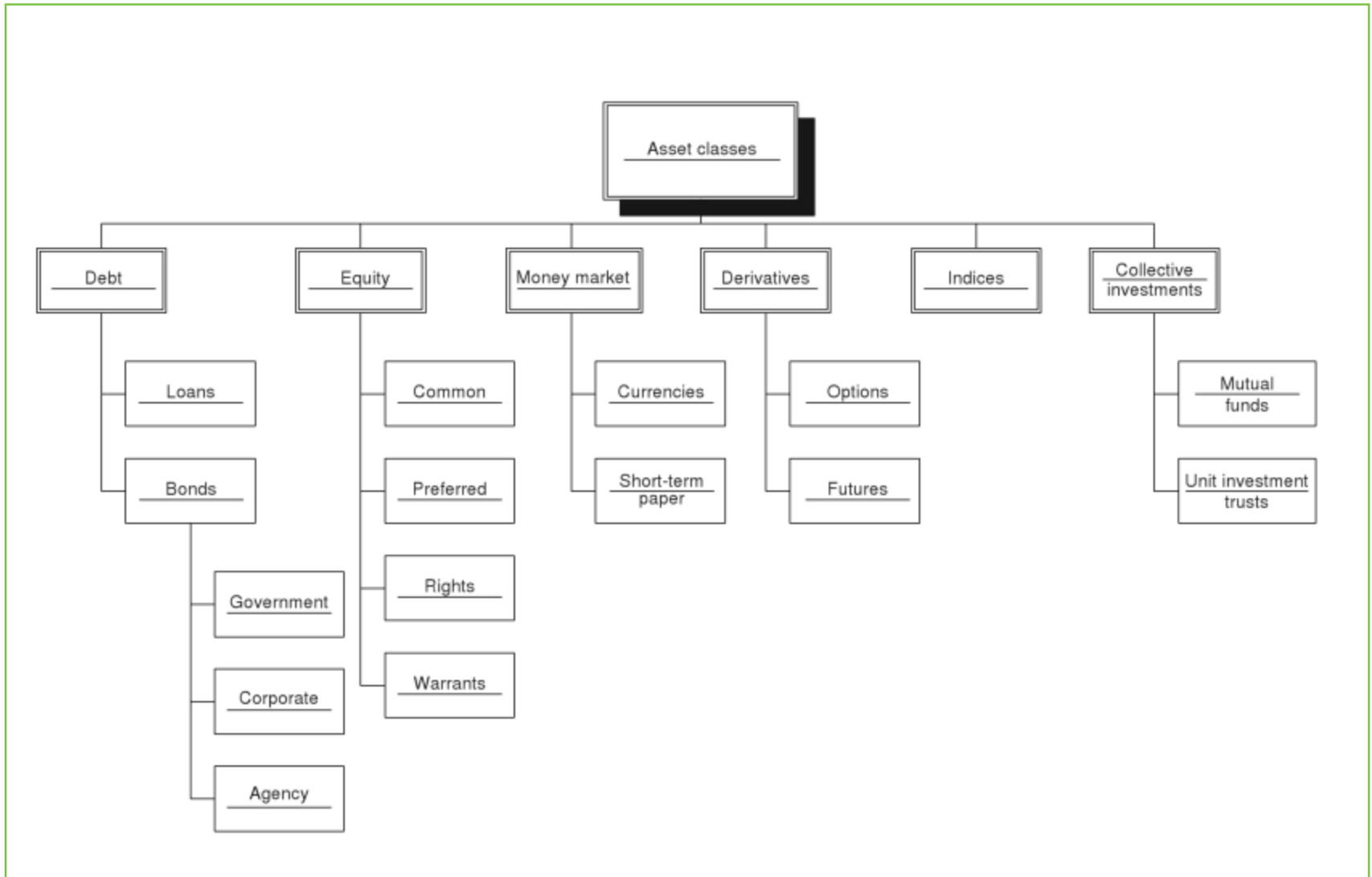
Company Links

[Home Page](#)

Key Ratios

	Last Twelve Months as of 12/31/14*	12/31/14 (A)	12/31/15 (E)	12/31/16 (E)
Enterprise Value/Sales	21.8	15.0	12.9	8.5
Enterprise Value/EBITDA	NEG	NEG	52.3	29.4
Enterprise Value/EBIT	NEG	NEG	99.3	45.1
Total Debt/Enterprise Value	0.1	0.1	-	-
Total Debt/EBITDA	NEG	NEG	2.7	1.5
EBITDA/Interest Expense	(9.9)	(9.9)	17.2	30.7
EBITDA-Capital Expenditures/Interest Expense	(15.8)	(15.8)	11.3	24.7
EBIT/Interest Expense	(16.0)	(16.0)	9.1	20.0

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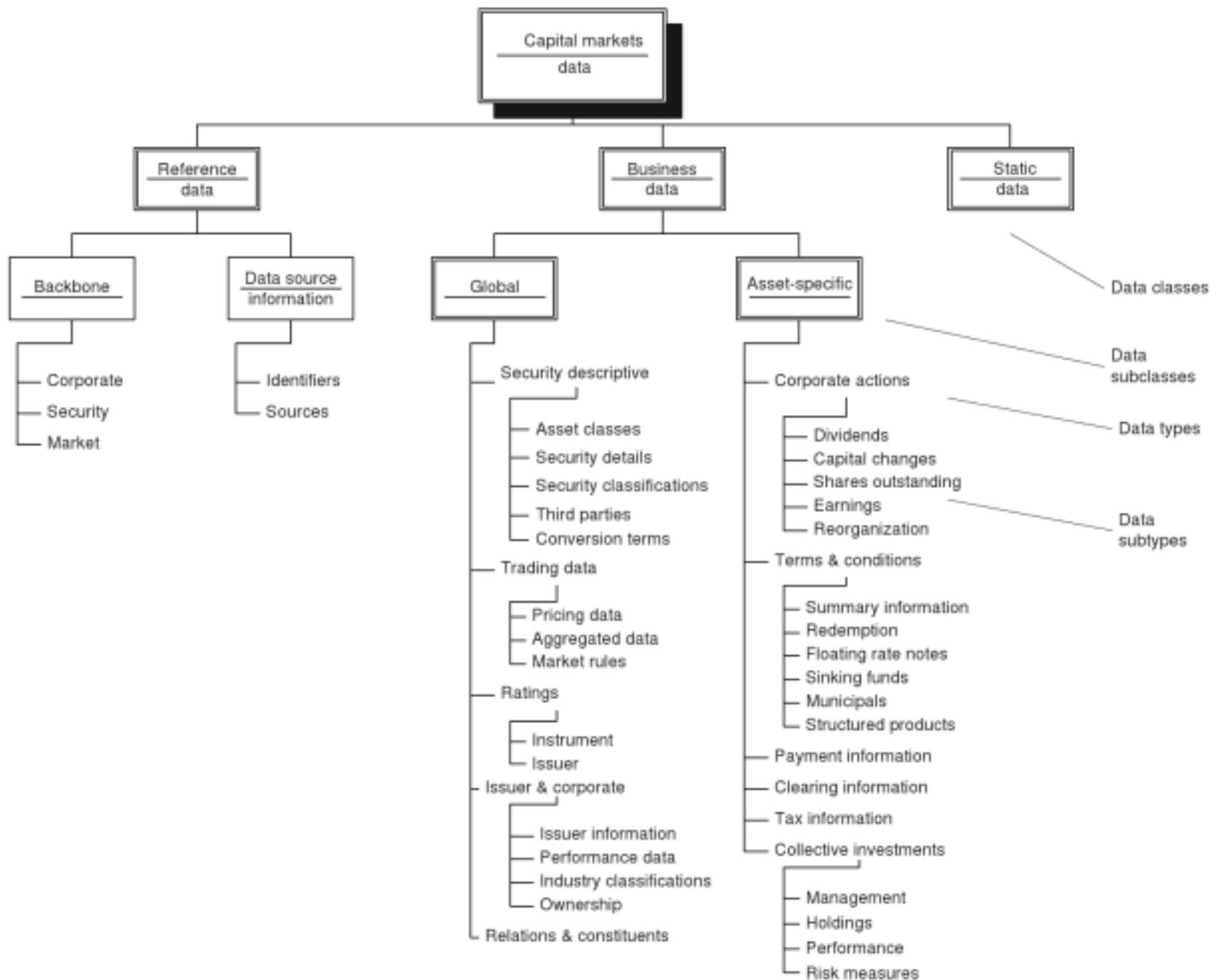


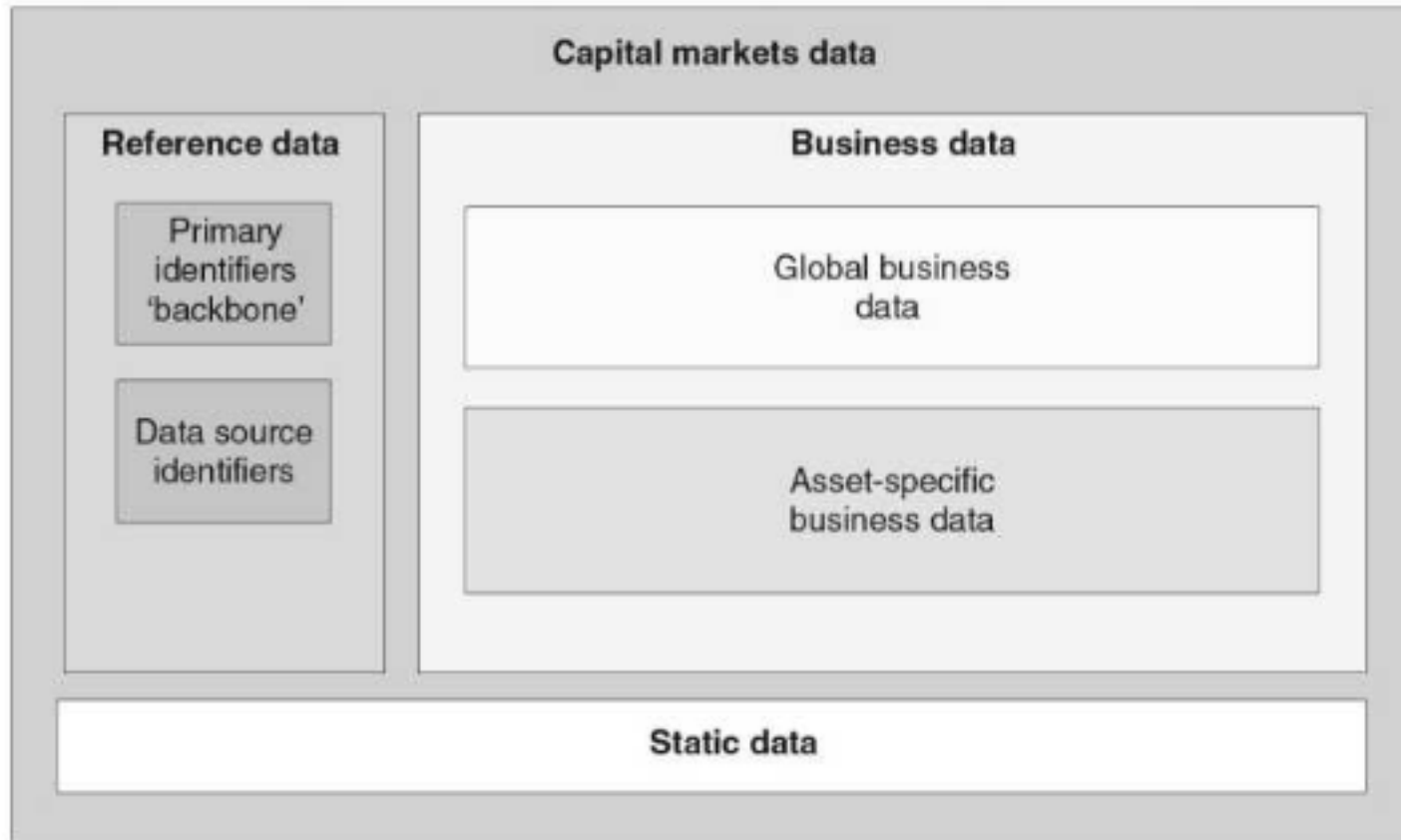
- Data types – information associated with individual financial instruments classified into logical groups or categories. These provide a shorthand manner in which to refer to a series of attributes sharing a common business relevance (also referred to as domains).
 - There are three fundamental data types, each of which is made up of one or more data subtypes.

- Reference data: defined as information that described each corporate organization, the securities it issues and the markets on which the securities are quoted and traded. Reference data has two main components:
 - Identifiers.
 - Basic descriptive information.

- Business data:
 - Global business data types, comprising
 - Security descriptive data
 - Market data
 - Issue & Corporate data
 - Asset-specific business data types, comprising
 - Corporate actions
 - Terms and conditions
 - Relations/constituents
 - Payment information
 - Clearing information
 - Tax information

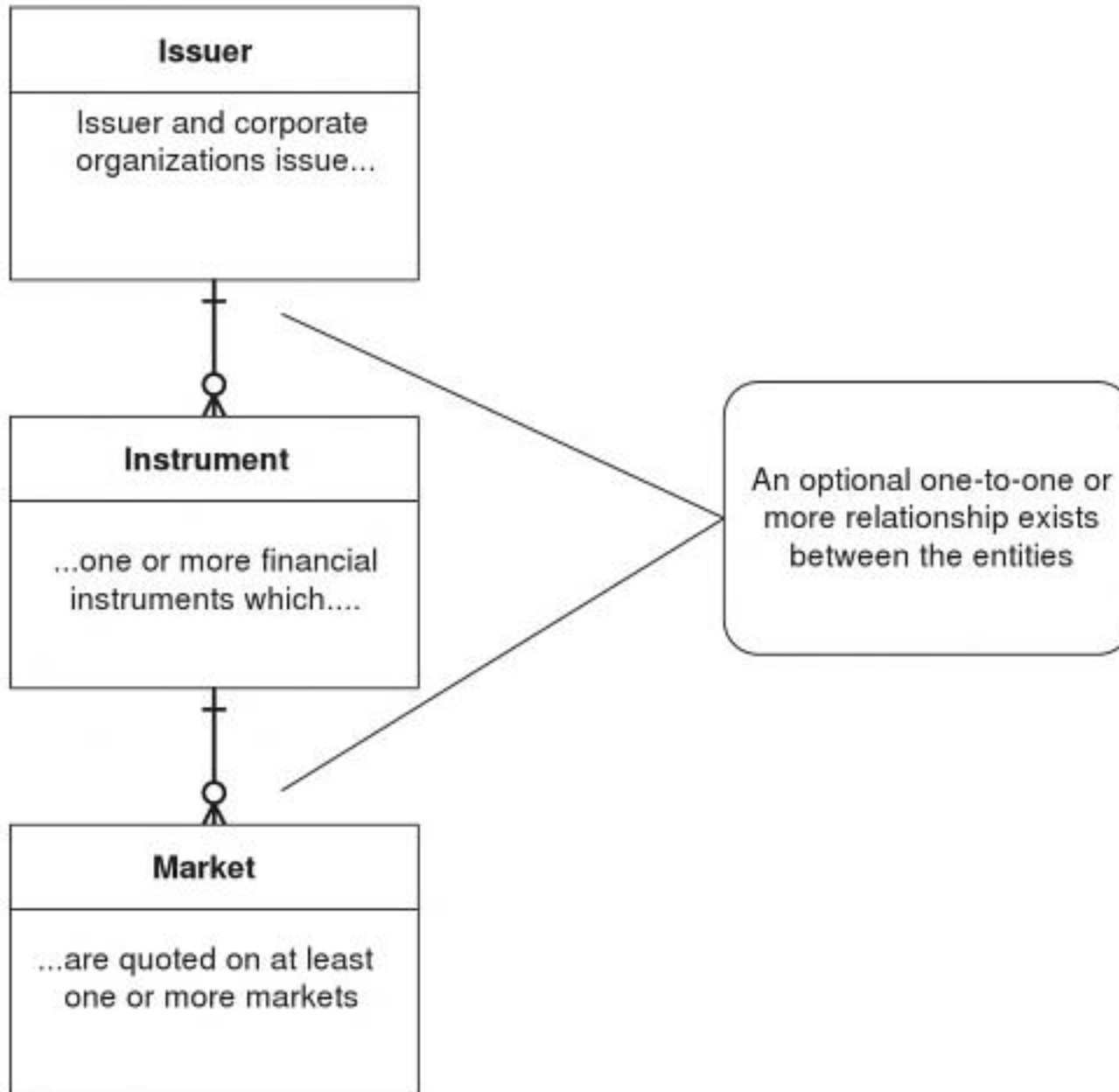
- Static data: also referred to in the industry as “domain tables” and “list of values”, amongst other terms. Static data provides a means for cross-referencing numeric and other coded values to a meaningful definition.





