**Appendix A. Interview Questions and Interview Summary**

*Appendix A.1. Conduct of the Interviews*

In support of this research, we conducted 12 structured interviews using telephone or Skype, to elicit practitioner opinions about the global LEI system. The interviews were arranged on a confidential basis. We have agreed not to name the individuals that we spoke, to or to give any indication of the firms for whom they work.

Our interviewees were five senior data managers in the major global investment banks, and seven industry experts working for advisory firms or consultancies (most of whom are active in the LEI PSPG). Interviews lasted between 30 min and 70 min, and were organized around the following “initial questions”:

* What are the major costs, efficiencies and risk-reductions that could be achieved from using LEI?
* How important is it to have good hierarchy reference data as part of the LEI, in order to achieve these benefits? Should this ownership hierarchy be provided by the LEI system?
* Current regulations (Dodd Frank in the US, European Market Infrastructure Regulation EMIR in Europe) are imposing quite challenging requirements on firms’ OTC businesses. Can LEI be helpful in meeting these challenges, and is it being developed in an appropriate way? Are other elements of the current re-regulation of global financial institutions being developed in a form that is consistent with the business adoption of LEI, or are other regulatory initiatives actually an impediment to adoption?

All of the interviews were developed as wide-ranging conversations about the LEI initiative. The bullet points functioned as a checklist to ensure that we had not forgotten to ask questions about the points of most importance for our research, and to organize our subsequent write up.

We took extensive handwritten notes of the interviews. The interview summaries and the first draft of the paper were circulated to all interviewees, to give them an opportunity to correct any misunderstandings, or to add further points that they think are relevant.

*Appendix A.2. Summary of Interviews*

The remainder of this appendix summarizes the comments made to us during these interviews. Here in this appendix, we were ‘unselective’, including—to the best of our understanding—every point that was made to us by our interviewees (though this has required quite a lot of rewording to ensure that this summary is in coherent written English). The main text of our paper, in contrast, is interpretative; we select and restate the points from the interviews that are most relevant to the narrative of our paper.

**Question 1:** What are the major costs, efficiencies, and risk-reductions that could be achieved from using LEI?

a. General perspectives

One interviewee suggested that there are only four important elements for data management in financial services: the identification of the instrument, the identification of the entity, the contractual details (i.e., the obligations being entered into and the role performed), and the reconciliation of hierarchies (so you know who exactly you are dealing with). Automation of this information will yield a wide range of benefits, both in terms of processing efficiency (both pre- and post-trade) and in the on-boarding of counterparties.

In the financial industry, everything is about data; knowing the counterparty and the securities that are trading. If data can be collected electronically, then there is no data ambiguity. This can lead to substantial social benefits. This is one fundamental principle for the global LEI, going forward.

There is currently no common identifier between the firms and within the firms, for an individual legal entity. Where firms have used external identifiers, these have the AVOX ID or BIC, neither of which provide all the information that they need. What the industry needs is a consistent identifier that can be cross-referenced, and that can be used to consolidate and aggregate positions; for example, credit balances in risk management, and counterparty exposures for derivative and commodity trading; that provides key information about locations and activities. In short, a single thing to bring everything together.

A fundamental problem in the industry is that there is a lack of good quality underlying granular data. In some jurisdictions, it is hard to obtain identity information, because there is a public record; however, in other jurisdictions, a lack of transparency makes it difficult. LEI reduces the costs for creating the transparency of data.

An interviewee mentioned that the benefits of LEI are across the entire range of business activities, allowing for quick and accurate identification. Another interviewee said that simply having a consistent unique identifier is already a huge benefit; this is particularly important for the financial industry, due to the very complex differences across jurisdictions, across products, and across technology and information support.

