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Research Article

An Analysis of the Long-Term Sustainability of the Large Companies Included in the Original Standard and Poor's 500 Index

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The changes generated by the natural economic and social development have configured a scenario where the companies' survival is gradually decreasing. This process is also impacting on the big corporations that were strongly consolidated for many years. This research has analysed that which of these major companies of the Fortune 500 Index have adapted themselves over the years and have survived. After locating the surviving companies, this paper studied the presence of elements of business quality in each of these firms. Then, using a fuzzy set methodology, this study obtained results that identified some of the main elements that might be considered as inductors of the business durability in the case of the big corporations: the effectiveness of the companies, the coherence with the mission, and the capacity of organisation are essential for the long-term sustainability of the companies especially if they are associated with a formalised structure of governance. The results also conclude that the simple presence of these elements is not enough for the permanence of the companies and only the progresses and improvements in these variables can guarantee the sustainability of the companies.

1. Introduction

1.1. Purpose of This Article. Technological change has been transforming the global economy for many years, and its scope and potential have brought fundamental changes in the organisation of companies [1–3]. This scenario of new opportunities has configured a new socio-economic space where the companies that are starting now are already operating under the rules of this new digital economy [4]. The other firms that had started their activities many years before needed to adapt to this process of digital transformation. Companies that cannot adapt do not survive. This is also true for all the big corporations that seemed to be strongly established before this process. From the five hundred companies in the original Standard and Poor's 500 Index in 1957, only seventy-four were still in the same index at the end of the 90s. Something similar happens with the Forbes index, where seventy years after its beginning, sixty-one of these companies had disappeared [5]. This space opens new opportunities but has also configured a competitive environment where the average life expectancy for the big companies decreases year after year [6, 7]. The average presence of a company in the Standard and Poor's 500 Index was thirty-three years in 1964 and twenty-four years in 2016, and it has been projected to decrease to only twelve years in 2027 [8]. It is the same for companies of the Fortune 500. In the 90s, the average lifespan of companies in that ranking was seventy-five years, and now it is only fifteen years. Dartmouth University professors Govindarajan and Srivastava extended this trend observed in large corporations to other companies, confirming that the life expectancy of companies is now getting shorter by the year [9]. Available

studies on how the technology and the electronic commerce improve the performance of the firms show different conclusions [1, 10–14].

This research focuses on the observation of the big companies that are able to adapt to the new era [15] and on the characteristics of their organisation [2] that would have favoured this survival. The aim is to study what factors of efficiency and organisation in the classical big companies that allowed them to maintain their competitive advantage have now adapted to the changes introduced by the technology and the electronic commerce [16]. Studying the presence of some of these factors in the companies is possible to identify the determinants of the business survival in the big corporations that have been able to overcome the process of change originated by the progressive implementation of the new digital economy.

The number of variables theoretically involved in the survival of companies in the face of large-scale changes can be very large, so it seems appropriate to make divisions for their study [17]. For this, here we have chosen a division based in the size of corporations for studying their survival capacity. So this paper has used the five hundred largest companies in the world, by revenue, contained in the Fortune Global 500 ranking. This is a little novelty in the academic research because while the scientific literature has identified many success factors for small businesses, but it is not seen in the case of the big corporations [18] even when large corporations survive more easily than small firms [19–25].

The first part of this research has identified which major companies in the mentioned index survived between its inception in 1957 and the year 2015. This allows us to find out which of the big corporations, that were strongly consolidated, have survived to the implementation of the new economy called. It has been considered that 2015 is a good year to close the research because, in this year, the process of development of the electronic commerce was already globalised, coinciding with the consolidation of the tools that facilitate the implementation of the online shops for any type of company (such as Prestashop or Magento).

1.2. Framework and Literature Review. Digital economy or electronic commerce cannot properly be considered as a cause of the business success or failure. However, this type of commerce configures a great alternative operating space that could influence the survival of the firms [26]. The academic literature typically groups the possible causes of business failure in internal factors of the firm on the one hand and in external factors of the firm on the other hand. Specifically, studies have linked the causes of business mortality with factors related to the incapacity to organise and manage the companies with financial problems and with variables related to the impossibility to be competitive and to adapt the companies to the changes required by the environment and the market [27–29]. Unfortunately, the factors that the academic literature identifies as important for firm success are the same factors that other studies use to explain the failure of the firms [7, 27].

In order to determine in this research the variables for including relation to the business survival, a preliminary study has been done on this issue. We have excluded the contributions on corporate resilience because this kind of resilience should be taken as a quality of the firms and not as a cause of the business survival over time. While it is a concept that has been used in relation to the success and the capacity of survival of the organisations, business resilience only should technically be used when referring to the ability of the corporation for adapting and confronting the difficulties [30–36] while still preserving their essential characteristics [37, 38].

In this study, the starting point for explaining the survival of the firms in a market comes from the economic theory, that considers it appropriate to base its findings on economic causes. The existence of profits in a market is an incentive to stimulate the entry of new firms in that sector because the companies go to the markets with higher levels of profits [20, 22, 39, 40]. This entrance of firms in the market increases the number of companies but reduces the initial profits [40–42]. This process progressively improves the efficiency of the markets, as a result of the competition [43–47] and the entry and exit of the firms [48, 49], as a function of the revenues or losses that they receive [50, 51]. Economic theory predicts that this adjustment will eventually end with the extraordinary profits of firms in the markets [52–57] and the surviving companies will no longer have profits [58–62]. This would explain why certain studies find that firms with minimal profits often survive, maintaining this state over the time [63–68].

Despite this, the survival of the firms appears influenced in other studies not only by economic factors but also by other factors [40, 63, 65, 68–72]. Some of these other factors are internal, such as the ability of the managers to govern the firms or the organisation that provides the right processes and routines for the operating of the companies [73]. What is especially important is the capacity of these organisational structures for adapting itself to the changes, to the new developments, technologies, markets, and innovations, and also to the new possible alternative strategies [74–77].

These internal variables are in direct connection with the external variables that also affect the long-term sustainability of the firms. Predicting how the changes in the environment can impact on a company is not an easy task [78, 79]. The ecosystem created with the arrival of the electronic commerce and digital economy elements offers innovations that must be internalised by the firms in a competitive environment [20, 73, 80–85], precisely with the help of the mentioned capacity for adapting and organising. Some studies note that the role of managers in the decisions of the firms [83–85] is essential in the organisational level [86–90] to manage this adaptation to the changes [63]. For instance, with the advent of the electronic commerce, if the managers of the firms perceive this arrival as an opportunity, then the possibilities of adaptability towards the use of this electronic commerce are multiplied [84, 85]. Of course, some other papers also combine these points with the psychological and emotional factors in the companies [86, 91–95], explaining how they can influence the necessary organisational

adaptation during the change process [96–100]. The presence, therefore, of both internal and external factors [101] suggests that this study uses both types of variables to measure the combined effect that they can have on the survivability of the firms [102].

