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Inter-municipal cooperation as a solution for public services delivery?  
The case of Unioni di Comuni in Emilia-Romagna Region.

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**Inter-municipal cooperation as a solution for public services delivery?  
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## Abstract:

*Inter municipal cooperation (IMC) represents a solution adopted all around the world in order to jointly provide services considering the complexity of contemporary socio-economic contexts. However, empirical evidence on IMC solutions is still weak. The purpose of this paper is to analyse associations of municipalities (Unioni di Comuni, UC), the prevalent kind of IMC established in Italy, as a possible solution for sustainable public services delivery. Our research questions refer to the main features of Unioni di Comuni as an IMC for public services delivery in Emilia-Romagna Region (Italy), to the explanation of those characteristics, and to the evaluation of UCs and their features in terms of autonomy, resilience and sustainability. In order to meet our objectives, we accomplished a cluster analysis, considering administrative and socio-economic data; in addition, we examined specific characteristics within each cluster to proceed with a comparison between clusters in terms of revenues from transfers from other governments layers, own revenues, current expenses and financial autonomy index in the last years. Our results suggest a general tendency: to provide services through UC in E-R; and to enhance their development in terms of public service specialization. But at the same time, UCs generally decreased their own financial autonomy, relying on transfers from other public institutions. In line with Resource-Dependence Theory (RDT), our empirical analysis finds different clusters of UCs which act as new centres for public service delivery in Emilia-Romagna Region in order to reduce uncertainty over resources through the creation of new inter-institutional balances. However, the statement that strong UCs compensate weak starting territorial features of municipalities is not self-evident.*

## JEL Classification:

C38 Classification Methods. Cluster Analysis, Principal Components, Factor Models; H11 Structure, Scope, and Performance of Government; H77 Intergovernmental Relations; H83 Public Administration; M48 Government Policy and Regulation; R58 Regional Development Planning and Policy; Z18 Public Policy.

## Key words:

Inter-Municipal Cooperation (IMC); Unioni di Comuni; Public Services delivery, Autonomy, Sustainability, Inter-Institutional Relationships, Resource-Dependence Theory.

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# 1 Introduction

Recently, some changes occurred in the socio-economic environment all over the world – global financial crisis, the instability in the economic systems, in some cases some natural emergencies – which determined an increase of complexity for public sector action. Hence, sustainability and resilience, together with innovation, became key words and *leitmotif* in public sector literature and for public managers and policy-makers.

All the above-mentioned factors contributed to a progressive reduction of the available resources, especially at local level. At the same time, they contributed to an increasing request of a higher level of intervention and adaptation of the contents of public services to the new requirements and needs of citizens and socio-economic stakeholders, also in terms of transparency and accountability of results (e.g. Andrews and Van de Walle 2013). Currently, those phenomena influence effective dynamics of public sector governance and management, considering also the reciprocal influence between them. Therefore, a context of great complexity affects public governance and management, and this is particularly evident when focusing on public services design, organization, provision and delivery, especially at sub-national level. In fact, at local level the relationships between public entities, the citizens and other stakeholders are close and immediate, while resources and scale of action might not be adequate. So, service organization and provision might be particularly crucial.

Among different resolutions adopted at sub-national level to provide local public services, Inter-Municipal Cooperation (henceforth also IMC) is a consolidated and relevant settlement that is quite diffused both in Europe and North America. Literature, among other issues, is still evaluating and trying to measure efficiency, effectiveness and sustainability of those initiatives (e.g. Allers and de Greef 2018; Blaeschke and Haug 2018) and the factors influencing their adoption and performance (e.g. Turrini *et al.* 2010; Voets *at al.* 2008). So, considering the complexity of the needs after crises and cutbacks policies, IMC represents a solution adopted to be resilient and to jointly provide services in socio-economic contexts.

This contribution refers the preliminary results of a research on IMC for public service delivery. In particular, we focus our attention on a specific kind of IMC that has been adopted in Italy, the *Unioni di Comuni* (associations of municipalities, henceforth also UCs). They have been first introduced in 1990, and currently represent the main instrument of IMC in Italy, though their diffusion is not uniform around the country. In effect, we concentrate our interest on a specific region,

Emilia-Romagna (henceforth also E-R), where those institutions are very diffused – actually 82.3 % municipalities belong to a UC, while in Italy (only) 39.1% of them belong to a UC – and particularly supported by the regional governments.

Thus, our purpose is to analyse this instrument as a possible resilient solution for autonomous, sustainable public services delivery, concentrating on the Italian region where they are more common in order to have a good sample of this phenomenon. In effect, UCs could be considered as an answer to: the progressive reduction of transfers from the national to local governments of the last decades, to different cutbacks initiatives applied after recent crises, but also to recover after some natural emergencies.<sup>5</sup> In addition, to jointly exercise some public functions and deliver services, municipalities need to implement changes and innovations – institutional, organizational, but also procedural. Some exploratory studies started to evaluate the effects of mandatory IMC in small Italian municipalities (e.g. Giacomini *et al.* 2018), nevertheless more and deeper research is necessary. So, our research questions refer to the main features of *Unioni di Comuni* as an Inter Municipal Cooperation for public services delivery in Emilia-Romagna Region, to the explanation of those characteristics, and to the evaluation of UCs and their features in terms of autonomy, sustainability and resilience. More specifically, with the aim of answering to the last question, we decided to consider a Resource-Dependence Theory approach (RDT) (see Malatesta and Smith 2014; Davis and Cobb 2010; Hillman *et al.* 2009; Pfeffer and Salancik 2003). This theory can be useful to better understand not only the intergovernmental relations between UCs, the municipalities which decided to create them and the regional (and national) governments; but also, and to partly explain the results of our empirical research on UCs in Emilia-Romagna Region.

In order to meet our purposes, we realized a cluster analysis of the *Unioni di Comuni* in Emilia-Romagna Region considering different demographic, socio-economic and administrative characteristics. In this sense, cluster analysis allows us to identify typical features of IMCs all around the region. Moreover, we examined specific characteristics within each cluster to proceed with a comparison between clusters in terms of revenues from transfers, own revenues, current expenses and financial autonomy index in the last years. From the methodological point of view, the paper is based on both a qualitative and quantitative methodology. The instruments of research are: a literature review, a documental analysis (national and regional legislation, institutional reports from

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<sup>5</sup> Like the earthquake in 2012 or the floods in 2014 and in 2017 that affected this region.

the municipalities and IMC). In addition, as above mentioned, a cluster analysis has been realized using data from official databases and open data from national government, Emilia-Romagna Region and other public institutions.

The rest of the paper is organized as follows: Section 2 gives some remarks on the literature on Inter-Municipal Cooperation, whereas Section 3 contains our conceptual framework. In Section 4 we will recall the Italian law regarding IMC, while Section 5 introduces the empirical methods used in the following section, which contains our cluster results. Section 7 provides insights into some financial indicators of Emilia-Romagna Region UCs, and Section 8 concludes.

## **2 Public services revisited and the Inter-Municipal Cooperation**

Recently, the conception, creation and delivery of public services have become particularly critical in public sector governance and management. Thus, co-creation, co-production, collaborations and partnerships with citizens, public and private (both for profit and non-profit) actors, together with contracting-out and privatization concerning public services have become notable issues and very inspiring topics for both theory (e.g. Osborne 2018; Nabatchi *et al.* 2017; Osborne *et al.* 2016; Brandsen and Honingh 2016; Voorberg *et al.* 2015) and practice (e.g. Bason 2017; Durose and Richardson 2016). In addition, innovation seems essential to understand and analyse the dynamics of public sector management and governance, in particular when considering public services delivery and the relationships with citizens and stakeholders (e.g. De Vries *et al.* 2016; Osborne and Brown 2013; Bason 2010; Hartley 2005). At the same time, it is important to point out the increasing diffusion and relevance of network solutions in policy-making, governance and in general in management issues (Kickert *et al.* 1997). Thus, the present conception of public service creation and delivery is based on networked-based relationships and instruments (e.g. Turrini *et al.* 2010). Networks solutions are particularly useful to achieve economies of scale and to reduce negative externalities. This is true considering sub-national governments, where the relationships between public entities, the citizens and other stakeholders are closer and immediate, while financial and material scale of action might be not optimal (McGuire and Agranoff 2011).

In the last decades, and in particular after the crises, different academics and practitioners have tried to consider the main issues and success/defeat factors of reforms. Innovations and initiatives are necessary to put local governments in the conditions of better answering to local necessities:

among others, we can cite privatisations and reversal privatisations, dynamic markets management, different forms of contracting, amalgamation, mixed public/private service delivery agreements, and inter-municipal cooperation (e.g. Aldag and Warner 2018; Bel and Gradus 2018; Bel *et al.* 2018; Kim 2018; Swianiewicz 2018).

