Can we exit the crisis without the emerging countries?

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Abstract

Advanced economies resemble each other, while emerging economies are very different from each other. That is why the emerging countries can exit this crisis in a different way than the advanced economies. This is because the crisis has affected each type of country differently according to their demographics, size and development, and the emerging economies do not need to carry out the same actions as the advanced economies.

Key words: Emerging countries, crisis, advanced economies

One of the professors I had who left me with some of my worst memories was a man who whenever I asked him a question in class answered me with: "That's not the question you should be asking!" And I realise that this question of whether we can exit the crisis without the emerging countries may not be the question we should be asking. Let me explain: the question is more whether we should think that perhaps this time the emerging countries will exit a crisis without us; that is, we shall talk about advanced economies and emerging economies, and I would like to begin by providing figures on each of them.

The distinction between an advanced and an emerging economy is the distinction between linear and non-linear equations. That is, linear equations all resemble each other while non-linear equations do not resemble each other much at all. The same holds true with emerging economies and advanced economies.

Advanced economies are essentially economies that resemble each other, since they have the same productive structure; in contrast, emerging economies are very different to each other in terms of their size, development, the relative importance of the sectors they have, demographics... just about everything. Therefore, instead of talking about emerging economies, we shall in general focus in on some of them. I have chosen three of them: China, Brazil and Angola.

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If we take the world economy as a whole, advanced economies make up 56% of the world GDP, 66% of world trade and 14% of the world population, and what we call emerging economies account for a little over half of the GDP, one-third of trade and 86% of the population. We can draw a few conclusions from these aggregate figures: if we look at the USA, the proportion of world exports coming from this country is the same as the proportion of world exports coming from China, and it is less than the proportion of world exports coming from Germany, which somewhat upsets our notion of the emerging countries. We should say that we are talking about exports of goods, not goods and services, which leads the USA's importance to drop, as it exports many services.

The first thing we should focus on is a figure that does not seem sustainable in the long term: the fact that 14% of the population has 56% of the GDP and that 86% of the population has the rest. This is something that will be corrected over time because if not, it may continue to worsen until it becomes unsupportable. To begin with, let us examine demographics. We economists are forced to talk about things in the long term; however, if there is a variable on which we can rely in the long term, it is demographics. No one knows what the technology will be like in five years, nor what institutions there will be, but we can know what the demographics will be. That is, we can know what they will be 20 years from now, but not 50 or 60 years hence. The UN's forecasts, for example, say that the world population will stabilise in around 2075 at approximately 8.6 billion people, let us say 9 billion, 50% more than now, although there are alternative hypotheses that range from 36 million to 2.5 billion. They are not very accurate forecasts beyond the first 50 years, but they are indeed valuable for the first 50 years; therefore, let us accept 8.5 billion people. This will largely happen by a drop in the fertility rate and the ageing of the population; as the population ages, the mortality rate rises and then there comes a point when the fertility rate drops and the mortality rate rises and reaches a maximum. From then on, the population will drop a bit and later, in around 2075, it will stabilise; however, what will not stabilise is the population distribution. Notice that in 1950, 29.5% of the world population was living in what we call "advanced economies", 22% were European and 7% in North America. In 2000, it was only 17%. The forecasts today for the long term are never over 13%, which means that the population living in what we consider advanced economies will have gone from almost one-third of the population to less than 15% within the next 75 years.

Given this proportion, where will the increase be? Not in Asia, which right now has 55% of the world population. This population will continue to account for 55% of the world population 300 years from now, we assume after 2075.

Latin America will never reach 10%; it is now at 6.6% and will reach 8%. The major shift is Africa. It accounted for 6.8% of the world population in 1950 and is expected to surpass 23.6%, despite AIDS, malaria and other diseases. There will be a change in the world population distribution, which will take place not so much in Asia or Latin America as in Africa compared to the advanced countries. This consideration, in my opinion, is enough for us to ask if we are the ones that should depend on the emerging countries, or whether the emerging countries are the ones that should depend on us, because it is clear that the economy's centre of gravity will shift towards them.

If we take the secondary variable, trade, we find what we already know. The advanced countries export goods to each other. If we take the case of Germany, for example, 86% of its exports are goods, 73% of its imports are goods and 76% of their trade is with advanced economies. Germany is a very open country, but primarily very open to other industrial countries, not to the rest of the world.

The case of the USA is a bit different. Less than 50% of its trade is with advanced economies; that is, more than half of this country's imports and exports are with the rest of the world, not with the EU, and not even with Mexico or Canada.

