

ANALYSIS OF ESG DISCLOSURES  
IN PILLAR 3 REPORTS. A TEXT MINING  
APPROACH

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Ángel Iván Moreno Bernal and Teresa Caminero García



# **ANALYSIS OF ESG DISCLOSURES IN PILLAR 3 REPORTS. A TEXT MINING APPROACH**

Ángel Iván Moreno Bernal

BANCO DE ESPAÑA

Teresa Caminero García

BANCO DE ESPAÑA

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## Abstract

Disclosure of prudential information on environmental, social and governance (ESG) risks will become mandatory from June, 2022 for large institutions with securities traded on a regulated market of any Member State. This paper tries to assess how prepared European financial institutions are for this requirement and applies text mining techniques to analyse the prudential reports, commonly referred to as Pillar 3 reports, for 2019 and 2020 of most of the significant banks under the ECB direct supervision in order to evaluate the level of awareness of these institutions in relation to the materiality of ESG risks. By applying a simple taxonomy of terms based on lexicons and regular expressions using a tool that we have developed, we are able to identify relevant excerpts with a high level of precision searching for different combinations of concepts within the taxonomy of terms. The results indicate that although there is an increased awareness of the ESG risks, with a significant increase in smaller institutions (those with less than 30 billion in assets), the level of detail included is generally low and the introduction of the new ESG mandatory disclosures should have a significant impact on the level of disclosures in this area.

**Keywords:** ESG, environment, social, governance, sustainability, climate change, carbon emissions, environmental risks, physical risk, transition risk, natural language processing, Pillar 3.

**JEL classification:** C81, G32, Q56, Q54, C19.

## Resumen

La divulgación de información prudencial sobre los riesgos ambientales, sociales y de gobernanza (ASG) será obligatoria, a partir de junio de 2022, para las grandes empresas con valores negociados en un mercado regulado de cualquier Estado miembro. Este artículo trata de evaluar el grado de preparación de las entidades financieras europeas para este requerimiento mediante la aplicación de técnicas de minería de textos para analizar los informes prudenciales, comúnmente denominados informes de Pilar 3, correspondientes al período 2019-2020, de la mayoría de las entidades financieras significativas que están bajo la supervisión directa del BCE, con el fin de evaluar el nivel de concienciación de estas entidades en relación con la materialidad de los riesgos ASG. Al aplicar una sencilla taxonomía de términos basada en léxicos y expresiones regulares, mediante una herramienta que hemos desarrollado, somos capaces de identificar fragmentos relevantes con un alto nivel de precisión, a partir de la búsqueda de diferentes combinaciones de conceptos dentro de la taxonomía de términos. Los resultados indican que, aunque hay un mayor conocimiento de los riesgos ASG y se aprecia un aumento significativo en las instituciones más pequeñas (aquellas con activos por debajo de 30.000 millones de euros), el nivel de detalle incluido es generalmente bajo y la introducción de las nuevas divulgaciones obligatorias ASG debería tener un impacto significativo en el nivel de divulgación de información en esta área.

**Palabras clave:** ASG, ambiental, social, gobernanza, medio ambiente, sostenibilidad, cambio climático, emisiones de carbono, riesgos ambientales, riesgo físico, riesgo de transición, procesamiento del lenguaje natural, Pilar 3.

**Códigos JEL:** C81, G32, Q56, Q54, C19.

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## 1 Introduction

Climate change and environmental degradation are, in words of the European Commission, “defining global challenges of our time” (European Commission, 2021) and are increasingly being addressed by different policy initiatives. The year 2015 is generally considered an inflection point. In this year the Paris Agreement<sup>1</sup> was signed, with the objective to limit the increase in the global average temperature well below 2°C above pre-industrial level. Also in 2015 more than 190 governments adopted the United Nations (UN) 2030 Agenda for Sustainable Development<sup>2</sup>, with seventeen Sustainable Development Goals (SDGs) and 169 associated targets to be reached by 2030. Specifically, goal number 13 urges to take action to combat climate change and its impacts. It was also in 2015 that the Task Force on Climate-Related Financial Disclosures (TCFD) was created, with the focus on improving climate-related corporate disclosures.

Although climate and environment-related policies have gained a greater development, following the logical sense of urgency, in the last years the focus is turning to the wider concept of sustainability, including its social aspect and also fostering responsible conduct of corporations. In this regard, the European Commission’s 2018 Action plan (European Commission, 2018) aims to:

- 1 reorient capital flows towards sustainable investment in order to achieve sustainable and inclusive growth;
- 2 manage financial risks stemming from climate change, resource depletion, environmental degradation and social issues;
- 3 foster transparency and long-termism in financial and economic activity.

In accordance to this Action Plan, the financial sector is expected to play a key role in this transition. To reflect this, some mandates have been extended to the European Banking Authority (EBA) aiming to improve the identification, assessment and management of Environmental, Social and Governance (ESG) risks by institutions and the assessment of their impact by supervisors, effectively affecting the three pillars of the banking prudential framework, by modifying the revised Capital Requirements Directive and Regulation (CRR2/CRD5).

The first mandate (Article 98(8) of the CRD5) relates to Pillar 2 and calls on the EBA to develop a report assessing the potential inclusion of ESG risks in the supervisory review and evaluation process (SREP) performed by competent authorities. To that end, in June 2021 the EBA published its Report on ESG risks management and supervision (EBA, 2021). The second mandate (Article 434a and Article 449a of the CRR2) relates to Pillar 3 and requires the EBA to develop a technical standard for including ESG risks in the Pillar 3 disclosure requirements

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1 [https://unfccc.int/sites/default/files/english\\_paris\\_agreement.pdf](https://unfccc.int/sites/default/files/english_paris_agreement.pdf).

2 <https://sdgs.un.org/2030agenda>.



in Part Eight of the CRR2. Following this mandate, the EBA published in March 2021 draft technical standards for public consultation (EBA, 2021). Lastly, the third mandate (Article 501c of the CRR2) relates to Pillar 1 and requires the EBA to assess whether a dedicated prudential treatment of exposures related to assets or activities that are substantially associated with environmental and/or social objectives would be justified.

Although the disclosure requirements outlined in the Technical Standards will be applicable from June 2022 for large institutions with securities traded on a regulated market of any Member State, it is worth noting that one of the main purposes of Pillar 3 reports is to *enable market participants to access key information relating to [...] risk exposures in order to increase transparency and confidence about a bank's exposure to risk [...]* (Basel Committee on Banking Supervision, 2019). With a similar base, the Securities and Exchange Commission (SEC) concluded in 2010 that existing disclosure requirements also applied to climate change matters, due to the business materiality of this type of risks (SEC, 2010). It is also important to note that the climate-related financial disclosure guidelines developed by the TCFD were published in 2017 and were created with the objective *to be useful to investors, lenders, and insurance underwriters in understanding material risks* (TCFD, 2017). Finally, the ECB, in their “ECB Guide on climate-related and environment risks” clearly indicated that the existing prudential framework required the disclosure of those types of risks (ECB, 2020). It seems only logical that some banks would have already started applying some of the different recommendations in their Pillar 3 reports even before the ITS were published.