Reference data logic

- Corporate organizations issue one or more securities of various types that are quotes on one or more market (such as stock exchanges) by one or more market participants.
 - Example1: NYSE:IBM & NASDAQ:IBM
 - IBM is listed on the NYSE. However, IBM can trade on the NYSE, the Nasdaq, and various electronic exchanges, such as Direct Edge or BATS or various other platforms.
 - NYSE:SU & TSX:SU
 - Suncor (SU) is an actual dual listing in two different countries. Suncor is listed in Toronto. Given the large amount of American money invested in Canadian energy, it probably made sense to list a sponsored ADR (*American Depositary Receipt*). Sponsored just means the company chose to have its stock trade in the US as an ADR; the stock in the US and Canada are equivalent in terms of rights; the only difference is the currency the stock trades in.



Reference data components

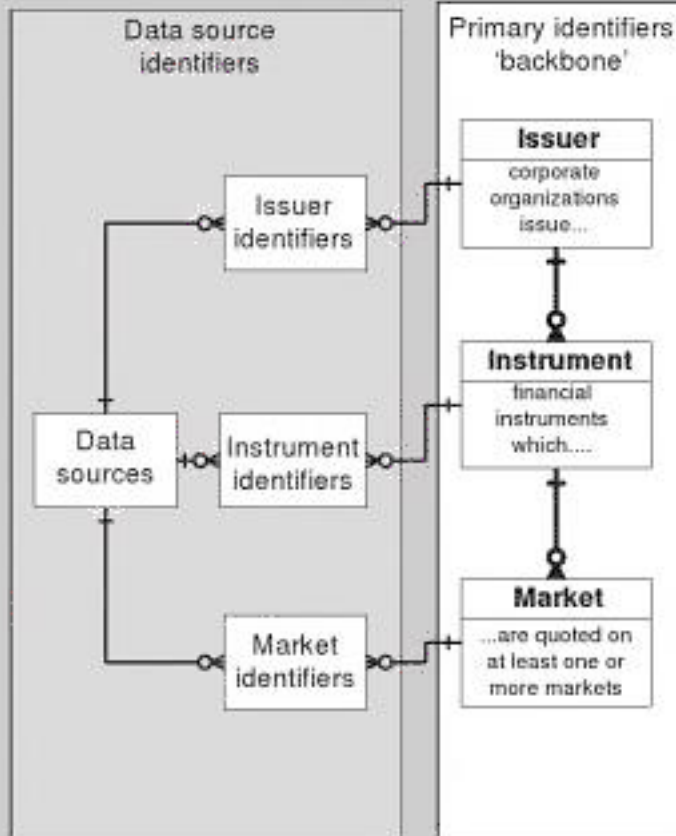
- Reference data is defined as the set of attributes that perform two very specific functions:
 - They provide unique identification (at the issuer, instrument and market levels).
 - They provide basic descriptive information that fully defines the individual data items identified by the unique identification.
- Reference data class can be broken into 2 subclasses:
 - Primary keys – usefully thought of as a backbone, this subclass contains a universe of identifiers that is independent from any one coding standard.
 - Data source identifiers – the universe of coding schemes and other forms of identification cross-reference to the primary keys.

Framework Backbone

- Issuer identifier
- Instrument identifier
- Market identifier

Capital markets data

Reference data



Business data

Global business data

Asset-specific business data

Static data

Instrument identifiers

Code type	Associated geography	Comments
CUSIP	United states and North America	Widely used, issued and managed by Standard & Poor's on behalf of the American Banker's Association
Common	Europe	
ISIN	International	
Valoren	Switzerland, Europe	Issued and managed by Telekurs SA; both domestic values and international values are issued
Wert	Germany, Europe	Official clearing code for Germany
SICOVAM	France, Europe	
Euroclear	Europe	
Various	Australia, Austria, Belgium, Brazil, Denmark, Hong Kong, Italy, Luxembourg, Malaysia, Netherlands, Norway, Spain, Sweden	Independently issued and managed coding schemes issued by official national numbering agencies

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Reference Data		
	Symbol	CUSIP
Class A	GOOGL	<u>38259P508</u>
Class C	GOOG	<u>38259P706</u>

Issuer

Market identifiers

- Ticker symbols – alphanumeric symbols issued and managed by exchanges.
- QUICK codes – used in Japan
- SEDOL codes – issued by the London Stock Exchange.
- RIC – Reuters Instrument Code.

Issue identifiers

- DUNS number – issued by Dunn & Bradstreet, this identifies registered corporations globally and is pretty much the closest to an accepted global standard.
- Bloomberg Company identifier
- CUSIP6 – the first six characters of the CUSIP symbol identify issuers.
- Reuters Organization identifier



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TWITTER, INC.



Print



Export Company



Export Family Tree

Company Details

Company Details

Executive Details

Industry Details

Family Tree

D-U-N-S@ Number:

00-467-9305

Company Name:

TWITTER, INC.

Street Address:

1355 MARKET ST STE 900
SAN FRANCISCO
CA
USA - 94103-1337
[View Google Map](#)
[View MapQuest](#)

County:

SAN FRANCISCO

MSA :

San Francisco, CA

Country Phone Code:

0001

Phone:

(415) 222-9670

Location Type:

Head Quarters

Subsidiary Status:

Non-Subsidiary

Years Established:

2006

Ownership:

Public



NEW YORK UNIVERSITY

NYU·poly

POLYTECHNIC INSTITUTE OF NEW YORK UNIVERSITY

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- Business Data
 - Where reference data has a very specific definition and scope, business data refers to a much broader universe of context. So the business data class contains the largest number of logical attributes.
 - The two large classes of business data are:
 - Global business data
 - Asset-specific business data

Global Business Data

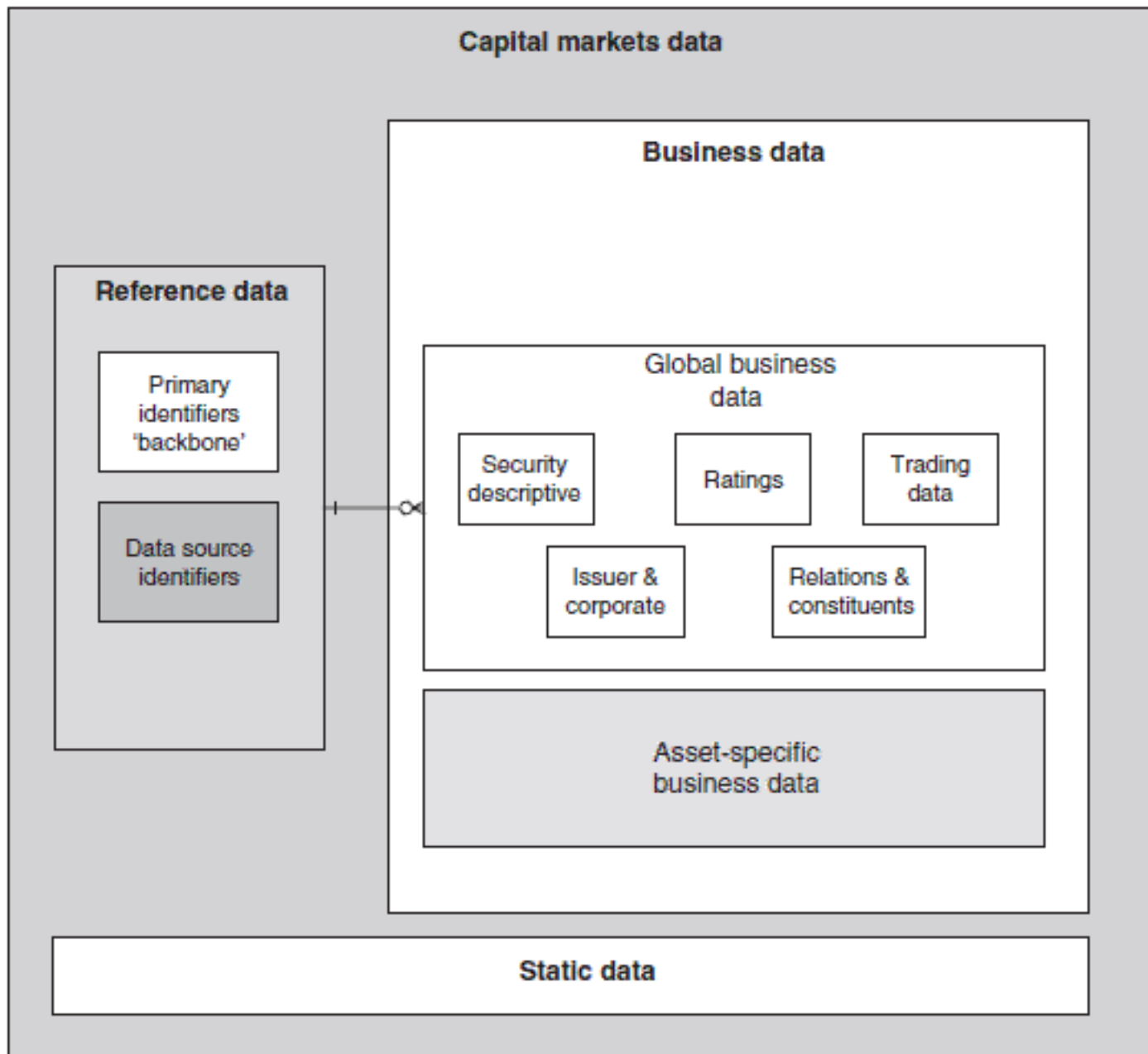
- ***Security descriptive data*** – the information that provides detailed definition and description of a particular instrument.
- ***Trading data*** – information (predominantly pricing) generated by global capital markets on a daily and intraday basis related to the exchange of financial instruments between counterparties.
- ***Ratings*** – evaluation of financial instruments and their issuers by recognized ratings agencies.
- ***Issuer & corporate information*** – information that describes the corporate entity and its business performance.
- ***Relations & constituents*** – detailed information on the constituents of securities made up of or related to one or more underlying securities and ownership interests.

Asset-specific business data

- **Corporate actions** – announcements and other business events that materially affect the structure and/or value of a security.
- **Terms & conditions** – these provide the details on the legal structure of financial securities and the conditions and schedule under which they may be exercised.
- **Payment information** – many securities and bonds in particular, include guaranteed cash flows to holders made in a wide variety of manners.
- **Collective investment details** – related to funds asset class.
- **Clearing information** – closely related to the trading global data type. This subtype records information to the post-trade processing of transactions, ensuring that buy and sell orders are matched and confirmed.
- **Tax information** – this subtype records the tax information that is related to the sale of securities.

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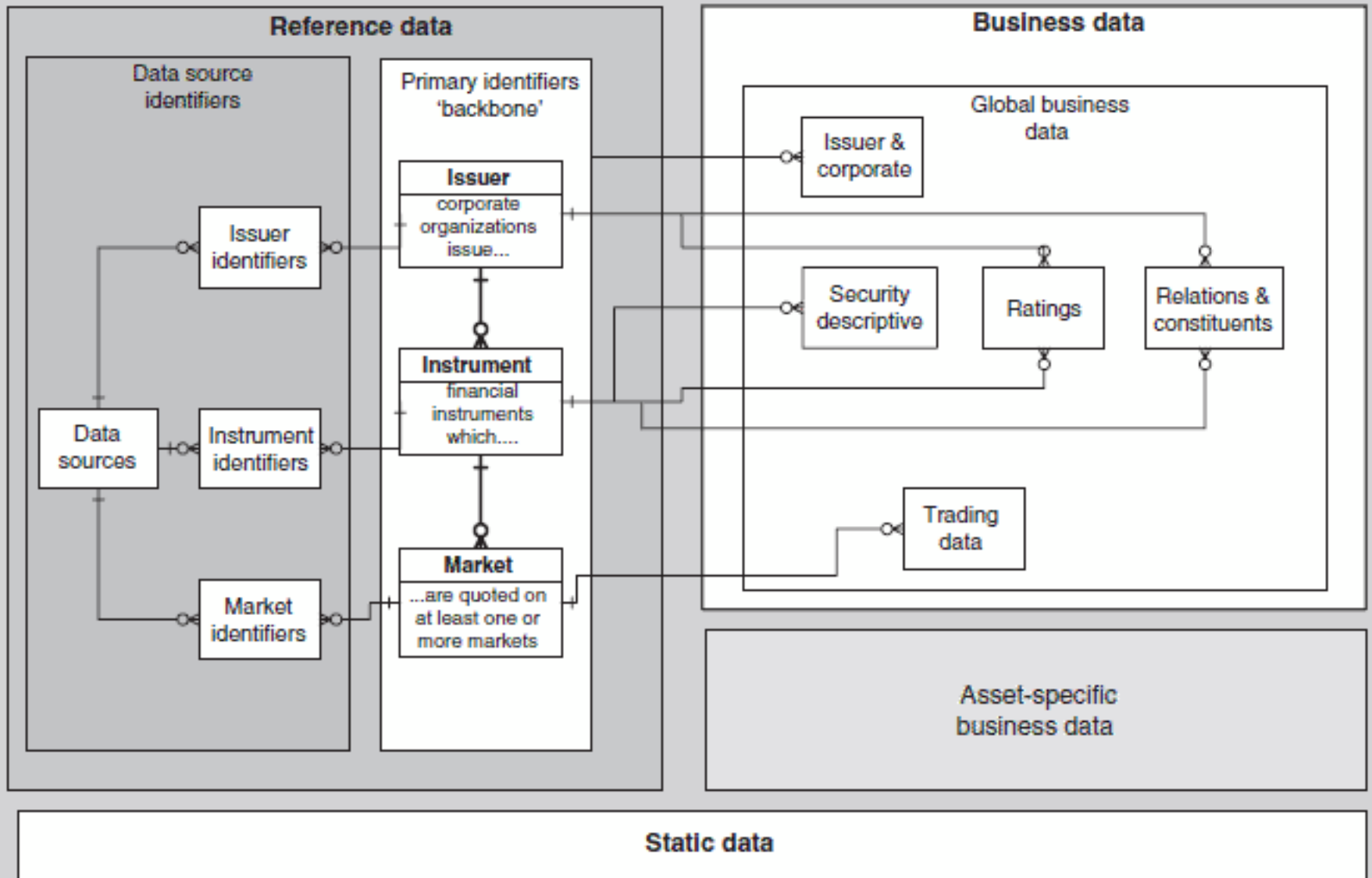
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Capital markets data



- **Security Descriptive Data**
 - Security details
 - Asset class data
 - Debt
 - Equity
 - Money Market
 - Derivatives
 - Indices
 - Collective investments
 - Security features
 - Security classification schemes
 - Third parties
 - Conversion terms

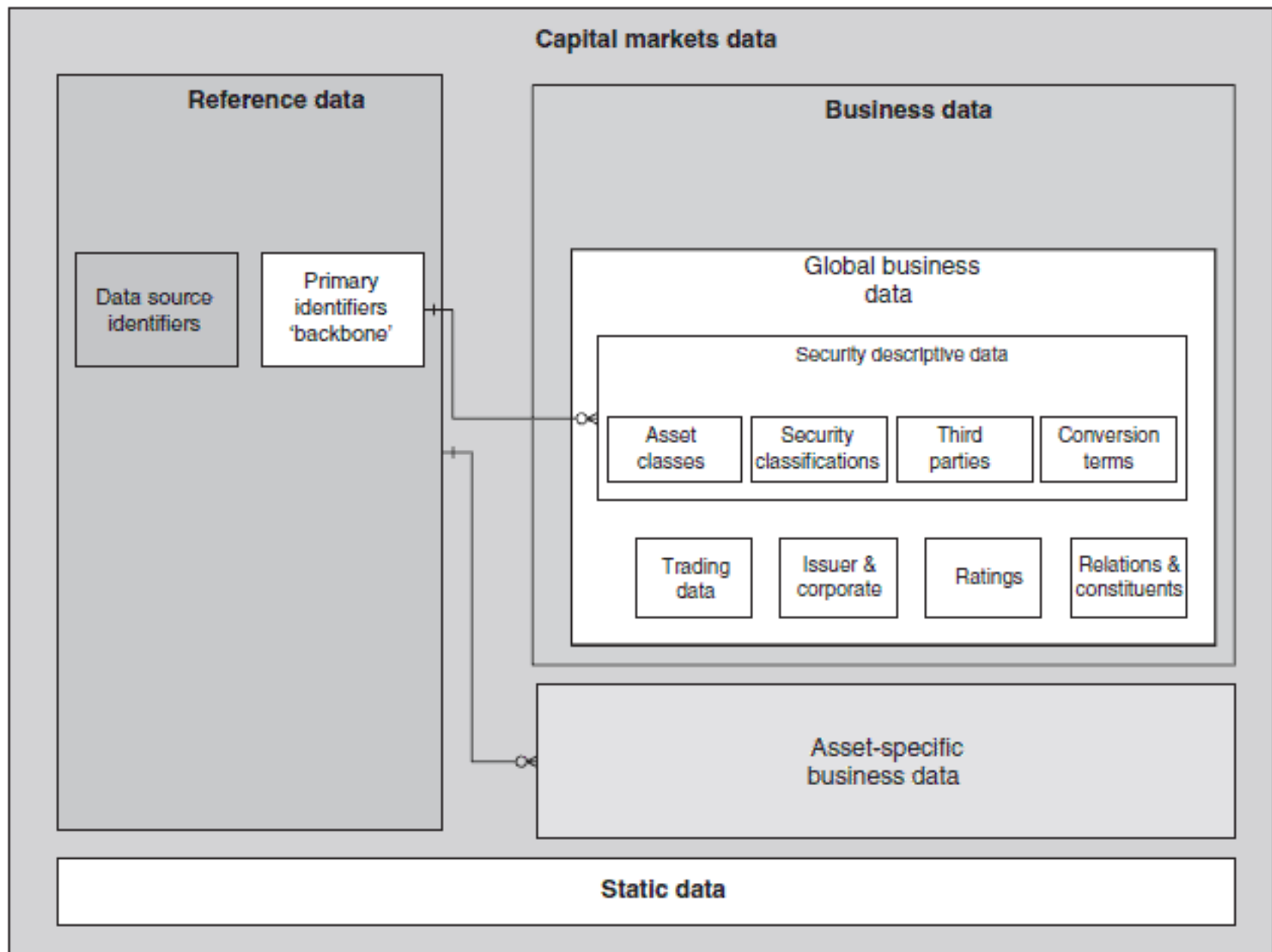
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Asset classes	Asset subclasses	Attributes
Equities	Common stock Preferred stock Rights Warrants	<ul style="list-style-type: none"> • Reference data • Multiple identifier types • Security descriptive data • Pricing and derived data • Corporate actions • Issuer data
Debt/fixed income	Corporate Government Agency Municipal Structured products Floating rate notes	<ul style="list-style-type: none"> • Reference data • Multiple identifier types • Security descriptive data • Pricing and derived data • Terms and conditions • Issuer data
Derivatives	Options Futures	<ul style="list-style-type: none"> • Reference data • Descriptive data • Pricing and derived data • Underlying instruments/constituents • Corporate actions
Money market	Foreign exchange, spot Foreign exchange, forwards Deposits Interbank rates Commercial paper Bankers acceptances Swaps	<ul style="list-style-type: none"> • Reference data • Pricing and derived data such as yields • Underlying benchmarks
Collective investments/funds	Mutual funds Unit investment trusts Money market funds Exchange traded funds	<ul style="list-style-type: none"> • Reference data • Pricing and related derived data • Collective investment details • Constituents and weightings • Corporate actions
Indices	Exchanges Agencies Bonds Geographic markets	<ul style="list-style-type: none"> • Reference data • Multiple identifier types • Pricing and related derived data • Constituents and weightings