If we take the case of a medium-sized country like Spain, 76% of the exports are goods, and agricultural raw materials are fairly important, since they account for 15% of exports. Seventy percent of imports are goods. From this standpoint, we are an advanced country, as we export and import certain goods. Our dependence on the advanced economies is quite important. Seventy-seven percent of our trade is with advanced economies, and of them 70% is with the EU; we are an EU province from this vantage point.

China is a totally different country. Ninety-three percent of its exports are goods, and it imports 71% of its goods because one of things that China does is import goods, assemble them and once again export them. Many of its exports match this description. When it is said that China exports advanced technological goods, it is often not true. It exports computers, and its Apples are made in China, but this means that it assembles them, not that it envisions or designs them; instead, they are simply assembled there. It imports a lot and exports a lot; it does a lot of traffic in fine-tuning. Naturally, in a case like China, the proportion of mineral resources and fuel is quite high; it is around 22%, much higher than in many European countries, with the exception of Spain: we have the highest proportion of energy imports in the EU, namely 20%. Yet the proportion of China's trade with advanced economies is much lower than that of other countries: 53% of its exports go to advanced economies. In other words, the USA is not the country that China floods with t-shirts and tennis shoes; instead, other countries receive a larger proportion than the USA does.

If we examine a country like Brazil, much of its imports are agricultural. Finally, we can find a textbook example: the developed countries export goods and import agricultural products, and the developing countries do the opposite. Thirty percent of Brazil's exports are agricultural products, 20% are minerals and 47% are manufactured goods. This is less than in the advanced economies, since its trade with advanced countries is much lower. The proportion of exports to advanced countries is only 40% because industrial countries' trade tends to be highly concentrated with other industrial countries, while the trade of non-industrialised countries does not primarily go to industrial countries.

It is clear that Brazil has a major client which is an emerging economy: Argentina. Twenty percent of Brazil's exports go to Argentina, 11% of its imports come from China and 7% of Brazil's exports go to China. This is a fairly significant figure because it is essentially comprised of soy; Brazil is the second largest soy producer in the world after the USA, and China is the leading soy consumer in the world. Therefore, there is a very important stream of soy running from Brazil to China, as an alternative to the USA. Thus, we can see that the largest manufacturing platform in the world right now is China, whose

degree of dependence on the West is lower than we might have thought. Perhaps we have imagined that most of China's imports come from the West, but this is not true, and that many of China's exports go to the West, but this is not true either, because they go to the rest of the world. And consider that Japan is one of the advanced economies, meaning that exports between China and Japan are counted among those of industrial countries, not emerging countries.

The last country we wish to examine is Angola. One advantage is that there are virtually no figures on Angola. A total of 98.7% of Angola's exports are mineral and energy resources. What is more, this country has another unique features, which is that there are one million Chinese workers in Angola who are primarily building roads and railways, but not only railway to carry minerals from the mine to the port, which is what we did. Instead, they are also building a railway network for the entire country.

The last thing we should examine, apart from demographics and trade, is capital. It is well known that the capital in advanced countries has decreasing performance; this is why it ends up being invested elsewhere and therefore the capital of England, the USA and other developed countries ends up being invested in under-developed countries. This was applied quite frequently in the 19th century, until English capital was ruined by purchasing shares in South American railways; since then, the capital from advanced countries does not so much go to Third World countries as the opposite. What has happened is that first savings shifted from advanced countries to the emerging countries, primarily to countries like China, and these countries have then devoted themselves to financing the advanced countries. As Paul Krugman said, the American economy consists of the fact that Americans build houses with the money lent to them by China. This is an oversimplification, of course, but it contains a grain of truth, since the Chinese, Japanese and Middle Eastern countries have financed the USA's spending for many years. The capital flows no longer go from the advanced countries to the emerging countries but in the opposite direction. Therefore, the major advantage of the advanced countries and especially the USA used to be having capital markets; that is, the USA's capital markets had fundamental features: first, they were liquid – one could buy and sell shares in vast quantities without really bothering anyone – and secondly, they were safe. This has come to an end: for a year and a half they have been neither liquid nor safe, and therefore this is one less reason why the emerging countries should be dependent on us.

Therefore, I think that this should lead us to conclude that it is not safe for the emerging countries to rely on us to exit the crisis and that they can exit the crisis that affects them differently than us; they can exit it without relying on us. They can serve as an engine for the advanced economies; what is always said about how the American economy is the engine of the world: they can play this role. However, can China replace the American economy as the engine of the world economy and help us to exit this crisis? No.

