

Stronger and more consistent financial data standards will enhance financial stability by addressing a major deficiency that impairs decision-making. Data standards, when implemented appropriately, will promote data transparency, comparability, and quality, enabling aggregation of risks, financial stability monitoring, and better firm risk management. Congress mandated the OFR to standardize the types and formats of data reported and collected. We have focused initially on one of the most fundamental standards: the need for a global Legal Entity Identifier (LEI).

5.1 What Are Data Standards?

Consumers and businesses are familiar with the value of data standards to promote understanding and comparability by providing common, clear definitions—examples include nutrition information published on packaged foods, the bar codes that, through the use of scanners, identify products at supermarket checkout lanes, and destination and other information on shipping containers. Standards also promote efficiencies and economies of scale—for example, note the growth of the Internet following common acceptance of the Internet Protocol.

The financial services industry and financial regulators have long employed data standards. There are common identifiers for registered securities, regulated legal entities, and certain financial transactions. Financial data vendors also use identifiers for their products, some of which have become de facto standards.

But these standards, while widespread in some cases, are not global or universal and are often plagued by gaps and overlap. They are sometimes subject to limits on use when they are proprietary, there is no common vocabulary or mapping to navigate among them, and they were not conceived or operated with a systemic perspective. There is also no consistent standard used to measure data quality.

The lack of high-quality, consistent, and accessible data was a key source of risk in the financial crisis. Risk systems designed to assess counterparty risk, interconnections, and short-term funding were strained because, in part, the data they required and even the reports they generated lacked standards for basic data identifiers, elements, and terms. Regulators and policymakers were caught trying to aggregate information from disparate systems, each with proprietary naming conventions for counterparties and instruments. Differences in the amount and consistency of information on terms and conditions of the data meant that even when common transactions were identified, there was limited assurance that they could be compared with certainty. The lack

of consistent and high-quality data not only exacerbated the buildup of risks, it also limited the ability to act decisively in the crisis. In sum, the market lacks standards on how to exchange, transport, and aggregate financial data.

Better data standards can solve many of these problems. Standard entity identifiers can uniquely identify parties to financial transactions; standard product identifiers can allow for comparability across financial products; and semantic standards about terms of contracts can provide precise definitions to describe the meaning of data. In addition, data can be assessed based on the quality of the information.

Each of these standards promotes *comparability*, which means that information can be reliably combined from different sources and systems and that terms and definitions mean the same thing—with no ambiguity—regardless of where the data came from.

Data standards sometimes evolve organically, as markets coalesce around a dominant convention, and they sometimes are set by industry organizations either through informal cooperation—such as the development of the Financial products Markup Language (FpML)—or formal consensus bodies like the International Organization for Standardization (ISO). Financial companies should welcome data standards: they reduce operating costs; they promote automation, so that information does not have to be manually checked and cleaned; they allow companies to aggregate their activities for analysis; and they promote straight-through processing, meaning that a transaction can be tracked consistently from the front office to the back office. For all these reasons, standards promote sound risk management.

In the short run, however, implementing formal data standards presents a collective action problem. Like national defense, data standards represent a public good—something available to everyone, whether or not he or she has borne any of the costs of providing them. Many in industry recognize the benefits of

data standards and are eager to benefit from them. However, those benefits—for internal economic and operational risk management, for prudential supervision, for measuring and protecting financial stability—are long-term and diffuse, while the costs—incurred as a result of changing processes and systems to adapt to the standards—are immediate and concentrated for market participants, companies, and regulators themselves. Consequently, as with some other public goods, data standards require appropriate governance and oversight from public authorities.

That is why Congress assigned to the OFR the responsibility to promote and facilitate the development of financial data standards. The OFR has begun this important work, focusing initially on the need for a global LEI. We are now working to implement the global LEI and also are developing our priorities for further standards work.

