Journal of Open Innovation: Technology, Market, and Complexity

MDPI

Article

Macro Level Measuring of Organization Legitimacy: Its Implication for Open Innovation

Adrián López-Balboa, Alicia Blanco-González *, Francisco Díez-Martín and Camilo Prado-Román

Business Administration Department, Rey Juan Carlos University, 28032 Madrid, Spain; lopezbalboaadrian@gmail.com (A.L.-B.); francisco.diez@urjc.es (F.D.-M.); camilo.prado.roman@urjc.es (C.P.-R.)
* Correspondence: alicia.blanco@urjc.es; Tel.: +34-914-888-041

Abstract: Although the field of organizational legitimacy is undergoing great advances, academics are still facing the challenge of its measurement. Currently, academics are focusing on improving and homogenizing legitimacy measurement systems at the micro level. However, measuring legitimacy at the macro level has not evolved according to the needs and possibilities provided by new technologies. This research aims to develop a new methodology to measure organizational legitimacy at the macro level, capable of processing large amounts of information. To this end, an analysis of the news content of the 50 companies that make up the EuroStoxx50 has been conducted for a full year. By doing so, we make three key contributions to managing organizational legitimacy. First, we provide a more complete and reliable measurement of organizational legitimacy thanks to mass information processing techniques, providing a technology-based solution to the obsolescence problem of legitimacy evaluation models at the macro level. Second, we provide empirical evidence of the relationship between legitimacy and organizational success based on the analysis of mass information. Third, we show evidence that a bias is introduced in the measurement of legitimacy due to the use of different sources for this purpose.

Keywords: legitimacy; media; news aggregator

check for updates

Citation: López-Balboa, A.; Blanco-González, A.; Díez-Martín, F.; Prado-Román, C. Macro Level Measuring of Organization Legitimacy: Its Implication for Open Innovation. *J. Open Innov. Technol. Mark. Complex.* **2021**, *7*, 53. https://doi.org/10.3390/joitmc7010053

Received: 11 January 2021
Accepted: 30 January 2021
Published: 3 February 2021

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Copyright: © 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

1. Introduction

Legitimacy has become an area of research of great interest for academics [1] as it has been proven to be a vital asset for the survival of organizations [2]. Organizational legitimacy refers to the social acceptance of an organization's actions [3]. This social acceptance enables organizations to influence stakeholders' behavior [4] and to achieve greater levels of access to key resources [5,6]. Organizational legitimacy researchers are providing numerous advances to deepen our understanding of its causes and consequences [7]. However, due to its intangible nature, there are still many obstacles and difficulties to be managed for its proper and accurate measurement [8].

Organizational legitimacy emerges from the individuals' evaluations of the actions performed by the organizations. These evaluations are subjected to numerous factors that directly influence individuals and are manifested in two different levels (macro and micro) [9,10]. At the micro level, the individual´s perception regarding the acceptance and desirability of organizations has been measured using surveys [11], e.g., [12]. At the macro level, organizational legitimacy has been primarily measured through news media content analysis, e.g., [13], the analysis of organizational compliance with accreditation bodies, e.g., [14], and recently, sentiment analysis [15].

While academics are focused on improving and homogenizing micro level legitimacy measurement systems [16,17], the measurement of legitimacy at the macro level has not evolved according to the needs and possibilities provided by new information technologies. Traditionally, the most widespread way of measuring macro level organizational legitimacy, is using news media content analysis, classifying news as positive or negative [3]. The news

published by the media is closely aligned with the public's opinions [18] and influences individuals´ evaluations [9]. So far, measuring legitimacy through the media has been carried out by manually encoding the news from the most representative media, limiting the sample size up to a maximum of 1277 [14,19]. This methodology that has been applied has some limitations, which this study aims to overcome.

In today's world, people's main sources of information are the online press and news aggregators [20]. Therefore, to obtain a measurement of social opinion, these sources should be taken into account. However, the enormous amount of news that would have to be manually processed makes the previous systems for measuring legitimacy and news encoding obsolete, requiring the use of new technologies, e.g., [21] that allow us to achieve a more reliable macro level measurement of organizational legitimacy [15]. At this point, some progress related to measurement based on information available on the web is found, for example, using social networks such as Twitter [22,23]. Measuring through social networks captures a broad variety of individuals´ evaluations, but it is not exempt of criticism such as the democratic potential of these technologies [24]; or the possibility of this information being manipulated by public relations firms that distribute positive messages about companies using fake profiles [25].

The aim of this research is to develop a new methodology to measure organizational legitimacy at the macro level, capable of processing large amounts of information. By doing so, we make three key contributions to managing organizational legitimacy. First, we favor a more complete and reliable measurement of organizational legitimacy thanks to mass information processing [15]. In this way, we provide a technology-based solution to the problem of the obsolescence of legitimacy evaluation models at the macro level. Second, although it has been indicated that organizational legitimacy favors organizational performance, this has not been proven with legitimacy measurements based on mass information. Therefore, we do not know if this methodology may show mixed results with the evidence previously obtained by academics. Consequently, we will control the legitimacy results achieved with this methodology through the companies' financial performance and the context in which they operate. This will make it easier for managers to make decisions related to organizational legitimacy management. Finally, previous legitimacy measurements, based on press news content analysis, have generally used a single newspaper as a source of information e.g., [26]. This form of measurement may be biased due to the editorial policy of said source. In this study, we analyze the news from numerous sources of information contained in journalistic databases and news aggregators. This comparative analysis also allows us to highlight the bias of introduced in the information by different sources when choosing the news to index.

The next section reviews the relevant literature. The methodology section outlines the sample data and model tested. The paper then presents and discusses the empirical results, comparing them with past literature. Finally, we conclude by considering the theoretical and managerial implications of the empirical evidence found in the study.

2. Literature Review: Organizational Legitimacy

The study of legitimacy poses many challenges due to the difficulty to define and measure this concept [8,26]. An institution is legitimate when its actions are perceived as adequate by society [27]. This idea is reflected in the definition given by [28] (p. 4): "Legitimacy is the generalized assumption or perception that the actions of an entity are desirable, adequate or appropriate within a socially constructed system of norms, values, beliefs and definitions".