On the main theme of this research about the possible relationship between the size of the firms and their survivability, the question is unresolved in the academia [103]. While Gibrat's law indicates that firms can develop itself independent of their absolute size [104], there are studies that have questioned this proposition [105–107], which says that it does not always work [108]. It is possible that the advantages associated with the experience and the years of life of the big companies [106, 109–111], such as the firms chosen in this paper, are compensated by the typical disadvantages and inefficiencies of an oversize, with high structural costs that complicate the innovative and adaptive capacity of the big corporation's adaptation [73, 106, 112–115]. In the theory, the companies learn as the number of years, and their life expectancy improves with their age. The young organisations are more susceptible to failure [116]. But, on the other hand, it seems that there is something like a company lie cycle, which ends with the fall and death of the big companies, unable to adapt themself for a long time to the great changes [109, 117–119]. So the question is open.

Curiously, it has been the commercial literature on management that has taken the greatest interest in the topic about the survival of the firms [63, 120–132]. Despite this interest, Marcus notes that this kind of literature lacks depth of analysis and rigorous methodology [133], basing its conclusions on the governance experience of the authors [27, 134–136]. Academic interest in the sustainability of firms is a recent topic that has emerged in the 1990s [19, 39, 40, 106, 109, 113, 125, 127, 137–145]. A review of the scientific literature shows that it is impossible to establish a unique theory about the relationship between the performance of a company and its durability in the long term [146]. As it has been said before, while some studies explain that the age of the companies improves the experience and survival capacity of the corporations [19, 47, 52, 147, 148], other studies emphasise on the deterioration of their capacity which adapts over time, affecting their survival [73, 114].

It is observed that an important part of the problem is that there are many different variables that can be used to measure the performance, profitability, and success of a company [131]. While some papers approach the issue from a purely economic and financial point of view [149], other studies approach it from the point of view of the organisation and management of the company [150, 151]. This supports the idea that it is necessary to combine both types of variables, and there are alternative ways for the survival of the companies in the time. This issue also connects with the problem of the use of qualitative variables, which have been largely ignored in many studies on business quality [152, 153] and which could provide a good explanation about the endurance of the firms over time. The uncertainty, the instability of certain states, the capacity of dynamism and innovation, the complexity of the governance structure, or the competition degree are factors considered in the Theory of Business Organisation [154–157] as these factors have implications in the longevity of the companies and should yet be modelled in integrated studies. Table 1 summarises all the main explanatory approaches to the business survival theories in the literature, and the most representative papers in each case.

Finally, it should be noted that in the last years, the scientific literature has often used the terms survival, resilience, longevity, sustainability, success, and survival interchangeably to refer to the continuity of companies over time [170]. This, with the review of the academic literature here done, allows us to conclude that there are no enough theoretical approaches to establish an explanatory framework for business sustainability. Therefore, although it is not the main purpose of this article, we provide some lines that should allow us to establish this general framework on the idea of business sustainability.

In order to do so, first we propose a temporal approach which is necessarily linked to a terminological aspect. Later, we will also provide here a conceptual explanation that will help to establish this comprehensive conceptual framework for this business sustainability. In addition, we will use parts of the conceptual framework described here to explore the possible factors that can support the business sustainability.

For doing a temporal approach to the capacity of an organisation to maintain its continuity over time [145], is possible to make a gradation. This possible temporal classification is linked to the use of different terms from a terminological point of view. In this way, from a shorter period to a longer time, it could use consecutively the terms survival, permanence, durability, sustainability, longevity, and hyperlongevity. Survival is related to a position of weakness which, if it is overcome, becomes permanence. If this continuity is entrenched, it is possible to talk about durability, which over the years results in business sustainability or business longevity. Very few authors have attempted to establish specific timescales for each of these terms usually because the studies are most often concerned with the short term [169].

The temporal conceptual framework that we present here is innovative but consonant with the few existing studies on the age of the firms. Basically, we divide the age of the corporates in different time periods, depending on their age and according to the denominations that we have made in the previous paragraph. The stages that we introduce as the temporal framework of this general theory on business longevity are as follows:

(i) Survival from 0 until 8 years old: this is a period of pure survival because 50% of companies die within only three or four years of starting up [103]. After seven years, if the company has survived, it seems that companies usually begin a new period of stability, entering the next stage [171, 172].

(ii) Permanence from 8 until 25 years old: this stage begins in the period in which the initial survival risks decrease and the business becomes stable

Table 1: Summary of visited references and representatives works in each focus.

Focus	Representative works
Economic theory	[22, 39, 40, 58, 60–62]
Efficient entry and exit	[45–47, 53, 57]
Entrepreneurship theory	[43, 49, 50, 158]
Economic viability	[5, 28, 63, 134, 159–161]
Maintenance of minimums	[63, 64, 66–68]
Staff, people, and organisation	[83–86, 88, 90–92, 151–153]
Organisational adaptation	[63, 64, 66, 67, 73–76, 86, 91, 92, 96, 97, 99, 142]
Popular and informal literature	[63, 120, 122–126, 128–132, 162]
Business success	[122–124, 163, 164]
Socio-psychological approach	[6, 68, 76, 84–86, 90–92, 94, 96, 99, 112]
Business life cycle model	[109, 118, 119, 165–169]
Age helps the permanence	[19, 47, 52, 106, 109–112, 116, 118]
Age risks the permanence	[73, 106, 109, 112, 114]

[173]. This period ends when the team that started and stabilised the company is replaced by the next generation. On average, this happens 25 years after the beginning of the firm [103].

(iii) Durability from 26 until 50 years old: this stage is managed by the successors of the founders or entrepreneurs who started the company and stabilised the original project. In this stage, it is common to find the period of maximum performance per employee [174]. this stage ends with the arrival of the next generation, after another 25 years more, when the company is 50 years old.

(iv) Long-term sustainability or long-term longevity for more than 50 years old: this stage begins with the arrival of the third generation. It is the mature age. We do not set an upper limit of years although those companies that have lived more than two hundred years could be considered as business hyper-sustainability or hyperlongevity [144, 175].

Thus, a company is perdurable if it lives the decades necessary to involve more than two generations [176], i.e., beyond fifty years. This possible general theoretical framework of long-term corporate longevity should consider that together with the financial capacity that allow the economic survival, the long-term continuity requires that the corporate governance focus on higher levels of performance [63]. In other words, companies that have survived several generations necessarily had to incorporate levels of excellence and superior quality, which have allowed them to adapt to the changes imposed by time [124]. This is only possible if in addition to maintaining a correct financial development, these companies orientate their activity towards achieving competitive advantages that guarantee their permanence in markets and environments that change. This vision allows the adaptation and innovation that helps companies to differentiate themselves, avoiding the erosion of the typical hard competition among equal rivals, which reduces the revenue and increases the risks of the business mortality [177, 178]. Long-term business sustainability implies that survival over time is only possible through the necessary adaptation to the changes that allow the company to endure.