One interviewee mentioned that another major issue for LEI implementation is the tremendous consolidation of the past (two) decades, with large firms having inherited a large number of legacy systems, each with their own internal identifiers. Now that pace of acquisition had slowed there was an opportunity for the consolidation and harmonization of these systems, and that LEI and other identification systems would play a key role in this task.

b. On-boarding and knowing your customer (KYC)

One benefit of LEI is the on-boarding of clients. Industries should have a single identifier to manage everything coming in, to join things together for a single ultimate parent that has thousands of entities below it. It certainly helps to reduce duplicates in the client master file during on-boarding. Although some large investment banks have their own matching service utility, which effectively looks at the names of clients and their languages, having a standard global LEI can still make things a lot easier. One example of is where a client establishes a relationship in the US, and then in the UK, one year apart; without a global identifier, these may not necessarily be linked up at all. Another example that we were given was the different names of counterparties. More than one interviewee mentioned problems with ‘Lehman Brothers’, which had several identifications in the firm’s internal systems at the time of its failure in the autumn of 2008; other examples of name confusion mentioned include Long Term Capital Management and several currently operating firms.

There are two types of costs for on-boarding: direct external costs, which are the fees that a firm pays for the data services used to identify the clients; internal costs, which are the costs from the IT operational support that is needed to manage and maintain this information, once it is acquired. A unique LEI should simplify everything and reduces these costs.

Although a number of identifiers are available from data vendors (Dun and Bradstreet, Thomson Reuters and Bloomberg), they cannot be used as an automatic tool for identification purposes, because there is no cross-reference information between these identifiers.

For the KYC aspect, there has been a collective action problem, or a failure to collect and validate information once and once only for each client. As a result, the firms sometimes know little about who they are doing business with, or must spend unnecessarily on obtaining reliable data. LEI will provide more control, more validity, and more accuracy and transparency about each entity that a firm is dealing with; a firm only needs one review for each client, instead of a number of reviews for the same client, due to the multiplicity of client identifications.

There is also a major problem with keeping data up to date. An example is in relation to a client having multiple accounts; when there is a change such as an acquisition, LEI can help to ensure that this change is reflected in the internal data much more efficiently, with less operational risk. Third-party registration has caused many quality issues in the past; for example, the data of entities that are not certified can lead to fake or made-up entities.

c. Anti-money laundering (AML)

Closely related to KYC is the challenge of complying with AML regulations. Several interviewees mentioned the recent large fines imposed by the US authorities. There is a new emphasis on legal compliance, and hence, on data.

Another interviewee described the importance of an AML “checklist”—it is essential to demonstrate that you have complied with every specific requirement of the regulations and the automation of processes; facilitation by accurate and reliable legal entity identification is the way to do this. As with KYC, a major headache in AML is ensuring that the data is fully up to date.

d. Buyside efficiencies

Buyside firms also benefit from a greater efficiency in KYC and AML processing. However, there are further benefits. Major asset managers; for example, PIMCO, have thousands of funds that are unallocated before a trade, but which are credited with cash or securities after a trade. The LEI will greatly facilitate these allocations.

Another benefit about KYC is that the LEI can help certain entities, such as trusts, to avoid investing in entities that are associated with controversial business areas, such as tobacco and arms trade.

One interview mentioned that underwritten securities require manual interventions, to ensure that they are credited correctly to the client accounts.

e. Data aggregation

LEI can make the work of data aggregation a lot easier and more cost-efficient. There are many problems in firms that are related to data aggregation.

One example is the evaluation of counterparty exposures to implement credit limits in complicated index securities, including Collateralised Loan Obligations (CLOs). A typical CLO has as many as 200 underlying names, and a large investment bank can have around 200 CLOs on the book. There are different names for the same entity in those CLOs, and it is difficult to identify the same counterparties. The costs for paying an outside vendor to identify which are the common counterparties are massive.

Another example given by an investment bank is that it has 6–7 systems for trading swaps, and it is very difficult for the systems to communicate with each other, due to the lack of a unique identifier. Again, aggregation is very challenging without a single common identifier.

f. Regulatory reporting

There is a need for efficiency in regulatory reporting, especially with an increasing burden of reporting requirements. LEI can help to reduce the cost for this reporting. This is not just a banking issue; for example, in the US, the insurance regulators are planning to require insurance companies to tag all of their holdings in their companies, with LEI for reporting.

It is recommended by several of our interviewees that regulators should require LEI to be tagged for all types of financial products. This also means that the firms that issue securities or that negotiate bank loans or other tailored financial products should have their own LEIs.

g. Trade and post-trade processing

Some of the independent data professionals and data managers mentioned the reduction in trade failures, and the promotion of straight-through processing as a further major cost reduction. The data managers whom we interviewed from the major firms only mentioned the automation of trade-execution and post-trade processing in passing, although this may reflect the fact that the main responsibilities for these operations lie elsewhere in the firm.