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Third-party information

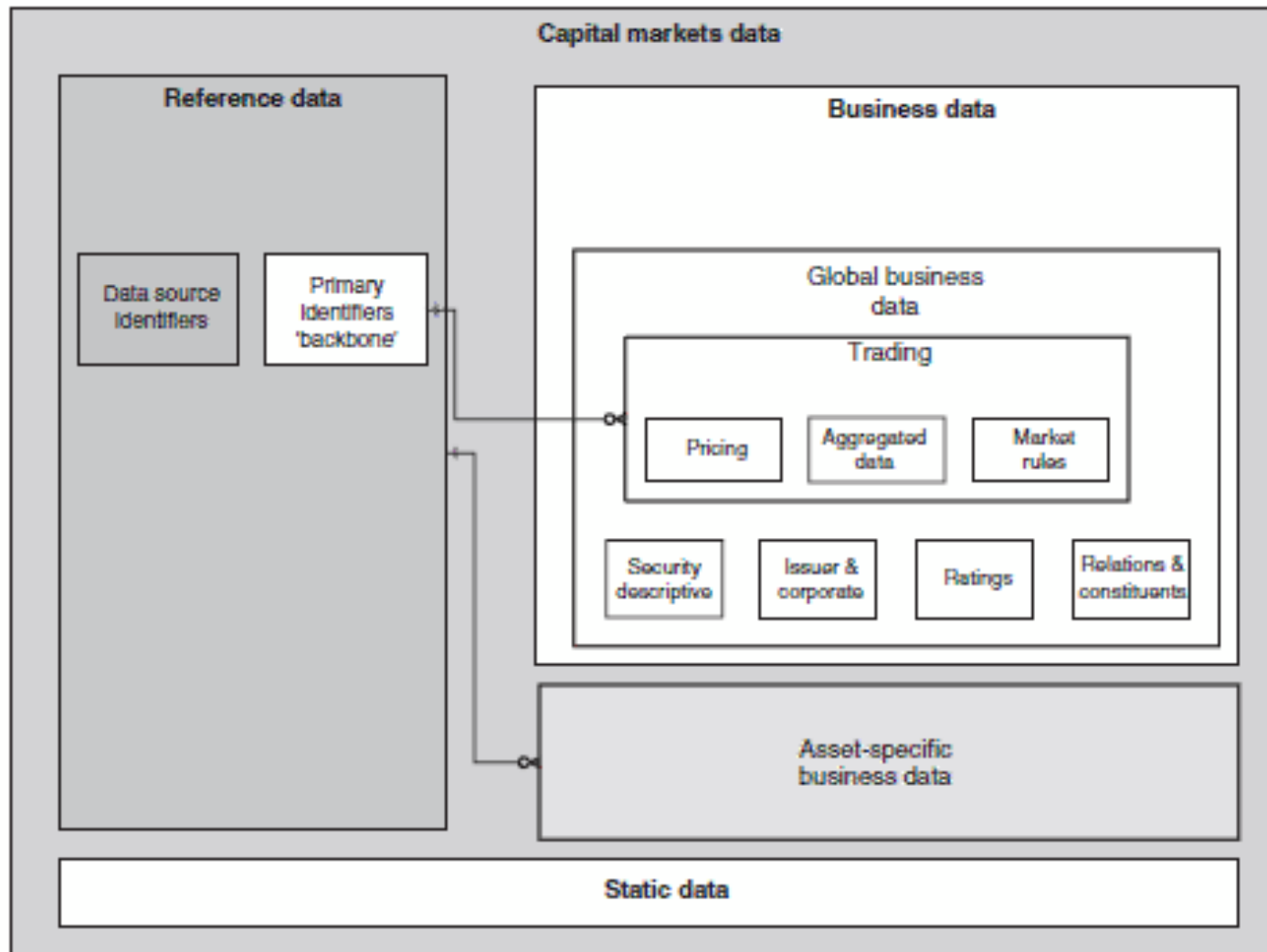
- Lead manager/underwriter
- Co-manager
- Trustee
- Counsel
- Paying agent
- Re-marketing agent
- Tender agent
- Transfer agent
- Registrar
- Escrow agent
- Financial advisor
- Clearing agent
- Information agent

Conversion terms

- **Three principal concepts**
 - Conversion terms – providing details related to the terms under which the conversion can be exercised.
 - Conversion events – providing a historical record of when conversions occur, as well as recording the schedule on when they may take place in future.
 - Conversion details – additional information (typically in free-form text) associated with a particular event.

Trading Data

- **Pricing data** – attributes that indicate the economic value placed on an individual security by participants in the market. It has two subtypes:
 - **End of day** – pricing values recorded at the end of day to provide a benchmark for a variety of functions.
 - **Time and sales** – time-indexed records of pricing values and counterparties recorded over the course of the trading day.
- **Time and sales data** – at the most specific level are details related to each individual trade, recording the time of the transaction and the details related to the sale (block size, execution price, bid and ask prices at time of execution, etc.)
- **Aggregated data** – much data is aggregated and calculated across the market. Examples includes indices, total volume, number of advancers and decliners.
- **Market rules** – information that described the manner in which the market operates and the conventions that are followed.



End-of-day pricing

- **Trade facts** – the universe of statistical facts that are used to communicate the value of the security, such as open price, high price, low price, bid price, ask price, last price, close price and volume.
- **Trade value** – the actual observed value for the associated trade fact.
- **Date** - all pricing data is date-relevant
- **Time** - the time of date at which a trade value was produced.
- **Frequency** - the periodicity on which the trade values are collected, such as tick-by-tick, daily, weekly, monthly, quarterly and yearly.
- **Price type** - the convention, if any, under which the price is quoted, such as
 - nominal quote, **not committed**
 - Quoted with interest **committed NYSE**

Reference Data			Business Data									
			Valuation Measures									
	Symbol	CUSIP	Market Cap (intraday)	Enterprise Value	Trailing P/E	Forward P/E	PEG Ratio	Price/Sales	Price/Book	Enterprise Value/Revenue	Enterprise Value/EBITDA	
Class A	GOOGL	38259P508	373.95B	322.83B	28.99	18.07	1.24	5.51	3.79	4.75	16.17	
Class C	GOOG	38259P706	366.69B	316.28B	28.45	18.44	1.35	5.41	3.72	4.66	15.85	
			Stock Price History									
	Symbol	CUSIP	Beta	52-Week Change	52-Week High	52-Week Low	50-Day Moving Average	200-Day Moving Average				
Class A	GOOGL	38259P508	0.77	8.49%	615.05	503	566.61	569.99				
Class C	GOOG	38259P706	1.17	N/A	604.83	502.8	556.3	560.55				
			Share Statistics									
	Symbol	CUSIP	Avg Vol (3 month)	Avg Vol (10 day)	Shares Outstanding	Float	% Held by Insiders	% Held by Institutions	Shares Short (as of 10/15/14)	Short Ratio (as of 10/15/14)	Short % of Float (as of 10/15/14)	Shares Short (prior month)
Class A	GOOGL	38259P508	1,838,580	1,745,860	678.36M	572.24M	0.23%	83.80%	2.68M	1.4	0.50%	2.54M
Class C	GOOG	38259P706	1,734,660	1,561,090	678.36M	572.24M	0.19%	31.90%	2.11M	1.1	N/A	2.00M

Aggregated data

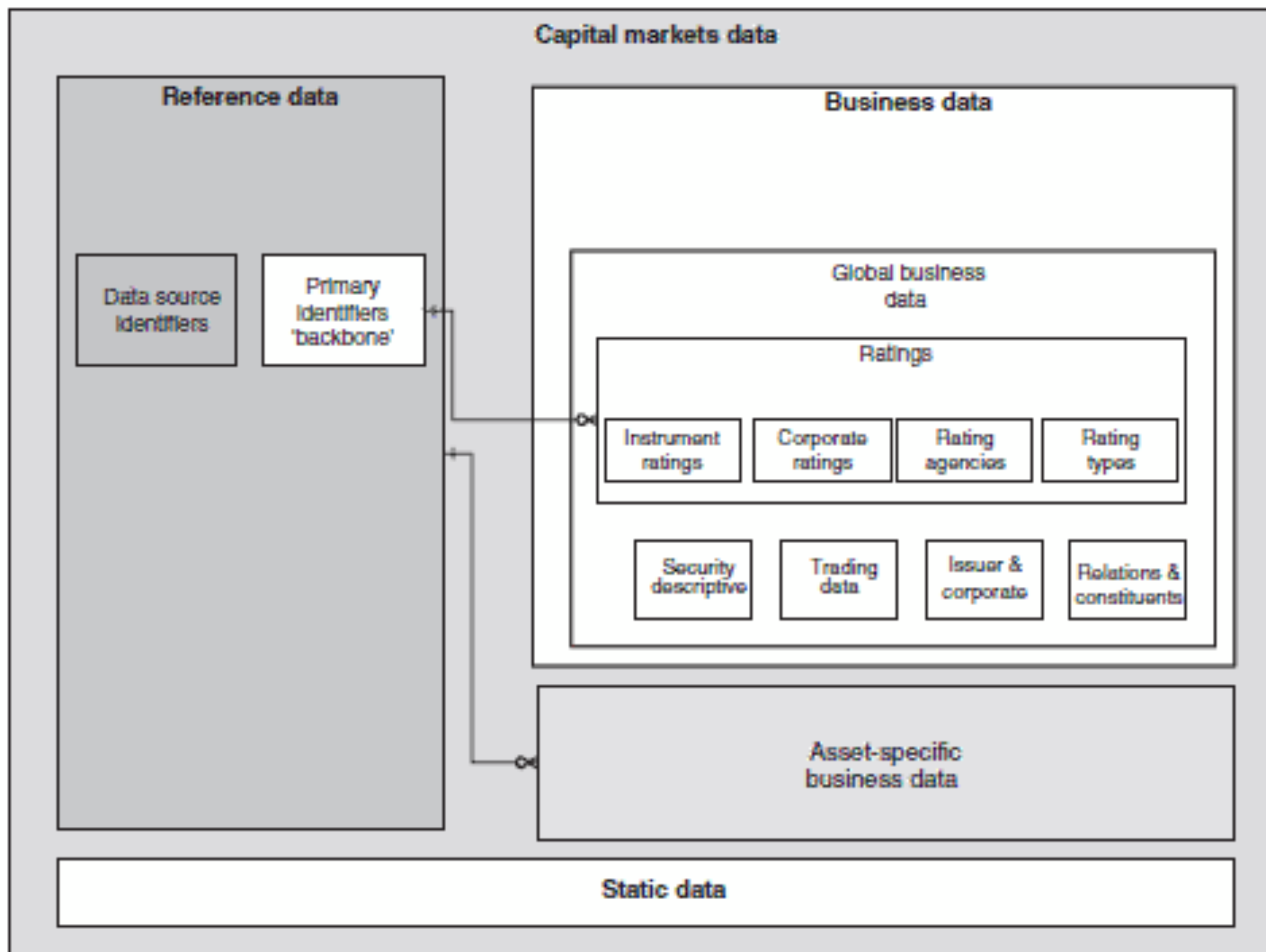
- *Total market volume*
- *Total market turnover*
- *Number of advancing securities*
- *Number of declining securities*
- *Number unchanged*
- *Number of trades executed.*

Market rules

- **Trading calendars** – details on when the market operates, including the days of the week and times of day.
- **Holiday calendars**
- **Settlement conventions**
- **Regulatory details**

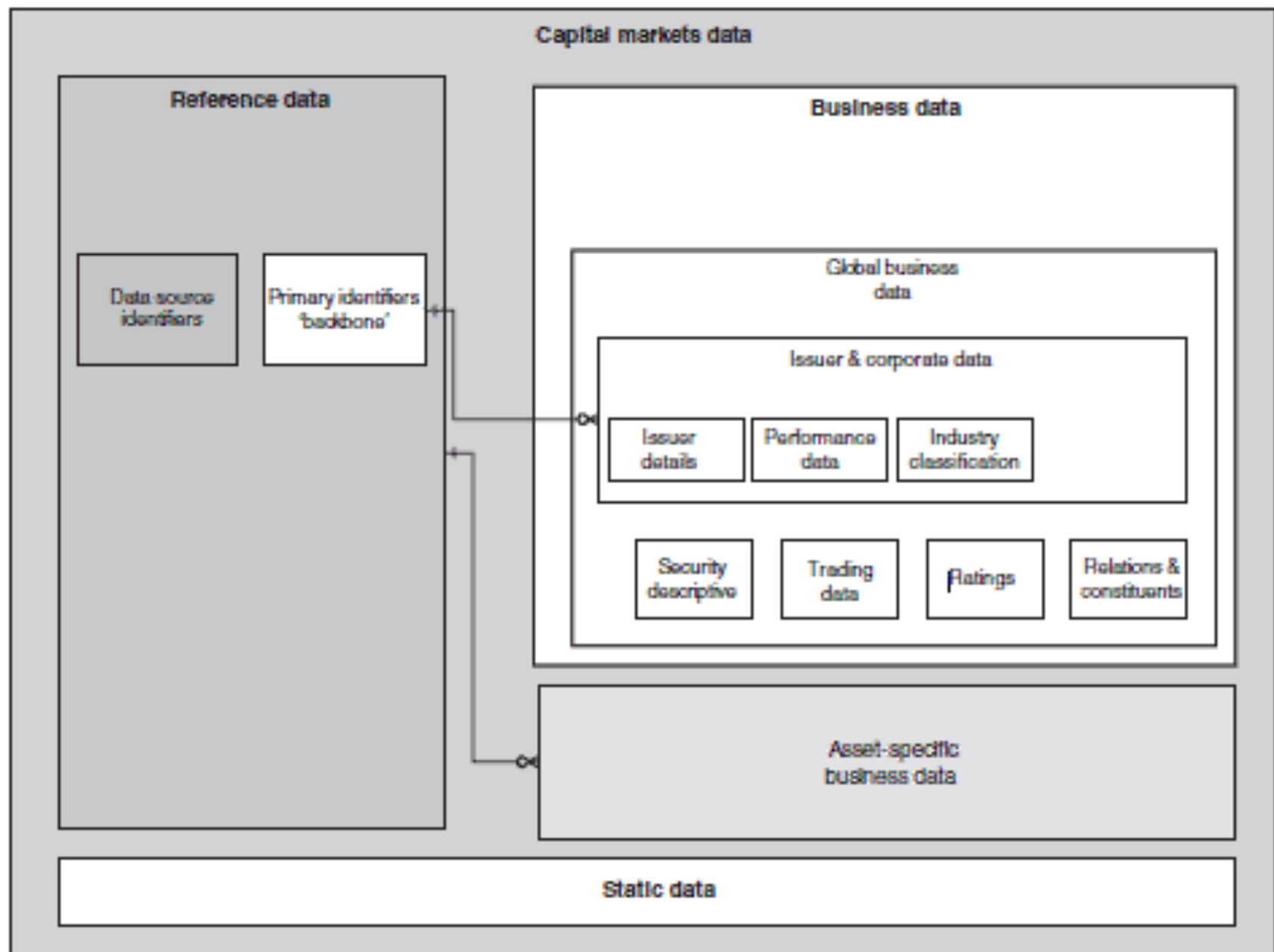
Ratings

- Ratings are issued at two levels:
 - Security – evaluation of the security and associated risk.
 - The actual rating as issued by the various agencies
 - Whether the security has been placed on a watch-list
 - Reviewed ratings
 - Corporate – an assessment of the creditworthiness of the issuer.