First, because the numbers do not add up. The Chinese economy is large, but it is much smaller than the economy of the USA. Secondly, because the trends do not line up either. What China should be doing right now is not strengthening its export sector but strengthening its internal demand. That is, a country as large as China cannot continue to develop through its export sector. This has a very great risk that we are beginning to glimpse; namely creating a

dual economy, that is, a modern economy, which is the economy that serves the export sector and develops, gets rich and leaves behind the second economy, namely the rural economy, which is stagnant. This phenomenon can already be seen in China. Consider the fact that the proportion of labour that works in industry today is the same as 30 years ago. Chinese industry has created relatively few jobs; obviously they are highly productive and very well paid jobs, but very few have been created and there is constant pressure from the rural world to join the modern world. This can only be achieved primarily through the export sector. Therefore, if China did what it should do, it would not be the engine of the world economy but the engine of its own economy. Thus, I think that neither the figures nor the trends will make these emerging countries help us exit the crisis too much. Despite that, we are living with a single economy, if I may, with the same image as always: we are all in the same boat.

I would like to point out something that seems inconceivable, even though it is not impossible, because stranger things have happened: that in 20, 30, 50 or even 100 years from now, we will have 8 billion people consuming the amount of resources that we currently consume per person or that Americans consume. Right now, there are restrictions on resources (water, food, cultivable land) which may or may not be heavy enough restrictions, but they are now. We are not very clear as to whether this can continue, such that the emerging countries can reach the same standard of living as the advanced countries. Let us say that it is fairly improbable in a world that is increasingly interconnected, when one part is increasingly aware of what the other parts are doing, that the major income inequalities remain in place; therefore, we can expect there to be some sort of convergence. I believe that this convergence is unlikely to happen at the upper end today; I am not saying that it is impossible, obviously. Instead, I mean that it seems unlikely. I think that this would not be feasible because major conflicts would arise due to the surplus of these major resources, and therefore the convergence would have to be more like a midpoint. Just to cite some figures, let us say that the world per capita income right now is $10,000, the income in a country like China is $5,000, in India it is $2,000, and in the advanced economies it is $37,000. These are huge, threefold, differences. And we are not talking about the poorest person in the world and the richest person in the world; no doubt they both live in Brazil. But we are not discussing that; we are talking about means: the difference is only threefold, and in the advanced economies it is tenfold, since there are major differences among the big countries. If we think that these differences will tend to converge because there are forces that tend to make them converge, it is difficult to imagine from the standpoint of natural resources that they can converge to the point where we are today, and even less so if we keep growing in this way. I think that that we can draw two conclusions from all of this, if we can draw any.

The first is that we should not take for granted that the emerging countries have to rely on us to exit the crisis because right now there is a real possibility that there are other physical circuits of goods and services. Let us think about the natural resources of Angola or Brazil and Chinese goods, including merchandise, services and capital. Remember the capital flow: even capital markets exist on the sidelines of the advanced economies. If there is not a large Asian capital market it is only for one reason: China and Japan do not get along with each other. This is the only reason. They have been working on monetary union projects for twenty years, but Japan has taken the role of

conceptual leadership, and China will never accept this. In other words, for the time being, as long as things remain thus, there will not be either an Asian monetary fund or an Asian capital market, two issues which have been discussed for some time now.

However, it is possible that China and Japan do manage to overcome these differences for the sake of the advantages that a closer union could bring them. In my opinion, the relationship between these two countries is the only obstacle to creating a single Asian market. Therefore, we cannot assume that the emerging countries have to rely on us to exit their crisis; we cannot expect them to remain our engine because they will not be.

As mentioned above, neither the figures nor the trends lead us here; therefore, as usual we are taking the worst possible attitude to facilitate an understanding of the emerging economies and ourselves, because we are looking at them over our shoulders, as always. The Americans are teaching the Chinese lessons on how they should make their exchange rate work; luckily they are not teaching them lessons on how to run their banking industry. They were doing this ten years ago, but now they have stopped. The rest of us are teaching them lessons on their human rights, and that is fine, but it should not be the only thing we have to say about countries like China. If you had lived in China, you would have seen to what extent the Western press, the press not only from here but from everywhere, has a systematically hostile attitude towards what happens in China.

That is, any report that could be interpreted either negatively or positively is always interpreted negatively. The Chinese know this, and these are things that build up over time and make our lives more difficult than they have to be.

