

Driving factors of the Collaborative Consumption in the European Union scene

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Abstract

The defense of unlimited economic growth as the main objective to be achieved has been questioned for decades and with even more intensity in recent years. In this context, the Sharing Economy's initiatives have dramatically increased. This study expands our current understanding of driving factors of the Collaborative Consumption in European Union member countries, focusing on the case of Spain. A cluster analysis was run, involving two methods: the hierarchical and the iterative. The results obtained were compared with the available scarce data and the position of the main stakeholders. The analysis has shown that the northwest in Europe is the best position to develop activities as part of a Sharing Economy. However, data have shown that there are countries as Spain, in the southwest, with a lot of initiatives: the consequences of the economic crisis and the need to save money have been shown as the main drivers of these new models of business in these states. On the other hand, the favorable attitude of the institutions of the European Union to the Collaborative Economy has to be highlighted and its rejection of increased regulation that would hinder its development.

Resumen

La defensa del crecimiento económico ilimitado como el principal objetivo a alcanzar ha sido cuestionada durante décadas y aún con más intensidad en los últimos años. En este contexto, las iniciativas de Economía Colaborativa han aumentado a un ritmo vertiginoso. Este trabajo estudia los factores impulsores del consumo colaborativo en los países miembros de la Unión Europea, centrándose en el caso de España. Se ha llevado a cabo un análisis clúster en el que se han utilizado dos métodos: el jerárquico y el iterativo. Los resultados obtenidos se han comparado con los escasos datos disponibles y la postura adoptada por los actores principales. El análisis ha demostrado que el noroeste de Europa es la mejor posición para desarrollar iniciativas de economía colaborativa. Sin embargo, hay países como España, en el suroeste, con un número importante de iniciativas: las consecuencias de la crisis económica y la necesidad de ahorrar dinero se han mostrado como los principales impulsores de estos nuevos modelos de negocio en estos estados. Por otro lado, cabe destacar la actitud favorable de las instituciones de la Unión Europea ante la economía colaborativa y su rechazo a una mayor regulación que dificulte su desarrollo.

Keywords: Business, consumption, e-commerce, economic, ICT, sustainable

Palabras clave: Negocio, consumo, comercio en línea, económico, TIC, sostenible

JEL Code: D10, D20, D40, D60, O10, O33

1 Introduction

The defense of unlimited economic growth as the main objective to be achieved has been questioned for decades and with more intensity in recent years (Heinrichs, 2013; Stiglitz, Sen, & Fitoussi, 2008). The consumption as a center of the entire system forgets such basic aspects as questioning the availability of basic resources and the deterioration of the environment (Lorek & Spangenberg, 2014; Schumacher, 1978; Stiglitz et al., 2008) and that is being reflected, for instance, in climate change (Krakauer, 2014). However, according to the scientific literature, there are other factors behind the recent increase in this type of activities, such as economic crisis, the Internet culture and environmental concern.

Internet offers many new and easy ways of sharing (Belk, 2014), through more or less informal economic activities, all of them dependent on online platforms and involving new governance structures, as part of the “Sharing Economy”. The Sharing Economy consists of a set of disruptive innovations that drastically alter markets (OECD, 2015). Sharing Economies compete with traditional ways of producing, distributing and consuming goods and services (Moehlmann, 2015).

Collaborative Economy initiatives involve changing the structure of the economic system, based on the existence of “Homo economicus”, who acts primarily out of self-interest. It is a rational person and always chooses to compete and gain ownership of things, rather than cooperate and share (Grassmuck, 2012). The “Homo economicus” focuses exclusively on maximizing its own benefit (Fernández, 2009). This theoretical individual does not take into account the potential positive or negative externalities of his actions.

In practice, irrationality or the willingness to share are features that should not be ignored (Marçal, 2016). In fact, there are many more initiatives and actions that contradict these theoretical bases (Arcidiacono, 2011). People, either as buyers or as suppliers, have behaved contrary to methodological individualism or instrumental rationality on several occasions (Fernández, 2009). Therefore, there is tension between how firms actually operate today and the ideals set forth in major theories of companies and markets (Tomassetti, 2016).