Issuer & Corporate Data

- **Issuer details**
 - Corporate name
 - Geographic incorporation
 - Address details
 - Key personnel
- **Performance data**
 - Balance sheets
 - Cash flow statements
 - Income statements
 - Corporate financial ratios
- **Industry classifications**
- **Ownership details**



- **Balance Sheets**
 - Asset details
 - Liabilities
 - Issuer equity
 - Reserves
 - Investments
- **Cash Flows**
 - Financing
 - Cash flow details
- **Income Statements**
 - Revenue details
 - Expense details
- **Financial ratios**

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- Ratio type
- Ratio value

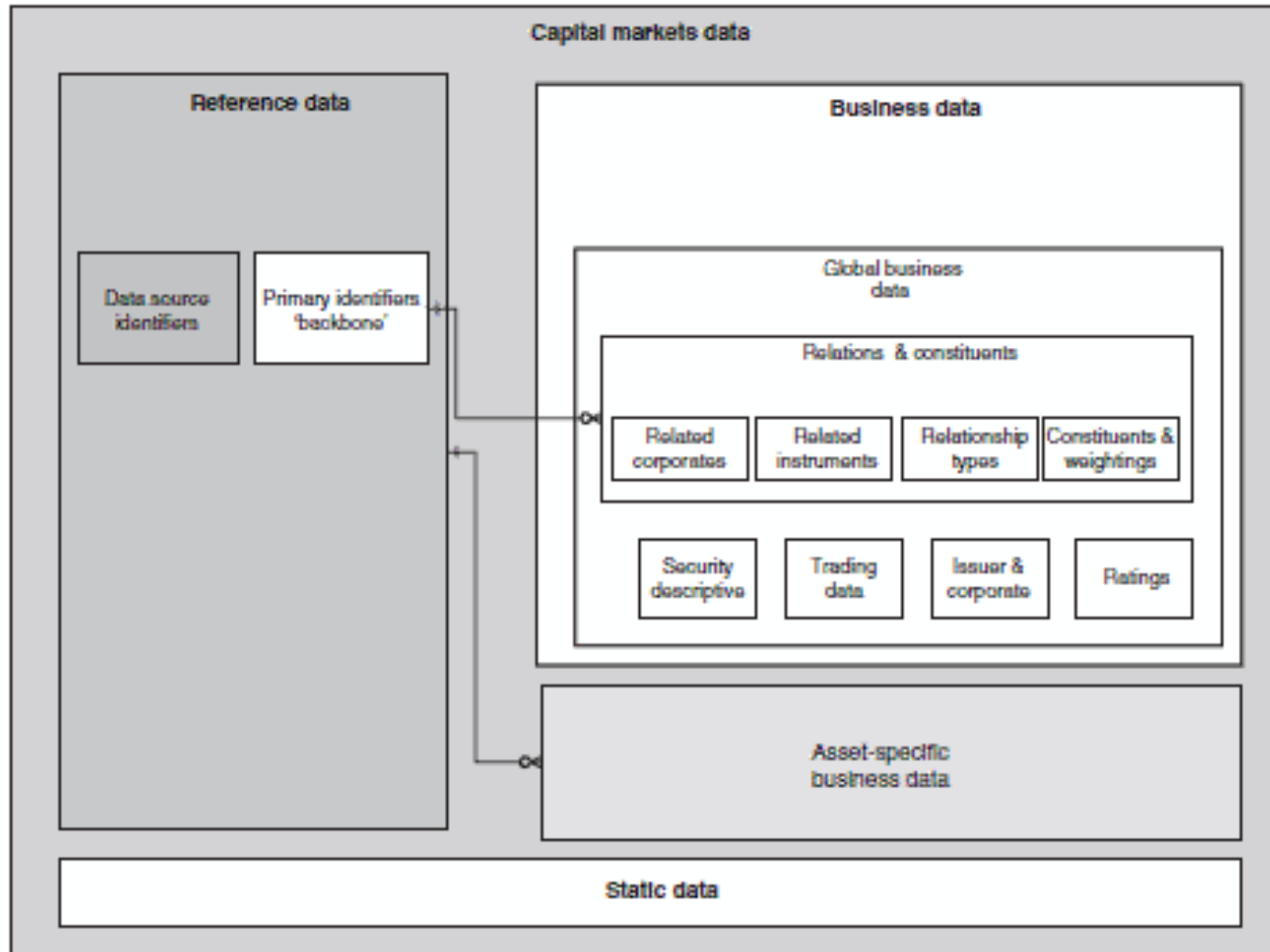
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Industry classifications

- Standard Industrial Classification (SIC)
- Morgan Stanley Capital International (MSCI)
- GICS (The Global Industry Classification Standard)
- Dow Jones STOXX Industrial Classification
- ICB Benchmark (FTSE/Dow Jones).

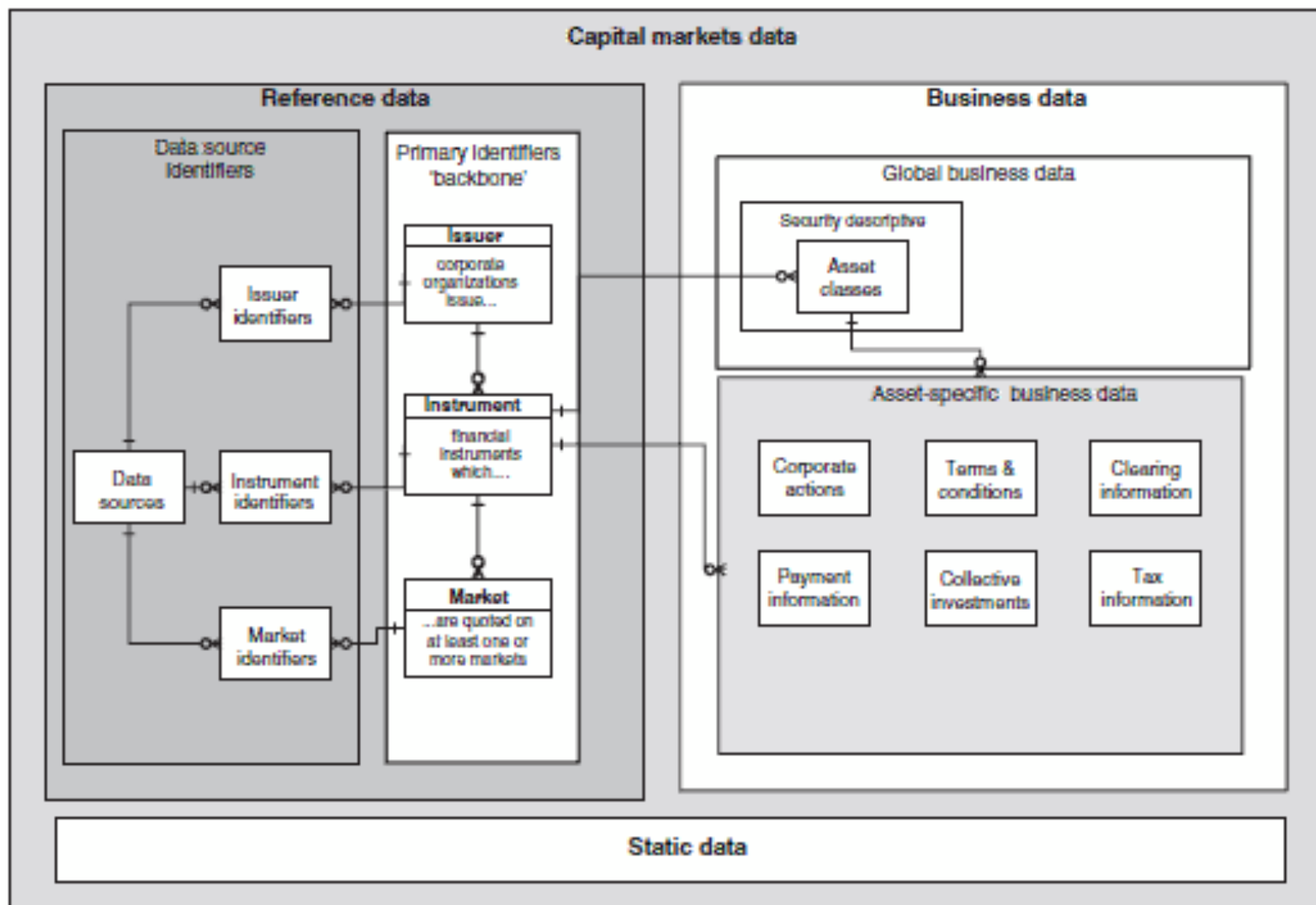
Relations and Constituents

- These relationships occur at two levels:
 - Issuer level – identifying corporate ownership and holdings
 - Instrument level – providing records of constituents & weightings.
- Corporate ownership and holdings
 - Wholly owned subsidiary
 - Minority interest
 - Joint venture.
- Security relations/constituents & weightings
 - Funds
 - Indices
 - Basket securities



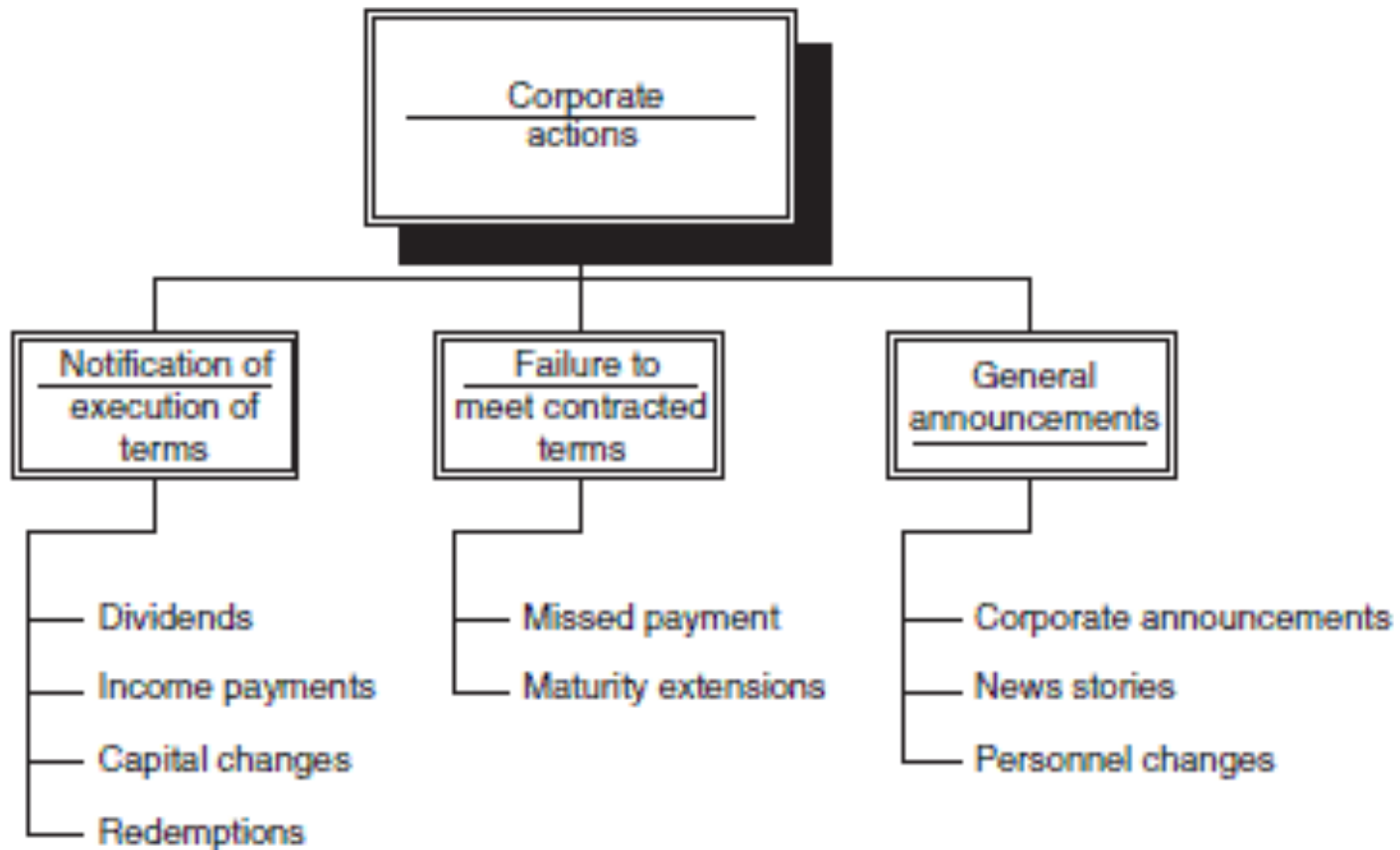
Asset-specific business data

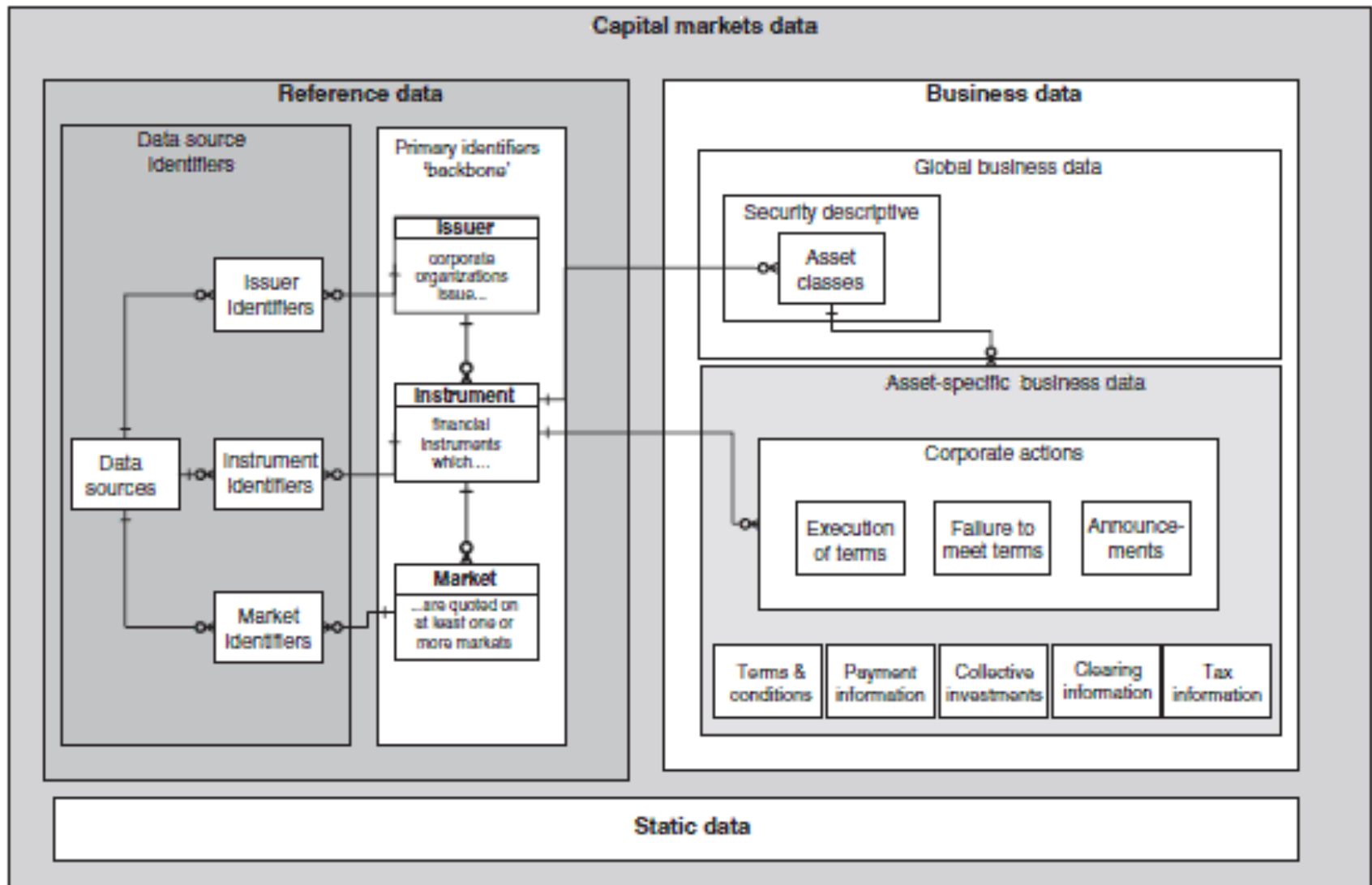
- **Corporate actions** – business events and announcements that have a material impact on holders of the associated financial instruments
- **Terms & conditions** – the defining legal terms, events and details associated with securities (primarily fixed income)
- **Payment information** – contracted terms, events and details associated with the income stream associated with securities
- **Collective investment details** – this covers the information related to securities, such as mutual funds, that are made up of other securities
- **Clearing information** – information related to the clearing and settlement rules associated with securities
- **Tax information** – details on the tax treatment related to securities.