This responsibility will require constant vigilance as financial markets and products evolve and standards grow obsolete (*Box I: The Growth of Financial Market Data*). The OFR and financial supervisors will not be able to monitor financial stability and financial companies will not be able to manage their risks if data standards don't keep up with these developments. At the same time, the requirement of any new standard should only be introduced after a thoughtful, careful analysis. The OFR is committed to engaging with the private sector and industry standard-setting bodies and working with regulators to align standards, as appropriate in well-defined cases.

There are many financial data standards in use today. One way to view financial data needs and standards can be by what they describe: entities, financial instruments, financial and business reporting, and transactions.

5.1.1 Entities

The financial crisis brought attention to the lack of comparability and consistency among entity identification standards.

Market participants—and their regulators—were unable to aggregate and then analyze their credit exposures to troubled financial institutions with many legal subsidiaries because there were no unique global entity identification standards in place that would facilitate the construction of definitive ownership or legal entity hierarchies. A large financial institution might have thousands of legal entities, each with their own names. Moreover, while there were identification methods in use in the market, they were diverse, incomplete, overlapping, and not directly comparable; this presented additional problems because of differing maintenance protocols, such as in describing the surviving entity of a corporate merger, the distinctions between different kinds of entities, or the reuse of identification numbers. As described further below, the OFR has made the establishment of a global and unique LEI one of its top early priorities and is active in the global LEI development effort overseen by the Financial Stability Board and endorsed by the G20.

A wide variety of entity identification schemes are used today to identify business, financial, and other entities that are involved in financial transactions. A number of regulatory standards have been established by agencies, including the Research Statistics Supervision Discount Identification (RSSD ID), which is a primary identifier used by the bank regulators, and the Central Index Key, which is used by the SEC to identify issuers, funds, and certain shareholders who have filed disclosures. The Financial Industry Regulatory Authority also has standards that it uses to identify broker-dealers and investment advisers who register with them. Various private sector organizations, vendors, and market participants also maintain proprietary entity identification standards that have met with varying levels of acceptance and adoption in particular markets, sectors, or applications. Some of these private standards have been accepted by the ISO.

Broad use of an LEI and the further spread of entity standards across the financial system

could help market participants and regulators understand the linkages and relationships among legal entities. The incorporation of LEIs into hierarchies of related entities—based upon underlying factors such as ownership, control, or different types of exposure—would further facilitate aggregation. Ultimately, it would be a powerful tool to facilitate the analysis of such phenomena as network effects and spillovers in a crisis.

5.1.2 Financial Instruments

As with entity identifiers, there are multiple schemes both for the identification and for the description of the several million financial instruments that are currently in the marketplace. The impetus for financial instrument identifiers in the United States came from the “paper crunch” of the late 1960s, when trading volumes overwhelmed the ability of market participants to process and clear trades that were paper-based. This event led to the creation in 1968 of the CUSIP Service Bureau, a for-profit joint venture of Standard & Poor’s and the American Bankers Association. CUSIP provides a common language for identifying financial instruments such as stocks and bonds. There is also an ISO standard for individual securities known as the International Securities Identification Number (ISIN). The CUSIP Service Bureau is the American member of the international association that maintains the ISIN standard.

But the CUSIP standard is primarily used for stocks, bonds, and some other instruments. Not all products have definitive standards. In the past decade, the evolution of specialized over-the-counter (OTC) markets such as credit default swaps has led to a proliferation of proprietary standards in this space. As with entity identifiers, extensive investment in software, data, and expertise has been required to maintain relatively “clean” and usable identifiers; nonetheless, errors and mismatches occur regularly. Because financial instruments, like entities, are not static, the data describing these instruments must be updated and maintained as corporate actions occur.

BOX I. THE GROWTH OF FINANCIAL MARKET DATA

The size and complexity of financial data has grown exponentially, reflecting the growth and complexity of financial activity. These changes pose increasing challenges to data managers.

The growth of the financial sector in the United States has been extraordinary. From 1952 to 2011, nominal GDP grew by 4,100 percent and financial sector assets grew by 16,000 percent, according to Flow of Funds data. The sector has also become extraordinarily complex with the growing ubiquity of derivatives and other risk-shifting products.

