

Laurent, François et al.

Research Report

The benefits of the Legal Entity Identifier for monitoring systemic risk

ESRB Occasional Paper Series, No. 18

Provided in Cooperation with:

European Systemic Risk Board (ESRB), European System of Financial Supervision

Suggested Citation: Laurent, François et al. (2021) : The benefits of the Legal Entity Identifier for monitoring systemic risk, ESRB Occasional Paper Series, No. 18, ISBN 978-92-9472-230-0, European Systemic Risk Board (ESRB), European System of Financial Supervision, Frankfurt a. M., <https://doi.org/10.2849/436741>

This Version is available at:

<https://hdl.handle.net/10419/238322>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Occasional Paper Series

No 18 / September 2021

The benefits of the Legal Entity Identifier for monitoring systemic risk

by

François Laurent (European Central Bank)

Beata Kaminska (EIOPA)

Carlos Aparicio (ESMA)

Bartosz Dworak (European Commission)

Luis Garcia (EBA)

Dominique Durant (Banque de France)

Lucia Ristori (Banca d'Italia)

Robert Kirchner (Deutsche Bundesbank)

Romain Calleja (ESRB Secretariat)

Eleni Katsigianni (ESRB Secretariat)

Dimitrios Vitellas (ESRB Secretariat)

Federico Pistelli (ESRB Secretariat)



ESRB

European Systemic Risk Board

European System of Financial Supervision

Contents

Introduction	2
1 How the unique and worldwide identification of legal entities supports financial stability	4
2 The case for the LEI and the state of play	6
2.1 The case for the LEI	6
Box 1 Introducing the LEI: concepts, governance and distribution	6
2.2 The state of play	9
3 Possible further uses and benefits of the LEI	12
3.1 Uses of the LEI by public authorities	12
3.2 Uses of the LEI by the wider financial/non-financial industry	13
4 Challenges to further LEI expansion	15
5 Addressing the challenges to achieve greater uptake of the LEI	17
5.1 LEI issuance by national registers	17
5.2 Alternative approach: LEI issuance facilitated by banks	19
5.3 Other considerations	20
6 Empirical evidence on the usefulness of the LEI – country experience	22
6.1 Germany: linking financial and non-financial datasets	22
6.2 France: how the LEI can bring additional benefits to an already unique national identifier	31
References	37
Imprint and acknowledgements	38



Introduction

This paper discusses the importance of the Legal Entity Identifier (LEI),¹ particularly its role in monitoring systemic risk, and provides background material for Recommendation ESRB/2020/12 on identifying legal entities² in order to support its implementation in the European Union.

In a global economy, there is a considerable degree of interconnectedness among legal entities, both within the financial sector and between the financial and non-financial sectors. This needs to be monitored to better ensure financial stability.³ In particular, the ability to uniquely identify entities, along with knowledge of how entities are interlinked, is necessary in order to measure and manage the risk of contagion among entities, sectors and countries.⁴

At the global level, the LEI has been given the important role of unequivocally identifying legal entities involved in financial transactions. The LEI is useful to regulators and other authorities for evaluating systemic risk (particularly in times of crises such as the current coronavirus (COVID-19) pandemic), conducting market surveillance and enforcement, supervising market participants, implementing resolution decisions, preparing high quality financial data and undertaking other public functions. Other advantages are also available to the wider financial industry, non-financial industry and academics. The LEI allows the private sector to foster improved risk management, increased operational efficiency and more accurate calculation of exposures, as well as addressing other needs. The LEI has benefits over other identifiers that currently exist at national or regional level. The global nature of the LEI is important because (i) trade and financial streams do not stop at the border of the European Union and (ii) many European entities are part of, or otherwise directly connected to, entities in other parts of the world. Properly identifying (parties within) such group structures is only possible with a global identifier. Therefore, the LEI is best suited to the purpose of monitoring financial stability.

Given these potential advantages, LEI coverage is currently not wide enough, especially for non-financial companies. It is therefore necessary to further promote the use of the LEI. To

¹ The LEI is a unique identification code for legal entities defined at global level. It includes entities that are legally or financially responsible for the performance of financial transactions or have the legal right in their jurisdiction to enter independently into legal contracts, regardless of whether they are incorporated (legally established companies) or constituted in some other way (e.g. trust, partnership, contractual). It excludes natural persons, but includes governmental organisations, supranationals, investment funds and non-profit organisations (ISO 17442-1:2020).

² **Recommendation of the European Systemic Risk Board of 24 September 2020 on identifying legal entities (ESRB 2020/12) 2020/C 303/01 (OJ C 403, 26.11.2020, p. 1).**

³ Investment funds, money market funds and other financial institutions represent an important source of wholesale funding for the banking sector. In 2019, wholesale funding provided by these non-bank financial institutions accounted for about 8% of total bank funding. This share has remained stable over many years, although there has been an increase in absolute amounts. Financing provided to non-bank financial institutions through loans, debt securities and equities issued by these institutions also accounted for about 8% of banks' total assets. Deposits with euro area credit institutions from euro area non-bank financial institutions accounted for less than 6% of bank liabilities for the first time in more than a decade. See *EU Non-bank Financial Intermediation Risk Monitor 2020 (NBFIMonitor)*, No 5, ESRB, October 2020.

⁴ The economic literature identifies two main channels of possible contagion: direct interbank linkages between financial institutions (also known as direct contagion) and contagion via changes in bank asset values (also known as indirect contagion). Several studies have investigated contagion and the propagation of potential losses within a network through both direct and indirect channels. See, for example, Azevedo, N. and Oliveira, V. (2020), "**Structural Systemic Risk: Evolution and Main Drivers**", *Journal of Network Theory in Finance*, Vol. 5, No 4, pp. 1–28; and Montagna, M., and Kok, C. (2016), "**Multi-layered interbank model for assessing systemic risk**", *Working Paper Series*, No 1944, ECB, Frankfurt am Main.



this end, the ESRB has issued Recommendation ESRB/2020/12 on identifying legal entities. This is aimed at (i) fostering the implementation of an EU legal framework to uniquely identify legal entities engaged in financial transactions via an LEI and (ii) making its use in supervisory reporting and public disclosures systematic.

The business model of the LEI in its current form, and notably the existence of fees for obtaining and renewing an LEI and the level of such fees, is one of the main reasons why its wider adoption has been limited. Therefore, alternative business models need to be considered. These would have the aim of offering entities an LEI (and allowing them to renew it) free of charge, or at least at significantly lower cost, and of addressing the challenges raised by the requirement for its annual renewal. Legislative requirements for the use of the LEI have already provided a stimulus for its greater uptake. However, such ambitions cannot be fulfilled without considering a role for Member States' registers or banks as validation agents. In addition, a number of other challenges exist which affect, to a greater or lesser degree, the global uptake of the LEI. While reviewing the business model of the LEI could address some of these challenges, other actions may also be necessary.

Finally, experience gained in Member States in using the LEI will be crucial for implementing the recommendation.

Section 1 of this document describes the importance of a unique identifier of legal entities to financial stability. Section 2 explains why the LEI is the identifier of choice and presents the state of play of its implementation. Section 3 sets out the advantages – other than financial stability – of a globally defined LEI for the two different types of user, namely public authorities and the wider financial and non-financial industry. Section 4 discusses the limitations on expanding the use of the LEI, such as: costs involved with LEI uptake; the existence of similar identifiers used by local, national or regional authorities rather than globally; the use of the LEI outside the financial sector; and the lack of legal requirements for the use of the LEI. Section 5 outlines and discusses two possibilities for addressing the above-mentioned shortcomings, namely having the LEI issued by national business registers at the time of business entity registration and having the LEI issuance facilitated by banks. Section 6 provides empirical evidence of the advantages of using the LEI in two Member States, namely Germany and France.

JEL Classification: C81, E44, G28

Keywords: Legal entity identifier, Master data, Record Linkage, Trade register number, Systemic risk



1 How the unique and worldwide identification of legal entities supports financial stability

The economy has become global, and as capital, goods and services flow with ever-growing speed across borders, complexity and interdependencies are increasing. The global economy is based on a web of contracts and financial transactions, including a large number of cross-border contracts that cover the entire planet, creating tightly knit and extremely complex patterns. This web covers not only financial institutions but also other entities that have relationships, contracts and exposures with each other and with the financial sector. If one crucial node breaks, a large portion of the network might unravel, potentially with deep implications across the globe. If left unchecked, such events could lead to financial contagion. The clear identification of individual entities and any connections among them is key to drawing a reliable map of the global economic and financial landscape. It is also an important prerequisite for reducing financial contagion and promoting financial stability.

Financial contagion may occur when financial and non-financial entities are linked via financial transactions, assets and liabilities. Channels for contagion include linkages among sectors via direct exposures, as well as intragroup exposure that can make some entities liable for the losses of related entities (within conglomerates). Financial contagion is more likely during crises. Financial crises often spread from the financial to the non-financial sector, as illustrated by the economic and social repercussions following the failure of the investment bank Lehman Brothers in 2008. An economic crisis may also spread from the non-financial to the financial sector, and could originate for instance from the over indebtedness of non-financial entities or any severe supply or demand crisis.

Within the financial sector, links between banks and non-banks are significant in terms of both direct exposures and intragroup exposures.⁵ For example, when asset management activities are consolidated within a banking group, the guarantees provided to client investors may force these groups to act as a backstop, affecting their liquidity and solvency. When asset management activities are unconsolidated, the existence of implicit guarantees and “step-in” risks (for reputational reasons) may still lead to similar outcomes, but without the prudential requirements that are in place for consolidated groups. Understanding the structure of conglomerates, and identifying the main legal entities they consist of and are exposed to, is invaluable for understanding interconnectedness and the risk of contagion.

In addition, large entities such as global systemically important institutions (G-SIIs) are highly complex corporate structures (the average G-SII has more than a 1,000 legal subsidiaries in over 40 jurisdictions) concentrating many obligations, often of large value. Their failure or distress would have a negative impact on the financial institutions in many countries and on the global economy at large. Policies have been introduced to reduce the probability and impact of the failure of G-SIIs.

⁵ See footnote 3 above.



The larger and more complex the group structure is, the greater the costs and time needed to resolve the entity. Therefore, in order to ensure financial stability, it is crucial to identify all of the entities affected and to obtain information on their structures. This is of key importance for the ESRB, which is responsible for the macroprudential oversight of the financial system within the European Union. In carrying out its tasks, the ESRB should contribute to the prevention or mitigation of systemic risks to financial stability in the European Union that arise from developments within the financial system, also taking into account macroeconomic developments, so as to avoid periods of widespread financial distress. It should also contribute to the smooth functioning of the internal market and thereby ensure that the financial sector makes a sustainable contribution to economic growth. The availability and wide adoption of a worldwide unique identifier to unequivocally identify entities engaged in financial transactions is essential for enabling the ESRB to fulfil this mandate.

The ESRB has therefore issued a Recommendation⁶ with the aim of further expanding the use of the LEI in the European Union. This Recommendation proposes the establishment of an EU legal framework to uniquely identify all legal entities engaged in financial transactions by means of an LEI and to make the use of the LEI more systematic in supervisory reporting and public disclosure. Taking into account the time necessary to adopt such a framework, the ESRB recommends that authorities continue pursuing and systematising their efforts in promoting the adoption and use of the LEI, making use in specific cases of the various sets of regulatory or supervisory powers they have been granted by national or EU law.