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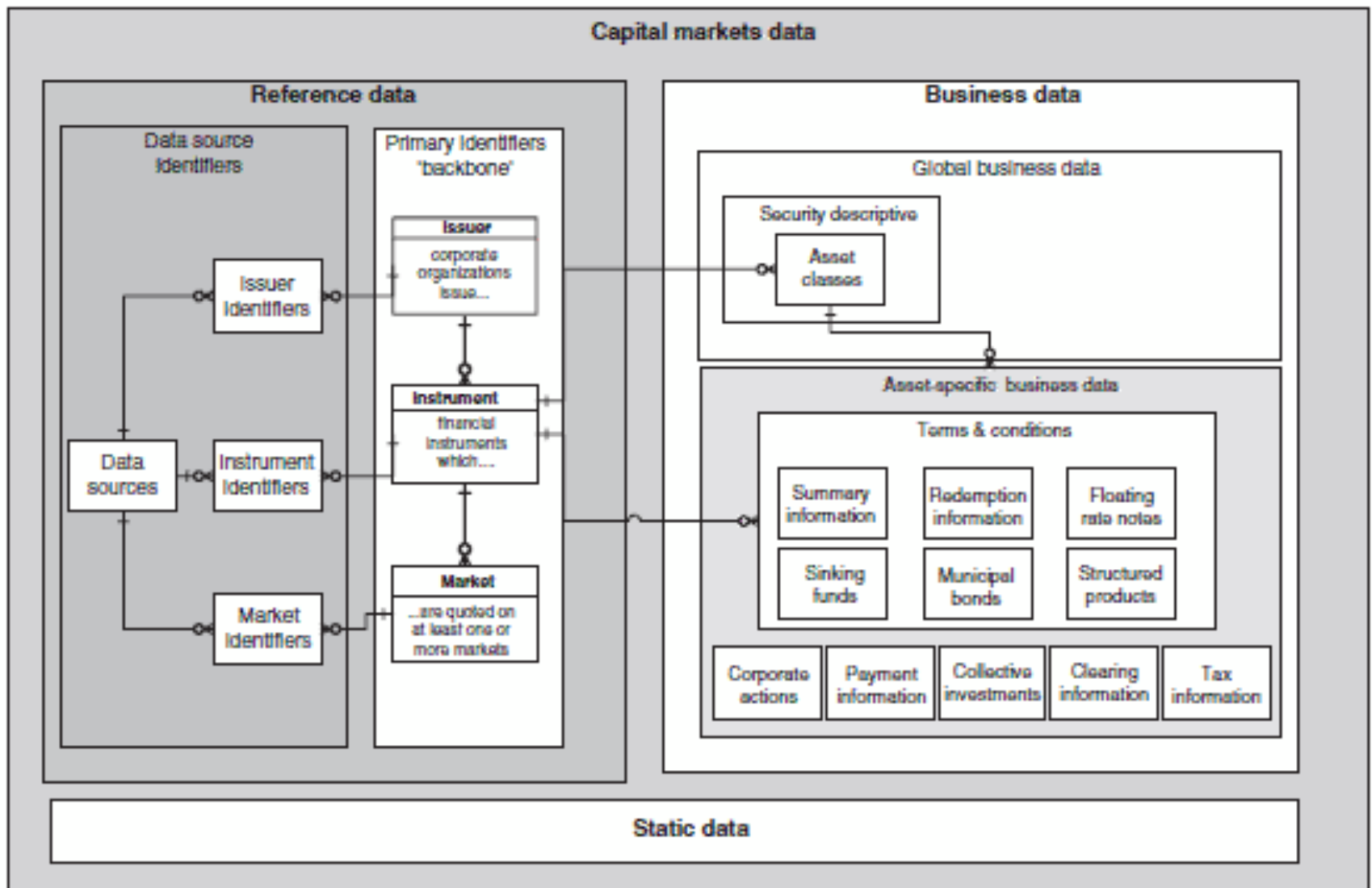
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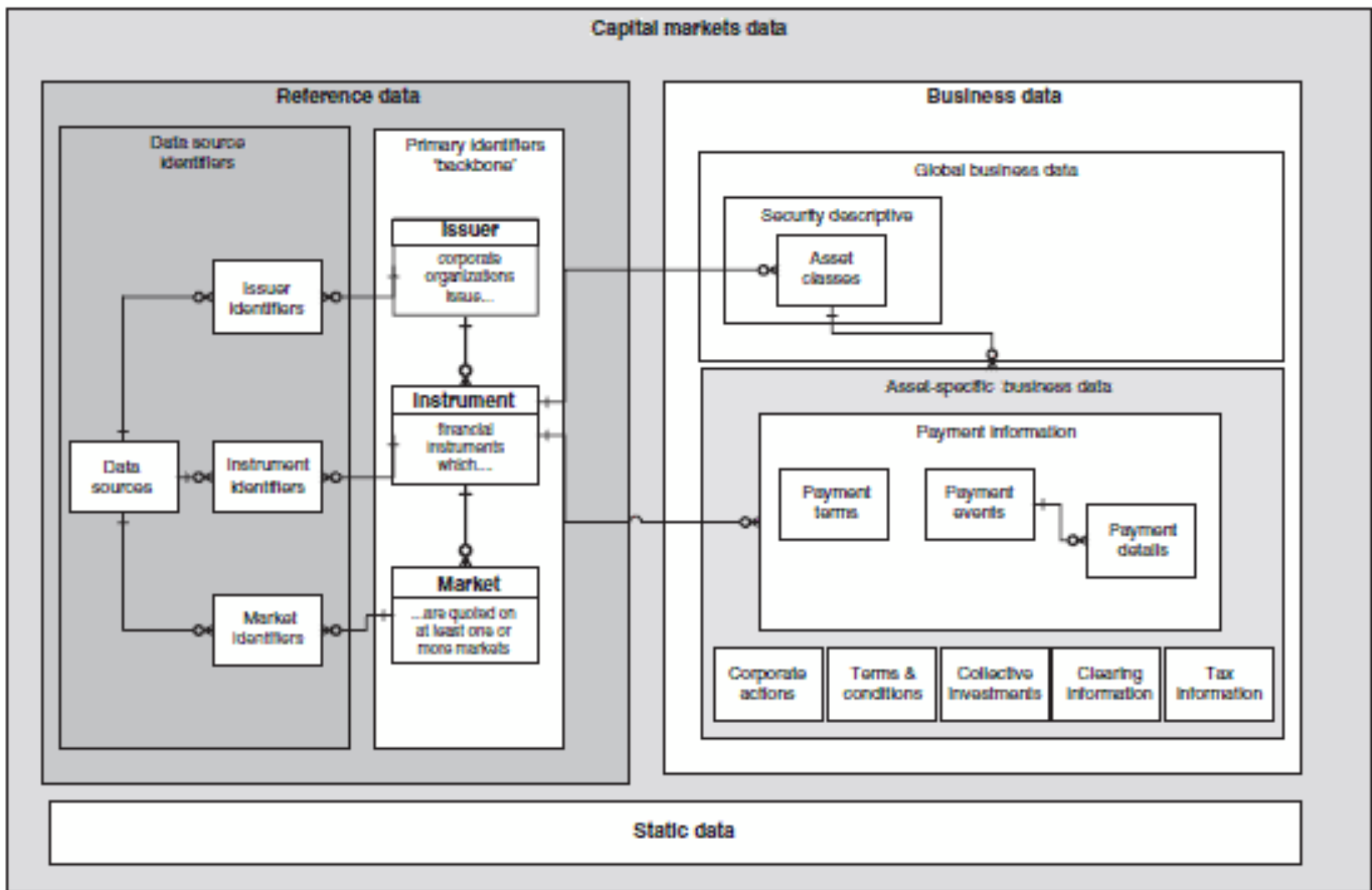
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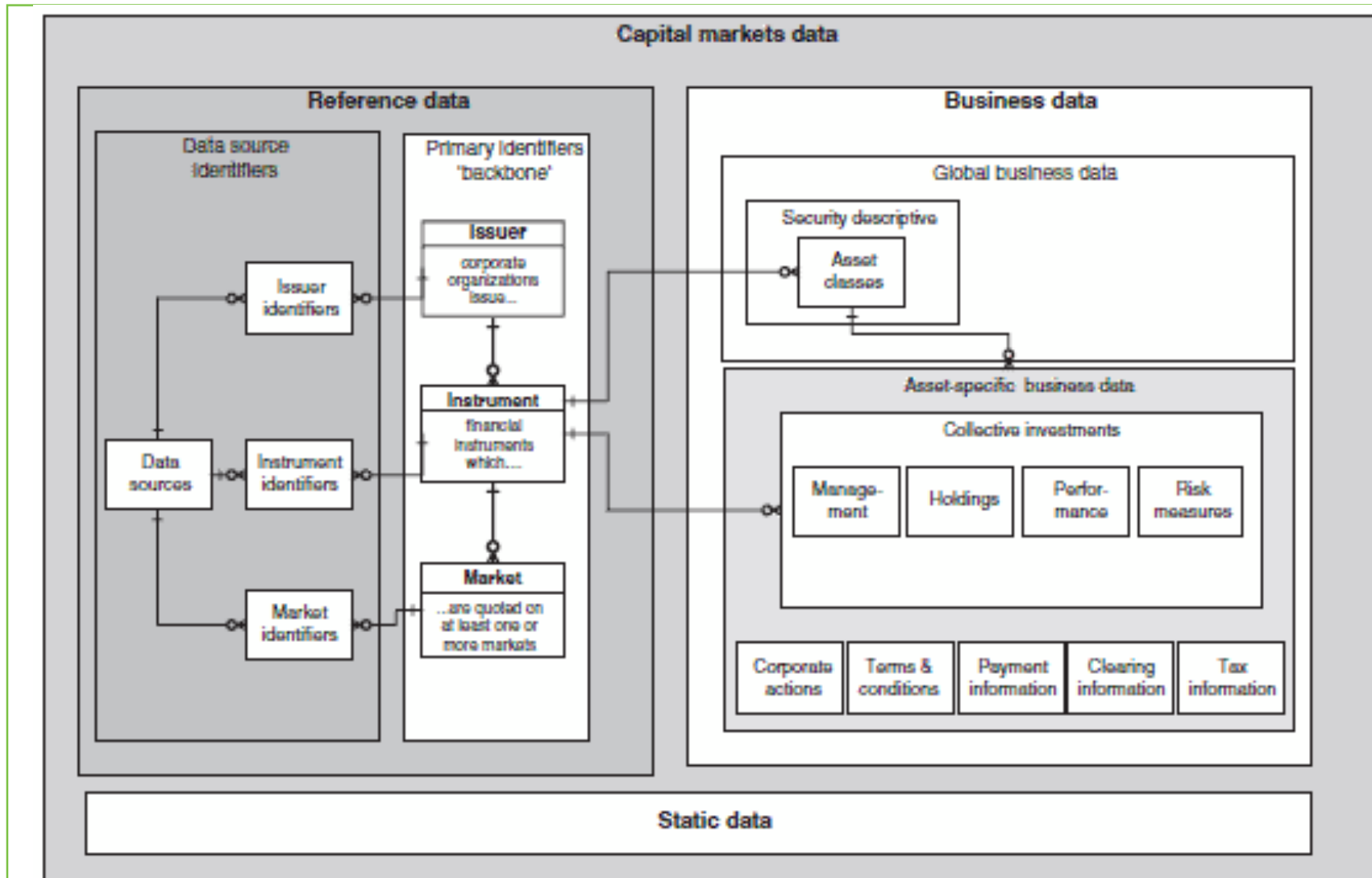
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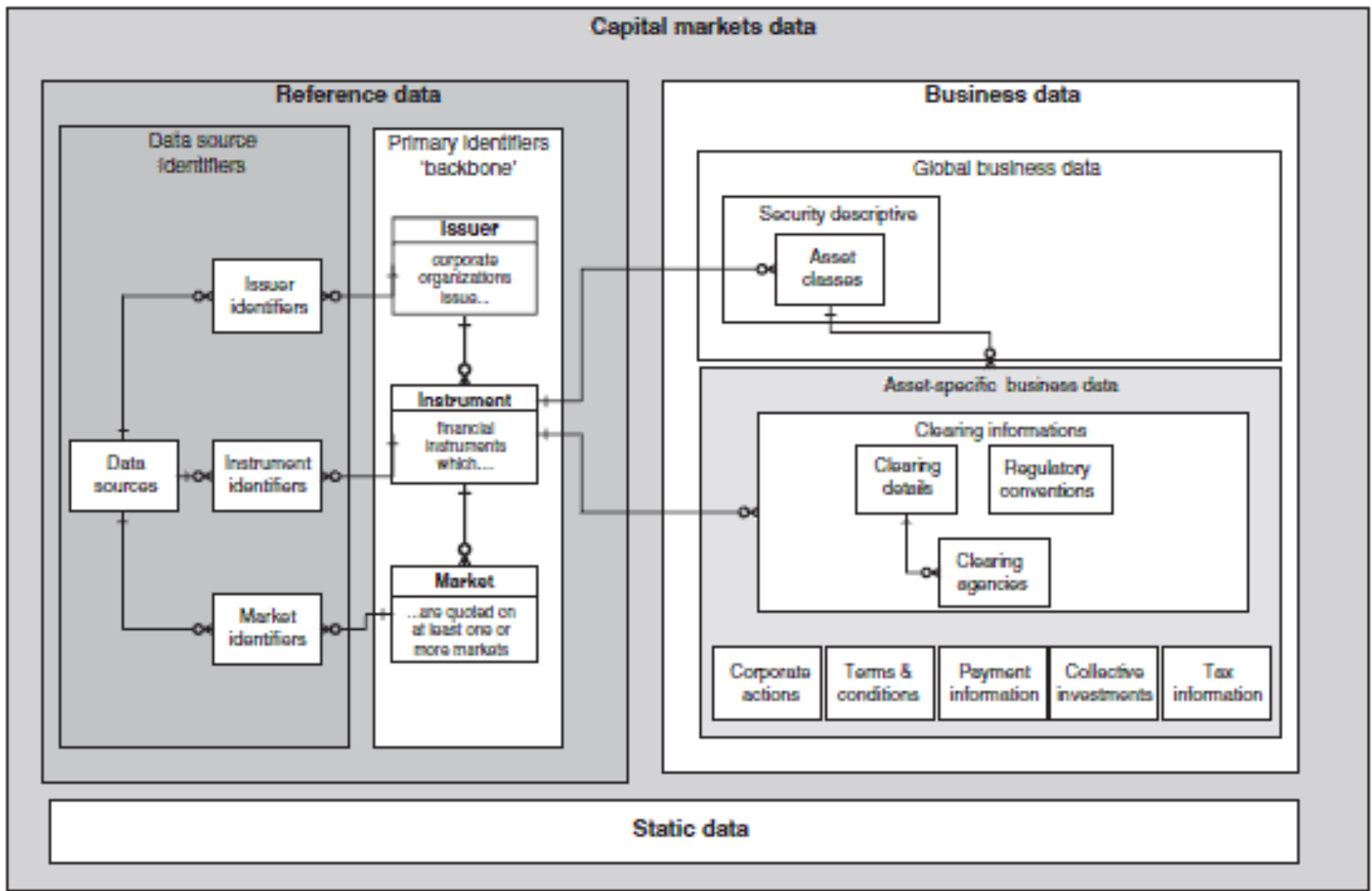
	Terms	Details	Events
Summary information	✓	✓	
Redemption information	✓	✓	✓
Floating rate notes	✓	✓	✓
Sinking funds	✓	✓	✓
Municipal bonds	✓	✓	
Structured products	✓	✓	