These developments create data management challenges because they increase the amount of data that has to be taken in, organized, and assessed. For example, every purchase of a share of stock is associated with a trade order; electronic quotes indicating the willingness of market participants to buy or sell a given amount at a given price; confirmation messages that the trade has been completed and settled; entries into the accounts at broker-dealers, mutual funds, or other agents; and data that gets wrapped into risk reporting of financial intermediaries.

Where all this data goes—and how effectively it is used, compared, and aggregated—determines how well the financial system manages risk. Any risks that are introduced in a balance sheet, trading book, or personal portfolio because of data gaps and a lack of data standards only grow more significant and potentially costly as the amount of data increases.

The charts illustrate the growth in financial sector data in the U.S. in the 2000s. **Chart I.1** shows the growth in electronic messages for the equities and options markets. Electronic messages include quotes and orders reported to 15 different markets. They are reported as the number of electronic messages per second for the busiest minute of the day; in essence, this reflects the peak strain on the electronic systems that are the backbone of these trading platforms. Since 2000, this measure has increased from about 7,000 to 2,400,000 messages per second.

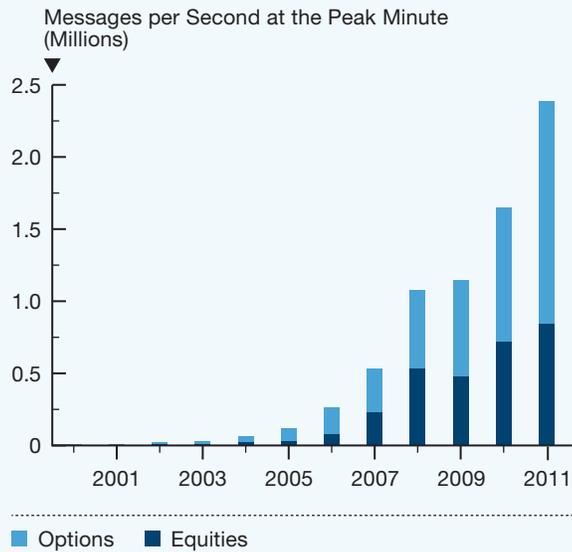
The growth in message traffic that creates these new data demands is not driven primarily by increases in the number of trades; between 2000 and 2011, annual trade volume in equities rose just 10 percent. Rather, it reflects increases in the number of quotes—indications that a market participant is willing to buy or sell—made possible by technological developments. Technology has increased the capacity of market participants to evaluate financial instruments and generate quotes, enabled algorithmic and high frequency strategies that play out across multiple trading venues and financial instruments, and increased the speed with which information can be processed. In 2000, options markets transmitted about 350

quotes for every trade. By 2011, that number had increased to about 7,750 **(Chart I.2)**.

Meanwhile, options and equities are just a part of the financial markets. Similar trends are playing out in markets for fixed-income securities, futures, swaps, and other derivatives. And these financial instruments are often fundamentally related to one another—for example, options on the same underlying asset, or exchange-traded funds and the underlying stocks in their portfolios. Large and increasing volumes of data are generated by dozens of trading venues and hundreds of financial institutions across these markets and internationally.

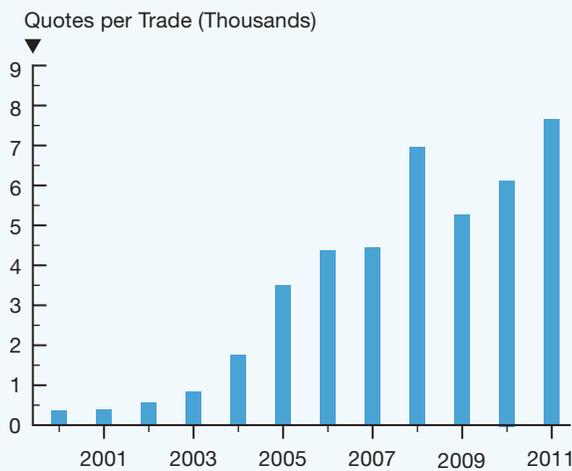
What is the implication of this data explosion for financial markets? Increased complexity and risk. The financial system needs to be able to compare, aggregate, and rely on millions of records created daily by different computer systems with different identifiers, different naming conventions, and different definitions. Such a complex and interconnected system is designed to fail without strong data standards and a common dictionary and definitions.