The importance of legitimacy lies in its ability to favor the survival of organizations. The social acceptance of an organization´s actions is a key asset whose effects have been widely contrasted by academics [1]. It has been proven that stakeholders provide greater support to legitimate organizations [29]. In fact, certain market players will only engage in transactions with legitimate organizations, actively refusing to engage in business with illegitimate institutions or even those whose legitimacy is in question [26]. This is relevant

for institutions because part of their market may depend directly on their legitimacy, if it disappears, their market may also disappear [30]. Thus, legitimacy provides a competitive advantage [31,32]. Furthermore, if an organization can convince the relevant public that its competitors lack legitimacy, it can eliminate part of its competition [14,33]. It has also been shown that legitimacy influences some financial indicators [34] such as the initial issue value of a public offering for sale [35], the stock market value [4] or stock volatility [13]. Additionally, organizations that lack legitimacy tend to be more closely monitored and regulated [26,36]. This limits the freedom of movement and the strategic capacity of organizations [37].

Legitimacy is a multidimensional concept, which depends on the perception that actors in society have. These perceptions have been grouped by academics into various dimensions [38]. In this way, an institution can be considered legitimate from its customers' perspective, but not from its employees' [39]. For example, business cost reductions can lead to price cuts that are well received by customers. However, this management may not be well accepted by employees if the reduction has occurred at the cost of worsening their working conditions. Because legitimacy is a concept that encompasses different evaluators, involved in varying social contexts and mental schemes, different types of perceptions arise regarding the same activity.

Both individual and collective actors intervene in the evaluation of legitimacy, as well as the interactions between them. Therefore, legitimacy is understood as a social construct formed by an individual level or micro level (propriety) and a collective component or macro level (validity) (Figure 1) [9].

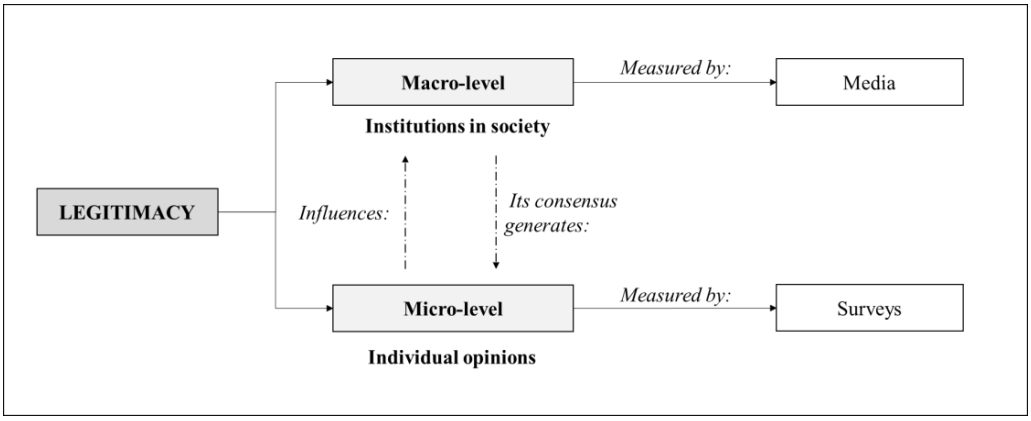

Figure 1. Macro level and Micro level. Source: Own elaboration.

The micro level collects individuals´ opinions when evaluating whether an institution´s actions are desirable and socially appropriate [40]. These individual actors form their opinions based on their personal perceptions [41]. At the same time, these views are also influenced by the macro level. That is, the consensus on an organization´s actions influence people´s individual opinions [42]. As individuals observe others, their attitudes are confirmed in a feedback process that ends up generating a consensus. Therefore, macro level legitimacy is the extent to which a consensus is generated within a collectivity that an organization is appropriate for its social context [10].

There are currently numerous procedures to measure legitimacy. In the first legitimacy studies, researchers turned to reports produced by government agencies [43], or by "rating" agencies and banks [25]. This technique continued and is still used as complementary to other forms of measurement. Another very widespread method is the use of surveys to measure public opinion [8,44]. In this case, surveys conducted with a specific population group to measure stakeholder legitimacy are more common than surveys conducted with samples of the general population [26]. These techniques allow us to measure micro level legitimacy, obtaining perceptions from specific actors, but they do not allow us to study the macro level.

This study focuses on the use of the mass media to measure the macro level legitimacy of an institution. This approach has hardly been explored in the literature, relegating the measurement of legitimacy at the macro level to a second place. Furthermore, recent changes in the media, especially the press, have led to new ways in which news is generated and consumed.

Traditionally, the most relevant media has been television, radio, and the written press, which has historically been considered the most important media used to obtain information [9]. With the introduction and democratization of the internet, a paradigm shift occurred, on which the newspaper industry was forced to change from the use of paper to the digital world [19]. Nowadays, the amount of information available on the Internet is significantly higher than what individuals historically had access to. Due to this excess of information, users increasingly trust intermediaries that allow them to discover, share and filter news [15]. These include social networks, messaging apps, news aggregators, and search engines [45]. Instant messaging apps do not provide public and usable information due to their private component, so they are not useful for the measure of legitimacy.

Social networks have been explored in previous studies because they generate large amounts of usable data [15,46]. In addition, they have a particularity compared to the rest of sources since there are both individual and collective actors creating content, in contrast to the rest of the sources that are usually dominated by individual actors—messaging apps—or by collective actors—news aggregators and search engines [47,48]. These advantages regarding the volume of data, however, are not transferred correctly to the publication and dissemination of news. Due to recent fake news scandals proliferating on social media, users have shown greater levels of confidence in the news they find through news aggregators and search engines [49].

Search engines work in a completely different way. They allow users to make queries producing results that are automatically ranked through algorithms. This has raised concerns about whether the criteria of these algorithms can generate content bubbles. However, empirical studies have shown that search engines have established themselves as a more varied and critical source of information: their users use a greater number of media as sources and are more likely to contrast information in sources with different political agendas; sometimes even unintentionally, which has received the name of automated serendipity [45].

News aggregators are websites—like Google News, Yahoo! News, or the Huffington Post—which select and redistribute the content generated by other news organizations on a single website [50]. Although they can generate their own content as in the case of the Huffington Post. These aggregators can make the selection through algorithms—Google News works in a similar way to the analogous search engine—through user ratings—the Huffington Post—or a mixture of these two—as in the case of Yahoo News! [51]. However, aggregators that depend on user ratings generally have a greater political bias than those based on algorithms. The Huffington Post has a defined ideology, whereas Yahoo News! and Google News are apolitical and more unbiased [51,52]. This is mainly because the algorithms of news aggregators lack the intrinsic bias that humans have. In addition, it has been found that the automation of Google News allows for the analysis of a greater number of sources, leading to results that simultaneously show links to media with different perspectives on the same topic [53].