It should be noted that the economic elements and the organisational and innovative elements are linked. It is necessary to guide the governance of the company for adapting to the markets by searching some differentiation that allows a competitive advantage. This advantage brings the necessary revenues that help the firm to do the same in the next cycle successively.

These guidelines, which can help to configure a possible framework on business long-term sustainability, will be used in this paper to select some elements involved, and this simple theoretical framework suggests that in addition to examining economic-financial elements, it is also necessary to incorporate elements related to the organisational structure of the firms and the capacity to adapt and innovate the market.

1.3. Choosing Factors. The purpose is to choose a combination of factors that can promote the durability of the firms it has been examined in different studies with models that include some of these possible influence variables [27, 41, 68, 101, 141, 179]. As it has been said, the problem of the survival of a company has traditionally been reduced to economic viability alone [47, 161, 179–185]. However, the economic and financial difficulties are often the final stage where a company arrives as an inevitable consequence of other kinds of previous weaknesses [27, 180]. Bad financial ratios are, in the classical academic literature, the prelude to the end of the firms [159, 186, 187], but they are usually not the main cause of this final but only the consequence of the previous different problems. In fact, the company managers link the economic problems in the firms with other previous factors, such as organisational inexperience or the inability of the corporates for updating to the market [188]. In this way, organisational factors are involved in the durability of the companies, which determine the financial performance of the firms [189]. Therefore, companies are not only organisations dependent on financial capital but they are also organisations that are dependent on its human capital, which manages precisely these economic resources [72, 190–192]. In addition to the economic-financial requirements, the organisational and managerial structure of

companies are also involved in business survival factors related to the ability to adapt to the environment in which firms develop [28, 63, 65, 68, 71, 72, 101, 146, 193, 194]. Are these organisational and adaptive weaknesses that most often cause the economic difficulties that finally threaten the continuity of the companies?

Thus, the literature has identified three possible spaces for grouping the possible causes of the collapse of the firms: financial space, organisational and managerial space, and market adaptation problems [65, 68, 195]. Some authors name these spaces as financial environment, organisational environment, and entrepreneurial environment [196]. It is also possible to find global business organisation models that connect with these three areas. According to this point, this paper has examined models of organisational quality that with a focus on the human and anthropological elements in business, offer results are based on the ability to transfer learning, adaptation, and innovation processes from individuals working in the companies to their own organisations [70, 73, 76, 152, 153, 197, 198]. Specifically, in Pérez López's [152] global model of business quality, the factors linked to a company's capacity to achieve its objectives are called "effectiveness." These kinds of variables conform to a first group of elements involved in the long-term sustainability of companies and are associated with the material reality of the enterprise and its economic structure. A second group of variables in this model grouped under the name of "organisation" are those relating to the way that the people in the company organise themselves to ensure that the company functions correctly. Third, there are the elements referring to the world around the company. Here, the quality of an organisation is measured by the degree of orientation that the members of the company have in relation to that environment. The company's institutional policies, associated with its mission, configure this third group of elements of quality in the organisations and it will be named in this paper as "coherence."

In this approach based on the quality of the companies, the three mentioned areas such as effectiveness, organisation, and coherence find their equivalent in the previous focus on environments: the financial environment, the organisational environment, and the entrepreneurial environment. All are very similar if these three environments are also transferred to the literature based on capabilities. Thus, the space called effectiveness is corresponded in the environments approach to what would properly be the company and would have its equivalent in the capabilities approach in the so-called economic-financial capacity of the company. The space of the organisation corresponds to the entrepreneur in the approach based in the environment, and in the organisational and managerial capacity, if the capabilities approach is used. Finally, the space labelled as coherence refers to the market if we are referring to the environments or to the capacity to adapt and innovate in the capabilities framework [27, 68, 101, 179]. The content of the business quality model studied by Pérez López [152] shows that business continuity depends on factors associated with the entrepreneur's ability for organising the business (organisation) in order to obtain an economic result (efficiency) in the service of a mission (coherence). Of course, these three areas are the same as it can be found in the practical manuals of processes for the quality improvement used for the firms. Of these, perhaps the best-known proposal may be, for example, the Malcolm Baldrige National Quality model [199], which like others business excellent models [200, 201], emphasises mainly on the elements of leadership and strategic planning together with the skills for the market analysis and the achievement of results.

This approach could also explain the differences between the general performance of the firms and their permanence. As it has been mentioned before, in some cases, this relationship is positive, but in other situations, it can be negative and would depend precisely on how each company responds in relation to the factors of efficiency, organisation, and coherence that appear in the model. When the time advances, companies must replace the progressive obsolescence of the initial assets with new investments but mostly with improvements in performance, management, organisation, learning, and innovation [202, 203]. Moreover, this explanation is also well synchronised with the theory of the business cycle, where firms that have passed the risks of the beginnings and after a period of stabilisation suffer dangers and threats again just because over time diffuses the resources especially those related to the firm's adaptive and innovative capacity [106, 109, 110, 204–207].

Considering the previous literature and the above definitions, the factors that promote the long-term sustainability of companies should be located within each of these three areas. The definitions given for each area are sufficiently intuitive, and it should be easy to specify the elements involved in the business continuity that it can be considered under each of the three spaces. So, for example, in relation to the aforementioned effectiveness, it is possible to include here factors such as the planning of efficient production processes, the setting and achievement of sales targets, or the attainment of specific economic results [131]. In turn, what has been called organisation in the model includes several factors. The main one is the existence in the company a correct definition of its organisational structure. A factor that also belongs to this group is the organisation of the work and the management efficiency in a context where human capital is an essential organisational part [160, 208, 209]. This section should also include, for example, elements relating to the management potential of the entrepreneurs and their ability to motivate. The third area of factors implied in the survival of companies is the degree of identification of the team with the company's objectives and its purpose. This space was named as coherence and embraces the typical elements of the company's internal culture [210], which are oriented towards the competitive promotion of the firm. Also grouped here, for example, are the policies of differentiation for adapting the company to the changes required by the market [131] or the establishment of links between the members of the company [211], as well as the transmission of information relating to the business, its progress, and the objectives set [212]. As can be seen, these are factors associated with the company's capacity for learning and innovating. These are just a few examples because while the

academic literature has clearly identified these three areas of quality in the firms, it is considered that they are not all related to the company's capacity to learn and innovate but associated with the company's capacity for innovation [79, 87, 213] and also when the factors in each of the three areas are studied, the numbers expand. Table 2 is a summary of the possible transfers between the delimited spaces in each of the approaches described above.