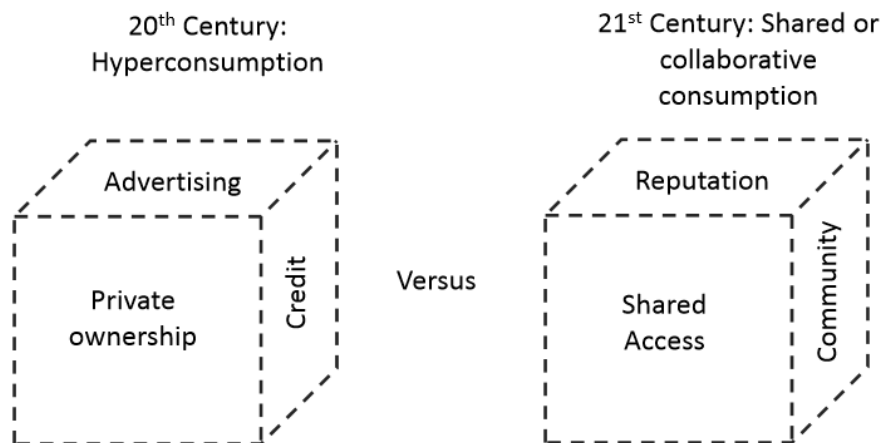
Collaborative Economy operating platforms emerged first in the United States (European Commission, 2013). However, in the last years, they are also present in Europe. The questions to which it is responding to this research has been stated: Which are the better positioned EU members to develop sharing economy's initiatives according to the driving factors that scientific literature has highlighted as most important? Does it match with the reality?

The main scheme of this work responds as follows: In the following Section, the scientific literature about the Sharing Economy and its main driving factors are studied. Section III contains the methodology. Section IV presents the results of this work. Finally, Section V and VI contain the discussion and the main conclusions.

2 The Collaborative Consumption

According to the European Commission, the 21st century is characterized by Collaborative Consumption as opposed to the 20th, when Hyperconsumption was the protagonist (European Commission, 2016). Figure 1 shows the main factors of each century in this field.

Figure 1. The Main Consumer Factors in 20th and 21st centuries. Source: Prepared by the author on the basis of European Commission (2016)



Thus, the so-called “Collaborative Economy” has emerged and it has developed rapidly in recent years. It is based on the idea of “the sharing turn” (Grassmuck, 2012). This involves changing the traditional structure of markets (Business to Consumer), formed by companies on the one hand, and consumers on the other. The figure called “prosumer” (producer user) appears in this new context of Collaborative Consumption (Becerra & Patiño, 2013; Levine et al, 2000).

There are many definitions of Collaborative Economy. For instance, Barnes y Mattsson (2016), have defined Collaborative Consumption as “The use of online marketplaces and social networking technologies to facilitate peer to peer sharing of resources (such as space, money, goods, skills and services) between individuals, who may be both suppliers and consumers” .

In the same line, the National Commission on Markets and Competition in Spain (CNMC) has indicated that the sharing economy includes a diverse and rapidly changing mode of production and consumption set. The agents innovatively share assets or underused services in return for a monetary value or without it. Individuals use digital platforms for these exchanges and, in particular, the Internet (National Commission on Markets and Competition, 2016).

The main features that determine a “Sharing Initiative Economy” are follows:

1. It is detected that a good or service is not being used efficiently
2. There is enough supply and demand
3. The necessary confidence (linked with reputation) is generated through a community because subjects have to be encouraged to participate, which means they have to share goods and services traditionally only shared with people nearby, such as family or friends, with

strangers (Monteil, 2014). These communities are often organized through virtual platforms, which act as digital intermediaries, between those who offer and those who demand the product. However, the role that these platforms assume is very uneven. According to the European Commission (2016), it is possible to distinguish between platforms that are mere intermediaries, that is to say, “digital intermediaries”, and the “service provider platforms”. The former are service providers of the information society and there is no labor relationship between the platform and the peers. However, the latter has more control over the activity of the users. In this case, labor dependence is possible.

