Creating a Linchpin for Financial Data: Toward a Universal Legal Entity Identifier

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Discussion Paper: Approach toward establishing and maintaining a universal standardized legal entity identifier, or LEI, for financial data.

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I. Introduction

The financial industry runs on information and data. Although financial data are made up of innumerable complex and idiosyncratic components, a fundamental building block for analysis is reference data about companies, organizations, and firms (henceforth referred to collectively as entities). Reference data might include a number of things, but an essential component is a systematic structure or code that uniquely identifies entities and their legal relationships with parent companies and subsidiaries capable of tracking changes in these relationships over time and quickly incorporating information on newly created entities. A universal, standard legal entity identifier (LEI) would likely provide a "public good" in that it could permit cheaper and more efficient analysis for all interested parties. It could also facilitate analysis that is currently incredibly difficult due to the plethora of proprietary entity identifiers.

An LEI could also be a critical component for measuring and monitoring systemic risk. The financial crisis demonstrated the extreme complexity of interrelationships and dependencies that exist between parties, counterparties, issuers, guarantees, and guarantors and how strains can rapidly spread through the financial network when one or more of the nodes within these horizontal or vertical relationships come under pressure. In principle, a system of unique identification of every entity would help to map these types of (inter)relationships in the financial system and allow a better understanding of the key linkages in advance of a crisis.

The financial services industry has been exploring the issue of unique entity identification for decades. More recently, several efforts have been made to advance the idea of a standard LEI, but competing priorities, funding issues, and an evident lack of industry focus have kept such a standard, and the benefits it could have yielded, from being implemented. However, recent economic events (historic market turmoil resulting in unprecedented numbers of mergers, acquisitions, divestitures, bankruptcies, and so on), suggest that this may be the right time to reconsider the usefulness of such a standard, especially one that is universal and based on an open architecture and determine how a universal and standardized LEI could be implemented. Indeed, the passage of the Dodd–Frank Wall Street Reform and Consumer Protection Act requires several financial regulators to write rules that involve entity identification, and the legislation set a tight time line for establishing these rules.

This paper explores the current state of entity identification in the market, the problems generated by the fragmentary nature of the current systems of identification, and the best-practice options for entity identification. To address these issues and move the discussion forward, the paper lays out a collaborative approach to the way in which the financial regulators and the financial industry might build and maintain a system of LEIs that we think provides incentives to attract interest for the wide range of parties involved. Standardizing identification of organizational and instrument structures identification are equally important, but this paper focuses on the best practices surrounding the implementation of an LEI at the entity level because organizational hierarchy, instrument identification, and counterparty exposure all build upon entity identification, therefore requiring that the LEI problem be solved first.[1]

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[1] Organizational hierarchy refers to corporate structure, including ownership and affiliation. Determining the rules and requirements will be complex and will need to be vetted with financial industry professionals and the regulatory

II. Current State of Entity Identification

The ability of a financial institution to uniquely and precisely identify, define, and link business entities is critical to a wide array of essential business and risk-monitoring processes. For example, business functions such as sales (that is, a holistic view of the client), compliance (for example, "know your customer" requirements), and risk management all rely on unique entity identification. Regulators may require a similar degree of precision as they assess the financial health, systemic risk, and other aspects of markets and their participants as part of their statutory responsibilities and practices.

Although private, public, and vendor entity identifiers are in use today, there is no single or tightly integrated identifier that is consistent across all sectors. There is also no consistent representation of an entity's organizational structure that is commonly used or universally available. Many institutions and agencies cross-reference their identifiers to one another, but ambiguities and inconsistencies in those relationships often make cross-referencing difficult and inaccurate. Simply put, having a multitude of identifiers adds layers of complexity, increases the potential for errors, and results in redundant efforts.

Within the Private Sector
Within the private sector, entity identification touches so many aspects of companies' critical business functions that many firms have created their own internal identifiers to facilitate their business objectives. Even within the same firm, many of these internal solutions have been developed on a department-by-department or function-by-function basis, further complicating internal business flows. In the cases where internal solutions may have provided some relief, on an aggregated, industry-wide basis, these stop-gap measures have further aggravated and complicated an already disparate, inconsistent, and incompatible industry-wide entity identification infrastructure.[2]

Within the Public Sector
The public sector, especially financial and securities regulators, have had to develop identifiers over the decades to track the entities they supervise. However, the identification schemas are often incomplete, do not include all financial organizations, and include relatively few nonfinancial organizations.