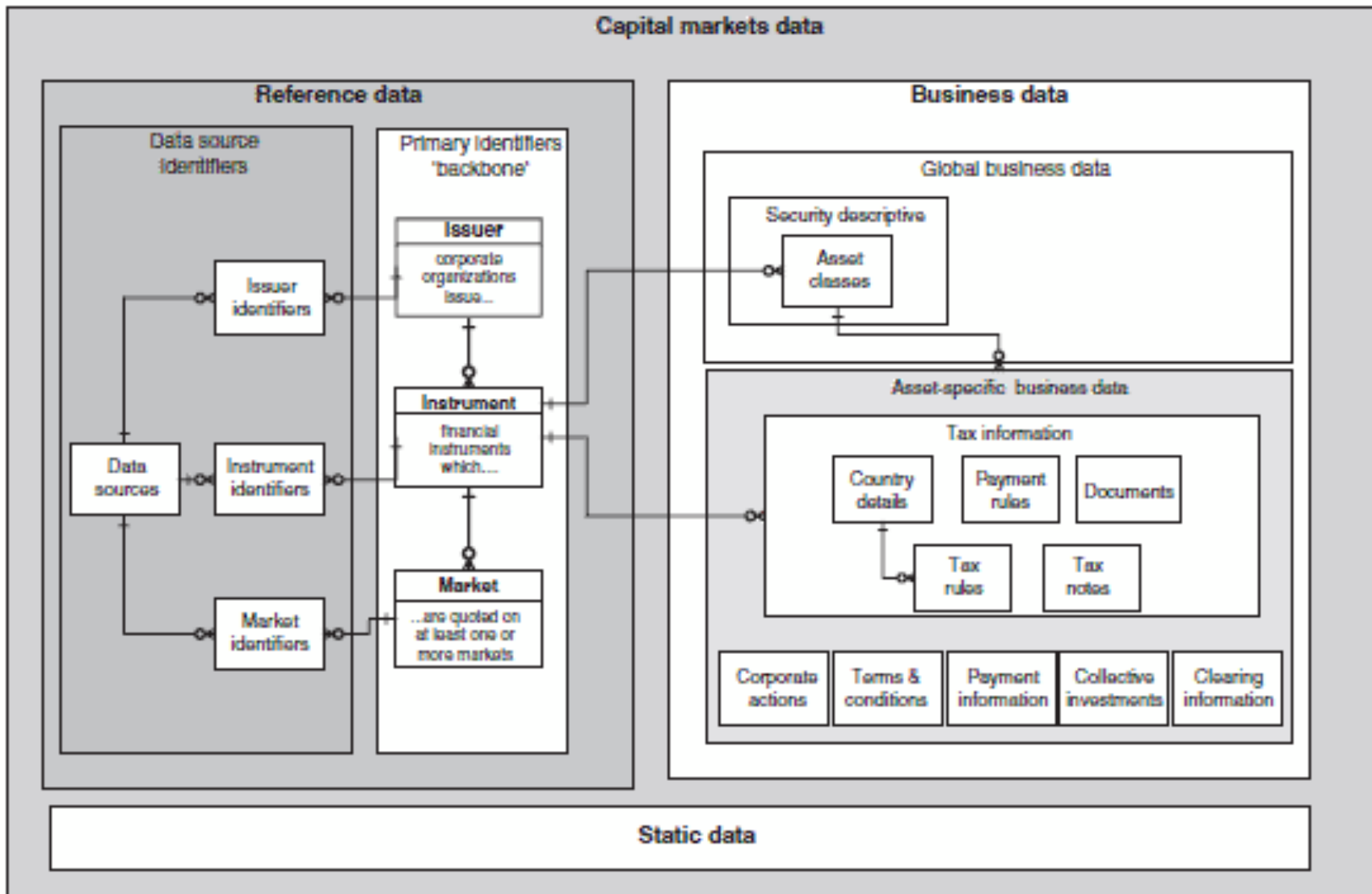


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Static Data

- Also known as ‘domain data’ or ‘lookup data’, this class of market data provides definitions to code values used on all datafeed services. Coded values are routinely used in order to minimize space and support processing efficiency. As a result, for any given code value there needs to be a corresponding definition held elsewhere in what is commonly referred to as a ‘lookup table’.
- Static data falls into two categories:
 - Global static data – this provides industry-accepted definitions and coding values. Many data sources carry these standard values in addition to their own proprietary representations
 - Data type-specific – values used only within a single data type. These vary considerably between data sources, all of which represent data content in a different format, thereby further increasing the complexity.

Global static data

- Currency codes – three-character ISO standard currency code values and their associated textual definition.
- Country codes – both two- and three-character ISO standard country codes are typically used.
- Market & exchange codes – a common international standard called the Marketing Identification Code (MIC) has recently become available and is seeing increasing usage.
- Industry classifications – over and above vendor classification schemes, there are a number in use, including (among others) the Standard Industrial Classification (SIC) and Morgan Stanley Capital International (MSCI).

Data type-specific

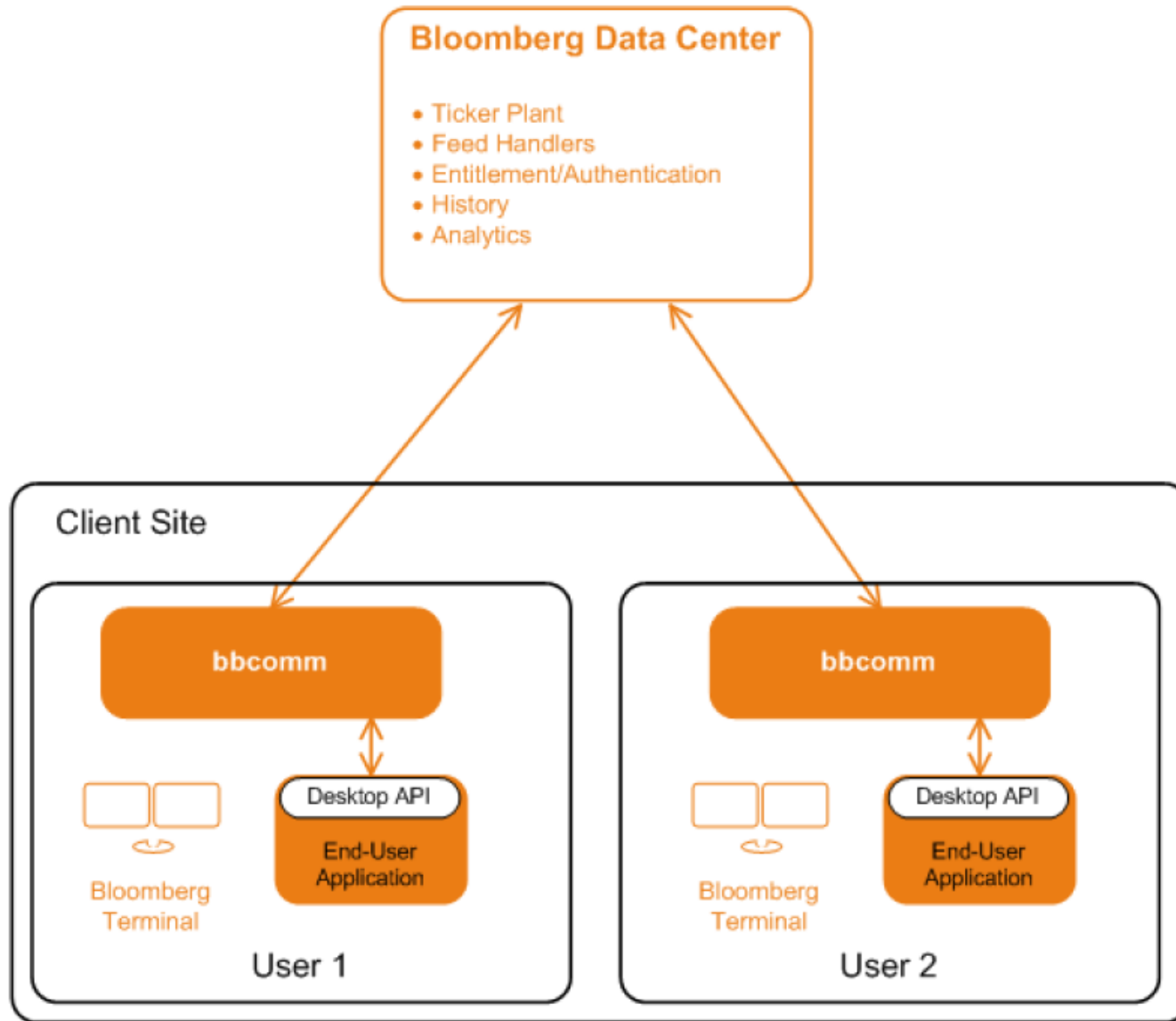
- The second category of static data is very diverse. Different data services deliver data content in different ways. Where one feed uses a code value and associated static data, another provides the definition as part of the content. The support for static data is assumed to be in line with the other content provided by the data source.

The Bloomberg API (BLPAPI)

- The Bloomberg API (BLPAPI) is a set of freely available software development kits (SDKs) that allow software developers to create applications that consume market data. The BLPAPI interface powers global market data distribution to desktops, workgroups and enterprise applications and is used daily by more than 100,000 Bloomberg customers.
- This API is part of Bloomberg's Open Market Data Initiative, which is focused on creating open standards for market data, covering symbology, programming interfaces, data schemas, and eventually, protocols.

Overview of the Bloomberg API

- 24x7 programmatic access to data from the Bloomberg Data Center for use in customer applications.
- Provide streaming real-time and delayed data, reference data, historical data, and intraday data.
- Uses an event-driven model. The interface is thread-safe and thread-aware, giving applications the ability to utilize multiple processors efficiently.
- Supports run-time downloadable schemas for the services it provides, and it provides methods to query these schemas at runtime.
- Is the interface to the Bloomberg Platform, B-PIPE, Server API and Desktop API.

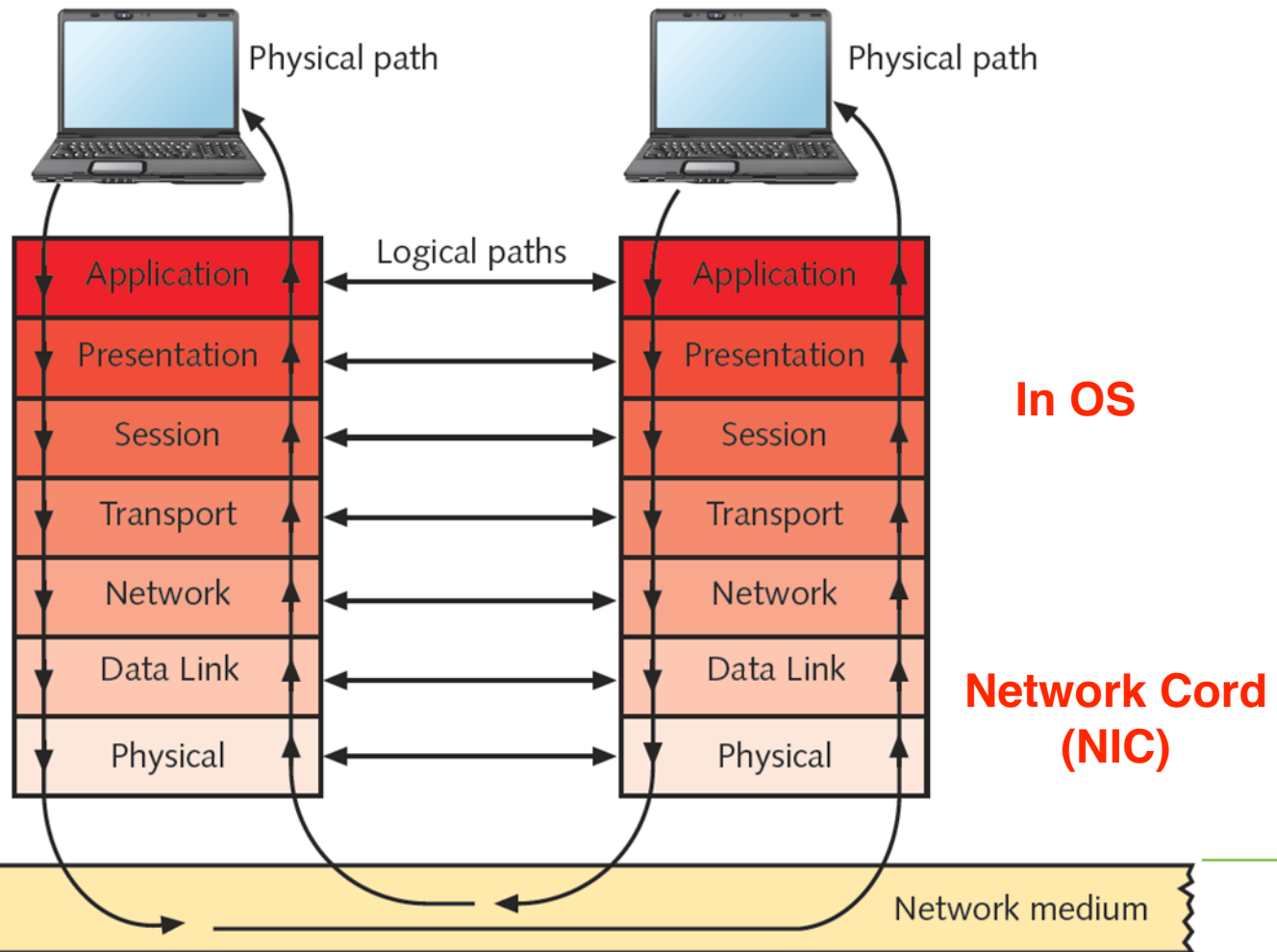


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Figure 1-3: The Desktop API

Flow of data through network



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Sockets and Ports

- Processes assigned unique port numbers
- Process's socket
 - Port number plus host machine's IP address
- Port numbers
 - Simplify TCP/IP communications
 - Ensures data transmitted correctly
- Example
 - Telnet port number: 23
 - IPv4 host address: 10.43.3.87
 - Socket address: 10.43.3.87:23

Typical Application Structure

- The Bloomberg API object model contains a small number of key objects which applications use to request, receive and interpret data.
 - An application creates a **Session** object to manage its connection with the Bloomberg infrastructure.
 - Using the **Session** object, an application creates a **Service** object and then opens each Bloomberg service that it will use.
 - Individual requests for data (via a **Request** object) .
 - A subscription for ongoing data updates (via a **Subscription** object).
 - The customer application obtains **Event** objects for the **Session** and then extracts from each **Event** object one or more **Message** objects containing the Bloomberg data.

Receiving market data from BLPAPI

- Request/Response mode for historical data
 - Session session(sessionOptions);
 - session.start();
 - session.openService("//blp/refdata");
 - Service refDataService = session.getService("//blp/refdata");
 - Request request = refDataService.createRequest("HistoricalDataRequest");
 - session.sendRequest(request);
- Subscription mode for real-time data
 - Session session(sessionOptions, sessionEventHandler);
 - session.start();
 - session.openService("//blp/mktdata");
 - SubscriptionList subscriptions;
 - subscriptions.add(security, fields, options, CorrelationId((char *)security));
 - session.subscribe(subscriptions);

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BHL ▾
Related Functions Menu ▾
Message ☆ 📄 ⚙️ ?

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- 

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The Bloomberg shows how demand for such bonds has fluctuated. Show me how »
- 

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Did you know?
All functions are organized onto a hierarchy of menus based on market sector and common workflows. See more >>

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What Function Do You Need Right NOW?



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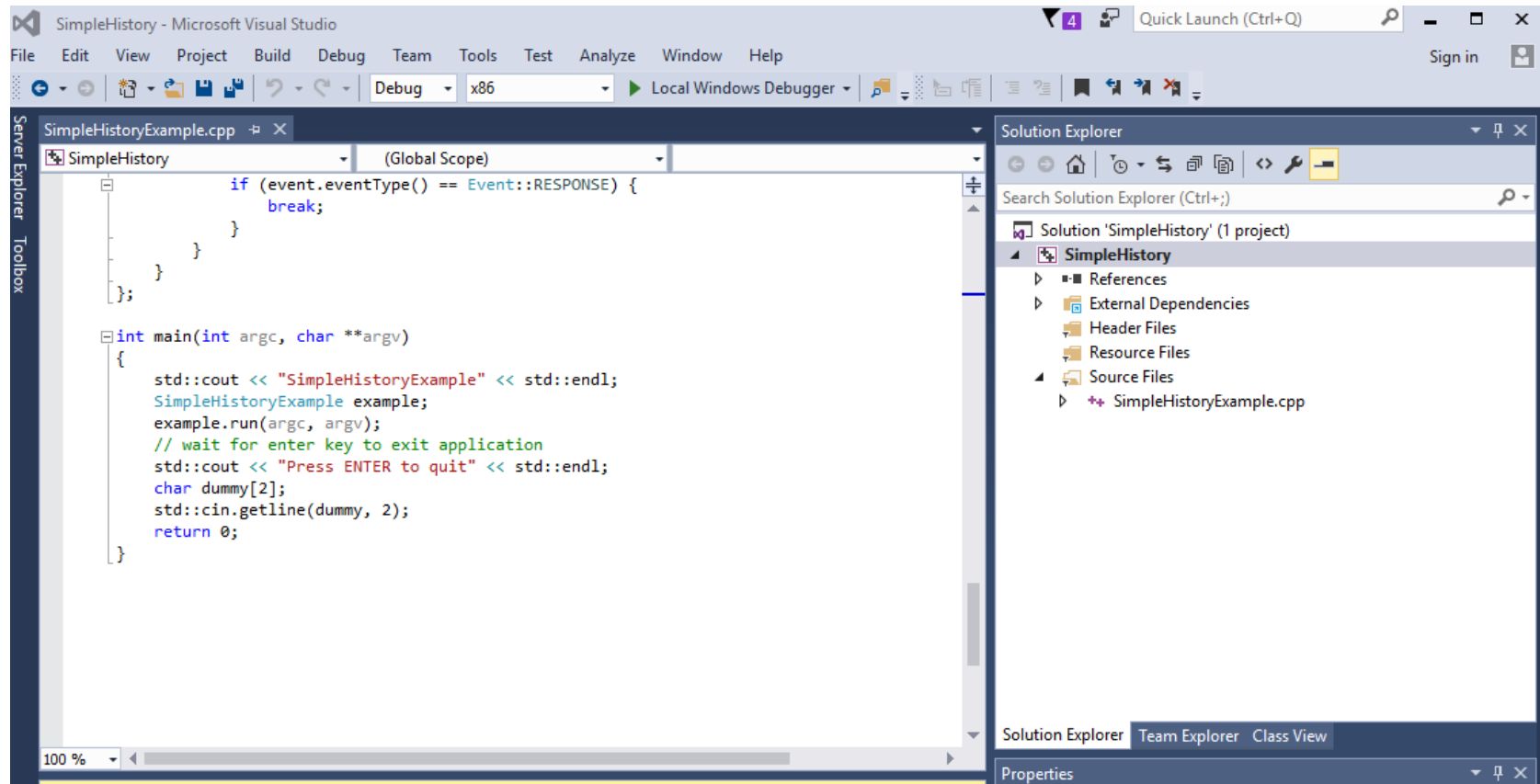
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Create SimpleHistoryProject



Add BLP include file directory

SimpleHistory Property Pages

? X

Configuration: Active(Debug) v

Platform: Active(Win32) v

Configuration Manager...