Analyses have been carried from macro and micro perspectives (Puschmann & Alt, 2016). From a macro-economic perspective, the sharing economy follows a hybrid market model. Depending on the involvement of money, two models may be identified: The first is the traditional market model, and the second is a gift giving model, where two agents exchange the ownership of a product without any money involved in the transaction process (Scaraboto, 2015). Sharing goods and services is another form of exchange that is present in the Collaborative Economy. On the other hand, from a micro-economic perspective, analyses have been carried out, especially in the area of marketing and public administration (Puschmann & Alt, 2016). For the moment, economic theory is foreign to these new models.

While businesses leveraging the Sharing Economy have begun to emerge in recent years, academic research on this field is limited (Park & Armstrong, 2017). At the moment, there are no official data. Therefore, several private companies have published reports with estimates that can provide guidance to visualize the magnitude that these models have acquired in a few years. PwC (2016), for instance, has highlighted that the growth in both revenues and transaction values of the sharing economy has been very strong since 2013, and accelerated in 2015, as large platforms invested significantly in expanding their European operations. This company has estimated that European revenues generated by these platforms almost doubled in 2015.

According to Arcidiacono (2016), four areas of socio-economic impact of sharing practices could be defined: market, environment (for example, incidence of collaborative service with an environmental impact), labor and networks, where the level of transparency of digital reputation algorithms are highly important.

However, there is little research studying the main driving factors of these new economic relationships. For instance, Barnes and Mattsson (2016) have used Delphi’s Method with twenty-five experts with the objective of answering the following research question: What are the main drivers, inhibitors and future developments in collaborative consumption? According to their analysis, economic and socio-cultural factors are considered the most important drivers of collaborative consumption. These factors are linked with cost reduction through new technologies. Digital relations, social networks and ICT skills are also important elements in the sharing economy. They have highlighted that, surprisingly, environmental factors appear to be the least important of those considered (“Need for more efficient resource use” and “Environmental sustainability”) ranking outside the top-10. On the other hand, the most important inhibitors to collaborative consumption are the “Lack of awareness” of this type of consumption and the “Lack of IT infrastructure”.

Meanwhile, the CNMC (2016) groups the causes of the emergence of these new economic relationships into five main groups. Firstly, economic factors, arising from the crisis and the progress in the use of Internet (leading to cost reductions); technological factors; socio-cultural factors, since new needs and consumer habits emerge; sociological factors, linked with the

feeling of belonging to a community that many design platforms of sharing economy allows; and, finally, regulatory factors, raising the need to review existing regulation to adapt to these new models of collaborative economy (National Commission on Markets and Competition, 2016).

Furthermore, another important issue to consider is the importance of culture. Specifically, there are two key points: the extent of Internet use and the frequency with which activities through the network are made. Furthermore, aversion to doing business with strangers is also important. In fact, the European Union (EU), that has a Business Innovation Observatory, has highlighted these factors as important drivers of the collaborative economy. For instance, the European Commission has stressed that the character of the American people is more likely to assume models of collaborative economy than the European (European Commission, 2013).

3 Method: Variables, clustering analysis and positions of main stakeholders

3.1 Variables

On the one hand, in order to go deeper into the driving factors for the development of this kind of market, a cluster analysis was run for 24 EU member countries. 8 variables were used (Table 1) based on the three sub-indices (ICT Access, Use and Skills) behind the ICT Development Index, prepared by the United Nations (International Telecommunication Union, 2013; Novo-Corti & Barreiro-Gen, 2015) due to the importance of ICT in the sharing economy and other variables that scientific literature has also highlighted as key points, such as age or education (Barnes & Mattsson, 2016; Puschmann & Alt, 2016).