The ID_RSSD is the primary identifier for the Federal Reserve's National Information Center (NIC). The NIC includes entity identifiers (the ID_RSSD) and codes for organizational hierarchies. For example, for each bank holding company maintained in NIC, details on all the entities in which the bank holding company has a regulatory or controlling interest are included. These entities include the holding companies themselves (the ultimate parent) and the banks, branches of banks, and nonbank subsidiaries associated with the ultimate parent. Having the ID_RSSD as a unique identifier, combined with the organizational hierarchy, is a powerful tool that allows regulators to sift through a complex web of corporate holdings. Although the ID_RSSD is used for regulatory reporting and is used by some data vendors, its

coverage is not complete beyond the banking industry and is not widely used outside of the regulatory community.

Other commonly used identifiers in the public sector include the CIK (Central Index Key), established by the Securities and Exchange Commission (SEC), which is used to identify issuers and certain shareholders in the SEC's EDGAR system; the Financial Industry Regulatory Authority's Web CRD (Central Registration Depository) and IARD (Investment Adviser Registration Depository) identifiers, which are used to identify broker–dealers, investment advisers, and investment adviser agents; and the National Association of Insurance Commissioners' company code and a group code which is used for the insurance industry.

When looking at this data landscape, the challenges for data analysis become obvious. When combining data collected from these separate industries, researchers and regulators must perform complex and time-consuming data matching across identifiers. Any researcher trying to merge banking data with data from other agencies must create and maintain his or her own cross-references between the data sets. And since, in many cases, the only common "link" between data sets is the entity name, matching on a name can be extraordinarily time consuming and can easily lead to erroneous results, particularly where no common, rigorous naming convention for entities exists.

In the Financial Data Vendor Industry
In the financial data vendor industry today, many vendors offer entity identification numbers and hierarchies as part of their product offerings. Many vendors adhere to industry best practices, providing unique identification of companies over time (see section III of this paper). However, most of these identifiers and hierarchies are proprietary and restricted contractually as to their use and redistribution. Many vendors see proprietary identifiers as a means to be commercially "sticky" with their clients creating a commercial conundrum that does not lend itself to what should be an industry-wide open standard solution.

Other Key Industry Players
Several other key players should be considered in evaluating the current state of all existing legal entity identification solutions. Several industry utilities—the Society for Worldwide Interbank Financial Telecommunication (SWIFT) or the Depository Trust and Clearing Corporation (DTCC), for example—may be willing to provide expanded entity identification solutions for the market. The International Standards Organization, or ISO, maintains various unique identification standards and is considering expanding existing standards or creating new ones to accommodate this industry need. And finally, several vendors have recently announced to the industry that they are willing to offer or are offering "open standard" identification solutions—the terms, conditions, and commercial aspects of these offerings have yet to be fully investigated.

Summary
In summary, the current landscape of legal entity identification solutions is disparate and incomplete and does not consistently meet the needs of the finance industry or its regulatory agencies. Understanding the current products and services available in the industry today is critical to understanding the operational and risk challenges that the industry faces, and it is also critical to formulating a best-practices solution that can provide both the private and public sectors with a way to foster improved efficiency and improved risk oversight.

III. Value of a Standardized LEI

As previously stated, unique legal entity identification is a critical factor of input to operational efficiency and risk management. Without an unambiguous and persistent identifier, the industry (and the regulatory community) faces operational hurdles on a regular basis. This section uses a number of specific examples to demonstrate that a case can be made that a universal, standardized LEI has the key aspects of a "public good"—that is, by allowing efficient analysis of firm-wide or industry-wide financial activity, a standardized LEI essentially offers positive externalities to the research and regulatory communities.

Below are examples of the hurdles encountered because of the lack of an industry-wide LEI:

1. *Identification of Non-Broker-Dealer Financial Industry Affiliates and Parent Companies*
   One of the key responsibilities of the regulatory community is to analyze the risk and effect of broker–dealer firms. In performing this analysis, a review of parent and affiliate companies of the broker–dealers is often required.