The second conclusion, in my opinion, is that these growing emerging countries, 84% of the world population, wants to reach a standard of living similar to ours, and this could cause a series of difficulties. It could lead us to the idea that perhaps convergence will not be entirely upwards, that we will not be where we are watching as the others approach us, but that this will force us to converge a bit towards the middle, and to make Keynes' idea about the economic possibilities of our grandchildren come true. Right now we are obligated to worship a false god; for the time being, for years what is good will seem bad and what is bad will seem good. Let me remind you about Mandeville's fable about the bees, which said that saving is a private virtue but a public vice; that if people save they do not consume, and that if people do not consume the economy grinds to a halt. This is what is happening now: we are being encouraged to consume, as Mandeville said, and Keynes said that they were false gods. For some time we will have to keep worshiping these false gods before things are the way they should be and we worry about what truly matters. This should have been written in around 1930. He should have spoken about his great-grandchildren, not his grandchildren. Perhaps this idea will actually come true during the lifetime of his great-grandchildren.

Study of the productivity and working partnerships of the Catalan and Madrilean clusters based on their output in the top Spanish communication journals

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Abstract

This study consists of an analysis of scholarly papers published in the seven highest-quality Spanish-language communication journals throughout the period 2007-2011. The study analyses the productivity and the collaborative models among the authors of these papers, and it draws an accurate, detailed map of activity in the Catalan and Madrilean clusters. The two clusters' production levels are similar, and together they account for most of Spain's output. The data also show the Catalan cluster's greater internal connectivity and a lower output in partnerships with the rest of Spain compared to the Madrilean cluster. Finally, the results show that international co-authorship is at a very early stage, and the joint output from Catalonia – Madrid is virtually non-existent.

Key words: Catalonia, Madrid, communication journals, authorship, papers

1. Introduction and objectives

The publication of papers in communication journals is a phenomenon that arose in the early 1980s, when this field of knowledge, adopting the model of the experimental sciences, began to use publication in scholarly journals as an essential way of disseminating the results of studies (Hicks, 2004). This led to a trend among authors to choose the journals according to the benefits they will bring to their CVs (Giménez & Alcain, 2006). On the other hand, agencies appeared with the goal of classifying journals in terms of quality, which promoted a small group of journals over others, giving rise to a competitive process among the journals to attract high-quality papers. This latter phenomenon had a key effect in non-English-speaking countries, since the Social Sciences Citation Index (SSCI-ISI) and SciVerse Scopus – both of which

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use English as their main language – became the international benchmarks in quality evaluation. In Spain, the reaction to this situation led the country to create its own evaluation systems with the goal of conferring prominence on high-quality Spanish-language publications. Despite this, the journals watched with concern as they were increasingly distant from the international productive epicentres and a slow series of efforts got underway to situate these publications in the most important international databases. At the same time, there were attempts to leave the hallmark of Spanish communication journals, which contained papers in Spanish, to evolve towards international quality standards dissociated with the regional origin of the papers. Notable examples of this are the fact that *El Professional de la Información* in 2006, *Comunicar* in 2007 and *Comunicación y Sociedad* and *Estudios sobre el Mensaje Periodístico*, both in 2009, were added to the ISI database.

This new working paradigm has aroused interest among researchers in communication to evaluate the state of the art of Spanish publications. Noteworthy studies include the ones by Soriano (2008) on the consequences of the effect of National Agency for Quality Assessment and Accreditation of Spain (ANECA) on Spain in terms of language, authorship and citations (Fernández - Quijada, 2010; 2011), the methodological flaws in papers published between 1998 and 2007 (Martínez-Nicolás & Saperas, 2011), the internationalisation of the impact factor (Lauf, 2005) and analyses of the internationalisation and co-authorships of very extensive samples of scholarly papers on communication (Escribà & Cortiñas, 2013; Fernández & Masip, 2013). The studies unanimously express a concern over the deficient status of Spanish matrix publications in their records of international publications, even though they do provide a ray of hope, especially in studies after 2008, which dovetails with the entry onto the scene of the Spanish communication journals.

In order to bring more factors to interpret the situation, we believe it is worthwhile to focus on aspects involving the internal distribution of the output. For this reason, in this paper we perform a study of the leading Spanish communication journals with the goal of specifying the work patterns and productive records of the two main regions of scholarly output in the field of communication in Spain: Catalonia and the Community of Madrid. Our goal is to go beyond the outline offered by Escribà and Cortiñas (2013), which traces a few master lines of productive activity and partnerships among universities based on an analysis of the most frequent ties among universities. Therefore, the study below meticulously quantifies all the productive and collaborative activities that take place in Catalonia and the Community of Madrid and analyses the ways in which each cluster collaborates abroad.