Table 1. Indicators

Indicator	Source	Theoretical support
1. % of households Internet Access	Eurostat - <i>ICT usage in households and by individuals</i>	International Telecommunication Union (2013); Novo-Corti & Barreiro-Gen (2015)
2. % of firms with broadband subscription	Eurostat - <i>ICT usage in enterprises</i>	Adapted from International Telecommunication Union (2013)
3. % Individuals having ordered/bought goods or services for private use over the internet in the last three months	Eurostat - <i>ICT usage in households and by individuals</i>	Adapted from Novo-Corti & Barreiro-Gen (2015)
4. Share of enterprises' turnover in e-commerce - %	Eurostat - <i>ICT usage in enterprises</i>	Adapted from International Telecommunication Union (2013)
5. Individuals' level of computer skills. Individuals who have carried out 1 or 2 of the 6 computer related activities	Eurostat – <i>Digital Skills</i>	Adapted from Novo-Corti & Barreiro-Gen (2015)
6. Population by age group. % of total population. Proportion of population aged 14-25 years.	Eurostat – <i>Population and Social Conditions</i>	Barnes & Mattsson (2016)
7. Lifelong learning	Eurostat – <i>Education and Training</i>	Barnes & Mattsson (2016)
8. At risk of poverty rate	Eurostat – <i>Employment</i>	Adapted from Barnes &

Household Internet access (variable number 1) is measured as the percentage of households where any member of the household has the possibility of accessing the internet from home. The percentage of firms with broadband subscription (variable number 2) includes fixed and mobile connections. The percentage of individuals having ordered/bought goods or services for private use over the internet in the last three months (variable number 3) covers all individuals aged 16 to 74 and financial investments are excluded. Share of enterprises' turnover in e-commerce (variable number 4) is measured as the enterprises' receipts from sales through electronic networks as a percentage of total turnover. Individuals' level of computer skills (variable number 5) was measured using a self-assessment approach, where the respondent indicated whether he/she had carried out specific tasks related to computer use, without these skills being assessed, tested or actually observed. Proportion of population aged 14-25 years (variable number 6) is measured as the % of total population. Lifelong learning (variable number 7) refers to persons aged 25 to 64 who stated that they received education or training in the four weeks preceding the survey (numerator). The denominator consists of the total population of the same age group. Both the numerator and the denominator come from the EU Labour Force Survey. This last variable has been selected and included in the analysis because in addition to its relevance, the vast majority of data relating to education are available only until 2012. However, the emergence of the Collaborative Economy, at least its major development, took place later. At risk of poverty rate (variable number 8) is the share of people with an equivalised disposable income, after social transfer, below the at-risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income after social transfers.

3.2 Cluster analysis

Clustering analysis was chosen as the most appropriate methodology for this work because it is possible to include different variables or factors related to an issue in the analysis and classify the studied agents in groups according to these factors. In this case, the studied agents are almost all EU member countries regarding the sharing economy and its driving factors.

The cluster analysis involves two main methods: the hierarchical and the iterative (Cruz-Jesus, Oliveira, & Bacao, 2012). A hierarchical procedure was used with the objective of defining the number of clusters to extract. In particular, Complete and Ward's methods, the most frequently used in the literature (Ward, 1963) were run with squared Euclidean distance. The decision about the amount of clusters was taken based on the analysis of the dendrogram graph. Once the number of clusters was determined, in this case 3, the k-means clustering algorithm was calculated. All these calculations were carried out using the PASW Statistics, 24, software.

Twenty-four EU member countries were part of the study: Austria, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, Netherlands, Poland, Romania, Slovakia, Spain, Sweden and United Kingdom. The following States were excluded from the study due to the lack of data in any of the variables analyzed: Belgium, Slovenia, Luxembourg, Portugal.

3.3 Positions of main stakeholders

Then, the results obtained in the analysis of clusters were compared to the limited available data about the presence of the collaborative economy in Europe.

Finally, the positions taken by the stakeholders involved have been analyzed through the study of the reports and statements that have been published so far.