There were different opinions on the application of LEI in automated computer and high-frequency trading. The post-trade process of matching and confirmation can be substantially shortened when there is standard identification and automation. However, it is also suggested that for the time being, LEI should mainly help back-office processing and front-office on-boarding mechanisms, and not actual trades. This is because it is computationally costly to include a 20-digit LEI in a high-frequency trading environment.

h. Managing and monitoring counterparty and credit risks

One interviewee drew a distinction between the operational and risk management benefits of LEI (a distinction that we have used in our main text). The main risk management benefit mentioned was dealing with counterparty defaults. Several interviews referred to the experience with Lehman Brothers. With LEI, firms will be able to move quickly to identify the counterparty, and to stop payments/transactions to counterparties that have failed. A number—especially those working outside of the major firms—spoke with some passion about the benefits of better risk management; one suggesting, for example, that if the benefits of better client on-boarding and KYC were worth one ‘util’, then the wider risk-management benefits were worth twenty ‘utils’.

Despite this emphasis on risk-management benefits, the discussion of risk management was entirely at a general level, mentioning better risk information or regulatory reporting. Our interviews had few specific examples of cost or efficiency benefits for risk-management from using the LEI. We recognize that this may be because none of our interviewees were risk-management professionals, who might suggest other specific examples.

**Question 2:** How important is it to have good hierarchy reference data as part of the LEI, in order to achieve these benefits? Should this ownership hierarchy be provided by the LEI system?

The interviewees provided a wide range of opinions to this question. Most interviewees from investment banks said that they have their own system for building up counterparty hierarchy; so that hierarchy is not a central issue to them. What needs to be implemented is to attach the LEI to the existing hierarchy system. They said that they understand the corporate structures of the clients that they are dealing with. Other vendors, such as Thomson Reuters and Bloomberg, also provide hierarchies. The ones who do not have a good understanding of corporate hierarchies are the regulators, and the regulators should ask the industry how to construct hierarchies, and not impose solutions upon the industry.

Most interviewees think that the aim of LEI is not for the provision of hierarchy structure. This is because LEI is a static identifier, but ownership can change anytime. The focus of LEI should be on keeping the core information fully updated, including industry classification codes, corporate status (profit vs non-profit); the country of residence (which may differ from the legal jurisdiction).

A service provider (which can be a utility behind LEI, but could be a third party) should provide the hierarchy information instead of the core LEI. Core LEI should contain things that do not change, e.g., the industry classification code, the country code. Also, there is no consensus on the ultimate parent (ultimate majority legal owner) and its related issues; in practice, four different categories are considered: controls (include golden shares); legal ownership; beneficial ownership; beneficial interests. There is no consensus for how each should be considered, and how the hierarchy is structured now.

One interview suggested strongly that hierarchy should not be done in LEI at all; and that all LEI should do is to provide a reference number, which is enough. Entities should provide hierarchy data on who owns them, through self-reporting. Another interviewee suggested that the information for (a) who controls it, and (b) what it controls, are already enough. Other information should be separated.

There are also strong views, however, supporting the hierarchy as an important component of LEI, especially from independent data professionals. One interviewee said that hierarchy transparency is one of the big promises from LEI; hierarchy data is currently incomplete, and in a very questionable quality; firms must get this data from the data vendors, or do it themselves. The ability to get a single view of hierarchy data from LEI will reduce the cost significantly for everybody. It is critical to have the reference hierarchy data as complete as possible. Although there are gaps in the hierarchy that the global LEI system may not be able to capture (mainly due to the firms hiding their own corporate structure from the public), the global initiative should be to try narrowing those gaps. The global LEI system should reveal firms that try to hide their hierarchy structure to the data users, and let the users judge for themselves whether to deal with those firms or not. However, the interviewee also said that hierarchy does not necessarily have to be part of the core LEI at the initial stage, if this slows things down.