Among all the possible variables involved in the long-term sustainability of the companies, we are going to examine in detail if in the surviving companies of the Fortune 500 index, there were improvements in the areas of effectiveness, organisation, and coherence. This will allow us to know if these three areas that define the quality level of the big corporations are involved in their long-term continuity [34]. Of course, although there are studies that have based their conclusions on the study of factors belonging to only one of the aforementioned areas [65], it is a better option to combine elements from the three areas [141] since it seems that the sustainability of the companies would be a combination of multiple variables [27]. For this reason, together with the presence of improvements in these three general areas of the quality model [152, 153, 198, 214], this study will also include an additional factor from the organisation section and two other factors related to the environment area. The idea is to check whether these additional elements help the durability of the companies, strengthening the advantages offered by improvements in the areas of quality that have been named as effectiveness, organisation, and coherence.

The additional variable to be considered, belonging to the organisational sphere of the company, will be the existence of a formal executive structure that manages the decision-making process and governance of the company. This is a structural dimension of formalisation [215], where there is a centralisation of the direction, which guides decisions and establishes procedures. No judgement is made here if this form of hierarchical organisation is better or worse than its alternative forms but simply if this way of governing companies helps their continuance.

In relation to the environment of the firm, two variables will be added in the model. The first variable involves the competitive capacity of the firm to assume the demands of the markets in which it operates. In this study, we are going to call it as competitiveness. The market is a reality that directly impacts on the company's activity and should therefore be considered in this model. From a theoretical point of view, it does not seem possible for companies to continue over time if they are not capable of providing a response to the challenges that the market presents at any moment by the innovation necessary to provide solutions [216]. The second variable measures the capabilities of the firms for facing all the others changes in the environment, and in this research, we are going to call it as dynamism. Companies are exposed to continuous changes in the environment, and the firms must be dynamic for adapting to it. Note that we are not referring here to the requirements imposed by competition and the market, grouped under the variable competitiveness, but to all the other changes imposed by the environment in which the company operates. Cultural influences, legal requirements, technological developments, or advances in the research and in the knowledge are some of the factors that require a dynamic adaptability from companies. This variable measures the capacity of a company to be flexible, creative, productive, agile, and capable of correctly analysing environmental signals in order to continuously internalise them and improve itself [217, 218]. This element is associated with the transformation capacity necessary for the companies to endure in changing environments and could be considered as a relevant variable for developing strategic decisions [219, 220] that will help in the continuity and sustainability of the companies over time [221]. Moreover, these types of variables, which associate companies with uncertainty, instability, change, or the complexity of the environment are present in the theory of business organisation [120], and their study remains a challenge [222, 223].

This theoretical description should be sufficient to justify the inclusion of these two variables associated with the business environment.

In total, a set of six variables has been defined in the model of this research, which will later be referred as follows:

(i) Business effectiveness (Effectiveness-E)

(ii) Business organisation (Organisation-A)

(iii) Business coherence (Coherence-U)

(iv) Formalisation of the governance structure (Formalisation-F)

(v) Competitiveness of the company (Competitiveness-T)

(vi) Dynamism for adapting to the changes (Dynamism-D)

It is important to note that although the efficiency variable includes elements related to the economic and financial capacity of the firm, the article focuses more on the elements of organisation and response of the human capital of the firms, considering that these are important elements for the survival of societies [40, 65, 69]. The variables related to business organisation and mission cannot be excluded in any case because they are a crucial part of the governance, operations, processes, and structures typical in the big corporations that are considered here [224].

2. Materials and Methods

2.1. Methodology. The specificity of the explanatory variables proposed for the study of corporate longevity requires a qualitative approach. This is because the suggested model does not allow the variables used to be measured with a stochastic approach, which is why this work has chosen a fuzzy set model. Some authors have explained the good behaviour of this methodology, that provides similar results to the conclusions obtained by probability distributions [225]. This method also gives consistent conclusions in comparison with the traditional deterministic models [226], especially in cases where, as in this study, we use qualitative

Table 2: Transfers between the delimited spaces in each of the approaches.

Spaces of quality	Environment	Capabilities	Factors
Effectiveness	Company	Economic and financial	Efficiency in the production processes Setting and achieving objectives Factors that contribute to the effectiveness consolidation of a business trajectory Good financial management
Organisation	Entrepreneur	Organisational and managerial	Integral management of the company Definition of the organisational structure Formalisation in the decision-making Professional and personal organisation
Coherence	Environment	Adaptive and innovative	Cohesion for action Identity and sense of mission Dynamic spirit for facing the changes Understanding of the market Ability to be competitive and distinctive Learning and innovation capacity

variables. Furthermore, it is easy to combine these fuzzy set models with other techniques, making these models a useful tool for the decision-making. This methodology has also been used in combination with traditional regressions [227–229].

This study has used a fuzzy set model typical of the methodology of qualitative comparative analysis (fs/QCA). The statistical tool used for the analysis has been R, with the use of the QCA package that applies the advanced Quine-McCluskey algorithm [230]. Although the origins of the QCA method is not a new one [231, 232], only recently the research has shown an increasing interest in its use [233–236] especially for the evaluation of particular qualitative elements in a company or to understand better the necessary conditions to achieve specific business objectives [231, 237–245].

QCA models work on sets of possible relationships to measure the causality and the implication of some variables in the explanation of other variables. Fuzzy logic is based on the relationships between causes and not on the influence that each independent cause has on the effect. Therefore, it uses a logic based on sets and used the term "presence" and not probability. This makes it possible to analyse whether a combination of factors (in this case, the presence of indicators of efficiency, organisation, coherence, formalisation, competitiveness, and dynamism in a company) appear as a sufficient requirement to achieve determined results or behaviours in the explained variable (in this case, the long-term sustainability of a successful company). In addition, it has another advantage that while in classical theory, the elements belong or not to a set (crisp sets), but in the fuzzy sets approach, it is possible for an element to be partially included (fuzzy sets) as a cause.

Then, first we have made a general theoretical approach for choosing the elements that are considered as involved in the long-term sustainability of a company. After justifying these elements, the study of the business school cases allows us to assign the degree of presence that each of these elements has in each company in a process called "calibration." Finally, when this calibration is completed, it is possible to establish the so-called "truth table." This is a table that shows the different scenarios or configurations that can be built by the combination of the presence of the different elements involved in the long-term sustainability of the company. This is usually done with the help of a software that uses combinatorial logic and set theory to discover which combinations of these elements are necessary or sufficient to produce a result. In our case, this result is the long-term sustainability of the firm, and the elements are the ones described before as efficiency, organisation, coherence, formalisation, competitiveness, and dynamism.

In summary, the QCA method has been found as the most appropriate for this study because of the reasons that follows:

(i) The variables used are essentially qualitative and used an exploration based on cases for whose analysis this methodology is particularly suitable

(ii) It allows the use of different configurations among the variables so that it is easier to explore which sets of variables produce a particular outcome (the sustainability of the firm)

(iii) The variables in the model are oriented towards established relationships between sets, rather than measuring quantitative correlations of variables, thus making it easier to establish sufficient and necessary conditions for proving concrete hypotheses

(iv) The model allows the equifinality as the capability of the model for arriving at the same result from different configurations of the conditions

(v) The number of companies used in this study for checking the variables of interest in this paper is perfect for using this type of fuzzy model in comparation with possible alternatives based on correlations

This fuzzy set method is increasingly used in scientific articles [246], and its methodology obtains consistent results enough to justify its use in this research. In addition, this study has considered the recommendations of the Standards for Reporting Qualitative Research (SRQR) too [247].