4 Results

4.1 Cluster analysis

4.1.1 Hierarchical procedure

Table 2 shows the used data before the standardization.

Table 2. Variables and used data (%) before typing

		Access Households	Firms Broadband	E-Com Indiv	E-Com Firms	Indiv Skills	Age	Lifelong learning	At-risk- of- poverty
1	Bulgaria	57	77	10	3	16	10,4	2,1	21,8
2	Czech Rep.	78	97	25	29	18	10,7	9,6	9,7
3	Denmark	93	99	66	17	15	12,9	31,9	12,1
4	Germany	89	95	61	13	18	10,8	8	16,7
5	Estonia	83	96	37	14	15	11,2	11,6	21,8
6	Ireland	82	95	43	32	13	11,4	6,9	16,4
7	Greece	66	87	20	2	13	10,4	3,2	22,1
8	Spain	74	98	28	15	12	9,7	10,1	22,2
9	France	83	96	49	15	15	11,9	18,4	13,3
10	Croatia	68	95	22	13	20	11,7	2,8	19,4
11	Italy	73	95	15	7	12	9,8	8,1	19,4
12	Cyprus	69	96	23	8	19	14,3	7,1	14,4
13	Latvia	73	95	24	7	13	11,3	5,6	21,2
14	Lithuania	66	99	19	7	11	13,3	5,1	19,1
15	Hungary	73	88	20	20	18	11,9	3,3	15
16	Malta	81	97	41	9	14	12,9	7,4	15,9
17	Netherlands	96	100	59	12	22	12,2	18,3	11,6
18	Austria	81	96	43	13	15	11,9	14,3	14,1
19	Poland	75	90	24	12	14	12,4	4	17
20	Romania	61	82	6	6	18	11,4	1,5	25,1
21	Slovakia	78	93	31	16	20	12,6	3,1	12,6
22	Finland	90	100	53	19	13	12	25,1	12,8
23	Sweden	90	97	62	18	18	12,6	29,2	15,1
24	UK	90	95	72	20	16	12,7	16,3	16,8

Source: Own elaboration with Eurostat data (2014)

After building the database, scores have been standardized to eliminate the effect of the measuring scale. A graph is obtained, called a dendrogram, which allows the number of existing conglomerates. It is the graphic representation that facilitates a better interpretation of the results of a cluster analysis.

In this case, the cluster analysis identified three different groups. Then, the result is a three-cluster solution obtained by using both Ward's and Complete's method (Figure 2 and 3):