⁶ See footnote 2 above.



2 The case for the LEI and the state of play

2.1 The case for the LEI

The G20 recognised at an early stage, in the light of the consequences of the 2008 financial crisis, that only one single international – global – infrastructure can perform the service of providing and maintaining reliable identity data for legal entities, ensuring that such data are accurate and available in real time. To this end, it called upon the Financial Stability Board (FSB) to undertake work to develop a global Legal Entity Identifier (LEI). The G20 endorsed the resulting LEI in 2012.

The LEI clearly and unambiguously identifies a legal entity at the global level with a unique code and connects to key reference data describing that entity.

The use of a unique, exclusive and universal LEI has increased authorities' ability to evaluate systemic risks and adopt remedial measures. As a connector between various sets of granular data on entities from multiple sources, the LEI also helps authorities to track market abuse and fraud, and to analyse interconnectedness for e.g. anti-money-laundering and financial stability purposes.

In its reference data, the LEI provides information on “who is who” (e.g. the official name of a legal entity and its registered address), duly checked against official sources such as business registers. However, as a further advantage, it also provides information on “who owns whom”. Specifically, legal entities that have or acquire an LEI report their “direct accounting consolidating parent” as well as their “ultimate accounting consolidating parent”.

The fact that the LEI enables full reporting of the group structure in the LEI database is also crucial for risk analysis. Indeed, the risk usually stems from the group and not from individual entities, and conducting a relevant risk analysis implies aggregating exposures at the level of the group.

Another benefit of the LEI is that it uniquely identifies legal entities nationally and internationally, at the global level.

Box 1

Introducing the LEI: concepts, governance and distribution

In technical terms, the legal entity identifier (LEI) is a 20-character alphanumeric code defined in ISO standard 17442. It is used to uniquely identify legally distinct entities and associated reference data, such as name, address, headquarters⁷ and (where applicable) information on the consolidation structure (parent and subsidiary relationship).

⁷ This is not necessarily identical to the address of the legal entity that owns the LEI.



In this paper, a “legal entity” is an entity that is eligible for an LEI according to the ISO 17442 standard and guidance on the eligibility for LEI published by the Regulatory Oversight Committee for the Global Legal Entity Identifier System.

The organisational structure responsible for issuing, updating and advancing the LEI (known as the Global LEI System, or GLEIS) is subdivided into the following three tiers.

1. The LEI Regulatory Oversight Committee (LEI ROC), which is responsible for governance and represents (financial market) authorities from all over the world.
2. The Global Legal Entity Identifier Foundation (GLEIF), which was established by the Financial Stability Board in June 2014 and is tasked with supporting the implementation and use of the LEI. As the worldwide central operating institution of the GLEIS, GLEIF coordinates operational business and ensures the operational integrity of the LEI system. GLEIF disseminates reference and group structure information as a public good free of charge in unique formats and different languages stemming from a large number of global registers, while handling the challenge of retrieving and matching the various items of information on enterprises. LEI data are publicly available free of charge in order to ensure transparency on market participants.
3. Local Operating Units (LOUs)⁸, which issue and renew LEIs locally (after checking the information provided to them by the entities that request an LEI against the information from official authoritative sources such as business registers) and ensure data quality.

The LEI and the GLEIS were established in order to allow a large range of potential uses of the LEI, including the following:

- by authorities of any jurisdiction or financial sector to assess systemic risk and maintain financial stability, conduct market surveillance and enforcement, supervise market participants, conduct resolution activities, prepare high quality financial data and undertake other official functions;
- by the private sector to foster improved risk management, increased operational efficiency and more accurate calculation of exposures, as well as addressing other needs.

As of the first quarter of 2021, more than 1.8 million LEIs have been issued,⁹ but adoption is low outside securities and derivatives markets, and uneven across jurisdictions. Most of the legal entities identified by an LEI are located in Europe, Canada and the United States, but a growing number of them are in China and India (see Figures 1 and 2 below).¹⁰

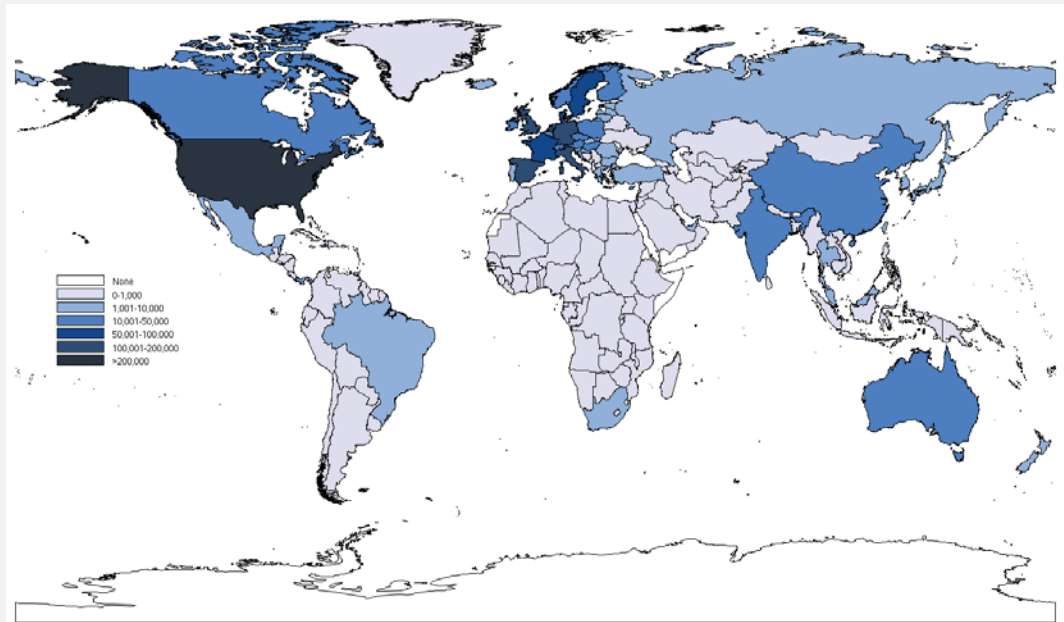
⁸ LOUs are companies or public authorities that are accredited by GLEIF to play this role.

⁹ See the GLEIF business reports for details, including the breakdown among jurisdictions and types of entities.

¹⁰ See the information on the GLEIF website concerning [regulatory use of the LEI](#) and [LEI statistics](#).

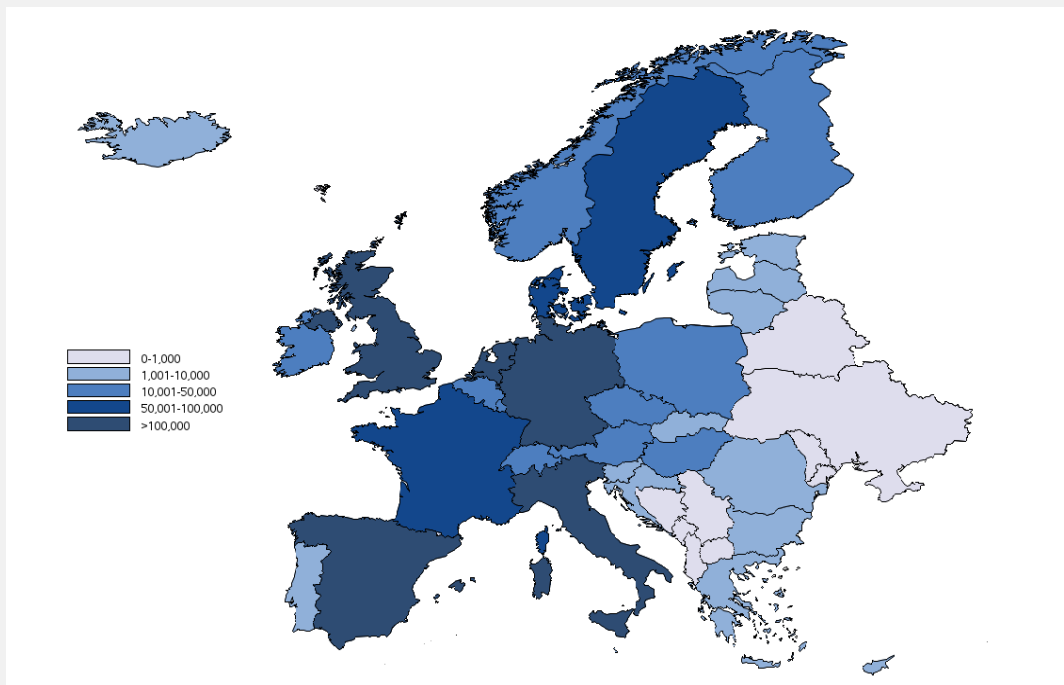


Figure 1
Entities with a LEI, worldwide



Sources: GLEIF.

Figure 2
Entities with a LEI, Europe-wide



Sources: GLEIF.



2.2 The state of play

LEIs identify reporting entities for close to 100% of the gross notional outstanding of over-the-counter (OTC) derivatives trades. They identify securities issuers for around 78% of the outstanding amounts of debt and equity securities. Regulatory use of the LEI was initially focused on derivatives reporting, for which it has now entered into force in major markets. Now, authorities are extending the requirement to use the LEI in reporting to other sectors (e.g. banking, insurance, securities issuance, investment holdings for insurance and pension funds), as well as introducing other uses, such as identification of firms in credit registers. Around half of all EU financial sector legislation includes a requirement to report the LEI, with a number of other legislative acts recommending such reporting or making it optional. The ROC and its members remain committed to supporting the introduction of the LEI as a unique identifier of parties to financial transactions.

Legislation has already been implemented to limit the access of entities without an LEI to financial markets in the European Union. The “no LEI, no trade” rule under the Markets in Financial Instruments Regulation (MiFIR)¹¹ has been of crucial importance for the adoption of the LEI in the European Union, as it requires an LEI as a precondition for access to EU markets.

Over the years, LEI adoption has been primarily driven by the establishment of requirements for its mandatory use in various pieces of legislation. In Europe, this has been the case in particular with the European Market Infrastructure Regulation (EMIR)¹², the Markets in Financial Instruments Directive (MiFID II)¹³, MiFIR, Solvency II¹⁴ and the Central Securities Depositories Regulation (CSDR)¹⁵. This effect can clearly be seen from Chart 1, which shows monthly LEI issuance from the first quarter of 2017 to the second quarter of 2020. While the number of LEIs issued per month remained fairly steady at between 1,000 and 3,000 up until the second half of 2017, it subsequently began to accelerate sharply, with a clear spike of as many as 48,000 LEIs issued per month around the last days of the implementation period for MiFID II (1 January 2018). Another, less pronounced spike can be seen around March 2020, when the Securities Financing Transactions Regulation (SFTR)¹⁶ entered into force.

¹¹ Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No 648/2012 (OJ L 173, 12.6.2014, p. 84).

¹² Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories (OJ L 201, 27.7.2012, p. 1).

¹³ Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU (OJ L 173, 12.6.2014, p. 349).

¹⁴ Directive 2009/138/EC of the European Parliament and of the Council of 25 November 2009 on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II) OJ L 335, 17.12.2009, p. 1).