As a follow-up of the publication of the “ECB Guide on climate-related and environmental risks”, the ECB performed in 2020 a study where they analysed the comprehensiveness of climate-related and environmental risk disclosures of 107 Significant Institutions (SIs) and 18 less significant institutions (LSIs) for the reference year 2019 within the Single Supervisory Mechanism (SSM). The study was manually performed and they took into account public corporate disclosures available, predominantly in the annual reports. The ECB concluded that, in general, institutions did not yet comprehensively disclose their risk profile and that significant efforts were needed to promote transparency in the financial markets on the climate-related and environmental risks institutions were exposed to (ECB, 2020).

The current article also evaluates the disclosures of Significant Institutions, but, although the climate and environment areas are the most developed by the EBA and, thus, the most represented, instead of just focusing on those disclosures, it widens the scope to include the Social and Governance aspects of ESG. To that end, we analyse the presence of ESG concepts related to material risks and opportunities within Pillar 3 reports of 2019 and 2020. The study covers 106 Significant Institutions and follows the same technique described by Moreno and Caminero (2020). We have enhanced the process and the tool used in our previous work to adapt it to this specific scope. Although institutions tend to provide an English version of their Pillar 3 report, this is not always the case, so the technique has been slightly modified in order to support the analysis of reports regardless their language at a micro level when reviewing Pillar 3 reports, but to provide an innovative and efficient way to

obtain an overview of the level of compliance at an aggregate level. It can also help analysts focus the effort on specific areas highlighted by the results.

The report is organized as follows: first we describe the methodology and sample; a section follows where we analyse the relevance given to ESG concepts in Pillar 3 reports and then we analyse some ESG risk-related metrics and ESG products. Finally, we evaluate the results.

## 2 Methodology and set-up

### 2.1 Sample of analysis

Starting from the list of SSM SI as of July 2021<sup>3</sup>, we gathered the different Pillar 3 reports from the corporate websites of each institution. We chose the English version whenever available. Otherwise, the version in the corresponding country language was used. For the instances where the Pillar 3 report was part of the annual report, only the Pillar 3 section was considered. If an institution had both qualitative disclosures and quantitative disclosures in separate documents, only the qualitative disclosures document was processed. In the event that a subsidiary was also a SI, we considered the highest level of consolidation, but also included the reports of the individual subsidiary, if available. As with the ECB study, this meant that since the disclosures of certain banks were considered at international consolidation level, sometimes they were outside the SSM scope (e.g. Bank of Canada, which has a subsidiary that is a SI in Luxembourg). The only exception was Sberbank Europe AG, which was considered at European consolidation level, since it was the only level available. In any case, disclosures by institutions with several subsidiaries in different SSM countries were only counted once. Those institutions for which reports were not available for both years were discarded. As a result, the sample consisted in 112 SIs that, after consolidating the subsidiaries of the same parent institution, resulted in 106 consolidated SIs, distributed as shown in Table 1 and Appendix A. Note that even if a subsidiary has less than \$500 billion total assets at individual level, but more than €500 billion at a consolidated level, it is classified in Table 1 at its consolidated level.

Table 1

#### OVERVIEW OF THE DISTRIBUTION OF THE SAMPLE ACCORDING TO INSTITUTION SIZE AND COUNTRY

	Country																			Total	Consolid.	
	AT	BE	BG	CY	DE	EE	ES	FI	FR	GR	IE	IT	LT	LU	LV	MT	NL	PT	SI			
<b>Significant Institutions</b>	<b>7</b>	<b>6</b>	<b>1</b>	<b>3</b>	<b>20</b>	<b>3</b>	<b>10</b>	<b>3</b>	<b>11</b>	<b>4</b>	<b>6</b>	<b>11</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>7</b>	<b>3</b>	<b>3</b>	<b>112</b>	<b>106</b>	
>€500 billion assets		1			5	2	2	1	6		3	2	2	2	3	1	2				32	26
€100 billion - €500 billion assets	2	2			6	1	2	1	1		1	3					2				21	21
€30 billion - €100 billion assets	2	1			9		6	1	4	4	2	5		1			3	3			41	41
<€30 billion assets	3	2	1	3								1	1	2		2				3	18	18

SOURCE: Own elaboration

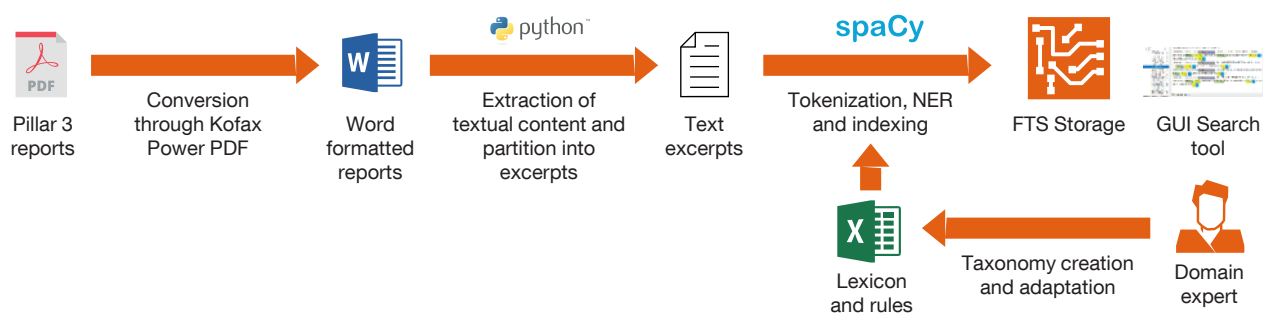
### 2.2 Method

As described in Moreno and Caminero (2020), the process involved extracting the text of the Pillar 3 reports, partitioning them into excerpts, tagging specific expressions according

<sup>3</sup> <https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.listofsupervisedentities202108.en.pdf>.

Figure 1

REPRESENTATION OF THE WORKFLOW OF THE PROCESS



SOURCE: Own elaboration.