Thus, our study pursues the following objectives:

- To measure the total and relative productive activity of researchers at the different universities in the Catalonia cluster and the Community of Madrid cluster based on the presence of papers in the leading communication journals in Spain.

- To analyse the structures of partnerships at the leading universities in each cluster in terms of the number of publications signed by a sole author and co-authorships, either within the same university, within the cluster, with the rest of Spain and with co-authors from abroad.

2. Method and materials

The leading communication journals were selected strictly according to objective quality and validity criteria during the period 2007-2011. Using the complete DICE1 database, we analysed each publication to check its activity during 2007-2011, and we ascertained high-quality track records based on the journals' inclusion in ISI, Scopus, Latindex, ISOC-CSIC, *the journal-source* category in IN-RECS2 and external reviews. We added *El Profesional de la Información* (EPI) to this classification, a journal which has openly expressed its aim of publishing research in the field of communication, even though it is included in the Library and Documentation databases.

The journals chosen for our study are:

- *Comunicar. Revista Científica Iberoamericana de Comunicación* y Educación Created in 1993 with the name of *Comunica. Revista de Medios de Comunicación y Enseñanza*, it adopted its current name in 1994. It is the most visible element in the activity of a group of Andalusian journalists and professors working under the name of *Grupo Comunicar* whose goal is to perform research in the field of communication. It has been an ISI member since 2007, and it also appears in Scopus. It is the Spanish matrix publication with the top position internationally. It comes out twice yearly.

- *Comunicación y Sociedad.* This is the quarterly (since 2013) publication issued by the Faculty of Communication at the University of Navarra which has been active since 1988. It has been present in both ISI and Scopus since 2009. Unlike other publications which choose to translate their issues into English, this publication has some papers in Spanish and others in English within the same issue. We should note that its desire for an international presence has been its main mission from the start.

- *Estudios sobre el Mensaje Periodístico* is the journal of the Department of Journalism I of the Complutense University of Madrid. Twice a year since 1994, it has published papers in Spanish (primarily), French and English. It and *Comunicación y Sociedad* are the only two university-based journals listed in ISI and Scopus.

- *El Profesional de la Información* is a publication on information, documentation librarianship and communication which was founded in 1992 with the name of IWE (*Information World en Español*). It had English and Dutch owners until it moved to Barcelona in 1997 and adopted the name of *IWE – EPI*, even though it was run out of Holland. After many changes, in 2005 it became a fully Spanish

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[1] DICE is the acronym of Editorial Dissemination and Quality (*Difusión y Calidad Editorial*) of Spanish humanities, social sciences and legal journals, the database maintained by the Spanish National Research Council (CSIC) which contains all the communication journals regardless of their activity and quality.

[2] IN-RECS is the database run by the EC3 group at the University of Granada which organises communication journals according to their number of citations. IN-RECS assigns the *journal-source* category to a publication not only because it receives a high number of national and international citations, also because it has high marks on an evaluation of the editorial process as well as a qualitative evaluation by researchers.

publication headquartered in Barcelona, although it was printed in Granada. Finally, everything moved to Barcelona, and this came with a surge in its international projection, which is reflected in its addition to the ISI and Scopus databases in 2006.

- *Revista Latina de Comunicacion Social.* This is an annual electronic journal founded in 1998 and issued by the Faculty of Information Sciences at the University of La Laguna. It is one of the longest-standing journals published on the Internet and has gone through three phases of growth and internationalisation, which has allowed it to be added to Scopus while also gaining outstanding marks in Spanish quality classifications.

- *Zer. Revista de Estudios de Comunicación* is the journal issued twice yearly by the Department of Communication and Social Sciences at the University of the Basque Country since 1996. It earns high marks in the Spanish classifications but is not present in international databases like ISI or Scopus.

- *Anàlisi* is a trimestral publication issued by the Autonomous University of Barcelona and the Open University of Catalonia that publishes scholarly papers in the field of the Communication Sciences. It got its start in 1980, and although it is one of the publications with the highest marks in Spain, it is not present in international databases.

After choosing the journals, the next step was to determine which papers to include in the study. Of the total sample, we eliminated those papers which did not fit the pattern of scholarly study. Specifically, this included book reviews, personal reflections and papers expressly excluded by their own publications, which were not considered in this study. Thus, the corpus of this study was 1,182 papers.