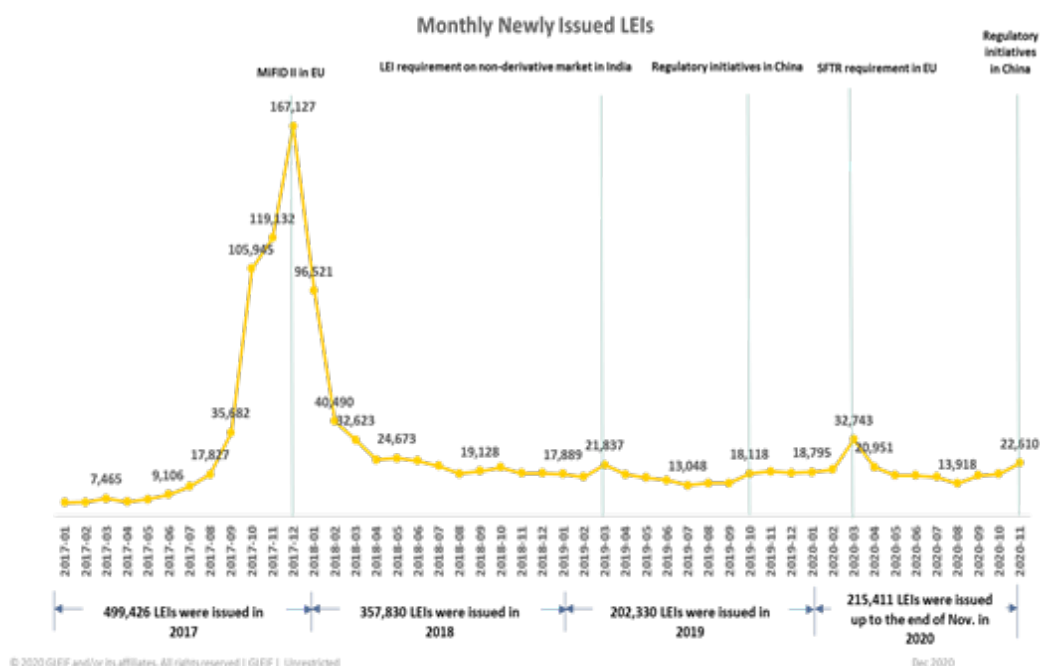
¹⁵ Regulation (EU) No 909/2014 of the European Parliament and of the Council of 23 July 2014 on improving securities settlement in the European Union and on central securities depositories and amending Directives 98/26/EC and 2014/65/EU and Regulation (EU) No 236/2012 (OJ L 257, 28.8.2014, p. 1).

¹⁶ Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2015 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012 (OJ L 337, 23.12.2015, p. 1).



Chart 1

Monthly newly issued LEIs: regulatory impactx



Sources: GLEIF website.

Other regulations – such as the ECB Regulation on AnaCredit¹⁷, which permits the use of LEIs but does not make it mandatory (as the ECB does not have the legislative power to enforce the use of the LEI for all counterparts of loans subject to AnaCredit reporting) – did not have a similar effect on LEI issuance.

Outside the peak periods driven by legislative deadlines (MiFIR as at end-December 2018 and the SFTR as at end March 2020), LEI issuance continues to be fairly stable, although the average monthly number of LEIs issued has increased slightly, to approximately 3,000 to 4,000, since early 2018. These figures clearly show the key role that legislative provisions requiring the use of the LEI can play in increasing its uptake.

Therefore, despite some limited progress, the LEI has far to go to meet the G20's objective.

A number of national, regional and other identifiers are used to cover specific needs. In the European Union, the European Unique Identifier (EUID) is for instance used in the Business Registers Interconnection System (BRIS) in order to ensure interoperability among the business registers of Member States. However, compared with these indicators, the LEI has the advantage of being fully global, and is used by many regulatory authorities across a number of jurisdictions globally. Being an ISO standard, it does not depend on local regulations. It is not jurisdiction-

¹⁷ Regulation (EU) 2016/867 of the European Central Bank of 18 May 2016 on the collection of granular credit and credit risk data (ECB/2016/13) (OJ L 144, 1.6.2016, p. 44).



specific and can be issued by any LOU across the globe. For example, where a non-European entity may be required to have an LEI to buy a security on a European platform, it will be able to get it from any LOU in the world¹⁸, even if the jurisdiction where it is incorporated does not require the LEI in any of its regulations. The LEI has a huge advantage in that it is a global identifier aimed at universal coverage and addressing a large variety of applications. This global nature is important because (i) trade and (especially) financials streams do not stop at the border of the European Union and (ii) many European entities are part of, or otherwise directly connected to, entities in other parts of the world. Properly identifying (parties within) such group structures is only possible with a global identifier. Therefore, the LEI is best suited to the purpose of monitoring financial stability.

The LEI offers greater transparency, which is particularly important in the light of the COVID-19 pandemic. For example, banks need to monitor group exposures when providing emergency liquidity to large and small European businesses, while governments that have decided to provide support packages to the economy need to have the right tools in place to be able to track who receives such help. More specifically, governments that wish to exclude companies with a head office or subsidiaries/branches in offshore centres may look for such information in the LEI database.¹⁹ This transparency is also needed in cross-border logistics to avoid cases of fraud such as those that have recently been observed in medical supplies procurement. While more and more retailers are trying to move online and use e-commerce to ensure the continuity of their business operations, the LEI public database²⁰ can help protect them against fraud from suppliers who either do not exist at all or are not who they claim to be.

The LEI therefore has the potential to become the identifier of the global economy. It offers a number of unique and important benefits, as it ensures one standard and one format across all jurisdictions, is readable in any language and provides a single location for information that is retrievable from anywhere in the world. Crucially, a broad international consensus has already been achieved on the LEI, giving it a significant advantage over a number of other regional and international entity identifiers in existence across the globe.²¹

The ESRB is of the view that the LEI and other identifiers, in particular the EUID, can coexist and serve complementary roles, and that business registers across the European Union could have a role to play for the allocation of LEIs alongside the national identifiers and the EUID.

¹⁸ If the LOU is accredited for the country of residence of that entity.

¹⁹ See the information on the GLEIF website about [accessing and using LEI data](#).

²⁰ See [LEI Search 2.0](#) on the GLEIF website.

²¹ See the information on the GLEIF website concerning [regulatory use of the LEI](#).



3 Possible further uses and benefits of the LEI

3.1 Uses of the LEI by public authorities

Other ways in which the LEI could be used by public authorities, although not necessarily linked directly to the role and mandate of the ESRB, are set out below.

- Supporting the collection of data on sustainable finance is another potential use case for the LEI. A central harmonised database of relevant information on each company's degree of sustainability and its exposures to climate risks would be beneficial for supporting the development of sustainable finance and ensuring investor protection by enabling easy access to the financial and environmental, social and governance (ESG) metrics describing the company. Such data would enable supply chains to be tracked (e.g. through the LEIs of suppliers and clients of companies). This would make it possible to estimate emissions across entire supply chains. In turn, it would help monitor the use of the proceeds of green bonds, make green labels more reliable and thus lower the reputational risk of "greenwashing" in green bonds markets.
- The LEI is also a linchpin of authorities' microdata strategy. It makes it easier to integrate various databases, since economic agents, in their various roles (as reporting agents, creditors, debtors, securities issuers, investors, protection providers, etc.) can be uniquely identified in various databases across national borders. This also improves the consolidation of microdatabases. In Europe, the LEI is extensively used by the ESCB's analytical credit datasets (AnaCredit), Securities Holdings Statistics Database (SHSDB), Centralised Securities Database (CSDB), money market statistical reporting (MMSR) dataset, Register of Institutions and Affiliates Data (RIAD), EMIR data and credit registers.
- Fight against money laundering: The extensive use of the LEI could also make anti-money laundering measures work more effectively, for instance by helping to identify (chains of) legal entities involved in financial transactions (payments). The detection and analysis of certain patterns (with the help of algorithms and artificial intelligence) would enable signs of potential money laundering to be flagged. Similarly, it could contribute to fighting VAT evasion in e-commerce. While the LEI would only be the first step in this regard, it would be a necessary one in order for further progress to be made. The LEI could also be required in information accompanying transfers of funds for the purpose of fighting money laundering and combating terrorist financing, e.g. in the case of international wire transfer messages. Furthermore, in addition to the identification of individual entities, the intragroup relationships present in the LEI database could make it possible to track parents and subsidiaries located in offshore centres. The location and legal form of these related entities could help tax authorities to identify possible tax evasion cases.



3.2 Uses of the LEI by the wider financial/non-financial industry

Greater use of the LEI does not only have benefits for regulators and other authorities. The advantages are also available to the wider financial industry, non-financial industry and academics. Being a public good, the LEI database can be freely consulted. The LEI creates the worldwide infrastructure for the digital age in the domain of legal entities, just as the telephone book did for the analogue age.

Some examples of benefits the LEI could bring to the wider financial and non-financial industry are listed below.

- For the private sector, the LEI can become a crucial means of connecting existing sets of granular data on entities from multiple sources and different departments in the group, on-boarding suppliers and analysing counterparty risk and group structure. Use of the LEI could also help banks to on-board corporate clients (especially for “know your customer” (KYC) requirements and document management), as well as supporting corporate client relationship management throughout the life cycle of the relationship. This last benefit also holds for non-financial companies. It additionally ensures that firms are able to know their international clients clearly and unequivocally, and to keep track of their financial identity. They can use the LEI to uniquely identify vendors, suppliers and other counterparties, thus reducing the costs associated with the data quality management of their internal registers and the risk of transacting business with bogus companies. Key corporate areas that stand to benefit from these developments are treasury, audit, risk control and accounting.²² This is particularly relevant for international groups or companies with international activities, as no other identifier offers the same format and standard worldwide. The FSB is exploring ways for innovations such as distributed ledger technology, artificial intelligence, various payment technologies and the LEI to promote financial stability and provide additional benefits to consumers and enterprises.²³ A promising application for the LEI, which could in parallel increase LEI coverage, is the inclusion of the LEI into digital certificates, signatures and applications running on blockchain infrastructures, in order to confirm the identity of a given entity or party to a transaction.²⁴
- For banks, the increased use of the LEI can lead to efficiency gains and cost reductions in cross-border bank remittances (for example, to identify the transmitter and receiver of bank remittances and to reduce the effort of verifying whether a company is on a sanction list). European banks could benefit from the development of a consistent and integrated framework

²² See McKinsey & Company and GLEIF (2017), *The Legal Entity Identifier: The Value of the Unique Counterparty ID*, e.g. pp. 6 ff., and GLEIF (2018), *A New Future for Legal Entity Identification*, e.g. pp. 8 ff.

²³ See FSB Chair Mark Carney's letter to the G20, p. 3: <http://www.fsb.org/wp-content/uploads/P271118.pdf>, <https://www.lexblog.com/2018/11/28/fsb-chair-letter-to-g20-leaders-reports-on-progress-made-in-2018-and-highlights-main-issues-ahead/> and <https://www.xbrl.org/news/fsb-explore-fintech-innovation-for-security/>.

²⁴ See See McKinsey & Company and GLEIF (2017), *The Legal Entity Identifier: The Value of the Unique Counterparty ID*, p.22.



for collecting statistical, resolution and prudential data with the LEI as an identifier for enterprises.