3. Methodology

3.1. Sample

The study sample includes the 50 companies that were listed on the European EUROSTOXX 50 Index in January 2020. Listed companies are considered institutionalized companies: these companies have been tested by many professional norms and standards, ensuring their legitimacy. In turn, they are large companies, whose actions generate impacts on society, ensuring media coverage. In addition, they operate in sectors and contexts that do not always coincide, so they are sufficiently homogeneous with each other and, at the same time, have many differences.

3.2. Measuring Organizational Legitimacy

We have measured organizational legitimacy through media content analysis. This way of measuring legitimacy has been used in numerous investigations [13,14] and consists of coding the type of impact (positive and negative) that a news item published in the media generates on the company under analysis.

We gathered news about the companies from two different sources of information: the news aggregator Google News and the Lexis Nexis database. We extracted the headlines from Spanish news that mention the companies in the sample for a full year, from January to December 2018.

Google News is an algorithm-based news aggregator that provides access to mass information and is politically unbiased. In total, 94,424 headlines were obtained. The headlines were extracted by a web scraping algorithm, using the Octoparse tool, with the following instructions: (i) in the advanced search tool of Google News, search for the news published in Spanish and in Spain that contained the name of the analyzed company; (ii) enter the news menu and filter by date range starting 01 January 2018; (iii) extract the news headlines from the front page. The number of headlines extracted ranges from 0, if no news has been generated on that date, to 10, which is the maximum number of items of news per page; (iv) advance to the following day and repeat step 3 each day until 31 December 2018 (mm-dd-yyyy).

Lexis Nexis is a company dedicated to legal, business and risk management research. We used its Nexis Uni database, which contains news published from more than 15,000 different sources. A total of 214,523 headlines were extracted from all the news published in Spanish newspapers, news agencies, blogs, and press releases that mention the companies in the study. For this purpose, the same name used previously in the aggregator was used. In this database, it was not possible to extract news regarding the company Total SA because the Lexis Nexis database does not allow to search by the exact term, returning a large amount of news unrelated to the company, which contained the term "total".

The data extracted was processed and cleaned to ensure the quality of further analysis, by means of the following actions: (i) elimination of empty entries or those that contained invalid values (e.g., "headline not found"); (ii) elimination of news in languages other than Spanish; (iii) substitution of characters that had been incorrectly decoded because they were unique to Spanish (e.g., "ó" has been incorrectly decoded as "Ã^3"); (iv) elimination of repeated headlines for the same company. At the end of this process, the number of news items amounted to 66,073 from Google News and 157,728 from Lexis Nexis. The total number of news items for each company is shown in Table 1. In order to ensure the comparability of the results between both sources of information, only the companies that had more than 100 news items were analyzed. Therefore, the following were excluded from the study: ASML, Deustche Börse, Linde, Total S.A, URW and Vinci S.A.

Meaning Cloud software was used for analyzing the news, which combines different natural language processing techniques to classify texts according to whether they express a very positive, positive, neutral, negative, very negative or no feeling perception. These values were coded by using the Janis–Fadner coefficient [48]:

- $(p^2 - p * n)/(\mathrm{c} * t) \rightarrow$ if $p > n$
- $0 \rightarrow$ if $p = n$
- $(p * n - n^2)/(\mathrm{c} * t) \rightarrow$ if $p < n$

where p is the number of positive or very positive headlines, n is the number of negative or very negative headlines, c is the total number of headlines with some sentiment, and t is the total number of headlines. Thus, the analyzed companies achieve a legitimacy value between -1 and 1. These values have been moved to a [0, 100] interval to improve their interpretability.

Table 1. Sample of news analyzed by company.

Company	Google News	Lexis Nexis	Company	Google News	Lexis Nexis
Adidas	2155	2001	Inditex	3129	5946
Ahold Delhaize	177	103	ING	2027	3819
Airbus	2991	4081	Intesa Sanpaolo	319	466
Air Liquide	443	163	Kering	77	587
Allianz	940	2635	Philips	2712	1792
Amadeus	1595	1268	L'Oreal	2463	923
Inbev	164	479	Linde	11	1285
ASML	67	107	Louis Vuitton	2037	1243
AXA	1046	1000	Munich RE	170	23
BASF	1603	1359	Nokia	3015	1797
Bayer	1897	3927	Orange	2845	4961
BBVA	3273	14969	Safran	109	395
BMW	3462	5320	Sanofi	424	824
BNP Paribas	579	1180	Santander	3582	29,709
Daimler	2639	1989	SAP SE	1496	489
Danone	1564	594	Schneider	1015	1649
Deutsche Börse	55	106	Siemens	1550	3907
Deutsche Post	169	200	Société Générale	255	863
Deutsche Telekom	119	468	Telefónica	1014	28,831
Enel	1918	2168	Total S.A.	1968	0
Engie	487	872	URW	22	22
ENI	190	879	Unilever	309	3418
Essilor	582	186	Vinci S.A.	85	1835
Fresenius	250	437	Vivendi	222	520
Iberdrola	3405	8030	Volkswagen	3447	7903

3.3. Control Variables

Although it has been indicated that organizational legitimacy favors organizational performance, this has not been verified with legitimacy measurements based on mass information. Therefore, we do not know if this methodology may show mixed results with the evidence previously obtained by academics. Therefore, we will control the legitimacy results achieved with this methodology, with the financial performance of the companies and the context in which they operate.

To control the effect of legitimacy on organizational performance, the following control variables have been used: gross income, operating income, earnings after tax, earnings per share, as well as the stock price at closing on 31 December for the years 2017, 2018, and 2019. This information has been obtained from the website: investing.com. Subsequently, the variation indices of these data between each year were calculated.

4. Results

From the results, it is drawn that the minimum legitimacy value obtained through this methodology was 47.11, while the maximum value was 63.63 (Table 2). The vast majority of companies also obtained values higher than 50. Only two companies in each of the samples obtained a legitimacy value below 50. Regarding the comparison between the samples, it is shown that the legitimacy average in Google News was 56.47, while its median was 56.70; in the case of Lexis, they were 54.17 and 56.33, respectively. In general, Google's values are 3.57 points on average higher than those obtained in Lexis.