Among different resolutions adopted at sub-national level to provide local public services, inter-municipal cooperation (IMC) for public service provision is a consolidated and relevant settlement that is quite diffused both in Europe and North America. Considering the complexity of socio-economic contexts and cutbacks policies, IMC is a possible solution adopted to be resilient and to jointly provide sustainable and effective public services. Thus, IMC is also considered an answer to the limited and sub-optimal dimension of the administrative area in charge of municipalities. In addition, in countries with fragmented decentralized governments – like Italy – IMC could represent a response to “the challenge of regional coordination to address spill-overs and externalities of service delivery” (Bel *et al.* 2018: 175). Literature presents different notions (e.g. Hulst *et al.* 2009), forms and classification of IMC (e.g. Feiock and Scholz 2010). In this contribution, following Steiner (2003) and Arn and Friederich (1994) we consider IMC as “the fulfilment of a public municipal task by two or more municipalities jointly or by third legal entity, whereby the task fulfilment simultaneously serves at least two municipalities and the participating municipalities participate directly (‘performing’) or indirectly (‘organizing’).” (Steiner 2003: 553).

The interest on IMC in the academy increased especially in the last ten years, after the economic and financial crises. IMC has been considered in literatures on public administration, public management and public governance, respectively focusing on different issues. For instance, many contributions offer different classifications of IMC: in terms of factors explaining their adoption (e.g. Kim 2018; Soukopová and Vaceková 2018) and their economic effects (e.g. Kim and Warner 2016); in terms of the study of IMC through a policy-making perspective (e.g. Bel *et al.* 2018); or in terms of governance (e.g. Hulst *et al.* 2009; Sørensen 2007). Since several years, literature on IMC focused its interest on performance and on the conditions/dimensions for successful IMC (e.g. Turrini *et al.* 2010; Voets *at al.* 2008). For instance, Giacomini *et al.* (2018) summarized the conditions under which IMC work well and can obtain good performance – higher efficiency and effectiveness in service delivery and higher legitimacy in negotiating and engaging with other governmental entities – and used them to interpret the results of their research focused on an Italian case too.

Literature is still evaluating and trying to measure efficiency, effectiveness and sustainability of IMC initiatives (e.g. Allers and de Greef 2018; Blaeschke and Haug 2018; Giacomini *et al.* 2018), nevertheless the results are not decisive. In effect, empirical researches (conducted through different methodological instruments and approaches) usually suggest the possibility that IMC determines savings, better use of resources, improvements from economies of scale and the internalization of some transaction costs. It seems to be able to also guarantee a better coordination of services provision and organization in a wider area, improvements in quality, effectiveness (wider office hours, standardisation of services). Nevertheless, according to some contributors, in some cases IMC can determine inefficiencies and a decrease of performance (see Feiock and Scholz 2010 and the “institutional collective actions dilemmas”). Finally, some critical issues in IMC could also concern transparency, accountability and institutional legitimacy, since those collaborations often give birth to second level institutions/initiatives which are not directly controlled by citizens and stakeholders.

### **3 The conceptual framework**

The purpose of this contribution is to analyse a particular instrument of IMC adopted in Italy, i.e. *Unioni di Comuni*, as a possible resilient solution for autonomous, sustainable public services provision. Thus, we decided to start our analysis concentrating first on the Italian region (Emilia-Romagna) where they are more common to have a better sample of this phenomenon. Our goal is to understand its use, and to start evaluating its activity in terms of autonomy and sustainability.

Some exploratory studies started to evaluate the effects of mandatory IMC in small Italian municipalities (Giacomini *et al.* 2018), nevertheless more and deeper research is necessary.

Therefore, our research questions are the following: (i) what are the main features of *Unioni di Comuni*, as an IMC for public services delivery in Emilia-Romagna Region? (ii) how to evaluate UCs and their features in terms of autonomy, resilience and sustainability?

In order to answer especially to the last question, we decided to consider a Resource-Dependence Theory approach (RDT) (see Malatesta and Smith 2014; Davis and Cobb 2010; Hillman *et al.* 2009; Pfeffer and Salancik 2003). RDT originated in the 1970s and concerns how an organisation’s behaviour is affected by dependence on the external resources which the organisation refers to.



RDT suggests that resource scarcity, not necessarily efficiency, motivates organisational action (Pfeffer and Salancik 2003; Leblebici *et al.* 1991).

RDT is based on the following propositions: (i) organisations are constrained by a network of interdependencies with other organisations. (ii) organisations adopt strategies to reduce their dependency on other organisations' resources in their environment. (iii) these dependencies produce inter-organisational and intra-organisational power relations (Pfeffer 1987; Ulrich and Barney 1984). Power is the inverse of dependence, which means that the balance of power favours the organisation that has influence over resources needed by other organisations. This is fitting with the situation of the UCs in Italy which seem to be financially dependent on transfers from the municipalities, the regional government and sometimes also from the national government. In this research, after the creation of a taxonomy of UCs, we will verify their level of dependence from other governments through an analysis of own revenues, of the financial autonomy index, and of current expenditures. RDT also affirms that another possible strategy to reduce the uncertainty and the interdependence from other entities is to form an inter-organisational alliance with the source of constraint. This is what happens between UCs and municipalities, and also between UCs and the regional governments, creating public interest networks for public services provision. However, according to Malatesta and Smith (2014: 19), alliances and agreements only provide partial absorption of interdependencies, thus allowing affiliated organisations to maintain greater organisational autonomy. Finally, through the exercise of political power, organisations actively attempt to influence the conditions (e.g. legislation) of the external institutional environment. Hence, this theory can be useful to better understand not only the intergovernmental relations between *Unioni di Comuni*, the municipalities which decided to create them, and the regional (and national) governments; but also, it can help to partly explain the results of our empirical research on UCs in Emilia-Romagna Region in terms of autonomy, resilience and sustainability.

#### 4 The setting. Inter-Municipal Cooperation for public services delivery in Italy

In Italy, the discussion between policy-makers about IMC started about 30 years ago. Afterwards, it received more or less attention, but it became particularly relevant in political discourse again recently, especially after some initiatives of the national government aiming to improve efficiency and austerity of public sector entities, through for instance Spending Review-inspired initiatives. Currently, in Italy there are 7,915 municipalities,<sup>6</sup> about 70 percent of them (69.5%) are “small municipalities” with less than 5,000 inhabitants, where around 16.3% (about 10 million) of the Italian population (60.5 million) live. Italian municipalities are particularly important for the local socio-economic context since they are the main providers of public services to citizens and local enterprises. In addition, they are the main funders for the creation of infrastructures for service provision and for supporting local economic systems. Usually, in this country, municipalities are in charge of offering several services through different kind of agencies and/or instruments. These are: social services (in partnership and complementarily with the health services provided by local health agencies), education (e.g. nurseries, kindergartens but also music conservatories), services supporting education and schools (e.g. transport, canteens), urban planning and regeneration, waste collection and disposal, water, gas and electricity supply, local transportation, local police, services to firms, and leisure services (e.g. theatres, cinemas, museums, swimming pools, gyms). So, local authorities of limited dimension can struggle serious problems in terms of both effectiveness and efficiency of public services provision within their administrative area of competence, especially after the recent crises and the cutbacks initiatives at national level. Thus, IMC can represent a good solution in order to provide enhanced services and to better use their resources.

Among different kind of IMC for public services delivery based on the creation of public networks, the more common in Italy are: *Unioni di Comuni* (Associations of municipalities), and *Convenzioni* (Agreements). *Convenzioni* are simply some contractual agreements involving two or more local authorities and aiming to regulate the cooperation for the delivery of public services. Therefore, they are quite flexible and not particularly difficult to establish. On the other hand, UCs are much more demanding: they consist in the creation of a new local authority, endowed with legal and

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<sup>6</sup> Source: Comuniverso-Ancitel from ISTAT 01/01/2019 (consulted on 27/03/2019): [http://www.comuniverso.it/index.cfm?Piccoli\\_Comuni\\_sotto5000\\_ab&menu=590](http://www.comuniverso.it/index.cfm?Piccoli_Comuni_sotto5000_ab&menu=590).

political powers similar to a municipality. Thus, they are much more binding also from a political point of view.

*Unioni di Comuni* have been first introduced in 1990, through the Law n.142/1990 which proposed them as an instrument aiming to the final merger of municipalities. Consequently, for about ten years the UCs were not broadly adopted by municipalities. Afterwards, the legislator abandoned the reference to compulsory merger (Law 265/1999), and encouraged the adoption of IMC for service delivery as a solution to the small dimension of many Italian municipalities and to the fragmentation of local governments system, also offering financial incentives to their adoption (Legislative decree 267/2000 and some directives from Ministries). Afterwards, since 2010, several legislative interventions<sup>7</sup> started forcing small municipalities, usually those with less than 5,000 inhabitants<sup>8</sup> to the joint provision of public services through IMC of some core tasks/areas of service called *funzioni* (functions or tasks).<sup>9</sup> <sup>10</sup>The law was accompanied by a schedule of the number of tasks/services to be jointly provided and the deadlines to be followed. Hence, the so-called Spending Review 2 Law imposed to small municipalities to provide through IMC a list of *funzioni*.<sup>11</sup> Lastly, the Law 56/2014 tried to go ahead with the redefinition of the framework of responsibilities and competencies between different governments and public sector institutions at sub-national level. Among other objectives,<sup>12</sup> this law gave great space to the *Unioni di Comuni* as an instrument of IMC able to guarantee efficiency and the rational dimension in the organization and delivery of public services, since it takes into account the local identity and social capital. Furthermore, according to this law, UCs are today the only instrument of IMC accepted for the provision of the core tasks/areas of service (*funzioni fondamentali*) apart from the last one (10).<sup>13</sup>

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<sup>7</sup> E.g. Law Decree 78/2010; Law 122/2010; Law 111/2011; Law 148/2011 and the Law 135/2012 also called Spending review 2.