2.2. Calibration. In the steps used by the QCA methodology [248], after choosing the variables and obtaining the samples, the next task is called calibration. This work consists of categorizing levels of belonging of the variables to the set by a value in a range. With this calibration, we quantify the presence in each company each of the elements that we have decided to examine. It is clear that each company can partially participate in each of these elements involved in its long-term sustainability, and this is what is established in the calibration. The study of the business school cases allows us to assign this degree of presence that each of these elements has in each company.

Here, to do this calibration, it has followed the usual rule of setting the range between zero and one, thereby determining graduations of membership of the values to the sets [227, 249]. In the crisp set approach, a complete membership to the set means that it will take value one, while the nonmembership is given if the value is zero. But outside these crisp sets, it is possible to establish fuzzy sets by using the so-called crossover points, such as a median of value 0.5. After specifying full membership, nonmembership, and the crossover point, it is necessary to make a transformation from the variables to the sets, which in this study has followed the proposal of Ragin [249]. It is understood that this transformation adjusts the sets well with the original variables. Furthermore, percentiles areused in this work to determine the inclusions, following the recommendation of Fiss [238].

After doing the calibration, it is necessary to build what in this methodology is called a truth table, where we have presented the conditions satisfied by each described case. The reductions of the possible configurations in the truth table [250] were made with the programme, using an advanced version of a well-known algorithm, the Quine-McCluskey algorithm [251–253]. In fact, Boolean algebra is used for the algorithm to define the set of combinations that show causal implication. The truth table provides consistency and coverage indicators for the solutions obtained so that it is possible to know the combinations that offer the minimum necessary to guarantee the result [249]. In the fuzzy set theory, consistency and coverage are determined by the following definitions:

$$\text{Consistency as } X \subseteq Y\text{: } \sum_{\min}(x_i, y_i)/\sum x_i,$$
$$\text{Coverage as } X \subseteq Y\text{: } \sum_{\min}(x_i, y_i)/\sum y_i.$$

Here, x_i is the degree of membership of individual i in configuration X, and y_i is the degree of membership in outcome Y. Consistency is understood here as the distance that exists in the relationship and goes from zero to one. It takes the value one when the relationship of a subset is perfect. A consistency value above 0.7 is generally accepted as significant in all the studies of this class. Using a more usual explanation, the consistency is the measure used in this methodology to test hypotheses. This ratio shows the degree of involvement or membership of a characteristic (independent or explanatory variable) in the output set (explained variable). It is the degree to which a characteristic belongs to the solution as a subset. It could be the equivalent of correlation but only in one sense.

On the other hand, the coverage, using a common language, shows how many cases support the result. The coverage indicates the percentage of cases covered by the solution. Acceptable values are variable, but if they are greater than 0.6, there are enough cases to consider the possibility of using an analysis based on some regression method.

2.3. Data Collection and Treatment. In this paper, we want to test the hypothesis of whether the proposed indicators taken from the model of company quality contained in the conceptual framework offered by Pérez López [152] contribute to the durability of a large company over time. To do so, first we have examined which companies from the original Fortune Global 500 index have survived over a long period of time between 1955 and 2015. Over the six decades used in this research, it was found that only 55 companies have survived in that time, that is, 11% of all companies that originally appeared in the Fortune ranking of 1955. There are 293 firms in the original ranking that were later acquired or merged with other companies, so they have not been considered as survivors. A further 29 firms that changed name or activity have also not been included as survivors. From the total of the initial 500 companies, there are also 76 firms that have not disappeared properly, but they have not continued in the ranking because they did not satisfy the ranking's requirements. In this case, these companies have also not been considered as survivors because this study is about the long-term sustainability of large companies, and their elimination from the ranking means that properly they were no longer considered as big companies. Finally, there were 47 companies that went bankrupt and obviously did not survive either. For tracking the continuity of these companies, we have used the tool provided by Wharton Research Data Services (WRDS) for this purpose [254].

Although it is not part of the scope of this paper to comment on the mortality of the firms used, it can be observed that all the lustrums offer a similar pattern of mortality. On average, 7.5 companies disappeared per year, i.e., almost 40 companies every five years. This means that entering in the ranking of large companies can be easy, but the difficulty it is to keep in the ranking for decades. In fact, 141 companies disappeared in the first fifteen years of the ranking, i.e., almost a third of those that started with the ranking. Afterwards, the mortality of companies continued but was stabilising. In the 70s, 18.25% of the companies that had survived from the beginning disappeared from the ranking. However, in the two decades that in the 90s coincided with the development of the electronic commerce, the percentage of firms that were dead was duplicated. These are some data on the mortality of the firms observed in this study although as it has been said before, this paper does not focus on the companies that have disappeared nor on the causes of their possible failure. This study examines the surviving companies and the characteristics detected in those companies that allowed their inclusion and permanence in the ranking, overcoming the needed changes.

Concerning the compilation of information about the variables to be evaluated in the surviving enterprises, it must be said that this task is one of the most important points of this research. Of the 55 surviving companies, it was possible to collect data on all these variables for 47 companies. These data, for the same variables, were used all together with the data from another 47 companies, that were chosen from the group of those that had not been survived, finally bringing data for 94 companies. Data on these variables have been obtained from different sources, usually using evidences that can be found in the cases studies of the business schools, as proposed by Eisenhardt [255].

To measure the firm's competitiveness variable in the market (variable T) and the chosen organisational variables (variable F and variable D), this paper has also used the reports of the companies involved. As the data for the independent and dependent variables were taken from different sources, the well-known problem of common bias was removed. Then, in order to find the progress that firms made in relation to the parameters that were labelled as effectiveness (variable E), organisation (variable A), coherence (variable U), and formalisation in the government (variable F), we have taken the data of these variables in two different periods. Thus, the model is dynamic and measures the evolution of the variables, understanding that there is an improvement if the difference between the value of the second period (2015) with respect to the first period is positive.

For each of the three representative variables of the quality in a company—effectiveness, organisation, and coherence, the paper has used several items to evaluate their measurement. In this way, it has been possible to set graduated scores for each of the company in the Fortune 500 index, depending on the number of evidence found in connection with these items. Table 3 shows a summary of the items used for each of these three variables.