Table 2. Legitimacy Results of Google News vs. Lexis Nexis.

Company	Google News	Lexis Nexis	Company	Google News	Lexis Nexis
Adidas	53.01	57.80	Iberdrola	55.52	55.98
Ahold Delhaize	56.21	52.04	InBev	59.93	52.7
Air Liquide	54.94	59.06	Inditex	57.6	54.49
Airbus	55.26	53.44	ING	54.6	52.79
Allianz	59.01	58.01	Intesa Sanpaolo	50.32	50.31
Amadeus	56.23	54.72	L'Oreal	59.29	58.67
AXA	58.49	52.98	Louis Vuitton	59.48	57.69
Basf	61.1	61.45	Nokia	58.11	60.01
Bayer	51.87	53.99	Orange	57.89	52.38
BBVA	57.14	52.77	Philips	61.58	60.08
BMW	56.67	52.04	Safran	56.73	53.22
BNP Paribas	57.32	50.7	Sanofi	54.51	50.88
Daimler	57.66	52.46	Santander	53.45	53.71
Danone	50.35	56.98	SAP	57.86	56.43
Deutsche Post	54.76	53.21	Schneider	63.41	56.28
Deutsche Telekom	58.81	58.02	Siemens	56.63	57.29
Enel	49.59	53.95	Societe Generale	49.3	50.28
Engie	63.63	50.99	Telefónica	55.66	50.9
ENI	59.01	53.03	Unilever	59.27	52.76
Essilor	54.99	53.98	Vivendi	51.63	47.11
Fresenius	57.43	50.05	Volkswagen	55.45	49.48

As shown, having a high score in one sample does not necessarily result in an equivalent score in the other one: 18 companies obtained scores with less than a two-point difference between the two samples, while 20 companies show a difference of more than four points. The case of Engie is particularly interesting, as it shows a 12.64-point difference between the Google sample, in which it is the most legitimate company, and the Lexis sample.

Pearson´s correlation coefficient between the legitimacies of the two samples is 0.36 (Figure 2). Although there is a slightly positive correlation between the two samples, it is practically insignificant. Measuring the legitimacy of a company this way is not affected by the amount of news published about it. The correlation coefficient between the number of news items analyzed and the results obtained is 0.003 for the Google News sample, and −0.15 for the Lexis Nexis sample.

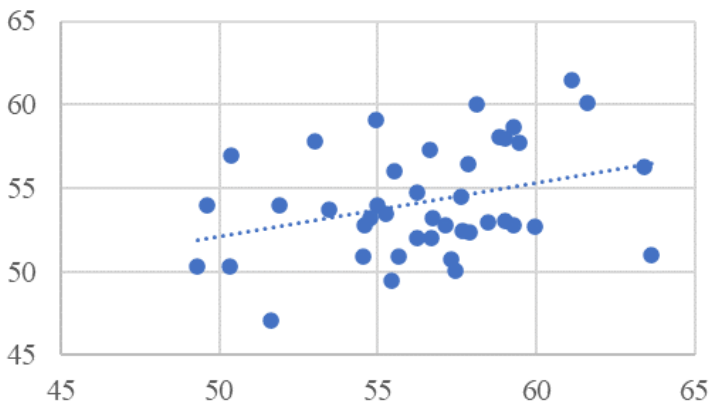

Figure 2. Correlation between legitimacy measured in Google News and Lexis Nexis.

In order to verify the possible geographic bias that exists due to news search having been limited to Spain, an analysis of the results by country was carried out. The companies have been grouped by countries where their headquarters are located to calculate the average of the results obtained by each country and compare them (Table 3). To carry out this analysis correctly, the results of Belgium and Finland were not used because they only

contribute with one company to the ranking. When calculating the correlation coefficient, a value of 0.85 is obtained. This coefficient between the number of companies per country and their legitimacy results has also been calculated, amounting to 0.53 for Google News and 0.54 for Lexis Nexis. Several observations can be made from the result of this analysis. First, there is a strong correlation between the legitimacy results by country obtained in each of the samples, indicating that there is not a geographic bias in the news aggregator or that, if such bias existed, it would be similar in both news sources as their scores have been similar. Spanish companies show this by having values similar to those obtained by French in both samples. Third, there is a weak positive correlation between the number of companies that each country has in the analysis and its average legitimacy performance, indicating that companies from the countries with the most members in this index tend to obtain higher legitimacy scores.

Table 3. Legitimacy by country and sector.

Variable		Number of Companies	Google News	Lexis Nexis
Country	Germany	12	56.69	55.02
	Belgium *	1	59.93	52.70
	Spain	6	55.93	53.76
	France	14	56.57	53.66
	Italy	3	52.97	52.43
	Finland *	1	58.11	60.01
	Netherlands	5	57.38	54.22
Sector	Food	3	55.50	53.91
	Automotive	3	56.59	51.33
	Cosmetics	2	59.28	55.72
	Defense/Aeronautics	2	56.00	53.33
	Energy	4	56.25	53.64
	Financial	7	54.37	51.93
	Industrial	2	57.82	55.16
	Chemical	2	58.02	60.25
	Health	4	54.70	52.23
	Technology	3	60.24	58.20
	Telecommunications	5	57.52	54.81
	Textile	3	56.70	56.66

* Country with a single company.

The analysis by sector detects possible biases that the news aggregator may have when selecting news for the different sectors which the companies belong to. It is also possible to study which sectors have the greatest legitimacy in the media, making a ranking that compares them. The Fortune database classification was used to classify the companies, which categorizes all companies into different sectors, making two modifications:

- The industrial machinery and electronics sectors have been grouped together since they only have one member. The companies which have been affected are Siemens and Schneider Electric, which have certain similarities in their operations, as they are dedicated to the manufacture of products belonging to a wide variety of industries, which allow for their grouping.
- Inditex, which is the only company classified within the retail sector, has been reclassified as a textile industry because it mainly commercializes this type of product.

The media and logistics sectors have also been excluded from the analysis because they only have one member each, Vivendi and Deustche Post, respectively. There are considerable differences in the average results of the different sectors. Specifically, the technological, chemical and cosmetics sectors stand out for having high legitimacy values in both samples. At the opposite end of the spectrum, the financial sector has the lowest legitimacy values in the study.