Each paper was individually studied by describing its author(s) in terms of geographic origin and institutional affiliation with the goal of precisely outlining the productivity and work alliances. The tallying process was supported by statistical analysis carried out with the help of the Microsoft© statistical package and the UCINET6 programme, complemented by the text by Bogartti, Everett and Freeman (2002).

3. Analysis

### 3.1. Total productivity

3.1.1. Catalonia

The results of the analysis of the data on total productivity show how the output is distributed in the different universities. Figure 1 shows how the three most productive Catalan universities are the UAB,3 the UPF and the UAB, which appear in a total of 150 of the 176 papers which were signed exclusively in Catalonia during the period 2007-2011. The remaining 26 papers had authors

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[3] Table of acronyms of the universities included in this study which are not explicitly specified in this text.

either exclusively from the URL, the UVIC, the URV, the UOC or the UIC, or were co-authored by professors within the same university or from these universities. Thirty-one more papers were authored by Catalans with alliances outside the Catalonia cluster, making a total of 207 papers in which at least one author is from Catalonia.

Figure 1. Productivity of the Catalonia cluster
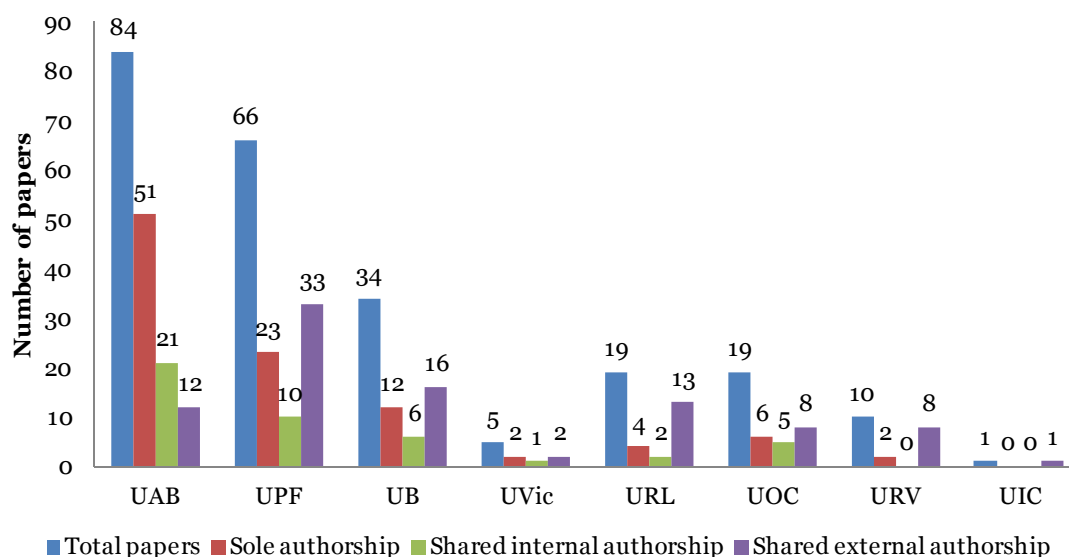
This analysis enables us to sketch the working patterns which reveal the desire to seek openness, regardless of productivity. Even though its productivity is not very high, the URL does show a high output of papers signed jointly with other universities. All told there are 13 papers signed in this way, while 6 are signed either individually or with other authors from the URL. These 13 papers are distributed unevenly. Six are the outcome of joint efforts with the UPF, 2 with the URV and 5 comes from sole partnerships with the UIC, the UB, the UNAV, the UNEX (University of Extremadura) and the UOC. This interpretation could also extend to the UOC, although in a less obvious way, since it has a total of 8 papers with other universities compared to 11 authored within the UOC itself.

The analysis of universities with the highest volume of output shows how the UPF, the second-ranked Catalan university in terms of the number of papers published, has 33 papers co-authored with other universities, compared to 23 signed individually and only 10 with internal co-authors. Regarding the UB, it has numbers that concur with the hypothesis that the Catalonia cluster focuses on studies open to other universities compared to internal studies; however, the UAB's results do not seem to match this trend and show a total predominance of individual output compared to papers with external partners.