The items chosen here to analyse each variable have been selected from the review of the academic literature presented before in relation to the factors involved in the long-term sustainability of companies. Regarding the rest of the variables used in the model, it is considered that they are well defined and are sufficiently precise, so it is not necessary to define additional items to evaluate them, and their measurement is immediate. The items chosen here to analyse each variable have been selected from the review of the academic literature presented before in relation to the factors involved in the long-term sustainability of companies. Regarding the rest of the variables used in the model, it is considered that they are well defined and are sufficiently precise, so it is not necessary to define additional items in order to evaluate them and their measurement is immediate. As it has already been explained, one of the advantages of these models is that they allow different levels of belonging to a set. Specifically, this study has used values of 0.0, 0.2, 0.4, 0.6, 0.8, and 1.0, depending on the number of evidence found in the business school cases reviewed, justifying the score in each case in an effort for being very objective. Table 4 provides a summary of the list of all items used and their calibration.

3. Results and Discussion

For getting results on the relationships between the sets with this fuzzy methodology, this work has used configurations that combine all the selected variables for each of the ninety-four companies in the Fortune 500 ranking. The idea is to check whether it is possible to test the following hypotheses:

(i) *Hypothesis 1*: if it is possible to find in a company the indicators of the quality of the firms, in the same terms that they have been defined here as effectiveness, organisation, and coherence, the long-term sustainability of the company is longer than if these indicators of business quality do not appear.

(ii) *Hypothesis 2*: it is not enough for the survival of a company the simple presence of the three indicators of quality business. Improvements in each of these three areas are necessary for the long-term sustainability of the business.

(iii) *Hypothesis 3*: if there are improvements in the effectiveness, organisation, and coherence of a company and also possible to find improvements in the formalisation of its governance, the longevity of the firm will increase over time.

(iv) *Hypothesis 4*: if there are improvements in the efficiency, organisation, and coherence of a company, the additional existence of a competitive and dynamic profile in the same companies contributes to the long-term sustainability of the firm.

After defining the presence of all the variables in the companies through the study of the business school cases, the next step with the QCA methodology is the analysis of the comparison of the conditions that attempt to verify a phenomenon. In this case, the phenomenon is the long-term sustainability of the company (P). In our study, as explained above, we have used the R Studio programme, which has a specific package for this data treatment with the QCA methodology.

As the possible combinations are extensive, the optimised Quine-McCluskey algorithm reduces the solutions to the compatible positions. Thus, the research has used the configurations of the sets listed in Table 4, either static (simple presence of the variables E, A, U, F, T, and D) or dynamic (improvements in the variables EE, AA, UU, FF, TT, and DD) in order to know their implication in the dependent variable long-term sustainability (P). In total, the number of models analysed are the result of combining the variables in static, dynamic, and mixed between them.

The result obtained allows us to obtain the so-called truth table. This table presents the presence or not of the variables considered, which are connected by means of logical functions to the variable to be explained. In our case, the truth table summarises the implication or not of each of the variables described in the durability of the company. The programme indicates the companies, if any, that verify each configuration.

Table 3: Elements used to set measurements on the proposed variables.

Variables in the model	Criteria used to measure the membership
Improvements in effectiveness	Efficiency in the productive processes Setting and achieving objectives Factors that contribute to effectiveness Consolidation of a path Good financial management
Improvements in the organisation	Integral management of the company Definition of the organisational structure Professional and personal development of employees
Improvements in coherence	Cohesion for the action Identity and sense of mission Dynamic spirit in the employees Recognition by the environment and the market Capacity to learn and innovate

Table 4: Calibration of the variables and identification of the sets.

Variable	Name of the set	Not fully membership	Crossing point	Full membership
Effectiveness	E	0.2	0, 65	1
Organisation	A	0.2	0, 65	1
Coherence	U	0.2	0, 65	1
Formalisation	F	0.2	0, 7	1
Competitiveness	T	−1.1	0, 05	1.5
Dynamism	D	−0.64	0, 05	1
Improvements in effectiveness	EE	−0.1	0	0.1
Improvements in organisation	AA	−0.1	0	0.1
Improvements in coherence	AA	−0.1	0	0.1

Not all configurations are meaningful. Those that are supported by the largest number of cases (companies in this case) should be used. In addition, the research should choose the configurations with high consistency in order to make the relevant conclusions and interpret them.

In our study, we used the R Studio program, which has a specific package for data processing with the QCA methodology. The results using static variables were relevant. But when we used variables based on improvements of effectiveness, organisation, and coherence, relevant results were obtained. Table 5 shows the records obtained in the configurations.

To verify the configurations in this research, the consistency must have values between 0.7 and 1. In these cases, the results can be accepted, and we call them true configurations. In our research, these will be the cases used to draw conclusions. Our study shows (Table 5) that with these levels of consistency and representativeness of companies are the configurations 93, 104, 122, 126, and 128.

Taking the relevant cases, we use the consistency and coverage values to summarize the results. Table 6 follows the recommendation and nomenclature of Ragin [249] and Ragin and Fiss [256] and allows us to offer the five configurations that have been proved as representative in our study. As explained above, when the letter is repeated, it means that this study is evaluating the improvements in that variable. If only one letter appears, it is because the work is simply recording the presence of the variable and not its improvement over time, and then the data belongs only to the second period.

This table summarises the results obtained which are considered relevant for obtaining conclusions and follows the recommendation and nomenclature of Ragin [249] and Ragin and Fiss [256].

In Table 6, the black circles (●) mean that the conditions are present. Strike through circles (⊗) mean that conditions are not present. Blank cells show that the condition is absent and is not relevant. Big black circles represent central conditions, while small black circles represent peripheral conditions. The results of the models have been ordered in Table 6 according to the value of the raw coverage.

As it can be observed, the higher values of raw coverage show the cases where the models incorporate a larger number of conditions. These results allow to establish some important observations in relation to the durability of large firms. First, it is possible to discover that although several variables are involved in the sustainability and long-term sustainability of the firms (equifinality), in all the cases, it is necessary for the companies to improve their positions in terms of effectiveness, organisation, and coherence with their mission. Second, the study shows that complementary positions can be verified, and this can allow the weaknesses or the absence of some variables to be compensated for the presence of others, and thus achieve the long-term sustainability of the companies over time.

This fuzzy analysis shows that it is not possible to test Hypothesis 1 because the simple presence of indicators of effectiveness, organisation, and coherence, as we have defined these characteristics before, are not relevant conditions for guaranteeing the entrepreneurial long-term

Table 5: This truth table shows the results obtained in the fuzzy sets analysis. In the table, the value 0 means no involvement of that variable in the explanation of the long-term sustainability of the company. On the contrary, the value 1 means relevance. And ? symbol means that nothing can be determined.