<sup>8</sup> Or 3,000 inhabitants if the municipality belongs to a mountain area and to a consortium of mountain municipalities.

<sup>9</sup> According to the law from 6 to 10.

<sup>10</sup> Nevertheless, last January 2019 the Constitutional Court partly contested the among mentioned obligation and opened to some exceptions under specific circumstances.

<sup>11</sup> 1) organization of general administration, financial management, accounting and control; 2) organization of public services of general interest (e.g. welfare, transport, energy/water provision...); 3) land register management (apart from national responsibilities); 4) urban and housing planning also at supra-municipal level; 5) civil protection and coordination of recovery activities; 6) management of waste collection and disposal (and tax collection); 7) local social services (planning, management and delivery); 8) school buildings construction (local competences), schools services planning and management (transport, canteens); 9) municipal and local police; 10) registry services, electoral and statistics offices management (apart from national responsibilities).

<sup>12</sup> For instance, the role of metropolitan cities, the reduction of responsibilities and powers of provinces.

<sup>13</sup> Whose deadlines were postponed.

In addition, there have been many financial incentives in favour of UCs, both at national and regional level.<sup>14</sup> For instance, Emilia-Romagna Region plays an important role in the promotion of IMC and UCs (Regional Law 21/2012) and gave many incentives to UCs, mergers and definition of the optimal range of intervention for (joint) public services delivery (e.g. Regional Law n.15/2016).

Currently, even though UCs represent the main instrument of IMC in Italy, their diffusion is not uniform around the country. Indeed, while in Italy (only) 39.1% of municipalities (3,094 out of 7,915) belong to an *Unione di Comuni*, in Emilia-Romagna Region the percentage is 82.3 (270 municipalities out of 328). In this Region, UCs are more common than in the rest of Italy, apart from Valle d'Aosta, a region with special status, where 73 of the 74 municipalities belong to an UC.<sup>15</sup>

#### **4.1 A focus on *Unioni di Comuni* in Emilia-Romagna Region**

In order to better analyse *Unioni di Comuni* as an IMC instrument for public service organization and delivery, we decided to concentrate our analysis on the region where UCs are largely diffused and particularly supported by the regional government.

As stated above, in Emilia-Romagna Region UCs are very common and have quite a long history, but they are rather heterogeneous in their features. Currently, there are 42 UCs in E-R.<sup>16</sup> These are quite homogeneously distributed (apart from some parts of the Parma province) both in the flat and in the mountain areas, and usually the main towns are excluded from them.<sup>17</sup> Generally, the UCs situated in the mountain areas have been established later than those in the flat area, due to the compliance to the Law (2013) requiring to transform the consortia of mountain municipalities (*Comunità Montane*) into UCs. Nevertheless, in general IMCs for services delivery have quite a long tradition in E-R, due to the existence of cooperation between municipalities far before the creation of UCs as formal institutions. In effect, the average age of the UCs is more than 8 years and many municipalities started their IMC through agreements back in the 1990s.

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<sup>14</sup> For instance, the possibility to overcome the temporary block of turn-over of civil servants.

<sup>15</sup> Data refer to 01/01/2019.

<sup>16</sup> Nevertheless, in our analysis we decided to consider 44 UCs since our data are collected until 31/12/2017.

<sup>17</sup> *Capoluoghi di provincia* (provincial capitals) are the main towns with administrative responsibilities over an administrative area called *Provincia*. The re-organization of sub-national governments and responsibilities aim at reducing as much as possible their powers.

The number of public services jointly provided through this IMC instrument is in general high: in some cases, it is more than 10, but it depends from case to case. The relevant number of services provided jointly through the IMC can have a significant impact on the budget (or financial reports) of a UC. Piazza (2017), for instance, compares the amount of current expenses among UCs and the municipalities which belong to them, and shows that in general a great number of *funzioni* offered through the UC drives to a huge weight on the UC current expenses, especially among the UCs with longer history, playing as governance broker of services delivery among municipalities. Nevertheless, this tendency is not always demonstrated. In effect, it depends also on some features of the socio-economical background, and on the history of the IMC itself.

Finally, it is relevant to highlight that UCs are a second level public institutions, since their representatives are not directly elected by the population but chosen from the municipalities' ones according to the national/regional law and the statute of each UC. Thus, some criticalities in accountability and governance of inter-municipal relationships and in public services organization and delivery are possible. Hence, the attitude and the historical tendency to networked governance through IMC is for instance relevant. In those cases, citizens seem not to care much about whom is effectively providing a service, but on the quality and effectiveness of it<sup>18</sup>.

## 5 Methodology and data collection

In this study, cluster analysis is adopted for its partitioning ability, in order to obtain an exploratory classification of the association of municipalities in Emilia-Romagna Region. Since we did not start with theoretical assumptions regarding the number of clusters we aimed to obtain, we firstly adopted a hierarchical approach which enables to choose the correct number of clusters in our analysis. Next, we proceeded with a non-hierarchical analysis to refine our results by allowing the switching of cluster membership.<sup>19</sup> Our population of interest is composed by all the existing

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<sup>18</sup> See for instance Pattaro and Ranuzzini analysis (2017) on the role of UC in the recovery from the earthquake of 2012 in Emilia-Romagna region.

<sup>19</sup> According to Hair *et al.* (2014), the “advantages of one approach can compensate for the weaknesses or the other” (p. 446). Indeed, following the authors, this hierarchical and non-hierarchical mix of approaches is considered the most complete way to proceed in a cluster analysis.

*Unioni di Comuni*, in Emilia-Romagna Region at the end of 2017. The dataset consists of 44 observations. Since our purpose is to consider different characteristics of the area of interest, we selected a set of starting socio-economic and administrative variables. The complete list of initial variables at association of municipalities level is presented on Table 1, while on Table 2, we show descriptive statistics for each variable employed in the analysis. Variables have been collected from different sources and refer to years 2015-2018.<sup>20</sup>

**Table 1 – Initial variables at UCs level, by year of reference and source**

<b>Variables</b>	<b>Description</b>	<b>Year</b>	<b>Source</b>
Total population	Resident population	2017	Emilia Romagna Statistics
Area	Land area (in square kilometers)	2017	
Density	Total population divided by land area	2017	
Functions attributed to UC	Number of functions attributed by municipalities to each association	2017	
Employees	Number of employees in manufacturing and services	2015	
% Foreigners	Ratio of foreigners to total population	2017	Anci*
Number of municipalities	Number of municipalities which are part of each UC	2017	
Total income	Sum of total gross income of the population	2018	Mef**
% Population over 65	Ratio of the over 65 years old to the total population	2017	Istat***

\* National Association of Italian Municipalities, via Comuniverso website

\*\* Ministry of Economy and Finance, via Mef website

\*\*\* Italian National Institute of Statistics, via I.Stat website

*Source: Authors' elaboration*

**Table 2 – Descriptive statistics: PCA initial variables, mean values**

<b>Variables</b>	<b>Mean</b>	<b>Std. Dev.</b>
Total population	59,303	38,765.8
Area	398.2	234.8
Density	170.4	95.0
Functions attributed to UC	6.9	2.8
Employees	18,930	14,650.2
Foreigners*	10.4	2.6
Number of municipalities	6.6	2.5
Total income (thousands)	911,460	92,359.6
Population over 65*	24.2	3.9

\* Percentages

*Source: Authors' elaboration*

<sup>20</sup> Links to the websites we used to gather the data can be found in Section 10 at the end of the article.