Control Variables

The results of calculating the correlation coefficients between the control variables and the legitimacy results of each sample are shown (Table 4). It is confirmed that none of the control variables have a significant correlation with the calculated legitimacy measures. There have been some values that stand out from the others in this analysis, such as the correlation between the variation of the earnings after tax between 2017 and 2018 with the legitimacy measured in Lexis Nexis, which has a coefficient of −0.428. This may indicate a slight negative correlation between an increase, or decrease, of the company's profit and its legitimacy in the media. The relationship between the value of the shares in the years 2018–2019 and the legitimacy measured in Lexis Nexis is also highlighted, with a correlation coefficient of 0.330. Since the news collected in this study is from 2018, this may indicate the existence of a slight positive correlation between legitimacy in the media and the stock price in the following year.

Table 4. Correlations between legitimacy and control variables.

Control Variable	Period	Google News	Lexis Nexis
Price	2017–2018	0.012	0.152
	2018–2019	0.106	0.330
	Variation	0.017	−0.070
Total Revenues	2017–2018	−0.050	0.032
	2018–2019	−0.321	−0.097
	Variation	−0.105	−0.013
Operating Income	2017–2018	−0.204	−0.309
	2018–2019	0.260	0.106
	Variation	−0.019	0.013
Results for the year	2017–2018	−0.195	−0.428
	2018–2019	0.093	0.064
	Variation	0.168	−0.302
Earnings per share	2017–2018	−0.243	−0.286
	2018–2019	0.205	0.203
	Variation	−0.075	−0.039

5. Discussion

This study represents a step forward in the study of the macro level measurement of legitimacy. Ref. [9] defended the need to continue measuring legitimacy at the macro and micro level to empirically verify the relationships between the two and deepen our understanding of how they influence each other. The micro level measurement of legitimacy has undergone a modernization in its methodology, taking advantage of the opportunities provided by the Internet, such as content analysis on social networks [48,54,55]. Although methodologies that use online media had been proposed for the analysis of legitimacy at a macro level on a smaller scale [56], it had not been studied how the selection of different sources of information affects the result, which is a relevant implication of this study. This study also shows that news aggregators play an important role in disseminating news on the Internet and that, as shown, they can introduce bias in the measurements.

First, this study demonstrates the possibility of measuring institutional legitimacy at the macro level by analyzing news headlines published in online media. Our results show that all analyzed companies are mentioned in a greater number of positive legitimacy news items than negative ones. This is reflected in the fact that all the companies have had legitimacy values higher than 50. This may be because the sample is made up of large companies, operating for a considerable number of years, established in their markets and listed on international indexes. Therefore, they are highly institutionalized companies and so, we show that companies with these characteristics respond accordingly to what is stated in the Institutional Theory [28].

Second, the comparison between the results obtained in both samples, Google News, and Lexis Nexis, provides greater knowledge about the effects that the former has on the perception of legitimacy of companies [20]. The existence of a weak correlation between the results of both samples indicates that companies with greater legitimacy tend to obtain higher scores, regardless of the source used to measure it, for example, companies such as Philips or Basf. However, other companies show great variations in their legitimacy measures, such as Engie, Adidas, or Danone. In addition, Google News scores are generally higher than Lexis Nexis. This may be due to the way Google News algorithms index news, which can generate a bias that, although it generally has a positive effect, benefits some companies greater than others.

Third, we have obtained similar results in both samples grouped by countries. The results show that German and Dutch companies have the highest media legitimacy, followed by French and Spanish companies, and with Italian companies ranking last place. It is noteworthy that Spanish companies, the country from which the searches were carried out, have not benefited from the news aggregator in contrast to the database. This indicates that Google News lacks a territorial bias that benefits, or harms companies, established in the countries from which the search is conducted.

From the economic and financial perspective, this study confirms the idea that if companies meet minimum economic expectations, their legitimacy is not affected by fluctuations in their financial performance [14]. No relationship has been found between legitimacy results and revenues, before and after-tax earnings, earnings per share, or stock price. Although Vivendi, which has obtained poor financial results in the year in which this study was carried out, has obtained the lowest legitimacy values; other companies such as the Volkswagen Group have obtained low legitimacy results, having good figures in their income statements. At the opposite end of the ranking, Nokia has obtained very high legitimacy results despite having reported losses in 2018 and 2017, thus showing that poor financial performance does not have to result in a loss of legitimacy for the company.

The differences between the calculated legitimacy values are large enough for there to be considerable differences in the positions that companies occupy in the rankings. Therefore, to obtain a measure of legitimacy in internet media that is as close as possible to reality, it is advisable to use different data sources and compare the results obtained in each one, always taking precautions when interpreting the data provided by the rankings.

Considerable differences have been found in the average legitimacy scores of each sector, which are also transferred from one news source to another. The sectors that benefit most from this effect are the technology, cosmetics, and chemical sectors, while the most harmed are the health and financial sectors. This seems to be related to the latest communication trends of large companies. The technology sector has grown considerably in recent years, allowing the existence of the media we used for this analysis and to which companies like Google itself belong to, so it is understandable that they have a greater legitimacy on the Internet. On the other hand, the cosmetics sector is known for its large marketing investments, an adequate online strategy, developed by the companies belonging to this sector, can enhance the legitimacy of companies. In the case of the chemical sector, it is thought that this high score is due to the efforts of European companies to comply with the ecological and sustainability regulations of the European Union, which would be reflected in a positive opinion from the media that discuss these topics. At the opposite end, we find the financial sector with the lowest average legitimacy of all. This seems to reflect the confidence crisis that these companies have faced after the explosion of the 2008 financial crisis. To overcome this situation, companies in this sector should redouble their communication efforts in the media.

6. Conclusions

6.1. Macro Level Measuring Legitimacy by Online Media

Useful conclusions are drawn from this study for the proper administration of legitimacy in the media, as well as for making observations on factors that influence it.

A relationship has not been found between the number of news items published about a company and the legitimacy obtained from it, as long as the company has generated enough content to be analyzed. It does not appear that the companies with the strongest media presence are benefited or harmed in terms of their legitimacy. Therefore, a company that wishes to improve its legitimacy in online media does not need to incur expensive communication campaigns to improve its presence in that media; carrying out the usual company activities is sufficient.