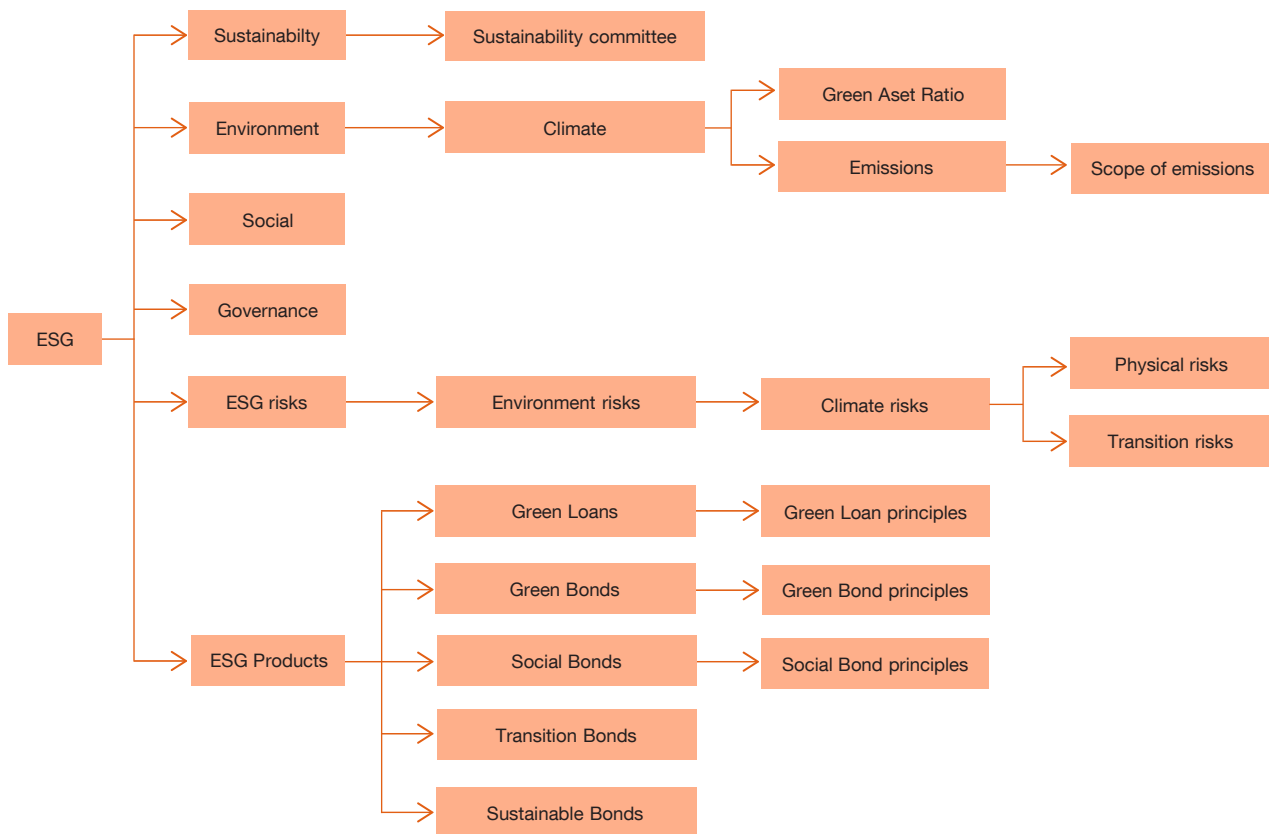
to a set of rules mainly based on lexicons and regular expressions and, finally, indexing the words and tags in the excerpts to allow querying the excerpts using a simple query language. Figure 1 shows the workflow of the process followed.

The tagging structure formed a taxonomy of concepts that allowed creating queries at different levels of the hierarchy. This taxonomy was created in an iterative way based on actual disclosures found in the reports using as a reference the EBA Report (European Banking Authority [EBA], 2021) and EBA Draft Implementing Technical Standards (ITS) (EBA, 2021). Figure 2 shows a partial view of the hierarchy. Note that each key concept had its own lexicon of expressions related to that level. It was possible to query for excerpts containing expressions of a given key concept only or including all the sub-concepts as well. In our analysis we always included the sub-concepts when querying a parent concept. One of the benefits of having this taxonomy layer on top of the terms is that excerpts in different languages can share the same concepts. This means that queries using the concepts can identify excerpts regardless their language as long as the lexicons contain the variations of the different languages. For example, for the *Sustainability* concept, our lexicon contained the English word “sustainability”, but also the German word “Nachhaltigkeit” (including compounds where this is the first word), the French expression “développement durable” or the Spanish term “sostenibilidad”. In fact, since Pillar 3 reports, although typically published in English, can be published in the official language of the corresponding jurisdiction, our lexicons included terms and expressions in five different languages: English, German, French, Italian, Spanish and Portuguese.

The lexicons were manually reviewed through several iterations so that when querying different concepts, the retrieved excerpts had minimal instances where those excerpts were not relevant to the concept being searched. For example, when querying for the concept of **Sustainability**, since “sustainability” was itself a word within the lexicon linked to this concept, the matching excerpts were prone to have some false positive results such as those discussing aspects related to maintaining a durable profitability of the business, using

Figure 2

**PARTIAL VIEW OF THE STRUCTURE OF THE CONCEPTS OF THE TAGGING TAXONOMY**



SOURCE: Own elaboration.

variations of the expression “sustainability of the business”. Most of the time this could be avoided by including those expressions within a “Not applicable” category, so that they would not be retrieved when creating a query using the original key concept. These false positive results are also called type I errors, as opposed to false negative results or type II errors. The latter refer to those excerpts not retrieved, but which are relevant to the intended query. An example would be an excerpt where the OCR process was inaccurate, resulting in a misspelled instance of the term “sustainability”. In this case, the excerpt would be relevant, but would not be part of the results, since the word would not match any of the expressions linked to the **Sustainability** concept. Once a good level of confidence was reached in terms of minimizing false positives, three sets of queries were created, each set targeting one of the following areas: **ESG awareness**, **ESG risks** and **ESG products**. The results of the queries were reviewed and the lexicons modified in order to obtain 100% of precision<sup>4</sup> (zero false positives) at the institution level, that is, an institution that had at least one true positive matching excerpt was considered a true positive match, since the objective was to identify institutions with at least one appropriate reference to the intended purpose of the query.

<sup>4</sup> In information retrieval, precision is defined as the fraction of relevant instances among the retrieved instances.

Note that false negatives are much more difficult to identify, since that would involve carefully reviewing all the non-matching excerpts, and the effort required to obtain this level or recall<sup>5</sup> was beyond the scope of this study. Still, we consider that the results offer a fair representation of the disclosures, since it is not unreasonable to assume that false negatives will be uniformly distributed.

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<sup>5</sup> In information retrieval, recall or sensitivity is defined as is the fraction of relevant instances that were retrieved (out of the total existing relevant instances).