Data from Table 2 suggest that, in E-R, on average, the associations of municipalities have a mean population of 59,300 inhabitants, the percentage of population over 65 years old is 24%, UCs have an average extension of 398 square kilometres, with a density of 170 inhabitants per square kilometre. If we consider administrative characteristics, the UCs of Emilia-Romagna are composed by more than 6 municipalities on average, and each municipality decided to jointly provide almost 7 services/functions through the UC. In this assessment we considered only the core tasks/areas of services (see previous paragraph) provided by all the municipalities belonging to the UC. In addition, total income in each UC is 911 million euros on average, 10% of the inhabitants were foreigners in 2017, and the average number of companies' employees per UC was 19,000 in 2015. Due to different scale and magnitude of the input values, we decided to standardize each variable. Moreover, as shown on Table A1 in the Appendix, in many cases there is a strong correlation between variables; this is a problem in key driver analysis because when two independent variables are highly correlated, it becomes difficult to accurately partial out their individual impact on the dependent variable (Sambandam 2003). Hence, in a cluster analysis perspective, we had to include only cluster variables that are not highly correlated. In our study, this means that multicollinearity does not allow to cluster directly input variables. Therefore, to solve this problem, we chose to proceed with an *ex-ante* Principal Component Analysis (PCA) in order to summarize our data into distinctive factors. Through PCA method, we extracted the important information from the table in order to represent it as a set of new orthogonal variables called principal components, and this procedure enables to display the pattern of similarity of the observations and of the variables (Abdi and Williams 2010). Considering our initial variables, practical reasons dictate that 3 or 4 components would be the best. The idea to retain factors with eigenvalues greater than 1, combined with the scree-test, indicates that 3 components are appropriate (Table A2 and Figure A1 in the Appendix).<sup>21</sup> Hence, in conclusion, we obtained three different components related to different features of our data (the correlation of each initial variable with the components can be found in Table A3 in the Appendix). The 3 factors represent the 80% of the total variance and they are:

1. *Economic and administrative dynamism;*
2. *Territorial Weakness and Extension;*
3. *Administrative Complexity.*

After the Principal Component Analysis, we used the hierarchical clustering procedures to examine a complete range of cluster solutions, aiming to obtain a preliminary set of clusters and checking the presence of outliers in the population. Firstly, we used Euclidean distance as a measure of similarity between observations. Euclidean distance is the most commonly recognized measure of distance, many times referred to as straight-line distance. After this estimation, in order to determine the similarity between subsequent cluster options, Ward's clustering algorithm was used, merging the pair of clusters at each step of the hierarchical procedure which minimizes the within-cluster variance, while maximising the between-cluster one (Hair *et al.* 2014). We then analysed the range of solutions through non-hierarchical cluster analysis to define the final cluster option. In this phase, defining in advance the final number of clusters, we used K-means as clustering algorithm which works through an optimizing procedure allowing for reassignment of observations till the most distinct clusters are obtained.

Since our research had mainly an exploratory goal, we did not know the number of clusters we needed to obtain in advance, and the hierarchical approach does not need to specify it previously. On the other hand, the second step (non-hierarchical cluster analysis) allows to find the optimal solution and is less susceptible to outliers in the data. So, in the second step, after an initial set of "seeds" predetermined by the researcher (one for each cluster), all individual observations (UCs) were assigned to the nearest cluster seed (Mazzocchi 2008). We used the clusters' means from the hierarchical procedure as the starting group centres (the "seeds") in the non-hierarchical determination of cluster. In this way, we obtained our final cluster solution.

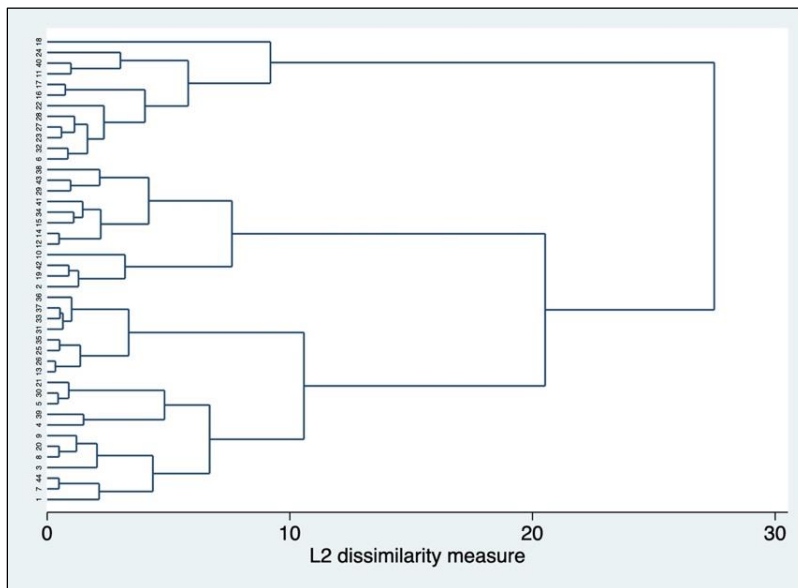
## **6 Cluster analysis results and comments**

Figure 1 shows the hierarchical cluster output plotted in a dendrogram. It is a tree graph in which each observation (each *Unione di Comuni*) starts on the left as a separate cluster. It graphically shows how the clusters are grouped at each step until they are all merged in a single cluster in the right-hand side of the graph (Hair *et al.* 2014). The choice of the final number of clusters depended on empirical investigation and researchers' conceptual considerations. The aim was to combine observations by introducing only small amount of heterogeneity within cluster at each step but maximizing the difference between clusters.



We used Duda-Hart index as a stopping rule (Duda et al. 2012), one of the most common indices used to determine the optimum number of clusters (Halpin 2016). In Duda-Hart index, an index value is computed for each cluster solution and larger values indicate more distinct clustering solution (see Table A4 in the Appendix for the complete list of values of the Duda-Hart index). The conventional rule is to find the largest value of the  $Je(2)/Je(1)$  which corresponds to low value of the pseudo T-squared (with higher value above and below it).

**Figure 1 – Dendrogram**

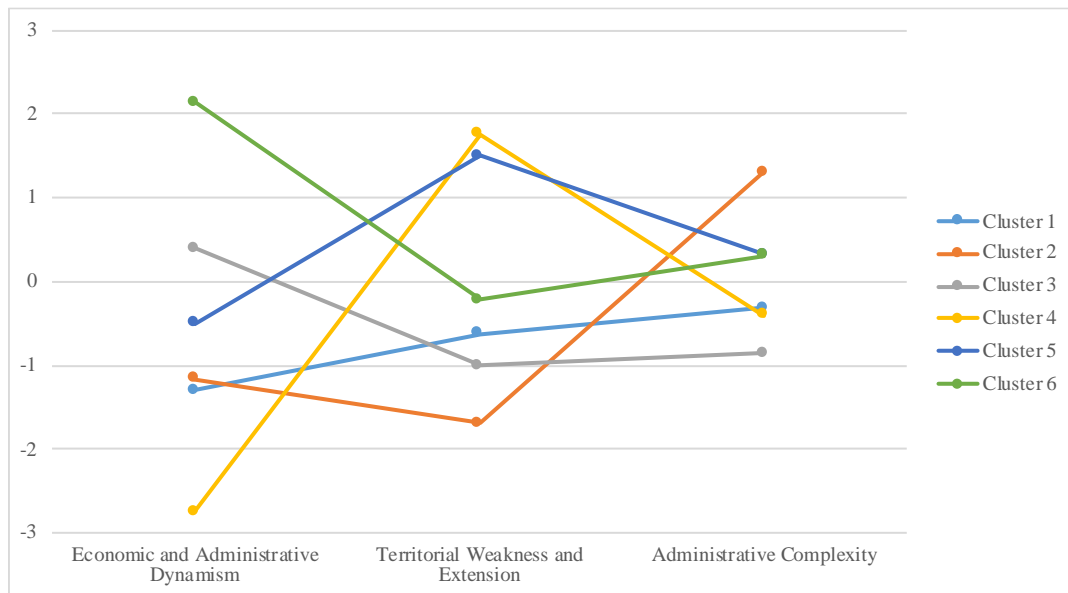


Source: Authors' elaboration

In our case, values suggested a good classification for a 7-clusters solution that is a good trade-off between homogeneity within clusters and an adequate differentiation among them. We found that one of our 7 clusters counts a single component (*Unione dei Comuni della Romagna Forlivese*). We know that hierarchical methods are very sensitive to the presence of outliers. We dropped out the outlier since it is not of interest to retain cluster with a single member, and 6 clusters remained. Through the non-hierarchical cluster analysis, we were able to display the list of different UCs classified by cluster (Table A5 in the Appendix), while Figure 2 compares the mean values of the three components used as clustering variables. As the figure shows, Cluster 5 and specially Cluster 4 report values below the mean of the first component, *Economic and administrative dynamism*, while they present the highest values for the *Territorial Weakness and Extension* component. In the third component, *Administrative Complexity*, Cluster 4 shows a negative value and Cluster 5 a

positive one. Cluster 1 and 2 maintain low values both on the first and on the second component. They are not similar compared to the third variable: Cluster 1 is below the mean, Cluster 2 reports the highest value among all clusters. Cluster 3 and 6 present the most negative point estimate in the second variable.

*Figure 2 –PCA components values, by cluster*



*Source: Authors' elaboration*

However, while Cluster 6 is characterized by positive values of both *Economic Background* and of *Administrative Complexity*, Cluster 3 presents a negative value for the *Administrative complexity* component only. Starting from these general insights, we conducted a first exploratory profiling of the 6 clusters:

- Cluster 1, *Unlucky pioneers*: we note that most of these UCs are among the first that experimented this form of Inter-Municipal Cooperation. Each statistic showed is below the regional average.
- Cluster 2, *Cozy suburbs*: this cluster is peripheral from an economic point of view with respect to the most dynamic clusters (3 and 6). On average, the municipalities of this cluster attributed more functions to the UCs than the regional level, and they show the lowest values of *Territorial weakness and extension* components.
- Cluster 3, *Small good performers*: this cluster is characterized by very low values of *Administrative Complexity* and *Territorial Weakness and Extension* components. These UCs

present a high number of employees and the density is the highest in the region. Considering average income, this cluster is richer than Cluster 6, but the total income is lower.