   Within the regulatory community, CRD numbers are used to identify broker–dealers. For broker–dealers, CRD numbers enable easy identification of parent and affiliates. However, if the parent, affiliates, or both are not broker–dealers, then outside data (such as the SEC form 10-K) must be used.

   Since no unique identifier is used across disparate sources (in this case, on the broker–dealer reports and the SEC financial 10-K and 10-Q reports), the parents and affiliates must be identified manually. Today the non-broker-dealer, non-investment-adviser affiliates and parent are identified by name, and as previously discussed in this paper, manual identification based on nonstandard naming conventions is highly prone to error.

   The introduction of an LEI could allow for consistent identification of the same non-broker-dealer, non-investment-adviser affiliate or parent associated with multiple broker–dealers and provide greater ability to identify systemic risk in broker–dealer firms.

2. *Identification of Counter Parties Involved in Trading, Clearing, and Settlement Activity*
   a. *Exchange product transactions*
      In today's market, each exchange (for example, the New York Stock Exchange, London Stock Exchange, and NASDAQ Stock Market) assigns a different market participant identifier to each broker–dealer. Often within the same exchange, local exchange rules allow broker–dealers to use multiple market identifiers for the same participant.

      The use of multiple market participant identifiers and the lack of consistent identifiers across exchanges combine to create a process that, in some instances, presents complications in the identification of the broker–dealer responsible for trades in a consolidated order audit trail.

      The introduction of an LEI would allow for the determination of the broker–dealer that facilitated the transaction and assist in assessing compliance with SEC and exchange rules.

   b. *Over-the-counter product transactions*

For over-the-counter (OTC) product transactions, most broker–dealer firms have developed internal solutions, sometimes across multiple systems within the same organization, to identify the counterparties to a transaction. Without a unique identifier assigned to each of the counterparties, it is extremely difficult to identify the exposures of the parties resulting from the transactions.

An LEI could also aid in position tracking. For each commodity, commitments of traders' reports issued by the Commodity Futures Trading Commission (CFTC) provide information on the size and direction of the positions taken, across all maturities, by three categories of futures traders: "commercials," "noncommercials," and "nonreportables."

The introduction of an LEI could enable easy identification of the same party across multiple transactions and, as a result, identify exposure and aid in position tracking activity.

c. *Instrument issuance tracking*
   Instrument issuance tracking refers to the tracking of financial instruments (also known as issues) issued by legal entities (also known as issuers). In order to effectively maintain the relationships of "issues to issuers," and track these issues in the secondary market, unique identification of both issue and issuer are required.

   Although this paper is focused on discussing the LEI (identifier of the issuers), it is worth noting that significant gaps still exist in the assignment of financial instrument identifiers. Although multiple financial instrument identifiers are in use today (CUSIP, ISIN, VALOREN[3], and so on), many asset classes are still without standard identifiers (for example, certain derivatives, loans, and so on). In order to establish a robust linkage connecting parent to child and child to issue, both instrument and legal entity standards should be established, made consistent, adopted, and supported.

   This work is also critical to tracking changes due to corporate actions. Tracing entities (and their issues) through corporate actions can be difficult, especially with regard to small entities that are not covered by analysts or whose reports and announcements are not disaggregated by data intermediaries. The use of an LEI, traceable throughout the life of such an entity, could improve the ability of investors and regulators to track such activities.

d. *Payment, clearing, and settlement activity*
   Once counterparties have entered into a financial transaction, they must clear and settle that transaction. This process often involves not only the original counterparties to the transaction but also a host of intermediaries and financial market utilities, including a variety of financial institutions. As with exchanges, each financial market utility assigns its own participant identifier(s) to each clearing entity.

   The use of multiple clearing participant identifiers and the lack of consistent identifiers across payment systems, central securities depositories, and central

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[3] CUSIP (Committee on Uniform Securities Identification Procedures), ISIN (International Securities Identification Number), and VALOREN numbers are codes that uniquely identify specific securities issues. CUSIP is used primarily in the U.S. and Canada. VALOREN is used primarily in Switzerland, and the ISIN is used on internationally traded securities.

counterparties present complications in the identification of common legal entities participating across multiple financial market utilities and their related settlement activity and exposures, both on an ongoing basis and in times of financial stress.