- Being fully integrated in initiatives on data transparency, the LEI supports the efficient disclosure of data at entity level and improves the information available to the general public (including investors, analysts, customers, other banks, rating agencies and researchers). For instance, the publication of the EU-wide stress tests conducted by the European Supervisory Authorities (ESAs) includes the LEI, so as to enforce market discipline through transparency.

Positive network externalities could be achieved through a larger number of LEIs. The broader the LEI coverage, the more it can be used as an identifier for various administrative and business purposes and as a connecting key for datasets for surveillance, risk analysis and financial security and stability analysis. Likewise, broader LEI coverage will lead to a more complete picture of group structures resulting from the reporting of direct and ultimate parents by registrants. In addition, the more the LEI is used in administrations, the higher the LEI data quality will be. This is because the LEI addresses challenges such as missing or inconsistent information. These scale effects will contribute to greater efficiency in administration compared with the status quo of multiple identifiers for legal entities and their considerable maintenance costs. Expanding the use of the LEI beyond the financial services sector could strengthen the network benefits.

Finally, extending the use of the LEI as a single identifier for legal entities in Europe would also help the EU financial services sector to embrace the benefits of modern technologies and support its transition into the digital age.



4 Challenges to further LEI expansion

In 2019, in a thematic review on the implementation of the LEI²⁵, the FSB listed a set of challenges still faced by the LEI system. Adoption is low outside securities and derivatives markets, and uneven across jurisdictions. Among smaller entities in particular, LEI coverage remains too low to effectively support certain regulatory uses or to allow a potential tipping point to be reached where voluntary take-up would suffice to propel further adoption.

There are a number of reasons for the limited adoption and implementation of the LEI. Notably, GLEIF's current business model does not fully align the benefits and costs of LEI use for participants. The key issues include the following.

- The cost of obtaining an LEI, as well as the cost and burden of renewing it annually, are seen by many entities as too high, especially for smaller entities.
- At the same time, the usability of data in the LEI system still falls short of authorities' expectations (e.g. potentially out-of-date reference data due to missed annual renewals of the LEI, or incomplete information on parent entities based on the level of consolidation).
- Some supervisors and authorities have not fully recognised the relevance of the LEI to anti-money laundering/combating the financing of terrorism (AML/CFT) screening in the context of, for example, the Financial Action Task Force (FATF) and the AML/CFT Expert Group (AMLEG) of the Basel Committee on Banking Supervision.
- Many similar local, national and regional identifiers exist which fulfil the minimum requirements of legal entity identification, although not on a global scale. There are currently insufficient links with these other (in particular, business register) identifiers, and the additional benefits of using the LEI are not communicated clearly enough.
- There is a lack of interest in, and awareness of, the LEI outside of the financial services sector, in part due to inadequate information and activities to promote the LEI (and its potential benefits) to authorities and entities active in those sectors.
- Legal requirements for the use of the LEI are lacking in many global jurisdictions. In many cases, even where use of the LEI is allowed, it is not required, which further reduces the incentive for entities to obtain one.
- Finally, there is a lack of critical mass in the uptake of the LEI resulting from many of the above factors, which, given the network effects of such global identifiers, could create the risk of a vicious circle without an adequate external stimulus.

The suboptimal acceptance rate of the LEI, mentioned above, together with insufficient reporting of parents, constitutes a factor that may hamper the reliability of financial stability analysis, making it

²⁵ See Financial Stability Board (2019), *Thematic Review on Implementation of the Legal Entity Identifier, Peer Review Report*.



difficult to accurately assess and compare risks across national markets. Existing gaps in the adoption of the LEI should therefore be addressed.



5 Addressing the challenges to achieve greater uptake of the LEI

With a view to addressing some of the shortcomings identified in the previous section, possible revisions to the way the LEI is currently issued (and renewed) are being considered by stakeholders of the GLEIS. Two options are under consideration, namely (i) having the LEI issued by national business registers at the time of business entity registration and (ii) having the LEI issuance facilitated by banks.

Both of the above options would address many of the challenges identified. However, the opportunity of having national business registers play a major role in LEI attribution is considered by the GLEIS as being the more effective of the two possible solutions in terms of expanding the use of the LEI. Discussions within the GLEIS on this topic are progressing and are expected to be concluded in the course of 2021.

5.1 LEI issuance by national registers

5.1.1 Underlying idea and how to organise such a system

In all EU countries, legal entities need to be registered in the jurisdiction where they are formed with their name, address and entity legal form. These national registers provide information on the entities for administrative purposes (although sometimes different registers exist for different purposes and contain different information). This process of collecting and verifying information on entities could also result in LEI issuance. In this way, synergies could be generated, duplication of work could be avoided, and additional costs for enterprises arising from obtaining an LEI could be reduced significantly or, in a best-case scenario, eliminated entirely. Quality checking procedures could be harmonised, meaning that they would only need to be done once. In addition, the LEI system could benefit from the quality checking procedures of official registers. Finally, as it is usually mandatory to report all relevant changes in the company data to the register within a short time frame after occurrence, such changes could then be used immediately for the LEI data too. The more administrations use the LEI for their purposes, the higher the efficiency of the whole system.

In terms of how the system would be organised in practice, countries' registers²⁶ could act as LOUs (which is already the case in six EEA countries²⁷ and Switzerland) or could work with existing LOUs domiciled in their country. This model could be taken even further by automatically issuing an LEI for any entity registering with a national business register in the future, and subsequently issuing an LEI for the entities already registered. The issuance and renewal of LEIs could thus be a by-product

²⁶ Central, commercial and company registers.

²⁷ Spain, France, Italy, Netherlands, Slovenia and Finland.



of the registration and authorisation processes that are in any case already conducted by the business registers.

Some additional marginal costs for issuing LEIs might be incurred, for example in connection with checks to ensure that an LEI is not issued twice. As for the collection and validation of Level 2 data, business registers could provide LEIs with Level 1 data only and arrange for Level 2 data to be obtained from other sources, probably via other LOUs. Business registers could also partner with an existing LOU for the technical connections to the GLEIS, thereby avoiding expensive IT development. A financial framework that addresses these issues would have to be designed and implemented with the various stakeholders concerned.

5.1.2 How LEI issuance by national registers could address some of the current shortcomings

The concept of official registers issuing LEIs as a by-product of the registration process would address a number of the factors that currently limit the uptake of LEIs, notably the questions of cost efficiency and LEI renewal challenges.

The total costs of obtaining and annually renewing the LEI are perceived as a hindrance to its wider adoption. In a study that GLEIF conducted with market participants, the question of cost was repeatedly mentioned as a barrier to wider adoption of the LEI.

The process of obtaining an LEI is currently carried out by registrants through the LOUs, with the registrants paying an issuance fee. The renewal of the LEI, which is aimed at maintaining the accuracy of the data record of the LEI code, and which needs to be carried out at the time information contained in the record changes (and at least annually), also triggers a renewal fee. Usually, the fee for renewal by an LOU is lower than the issuance fee. The cost of obtaining (and renewing) an LEI breaks down into two components : (i) a service fee to cover the costs incurred by the LOU in carrying out its tasks, which most notably include validating the information provided against the relevant official register (or the documents provided by the registrants for Level 2 data); and (ii) a contribution to GLEIF, to cover its operating expenses for functions such as providing the LEI infrastructure and information free of charge to the public, promoting the LEI, and cooperating with private and public institutions for the enhancement and use of the LEI.

Currently, the actual cost of obtaining (and renewing) an LEI differs from one LOU to another, and is in the region of USD 50-60 per year. The contribution to GLEIF which forms part of this cost is uniformly USD 11 (as of 2018, reduced from USD 20 in 2014, to reflect growth in LEI numbers). The LEI system is based on a cost recovery principle, meaning that, as per the master agreement with GLEIF, an LOU can charge fees only up to a level that allows it to cover its operating costs. The same principle applies to GLEIF.

In an ideal situation, the LEI system would be maintained by having LEI-issuing registers pay a contribution to GLEIF, as it is currently done by the LOUs. Current estimates by GLEIF suggest that more than 50 million EU enterprises may be eligible for an LEI. The maximum contribution to GLEIF, according to its hypothesis, could thereby decrease to a figure in the region of €0.20 per LEI registration and renewal, resulting in an upper bound for an EU GLEIF contribution of €10



million. In this context, GLEIF is considering developing a costing model where it would no longer charge a fee per LEI but would instead establish a service fee for business register LOUs, in which the costs incurred by GLEIF in carrying out its services would be estimated and then divided over the number of expected LEIs.

The GLEIF contribution could be made independent of the number of LEIs provided, in order to avoid overtaxing business registers in countries that systematically adopt the LEI as the main identifier for all companies and to avoid disincentives to this adoption. However, this would require the overall amount that GLEIF currently receives to be carefully established, while the share for each national register would subsequently need to be properly elaborated.

In order to ensure correct identification of legal entities at any given moment, the reference data of the LEI need to be correct at all times. This means that as certain characteristics of the legal entity may change, these data need to be updated. Obviously, such modifications imply costs and effort on the part of the legal entities. Currently, in order to address this issue, there is a requirement for an LEI to be renewed when a change occurs in the underlying data record, but at least on an annual basis. This ensures that reference data are regularly reviewed. However, it also has a negative side-effect: if the basic data of the legal entity have not changed over the course of the previous year, renewing the LEI is an expenditure without any apparent benefit to that entity. In addition, as the renewal (ad hoc or annual) is not required by many regulations, there is no strong incentive to renew and therefore no guarantee that the reference data are up to date at any given time, which introduces a significant level of uncertainty for supervisors.

Having national business registers issue the LEIs would largely address this problem. Official registers would need to reflect any change in the reference data of a legal entity, and such a change would become effective and legally binding when entered in the official register. Linking the process of LEI renewal with this process of changing the register would therefore ensure that LEI reference data are always up to date and give a true picture of the official situation, while at the same time eliminating the burden of regular LEI renewal on legal entities.

5.2 Alternative approach: LEI issuance facilitated by banks

Another path that could lead to the reduction of LEI processing costs in a competitive context is to rely on banks to register their corporate clients and obtaining an LEI for them. As a by-product of their KYC processes, banks receive relevant documents from their corporate clients. Since this information is relevant for LEI and KYC at the same time, an association between LOUs and banks would enable the issuance of LEIs as a by-product of KYC and ultimately play an important role in facilitating ongoing customer due diligence. A common identifier used by many banks may also allow for the sharing of the validation process, renewals and updates. Other benefits of using the LEI in such a context would be (i) harmonisation of processes for national and foreign clients and (ii) improved identification of groups. In such a scenario, the bank would have to be authorised by its clients to play the role of an authorised agent to register and obtain an LEI for them.

Since, according to this approach, banks or competent LOUs need to bear the costs of issuing, renewing and guaranteeing the quality of the LEI, it can be assumed that those costs would be passed on to their clients. However, it is important to note that in order to issue LEIs, banks would



in any case need to verify the reference data of legal entities, such as the name, address, etc., with official registers. Therefore, in principle, any such costs could be kept to a minimum. The full assumption of the costs by banks is currently being explored by GLEIF as part of the GLEIS 2.0 project, and some experiments are being conducted with major banks in different jurisdictions.