The most significant limitations of this study are related to the process of data extraction and processing. There is no official support for tools that enable the extraction of information from news aggregators, so it has been necessary to resort to third-party programs for this, which do not offer total reliability and may damage the integrity of the data obtained. In addition, the name of some companies, such as Total SA, as well as the lack of search options for literal terms in databases such as Lexis Nexis, makes analysis difficult, since it is not possible to separate the news that mention the company from those that use the term "total".

Another limitation is that the results are determined by the quality of the analysis software. These analyzers are also language-dependent, so they can limit the options available when proposing analyses of this type. Finally, a limitation, which defines a new research line, is the limited information found in the literature about the use of online media to measure legitimacy, as well as the effects that different types of sources have on the measured results. Carrying out these studies are the first steps towards a greater understanding of the measurement of legitimacy through the current media, in addition to the relationship that exists between the measurements of legitimacy obtained by performing measurements at the macro and micro level.

The results of this paper open many new lines of research related to the measurement of legitimacy in online media. First, it has been verified that there is no bias that benefits or harms the legitimacy of the institutions of a country for having compiled the news published in that country in the news aggregator Google News. However, it cannot be said that the legitimacy of institutions does not vary from one country to another. It is proposed to conduct a study in which the news from different institutions in several countries is compiled to compare the results obtained and study the perceptions of the same institutions in different countries. Second, the news has been processed using sentiment analysis to quantify the measures of legitimacy. There are plenty of sources of information with the news databases collected, which can be studied using different techniques. It is proposed to conduct an analysis of the content and topics of the news obtained in online media to analyze the concepts that are being the most relevant for the legitimacy of institutions. Thanks to this, organizations could be provided with more information on which activities and events are being the most beneficial and detrimental to their legitimacy.

Finally, the legitimacy metrics obtained in this study are measured exclusively in the media and, therefore, belong to the macro level. It is proposed to compare the results obtained in this study with legitimacy metrics obtained at a micro level to compare how these two measures are related. One way that is proposed to do this would be through an analysis of users' social media posts or through stakeholder surveys.

6.2. The Value of Organizational Legitimacy for Open Innovation

Open innovation relies on external cooperation. A key element that allows for this cooperation is the existence of trust between the collaborating organizations. Here legitimacy plays a vital role since legitimate organizations inspire trust towards their stakeholders [57].

This happens because legitimacy generates a feeling of security and trust among individuals, this sense of confidence increases people's willingness to accept the actions and decisions of the most legitimate organizations [58]. This induces companies to actively seek strategic partnerships with legitimate organizations [59]. In addition to this, researchers have found that organizations that gain the most from innovation are those that adopt strategies that give them legitimacy in the eyes of stakeholders, for instance,

by creating associations with established entities [60]. Companies must properly manage their legitimacy to establish cooperating relationships with other institutions. Later, this cooperation will boost their own legitimacy, facilitating further cooperation, and thus, open innovation.

Proper legitimacy management requires accurate ways to measure it, but legitimacy measures are problematic due to the multilevel nature of the concept [38]. In this research, we proposed a model, based on public and accessible online media information, to measure organizational macro level legitimacy. Not only this but online media has shown to be a means to obtain legitimacy [61], boosting the confidence in this measurement. This allows for organizations to have access to a new perspective on their legitimacy, as well as that of their partners and competitors.

This information will help companies become more legitimated and promote strategic alliances. This will allow the acquisition and integration of innovations from external sources, sharing resources and innovation processes with its partners [62], in a more trustworthy way. When a social agent (suppliers, universities, R&D centers, etc.) must collaborate with an organization, they will have an indicator of the acceptance and desirability of their partner.

Ultimately, legitimacy affects the relationship between the organizational commitment with open innovation and the incorporation of new processes [63], as well as business model innovation [64]. Beyond this, legitimacy-fueled pressures are driving institutions to innovate as is the case of the new corporate green innovative practices [65].

Author Contributions: Conceptualization: A.B.-G., F.D.-M., and C.P.-R.; Methodology: A.L.-B. and A.B.-G.; Software: A.L.-B.; Validation: F.D.-M. and C.P.-R.; Formal analysis: A.L.-B. and A.B.-G.; Investigation: A.L.-B., A.B.-G., F.D.-M., and C.P.-R.; Resources: C.P.-R.; Data Curation: A.L.-B. and A.B.-G.; Writing—Original Draft: F.D.-M. and A.B.-G.; Writing—Review and Editing: C.P.-R.; Supervision: A.B.-G.; Project administration: A.B.-G., F.D.-M., and C.P.-R. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Acknowledgments: We want to thank MeaningCloud for the disinterested use of its software to test this research.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Suddaby, R.; Bitektine, A.; Haack, P. Legitimacy. *Acad. Manag. Ann.* **2017**, *11*, 451–478. [CrossRef]
2. Ruef, M.; Scott, W.R. A multidimensional model of organizational legitimacy: Hospital survival in changing institutional environments. *Adm. Sci. Q.* **1998**, *43*, 877–904. [CrossRef]
3. Deephouse, D.L.; Bundy, J.J.; Tost, L.P.; Suchman, M.C. Organizational legitimacy: Six key questions. In *The Sage Handbook of Organizational Institutionalism*; Sage: Thousand Oaks, CA, USA, 2017; Volume 4, pp. 27–54.
4. Lamin, A.; Zaheer, S. Wall Street vs. Main Street: Firm Strategies for Defending Legitimacy and Their Impact on Different Stakeholders. *Organ. Sci.* **2012**, *23*, 47–66. [CrossRef]
5. Stuart, T.E.; Hoang, H.; Hybels, R.C. Interorganizational endorsements and the performance of entrepreneurial ventures. *Adm. Sci. Q.* **1999**, *44*, 315–349. [CrossRef]
6. Ito, Y. Interorganizational Business Development Utilizing Legitimacy for Resource Mobilization in Large Firms: Successful and Unsuccessful Cases. *Ind. Mark. Manag.* **2018**. [CrossRef]
7. Díez-Martín, F.; Blanco-González, A.; Prado-Román, C. The intellectual structure of organizational legitimacy research: A co-citation analysis in business journals. *Rev. Manag. Sci.* **2020**. [CrossRef]
8. Alexiou, K.; Wiggins, J. Measuring individual legitimacy perceptions: Scale development and validation. *Strateg. Organ.* **2019**, *17*, 470–496. [CrossRef]
9. Bitektine, A.; Haack, P. The 'macro' and the 'micro' of legitimacy: Toward a multilevel theory of the legitimacy process. *Acad. Manag. Rev.* **2015**, *40*, 49–75. [CrossRef]
10. Tost, L. An integrative model of legitimacy judgments. *Acad. Manag. Rev.* **2011**, *36*, 686–710.
11. Díez-Martín, F.; Prado-Roman, C.; Blanco-González, A. Beyond legitimacy: Legitimacy types and organizational success. *Manag. Decis.* **2013**, *51*, 1954–1969. [CrossRef]
12. Chung, J.Y.; Berger, B.K.; DeCoster, J. Developing Measurement Scales of Organizational and Issue Legitimacy: A Case of Direct-to-Consumer Advertising in the Pharmaceutical Industry. *J. Bus. Ethics* **2016**, *137*, 405–413. [CrossRef]