- Configuration Properties
 - General
 - Debugging
 - VC++ Directories
 - C/C++
 - General**
 - Optimization
 - Preprocessor
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 - Precompiled Headers
 - Output Files
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- Linker
 - General
 - Input
 - Manifest File
 - Debugging
 - System
 - Optimization
 - Embedded IDL
 - Windows Metadata
 - Advanced
 - All Options
 - Command Line

Additional Include Directories	E:\blp_new\blpapi_cpp_3.8.18.1\include;%(AdditionalIncludeDirectories)
Additional #using Directories	
Debug Information Format	Program Database for Edit And Continue (/ZI)
Common Language Runtime Support	
Consume Windows Runtime Extension	
Suppress Startup Banner	Yes (/nologo)
Warning Level	Level3 (/W3)
Treat Warnings As Errors	No (/WX-)
Warning Version	
SDL checks	
Multi-processor Compilation	

Additional Include Directories

Specifies one or more directories to add to the include path; separate with semi-colons if more than one. (/I[path])

OK

Cancel

Apply

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Add BLP library

SimpleHistory Property Pages

? X

Configuration: Active(Debug) Platform: Active(Win32) Configuration Manager...

Configuration Properties	
General	
Debugging	
VC++ Directories	
C/C++	
General	
Optimization	
Preprocessor	
Code Generation	
Language	
Precompiled Headers	
Output Files	
Browse Information	
Advanced	
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Command Line	
Linker	
General	
Input	
Manifest File	
Debugging	
System	
Optimization	
Embedded IDL	
Windows Metadata	
Advanced	
All Options	
Command Line	

Output File	\$(OutDir)\$(TargetName)\$(TargetExt)
Show Progress	Not Set
Version	
Enable Incremental Linking	Yes (/INCREMENTAL)
Suppress Startup Banner	Yes (/NOLOGO)
Ignore Import Library	No
Register Output	No
Per-user Redirection	No
Additional Library Directories	E:\blp_new\blpapi_cpp_3.8.18.1\lib;%AdditionalLibraryDirectories)
Link Library Dependencies	Yes
Use Library Dependency Inputs	No
Link Status	
Prevent Dll Binding	
Treat Linker Warning As Errors	
Force File Output	
Create Hot Patchable Image	
Specify Section Attributes	

Output File
The /OUT option overrides the default name and location of the program that the linker creates.

OK Cancel Apply

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Specify BLP library for your program

SimpleHistory Property Pages

? X

Configuration: Active(Debug) Platform: Active(Win32) Configuration Manager...

C/C++	
General	
Optimization	
Preprocessor	
Code Generation	
Language	
Precompiled Headers	
Output Files	
Browse Information	
Advanced	
All Options	
Command Line	
Linker	
General	
Input	
Manifest File	
Debugging	
System	
Optimization	
Embedded IDL	
Windows Metadata	
Advanced	
All Options	
Command Line	
Manifest Tool	
XML Document Generator	
Browse Information	
Build Events	

Additional Dependencies	blpapi3_32.lib;blpapi3_64.lib;%(AdditionalDependencies)
Ignore All Default Libraries	
Ignore Specific Default Libraries	
Module Definition File	
Add Module to Assembly	
Embed Managed Resource File	
Force Symbol References	
Delay Loaded DLLs	
Assembly Link Resource	

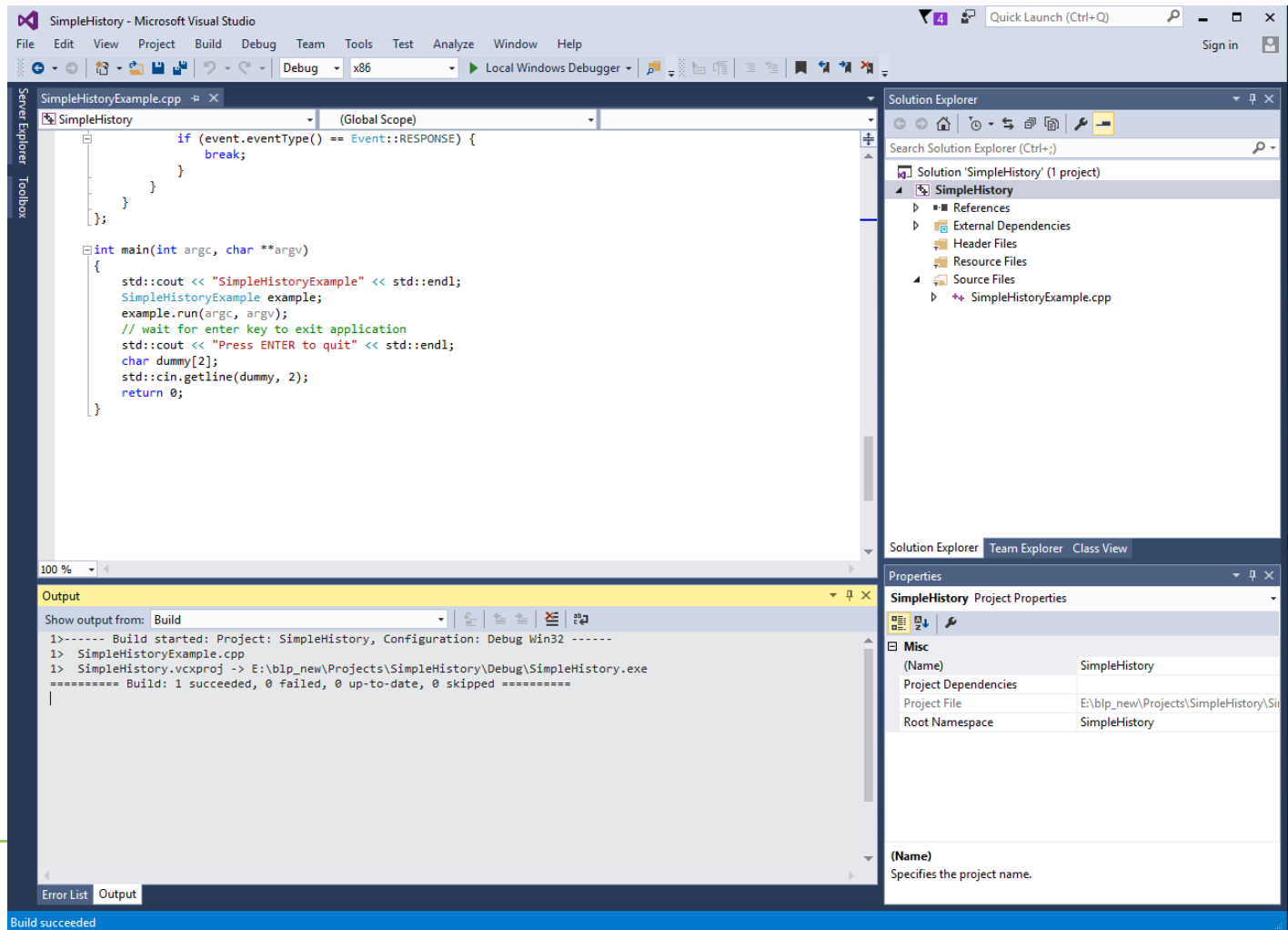
Additional Dependencies
Specifies additional items to add to the link command line. [i.e. kernel32.lib]

OK Cancel Apply

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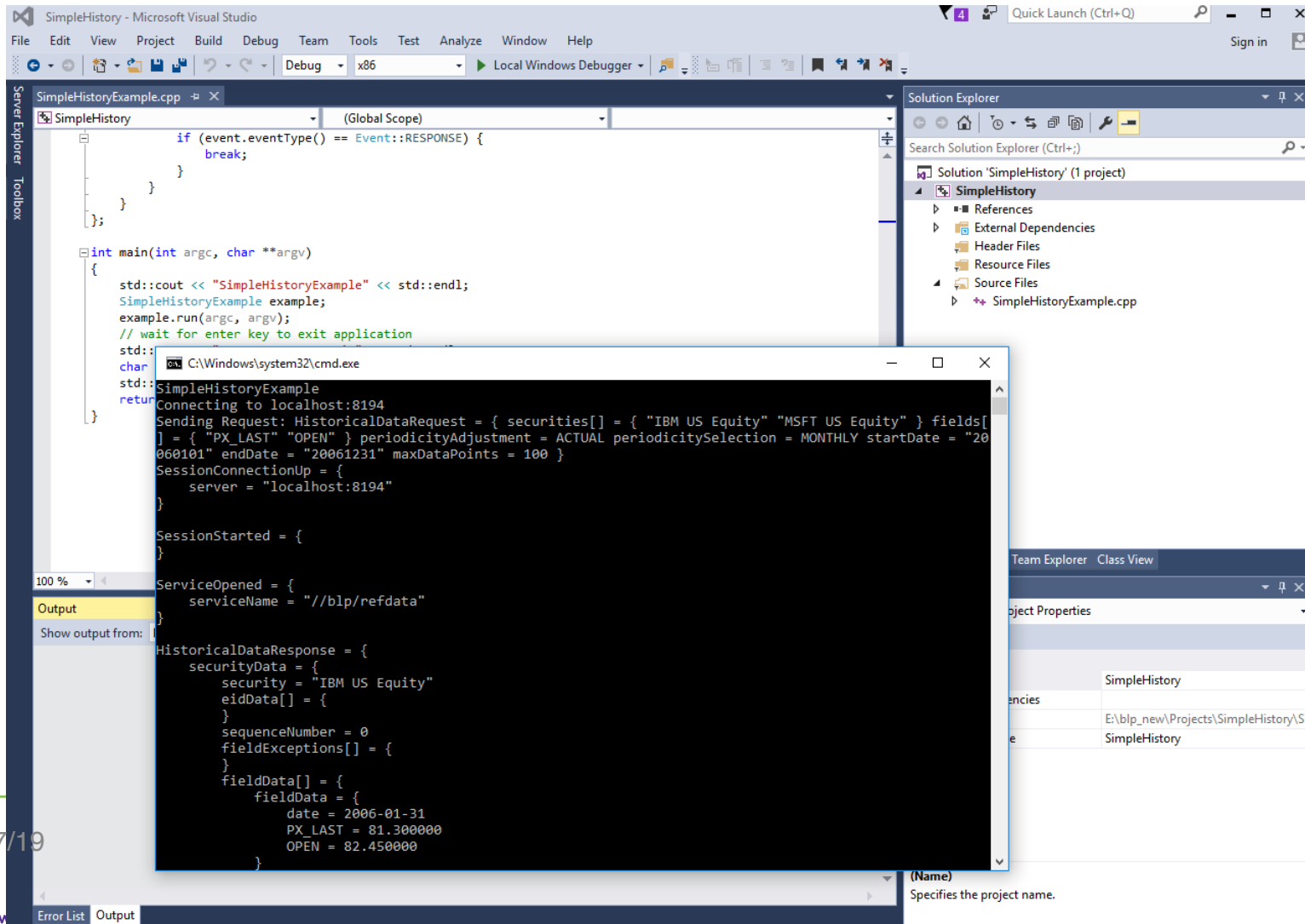
Build your program



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Run your program



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NEW

Error List Output



BLPAPI examples to walk through

- Request/Response mode for historical data
 - SimpleHistoryExample.cpp
- Subscription mode for real-time data
 - RealTime.cpp

Homework Assignment 1

- Modify the Bloomberg API program SimpleHistoryExample.cpp to
 - 1) Add the following fields for market data retrieval:
 - Daily Volume
 - High Price
 - Low Price
 - 2) Change the startDate to 1st day of the year and endDate to today.
 - 3) Write the historical data you collect into a file instead of on screen.

Homework Assignment 2

- Modify the Bloomberg API program RealTime.cpp to add
 - 1) To retrieve Ask side of real-time quotes: ask price and ask size of each quote.
 - 2) Write the real-time data you collect into a file in addition to what shown on screen.