Figure 2. Dendrogram. Ward's method

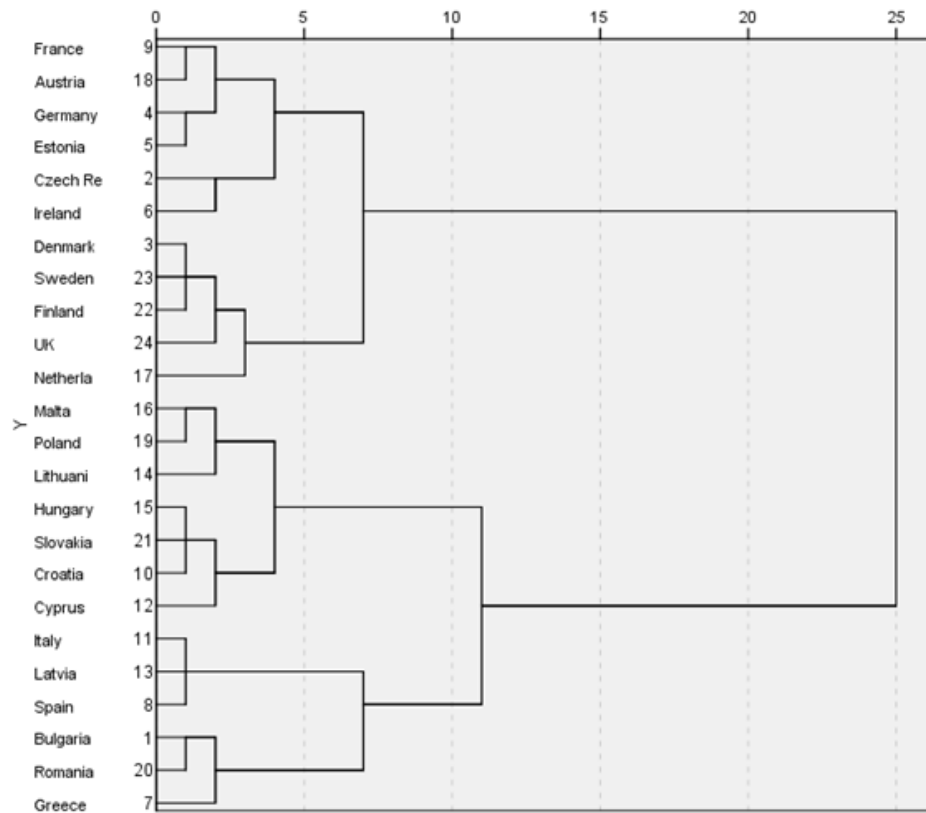
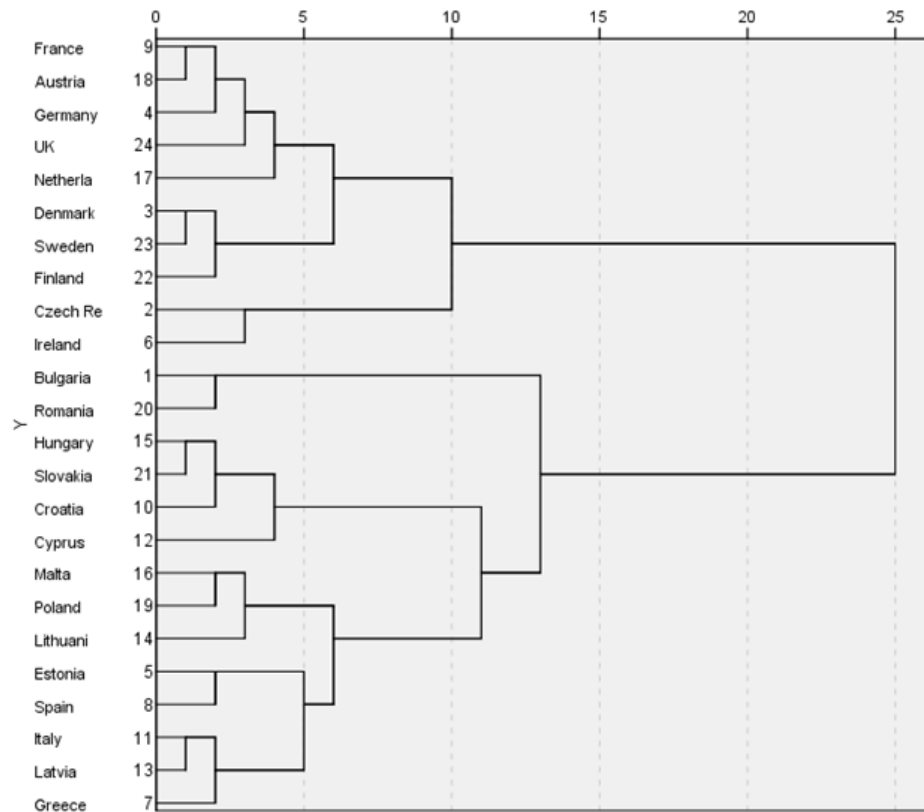


Figure 3. Dendrogram. Complete's method



4.1.2 K-means clustering

Once the number of clusters was determined, in this case 3, the k-means clustering algorithm was calculated. It is a clustering technique that determines new cluster members according to first cluster center and calculates new cluster centroids, iteratively.

Proposing three clusters, countries studied are distributed as follows: the first cluster has 3 countries, the second 12 and the third 9. The detailed distribution of states in each cluster is:

Cluster 1 (three states): Bulgaria, Greece and Romania.