13. Bansal, P.; Clelland, I. Talking trash: Legitimacy, impression management, and unsystematic risk in the context of the natural environment. *Acad. Manag. J.* **2004**, *47*, 93–103.
14. Deephouse, D.L.; Carter, S.M. An Examination of Differences Between Organizational Legitimacy and Organizational Reputation. *J. Manag. Stud.* **2005**, *42*, 3–23. [CrossRef]
15. Etter, M.; Colleoni, E.; Illia, L.; Meggiorin, K.; D'Eugenio, A. Measuring Organizational Legitimacy in Social Media: Assessing Citizens' Judgments With Sentiment Analysis. *Bus. Soc.* **2018**, *57*. [CrossRef]
16. Bitektine, A.; Hill, K.; Song, F.; Vandenberghe, C. Organizational Legitimacy, Reputation, and Status: Insights from Micro-Level Measurement. *Acad. Manag. Discov.* **2020**, *6*, 107–136. [CrossRef]
17. Haack, P.; Sieweke, J. Advancing the Measurement of Organizational Legitimacy, Reputation, and Status: First-order Judgments vs. Second-order Judgments. Commentary on 'Organizational legitimacy, reputation and status: Insights from micro-level measurement'. *Acad. Manag. Discov.* **2020**, *6*, 153–158. [CrossRef]
18. Gamson, W.A.; Croteau, D.; Hoynes, W.; Sasson, T. Media Images and the Social Construction of Reality. *Annu. Rev. Sociol.* **1992**, *18*, 373–393. [CrossRef]
19. Chyi, H.I.; Yang, M.J. Is online news an inferior good? Examining the economic nature of online news among users. *J. Mass. Commun. Q.* **2009**, *86*, 594–612. [CrossRef]
20. Albarrak, M.S.; Elnahass, M.; Papagiannidis, S.; Salama, A. The effect of twitter dissemination on cost of equity: A big data approach. *Int. J. Inf. Manag.* **2020**, *50*, 1–16. [CrossRef]
21. Castelló, I.; Etter, M.; Nielsen, F. Strategies of Legitimacy through Social Media: The Networked Strategy. *J. Manag. Stud.* **2015**. [CrossRef]
22. Colleoni, E. CSR communication strategies for organizational legitimacy in social media. *Corp. Commun. Int. J.* **2013**, *18*, 228–248. [CrossRef]
23. Hindman, M. *The Myth of Digital Democracy*; Princeton University Press: Princeton, NJ, USA, 2009.
24. Schuckert, M.; Liu, X.; Law, R. Insights into Suspicious Online Ratings: Direct Evidence from TripAdvisor. *Asia Pac. J. Tour. Res.* **2016**, *21*, 259–272. [CrossRef]
25. Deephouse, D.L. Does isomorphism legitimate? *Acad. Manag. J.* **1996**, *39*, 1024–1039. [CrossRef]
26. Deephouse, D.L.; Bundy, C.J.; Tost, L.P.; Suchman, M.C.; Bundy, J.; Suchman, M. *The SAGE Handbook of Organizational Institutionalism*, 2nd ed.; Sage: Southend Oaks, CA, USA, 2016.
27. Clark, D.L.; Meyer, J.W.; Scott, W.R. Organizational Environments: Ritual and Rationality. *Adm. Sci. Q.* **1985**, *30*, 295. [CrossRef]
28. Suchman, M.C. Managing Legitimacy: Strategic and Institutional Approaches. *Acad. Manag. Rev.* **1995**, *20*, 571–610. [CrossRef]
29. Choi, Y.R.; Shepherd, D.A. Stakeholder Perceptions of Age and Other Dimensions of Newness. *J. Manag.* **2005**, *31*, 573–596. [CrossRef]
30. Prado-Román, C.; Díez-Martín, F.; Blanco-González, A. The effect of communication on the legitimacy and performance of organizations. *Rev. Bras. Gest. Neg.* **2020**, *22*, 565–581.
31. Payne, G.; Cruz-Suarez, A.; Prado-Román, A. Legitimacy as competitive advantage: A US airline case study. In *Organizational Legitimacy*; Springer: Cham, Switzerland, 2018; pp. 121–140.
32. Miotto, G.; Del-Castillo-Feito, C.; Blanco-González, A. Reputation and legitimacy: Key factors for Higher Education Institutions' sustained competitive advantage. *J. Bus. Res.* **2020**. [CrossRef]
33. Loasby, B.J.; Pfeffer, J.; Salancik, G.R. The External Control of Organizations. A Resource Dependence Perspective. *Econ. J.* **1978**, *89*, 969. [CrossRef]
34. De Lange, D.; Valliere, D. Sustainable firms and legitimacy: Corporate venture capital as an effective endorsement. *J. Small. Bus. Manag.* **2020**, *58*, 1187–1220. [CrossRef]
35. Cohen, B.D.; Dean, T.J. Information asymmetry and investor valuation of IPOs: Top management team legitimacy as a capital market signal. *Strateg. Manag. J.* **2005**, *26*, 683–690. [CrossRef]
36. Díez-de-Castro, E.; Díez-Martín, F.; Madrid-Sanz, M. The Organizational Legitimacy as an Entry Barrier in Large International Contracts. *Harv. Deusto Bus. Res.* **2019**, *8*, 175–188. [CrossRef]
37. Child, J. Organizational Structure, Environment and Performance: The Role of Strategic Choice. *Sociology* **1972**, *6*, 1–22. [CrossRef]
38. Díez-Martín, F.; Blanco-González, A.; Díez-de-Castro, E. Measuring a scientifically multifaceted concept. The jungle of organizational legitimacy. *Eur. Res. Manag. Bus. Econ.* **2021**, *27*, 100131. [CrossRef]
39. Fisher, G.; Kotha, S.; Lahiri, A. Changing with the times: An integrated view of identity, legitimacy, and new venture life cycles. *Acad. Manag. Rev.* **2016**, *41*, 383–409. [CrossRef]
40. Schulz, D.; Jonker, J.; Faber, N. Outside-In Constructions of Organizational Legitimacy: Sensitizing the Influence of Evaluative Judgments Through Mass Self-Communication in Online Communities. *Int. J. Commun.* **2021**, *12*, 23.
41. Diez-Martin, F.; Blanco-Gonzalez, A.; Prado-Roman, C. Factors Affecting Individual Decisions Based on Business Legitimacy. *J. Promot. Manag.* **2019**, *25*, 181–199. [CrossRef]
42. Miotto, G.; Youn, S. The impact of fast fashion retailers' sustainable collections on corporate legitimacy: Examining the mediating role of altruistic attributions. *J. Consum. Behav.* **2020**, *19*, 618–631. [CrossRef]
43. Dowling, J.; Pfeffer, J. Organizational legitimacy: Social values and organizational behavior. *Pac. Sociol. Rev.* **1975**, *18*, 122–136. [CrossRef]