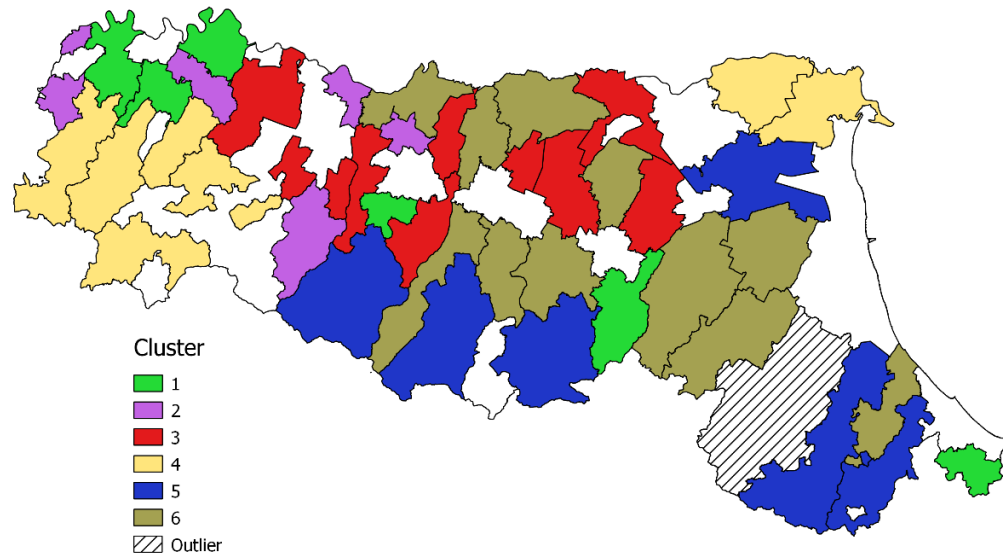
- Cluster 4, *Sleeping beauties*: This cluster presents young UCs with few municipalities, with a low population density, and with the lowest number of functions. Other traits of these UCs do not emerge, so, we choose to call this cluster as the protagonist of the famous fairy tale.
- Cluster 5, *Hardship on the mountains*: associations in this cluster are mainly situated in the mountain areas of the region, including small towns with a specific administrative history of inter-municipality far before the constitution of the UCs (e.g. already existing consortia of mountain municipalities). These territories present administrative features characterised by a complex governance of the territory and a very high *Territorial Weakness and Extension*.
- Cluster 6, *Ideal types*: this cluster includes institutions with the highest *Economic Background* features, and average *Territorial Weakness and Extension* and *Administrative Complexity* components. These UCs represent the ideal Emilia-Romagna local government, with a high level of wealth and urbanisation, a large presence of industrial activity and a well-established administrative history. In effect many of the municipalities of this cluster experienced forms of inter-municipal cooperation for service delivery far before the existence of UCs as institutions (e.g. agreements, as we outlined in Section 4).

Figure 3 provides the map with the territorial distribution of the 6 clusters in the region, while Table 3 presents descriptive statistics for our cluster solution. As above claimed, Figure 3 shows that Cluster 1 (*Unlucky pioneers*) and Cluster 4 (*Sleeping beauties*), characterized by low economic performance, are located in the corners of our region (respectively, North-West and South-East the former, South-West and North-East the latter), while Cluster 3 contains UCs located in the core part of the region (which we can broadly identify referring to the ancient “Via Emilia” that is a sort of “backbone” of the region).<sup>22</sup>

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<sup>22</sup> Via Emilia is the ancient Roman way which connected in a straight line the main Roman towns of the Region from West (Placentia- Piacenza) to East (Ariminum- Rimini).

*Figure 3 – Clusters' territorial distribution*



*Note: borders identify E-R municipalities, whereas different colours identify different clusters of UCs.*

*Source: Authors' elaboration*

Considering the number of UCs, Cluster 2 (*Cozy suburbs*) is the smallest cluster and it is localized in the West part of the region. Cluster 5 and 6 are located in various provinces in the Center and East part of the region, but Cluster 5 is mostly present in mountain areas.

With reference to population, the least populous clusters are the ones we labelled *Cozy suburbs* and *Sleeping Beauties*, respectively with 23,300 and 20,100 inhabitants on average per UC. The clusters with the highest average value of population per UC are Cluster 3 (*Small good performers*) and Cluster 6 (*Ideal types*), with 65,999 and 97,469 inhabitants on average. UCs labelled *Hardship on the mountains* have the widest territories but the second lowest density, and this explains their high value of the *Territorial weakness and extension* component. On the contrary, Cluster 3 *Small good performers* shares a high population with *Ideal types*, but in a smaller territorial area.

Not surprisingly, the variable indicating the average number of employees in services and manufacturing per UC shows the highest value in the cluster *Ideal types* (34,104 employees on average),

followed by the *Small good performers*. These clusters are also the richest in terms of total income, while the poorest are the *Sleeping beauties*. Average income is smooth among clusters, but *Small good performers* show the highest value. Cluster 4 (*Sleeping beauties*) shows the lowest value (fewer than 4,000) in terms of average industry and services' employees per UCs, and shares economic fragility also with UCs labelled *Hardship on the mountain* and with *Unlucky pioneers*, as it is shown by the low average income and the high percentages of elderly people.

**Table 3 - Descriptive statistics by cluster, mean values and percentages**

Variables	Cluster						Total
	<i>Unlucky pioneers</i>	<i>Cozy suburbs</i>	<i>Small good performers</i>	<i>Sleeping beauties</i>	<i>Hardship on the mountains</i>	<i>Ideal types</i>	
	1	2	3	4	5	6	
Total population	31,329	23,292	65,999	20,107	55,293	97,469	59,303
Area	229.6	183.1	272.9	475.2	666.9	423.2	398.2
Density	146.7	146.6	248.2	45.7	84.4	247.5	170.4
Functions attributed to UC	6.3	7.4	5.1	4.5	7.5	9.2	6.9
Age	11.2	6.4	9.9	5.2	5.5	9.9	8.3
Municipalities <1,000 per UC*	4.7	5.0	0.0	16.7	6.7	0.0	4.7
Number of municipalities per UC	5.8	3.8	6.0	5.8	7.8	7.6	6.6
Employees	8,359	13,840	22,018	3,983	9,199	34,104	18,930
Foreigners*	8.9	14.3	10.3	7.2	9.5	11.7	10.4
Population over 65*	22.3	22.2	21.7	32.0	25.7	23.0	24.2
Total income (000)	493,791	373,356	1,052,295	267,284	790,380	1,515,367	911,460
Average income	21,587	21,314	22,184	18,000	19,081	21,445	20,781
Number of UC	6	5	9	6	6	11	44

\* Percentages

Source: Authors' elaboration

We consider now administrative variables. The number of municipalities per UC is very similar in every cluster. However, *Cozy suburbs* of Cluster 2 contain the lowest number of municipalities per UC (3.8) on average, and Cluster 5 and 6 show the highest number (7.8 and 7.6). If we consider the functions attributed to UCs, Cluster 3 and Cluster 4 show the lowest values: however, *Small good performers* of Cluster 3 contain older UCs than *Sleeping beauties* of Cluster 4. Moreover, Cluster 3 has no municipalities under 1,000 inhabitants in its UCs, with respect to Cluster 4, which

shows the highest value of small municipalities among clusters. *Unlucky pioneers*, *Small good performers* and *Ideal types* contain the oldest UCs.

If we consider some demographic indicators, clusters with the highest number of foreigners are the *Cozy suburbs*, the *Small good performers* and the *Ideal types*. The oldest population is in Cluster 4 (*Sleeping beauties*), and Cluster 5 which mainly contains mountain territories. Other clusters are similar to each other and they all have between 21% and 23% of the population over 65 years old. In summary, *Ideal types* (Cluster 6) show the strongest economic capacity, together with solid administrative features. They are old UCs, and present the highest number of functions attributed to UCs by member municipalities. “Via Emilia” UCs, i.e. *Small good performers* (Cluster 3), get in second position from an economic point of view, and are similar to Cluster 6 considering demographic characteristics (high population and high percentage of foreigners), but they are located in smaller areas. From an administrative point of view, they are as old as components of Cluster 6; however, these UCs jointly exert fewer functions than their “older brothers”. *Cozy suburbs* (Cluster 2) are immediately after Cluster 3 and 6 in terms of economic features. Placed in the West part of the region, they are the smallest cluster considering the number of UCs, and with the lowest number of municipalities per UC. Located in peripheral areas of the region, *Sleeping beauties* (Cluster 4) show administrative fragility since they are the youngest, with small municipalities and the lowest number of functions jointly exerted by UCs. *Hardship on the mountain* (Cluster 5) are the widest territories, they present economic and demographic fragility and show the highest number of municipalities per UC, with a high number of functions jointly exerted. In peripheral areas, we find also *Unlucky pioneers* (Cluster 1), which are on average the oldest UCs of the region; however, they do not rank the highest in terms of administrative features and share economic fragility with Cluster 4 and 5.