Chart I.1 Peak Messaging for Options and Equities Markets



Source: Statistics compiled by the Financial Information Forum with data from BATS, Direct Edge, SIAC, NASDAQ and NYSE Arca

Chart I.2 OPRA Maximum Quote to Trade Ratio



Source: Statistics compiled by the Financial Information Forum with data from SIAC

Derivatives pose special problems for standardization because they derive their value from underlying instruments. Asset-backed securities similarly represent collections of instruments, such as credit card receivables or mortgages. Tracing the contents of a product like a mortgage-backed security is especially difficult because there is no standard way to identify and link the specific underlying mortgages to the security. Other complex securities, such as collateralized debt obligations based on managed pools of assets, pose problems because of their complexity. Bilateral swaps can also pose difficulty because of their customized nature.

5.1.3 Financial and Business Reporting

Companies report information in public financial disclosures (such as 10Ks for the SEC), regulatory performance reporting (such as Call Reports for banks and Focus Reports for broker-dealers), and reporting of fund portfolios and positions. These reports have been dominated by standards imposed by regulators or other standard setters and implemented by vendors of accounting and portfolio software systems. This has been valuable for internal purposes for companies and institutions, but even post-merger integration of companies with systems provided by different vendors have been remarkably difficult to combine, even after years of effort. This will remain an issue until standards are adopted and used on a widespread basis.

The implementation of XBRL (eXtensible Business Reporting Language) is an important example of cooperation between the regulatory and business community to improve data standards with broad benefits. Developed in 1998 by a team of accountants and technologists, XBRL is maintained by XBRL International, Inc. and its units at the national level, and it is used extensively in the financial markets. In practice, standardized lists (“taxonomies”) of definitions (“tags”) are developed, maintained, and used for reporting. The taxonomy for U.S. GAAP (Generally Accepted Accounting Principles) reporting

to the SEC, which required all publicly listed companies to report using XBRL starting in 2009, is maintained by the Financial Accounting Standards Board, while the taxonomy for the Call Reports is maintained by the Federal Financial Institutions Examination Council (FFIEC) (*Box J: Case Studies in the Adoption of Data Standards by U.S. Regulators*).

5.1.4 Transactions

Financial transactions represent an area in which the industry has developed standards without government intervention, although there are gaps and weaknesses in those standards. The Financial Information eXchange (FIX) protocol was developed in 1992 out of the trading relationship between Fidelity Investments and Salomon Brothers; it was incorporated as an independent standards organization, FIX Protocol, Ltd., which now oversees a standard for the communication of electronic messaging and transactions. This is an example of how a de facto standard has become a global standard used widely in financial market transactions. The FIX standard has become ubiquitous in the electronic trading of listed securities, including equities, bonds, commodities, currencies, options, and other listed derivatives.

Similarly, FpML was developed from eXtensible Markup Language in 1997 at JPMorgan to provide a methodology to consistently transact derivatives instruments and has become a de facto standard for transactions in derivatives. An FpML organization was created in 1999 to maintain the standard. Again, derivatives and complex securities pose particular problems in standardizing transactions data, but these problems are tractable.

Financial market infrastructure systems used for payment, clearing, settlement, and collateral management are typically based on a combination of FIX, FpML, and the SWIFT (Society for Worldwide Interbank Financial Telecommunication) messaging protocol, depending on the types of instruments and the trading venues. The use of ontologies and

semantics is a promising new avenue to resolve discrepancies in this area.