The introduction of an LEI would facilitate identification of the same party across multiple financial market utilities and, as a result, facilitate the identification of common entities and aid in tracking settlement activity and exposures.

3. *Economic Research*

Researchers at government agencies, at universities, and in the private sector frequently need to combine data from a variety of sources in order to get a comprehensive picture of a particular market or profile a particular entity. When combining data from multiple sources, it is critical that data collected be normalized, combined, and compared.

In the absence of a standard LEI, researchers, as well as financial institutions, are forced to perform time-consuming and costly cross-referencing, mapping, and reconciling exercises before they can effectively analyze the data collected, enabling them to provide the necessary oversight over complexity and guard against unacceptable risk. In the aftermath of the recent market crisis, greater focus will be placed on such analysis, some of which is mandated by new legislative law. Standardized LEIs are critical enablers to this type of analysis.

It is also necessary for researchers to look at entities or panels of entities over long periods. In constructing time series, the legal entity is not always the entity of greatest interest to researchers. For instance, it is not uncommon that a merger of banking organizations results in one legal entity acquiring a bank charter and negligible assets while another legal entity (operating under a different charter) acquires the bulk of the assets and liabilities. In some cases, researchers prefer to follow the entity holding the assets and liabilities rather than the entity that acquired the charter. In either analysis, clear and unambiguous identification of entities is the elemental building block that enables analysis and tracking of legal entities over historical periods.

In the end, macroprudential regulation and policy decisions are driven by economic research, so the ability to collect and properly analyze data from across the industry has a direct effect on these decisions. Improved economic research through the implementation and use of a standard LEI could lead to a more effective regulatory regime and better informed policy decisions.

4. *Holistic View of the Business*

The challenge of entity identification is not limited to regulators and researchers.[4] Private organizations and data vendors that consume, create, aggregate, or store data about financial firms also have a need for industry-wide entity identifiers. Many critical business functions within financial firms and financial market utilities are dependent on unique identification of legal entities. As firms have migrated away from the traditional product-centric operational strategies to a more service oriented approach, businesses are increasingly analyzing a diverse set of product offerings across business lines rather

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[4] David Bannister (2010), "Single Customer View: Keeping One Eye on the Ball," *Banking Technology,* September 7, https://bankingtech.com/bankingtech/single-customer-view-keeping-one-eye-on-the-ball/20000186662.htm;jsessionid=343059201690E8054AC34A446423717C.f11b1cefac76ad95c7627468fee9bde7e866d022.

than evaluating products in isolation. This is referred to as a holistic view. The need for a holistic view is also true of financial market infrastructures such as central counterparties and settlement systems that are increasingly becoming more integrated through operational linkages and common corporate relationships.

In order to achieve the holistic view, firms are constructing consolidated views (building central data warehouses), where information from multiple business lines are pooled together for analysis and review. As stated previously, generating and maintaining internal identifiers is a costly and error-prone exercise. And the ability to share data across firms, or report to regulators in a consistent and standard manner, is hampered by the need for additional cross-referencing.

Having publicly available LEIs could enable organizations to operate more efficiently; could enable organizations to provide better risk analysis and customer service; and could better prepare organizations to be compliant with regulatory reporting requirements resulting from newly implemented regulatory reform.

IV. Key Elements of a Standardized LEI

When creating a universal, standardized LEI, it makes sense to follow the best practices that have been established in the development of proprietary identifiers. Some of the key components of what should be considered in defining the LEI standard are as follows:

1. *Scope of Coverage*
   All eligible market participants, including governmental agencies such as the Federal Deposit Insurance Corporation, or infrastructure participants such as the DTCC, should be assigned a unique LEI. These participants include, but are not limited to, financial intermediaries (banks and finance companies), companies listed on an exchange, companies that trade stock or debt, entities under the purview of a financial regulator, and their holding companies.