### 3 Analysis of the relevance given to ESG

The first area of analysis was the awareness of ESG in terms of whether Institutions considered relevant mentioning ESG concepts as part of the Pillar 3 disclosures. Chart 1 was created by creating queries looking for excerpts with the concepts referred in the bar heading plus its sub-concepts, following the hierarchy partially outlined in Figure 2. So, the bar indicating the institutions mentioning ESG concepts, also include institutions mentioning ESG risks, as well as Environment risks or Climate risks. It is worth noting that the more specific the concept is, the shorter the bar, indicating that institutions tend to give generic references to ESG concepts in their Pillar 3 disclosures. Our top-level ESG concept was very wide in scope, including from direct “ESG” references to more loosely related terms such as “Corporate Social Responsibility”.

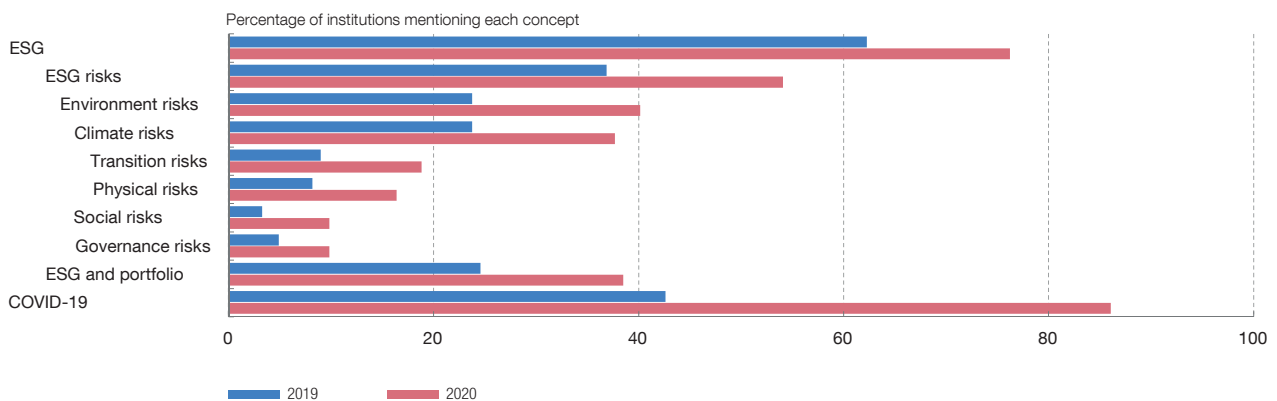
The chart also reveals that in 2020 more institutions mention each of the concepts than in 2019, indicating a progressive increase of awareness of ESG as material to the business. As a reference, institutions mentioning COVID-19 are also represented. The existence of references to this concept in 2019 are explained by the fact that the publication date of the 2019 report can be well into the following year. Besides, some institutions actually provide an updated version of their 2019 Pillar 3 reports to account for the pandemic impact.

Regarding Governance, most of the mentions to Governance by institutions are related to the governance of the institution itself. Following the EBA guidelines, our main focus was the risks to which the institutions were exposed via the impact of ESG factors on their counterparties or invested assets, i.e. the risks arising from their core activities. Consequently, our concept of *Governance* was restricted to the concept or “responsible governance” and our concept of *Governance risks* only included explicit references to Governance risks or factors. To accommodate the idea that the main interest relies in ESG

Chart 1

#### INSTITUTIONS MENTIONING IN PILLAR 3 REPORTS CONCEPTS RELATED TO ESG

PERCENTAGE OF INSTITUTIONS MENTIONING IN PILLAR 3 REPORTS CONCEPTS RELATED TO ESG



SOURCE: Own elaboration.

Figure 3

**SAMPLE EXCERPT RETRIEVED MATCHING THE “CLIMATE RISK” CONCEPT**

The growing importance of climate change as a source of indirect risk is increasingly being recognized in credit policy discussions. Climate risk can arise as physical risk, where changing weather patterns may adversely impact a client's operations, their access to critical resources, their supply chains or their distribution networks. It can also be a transition risk if movement to a lower carbon economy increases the costs or reduces the demand for their products or services. Climate risks are assessed at a relationship level or on a transactional level, such as assessing a client's perspective on the potential impacts of the climate change agenda on their operations, and the extent to which such impacts are reflected in their business planning assumptions.

SOURCE: Own elaboration.

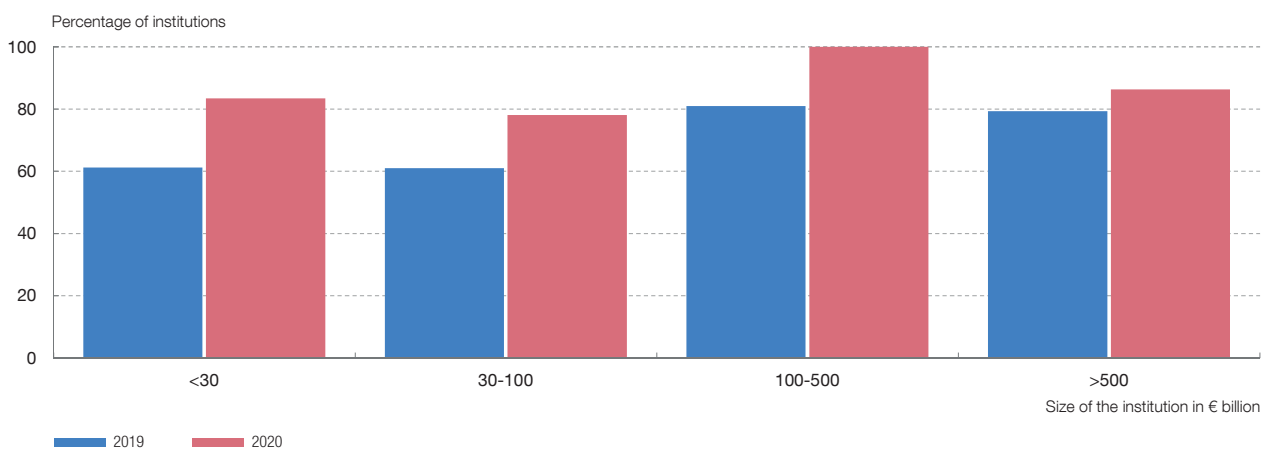
in relation to the counterparties, we created a query for excerpts with the combination of concepts related to ESG and concepts related to activities or portfolio of the institution, matching this way excerpts where those two concepts were discussed. The result can be seen in Chart 1 under the label “ESG and portfolio”.

An example of excerpt retrieved for the “climate risk” concept is shown in Figure 3, including the tagging added in the process. This sample excerpt not only shows awareness of the importance of climate risk for the business, but also suggests that the institution is actively assessing the ESG risks of its clients, although additional details are missing, such as a more explicit description of the methodology and frameworks used.