5.1.5 Definitions of Common Concepts

Behind the preceding discussion of entities, products, reporting, and transactions is the notion that consistent definitions and representations of common concepts across the financial system reduce risk and enhance financial stability. In general, every reader has a shared idea of what the words “bond” or “stock” mean when used in the context of a financial instrument. The commonly shared concepts of these terms ensure the speaker and listener agree to their meanings in conversation without further elaboration or definition. But other terms in the financial lexicon are often murky and undefined. The definitions and terms of a structured product or an OTC derivative are examples where the lack of consistency in terminology can prove costly.

Within the context of electronic systems that capture the data associated with financial transactions, instruments, and positions, the ability for multiple systems to rely on the common definitions of terms and the meanings of names would provide important benefits for aggregation and operational consistency. Users of the combined data could rely on the fact that differences are not attributable to differences in data design or definition. Data could be more easily aggregated to evaluate firmwide, marketwide, or systemwide exposures.

Common definitions often reside within a single type of transaction, financial product, report, or entity. For example, the term “net income” can be defined in a common calculation

for all annual 10-K accounting reports, or a “call feature” can be designed to include similar characteristics or types of terms for all callable bonds. They also can also reside across transactions, products, reports, or entities. The same description could be assigned to the term “net income” in any and all reports where net income is reported.

The value of common concepts exists at a very granular level for data collections. It is exactly at this building block level where differences in definitions limit comparability as data are combined and aggregated. Financial innovation often occurs by changing, often slightly, the terms and conditions of an existing instrument to create something new. But when the way the data are collected and stored does not capture differences in the definition of commonly shared terms, risks can be aggravated.

5.1.6 Libraries and Repositories: Keeping Track of Concepts and Structures

As standards are developed for entities, transactions, reporting positions, definitions, and other dimensions of the financial system, it is important to establish a strong and well-designed system for tracking definitions, ensuring that where possible there are consistent definitions and mapping across standards, and that there is a pool of existing concepts, definitions, and tags to draw from when new data models are being characterized or built. OFR has the mandate, in coordination with other agencies and institutions, to develop a library or repository for data representations and metadata.

BOX J. CASE STUDIES IN THE ADOPTION OF DATA STANDARDS BY U.S. REGULATORS

The OFR will increasingly work with the regulatory agencies to help promulgate and encourage the adoption of data standards that facilitate the sharing of data among agencies and promote the transparency of financial activity. The concept of interagency collaboration is not new; the U.S. financial regulatory agencies have been sharing data with one another for decades and have moved in recent years to better standardize the collection and distribution of data.

The Central Data Repository (CDR) provides one example of an interagency collaboration project aimed to improve the intake, management, and distribution of data through the adoption of common data standards. The banking agencies on the Federal Financial Institutions Examination Council (FFIEC)—the Federal Reserve, FDIC, and OCC—collaborated to build the CDR, a data collection and distribution system for Call Report data built on eXtensible Business Reporting Language, or XBRL.

The business case for the project was clear and compelling. Prior to the CDR and the use of XBRL, the process of collecting, managing, sharing, and publishing Call Report data was inefficient, had multiple handoffs among participants in the data collection process, required significant time to achieve high data quality, and lacked process transparency. Validation of adherence to reporting requirements and the quality of data submissions were not uniformly applied to all submissions because of the multiple systems involved in the process. Thus, accurate data could only be achieved at the expense of the timeliness of the data.

By adopting the use of XBRL within the CDR, the agencies were able to achieve a transformation in the data management process for Call Report data. Reporting requirements and data quality requirements

are now expressed electronically and in machine readable format using XBRL and can be shared among all participants of the data supply chain. This revolutionary way to share reporting metadata among the agencies, reporting institutions and report preparation vendors enabled the agencies to realize tangible business benefits, including cleaner data, faster data inflow, increased productivity, and seamless throughput.