2. *Entity Types That Need Identifiers*
   Entity types should include issuing firms, entities acting as guarantors, selling firms (broker–dealers), buying firms (asset managers), clearing and settlement organizations, custodian and agent banks, payment system participants, distributors of financial products, exchanges and other trading system operators, collective investment vehicles and portfolios, hedge funds and fund managers, partnerships, government bodies , and supranational organizations.

   Although the need to identify subsections of a firm, such as a branch or trading desk, is sometimes necessary for use by regulators or market participants, the need is not uniform, and therefore the LEI should be set at the entity level. In the cases where a corporate hierarchy exists, the LEI should be assigned to each entity within the organization, not just the parent. Estimates indicate that within the United States, this universe would total between 500,000 and 2,000,000 entities.

3. *Structure of the Identifier*
   Several characteristics of the LEI are ideal for the identifier to be useful to a large audience.

   a. *Singularity and uniqueness*

There should be only one identifier per entity. Each entity within a corporate organization should have its own unique identifier. And every identifier should be unique and never reused.

Singularity and uniqueness are necessary to ensure that data users can confidently and easily identify a specific organization. Singularity would require that, over time, financial regulators would recognize the LEI even if they continue to maintain a separate internal identification system.

b. *Persistence and neutrality*
An identifier should follow an entity through its life regardless of corporate actions or other business or structural changes. The LEI should follow an entity through name changes, location moves, charter changes, and the acquisition of other entities. Persistence is important not just because it reduces the need to research changes but also because it reduces errors in analysis. Almost all economic analysis includes some evaluation of data over time.

For an identifier to be persistent over time, it should be neutral. For example, it is popular to incorporate geographic information or company name information into a corporate identifier. However, this practice violates basic data management principles and best practices regarding unique identification symbology. Descriptive attributes should not be coded into the identifier. Doing so creates a tight coupling of identifier to characteristics and, if allowed to happen, requires an identifier to change every time an entity characteristic changes. Entity characteristics should be viewed as separate elements within a reference data system and should not be incorporated into the identifier.

Only in the case where the legal status of an entity changes should the assignment of a new identifier be considered (usually in the case of a major corporate action, such as a merger or acquisition), and it should follow very strict and comprehensive rules. If this event occurs, the changing of the LEI should be based on a set of principles defined by a council of rule makers who are responsible for maintaining historical identifiers and links to those identifiers for audit and historical analysis purposes.

c. *Extensibility*
To ensure that the LEI will be persistent and unique over time, it is important that the LEI be extensible. The identifier should be robust enough to allow for growth in the volume of identifiers without having to reuse numbers. To ensure extensibility, standard algorithms used in industry today to create and properly size unique identifiers should be used in creating the LEI.

d. *Reliability and interoperability*
Finally, if the LEI is expected to be widely accepted, assurances that it is reliable and interoperable must be made. The mechanism for assigning and maintaining identifiers must ensure high quality. Users of the LEI must be confident that they have uniquely and accurately identified the firm they are looking for.

Where possible, the LEI should be compatible with existing systems and not conflict with other numbering or identification systems. The LEI must be usable in different computer environments to facilitate automating processes. In addition, the schema should be standard and work across various platforms.

4. *Public Availability*

Use of identifiers must not be contractually restricted in their use. The LEI must be available for use for report collection and dissemination. It is particularly important that LEIs be publicly available for counterparty reporting and identification.

5. *Incentive Compatibility*

To the highest degree possible, entities should desire to use the identifiers in their accounts, for payments, for risk management, and for other purposes and to act in ways that lead to maintenance of the system of identifiers. Incentive compatibility of the reference data system is critical if its usefulness is to survive inevitable shifts in market structure and function. If entities see an advantage in doing their part to maintain the system, the system is more likely to be robust than if it operates purely under compulsion. Some degree of compulsion may be necessary to start the process, but every effort should be made to involve players in such a way that everyone has a vested interest in its continuation.

6. *Registration Process*

Time frames for assignment will need to be defined and the assignment of a new LEI should not materially hinder the normal course of a firm's business. The turnaround time for identifier assignment should be less than the average number of business days required to form a new organization and may need to be intraday in some cases.

7. *Quality Assurance Processes*

Requirements should include a demonstration of high-quality processes—in identifier assignments and legal entity hierarchy mappings—and should demonstrate sound maintenance practices, especially throughout the corporate action event processes. These processes should be adequately governed and auditable.