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```
FB US Equity Trade: 2018-03-19T15:28:57.527-04:00, 171.58, 100
FB US Equity Trade: 2018-03-19T15:28:57.528-04:00, 171.58, 414
FB US Equity Trade: 2018-03-19T15:28:57.530-04:00, 171.59, 102
FB US Equity Trade: 2018-03-19T15:28:57.593-04:00, 171.57, 400
FB US Equity Trade: 2018-03-19T15:28:58.180-04:00, 171.58, 200
FB US Equity Trade: 2018-03-19T15:28:58.180-04:00, 171.58, 100
FB US Equity Trade: 2018-03-19T15:28:58.180-04:00, 171.58, 100
FB US Equity Trade: 2018-03-19T15:28:58.181-04:00, 171.57, 100
FB US Equity Trade: 2018-03-19T15:28:58.181-04:00, 171.57, 100
FB US Equity Trade: 2018-03-19T15:28:58.183-04:00, 171.57, 100
FB US Equity Trade: 2018-03-19T15:28:58.183-04:00, 171.57, 100
FB US Equity Trade: 2018-03-19T15:28:58.183-04:00, 171.57, 100
FB US Equity Trade: 2018-03-19T15:28:58.200-04:00, 171.59, 100
FB US Equity Trade: 2018-03-19T15:28:58.243-04:00, 171.59, 100
FB US Equity BID Quote: 2018-03-19T15:28:58.404-04:00, 171.58, 200
FB US Equity ASK Quote: 2018-03-19T15:28:58.487-04:00, 171.59, 300
FB US Equity Trade: 2018-03-19T15:28:59.025-04:00, 171.58, 100
FB US Equity Trade: 2018-03-19T15:28:59.048-04:00, 171.58, 200
FB US Equity Trade: 2018-03-19T15:28:59.048-04:00, 171.57, 100
FB US Equity Trade: 2018-03-19T15:28:59.048-04:00, 171.57, 100
FB US Equity Trade: 2018-03-19T15:28:59.059-04:00, 171.58, 100
FB US Equity Trade: 2018-03-19T15:28:59.080-04:00, 171.57, 200
FB US Equity Trade: 2018-03-19T15:28:59.108-04:00, 171.57, 100
FB US Equity Trade: 2018-03-19T15:28:59.153-04:00, 171.57, 100
FB US Equity Trade: 2018-03-19T15:28:59.153-04:00, 171.57, 100
FB US Equity Trade: 2018-03-19T15:28:59.200-04:00, 171.57, 100
FB US Equity Trade: 2018-03-19T15:28:59.202-04:00, 171.56, 100
FB US Equity Trade: 2018-03-19T15:28:59.232-04:00, 171.57, 200
FB US Equity Trade: 2018-03-19T15:28:59.233-04:00, 171.57, 100
FB US Equity Trade: 2018-03-19T15:28:59.267-04:00, 171.558, 180
FB US Equity Trade: 2018-03-19T15:28:59.412-04:00, 171.56, 157
FB US Equity Trade: 2018-03-19T15:28:59.801-04:00, 171.57, 100
FB US Equity BID Quote: 2018-03-19T15:28:59.574-04:00, 171.55, 100
FB US Equity ASK Quote: 2018-03-19T15:28:59.801-04:00, 171.57, 300
FB US Equity Trade: 2018-03-19T15:29:00.030-04:00, 171.57, 100
FB US Equity Trade: 2018-03-19T15:29:00.030-04:00, 171.565, 100
FB US Equity Trade: 2018-03-19T15:29:00.034-04:00, 171.55, 100
FB US Equity Trade: 2018-03-19T15:29:00.040-04:00, 171.55, 100
FB US Equity Trade: 2018-03-19T15:29:00.040-04:00, 171.55, 100
FB US Equity Trade: 2018-03-19T15:29:00.066-04:00, 171.53, 200
FB US Equity Trade: 2018-03-19T15:29:00.070-04:00, 171.52, 950
FB US Equity Trade: 2018-03-19T15:29:00.124-04:00, 171.55, 100
FB US Equity Trade: 2018-03-19T15:29:00.174-04:00, 171.55, 100
FB US Equity Trade: 2018-03-19T15:29:00.174-04:00, 171.55, 100
FB US Equity Trade: 2018-03-19T15:29:00.174-04:00, 171.55, 100
FB US Equity Trade: 2018-03-19T15:29:00.174-04:00, 171.55, 200
FB US Equity Trade: 2018-03-19T15:29:00.174-04:00, 171.55, 100
FB US Equity Trade: 2018-03-19T15:29:00.174-04:00, 171.55, 100
FB US Equity Trade: 2018-03-19T15:29:00.174-04:00, 171.55, 200
FB US Equity Trade: 2018-03-19T15:29:00.175-04:00, 171.55, 200
FB US Equity Trade: 2018-03-19T15:29:00.407-04:00, 171.559, 3000
FB US Equity ASK Quote: 2018-03-19T15:29:00.407-04:00, 171.58, 400
FB US Equity BID Quote: 2018-03-19T15:29:00.765-04:00, 171.55, 200
FB US Equity Trade: 2018-03-19T15:29:01.059-04:00, 171.565, 400
FB US Equity Trade: 2018-03-19T15:29:01.237-04:00, 171.55, 173
FB US Equity Trade: 2018-03-19T15:29:01.551-04:00, 171.53, 500
FB US Equity Trade: 2018-03-19T15:29:01.568-04:00, 171.55, 500
FB US Equity Trade: 2018-03-19T15:29:01.817-04:00, 171.57, 200
FB US Equity Trade: 2018-03-19T15:29:01.870-04:00, 171.53, 200
FB US Equity BID Quote: 2018-03-19T15:29:01.870-04:00, 171.53, 200
FB US Equity ASK Quote: 2018-03-19T15:29:01.982-04:00, 171.57, 400
```

Homework - StockHistory

New Project ? X

Recent .NET Framework 4.5.2 Sort by: Default Search Installed Templates (Ctrl+E)

Installed

Templates

- Visual C#
- Visual Basic
- Visual C++**
 - Windows
 - ATL
 - CLR
 - General
 - MFC
 - Test
 - Win32
 - Cross Platform
 - Extensibility
 - Visual F#
 - SQL Server
 - JavaScript
 - PowerShell
 - Python
 - TypeScript
 - Game
 - Build Accelerator

Blank App (Universal Windows) Visual C++

DirectX 11 App (Universal Windows) Visual C++

DirectX 12 App (Universal Windows) Visual C++

Blank App (Universal Windows 8.1) Visual C++

Hub App (Universal Windows 8.1) Visual C++

Win32 Console Application Visual C++

Pivot App (Windows Phone) Visual C++

MFC Application Visual C++

WebView App (Windows Phone) Visual C++

Win32 Project Visual C++

Empty Project Visual C++

[Click here to go online and find templates.](#)

Type: Visual C++
A project for creating a Win32 console application

Name: StockHistory

Location: E:\blp_new\Projects\ Browse...

Solution name: StockHistory

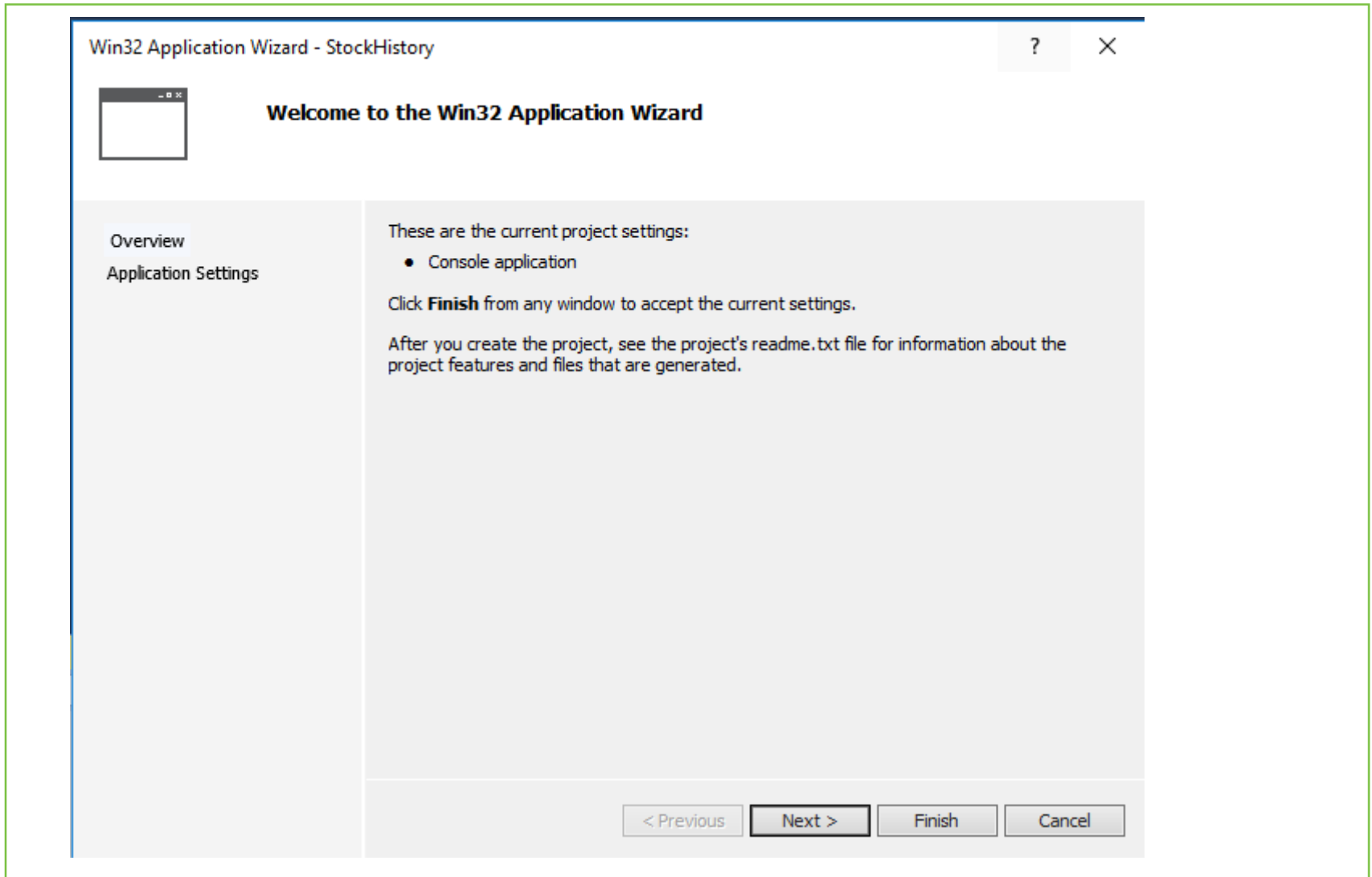
☒ Create directory for solution

☐ Add to source control

OK Cancel

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Application Settings

Overview

Application Settings

Application type:

- ☐ Windows application
- ☒ Console application
- ☐ DLL
- ☐ Static library

Add common header files for:

- ☐ ATL
- ☐ MFC

Additional options:

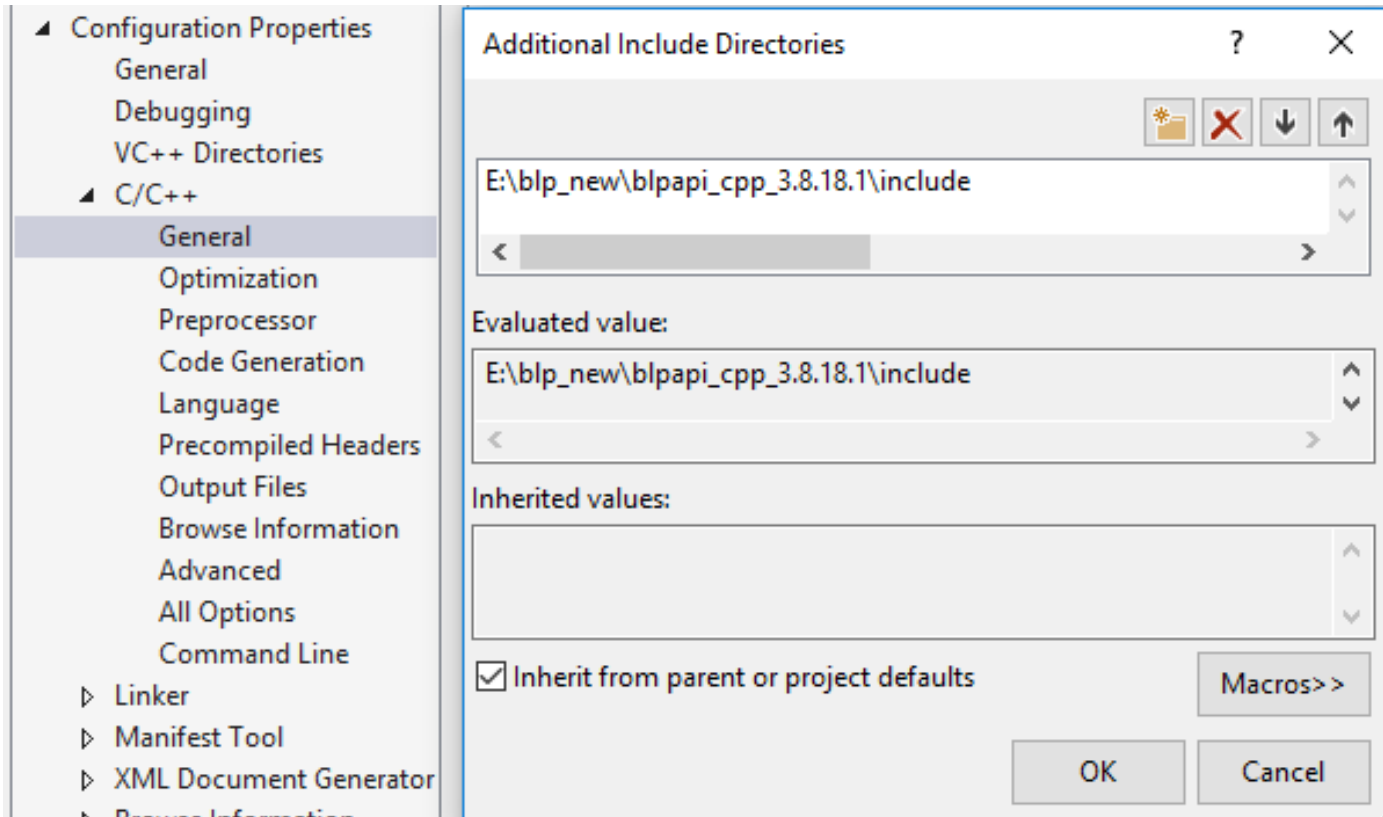
- ☒ Empty project
- ☐ Export symbols
- ☐ Precompiled header
- ☐ Security Development Lifecycle (SDL) checks

< Previous

Next >

Finish

Cancel



Configuration: Active(Debug)

Platform: Active(Win32)

Configuration Manager...

- Configuration Properties
 - General
 - Debugging
 - VC++ Directories
 - C/C++
 - General
 - Optimization
 - Preprocessor
 - Code Generation
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 - Precompiled Headers
 - Output Files
 - Browse Information
 - Advanced
 - All Options
 - Command Line
 - Linker
 - General**
 - Input
 - Manifest File
 - Debugging
 - System
 - Optimization
 - Embedded IDL
 - Windows Metadata
 - Advanced
 - All Options
 - Command Line

Output File	\$(OutDir)\$(TargetName)\$(TargetExt)
Show Progress	Not Set
Version	
Enable Incremental Linking	Yes (/INCREMENTAL)
Suppress Startup Banner	Yes (/NOLOGO)
Ignore Import Library	No
Register Output	No
Per-user Redirection	No
Additional Library Directories	E:\blp_new\blpapi_cpp_3.8.18.1\lib;%(AdditionalLibraryDirectories)
Link Library Dependencies	Yes
Use Library Dependency Inputs	No
Link Status	
Prevent Dll Binding	
Treat Linker Warning As Errors	
Force File Output	
Create Hot Patchable Image	
Specify Section Attributes	

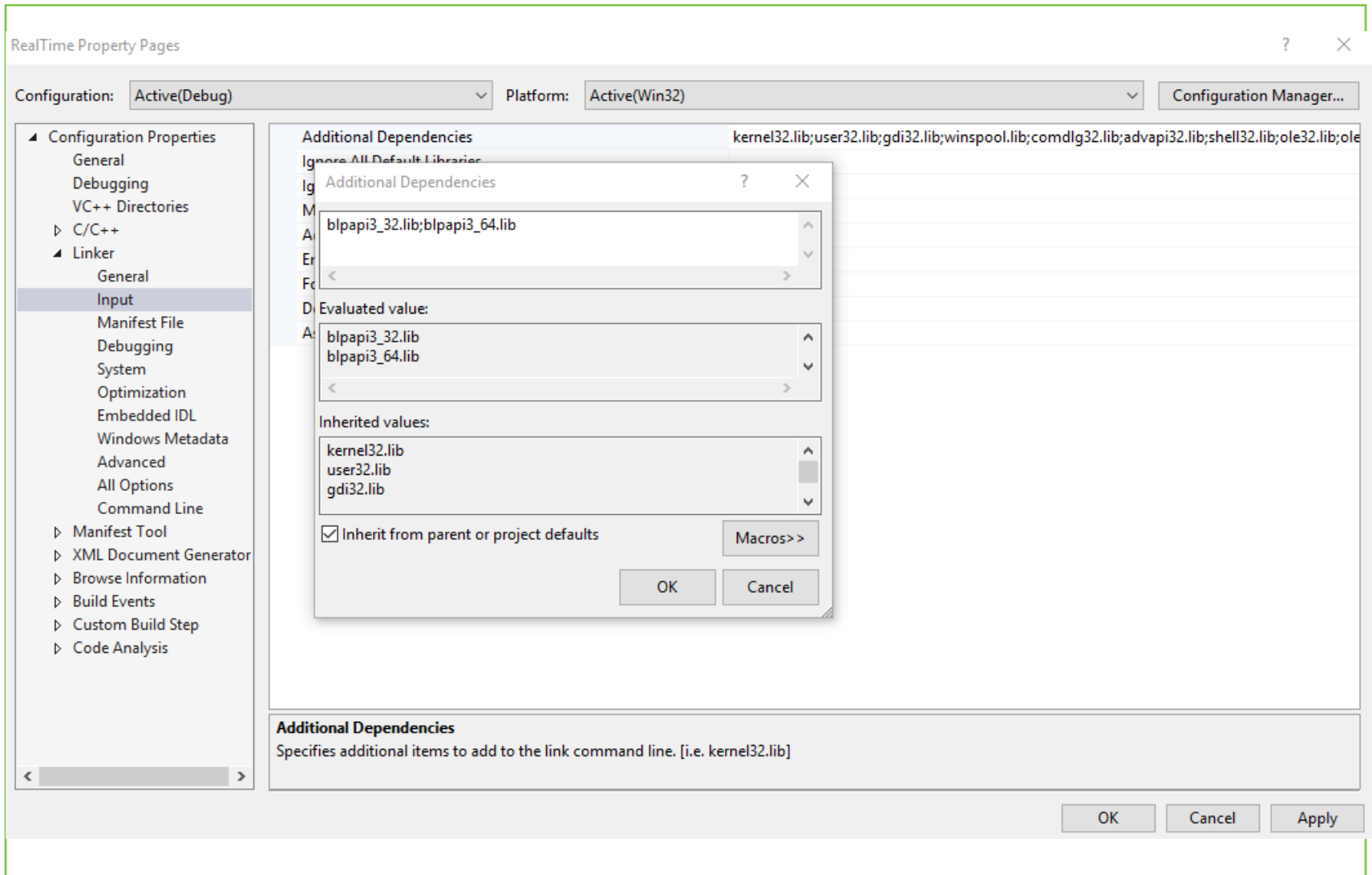
Output File

The /OUT option overrides the default name and location of the program that the linker creates.

OK

Cancel

Apply



References

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- Bloomberg API, www.bloomberglabs.com/api/libraries
- Bloomberg API, Version 3.x, Developer's Guide, June 30, 2014 Version 2.54, bloomberglabs.com/content/uploads/sites/2/2014/07/blpapi-developers-guide-2.54.pdf.
- Programming the Bloomberg Open API using C++ Real-Time Data with Subscriptions, holowczak.com/bloomberg-api-cpp-win32-subscriptions.