Soon after the implementation of the CDR, the agencies released a Public Data Distribution (PDD) system built on the CDR to modernize and standardize the way Call Report data are distributed to the public. The PDD system leverages the CDR's internal metadata and XBRL taxonomies to automate the flow of information directly from the data intake point, through validation, to direct publication to the public after the data pass certain validation criteria. This automated throughput increases the timeliness of the data for public consumption as well as the transparency of the standards used to validate the quality of the data.

Another example is provided by the effort to improve information about money market funds (MMFs).

The SEC in 2009 mandated that MMFs file monthly a new Form N-MFP with detailed information about their holdings, among

other information, in a file using XML and a standardized set of tags and definitions. This made such information available for the first time—and in a format that the OFR's Data Center can take in from the SEC for use by researchers and for reporting to the FSOC. The OFR can share the transformed MMF data back to the SEC and other FSOC agencies, saving them effort and preserving comparability.

However, lack of a standard, universal set of identifiers makes it difficult to ensure that

securities issued by multiple entities that are related, but which have different names, are in fact the same entities; because of this, aggregating exposures is slower than it should be and prone to errors that would disappear with a proper entity identifier. The lack of consistent identification standards for the entities associated with portfolio securities was and will continue to be a barrier to effective analysis and monitoring of the MMF sector.

5.2 Benefits of Data Standards

Improved data standards would create important benefits for market participants, regulators, and the OFR in its mission to analyze threats to financial stability.

5.2.1 Benefits to Industry

Standardization significantly reduces costs and risks for private companies. Institutions spend billions of dollars simply to cleanse, correlate, link, and maintain vital but complex information on entities, securities, transactions, and other financial information, most of which are dependent on one or more existing standards. But since each financial company creates its own master list of entity and product identifiers, each set depends on different standards, and multiple standards schemes are required to gain full coverage of a domain, for example, across instruments or entities. Businesses spend a great deal of money on technology, tools, and staff to index and map records across different standards—including the often-necessary internal standards across their organization—and to ensure that data integrity is maintained.

Even after a company makes such investments, there remain gaps and inaccuracies. For example, a major cause of failed trades is the use of inaccurate standardized data such as company or product identifiers. And, if the quality of institutional data is poor—say, about its own counterparties and their ultimate parent companies—then a financial institution's own risk management will be inaccurate, which could contribute to erroneous decisions and inappropriate risk-taking.

In short, improved standards are important tools for institutions to advance their own resilience to risk, via better and stronger reporting tools, reporting data quality, and more timely information. The expense of improved industry standards and adoption of global standards could be outweighed by benefits to the gathering, maintaining, cleansing, and use

of critical data for the industry's own operations, risk management, and regulatory compliance.

Industry practitioners have long been aware of these issues but are hampered by both collective action problems and internal incentive issues.

5.2.2 Benefits to Regulators

Data standards are a vital and powerful tool that the Council and its member agencies can use to reduce the complexity of sharing and using data and to improve the information provided to policymakers.

Among the U.S. banking regulators on the FFIEC, there is some standardization of collections in the bank Call Reports and other regulatory data, using the XBRL data standard and a set of common definitions for financial terms. However, agencies vary widely in the complexity of their data analysis requirements and corresponding data management systems. There are many opportunities to converge on existing standards or to develop new ones where none exist. This is essential to understand a financial system dominated by large, complex financial institutions that cross agency lines. Common standards will save money for regulators, increase regulatory productivity and improve outcomes at both the microprudential and macroprudential levels.

The opportunities for sharing information, savings, improved productivity, and better analysis and analytical tools are as great for the Council as the benefits can be for the OFR and for industry. There has been enthusiasm among the Council agencies about the opportunity to develop common standards and to share existing data. The OFR has been working with the agencies, directly and through the Council and its Data Committee, in order to facilitate greater interagency data sharing and to promote data standards.

5.2.3 Benefits to Financial Stability Monitoring

The OFR's ability to research and monitor the financial system is hindered by the fact that

financial data are fragmented into innumerable sets, each with its own technical, definitional, classification, identification, and other standards. Financial stability monitoring and analysis are hindered when data from multiple institutions, sectors, or markets cannot be linked, integrated, and analyzed on a timely or accurate basis.