	EE	AA	UU	FF	D	T	Out	n	Incl		EE	AA	UU	FF	D	T	Out	n	Incl
1	0	0	0	0	0	0	?	0	—	65	1	0	0	0	0	0	?	0	—
2	0	0	0	0	0	0	?	0	—	66	1	0	0	0	0	0	?	0	—
3	0	0	0	0	0	1	?	0	—	67	1	0	0	0	0	1	?	0	—
4	0	0	0	0	0	1	?	0	—	68	1	0	0	0	0	1	?	0	—
5	0	0	0	0	1	0	?	0	—	69	1	0	0	0	1	0	?	0	—
6	0	0	0	0	1	0	?	0	—	70	1	0	0	0	1	0	?	0	—
7	0	0	0	0	1	1	?	0	—	71	1	0	0	0	1	1	?	0	—
8	0	0	0	0	1	1	?	0	—	72	1	0	0	0	1	1	?	0	—
9	0	0	0	1	0	0	?	0	—	73	1	0	0	1	0	0	?	0	—
10	0	0	0	1	0	0	0	1	0.333	74	1	0	0	1	0	0	?	0	—
11	0	0	0	1	0	1	?	0	—	75	1	0	0	1	0	1	?	0	—
12	0	0	0	1	0	1	?	0	—	76	1	0	0	1	0	1	?	0	—
13	0	0	0	1	1	0	?	0	—	77	1	0	0	1	1	0	?	0	—
14	0	0	0	1	1	0	0	2	0.219	78	1	0	0	1	1	0	?	0	—
15	0	0	0	1	1	1	?	0	—	79	1	0	0	1	1	1	?	0	—
16	0	0	0	1	1	1	0	3	0.348	80	1	0	0	1	1	1	?	0	—
17	0	0	1	0	0	0	?	0	—	81	1	0	1	0	0	0	?	0	—
18	0	0	1	0	0	0	0	2	0.342	82	1	0	1	0	0	0	?	0	—
19	0	0	1	0	0	1	?	0	—	83	1	0	1	0	0	1	?	0	—
20	0	0	1	0	0	1	?	0	—	84	1	0	1	0	0	1	?	0	—
21	0	0	1	0	1	0	?	0	—	85	1	0	1	0	1	0	?	0	—
22	0	0	1	0	1	0	?	0	—	86	1	0	1	0	1	0	?	0	—
23	0	0	1	0	1	1	?	0	—	87	1	0	1	0	1	1	?	0	—
24	0	0	1	0	1	1	?	0	—	88	1	0	1	0	1	1	?	0	—
25	0	0	1	1	0	0	?	0	—	89	1	0	1	1	0	0	?	0	—
26	0	0	1	1	0	0	0	2	0.486	90	1	0	1	1	0	0	?	0	—
27	0	0	1	1	0	1	?	0	—	91	1	0	1	1	0	1	?	0	—
28	0	0	1	1	0	1	?	0	—	92	1	0	1	1	0	1	?	0	—
29	0	0	1	1	1	0	?	0	—	93	1	0	1	1	1	0	1	1	0.954
30	0	0	1	1	1	0	0	5	0.368	94	1	0	1	1	1	0	?	0	—
31	0	0	1	1	1	1	0	1	0.267	95	1	0	1	1	1	1	?	0	—
32	0	0	1	1	1	1	0	5	0.368	96	1	0	1	1	1	1	?	0	—
33	0	1	0	0	0	0	?	0	—	97	1	1	0	0	0	0	?	0	—
34	0	1	0	0	0	0	0	1	0.288	98	1	1	0	0	0	0	?	0	—
35	0	1	0	0	0	1	?	0	—	99	1	1	0	0	0	1	?	0	—
36	0	1	0	0	0	1	?	0	—	100	1	1	0	0	0	1	?	0	—
37	0	1	0	0	1	0	?	0	—	101	1	1	0	0	1	0	?	0	—
38	0	1	0	0	1	0	0	2	0.398	102	1	1	0	0	1	0	?	0	—
39	0	1	0	0	1	1	?	0	—	103	1	1	0	0	1	1	?	0	—
40	0	1	0	0	1	1	0	1	0.416	104	1	1	0	0	1	1	1	2	0.898
41	0	1	0	1	0	0	?	0	—	105	1	1	0	1	0	0	?	0	—
42	0	1	0	1	0	0	0	2	0.264	106	1	1	0	1	0	0	0	2	0.517
43	0	1	0	1	0	1	?	0	—	107	1	1	0	1	0	1	?	0	—
44	0	1	0	1	0	1	?	0	—	108	1	1	0	1	0	1	?	0	—
45	0	1	0	1	1	0	0	1	0.448	109	1	1	0	1	1	0	?	0	—
46	0	1	0	1	1	0	0	1	0.314	110	1	1	0	1	1	0	?	0	—
47	0	1	0	1	1	1	?	0	—	111	1	1	0	1	1	1	?	0	—
48	0	1	0	1	1	1	0	2	0.296	112	1	1	0	1	1	1	?	0	—
49	0	1	1	0	0	0	?	0	—	113	1	1	1	0	0	0	?	0	—
50	0	1	1	0	0	0	0	3	0.474	114	1	1	1	0	0	0	0	1	0.602
51	0	1	1	0	0	1	?	0	—	115	1	1	1	0	0	1	?	0	—
52	0	1	1	0	0	1	?	0	—	116	1	1	1	0	0	1	?	0	—
53	0	1	1	0	1	0	0	1	0.335	117	1	1	1	0	1	0	?	0	—
54	0	1	1	0	1	0	0	1	0.496	118	1	1	1	0	1	0	0	1	0.579
55	0	1	1	0	1	1	0	2	0.253	119	1	1	1	0	1	1	?	0	—
56	0	1	1	0	1	1	0	1	0.508	120	1	1	1	0	1	1	?	0	—
57	0	1	1	1	0	0	0	1	0.470	121	1	1	1	1	0	0	?	0	—
58	0	1	1	1	0	0	0	2	0.640	122	1	1	1	1	0	0	1	4	0.997

Table 5: Continued.

EE		AA	UU	FF	D	T	Out	*n*	Incl	EE		AA	UU	FF	D	T	Out	*n*	Incl
59	0	1	1	1	0	1	?	0	—	123	1	1	1	1	0	1	?	0	—
60	0	1	1	1	0	1	?	0	—	124	1	1	1	1	0	1	?	0	—
61	0	1	1	1	1	0	0	2	0.477	125	1	1	1	1	1	0	?	0	—
62	0	1	1	1	1	0	0	13	0.528	126	1	1	1	1	1	0	1	6	0.724
63	0	1	1	1	1	1	?	0	—	127	1	1	1	1	1	1	?	0	—
64	0	1	1	1	1	1	0	13	0.500	128	1	1	1	1	1	1	1	7	0.926

EE: improvements in the variable effectiveness (dynamic), AA: improvements in the variable organisation (dynamic), UU: improvements in the variable coherence (dynamic), FF: improvements in the variable formalisation (dynamic), T: presence of the variable competitiveness (static), D: presence of the variable dynamism (static), Out: outcome value, *n*: number of companies responding to that configuration, incl: sufficiency inclusion score, Truth table: > dTT1<-truthTable (fort500, outcome = "P," conditions = c("EE," "AA," "UU," "FF," "D," "T")+ n.cut = 1, incl.cut1 = 0.65, complete = TRUE).