A critical quality control is ensuring that duplicate identification numbers are not erroneously assigned. The quality assurance processes should include checks for existing entities, including name searches, address searches, and combinations of text strings and other characteristics.

A number of standards used in industry today ensure quality and accuracy in identification assignment. For example, the Item Unique Identification Standard is an identification assignment implemented by the Department of Defense (DoD) to uniquely and unambiguously identify objects (that is, equipment, operating materials, and supplies), enabling lifecycle traceability.[5] The Universally Unique Identifier is another unique identification standard used in software development, intended to enable unique identification without significant central coordination. No matter the methodology selected, LEI creation should adhere to industry best practices in identification assignment to ensure high quality and accuracy.

8. *Relationship to an Open Standard*

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[5] U.S. Department of Defense, Defense Procurement and Acquisition Policy, "Unique Identification," webpage, www.acq.osd.mil/dpap/pdi/uid/index.html.

Entity identification should work through an open standard. As early as 1998, the U.S. government recognized the need to move away from institution- or government-unique standards toward voluntary consensus standards[6].

9. *Reference Data*

Reference data should be sufficient to verify that users have correctly identified an entity. At a minimum, the reference data should include the entity's name and location and be part of the publicly available information.

V. Implementation Issues for a Standardized LEI

In addition to gaining consensus about what elements a standardized LEI should include, there would no doubt be numerous implementation issues to overcome. This section discusses three possible approaches to establish, implement, and service an industry standard LEI. The first approach suggests implementation via the private sector. The second suggests implementation by the public sector. The third discusses a hybrid approach, combining regulatory participation with industry infrastructure and best practices. For all three approaches, developing an industry-wide consensus on the approach will be difficult, and start-up costs are likely to be significant. A significant difference between the approaches is how decisions are made and who will bear the costs.

It should be noted that, regardless of the solution selected, a successful legal entity implementation and maintenance strategy will almost certainly involve some level of international cooperation.

1. *Private-Sector Solution*

As previously stated in this paper, many vendors offer entity identification numbers and hierarchies as part of their product offerings. A number of vendors and industry utilities issue entity identification numbers today, including but not limited to Standard & Poor's, Avox, Omgeo, FactSet, Bloomberg, Thomson Reuters, Dunn & Bradstreet, Telekurs, Markit (red code), SWIFT, and Alacra. And many such numbers have been used successfully to facilitate trade settlement and cash transfer for years.

For the private sector to be successful in establishing and implementing a unique LEI, a single identifier would need to emerge out of the multitude of identifiers that already exist. Although the industry has created a cache of artifacts, analysis, and design documents that speak to the problem, the obvious commercial and competitive challenges remain, as many vendors in the market view their identifiers as proprietary or as components of their larger product offerings.

For the private sector to solve this problem itself, financial institutions would need to apply pressure to the vendor community and demand that a collaborative solution be reached.

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[6] Office of Management and Budget (1998), *Circular A-119, Revised,* a circular on federal participation in the development and use of voluntary consensus standards and in conformity assessment activities, February 10, available at www.whitehouse.gov/omb/circulars_a119.

2. Public-Sector Solution

For the public sector to address this problem, the global regulatory community would need to become the assigning and maintaining agent of the LEI, operating across multiple jurisdictions. As implied in the private-sector approach, creating and maintaining a high-quality LEI system could be costly. For this approach to work in the public sector, government funding could be needed in every jurisdiction. The scope and size of the agency, given the responsibility of the LEI, could need to expand to accommodate the universe of entities that fall under the LEI banner and to support the community of users that need to acquire identifiers from the agency. And the agency should be prepared to interact on a regular basis with an expanded universe of global LEI facilitators.

The LEI could be viewed as and considered a critical public good. The most applicable examples of a public-sector solution, all-be them domestic, are the Social Security Administration's issuance of the Social Security number[7] and the Internal Revenue Service's issuance of the taxpayer identification number.

3. Private-Sector Solution with Public-Sector Involvement

The third approach is to establish a collaborative solution between the regulatory community and commercial providers.