Another interviewee said whether hierarchy should be part of the second stage of LEI is an open question. It is hard to evaluate whether the extra amount of effort required to achieve the hierarchy structure within global LEI system is worthwhile. Particularly, it is very difficult for a LOU to maintain a consolidated picture of multinational firms, although there are possible solutions, such as the exchange of information between LOUs or COUs taking the job to consolidate multi-national firms. However, we should also be aware that hierarchy is not the initiative of the COU and the LOUs. Thus, it is unclear whether the global LEI system should provide hierarchy information.

Another interviewee argued that only having one group of people with access to the data and who want to make money from the hierarchy is incredibly dangerous, because inevitably, the way they will do it is by following the herd. Everyone is going off the cliff at the same time. It is important to have the core principles laid down by the ROC and by the regulations that are accepted by all players, before anyone can become an established player.

One other suggestion was that LEI will be useful in maintaining their understanding of counterparty and client hierarchies, by the provision of verifiable objective information; they will welcome LEI as a source of information on a percentage of shareholding, especially for the entities that have a majority of shareholdings. These are objective fact that can be checked, and that are not subject to judgement. They can use this as an input for their own hierarchy analysis. However, the final development of understanding of hierarchies inevitably involves the application of judgments and this judgment should be the internal decision within the firm, not imposed by LEI

**Question3a:** Current regulations (Dodd Frank in the US, European Market Infrastructure Regulation EMIR in Europe) are imposing quite challenging requirements on firms OTC businesses. Can LEI be helpful in meeting these challenges, and is it being developed in an appropriate way?

One interviewee said LEI is a tremendous enabler for current regulations. Therefore, the OFR should try to streamline regulatory reporting in the US with LEI, and it should go further than OTC counterparty trading. Another interviewee also suggested a similar point, and said that no transactions should be done without a LEI or a pre-LEI.

However, it has also been pointed out that although LEI itself has huge potential as a global solution, and more firms are pushed to use LEI. Some jurisdictions may not be like LEI, because of the dominant role of the US and the Europe, and this has to be resolved. However, as more and more jurisdictions are following the standards, this eventually should not be a problem.

A number of interviewees said regulators should adopt LEI for regulatory reporting on a global basis. In Europe, although LEI is used in EMIR, the adoption of the other identifiers at the same time is a major failing in EMIR. There is also a similar concern for the adoption of Dun and Bradstreet number in the US. At this moment, the situation is that only the US and Europe use LEI for the transaction of certain products. Japan is quite keen to see the system be a success, but they do not want to have the system solely run and governed by US industries.

**Question 3b:** Are other elements of the current re-regulation of global financial institutions being developed in a form that is consistent with the business adoption of LEI, or are other regulatory initiatives actually an impediment against adoption?

One interview suggested that the current regulation needs to be a lot clearer, and that regulatory should use reference data to classify financial/non-financial counterparties. There is a huge gray area under different regulations (Dodd-Frank and EMIR classifications are not entirely consistent). Also, there should be much more sharing of information across borders.

There is not enough clarity about use of LEI for regulatory purposes, except for OTC-derivative trading. A much more desirable situation is that any place where the regulators require data that needs the identification of counterparty, should be using LEI (including security reporting and issuance in security markets).

Another interviewee said the re-regulation has not been developed with the adoption of LEI in mind, because of the delay of the LEI system. There is a degree of fragmentation in the pre-LEI world, with slightly different approaches taken by different LOUs, and this may not be easy to overcome later. Similarly, core principles of LEI should be the same everywhere, although some local variation may exist. Countries that do not follow these standards should not have their LOUs recognized. Suggested countries that might be taking a somewhat inconsistent approach included Russia, Japan, and the UK (but in this interview, we did not pursue the question of how exactly their LEI issuances might differ).

Historically, too much regulatory work being done in the US and the Europe was undertaken independent of each other historically. But the situation has improved recently, and a lot more coordination is happening now. More cooperation, more teamwork, and more discussion between regional regulators should be encouraged.

From the industry perspective, there is a lot of confusion: what is the time-frame, what is ROC doing, the existence of different initiatives within US and around the world; all of these matters have not been communicated to the industry. The industry does not know what to do. The largest firms may be in a better position, but medium-sized and smaller firms do not understand the ROC and the global initiatives. The industry generally does not fully understand the benefits of LEI. From the industry point of view, many firms in the industry think that what the ROC has done in the last six months is not really important to their business activities (the interviewee who said this emphasized that this was not their own view; they thought that considerable progress had been made, but that this was the perspective of many in the industry).