Cluster 2 (twelve states): Estonia, Ireland, **Spain**, Croatia, Italy, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland and Slovakia.

Cluster 3 (nine states): Austria; Czech Republic, Denmark, Finland, United Kingdom, Germany, France, the Netherlands and Sweden.

The distance between centers of the final clusters is high, so it seems that the groups are sufficiently differentiated (Table 3).

Table 3. Distances between final cluster centers

Clúster	1	2	3
1		3,477	5,732
2	3,477		2,786
3	5,732	2,786	

4.2 Data available and stakeholders' positions

As stated above, there are no official data at the moment. Therefore, several private companies have published reports and research in this field in order to estimate the magnitude that these models have acquired in a few years and identify the main driving factors.

PwC (2016) has studied the presence of the sharing economy in Europe. This research focused on: Austria, Germany, Czech Republic, Belgium, Luxembourg, Romania, Poland, France, United Kingdom, Netherlands, Italy and Spain. According to it, the countries in which the participation in collaborative economy was highest in Europe in 2015 were Spain (31%) and Italy (33%). The percentages in Austria, Germany or Belgium were the lowest.

This study has also analyzed the factors influencing participation in the collaborative economy in the same year. It highlights the following as main factors: a) It saves money, b) An easy way to make extra money, c) It is good for the environment, d) It helps to build communities. In Spain and Italy factor a) was the most important and they had the highest percentage in comparison with the rest of the states.

ING (2015) has elaborated a study about the rapid growth of the sharing economy, using a survey. They have compared the opinions of around 1.000 respondents from fifteen countries (European states, Australia and USA). They affirm that among young and highly educated sharing is most popular.

On the other hand, focusing our attention on the position of the main stakeholders, it is possible to identify different attitudes.

First at all, the institutional position in Europe will be presented. It is represented, on the one hand, by the European Economic and Social Committee, that is a consultative body of the European Union, composed of representatives of organizations of workers and employers and other stakeholders and, on the other hand, the Committee of the Regions, which is also an advisory body of the EU, but in this case, it is composed of elected local and regional representatives from twenty-eight Member States. These bodies show a pro-collaborative economy attitude in their reports. For instance, European Economic and Social Committee (2014) drew up proposals and action strategies in 2014, always from the perspective of consumer protection. The proposed definition of the legal and fiscal environment of activities under collaborative consumption, regulating issues such as liability, insurance, use rights, rights against planned obsolescence, property rates or quality standards stand out among the issues addressed. Also, with respect to established lines of action, it highlights the proposed dissemination and public awareness of individual and collective benefits that entail collaborative

economy initiatives, promoting pilot projects, and encouraging the spread of collaborative consumption by activating and energizing the networks promoted.

For its part, the Committee of the Regions also shows a positive attitude towards collaborative economy initiatives. In fact, it considers that the positive externalities are numerous and beyond the possible negative externalities that may result from these initiatives (Committee of the Regions, 2016).

At the state level, for example, the National Competition Commission in Spain, remains generally positive, but deals with consumer complaints. In the words of the Commission: “This better individual and social use occurs through the provision of platforms of these resources, goods or services by users. Access to these economic assets, previously underused, resulting in greater economic efficiency of the system and, *ceteris paribus*, an increase of competition” (National Commission on Markets and Competition, 2016).

Consumers, meanwhile, make requests, such as avoiding the creation of oligopolies and monopolies in the Collaborative Consumption. They also call that the responsibility has to be specified in case of problems and that private activity and professional activity should be distinguished. The project called “Collaboration or Business? Collaborative consumption: From value for users to a society with values” (OCU, 2016) is an example of actions carried out by several associations of European consumers. They have conducted a study with 8,670 consumers in Belgium, Spain, Italy and Portugal. They have studied, among other things, the reasons for participating in collaborative consumption initiatives, such as saving money or better suiting their needs or the main barriers to accessing these measures.