In this model, the public sector acts as the guide and catalyst for the solution, while the private sector provides its expertise and vast data management infrastructure and distribution capabilities to establish and propagate the identifiers in the most efficient and effective manner possible.

Several existing models for public and private cooperation may be considered.
   a. The first example of a successful implementation relates to Internet domain names. In June 1998, the Department of Commerce (DOC) issued a white paper endorsing the creation of a new not-for-profit corporation of private-sector Internet stakeholders to administer policy for the Internet name and address system. In November 1998, the DOC formally approved a new corporation, called the Internet Corporation for Assigned Names and Numbers (ICANN). Later that year, the DOC and ICANN established a memorandum of understanding (MOU). That MOU initiated a process intended to transition technical Domain Name System (DNS) coordination and management functions to a private-sector not-for-profit entity (that is, ICANN). The DOC retained a role with respect to the DNS via three contractual agreements.[8]

   b. The National Information Exchange Model (NIEM) is another example of public and private cooperation. NIEM is designed to support processes and standards that allow jurisdictions to promptly and effectively share critical information. Data are formatted in a consistent manner so that they are exchanged and

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[7] This example does not imply that the LEI would apply to all individuals.

[8] See U.S. Department of Commerce, National Telecommunications and Information Administration (1998), "Management of Internet Names and Addresses," statement of policy (Docket No. 980212036-8146-02), www.ntia.doc.gov/ntiahome/domainname/6_5_98dns.htm. Details regarding those agreements and Internet domain naming more broadly can be found, for example, in Lennard G. Kruger (2009), *Internet Domain Names: Background and Policy Issues* (Washington: Congressional Research Service), www.fas.org/sgp/crs/misc/97-868.pdf.

understood from organization to organization, without confusion derived from semantics. This standard allows NIEM to greatly assist in the coordination of efforts following large-scale emergencies by providing a shared information platform.[9]

    c.   A government-owned and contractor-operated (GOCO) model could also be considered. This model appears to be commonly employed by the military. The DoD contracts with hundreds of different companies that provide essential services for it at DoD-owned plants. Lockheed Martin and Boeing are examples of primary operators of GOCO plants, each with outstanding contracts of around $10 billion from the government in fiscal year 2009. This setup allows each party to more efficiently provide services for which they are well suited. The DoD outlines product needs, while contractors implement production steps.[10]

    d.   The automated clearinghouse (ACH) network is another example of private and public collaboration to meet the needs of the economy.   Rules for the ACH network are set by the National Automated Clearing House Association. There are only two operators of the ACH system—the Electronic Payments Network, owned by The Clearing House, and FedACH, owned by the Federal Reserve System.

VI. Discussion

Recognition is spreading in the private and public sectors, both here and abroad, that standardized legal entity identification could serve as a critical element in the analysis and monitoring of financial stability and systemic risk.[11]

Upon reviewing the current state of legal entity identification in the industry today, looking at the gaps that exist and the challenges they create, and reviewing the possible approaches to addressing these challenges it appears likely that a private-sector solution with public-sector involvement may provide the most robust and expedient solution to this industry-wide problem. In addition to the practical advantage of a joint effort, this approach is also consistent with the practices defined by the OMB *Circular A-119, Revised,* which encourages public and private collaboration.[12]

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[9] See National Information Exchange Model, "Learn More about NIEM," webpage, www.niem.gov/whatIsNiem.php.
[10] See FedSpending.org, a project of OMB Watch, "Contracts for Operation of Government-Owned Facilities— Government-Owned Contractor-Operated (GOCO) R&D Facilities (FY 2000–2009), webpage, www.fedspending.org/fpds/fpds.php?psc_sub=M181&detail=-1.
[11] Dick Hales (2004), "Who needs (or even wants) the new Legal Entity Identifier (LEI)?" IT-Director.com, June 17, http://www.it-director.com/business/content.php?cid=7166.