Table 6: The fuzzy sets results.

Number of the configuration		128	126	122	104	93
Effectiveness	E					
Organisation	A					
Coherence	U					
Improvements in E	EE	●	●	●	●	●
Improvements in A	AA	●	●	●	●	⊗
Improvements in U	UU	●	●	●	⊗	●
Formalisation	F					
Improvements in F	FF	●	●	●	⊗	●
Competitiveness	T	●	●	⊗	●	⊗
Dynamism	D	●	⊗	⊗	●	●
Consistency		0.926	0,724	0.997	0.898	0.954
Raw coverage		0.187	0.187	0.127	0.056	0.013

sustainability in the models generated. Improvements in these variables are necessary. This point connects directly with Hypothesis 2, which has been verified as true because the results obtained show that improvements in each of these three variables relatives to the entrepreneurial quality are relevant for the continuity of the companies.

Finally, Hypothesis 3 also appears proved, so it can be assumed that if there are growths in effectiveness, organisation, and coherence in a company, and there are also improvements in the formal and hierarchical organisation of its governance, its longevity will increase. The results obtained demonstrate this hypothesis, as can be seen in the configurations numbered as 128, 126, and 122 in Table 6, where it has been summarised the results of the study. Finally, the analysis of Hypothesis 4 shows that the competitiveness and dynamism in a firm are factors that can compensate the absence of some other significant variable for the longevity of the companies. But by themselves, the presence of only these two variables does not necessarily imply the long-term sustainability of the firms. In the different models used, the companies with the highest performers related to the variables for long-term sustainability studied were Archer Daniels Midland, Coca-Cola, General Mills, Kellogg, Altria Group, 3M, Abbott Laboratories, Bristol-Myers, Johnson & Johnson, Merck, Procter & Gamble, Monsanto, Whirlpool, Dana, General Dynamics, Honeywell Intl., Joy Global, and Textron United Technologies. As everybody can see in the resume of Table 6, the results place them in a range of inclusion between 0.724 and 0.997. Then, it is possible to argue that there is evidence that the improvements in the variables of effectiveness, organisation, and consistency that these big companies made have been an important aid to their survival over the years even in the face of major changes. Moreover, it is important to highlight the fact that there are no cases that contradict this statement but only those which reaffirm it.

In fact, most of the companies that were identified as survivors to the changes brought by the arrival of the digital economy and the electronic commerce still continue in 2020 in the ranking of the largest companies. Only five companies were missing from those fifty-five survivors. Ashland and Avon Products fell below position 500 in the ranking, Dow Chemical merged with Dupont, Monsanto was bought by Bayer and McGraw Hill was bought by Apollo Global Management. It is easy to see too, for instance, in the case of 3M or Whirlpool among others, that the companies remaining themselves in the index over time stay relatively in similar positions. 3M was ranked 93rd in 2015 and in 2018, stayed in 97th position, and in the same dates, Whirlpool has moved from 140th to 134th.

4. Conclusions

Following the recommendation of Ragin [249], configurations with a higher raw coverage imply a higher causality strength, so they should be considered with more attention.

In this study, as is shown in Table 5 and in Table 6 with the summary of the results, this is true for the configurations numbers 128 (0.187), 126 (0.187), and 122 (0.127). These are precisely the configurations that show better results because included improvements in the factors involved in the three variables for the enterprise quality defined as effectiveness, organisation, and consistency. In all the cases, the sets show that the long-term sustainability of the enterprises depends on the progress in these three variables.

It is also relevant that when some of these variables do not improve over time, as is the case of the configurations 104 and 93 shown in the summary of Table 6, the raw coverage decreases. As it has been mentioned above, the data show that the mere presence of the variables, labelled as effectiveness, organisation, and coherence, is not enough to ensure a long continuity in the life of the companies, but what is really necessary for their long-term sustainability is to make progresses and improvements in all the three variables. This allows us to conclude that for the long-term sustainability of the companies, it is not enough to achieve the excellence in some moments. It is necessary to make progresses in terms of effectiveness, organisation, and coherence as these variables were defined before. The configuration 128 and 126, which bring the highest raw coverage level in this study show together an extensive number of perdurable companies where it is easy to check that there were progresses in these variables and not only their presence at any time. This is an important point because it confirms that the variables chosen in this work are involved in the permanence of the companies although in this way.

From the results obtained, the configuration 128 is the one with the highest inclusion, with a consistency of 0.997. In this case, improvements in effectiveness, organisation, and coherence have also been strengthened by progress the variable called formalisation (F). Again, what is relevant is the progress and the improvement in these variables so that the static positions of simple presence in a moment are not enough to induce the longevity of the companies. This is exactly what happens in this model with the competitiveness and the dynamism of the firms studied, which by themselves alone are not relevant for the long-term survival of the companies. As it has been explained, competitiveness and dynamism are two variables of response of the company to the requirements of the markets. In this sense, both variables are external, and the company simply must provide a good response to the challenges proposed by the markets. But behind these responses, the durability of the companies depends much more on the implementation of improvements in the variables where the firms have a stronger control: those factors related to the variables called effectiveness, organisation, and coherence. The improvements in these three variables are what that builds the quality of the companies, allowing the survival of these companies for a long time, but many of these major companies, reasonably, also offer a competitive and dynamic answer to the impacts than they receive, strengthening their survival capacity.

With a high level of consistency, the configuration 93, as is illustrated by the summarised results of Table 6, where the default of improvements in the organisation has been compensated, on the other hand, by the ability of the companies for adapting themselves to the scenarios of change. This point offers us a relevant conclusion too. This variable was called dynamism (D) and is also associated with the environment where the firm operates, measuring the capacity of the companies for offering flexible and adapted answers to those environments. Consequently, the dynamism is the variable that connects the external environment of a company with its organisation. And this explains how for the companies in this study, it has been possible to compensate the reductions in the variable named organisation with the elements of flexibility and adaptability of the dynamism variable. Thus, this dynamism, as a capacity for adaptation, has compensated the typical organisational problems of the large size of many of these firms, helping them for surviving, for instance, to the changes of the digitalisation process.

In summary, this research proves that the major companies in the Fortune 500 have perdured for at least sixty years, and even surviving to the changes imposed by the revolution of the digital economy could make it because they made efforts to improve their own organisation (organisation variable), thereby achieving improvements in their results (effectiveness variable) and progressing in the mission that they had defined (coherence variable). These are the excellence indicators in the great organisations that should be promoted to achieve the long-term sustainability of the great companies.

Based on these premises, the future research will be able to provide additional complementary elements that reinforce the factors of business sustainability presented in this study.

Data Availability

The name of the current companies is a public access (https://fortune.com/rankings). For the rest of data, especially for the tracking of the continuity of the companies, we have used the multitool provided by Wharton Research Data Services (WRDSs). The construction of the data table based on cases of the business schools has used the data of the Case Centre by an academic access (https://www.thecasecentre.org).

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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