For example, the analysis of interconnectedness among large, complex financial institutions requires aggregation of data about counterparty risk exposures for large numbers of complex and ever-changing positions. While the data describing some securities—say, exchange-traded equities or basic plain vanilla swaps—are relatively standardized, data on some of the most important securities are non-standard or have multiple non-integrated standards. This can happen because of convention or because there are multiple service providers, each with its own proprietary standard. Even where there is a data standard, the lack of other, related standards prevents reliable analysis of the data.

Data scrubbing and other traditional approaches can be adequate for some analytical purposes that require limited information, for example in studies of single sectors of securities or markets. However, given OFR's financial stability mission and its forward-looking posture, traditional matching and maintenance techniques are not likely to produce actionable data fast enough. In order to use data for research or for monitoring on behalf of the Council, OFR would have to carry out activities that might be prohibitively expensive, extremely time-consuming, and even then likely to yield incomplete and imprecise data. Where strong data standards exist, the OFR has been able to gather and analyze data swiftly, as in the case of the data about money market funds contained in the SEC's new Form N-MFP.

Data standards become even more crucial when it comes to complex markets or products, such as OTC derivatives, or for combining data for securities that are traded across multiple markets. For example, despite the fact that repos

are major funding vehicles for large, complex financial institutions, data standards do not exist. As a result, it remains difficult to gather and compare these important securities with respect to portfolio holdings, trading, and their other characteristics. To the extent that the repo market is vital to the stability of the financial markets, analysts must be able to routinely and precisely access data about this market.

Fueled by globalization and advances in computer power, derivative markets have exploded in size and complexity over the past 20 years. Techniques for structuring securities composed of multiple underlying instruments have led to an almost infinite possible number of connections among firms, their counterparties, and the underlying assets at risk. This complexity has tended to overwhelm

the more mundane accounting and back-office processing systems in the supply chain, creating what has been described as a “data fog,” where specific, discreet answers to questions about who owes who and how much are incredibly difficult to resolve (Tett, 2012). Data standards are not a panacea, but they are a necessary and required part of any solution.

With better standards, the Council and the OFR will be able to conduct more and more reliable research into the sources of threats to the financial system. Researchers will also be better situated to evaluate the efficacy of the guardrails and shock absorbers put in place to limit the buildup of risks. Policies for consideration by the Council can be developed more confidently, practically, and on a timely basis.

5.3 The LEI Initiative

A Legal Entity Identifier (LEI) is a unique code to identify legally distinct entities that engage in financial market activities. Longstanding issues with incompatible systems have contributed to delays and errors in risk assessments for both supervisors and industry participants. Building on earlier work by Treasury staff and the industry in 2010, OFR staff initiated discussions with the FSB in July 2011, leading to a global initiative to address the issue. This initiative, endorsed by the G20 and led by an FSB Expert Group of foreign and U.S. authorities, including the OFR, made substantial progress in the past 12 months and is an impressive example of cooperation among diverse regulators, standard-setters, and private market participants in pursuit of a standard with deep and clear benefits. In May 2012, the ISO published an LEI standard, consisting of a 20-character alphanumeric code and a minimal set of reference data. In June, the G20 endorsed the FSB’s recommendations calling for the implementation of a global LEI by mid-2013, consistent with the ISO standard. OFR staff will continue to play a leading role as this process moves forward.

Historically, the financial industry has lacked a globally accepted standard to identify the parties to financial transactions or the legal entities that create financial instruments. Over time, market participants and the supervisory community created a variety of public and proprietary entity identifiers that address specific needs but none that provides a single industry-wide or global solution.

This gap in standards has made it difficult for risk managers and the supervisory community to analyze counterparty risks, credit exposures, and the relationships between large financial companies and their subsidiaries. Market participants have borne the expense of building and maintaining custom applications that translate and map among systems of identifiers—but these applications require

significant effort, particularly in updating identifiers following corporate mergers and acquisitions, and often relate to only narrow segments of the market. The lack of a standard entity identifier has made it difficult for supervisors to monitor and analyze threats to financial stability, and risk managers have been unable to manage firmwide risks on a timely basis.