While an approach whereby LEIs are issued by national registers or banks would offer many benefits and ease the implementation of the ESRB Recommendation on identifying legal entities, it would still have a number of shortcomings, which would need to be addressed by other means.

5.3 Other considerations

5.3.1 Extending the LEI beyond the financial sector and globally

The benefits of using the LEI are not limited to the financial sector. Many entities which are not financial service providers frequently interact with financial entities – banks, financial markets, pension funds, etc. – on many levels and through a variety of transactions and contracts. A unique global identifier such as the LEI would facilitate these interactions for both parties. In addition, it would give supervisory authorities a better picture of the various counterparty exposures of financial sector entities to non-financial sector entities. The LEI can also be used to identify entities for the purposes of registration, public procurement, payment of EU structural funds, obtaining various permits and exemptions, facilitating commercial transactions, issuing invoices, payment of VAT, etc.

By having the systematic issuance of the LEI as a by-product of registration in official registers, all legal entities, including those outside the financial sector, would be able to benefit from the LEI. All businesses in any type of sector where identification of entities plays a role would have this universal identifier at their disposal and could embed it naturally in the design of their solutions. This may be especially useful in the current situation for monitoring the publicly guaranteed loans provided mainly to small and medium-sized enterprises in order to mitigate the consequences of the COVID-19 pandemic.

In order to stimulate the uptake of the LEI outside of the financial services sector, proper information and communication activities would need to be undertaken on the LEI, its benefits and its (potential) use cases, and relevant legislation would need to be adapted in order to allow, at least in the first instance, for the LEI to be used alongside any existing identifiers. As a second step, once the LEI becomes better known and its benefits become visible, stricter requirements on the use of the LEI could be envisaged, possibly together with efforts to build linkages with existing sectoral identifiers. Such an approach could be gradual, focusing on a small number of the most closely related sectors at first, and gradually expanding to include others.

Another aspect requiring careful consideration is the adoption of the LEI by other key global jurisdictions. Coordinated global adoption would avoid an additional obstacle to increasing uptake in the European Union, namely reluctance to be the only jurisdiction to mandate the LEI across the board, with the additional costs and burdens this may generate, while still missing out on the main



benefits of truly global uptake. Successful implementation would ensure that critical mass is attained and would generate the network effects that could further drive uptake.

5.3.2 Relationship to existing identifiers used in the European Union

As mentioned in Section 2, a number of national, regional, and proprietary entity identifiers already exist and are in use across the globe. In the European Union, one notable identifier of this kind is the EUID, which is based on national identifiers and is mainly used to interconnect national business registers across all EU Member States and EEA countries. Approximately 20 million EUIDs have been attributed to date.

Nonetheless, as mentioned previously, the EUID is not used outside Europe and therefore cannot be considered a truly global legal entity identifier. As such, at present neither the EUID nor any national identifier is able to play the role envisaged by the global regulatory community for the LEI.

However, a greater commitment to the LEI does not mean that the EUID should be dismissed. Sound national identifiers and high-quality business registers provide an essential service by ensuring the availability of high-quality, accurate company information. Indeed, to obtain an LEI, registrants have to provide their national identifier and indicate the registration authority that issued it. The registrant must also indicate the jurisdiction in which the entity is incorporated. These are all components of the EUID. Hence, there is natural complementarity between the EUID and the LEI.

5.3.3 Principle of proportionality

Finally, it is important to ask to what extent the use of the LEI should be imposed on smaller entities that, for the most part, trade only locally, and as such do not pose a significant risk to financial stability and would not benefit to any significant extent from the LEI. While the use of a single identifier by all legal entities, irrespective of their size, would be the optimal solution from the point of view of supervisors (not least as it would maximise the benefits arising from the use of the LEI for the different purposes), there may be cases where the costs of imposing the LEI on certain entities would outweigh its benefits (in particular for those smaller legal entities). For this reason, a proportional approach which minimises the burden for smaller entities may be necessary. There could be several ways of ensuring proportionality in this respect.

The principle of proportionality should be applied so as to avoid undue cost burdens. For example, EU legislation could exempt smaller entities that do not form part of a wider group from the requirement to obtain an LEI, or require that they be provided with an LEI at no cost. Addressing the cost aspects of the LEI by means of a proportionate approach is crucially important, as the methods of identifying legal entities differ between jurisdictions.



6 Empirical evidence on the usefulness of the LEI – country experience

In this chapter, two cases are presented for the LEI that demonstrate its usefulness and appropriateness in the national contexts of Germany and France respectively. The German case study starts by illustrating the current problem of not having a unique ID when linking different datasets and the practical limitations of state-of-the-art record linkage techniques. A common and stable ID would overcome these problems, and the LEI would be fit for this purpose. France already has a unique national code but can still benefit from the LEI as a means of obtaining information on the direct and ultimate parent and as a unique identifier for entities from other countries.

6.1 Germany: linking financial and non-financial datasets²⁸

Executive summary

There is currently no unique ID that can be used to link datasets from financial and non-financial sources in Germany. Consequently, records are linked in many cases using a method based on the name/legal seat and trade register number of the relevant entities. However, this method presents many problems, such as mistakes resulting from typos in the names/legal seats of the entities during the manual data entry procedure, and the fact that the trade register number cannot play the role of a unique ID for several reasons. This section describes these problems in more detail and gives the example of a specific record linkage where approximately 200,000 entities could not be linked without further enhancements. These findings provide evidence for the necessity of a common and stable ID. The LEI would serve this purpose. Not only would it facilitate national linkages, it would also provide further advantages, even at entity level. Important reference data for an entity could be directly extracted, which would enhance registers for the benefit of the public and of other receivers' systems, thereby reducing costs. In addition, it would be easier to carry out data quality checks. The global approach of the LEI is also particularly promising for cross-country or supranational data exchanges. Finally, the planned expanded form of the LEI promises further benefits as it makes the identification of group entities by the LEI of the parent entity much easier and more reliable.

6.1.1 Potential of the LEI to serve the purposes of linking, enriching and improving data in Germany

The following sections describe and quantify the impact of several problems that arise when linking two major German datasets without an unique identifier. These large datasets originate from

²⁸ This text was drafted by Dominik Elgg with the help of Eniko Gabor-Toth, Klaus Gerstner, Stefan Hoffmann, Anica Morawietz, Katharina Muno, Christopher-Johannes Schild, Norman Wilson and Katja Ziprik. Katja Ziprik created a record linkage between the Deutsche Bundesbank's RIAD database and Destatis' URS 2018, while Christopher-Johannes Schild and Eniko Gabor-Toth provided record linkages between the URS and further datasets.



financial and non-financial sources (central bank and national statistical institute (NSI)). Such record linkages are used for the purposes of financial stability and systemic risk analysis. This analysis focuses for instance on the impact of financial market reforms on banks and SME financing. It also looks at risks for financial institutions originating from the corporate sector, and more specifically from the commercial real estate market, together with allocation risks due to shifts in the composition of credit portfolios.²⁹

A national unique entity identifier is not available in Germany. The trade register number, the form of ID that first comes to mind in this regard, is not available for all German entities with economic activity. According to the NSI business register for 2018 (*Statistisches Unternehmensregister – URS 2018*) maintained by the Federal Statistical Office (*Statistisches Bundesamt – Destatis*), out of nearly 3.5 million active entries, 2.4 million entities, including 2.1 million sole proprietors and 180,000 simple partnerships, do not have a trade register number.³⁰ But even for the entities with a trade register number, many problems arise because of the instability of this number. These problems are described below. Other IDs also do not qualify for similar reasons³¹, so at the Deutsche Bundesbank, record linkages between different statistical or economic areas are generated in different ways. Deterministic record linkage methods often include the following means of identification:

- identical names and geographical components (such as seats or other address information);
- identity of trade register number or other external or proprietary IDs.

Alongside these deterministic means of identification, probabilistic methods can represent subsequent steps in record linkage methods, giving a probability of two entity records being the same. The input variables for these record linkage steps are already suboptimal from a general perspective and, depending on the quality of variables maintained in databases, can even pose severe problems.

6.1.1.1 Problems resulting from names and geographical components

In Germany, the name of a company does not have to be unique. Therefore, a geographical component, in particular the legal seat, is necessary as a means of differentiation for legal purposes and subsequently for record linkages.

The name of a company and its legal seat are textual entries, so there is always a risk of mistakes being made. Spelling mistakes are still prevalent in many datasets, particularly for smaller entities where the first and last names are included in the company name. The description of the legal form

²⁹ Record linkages on German data were used in e.g. Deutsche Bundesbank (2019), *Financial Stability Review*, p. 67 ff., and Financial Stability Board (2019), *Evaluation of the effects of financial regulatory reforms on small and medium-sized enterprise (SME) financing*.

³⁰ See also Section 6.1.1.2.

³¹ The ID in the statistical business register may not be used publicly, while the turnover tax ID – although a widespread form of identification – is not available through a register.



is likewise often part of the name, which might also be in the form of an abbreviation. For example, taking URS 2018 as a basis, of the names of the more than 9,500 entities that are stock corporations, 13% include the term *Aktiengesellschaft* while 87% include the abbreviation AG. Similar figures result for the almost 700,000 private limited companies (*Gesellschaft mit beschränkter Haftung*, GmbH).

The 99th percentile of entity name length in URS 2018 is 127, the 0.999 quantile is 172, and more than 5,000 entities have a name more than 170 characters long, creating potential problems if some entries are still recorded manually. The median is 28.³² Confusion can also occur with regard to word order, which can be significant when differentiating sibling companies within a group.

Technical restrictions and different coding of text in databases are further sources of potential errors in identifying entities by names. Among the problems are limitations on characters or the presence of special characters with diacritics.³³ More than 750,000 entries in URS 2018, representing 22.6% of all entities, have the umlaut diacritic. Although the problems mentioned so far can be mitigated by better data cleaning, the use of further pre-processing steps and more sophisticated record linkage methods are making the procedures far more complex.³⁴

In particular, group companies' names are often very similar, which can lead to problems when they are entered manually into a database. Company names can also change over time. In 2018 alone, names were changed in around 128,000 cases, representing some 3.4% of all entities included in both URS 2017 and URS 2018. Databases often cannot detect company name changes easily, particularly if a broad database or register is fed from several sources, often of secondary nature and of lower quality.

In addition, firms can have several addresses relating to e.g. legal seat, headquarters, contact persons or production facilities.

6.1.1.2 Problems resulting from the German trade register number

Although using the German commercial or trade register number (TRN) would appear to be more advantageous than using the name/place-based identification method, the TRN was not in fact designed for use as an ID in national databases, and particularly not for the purposes of meeting economic, statistical or systemic risk objectives. German TRNs are determined on a decentralised basis at over 100 registration courts. The registration courts have different departments, which results in an ID structure consisting of at least three parts: registration court place, department and number.

³² There is a degree of uncertainty in these statistics as, in some cases, the entity names entered in the URS include specific information such as names of departments or contact persons. However, this should not affect the general interpretation of the statistics.

³³ The diaeresis, tilde and umlaut in German.

³⁴ See, for example, Schild, C.-J., Schultz, S. and Wieser, F. (2017), *Linking Deutsche Bundesbank Company Data using Machine-Learning-Based Classification*, Technical Report 2017-01, Deutsche Bundesbank Research Data and Service Centre.