Finally, professional organizations (transport, hostelry etc.) and neighborhood associations are among the detractors of these initiatives. They ask for very restrictive regulation (the same as that required for themselves or even a total ban on these activities).

In fact, according to Arcidiacono (2016), some critical issues are beginning to emerge, such as tax avoidance, regressive welfare and job matching empowered by the national policy of deregulation of the labor market, potential “share-washing” practices, uncertain outcomes of the regulation about sharing or some cases of racial and social discrimination. It is not always true that the sharing economy is a fully disintermediated or indiscriminately cohesive and inclusive (Hardin & Luca, 2014).

5 Discussion

The first cluster is composed of the three countries (Bulgaria, Greece and Romania) with the worst situation in the development of collaborative economy initiatives. Essentially, it is due to their low percentages in use of ICT (both by individuals and companies) as well as in lifelong learning (shorter than others European countries). These are countries in the east and rather in the southeast (in fact, they are neighboring countries). Despite having a percentage of young people similar to many other European states, they need to develop access to new technologies and standardize their use. In fact, for example, the functioning of public administration itself remains very cumbersome and very dependent on attendance procedures and through paper documents.

The second cluster is formed by the other states that have been included, that is to say, twelve countries (Estonia, Ireland, Spain, Croatia, Italy, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland and Slovakia). This cluster has intermediate characteristics between the previous two and, in fact, the location is more heterogeneous than in others.

However, in practice and, given the limited data available, this cluster is not displayed as homogeneous. Certain states that are part of it, such as the case of Spain and Italy, have developed numerous collaborative economy initiatives.

These initiatives have been motivated, mainly, by the need to find alternative ways to obtain income that the economic crisis has imposed since 2008. This need is not only people in their role as consumers but also as unemployed people. This factor has not been included in the analysis as it is considered circumstantial by many institutions, but, in practice, the effects of the crisis continue to be seen eight years later. These States, a priori, and taking into account their development in access, use and ICT skills and their younger population or training, would not be the most suitable for the development of these activities. However, the need to save money without sacrificing certain services causes the appearance of activities and subsequent acceptance by consumers.

Finally, the third cluster is composed of nine states (Denmark, Finland, United Kingdom, Germany, France, the Netherlands and Sweden). According to the studied factors, the best positioned countries facing the sharing economy are concentrated in this cluster, because they have the higher percentages in the most of the variables (except at risk of poverty rate).

These countries are located in northern Europe, which is the best location for the development of measures of collaborative consumption, according to the factors included in the analysis.

Also, European agencies themselves are showing a positive attitude towards the Collaborative Economy. In fact, these organizations have the will not to legislate or do as little as possible. This facilitates the progress of these activities.

Therefore, the development and use of technology and culture is important, but customs also change if the context changes: in the context of crisis since 2008, especially in countries of southern Europe, for example in Spain, the “culture of ownership”, until now widespread, has declined out of necessity. Consequently, Spanish people tend to share or lease rather than buy.

6 Conclusions

The analysis of the main driving factors of the Collaborative Consumption in the EU member countries has shown differences between the North and the South as well as the West and the East. According to the clustering analysis, northwest Europe is the best position to develop activities of the Sharing Economy.

However, data from private organizations have shown that there are countries in the southwest with a lot of initiatives. This is the case in Spain or Italy. Going deeper into this aspect, the consequences of the crisis (with harsh effects in this area) and the need to save money have been shown as the main drivers of these new models of business in these states. It has shown that not only are the development of ITC or education important, but also economic factors are relevant where the crisis has been hard.

Furthermore, an analysis of the positions of main stakeholders has been conducted. The favorable attitude of the institutions of the European Union toward the Collaborative Economy has to be highlighted, along with its rejection of increased regulation that would hinder its development. Nevertheless, there is a lack of tailored policy frameworks for regulating new collaborative economy businesses. In the absence of this framework, public policies might apply conventional industry standards and rules in a wrong way.

The present study is meaningful as prior research. It has limitations due to the lack of official data, but it is a first and essential step in the knowledge of these disruptive innovation models.

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