Another comment is that there are substantial challenges for the US Y14 data collection, which supports the regular assessment and stress testing requirements required under Dodd-Frank[37](https://www.mdpi.com/1911-8074/12/1/39/htm#fn037-jrfm-12-00039) and FSA liquidity reporting in the UK. These exercises have caused enormous difficulties in practice.

Other Issues Raised by the Interviewees

We complete our interview summary by noting a number of further issues that emerged in the course of our interviews, mainly concerning data quality and data governance.

An interviewee pointed out that a key potential problem associated with entity identification LEI is about country identification. A company registered in the Cayman Islands but operating in the US could be considered a US company, but it would be under the Cayman Islands under the LEI system. This has to be considered when LEI is issued. One possible suggested solution is to include both the country of registration and country locations where the decision makers are found.

There was also discussion about the role of senior management—the board members and the chief executive officer. In the past they have not engaged in data issues in detail. The command has always just involved finding a solution, and they have not been reluctant with making investments in data solutions. This raises the question of whether they will be willing to spend money on the adaption-operational systems, to take advantage of the full scope, for efficiency gains from LEI.

A number of interviewees said that there are now fundamental changes in attitudes. On-boarding correctly, and the streamlining of data processes can result in significant cost savings. CEOs are realizing how important this is. They are asking the question: “is data represented at this meeting?”. Another interviewee commented that 10–12 years ago, the focus was entirely on product transactions, with nothing on the clients, settlement instructions, or credit controls. This has all changed, with the Chief Data Officer playing a central role and meeting monthly with the CEO.

Another said that the firms that have been reluctant to standardize their internal data/models to allow for the identification of the same entities are hurting themselves, even without LEI. Although LEI is now only another Reuters or Bloomberg identifier, it will become larger; firms that were reluctant will wake up and invest in their systems, which adopt LEI. Another interviewee commented that firms will need to recognize the benefits of LEI, and not just for the regulatory mandate. The situation should be, at some point, that if you don’t have an LEI, you will be reputationally disadvantaged. So, it is better to get an LEI, in order to be part of the global financial network.

Data quality and validation was also discussed by several interviewees. LEI provides transparency and information for updating knowledge in certain contexts, detecting corporate events, and updating any changes in corporate structure. A major challenge, however, are the different requirements for disclosure of different jurisdictions, with banks often signing non-disclosure agreements about basic customer information. A number of jurisdictions were mentioned, which have very limited disclosure requirements on e.g., ownership or financial transactions, but this is a headache, because it limits the ability to aggregate information, even with an LEI.

One interviewee said although LOUs are responsible for maintaining data and data quality, they should not be turned into research organizations, and they should be given the burden of validating everything. A commonly held view is that it is the job of the entity to make sure that the data is correct (as demanded by regulators and jurisdictions), and this is not the responsibility of the registries. In the example of GS1, if firms do not have the correct information, they do not receive orders, so that the firms need to make sure that their information is correct. If LEI is only used for regulatory reporting, the entities are not going to have the same degree of willingness for maintaining correct information. If LEI is used widely for financial transactions, this will drive the accuracy of LEI. Regulatory requirements should just be a beginning, and they should not be used in the long-run for maintaining data quality.

One interviewee suggested that senior managers should be involved, to ensure the data quality of LEI, and that granularity must be taken to the lowest level. Third-party registration has caused a lot of problems with data quality in the past; for example, the data of entities without being certified can lead to fake or made-up entities. Some third party system suppliers also do vertical sales to all their silos, to boost revenues.

A related issue about third-party vendors is that they have taken advantage of major firms, by selling separate services into all of the different vertical silos. They have been more interested in boosting their own revenues than with providing the most cost-effective solutions at the cross-business line and cross-jurisdictional level. A move to integrated data management at the firm level should provide an opportunity to bargain for much better terms from the vendor.

Finally, one interviewee raised the issue of the structure and governance of the LEI system itself. They mentioned that if it is to work, LEI needs to be a truly federated system that is able to understand local languages and local industries. These were failures of other business entity identifiers before; LEI could fail if it is not done properly in every locality.