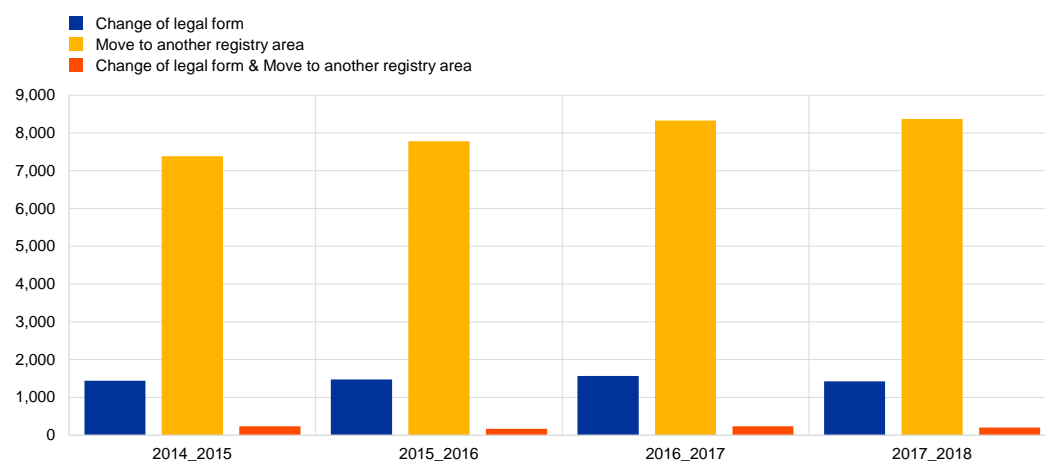
This decentralised management, together with the use of the name of the registration court, generally leads to **significant ID instability over time**. Companies can move to another trade register area without changing their characteristics, yet they receive a new TRN.

Legal form changes also result in ID instability. If an entity changes its legal form from unlimited to limited liability, the court department changes, and with it the TRN. Even when entities with limited liability change their legal form within the respective department, e.g. from private limited company (GmbH) to stock corporation, a new TRN is given. Such legal form changes are not uncommon among limited liability companies.

Over the last four years, 42,870 changes have occurred. Some entities have undergone more than one change, and around 2.9% of all firms with a TRN have changed their register number. In all, 90% of the changes can be explicitly traced to changes in legal form, a move to another trade register, or both (Chart 2). A move to another trade register is therefore the main reason for the instability of the TRN ID.

Chart 2
Reasons for changes in trade register number

(units)



Sources: Deutsche Bundesbank.

Decentralised management by registration courts entails further problems. In order to reduce the cost of public administration, registration courts have been merged in the past. When this has happened, new TRNs have been assigned, or a suffix has been added to the number of the old court in order to differentiate from entities with the same number of the new court. Consequently, the German TRN is composed of four parts. Approximately 41,000 cases have a suffix in URS 2018.

There is no harmonised approach to handling such mergers by the courts. Consequently, if the suffix is not maintained appropriately in a database, duplicates will show up in the record linkage. In addition, some databases have no resources to keep track of such changes by trade registers. Therefore, TRNs from old registration courts are still included in databases. In URS 2018, for



instance, there are still around 3,000 entries with old registration courts. In the Bundesbank's database for external sector statistics (*Außenwirtschaftliche Meta- und Stammdaten – AWMuS*), there are 73 such entries out of almost 60,000 firms having conducted international operations within the last year.

One particular problem in Germany is that some registration courts, e.g. the Berlin registration court, use a general suffix. Companies do not need to present this suffix, but it is shown in official search engines. There are 61,275 entries with a TRN from Berlin, accounting for 5.6% of all firms in URS 2018.

As the name of the registration court is part of the TRN, problems also arise due to trade register place names and spelling. Often the place name is not kept consistent across datasets. For instance, the registration court in Berlin can be entered as "Berlin", "Charlottenburg (Berlin)" or "Berlin-Charlottenburg". Typos are encountered as well. In the Bundesbank's AWMuS database, there are more than 5,000 registration court entries with a different spelling from the standard. To resolve these issues, the use of the registration court ID³⁵ or another form of a court ID is recommended.

These problems of instability show up naturally every year. Consequently, there are ongoing complications that rule out the use of the TRN as a unique ID for a national database collecting data from several sources (e.g. mandatory reporting system combined with private and administrative data).³⁶

To add to the instability, all four parts of the TRN are susceptible to typos.

Finally, as mentioned in Section 6.1.1.1 above, some units of economic activity simply have no TRN. Although they might not qualify as official companies in European statistics, e.g. in the case of a sole proprietor, they could be of importance for systemic risk analysis. In URS 2018, there are 2.1 million sole proprietors. Some of them are relatively large: almost 200 have turnover of more than €50 million, while more than 2,500 have more than 50 employees.³⁷

6.1.1.3 Current evaluations confirming the problems of TRN and name/place-based record linkages

A TRN and name/place-based deterministic record linkage between URS 2018 and the Deutsche Bundesbank's RIAD 2020 database prepared in March 2020 illustrates the problem with record linkages and the potential benefits of using the LEI. Of the more than 730,000 RIAD active non-

³⁵ This ID is called the XJustiz ID. However, the setting or changing of legal register IDs of this kind is determined by institutions based on needs that might differ from the needs of a national data register for economic purposes.

³⁶ Within the Business Registers Interconnection System (BRIS) of the European Union, the EUID for all Member States is based on the company registration number. (For German entities, this number comes from the German trade register system.) The BRIS itself keeps track of any changes to the company registration number, so this system does not have the same problems as those mentioned above. However, if an outside register were to use the EUID instead of the TRN, having no access to the tracking of changes, the problems would be similar.

³⁷ See the [Destatis business register](#). Some of these larger sole proprietors might have a TRN.



financial RIAD entities with a trade register number³⁸, 527,000 could be linked with the statistical register (compared with a total of 1.1 million entities in the URS with a trade register number). More than a quarter of the RIAD entities could not be linked. The majority of these entities had the legal form of a private limited liability company (GmbH).

The number of entities linked could be improved by adding conditional queries, integrating probabilistic methods or using further IDs. However, more importantly when interpreting this number, RIAD entries could simply be missing from URS 2018 as the registers do not include the same population by definition. To analyse this issue in more detail, a sample of 50 entities was built. From this sample, more than two-fifths were identified in URS 2018. The missing links were mainly attributable to typos in TRNs and name problems in RIAD, but also to other shortcomings with the TRN. Almost a quarter of the sample could be found in former versions of the URS. These cases were attributable to changes in entity names, legal forms or seat transfers to another registration court.

In two-thirds of sample cases, the LEI would have led to clear identification, as typos are highly unlikely with the LEI. This is thanks to the checks carried out and the fact that the LEI is stable, even in the case of legal form or seat changes. With full coverage through the LEI, it would also no longer be necessary to rely on company names in the record linkage process or on the specific aspect of the register number as discussed in Section 6.1.1.2. In the remaining third of the sample (50 entities), there were some young companies in RIAD which could not be part of URS 2018. The rest seemed to be missing from the URS, probably because these entities were already absent from the URS sources.

The sample analysis generally confirms the suspicion that the name/place and German TRN-based record linkage leads to many unidentified entities.

Changes in the TRN number create a high degree of uncertainty over time. Therefore, further record linkages were analysed. The first was the linkage of the URS over several years with the dataset on individual financial statements of non-financial firms (*Jahresabschlüsse nichtfinanzieller Unternehmen – JANIS*)³⁹. In this dataset, multiple linkages occur in around 27,000 out of 190,000 cases. Similarly, with a URS-AWMuS record linkage, there are around 26,000 multiple linkages out of 164,000 cases. These multiple linkages are another drawback of current record linkage methods. They would be reduced significantly with the LEI, resulting instead in straight 1:1 linkages across different datasets.

³⁸ Financial entities, along with other entities that are, by definition, not included in the URS, were excluded from the linkage. This was due to sources of the NSI business register not providing complete information on these entities. The filter was broadly defined on the basis of the variables for ESA sector, employees and names.

³⁹ This dataset can be used by external researchers at the Deutsche Bundesbank's Research Data and Service Centre.



6.1.1.4 LEI as a global solution offering more benefits than just an ID

On the basis of the German case study, it is evident that the LEI has strong benefits if its use is extended substantially to non-financial entities. As demonstrated in Section 6.1.1.3, using the LEI as a unique identifier would guarantee that entities from different databases could be linked for the purpose of unambiguously identifying entities, resolving the limitations on current procedures resulting in particular from the restrictions of the German TRN. Naturally, this reasoning assumes that (i) the LEI is implemented comprehensively by all financial and particularly non-financial entities, (ii) it is included appropriately in IT systems and (iii) legal rules allow all data sharing.⁴⁰ This expansion in scope – at least to corporations in the non-financial sector – is currently hypothetical, although the problems indicate the necessity of change. Improved linkages would generate further benefits, such as data quality improvements and data enrichments, by enabling or at least facilitating access to and linkage with additional economic or administrative datasets (see Section 6.1.2).

The LEI offers far more advantages than just being a national ID, as the GLEIS is designed as a harmonised, global initiative. LEI data can therefore be shared publicly even across countries and regions, which can be of great value for the analysis of international capital flows.

Another example of the LEI benefiting data exchange is within supranational regimes, such as in the case of the ESCB's RIAD database, which enables the processing of data sourced from national central banks.⁴¹

A further positive aspect of the LEI is that it enables better understanding of multinational group data, since it facilitates the sharing of information on national affiliates with other foreign institutions in the jurisdiction where the parent entity has its legal seat. In this respect, the collection of Level 2 data by the GLEIS (in "Parent Reference Data Format") promises further benefits, once the identification of group entities by the LEI of the parent entity has been made easier.⁴² To date, intensive and costly tracking of groups on a yearly basis has been necessary. This has often been based on unstructured, partly incomplete and even outdated information from the notes of financial statements or trade registers. Again, the risk of typos is present when recording this information, while mistakes in typesetting have also been observed. With this LEI project, groups could indicate their structure themselves.

As the LEI is more than an ID, some information on the company, such as address, jurisdiction, legal form and status code, is included in the GLEIF database. Consequently, with the LEI, fewer resources would be needed for individual register management. For example, in the Deutsche Bundesbank's Financial Statement Data Pool, the more than 500 legal form checks carried out on approximately 125,000 entities each year would no longer be necessary.

⁴⁰ Legal restrictions in Germany apply, e.g. depending on the direction of data exchanges.

⁴¹ See [Guideline \(EU\) 2018/876 of the European Central Bank of 1 June 2018 on the Register of Institutions and Affiliates Data \(ECB/2018/16\) \(OJ L 154, 18.6.2018, p. 3\)](#).

⁴² See the information on the GLEIF website [regarding Level 2 data](#).



With regard to legal forms, different classifications are usually implemented in databases or registers, leading to the need for “lowest common denominator” harmonisation when analysing data from several datasets. In extreme cases, clear harmonisation is not possible because of overlapping categories. Within the LEI regime, GLEIF is offering an international harmonised code list for accepted legal forms. It is also constantly looking for opportunities to map the LEI to other identifiers; mapping tables already exist for the Business Identifier Code (BIC) and International Security Identification Number (ISIN).^{43, 44}

A more technical aspect is that a check for typos is integrated and can be implemented in IT systems.⁴⁵ As the LEI is used worldwide, the costs for IT implementation of such checks are likely to be less than in the case of a national identifier.