## 7 Analysis of UCs financial dimensions and discussion

Do clusters differ in terms of capacity to provide services and goods? More specifically, do they differ in terms of autonomy, resilience and sustainability? The answer to these questions is the goal of this section, which uses financial indicators of the UCs as a proxy of governmental capacity.

In Section 6, we demonstrated how UCs can be grouped together in networks of organisations with similar administrative and socio-economic features. These networks try to manage inter-organisational interdependences, as the RDT approach described in Section 3 highlights. Here, we analyse whether different patterns of dependence of UCs among clusters do emerge.

*Table 4 – UCs financial indicators at regional level, average values per year*

Year	Revenues from transfers		Extra-Tax Revenues		Current Expenditures		Financial Autonomy	Total Number of UCs per Year
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	%	
2005	75.8	61.0	49.5	59.1	127.0	110.4	34.0	5
2006	64.0	75.9	42.0	54.2	105.2	115.8	33.7	8
2007	89.5	92.3	50.9	63.0	139.7	129.4	32.8	9
2008	88.7	110.9	46.2	68.4	134.5	156.4	28.5	17
2009	78.3	100.4	33.1	49.9	109.4	133.1	31.9	22
2010	87.4	96.1	29.3	47.3	114.8	127.2	22.0	23
2011	90.4	102.6	28.8	45.6	118.0	130.3	21.5	25
2012	99.3	105.0	29.0	43.7	125.9	131.5	20.7	25
2013	113.0	111.2	27.9	38.0	140.4	129.1	19.2	34
2014	118.8	105.9	33.2	44.6	146.0	124.2	19.4	44
2015	129.3	106.2	32.6	41.3	152.0	122.6	19.1	44
2016	150.9	112.1	37.7	44.2	181.0	146.1	18.7	44
2017	155.0	101.2	35.9	29.9	180.6	113.3	19.5	44

*Source: Authors' elaboration*

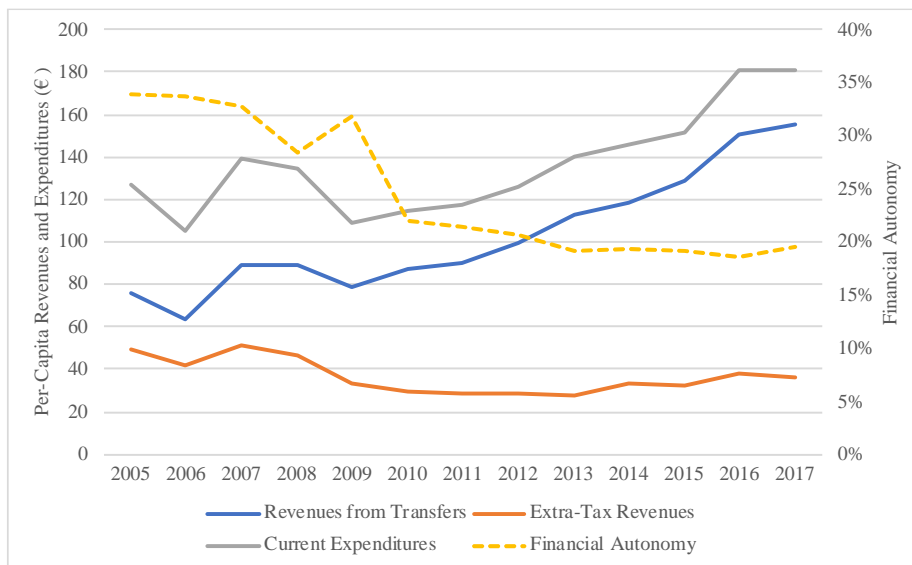
Table 4 shows average trends of: transfers from public entities (municipalities constituting UCs, Province, Region and national State), own revenues (called extra-tax revenues in Italian)<sup>23</sup> and current expenses, of the UCs in Emilia-Romagna Region. Data refer to a span of time of 13 years,

<sup>23</sup> Those revenues are generated by fees from the use of public services and infrastructures, and income from public assets.

considering the financial statements between 2005 and 2017.<sup>24</sup> In the remaining part of the paragraph, all values are expressed in Euros per inhabitants, unless otherwise stated.

As the table shows, the number of associations of municipalities hugely increased in the last 13 years.<sup>25</sup> These financial values can well describe the evolution of UCs in the long run (see Figure 4). Mean current expenditures increased over time and are used as a proxy for UCs volume of activity. Over time, municipalities have attributed to UCs, on average, an increasing number of services and activities/responsibilities. On the other hand, own revenues can be used as a proxy for the ability to use own resources to manage activities, and they did not increase over time on average.

**Figure 4 – Trends in UCs financial indicators at regional level, 2005-2017**



Source: Authors' elaboration

Transfers represent the UCs funding from other public sector institutions and agents, and they show a trend similar to current expenditures. On average, transfers and funding to UCs increased over time as the responsibilities and services in charge of the *Unioni di Comuni* increased.

Figure 4 graphically shows these trends, and adds to the picture the financial autonomy indicator, which is the ratio of tax and extra-tax revenues to the sum of all current revenues (tax revenues,

<sup>24</sup> We decided not to consider revenues from taxes since UCs generally are not in charge of own taxes.

<sup>25</sup> We could not find financial data from all the associations of our population even if we have a high coverage during years; inactive UCs do not provide budgets and financial statements, and in addition in some cases some values are missing.



extra-tax revenues and transfers). For each UC, it is a proxy for the capacity to use own resources, considering all revenues and transfers.

The financial autonomy indicator (right vertical axis) decreases over time (from 34% to 19%). Figure 4 shows the increasing financial dimension of UCs, their increasing dependence from funding, and their decreasing autonomy over time.

The following step is analyzing these financial values by cluster, in order to decompose these trends by territorial features. Table 5 compares revenues from transfers by cluster in the last 5 available years.<sup>26</sup> On average, mean transfers increase for all cluster over years, and Cluster 1 (*Unlucky pioneers*) shows the highest increase (more than 200% comparing years 2013 and 2017).

**Table 5 – UCs revenues from transfers 2013-2017, average values per cluster**

Year	Cluster						F	P-Value	Total
	1	2	3	4	5	6			
2013	25.7	233.2	66.6	133.9	52.8	174.4	3.06	0.029	113.0
2014	27.6	156.7	77.2	179.3	95.9	193.7	3.22	0.018	118.8
2015	42.5	191.7	83.4	103.4	121.0	198.0	2.60	0.044	129.3
2016	84.0	235.4	103.2	139.9	110.7	224.3	2.80	0.032	150.9
2017	83.0	228.4	91.8	154.5	115.3	256.1	6.25	0.000	155.0

*Source: Authors' elaboration*

Clusters are effective in discriminating the mean value of transfers between groups of UCs over years, since F-Statistics are significant at least at 5% in the period considered. Cluster 2 (*Cozy Suburbs*) and Cluster 6 (*Ideal Types*) show the highest values of this variable. More specifically, for all years considered, Cluster 6 has higher values of mean transfers with respect to Cluster 1 (t-test significant at 10% in 2013, 5% in 2014-2016 and 1% in 2017) and Cluster 3 (*Small good performers*) (t-test significant at 10% in 2013, 2015 and 2017, 5% in 2014 and 2016). In the last 2 years, Cluster 6 shows statistically significant differences (significance at 5% level) also with respect to Cluster 5 (*Hardship on the mountains*). Also, Cluster 2 shows higher differences with respect to the same clusters in all years (with the exception of year 2016, where differences are not statistically significant).<sup>27</sup>

<sup>26</sup> The choice to consider only the last 5 years is related to the great increase of UCs in the same period of time, especially after some legislative interventions at national and regional level and the institution of more financial incentives to the constitution of UCs. See Section 4 for more details.

<sup>27</sup> Significance of t-test: with reference to Cluster 1: 5% in 2014, 2015 and 2017; 1% in 2013. With reference to Cluster 3: 10% in 2014 and 2015; 5% in 2017; 1% in 2013. With reference to Cluster 5: 5% in 2017.

**Table 6 – UCs extra-tax revenues 2013-2017, average values per cluster**

Year	Cluster						F	P-Value	Total
	1	2	3	4	5	6			
2013	7.4	31.0	35.1	49.4	8.6	35.7	0.54	0.747	27.9
2014	7.1	39.4	38.0	91.7	20.4	36.3	1.74	0.153	33.2
2015	12.8	30.3	43.2	27.5	16.8	46.8	0.71	0.623	32.6
2016	13.8	74.6	24.4	34.9	36.1	46.7	1.30	0.288	37.7
2017	17.5	39.1	26.9	37.0	36.2	52.0	1.19	0.337	35.9

*Source: Authors' elaboration*

Table 6 provides estimates for extra-tax revenues. Only Cluster 1, Cluster 5 and Cluster 6 show increasing mean values whereas other clusters present fuzzy trends. In this case, clusters do not provide a clear discrimination between UCs over years (F-Statistics are not significant).