Chart 2

**INSTITUTIONS MENTIONING IN PILLAR 3 REPORTS CONCEPTS RELATED TO ESG BY SIZE**

PERCENTAGE OF INSTITUTIONS MENTIONING IN PILLAR 3 REPORTS CONCEPTS RELATED TO ESG BY SIZE



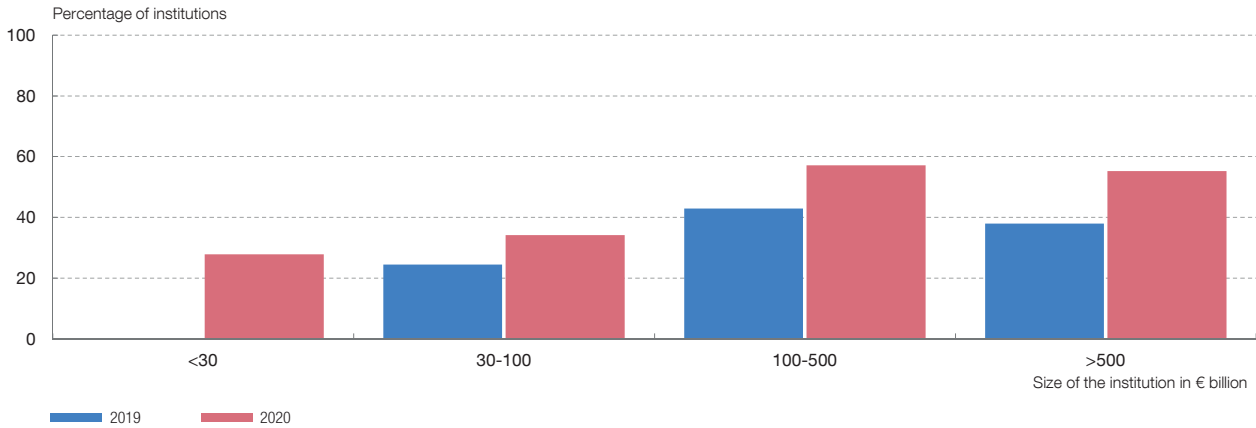
SOURCE: Own elaboration.



Chart 3

**INSTITUTIONS MENTIONING IN PILLAR 3 REPORTS CONCEPTS RELATED TO ESG TOGETHER WITH PORTFOLIO OR ACTIVITIES BY SIZE**

PERCENTAGE OF INSTITUTIONS MENTIONING IN PILLAR 3 REPORTS CONCEPTS RELATED TO ESG TOGETHER WITH PORTFOLIO OR ACTIVITIES BY SIZE<sup>E</sup>



SOURCE: Own elaboration.

Chart 2 shows the distribution by institution size among those that mention concepts related to ESG. We observe that at this level there are no significant differences, most likely due to the wide meaning of our ESG concept. Going down up to the level of the combination of ESG and portfolio (Chart 3), we observe a relevant difference between bigger institutions and smaller ones, especially in 2019, when no references were found for smaller institutions. This is aligned with the results of the manual analysis performed by the ECB in their 2020 report (ECB, 2020). The fact that in 2020 institutions with less than €30 billion in assets show a considerable increase in this metric might be related with the regulatory initiatives announced and guidelines published both at the ECB and EBA levels, since in our manual review of the matching excerpts we identified more references to these initiatives in the 2020 reports. Note that results by jurisdiction would be biased towards the size distribution within each jurisdiction and therefore we believe that an analysis by size provides more meaningful results.

## 4 Analysis of the ESG risk-related methods described

The second area of analysis was on ESG risk-related methods. The EBA outlines several key concepts in this area:

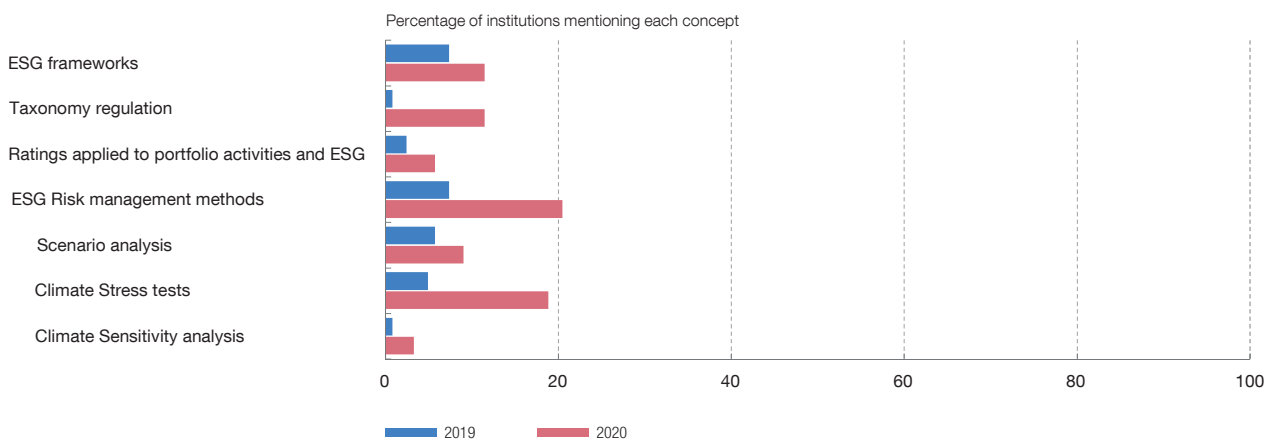
**International Frameworks** and standards defining ESG factors. These are used by institutions to help them identify ESG factors as well as to have a reference against which they can align their portfolio and activities. Examples of such frameworks are the UN SDGs, the principles for Responsible Investment (PRI), the United Nations Environment Programme Finance Initiative (UNEP FI) Principles for Responsible Banking or the Global Sustainability Standards Board Reporting Initiative (GRI).