6.1.2 Enhancement and enrichment of data in existing registers using the LEI

If the LEI is introduced comprehensively, particularly in the non-financial sector, improvements will not be restricted to the record linkage itself. The objective of record linkages is to bring datasets or registers together. Due to uncertainty in given record linkages based on the problems mentioned above, restraints or inhibitions may exist when enhancing existing variables or adding new elements to one dataset from another. With the LEI, these limitations would be largely resolved.

One example of a data enhancement could be the NACE Rev. 2 sector code.⁴⁶ Sectors are an important classification variable in economic statistics. Classifying economic activities according to NACE Rev. 2 is quite a difficult task for a majority of entities, so datasets often differ in this respect. Figure 3 below shows differences in two-digit divisions between JANIS and URS 2018 based on approximately 55,000 entity links.⁴⁷ Theoretically, all dots should lie on the diagonal line, although in practice this is clearly not the case. Only 74% of the entries have the same NACE division. Differences appear in all NACE sectors and seem to be generally independent of the dataset. Disparities are visible in the graph, mainly at the wholesale sector (NACE sector 46). Significant differences are also concentrated at 70 on both axes, indicating a specific problem in classifying head offices.⁴⁸ Using the LEI as a unique ID would be a necessary precondition for overcoming

⁴³ See [the GLEIF Registration Authorities List](#) and [the information on the LEI mapping service](#) on the GLEIF website.

⁴⁴ To keep the LEI relevant for digital innovation processes, GLEIF has started to cooperate with other organisations using the LEI as an element within their standards, and to develop semantically correct models of LEI data records relevant to the integration of the LEI into other key standards. Currently, this includes an LEI model in eXtensible Business Reporting Language (XBRL) and one in Resource Description Framework (RDF).

⁴⁵ Controls can also be implemented based on the publicly available GLEIF database. For instance, a verification will be implemented in RIAD based on the publicly available dataset from GLEIF. In addition, the ESCB’s CSDB (which contains data on LEI for security issuers) uses controls which are considered quite effective.

⁴⁶ NACE is the abbreviation for *nomenclature statistique des activités économiques dans la Communauté européenne*. See e.g. [the explanation on the Eurostat website](#).

⁴⁷ To match the two datasets, the Deutsche Bundesbank Research Data and Service Centre’s ID-Mapping v2020-1-0 was used.

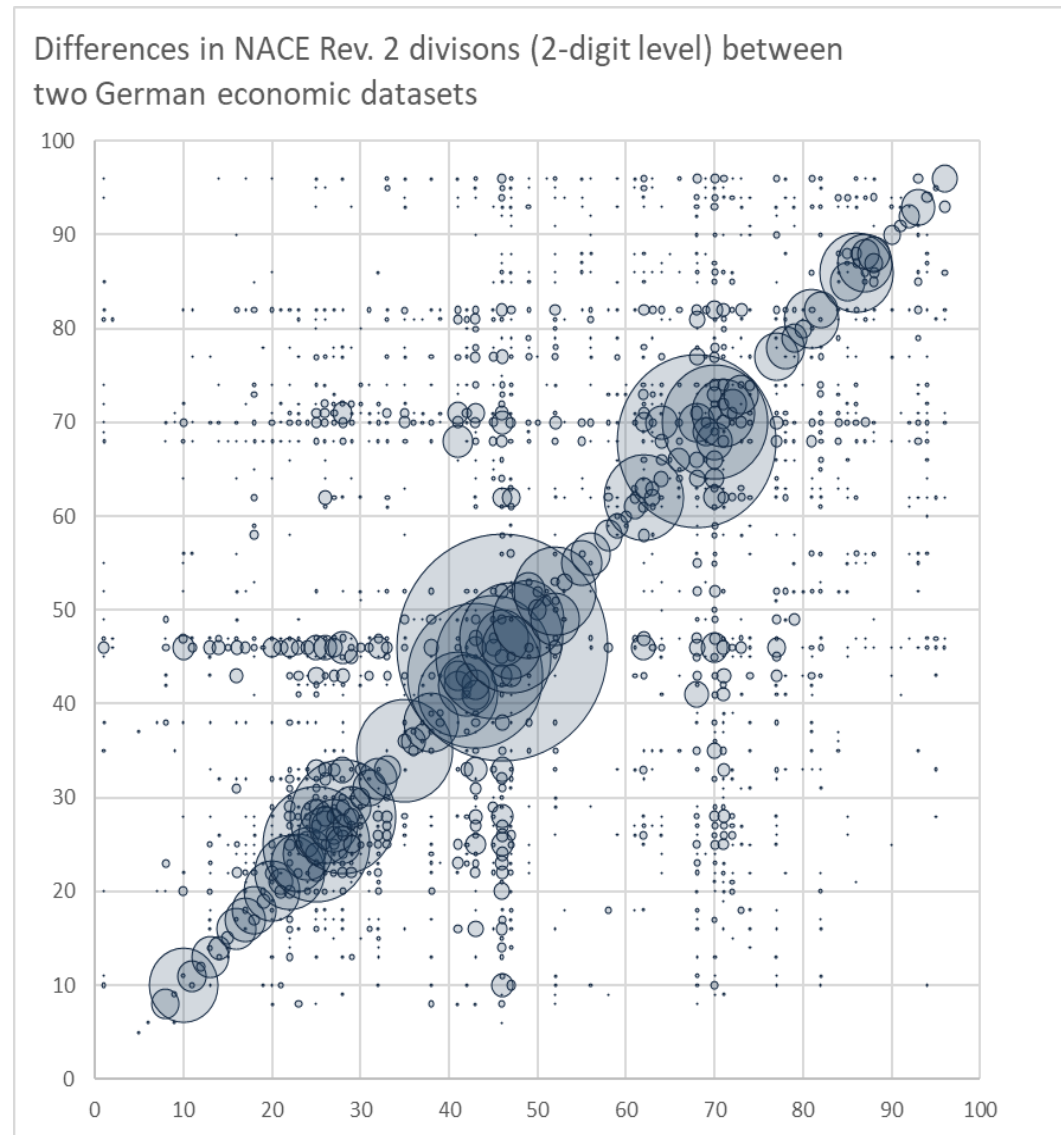
⁴⁸ The Deutsche Bundesbank and Destatis have started to align such cases for larger entities.



these problems in a comprehensive manner by allowing a better understanding and an easier comparison of data.

Figure 3
Differences in NACE rev.2 divisions (2-digit level) between two German economic datasets

(NACE codes)



Sources: Deutsche Bundesbank.

Notes: bubbles in the graph represent the share in the number of linkages.



With the LEI, further enhancements are possible due to fewer linking constraints between registers: data such as added value and total assets⁴⁹ could be quite easily shared between them. For instance, total assets are currently not available in the URS. With the integration of this information, the statistical office could determine enterprise sizes within the URS based on all the variables mentioned in the SME Recommendation.⁵⁰

It is important to note that broad coverage by the LEI will not result in a change in rights of access to institutional data, i.e. public access to any sensitive data on firms will not be given. Only the LEI-specific data for registration and renewals and – if available and disclosed – information on the parent entity and the subsidiaries are publicly available.⁵¹ Current data privacy regimes will therefore not be affected.

6.2 France: how the LEI can bring additional benefits to an already unique national identifier

Executive summary

In France, all legal entities, whatever their legal form (company, individual acting in business capacity, government entity, non-profit organisation, fund with legal personality) are registered in the SIRENE database with a unique national code – the SIREN code. The SIRENE database is managed by the National Institute of Statistics and Economic Studies (*Institut national de la statistique et des études économiques* – INSEE). It is made available free of charge and updated daily on the government website. INSEE is also the main LOU in France, managing 88% of LEIs issued. Its management of the national registers helps INSEE to ensure the highest quality in the LEI database.

From a user point of view, France already benefits from a unique national code, similar in that respect to the LEI. In addition to the LEI information, the SIRENE database provides the entity's economic activity and the size of its workforce. However, France can still benefit from the LEI for two reasons. First, the LEI includes information on the direct and ultimate parent, which is not available to the public in the SIRENE database. Second, the LEI extends the benefit of a unique identifier to other countries.

The LEI is therefore a perfect tool for monitoring cross-border activity and implementing anti-money laundering regulations efficiently. French businesses would benefit from the ability to retrieve, on a unique website, information on foreign businesses similar to the information they are used to finding on the INSEE website for French businesses. In addition, there would be financial stability

⁴⁹ From a balance sheet perspective, there are several more such flows or yearly fixed data items that could be shared, such as tangible assets, equity, nominal capital or depreciation.

⁵⁰ Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (OJ L 124, 20.5.2003, p. 36).

⁵¹ For a practical example, see the [entry for Daimler AG in the LEI Reference Data](#).



surveillance benefits thanks to the mapping of groups and the unique worldwide identification of entities, reflecting the cross-border nature of financial risks.

For that reason, banks, corporate treasurers, the Banque de France and the French financial supervisors are very supportive of the development of the LEI in financial transactions, including non-financial entities, provided that proportionality is observed.

6.2.1 The SIREN code: similar benefits to those of the LEI for French legal entities

The SIRENE register gathers economic and legal information on close to ten million businesses and branches across all sectors of activity and legal forms in metropolitan France and overseas departments. Foreign enterprises that are represented in France or carry out activities there are also listed.

The SIRENE database is now available on the government open data platform (data.gouv.fr) and from an application programming interface (API)⁵². On average, 17,000 updates are submitted every day. INSEE works with many actors, such as commercial court clerks, gathering information on registrations, deletions and changes made to the repository. This makes SIRENE one of the world's most complete databases. It contains essential economical information and identification, including the following.

- The addresses of enterprises and establishments, together with their legal status.
- The SIREN/SIRET Number: The SIREN number is a unique ID number assigned to each enterprise by INSEE. This number identifies a legal person from its creation until its termination. The SIRET number is assigned to each local establishment. It comprises the SIREN number and an internal ranking number (*numéro interne de classement* – NIC). All enterprises and establishments in France can be identified with these two codes.
- The activity code⁵³: Every operating business has a code characterising its major activity in reference to the classification of economic activities. This code allows precise statistics to be made available on sectors of activity in France.
- The size of the workforce by segment for enterprises and establishments.

The SIRENE database will soon include the LEIs of French entities that have one. The only entities registered in France which are not registered in the SIRENE database are funds without legal personality (*fonds communs de placement*). For this reason, they cannot have a SIREN. However they are considered legal entities according to the LEI standard and can obtain an LEI. They are listed in the GECO database of the French financial market regulator (*Autorité des marchés*

⁵² See [the API Store on the INSEE website](#).

⁵³ The French activity code (known as the *Activité Principale de l'Entreprise* – APE or *Nomenclature d'activités françaises* – NAF) – follows the same structure as the European NACE code, which is itself concordant with the International Standard Industrial Classification of All Economic Activities (ISIC).



financiers – AMF). INSEE, the main LOU in France, accesses the AMF GECO database to validate the LEI data of the funds registered in France.