Clusters show also distinctions with respect to mean current expenditures over years, as it can be seen from Table 7. Again, average expenditures constantly increase for Cluster 1, Cluster 5 and Cluster 6, whereas Cluster 2 and Cluster 6 show the highest values. Cluster 6 has statistically significant higher values than Cluster 1 in all years considered, and increasing differences with respect to Cluster 3 and Cluster 5.<sup>28</sup> High volumes of mean current expenditures can be seen also for Cluster 3 (*Small good performers*) and 4 (*Sleeping beauties*). Cluster 1 presents the smallest values but, at the same time, the highest increase over years (from €33.9 in 2013 to €95.9 in 2017).

**Table 7 – UCs current expenditures 2013-2017, average values per cluster**

Year	Cluster						F	P-Value	Total
	1	2	3	4	5	6			
2013	33.9	261.8	100.0	175.0	70.2	208.2	2.48	0.062	140.4
2014	33.5	188.5	112.1	247.7	109.0	224.9	3.29	0.016	146.0
2015	49.7	212.1	116.9	115.4	134.6	232.9	2.36	0.062	152.0
2016	94.0	300.4	118.8	168.7	139.7	263.3	2.48	0.051	181.0
2017	95.9	252.8	111.1	176.1	148.0	293.1	5.81	0.001	180.6

*Source: Authors' elaboration*

Table 8 focuses upon revenues from transfers in 5 years for which such factorization of data was available. On average, Cluster 6 shows the highest transfers deriving from member municipalities of its UCs, whereas Cluster 2 presents the highest transfers from the region. Per capita transfers

<sup>28</sup> Significance of t-test: with reference to Cluster 1: 10% in 2013, 5% in the 2014-2016 time span, 1% in 2017. With reference to Cluster 3: 5% in 2016, 1% in 2017. With reference to Cluster 5: 10% in 2016, 5% in 2017.

from the state are very low, highlighting the guiding role of the region, Italian middle level of government, in promoting and enhancing such cooperation between municipalities. However, differences among clusters are significant only in 3 out of 5 years considered (significance at 10% for years 2013-2015), and only with reference to transfers from member municipalities. In this case, Cluster 1 has lower values of transfers from its own municipalities with respect to clusters with higher values of that variable (2 and 6) in almost all years considered.<sup>29</sup> Transfers from municipalities are lower for Cluster 3 with respect to Cluster 6, and differences are weakly statistically significant in 2014 and 2015.<sup>30</sup>

*Table 8 – UCs revenues from transfers 2011-2015, per typology and cluster*

Year	Variable	Cluster						F	P-Value	Total
		1	2	3	4	5	6			
2011	From the Region	7.0	61.5	11.1	4.8	9.2	28.2	1.12	0.381	21.5
	From the State	1.4	0.9	2.0	4.2	1.9	1.0	0.45	0.812	1.5
	From Member Municipalities	13.4	78.3	36.2	71.3	15.9	87.1	1.02	0.428	54.6
2012	From the Region	8.1	53.7	10.6	10.3	10.5	30.6	0.89	0.501	21.5
	From the State	1.6	0.6	0.6	0.0	2.8	2.3	0.81	0.557	1.5
	From Member Municipalities	14.2	97.9	35.9	91.0	60.2	103.3	1.52	0.223	65.4
2013	From the Region	5.5	55.0	10.5	6.8	5.6	39.1	1.22	0.331	23.6
	From the State	1.2	0.5	0.3	0.0	0.4	1.4	0.60	0.701	1.5
	From Member Municipalities	18.0	163.0	50.8	127.1	44.2	126.5	2.19	0.090	85.9
2014	From the Region	5.9	16.6	11.6	45.9	27.0	45.8	1.84	0.133	25.5
	From the State	1.5	0.4	0.7	9.3	0.4	2.4	4.16	0.005	3.7
	From Member Municipalities	15.9	82.0	43.9	70.8	30.1	125.4	2.25	0.072	65.0
2015	From the Region	8.9	39.7	11.8	28.9	22.9	31.1	1.06	0.401	24.2
	From the State	2.3	0.4	1.5	5.6	1.8	3.6	0.94	0.470	4.5
	From Member Municipalities	21.2	88.8	52.7	26.4	49.2	132.8	2.14	0.086	70.4

*Source: Authors' elaboration*

<sup>29</sup> Significance of t-test: with reference to Cluster 2: 5% in the 2011-2013 time span. With reference to Cluster 6: 10% in 2012 and 2013, 5% in 2014 and 2015.

<sup>30</sup> Significance of t-test: 10% in 2014 and 2015.

## 7.1 Discussion

In conclusion, we can state that municipalities increasingly relied on UCs as service providers and empowered their expenditures capability in last decades accordingly. At the same time, associations of municipalities have not been able to increase their own revenues. In addition, they generally decreased their own financial autonomy, relying on transfers from other public institutions. On average, Cluster 2 (*Cozy Suburbs*) and Cluster 6 (*Ideal Types*) have higher revenues from transfers and higher current expenditures per inhabitants; Cluster 6 constantly increased these values from 2013 to 2017 and showed the highest increasing contribution from its own municipalities in terms of funding between 2011 and 2015. The power of Cluster 6 in terms of territorial socio-economic conditions goes beyond the institutional dimension. However, despite the highest total population among clusters (which lowers the per-capita financial values), the administrative features of Cluster 6 (e.g. old UCs in the cluster, highest number of functions attributed to UCs by municipalities) are reinforced by financial decisions in terms of expenditures and revenues at the UCs level, strengthening the role of *Ideal types* UCs as autonomous and resilient service providers. Territories of Cluster 2, *Cozy suburbs*, even if characterized by fewer inhabitants and less economic dynamism with respect to Cluster 6, share similar trends in terms of UCs financial indicators but a higher level of revenues from regional transfers. *Cozy suburbs* contain a low number of municipalities, but they jointly provide a high number of functions. Hence, these institutions seem a sustainable opportunity to overcome less favorable peripheral territorial conditions. Cluster 3 (*Small good performers*) and Cluster 4 (*Sleeping beauties*) share some financial dimension of Cluster 2 and 6 on a smaller scale. In these clusters, the smaller number of functions attributed to UCs lowers the financial indicators of our analysis. Finally, two distinctive behaviors characterize the most fragile territories, i.e. Cluster 1 (*Unlucky pioneers*) and Cluster 5 (*Hardship on the mountain*). While the latter seems to reproduce strong and resilient administrative cooperation of mountain territories (pre-existing consortia) in new UCs, the former contains UCs with a long institutional history but with very low values of all financial indicators: in this sense these UCs do not seem strong enough to represent a structural delegated form of government.

Our results are perfectly in line with the RDT stating that resource scarcity, not necessarily efficiency, motivates organisational action (Pfeffer and Salancik 2003; Leblebici *et al.* 1991). Indeed, UCs verify all the main RDT propositions: (i) organisations are constrained by a network of inter-

dependencies with other organisations; (ii) organisations adopt strategies to reduce their dependency on other organisations' resources in their environment; (iii) these dependencies produce inter-organisational and intra-organisational power relations (Pfeffer 1987; Ulrich and Barney 1984). Hence, UCs seem to act as municipalities' delegate aiming to reduce uncertainty through Inter-Municipal Cooperation. Indeed, UCs reduce the dependence from other entities since they allow an inter-organisational alliance with the source of constraint (for instance with municipalities and regional government). In the view of municipalities' policymakers, UCs may act as a new balance of power, i.e. an organisation that has an influence over resources needed by them. However, as our results show, this means that UCs seem far from becoming self-sustainable institutions. Moreover, considering clusters' budget analysis, we concluded that strong socio-economic territorial conditions bring to strong inter-organizational alliances (UCs), in terms of expenditures and revenues. This is clearly exemplified by strong institutions as *Ideal Types* or smaller but dynamic realities as *Cozy Suburbs*. On the contrary, the idea that strong UCs compensate for weak territorial features is not self-evident and must be studied in deep. In fact, weak socio-economic and administrative territories seem to be left back with respect to other UCs in terms of autonomy, resilience and sustainability.

## 8 Conclusions

In this contribution we have distinguished *Unioni di Comuni* (UCs) of Emilia-Romagna Region into patterns on the basis of their socio-economic characteristics. Firstly, the results of our clustering procedure show 6 groups of association, which we labelled: *Unlucky pioneers*; *Cozy suburbs*; *Small good performers*; *Sleeping beauties*; *Hardship on the mountains*, and *Ideal Types*. This grouping confirms our previous idea about the characterisation of these institutions: a central dominant group of institutions typical of the economic and administrative features of the region (*Ideal Types*), followed by a similar cluster with minor UCs (*Small good performers*), some very active and young UCs (*Cozy suburbs*), the mountain area characterised by high administrative complexity and economic weaknesses (*Hardship on the mountains*), some UCs with a long history of IMC but quite bad economic performance (*Unlucky pioneers*), and a final cluster with "residual" UCs which seem a little bit undefined (*Sleeping Beauty*).