- The **EU Taxonomy regulation** ((EU) 2020/852). This regulation classifies environmentally sustainable economic activities based on uniform criteria and can be used by institutions to assess their portfolio with the objective to progressively increase its alignment with the taxonomy.
- **ESG Ratings and scoring**. This can provide complementary information for standard risk monitoring by institutions and investors, providing inputs as well for counterparties as to how they can improve their strategies and business models and the key areas they should look at.
- **ESG Risk management methods**. The EBA considers **scenario analysis** a useful method to assess ESG risks. Specifically, in the climate and environment area, the EBA identifies two frameworks:

Chart 4

### INSTITUTIONS MENTIONING IN PILLAR 3 REPORTS CONCEPTS RELATED TO ESG FRAMEWORKS AND RISK MANAGEMENT METHODS

PERCENTAGE OF INSTITUTIONS MENTIONING IN PILLAR 3 REPORTS CONCEPTS RELATED TO ESG FRAMEWORKS AND RISK MANAGEMENT METHODS

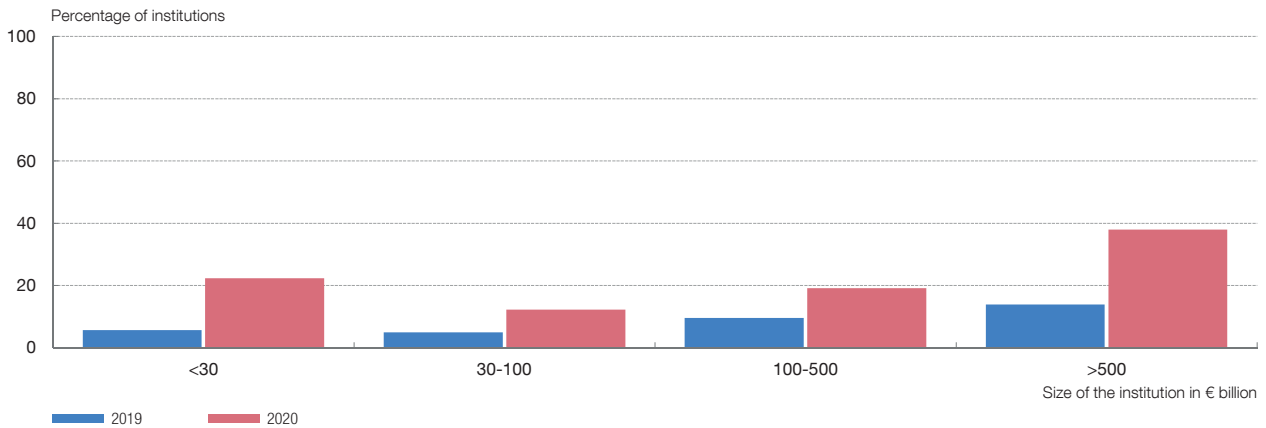


SOURCE: Own elaboration.

Chart 5

**INSTITUTIONS MENTIONING IN PILLAR 3 REPORTS CONCEPTS RELATED TO ESG FRAMEWORKS AND RISK MANAGEMENT PORTFOLIO BY SIZE**

PERCENTAGE OF INSTITUTIONS MENTIONING IN PILLAR 3 REPORTS CONCEPTS RELATED TO ESG FRAMEWORKS AND RISK MANAGEMENT PORTFOLIO BY SIZE



SOURCE: Own elaboration.

- **Climate Stress tests.** These are mainly mentioned in the area of “climate stress tests” and they feature fully fledged scenarios that map out possible future development paths of transition variables (e.g. carbon prices), physical variables (e.g. temperature increases) and the related changes in macro variables.
- **Climate sensitivity analysis.** This is a simpler exercise without scenarios, assessing changes in portfolio risk attributes by changing some of the inputs in financial models based on classification of exposures into ‘green’ and ‘non-green’.

The above concepts have been included in the analysis and the results can be seen in Chart 4. Again, all metrics increase from 2019 to 2020, but it is also clear that very few institutions mention these very specific concepts. When arranging the metric by size (see Chart 5), it becomes clear that bigger institutions tend to refer to this concepts more. Again, the difference between 2019 and 2020 in smaller institutions is noteworthy.

## 5 Analysis of ESG products mentioned

Our last area of analysis is related to the mentions to ESG-related products. These are products typically marked as “green” or “social”, being the two main categories loans and bonds. Some institutions offer some type of “**green loans**” or “green mortgages” to corporates, households or sovereigns. These institutions have developed either internal standards or use established market standards, for example, the Green Loans Principles or the Energy Efficient Mortgages Action Plan (EeMAP). We have included in the “green loan standards” concept also the mentions to mortgages with energy-efficient labels, seeing that as an adoption of a standard. In the case of Bonds, the EBA mentions three types in their report:

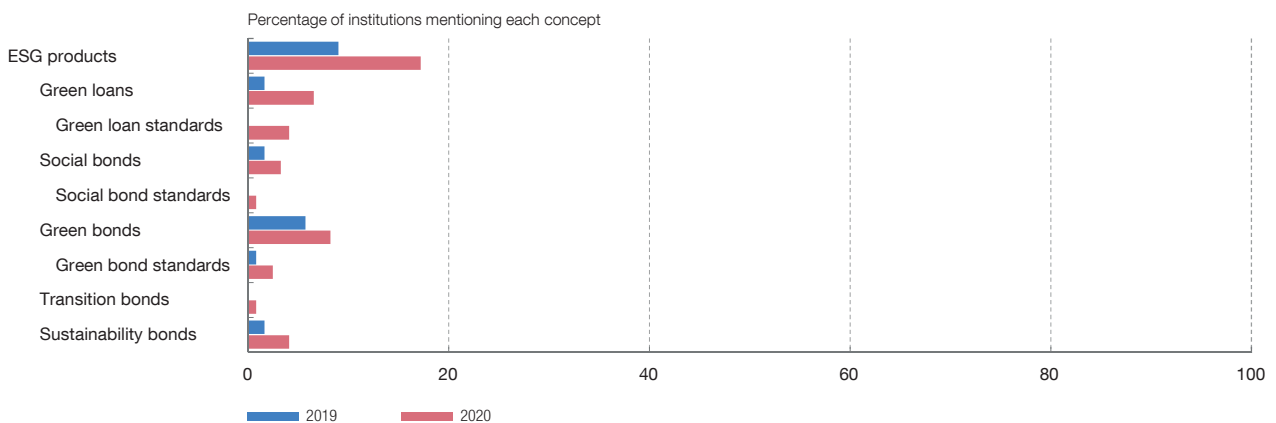
- **Social bonds.** They are issued to raise funds for projects with positive social outcomes. There are some related **standards**, such as the Social Bond Principles or the ASEAN Social Bond Standards.
- **Green bonds.** Institutions use one of the existing market **standards** to structure their issuance. For example, the Green Bond Principles or the Climate Bonds Standard. Looking in the future, the currently proposed regulation for a European Green Bonds Standard (EUGBS) is expected to gain wider adoption.
- **Sustainability-linked bonds.** These are bonds linked to sustainability standards, such as the EU taxonomy. They look to improve the borrower’s sustainability profile by aligning loan terms to the borrower’s performance against the relevant predetermined sustainability performance targets.