6.2.2 INSEE: the national business register and the main LOU in France

INSEE was sponsored as a pre-LOU for France in 2013, chosen because of its expertise in the management of registers. It was confirmed as an LOU in 2018, when GLEIF reviewed the accreditation of all existing LOUs. INSEE operates in a competitive environment alongside 12 other LOUs accredited for France. However, INSEE currently manages 88% of the LEIs granted to entities located in France, whatever their legal form (legal entities registered in the SIRENE database or funds without legal personality registered by the AMF). Making information on individuals acting in a business capacity public is under legal review in the light of the application of the General Regulation on Data Protection.

In providing LEIs, INSEE benefits from the full information embedded in the SIRENE database, along with additional information. As a business register, the SIRENE database includes all the Level 1 information that is needed for the LEI, i.e. name, address and country of the entity, address and country of the head office, legal form, date of creation and date of cessation. This information can easily be computed by INSEE, which holds it in its databases, but it is also made public and fully accessible to other LOUs.

In addition, INSEE stores internal information that is not fully public but can be useful in the management of LEIs. First, INSEE has primary access to corporate events such as mergers and terminations of legal entities. Indeed, INSEE updates the SIRENE database with annual surveys and can challenge the LEI registrants on the basis of these updates. Second, INSEE has access to confidential information on the parents that can, if necessary, complement the accounting documents obtained from the registrants. In both cases, the internal information held by the national business register can enhance the quality of the LEI database.

The internal information held by INSEE can also make the process of obtaining an LEI safer. INSEE has the name of the entity's manager, who is contacted to ensure that the person requesting an LEI in the name of the entity has the right to do so. To make the registration process smoother for registrants, INSEE allows for an LEI to be requested for a partner or client company on the basis on a signed mandate. INSEE makes the process safer by checking that the principal is the manager of the entity for which the agent is requesting an LEI. However, there is a limitation to this facility: INSEE is not in a position to provide bulk registration for all the subsidiaries of an international group, as it is accredited only for metropolitan France and French overseas departments. Nevertheless, bulk registration in France could develop if INSEE coordinates its efforts with those of banks as part of the GLEIS 2.0 initiative.



6.2.3 The use of the LEI by the private sector and the progress envisaged

The French Banking Association (*Fédération Bancaire Française* – FBF) and the French Association of Corporate Treasurers (*Association Française des Trésoriers d'Entreprise* – AFTE) are convinced of the usefulness of the LEI for KYC processes and for the purposes of implementing anti-money laundering regulation. International banking and corporate groups acknowledge the benefits of the LEI as a unifying code for their multiple internal client databases. They also recognise the benefits of the GLEIF database as an updated external source of information, especially regarding group structures. They particularly appreciate the worldwide nature of the LEI, which fits with their global activities. They all support the development of the LEI to leverage these benefits. The use of the LEI in payment messages is seen as a key feature of implementing anti-money laundering legislation.

In addition to their support for the regulatory development of the LEI, French banks and treasurers are developing platforms for exchanges between banks and corporates for KYC purposes.⁵⁴ All of these solutions use the LEI as an identifier, and some make use of the GLEIF database as a source of information. Some platforms bring together banks, insurers and asset managers throughout Europe and are intended to facilitate the sharing of documents by corporates for KYC purposes, so that they can make all of them available at once to their multiple banks through a decentralised blockchain-like network.

6.2.4 The use of the LEI by the public sector and the progress envisaged

The Banque de France, the French Prudential Supervision and Resolution Authority (Autorité de contrôle prudentiel et de résolution – ACPR) and the AMF use the LEI extensively to enhance the efficiency of their data management and market analysis. They also devote their best efforts to extending its use within the scope of their activity. The LEI is included as a key identifier in many of the forms of reporting to these bodies and in the databases they use.

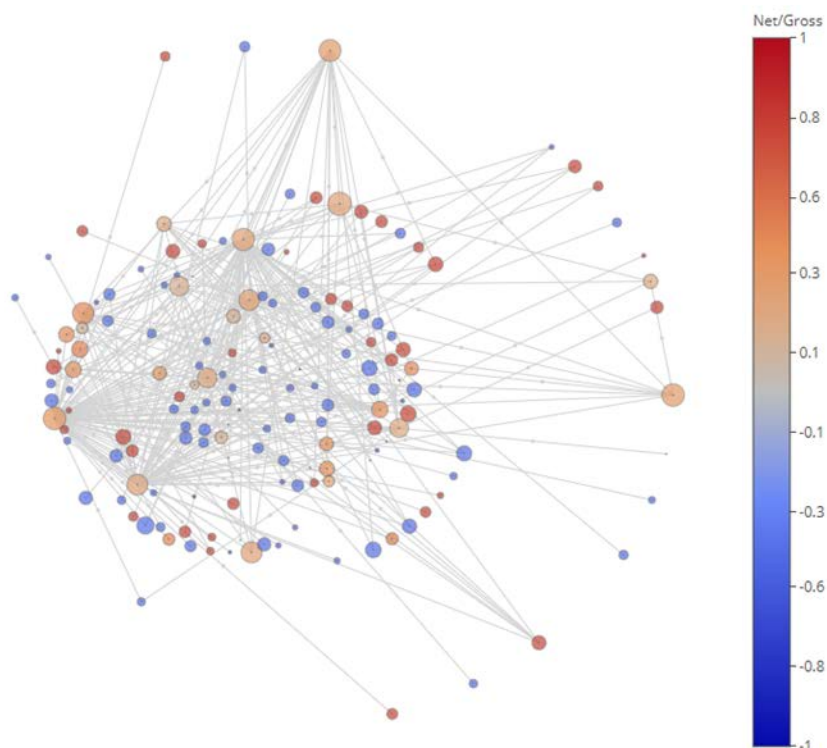
The most obvious case is the information on derivative transactions made available to the Banque de France, the ACPR and the AMF thanks to EMIR. In databases retrieved from trade repositories, 99.9% of the reporting entities and their counterparts are identified with an LEI. The LEI represents reliable and stable reference data, with key information such as geographical locations and relationships between entities permitting exposures to be aggregated at group level. It helps in building a network of exposures, making it easier to identify participants that can experience significant losses in the event of adverse market developments and key players whose failure would have a significant impact on other market participants.

⁵⁴ See the [AFTE presentation on KYC](#), 19 November 2019.



In Figure 6 below, buyers of the derivative are in red, sellers are in blue, and actors that are both buyers and sellers are in orange. If their gross exposures are high, their net exposures are low and they finally take limited risk.

Figure 4
Network of derivatives buyers and sellers



Sources: Banque de France.

The AMF also benefits from the LEI in the analysis of transactions on financial instruments it receives from market intermediaries thanks to MiFIR. In the tracking of market abuse, the LEI facilitates the automatic reconciliation of transactions and avoids the imposition of many costly additional requirements on market participants.

The LEI is a key identifier in the different reference databases used by the Banque de France. It is sourced from the ACPR and AMF databases for banks, insurers and mutual funds. Since its extensive use in RIAD, the dataset of reference data on legal entities maintained by the ECB, and more specifically for the identification of custodians in the security-by-security reporting of banks and debtors in AnaCredit, the LEI is spreading through the different reference databases used by the Banque de France for scoring the beneficiaries of private loans and managing statistical reporting. It is especially useful for identifying foreign branches and foreign counterparts of French financial institutions.

The Banque de France, ACPR and AMF are developing several initiatives to develop the use of the LEI by reporting entities for themselves. Banks (as of 2014) and insurers (as of 2016) are already



obliged to have an LEI thanks to European reporting requirements. The ACPR will go a step further in 2021 by imposing the use of the LEI as the identification key for financial reporting by banks and insurers. This will oblige all reporting entities, including foreign branches, to have an LEI.

In order to help reporting entities to identify their counterparts with the LEI, the ACPR already publishes the list of supervised banks that have an LEI and will publish the list of supervised insurers that have an LEI in due course. The AMF will do the same with regard to mutual funds. The Banque de France will also publish the sector classification of entities for statistical reporting with the LEI, and the SIRENE database will soon include the LEI as an identifier in addition to the SIREN code.

Promoting and facilitating the use of the LEI by the public is key to increasing its usefulness. The larger the number of entities with an LEI, the more tangible its benefits in terms of unambiguously identifying entities on a global basis, connecting databases and integrating information on ownership structures.



References

Azevedo, N. and Oliveira, V. (2020), “Structural Systemic Risk: Evolution and Main Drivers”, *Journal of Network Theory in Finance*, Vol. 5, No 4, pp. 1–28.

Deutsche Bundesbank (2019), *Financial Stability Review*.

European Systemic Risk Board (2020), *EU Non-bank Financial Intermediation Risk Monitor 2020 (NBFIMonitor)*, No 5, October 2020.

Financial Stability Board (2019), *Evaluation of the effects of financial regulatory reforms on small and medium-sized enterprise (SME) financing*.

Financial Stability Board (2019), *Thematic Review on Implementation of the Legal Entity Identifier*.

McKinsey & Company and GLEIF (2017), *The Legal Entity Identifier: The Value of the Unique Counterparty ID*.

GLEIF (2018), *A New Future for Legal Entity Identification*.

Montagna, M. and Kok, C. (2016), “Multi-layered interbank model for assessing systemic risk”, *Working Paper Series*, No 1944, ECB, Frankfurt am Main.



Imprint and acknowledgements

This paper summarises work undertaken under the auspices of the ESRB Task Force on the Legal Entity Identifier, chaired by François Laurent, which reports to the ESRB Advisory Technical Committee, chaired by Pablo Hernández de Cos. Substantial contributions to this paper were provided by the Editorial Board, chaired by Emilia Bonaccorsi di Patti, and especially by the referees Stan Maes and Vitor Oliveira. The authors would also like to thank the members of the ATC for their comments and suggestions.

François Laurent

European Central Bank; email: francois.laurent@ecb.europa.eu

Beata Kaminska

European Insurance and Occupational Pensions Authority; email: beata.kaminska@eiopa.europa.eu

Carlos Aparicio

European Securities and Markets Authority; email: carlos.aparicio@esma.europa.eu

Bartosz Dworak

European Commission; email: bartosz.dworak@ec.europa.eu

Luis Garcia

European Banking Authority; email: luis.garcia@eba.europa.eu

Dominique Durant

Banque de France; email: dominique.durant@banque-france.fr

Lucia Ristori

Banca d'Italia; email: lucia.ristori@bancaditalia.it

Robert Kirchner

Deutsche Bundesbank; email: robert.kirchner@bundesbank.de

Romain Calleja

ESRB Secretariat; email: romain.calleja@ecb.europa.eu

Eleni Katsigianni

ESRB Secretariat; email: eleni.katsigianni@ecb.europa.eu

Dimitrios Vitellas

ESRB Secretariat; email: dimitrios.vitellas@ecb.europa.eu

Federico Pistelli

ESRB Secretariat; email: federico.pistelli@ecb.europa.eu

© European Systemic Risk Board, 2021

Postal address 60640 Frankfurt am Main, Germany
Telephone +49 69 1344 0
Website www.esrb.europa.eu

All rights reserved. Reproduction for educational and non-commercial purposes is permitted provided that the source is acknowledged.

The cut-off date for the data included in this report was 1 June 2021.

For specific terminology please refer to the [ESRB glossary](#) (available in English only).

PDF ISBN 978-92-9472-230-0, ISSN 2467-0669, doi:10.2849/436741, DT-AC-21-001-EN-N