3.1.2. C. Madrid

The Community of Madrid cluster shows a similar structure to the Catalonia cluster in terms of productivity, as practically all its output comes from three universities, the UCM, the URJC and the UC3. In overall terms, the Madrid core

signed a total of 189 papers, and 8 of them come from studies performed by the UDM, UEM and UPOLM, either individually or with co-authors from the same university. We should note that we found no joint publications among the three least productive universities in this cluster. The overall interpretation of the Community of Madrid cluster yields a total of 239 papers in which at least one author is affiliated with a university in the Autonomous Community of Madrid.

Figure 2. Productivity of the Community of Madrid cluster
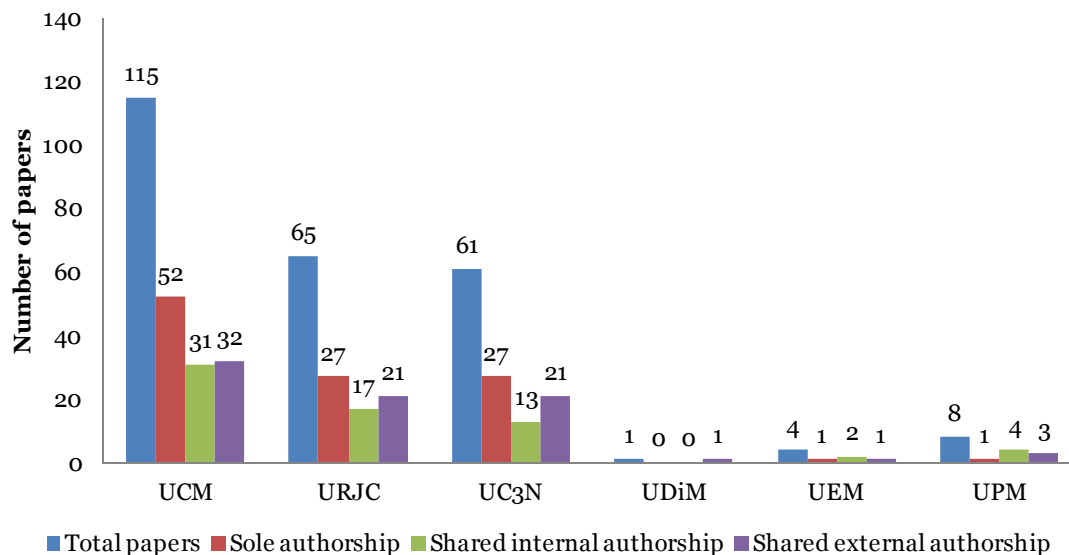
According to Figure 2, individual and internal work within the university is more common than openness to partnerships with other universities. In none of the universities, regardless of their overall productivity level, do external co-authorships exceed internal output. One noteworthy feature is that in the three leading universities, individual papers come first, following by external partnerships and finally internally co-authored papers.

3.2. Relative productivity

In order to complete the study on institutional productivity, we analysed the number of papers written at a given university – in sole authorship or shared internal or external authorship – in relation to the number of research staff members with permanent ties to the university.[4] This ratio (number of papers/number of tenured researchers) has the highest value at the UPF, at 1.74, followed by the UB at 1.48. It is interesting to note that the universities with the largest faculties (UAB and UCM) showed values of 1.01 and .097, respectively, that is, one paper per professor.

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[4] To tally this, we considered the categories of career civil servant, tenured PhD professor and assistant professor, which is equivalent to a tenured PhD professor in Catalonia and the Basque country.

3.3. Regions associations within the clusters

3.3.1. Catalonia

Figure 3 allows us to analyse all the collaborative interactions which have taken place during the period of the study within the Catalonia cluster. The activity represented provides a very clear picture of the policy of exchanges among universities. With the exception of the UIC, which has no papers co-authored within the cluster, as its only case of co-authorship is with Switzerland – the remaining universities clearly interact with each other. In this sense, the UPF has issued publications in conjunction with 6 other Catalan universities, followed by the URL with 5 other universities. The UAB has poorer results with the two kinds of partnerships. This corroborates the results of the volumes of productivity in co-authorship abroad.