Secondly, the analysis on budgets trends over time shows that UCs increased, on average, the current per capita expenditures. At the same time, transfers from other institution also increased, but the financial autonomy of UCs decreased. Cluster 2 (*Cozy Suburbs*) and Cluster 6 (*Ideal Types*) have higher revenues from transfers per inhabitants and higher current expenditures per inhabitants; Cluster 6 constantly increased these values from 2013 to 2017 and shows the highest increasing contribution from its own municipalities in terms of funding between 2011 and 2015. Considering the most fragile territories, Cluster 1 (*Unlucky pioneers*) contains UCs with a long institutional history but with very low values of all financial indicators: in this sense these UCs do not seem strong enough to represent a structural delegated form of government. On the contrary, Cluster 5 (*Hardship on the mountains*) seems to reproduce strong administrative cooperation of mountain territories (pre-existing consortia) in new UCs.

Thus, our results show that there is a general tendency to provide services through *Unioni di Comuni* in E-R, and to empower and enhance their development in terms of public service specialization. In last decades, municipalities increasingly relied on UCs as service providers and empowered their expenditures capability accordingly. At the same time, UCs generally decreased their own financial autonomy, relying more and more on transfers from other public institutions.

This paper refers the preliminary results of the research, hence there are some weaknesses. These are related not only to the exploratory nature of the research, but also to the focus on a single instrument of IMC and on a specific region of a specific country. In addition, the identification of financial autonomy and sustainability indicators are still at a preliminary stage. Nevertheless, we started from the Italian region where a particular kind of IMC is very common, in order to have a better sample of the application of this instrument.

In line with Resource-Dependence Theory (RDT), our empirical analysis finds different clusters of UCs which act as new centres for public service delivery in Emilia-Romagna Region. Their goal is to reduce uncertainty over resources, through the creation of new inter-organizational balances. However, the idea that strong UCs compensate weak starting territorial features of municipalities is not self-evident. Thus, future research at regional and national level should for instance investigate whether territories with different socio-economic and administrative power can aspire to convergence with other territories through Inter-Municipal Cooperation in the form of *Unioni di Comuni*.

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## 10 Websites

Emilia-Romagna Statistical website: <https://statistica.regione.emilia-romagna.it>.

Emilia-Romagna website on association of municipalities: <http://autonomie.regione.emilia-romagna.it/unioni-di-comuni>.

Open Data of the Ministry of Economy and Finance (MEF): [http://www1.finanze.gov.it/finanze3/analisi\\_stat/index.php?tree=2017](http://www1.finanze.gov.it/finanze3/analisi_stat/index.php?tree=2017).

Open Data of the National Institute of Statistics (Istat): <http://dati.istat.it/>.

Statistical Archive of Active Companies (Asia), via E-R Statistics: <https://statistica.regione.emilia-romagna.it/settori-produttivi/archivio-statistico-delle-imprese-attive-asia>.

Statistical website of the national association of municipalities (ANCI): <http://www.comuniverso.it>.

## 11 Appendix

**Table A1 – Correlations between initial variables**

Variables	Total population	% Over 65	% Foreigners	Area	Employees	Density	Total income	Functions attributed to UC	N. of municipalities
Total population	1.000								
% Over 65	-0.309	1.000							
% Foreigners	0.091	-0.344	1.000						
Area	0.482	0.433	-0.223	1.000					
Employees	0.782	-0.321	0.312	0.213	1.000				
Density	0.538	-0.722	0.233	-0.392	0.490	1.000			
Total income	0.967	-0.284	0.128	0.431	0.809	0.534	1.000		
Functions attributed to UC	0.313	-0.129	0.339	0.179	0.386	0.124	0.258	1.000	
N. of municipalities	0.495	0.005	0.006	0.590	0.399	-0.031	0.479	0.162	1.000

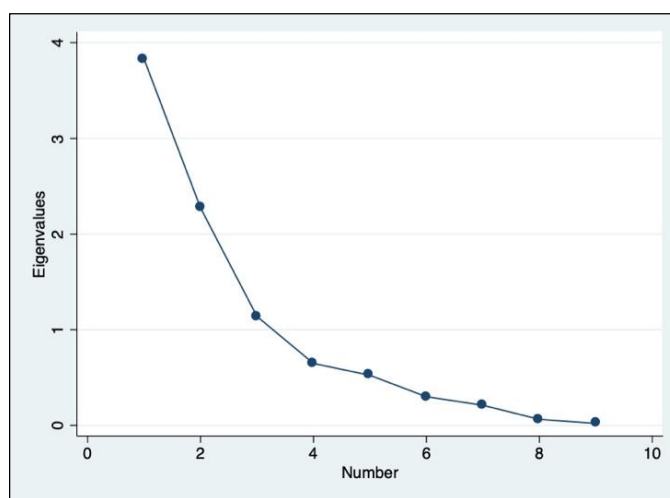
*Source: author's elaboration*

**Table A2 – Results for the extraction of components**

Component	Eigenvalue	Proportion	Cumulative
1	3.83	0.43	0.43
2	2.27	0.25	0.68
3	1.14	0.13	0.80
4	0.65	0.07	0.88
5	0.52	0.06	0.93
6	0.30	0.03	0.97
7	0.21	0.02	0.99
8	0.06	0.01	1.00
9	0.02	0.00	1.00

*Source: author's elaboration*

**Figure A1 – Scree test for component analysis**



*Source: author's elaboration*

*Table A3 – PCA components and correlations with initial variables*

Variables name	PCA Components		
	Economic and Administrative Dynamism	Territorial Weakness and Extension	Administrative Complexity
Total population	<b>0.482</b>	0.114	-0.172
% Population over 65	-0.236	<b>0.478</b>	0.119
% Foreigners	0.157	-0.293	<b>0.622</b>
Area	0.168	<b>0.589</b>	0.051
Employees	<b>0.452</b>	-0.012	0.058
Density	<b>0.317</b>	<b>-0.430</b>	-0.289
Total income	<b>0.478</b>	0.099	-0.182
Functions attributed to UC	0.228	0.005	<b>0.669</b>
Number of municipalities	0.274	<b>0.362</b>	0.017

*Source: author's elaboration*

*Table A4 – Duda-Hart Index (2 to 20 partitions)*

Number of Clusters	Duda/Hart	
	Je(2)/Je(1)	Pseudo T-squared
2	0.620	18.37
3	0.656	9.45
4	0.451	12.16
5	0.535	8.69
6	0.594	6.84
7	0.584	6.42
8	0.177	13.97
9	0.423	6.84
10	0.519	5.56
11	0.494	6.15
12	0.354	10.95
13	0.222	7.01
14	0.106	8.47
15	0.486	4.22
16	0.470	3.38
17	0.169	4.93
18	0.057	16.61
19	0.301	4.64
20	0.488	3.14

*Source: author's elaboration*

**Table A5 – List of UCs (Unioni di Comuni) per cluster, 6 clusters solution**

<b>Cluster</b>	<b>UCs</b>	<b>Province</b>
1	Unione di Comuni Bassa val d’Arda Fiume Po	Piacenza
	Unione dei Comuni Bassa Val Trebbia e Val Luretta	Piacenza
	Unione Colline Matildiche	Reggio Emilia
	Unione della Valconca	Rimini
	Unione dei Comuni “Savena-Idice”	Bologna
	Unione Valnure e Valchero	Piacenza
2	Unione Montana Appennino Parma Est	Parma
	Unione Bassa Est Parmense	Parma
	Unione dei Comuni della Via Emilia Piacentina	Piacenza
	Unione Terra di Mezzo	Reggio Emilia
	Unione Comuni Val Tidone	Piacenza
3	Unione Alto Ferrarese	Ferrara
	Unione Comuni del Sorbara	Modena
	Unione Pedemontana Parmense	Parma
	Unione Pianura Reggiana	Reggio Emilia
	Unione Terre d’acqua	Bologna
	Unione Comuni Terre di Pianura	Bologna
	Unione Terre Verdiane	Parma
	Unione Tresinaro Secchia	Reggio Emilia
Unione Val d’Enza	Reggio Emilia	
4	Unione Comuni Montani Alta Val d’Arda	Piacenza
	Unione Comuni Montani Alta Val Nure	Piacenza
	Unione dei Comuni del Delta del Po	Ferrara
	Unione Montana dei Comuni della Val Trebbia e Val Luretta	Piacenza
	Unione dei Comuni Terre e Fiumi	Ferrara
	Unione dei Comuni Valli Taro Ceno	Parma
5	Unione Comuni del Frignano	Modena
	Unione dei Comuni dell’Appennino bolognese	Bologna
	Unione Montana dei Comuni dell’Appennino Reggiano	Reggio Emilia
	Unione dei Comuni Valle del Savio	Forli-Cesena
	Unione dei Comuni “Valli e Delizie”	Ferrara
	Unione di Comuni Valmarecchia	Rimini
6	Unione Bassa Reggiana	Reggio Emilia
	Unione Comuni del Distretto Ceramico	Modena
	Unione dei Comuni della Bassa Romagna	Ravenna
	Unione della Romagna Faentina	Ravenna
	Unione delle Terre d’Argine	Modena
	Unione Comuni Modenesi Area Nord	Modena
	Nuovo Circondario Imolese	Bologna
	Unione Reno Galliera	Bologna
	Unione Rubicone e Mare	Forli-Cesena
	Unione Terre di Castelli	Modena
Unione Valli del Reno, Lavino e Samoggia	Bologna	