In addition to these three types of bonds, some institutions issue also a product called “**transition bonds**”, which, despite the existence of several framework proposals

Chart 6

### INSTITUTIONS MENTIONING IN PILLAR 3 REPORTS CONCEPTS RELATED TO ESG PRODUCTS

PERCENTAGE OF INSTITUTIONS MENTIONING IN PILLAR 3 REPORTS CONCEPTS RELATED TO ESG PRODUCTS

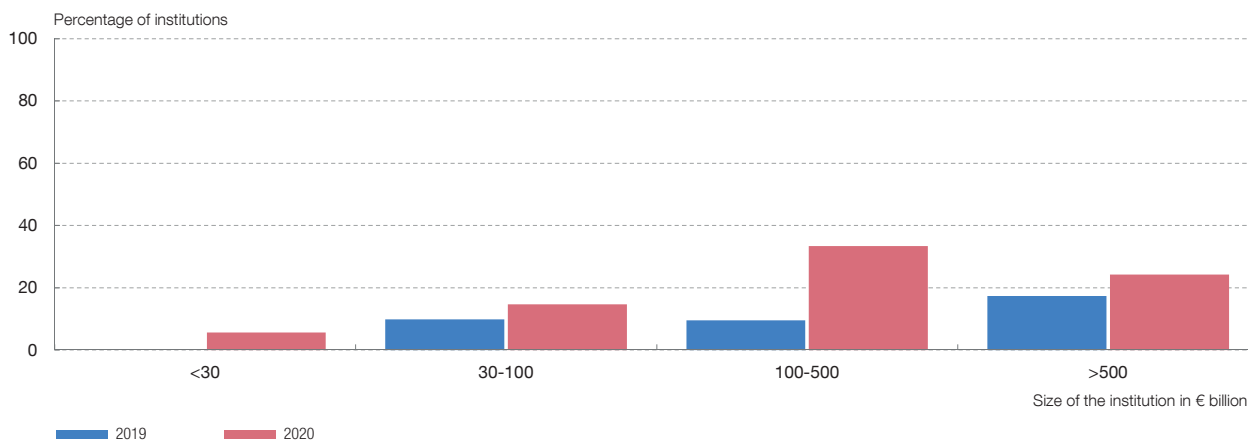


SOURCE: Own elaboration.

Chart 7

**INSTITUTIONS MENTIONING IN PILLAR 3 REPORTS CONCEPTS RELATED TO ESG PRODUCTS BY SIZE**

PERCENTAGE OF INSTITUTIONS MENTIONING IN PILLAR 3 REPORTS CONCEPTS RELATED TO ESG PRODUCTS BY SIZE



SOURCE: Own elaboration.

(Shrimal, 2021), do not currently have any set of formal principles. Still, the International Capital Market Association (ICMA) has published a Q&A document in which they set some guidelines for this type of bonds (ICMA, 2020).

Finally, besides the sustainability-linked bonds mentioned above, there are also **sustainability bonds**, which should follow the Sustainability Bonds Guidelines provided by the ICMA, which defines them as *any type of bond instrument where the proceeds or an equivalent amount will be exclusively applied to finance or re-finance a combination of both Green and Social Projects* (ICMA, 2021). Note that the difference between the sustainability-linked bonds and the sustainability bonds is basically that the first is linked on sustainability goals, regardless where the proceeds are applied and the second is linked to a sustainable project, regardless if eventually a sustainability goal is met. Despite their differences, we decided to include them under the same heading for simplification. Green private placements were also included under the green bonds heading, although they only appear once and only in 2020.

Basing our analysis on the concepts above, in the Chart 6 we can see again that the number of institutions mentioning these products increase in 2020, although the percentage remains low. Some institutions refer to “green financial products” without further development, thus being counted only towards the “ESG products” heading. Although the number of institutions referencing Green Bonds increased slightly, some institutions mentioned them in 2019 but not in 2020. Note also that in 2020 some institutions also issued what was coined as “COVID social bond”, directed to recovery and reactivation efforts and they are included within the social bonds heading. When looking at the distribution by size (Chart 7) we see the same pattern as previously identified: a greater percentage of large institutions mention these products than of smaller institutions.

## 6 Conclusions

In this article we applied the techniques outlined by Moreno and Caminero (2020) to evaluate the level of awareness of the materiality of ESG factors in Pillar 3 reports in 106 Significant Institutions. The results are aligned with the results published by the ECB in their 2020 report (ECB, 2020).

The technique was applied to reports in multiple languages, allowing to perform a consolidated analysis over the whole sample, reaching a very fine level of granularity of the disclosure concepts object of study. The rules and lexicons were fine-tuned until obtaining a 100% of precision in the results, but since the recall level was not verified, results might be biased towards a conservative side. Still, using this type of semi-automatic technique, proves to provide a relatively quick way to obtain an overview of the evolution of ESG disclosures within Pillar 3 reports, giving some interesting insights useful for supervisors and policy-makers. This approach could be further extended to other areas within the central bank supervision tasks. The multi-language possibility opens the door to collaboration with other supervisors in similar innovation projects that could be applicable to multiple jurisdictions.

The results show an increased awareness of the ESG factors as material to the banking business, especially for larger institutions, but with smaller ones seemingly catching up quickly in 2020. This evident growing awareness coincides with the increase of regulation efforts towards making the financial system a key part of the transition towards a more sustainable economy. Still, the level of references to concepts related to very specific disclosures remains very low. As the new ITS on Pillar 3 disclosures on ESG risks becomes mandatory, the level of detail in the disclosures it is expected to increase.