Figure 3. Description of institutional affinities within the Catalonia cluster
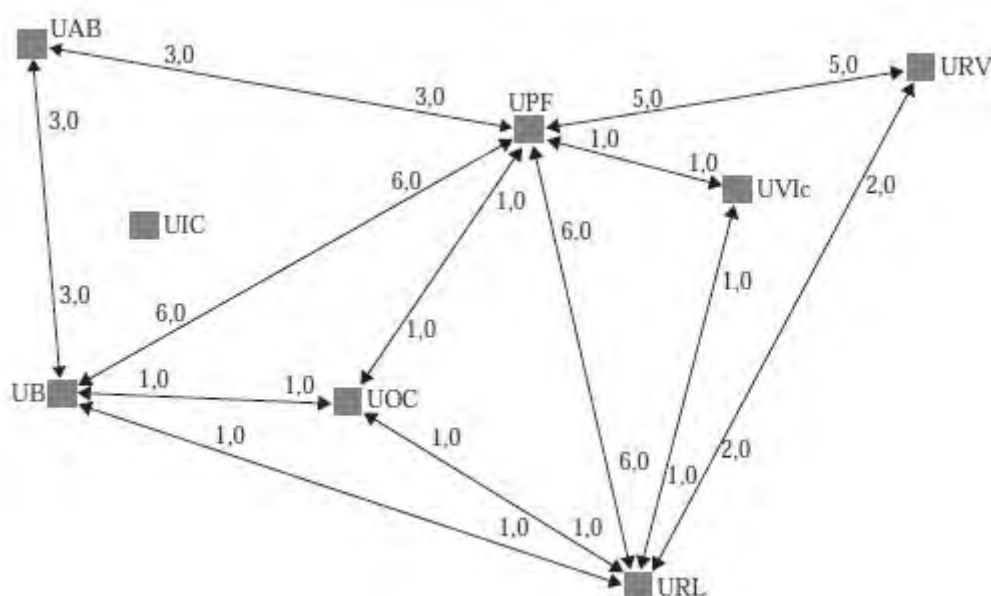
3.3.2. C. Madrid

Figure 4 shows the nodal distribution of all the partnerships among the universities in the Community of Madrid cluster during the period 2007-2011. The diagram shows that the number of partnerships was never higher than 3, while it also shows that the UCM served as a core, particularly fed by partnerships with the UC 3 and the URJC, which, in turn, only cooperated on one occasion. Regarding the UPOLM, none of its co-authored papers were signed in partnership with researchers from the same autonomous community.

Figure 4. Nodal description of institutional affinities within the Community of Madrid cluster
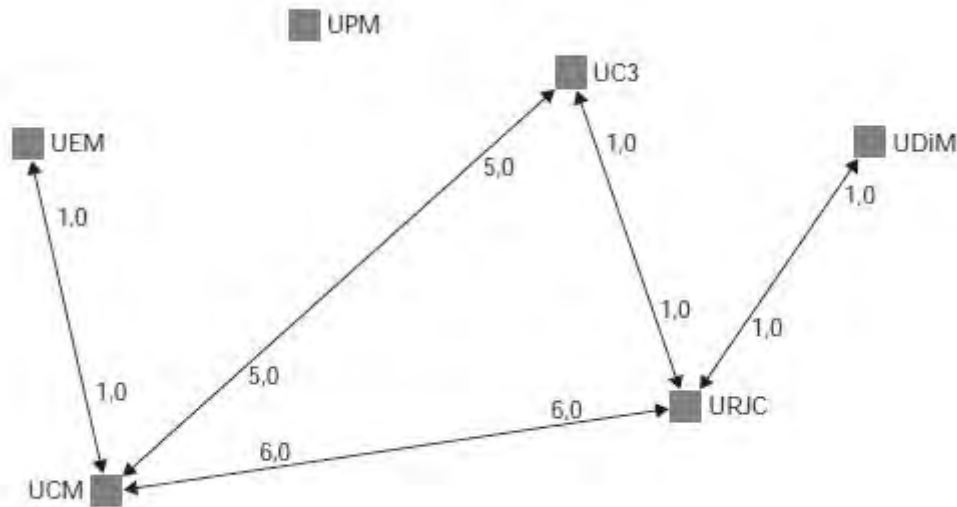
3.4. Regions associations external to the clusters

The information collected shows the collaborative dynamics of the universities in both clusters in terms of their affinities beyond their corresponding autonomous communities.

3.4.1. Catalonia

Catalan universities yielded the results shown in Figure 5. The figures reveal first a very low presence of papers coming from alliances between the Catalonia and Madrid clusters, and secondly the fact that in the universities with lower levels of co-authored scholarly output this output is not exclusively with other universities in Catalonia and instead there is a significant percentage that extends beyond the geographic boundaries of the Catalan cluster. In this sphere of analysis, the institutional dispersion factor is important when establishing alliances, that is, the number of different universities with which research projects have been signed. In this tally, the UPF is the institution that has co-authored papers with the highest number of different universities outside of Catalonia (10), followed by the UAB, the UB and the UOC, with 5 each.