While the lack of a universal global entity identification system has been a problem for decades, the financial crisis exposed the depth of the problem. When Lehman collapsed in 2008, neither financial regulators nor private sector risk managers were able to view the total extent to which important market participants were exposed to Lehman and its many legal entities, nor how market participants were connected to each other in global markets.

Industry proposals to address the lack of a standard for entity identification go back at least 20 years. Collective action problems and structural incentive issues have prevented private industry from solving this problem on its own. It is generally agreed that regulators can and should play a role in assisting in the creation and global adoption of a standard when this occurs by requiring standards for regulatory reporting.

In 2010, a task group of U.S. regulatory agencies published a discussion paper on the need for a standardized global LEI (Bottega and Powell, 2011). Several of the contributors to that report have since joined the OFR. Based on its authority under Dodd-Frank and leveraging the strong interagency and private industry consensus on the need for a global LEI, the OFR's first policy statement in November 2010 called for the establishment of a universal standard for identifying entities through a consensus process including the financial industry and international standard-setting bodies (OFR, 2010). In the same month, the SEC and CFTC proposed rules, also under Dodd-Frank, for the reporting of swaps and security-based swaps that would require a

unique identifier for counterparties, should one be available.

The response to the OFR, SEC, and CFTC statements among the industry, international bodies, and foreign regulators has been very positive. In 2011, a global coalition of financial services firms and trade associations published a proposal for industry requirements for a global LEI solution (SIFMA, 2011). Beginning in July 2011, the OFR helped lead the U.S. engagement with national and global authorities, standard-setters, and industry organizations to advance the LEI initiative on the international level. With the endorsement of the G20, the FSB coordinated efforts of the global regulatory community to begin to develop governance and standards recommendations for a global LEI.

The FSB held a multi-day workshop in Basel, Switzerland in September 2011 inviting all stakeholders, public and private, to engage in a range of discussions on the development and implementation of a global LEI. Following the workshop, in December 2011 the G20 endorsed the creation of the FSB LEI Expert Group to study the issue in an expedited fashion and to create recommendations for delivery to the G20 Leaders Summit in June 2012. OFR's engagement through the FSB LEI Expert Group was deep and extensive, chairing and co-chairing working groups and actively working with public and private stakeholders to develop consensus. The culmination of these efforts was the delivery of the LEI Expert Group recommendations to the FSB Plenary meeting on May 29–30, 2012, addressing critical issues of governance, operating principles, and structure for an LEI and recommending its implementation (FSB, 2012).

In May 2012, ISO published its LEI standard, ISO 17442-2012. ISO 17442-2012 describes a 20-character alphanumeric code and a limited set of reference data that enable unique identification of global entities and defines robust open governance of the issuance and maintenance of the LEI data. The LEI will be available worldwide and is scalable. LEI codes

will be unique and will persist with their entities over time (ISO, 2012). OFR staff participated in the ISO LEI standard-setting process and initiated ISO Secretariat interactions with the FSB LEI Expert Group.

On June 20, 2012, the G20 leaders endorsed the FSB recommendations on next steps for implementing the global LEI proposal, consistent with the ISO standard. Following that endorsement, the FSB established the LEI Implementation Group to follow through on the timetable set forth in the recommendation for the global LEI system to be operational by March 2013. OFR is the primary lead for the U.S. regulatory community, working with U.S. regulators and private industry, and is the co-chair of the FSB Implementation Group for the Americas.

The OFR is also working closely with the Council agencies to prepare for the availability of a global LEI. For example, it is working closely with the CFTC to facilitate development and implementation of the CFTC Interim Compliant Identifier (CICI) for swaps. The CICI is compliant with the ISO standard and represents an early implementation of the global LEI system.

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