## Annex 1

Table A1.1

Name (a)	Country	Size in €billion
AXA Bank Belgium SA ; AXA Bank Belgium NV	Belgium	<30
Banque Degroof Petercam SA ; Bank Degroof Petercam NV	Belgium	<30
Belfius Banque SA ; Belfius Bank NV ; Belfius Bank SA	Belgium	100-500
Investeringsmaatschappij Argenta NV ; Soci�t� d'investissements Argenta SA ; Investierungsgesellschaft Argenta AG	Belgium	30-100
KBC Group NV	Belgium	100-500
The Bank of New York Corporation	United States	>500
The Bank of New York Mellon SA	Belgium	30-100
DSK Bank AD	Bulgaria	<30
Aareal Bank AG	Germany	30-100
Bayerische Landesbank	Germany	100-500
COMMERZBANK Aktiengesellschaft	Germany	100-500
DekaBank Deutsche Girozentrale	Germany	30-100
Deutsche Apotheker- und �rztebank eG	Germany	30-100
Deutsche Bank AG	Germany	>500
Deutsche Pfandbriefbank AG	Germany	30-100
DZ BANK AG Deutsche Zentral-Genossenschaftsbank	Germany	100-500
Erwerbsgesellschaft der S-Finanzgruppe mbH & Co. KG	Germany	30-100
Goldman Sachs Group, Inc.	United States	>500
Goldman Sachs Bank Europe SE	Germany	>30
Hamburg Commercial Bank AG	Germany	30-100
J.P. Morgan	United States	>500
J.P. Morgan AG	Germany	30-100
J.P. Morgan Bank Luxembourg S.A.	Luxembourg	30-100
Landesbank Baden-W�rttemberg	Germany	100-500
Landesbank Hessen-Th�ringen Girozentrale	Germany	100-500
M�nchener Hypothekenbank eG	Germany	30-100
Morgan Stanley	United States	>500
Morgan Stanley Europe Holding SE	Germany	<30
Norddeutsche Landesbank -Girozentrale-	Germany	100-500
State Street Europe Holdings Germany S.�.r.l. & Co. KG	Germany	30-100
UBS AG	Switzerland	>500
UBS Europe SE	Germany	30-100
Volkswagen Bank GmbH	Germany	30-100
SEB Pank	Sweden	>500
AS SEB Pank	Estonia	<30
AS "SEB banka"	Latvia	<30
AB SEB bankas	Lithuania	<30
Luminor Holding AS	Estonia	100-500
AIB Group plc	Ireland	30-100
Bank of America Corp.	United States	>500
Bank of America Europe Designated Activity Company	Ireland	30-100
Bank of Ireland Group plc	Ireland	100-500

**SOURCE:** Own elaboration.

**a** Two institutions were discarded because not all reports were available for both years: HASPA Finanzholding and Liberbank.

Table A1.1 (cont.)

Name (a)	Country	Size in €billion
Barclays Bank	United Kingdom	>500
Barclays Bank Ireland PLC	Ireland	30-100
Citibank	United States	>500
Citibank Holdings Ireland Limited	Ireland	30-100
Ulster Bank Ireland Designated Activity Company	Ireland	30-100
ALPHA SERVICES AND HOLDINGS S.A.	Greece	30-100
Eurobank Ergasias Services and Holdings S.A.	Greece	30-100
National Bank of Greece S.A.	Greece	30-100
Piraeus Financial Holdings S.A.	Greece	30-100
ABANCA Corporación Bancaria S.A.	Spain	30-100
Banco Bilbao Vizcaya Argentaria, S.A.	Spain	>500
Banco de Crédito Social Cooperativo, S.A.	Spain	30-100
Banco de Sabadell, S.A.	Spain	100-500
Banco Santander, S.A.	Spain	>500
Bankinter, S.A.	Spain	30-100
CaixaBank, S.A.	Spain	100-500
Ibercaja Banco, S.A.	Spain	30-100
Kutxabank, S.A.	Spain	30-100
Unicaja Banco, S.A.	Spain	30-100
BNP Paribas S.A.	France	>500
BPCE S.A.	France	>500
Bpifrance	France	30-100
C.R.H. - Caisse de Refinancement de l'Habitat	France	30-100
Confédération Nationale du Crédit Mutuel	France	>500
Crédit Agricole S.A.	France	>500
HSBC Holdings Plc	United Kingdom	>500
HSBC Continental Europe	France	100-500
HSBC Bank Malta p.l.c.	Malta	<30
La Banque Postale	France	100-500
RCI Banque SA	France	30-100
SFIL S.A.	France	30-100
Société Générale S.A.	France	>500
Banca Carige S.p.A. - Cassa di Risparmio di Genova e Imperia	Italy	<30
BANCA MONTE DEI PASCHI DI SIENA S.p.A.	Italy	100-500
Banca Popolare di Sondrio, Società Cooperativa per Azioni	Italy	30-100
Banco BPM S.p.A.	Italy	100-500
BPER Banca S.p.A.	Italy	30-100
Cassa Centrale Banca - Credito Cooperativo Italiano S.p.A.	Italy	30-100
Credito Emiliano Holding S.p.A.	Italy	30-100
Iccrea Banca S.p.A. - Istituto Centrale del Credito Cooperativo	Italy	100-500
Intesa Sanpaolo S.p.A.	Italy	>500
Mediobanca - Banca di Credito Finanziario S.p.A.	Italy	30-100
UniCredit S.p.A.	Italy	>500
Bank of Cyprus Holdings Public Limited Company	Cyprus	<30
Hellenic Bank Public Company Limited	Cyprus	<30

**SOURCE:** Own elaboration.

**a** Two institutions were discarded because not all reports were available for both years: HASPA Finanzholding and Liberbank.



Table A1.1 (cont.)

Name (a)	Country	Size in €billion
RCB Bank LTD	Cyprus	<30
AS "Citadele banka"	Latvia	>500
"Swedbank" AB	Sweden	>500
"Swedbank" AS	Estonia	<30
"Swedbank" AS	Latvia	<30
"Swedbank", AB	Lithuania	<30
Akcinė bendrovė Šiaulių bankas	Lithuania	<30
Banque et Caisse d'Epargne de l'Etat, Luxembourg	Luxembourg	30-100
Banque Internationale à Luxembourg S.A.	Luxembourg	<30
Precision Capital S.A.	Luxembourg	<30
RBC Royal Bank	Canada	>500
RBC Investor Services Bank S.A.	Luxembourg	<30
Bank of Valletta plc	Malta	<30
MDB Group Limited	Malta	<30
ABN AMRO Bank N.V.	The Netherlands	100-500
BNG Bank N.V.	The Netherlands	100-500
Coöperatieve Rabobank U.A.	The Netherlands	>500
de Volksbank N.V.	The Netherlands	30-100
ING Groep N.V.	The Netherlands	>500
LP Group B.V.	The Netherlands	30-100
Nederlandse Waterschapsbank N.V.	The Netherlands	30-100
Addiko Bank AG	Austria	<30
BAWAG Group AG	Austria	30-100
Erste Group Bank AG	Austria	100-500
Raiffeisen Bank International AG	Austria	100-500
Raiffeisenbankengruppe OÖ Verbund eGen	Austria	30-100
Sberbank Europe AG	Austria	<30
Volksbank Wien AG	Austria	<30
Banco Comercial Português, SA	Portugal	30-100
Caixa Geral de Depósitos, SA	Portugal	30-100
LSF Nani Investments S.à.r.l.	Portugal	30-100
Agri Europe Cyprus Limited	Slovenia	<30
Biser Topco S.à.r.l.	Slovenia	<30
Nova Ljubljanska Banka d.d. Ljubljana	Slovenia	<30
Kuntarahoitus Oyj	Finland	30-100
Nordea Bank Abp	Finland	>500
OP Osuuskunta	Finland	100-500

**SOURCE:** Own elaboration.

**a** Two institutions were discarded because not all reports were available for both years: HASPA Finanzholding and Liberbank.

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