44. Díez Martín, F.; Blanco González, A.; Prado Román, C. Measuring organizational legitimacy: The case of Mutual Guarantee Societies. *Cuad. Econ. Dir. Empresa* **2010**, *43*, 115–144.
45. Fletcher, R.; Nielsen, R.K. Automated Serendipity: The effect of using search engines on news repertoire balance and diversity. *Digit. J.* **2018**, *6*, 976–989. [CrossRef]
46. Herck, R.V.; Decock, S.; De Clerck, B. 'Can you send us a PM please?' Service recovery interactions on social media from the perspective of organizational legitimacy. *Discourse Context Media* **2020**, *38*, 100445. [CrossRef]
47. Monfort, A.; Villagra, N.; López-Vázquez, B. Exploring stakeholders' dialogue and corporate social responsibility (CSR) on twitter. *Prof. Inf.* **2019**, *28*, e280513. [CrossRef]
48. Galán-Valdivieso, F.; Saraite-Sariene, L.; Alonso-Cañadas, J.; Caba-Pérez, M.C. Do corporate carbon policies enhance legitimacy? A social media perspective. *Sustainability* **2019**, *11*, 1161. [CrossRef]
49. Newman, N.; Fletcher, R.; Kalogeropoulos, A.; Levy, D.A.L.; Nielsen, R.K. *Reuters Institute for the Study of Journalism/Digital News Report*; University of Oxford: Oxford, UK, 2018.
50. Isbell, K. The Rise of the News Aggregator: Legal Implications and Best Practices. *SSRN Electron. J.* **2010**. [CrossRef]
51. Lee, A.M.; Chyi, H.I. The Rise of Online News Aggregators: Consumption and Competition. *JMM Int. J. Media Manag.* **2015**, *17*, 3–24. [CrossRef]
52. Meraz, S. Using time series analysis to measure intermedia agenda-setting influence in traditional media and political blog networks. *J. Mass. Commun. Q.* **2011**, *88*, 176–194. [CrossRef]
53. Carlson, M. Order versus access: News search engines and the challenge to traditional journalistic roles. *Media Cult. Soc.* **2007**, *29*, 1014–1030. [CrossRef]
54. Janis, I.L.; Fadner, R.H. A coefficient of imbalance for content analysis. *Psychometrika* **1943**, *8*, 105–119. [CrossRef]
55. Miotto, G.; Blanco-González, A.; Díez-Martín, F. Top business schools legitimacy quest through the Sustainable Development Goals. *Heliyon* **2020**, *6*, e05395. [CrossRef]
56. Vergne, J.P. Toward a new measure of organizational legitimacy: Method, validation, and illustration. *Organ. Res. Methods* **2011**, *14*, 484–502. [CrossRef]
57. Piber, M.; Demartini, P.; Biondi, L. The management of participatory cultural initiatives: Learning from the discourse on intellectual capital. *J. Manag. Govern.* **2019**, *23*, 435–458. [CrossRef]
58. Tyler, T.R. Psychological Perspectives on Legitimacy and Legitimation. *Annu. Rev. Psychol.* **2006**, *57*, 375–400. [CrossRef] [PubMed]
59. Byun, J.; Ellis, D.; Leopkey, B. The pursuit of legitimacy through strategic alliances: The examination of international joint sport event bidding. *Eur. Sport Manag. Q.* **2020**. [CrossRef]
60. Rao, R.; Chandy, R.; Prabhu, J. The Fruits of Legitimacy: Why Some New Ventures Gain More from Innovation Than Others. *J. Mark.* **2008**, *72*, 58–75. [CrossRef]
61. Aerts, W.; Cormier, D. Media legitimacy and corporate environmental communication. *Account. Organ. Soc.* **2009**, *34*, 1–27. [CrossRef]
62. West, J.; Bogers, M. Leveraging External Sources of Innovation: A Review of Research on Open Innovation. *J. Prod. Innov. Manag.* **2014**, *31*, 814–831. [CrossRef]
63. Jean, R.J.; Sinkovics, R.R.; Hiebaum, T.P. The Effects of Supplier Involvement and Knowledge Protection on Product Innovation in Customer-Supplier Relationships: A Study of Global Automotive Suppliers in China. *J. Prod. Innov. Manag.* **2014**, *31*, 98–113. [CrossRef]
64. Hu, B.; Zhang, T.; Yan, S. How Corporate Social Responsibility Influences Business Model Innovation: The Mediating Role of Organizational Legitimacy. *Sustainability* **2020**, *12*, 2667. [CrossRef]
65. Li, D.; Zheng, M.; Cao, C.; Chen, X.; Ren, S.; Huang, M. The impact of legitimacy pressure and corporate profitability on green innovation: Evidence from China top 100. *J. Clean. Prod.* **2017**, *141*, 41–49. [CrossRef]