Office of Financial Research (2010), "OFR Policy Statement on Legal Entity Identifiers", http://www.treas.gov/ofr/docs/OFR-LEI_Policy_Statement-FINAL.PDF.
[12] The National Technology Transfer and Advancement Act of 1995 codified OMB *Circular A-119* and directs federal agencies to use voluntary consensus standards in lieu of government-unique standards except where inconsistent with law or otherwise impractical. This provision's intent is to eliminate the cost to the government of developing its own standards, decrease the burden of complying with agency regulation, provide incentives and opportunities to establish standards that serve national needs, encourage long-term growth for U.S. enterprises, promote efficiency

With the passage of the Dodd–Frank Act, various elements of this new legislation call for the implementation of data and content standards in collecting and analyzing critical market information. Recently, the CFTC and SEC released proposed rules addressing counter party identifiers.[13] Given this mandate, a second recommendation of this paper is to align the objectives of the establishment of a standard LEI with the data standard mandates of the act, to ensure consistency in approach, and to leverage the importance and urgency of these efforts to address these critical data needs.

The next steps toward resolving the LEI problem are to gather financial industry participants to explore the variety of issues. This work could include encouraging market participants to host information gathering sessions or rely upon regulators to develop a public process for examining these issues.

The approach should be open and collaborative. One method is to rely upon a series of requests for information by the involved regulatory community members that could gather input from interested parties on the various questions about structure, maintenance, governance, licensing, and the full range of issues.

The initial implementation should address the highest-priority use cases, with a road map to address the other use cases over time. The important topics of reference data and organizational hierarchy need to be addressed in conjunction with or shortly after the development of the LEI. To ensure robust reference and hierarchy data it could be beneficial if the implementation were flexible and iterative.

The plans to create and adopt a standard LEI must pass the rigors of industry acceptance and be viable and reasonable in its implementation. Throughout all of this and future analysis, iterative implementation should be considered wherever possible. Although this point is more of an implementation consideration than a specification consideration, moving this standard forward in a meaningful way through iterative rollouts, implementation, and acceptance could provide benefits more quickly and enable useful modifications to the standard.

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and economic competition through the harmonization of standards, and further the policy of reliance upon the private sector to supply government needs for goods and services.

In addition, to promote trade and implement the provisions of international treaty agreements, the provision requires federal agencies to consider international standards in procurement and regulatory applications. As defined in OMB *Circular A-119,* "voluntary consensus standards" are standards developed or adopted by voluntary consensus standards bodies, both domestic and international. These standards include provisions requiring that owners of relevant intellectual property agree to make that intellectual property available on a nondiscriminatory, royalty-free, or reasonable royalty basis to all interested parties. "Voluntary consensus standards bodies" are domestic or international organizations that plan, develop, establish, or coordinate voluntary consensus standards using agreed-upon procedures.

[13] CFTC (2010), "Swap Data Recordkeeping and Reporting Requirements",
http://www.cftc.gov/ucm/groups/public/@otherif/documents/ifdocs/federalregister112210.pdf.

SEC (2010), SEC Proposed Rules on Security-Based Swap Reporting", http://www.sec.gov/news/press/2010/2010-230.htm.

VII. Conclusion

Public and private industry has recognized for years that clear and unambiguous identification of legal entities is critical to financial research, markets monitoring, and systemic risk analysis. But the common problem encountered by all organizations that use financial data is that unique and accurate identification of legal entities and their subsidiaries without a recognized industry standard has been very difficult, costly, and prone to error.

The global financial community experienced what may have been the worst economic crisis since the Great Depression. And through that experience, many individuals now recognize the need for improvements in our global regulatory mechanism that will provide for real-time analysis across multiple financial markets to identify systemic risks and stresses in market conditions before they occur. For years, efforts to develop and implement an industry-wide legal entity identification standard have been unsuccessful. The economic incentive to invest in an operational standard was a difficult case for the industry to make. The vendor community tried to provide solutions for these private and public challenges; however, no solution has been sufficiently robust, comprehensive, or open to serve as an industry-wide standard. Viewing the LEI as a public good that could provide efficiencies across the financial industry and may help to create the incentives to develop an industry-wide standard.

A standardized and universal LEI could enable examiners, economists, and financial analysts to accomplish analyses during stressed market conditions and improve systemic analysis across the breadth of the financial markets. Such an identifier could improve analysis conducted not only by the regulatory community but also the financial services industry at large, both domestically and internationally.

Acknowledgments

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