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Political Networks in the European Parliament: Network Analysis of the 2013 Common Agricultural Policy Reform

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Abstract: EU-level decision-making has been already analysed from a number of point of views. Nevertheless, social network analysis in the context of the EU's legislative procedures as well as in the European Parliament is still limited. The objective of this paper is to analyse the relationships of the Members of the European Parliament during the elaboration of the legislative instruments of the 2013 Common Agricultural Policy reform. Interpersonal networks of EP members are extrapolated to networks of EP groups and EU Member States. The novelty of this research is the combination of network analysis with the analysis of the legislative amendments of the EP. The results show that Members of the EP from net contributor Member States as well as from the EP Group of the European People's Party are the most active ones in the network. Also, EP Members from new Member States play a marginal role in the analysed EP network.

Keywords: European Parliament, Social Network Analysis, Common Agricultural Policy,

1 Background and objectives of the research

In recent years, social network analysis has been on an upward track of importance and interest in the field of social sciences, including political science. Network analysis aims at identifying key players and mapping out mostly hidden, invisible networks between them in a variety of fields: social relationships, business networks, internal relationships within an organisation or company, etc. However, social network analysis as a methodological tool has not yet been widely applied in the context of the EU' political setting.

EU-level decision-making has been extensively analysed in the last decades from a number of points of view. Tremendous amount of literature examined the role of each

of the EU organs – primarily the European Commission, the European Parliament and the European Council – in EU decision-making and legislation. Scholarly attention focused on the interrelatedness and the relative powers of these three institutions with the objective to measure their influence on the final political outcome. There is a high number of stakeholders influencing decision-making in the European Union. Not only the three key institutions, but also the rotating Presidency of the EU, national governments and EU-level civil organisations have an impact on the EU's legislation. This variety of stakeholders forms a perfect environment for social network analysis.

The role of the European Parliament in EU legislation has mostly been assessed in light of its gradual empowerment by the consecutive European treaties. Legally, the Treaty of Maastricht made the EP a co-legislator with the Council, which was further extended to the most of the EU's policy domains by the Treaty of Amsterdam, Treaty of Nice and the Treaty of Lisbon.

Scholarly work in this field mostly aimed at measuring the EP's influence in numerical terms under the various legislative procedures. Tsebelis and Kalandrakis (1999), Kreppel (2002), Tsebelis et al. (2001), Lucic (2004) and Yordanova (2010) calculated success rates of EP amendments to measure the power of the European Parliament. Another group of related research – including Kreppel (1999), Shackelton (1999) and Kardasheva (2009) – focused on identifying the factors – variables – that influence the adoption of EP amendments. Nevertheless, to date, there has not been any research conducted, which would have applied social network analysing technics for the legislative procedures of the European Parliament. Therefore, the network analysis of the legislative amendments of the EP is a completely new segment of research.

The Common Agricultural Policy (CAP) is the highest-budget common policy in the EU since its establishment in 1962. Therefore, it attracts particular attention both from the side of political stakeholders – including the three EU organs that have a role in EU decision-making and legislative procedures – as well as from civil society. Previous research mostly analysed the role of the introduction of co-decision procedure in the CAP and its consequences on the European Parliament. Crombez and Swinnen (2011) analysed the prospective impact of co-decision on the CAP reform. Swinnen et al. (2012) focused on the role of the EP in the co-decision procedure. Their conclusion was that in practice, the EP is not an equal co-legislator with the Council. Roeder-Rynning et al. (2012) analysed the factors that influenced the extension of the co-decision procedure to the CAP before the Lisbon Treaty. Greer et al. (2012) concentrated on the inter-institutional relations among the Commission, Parliament and the Council in the field of the CAP. Their conclusion was that even under the co-decision procedure, the Council is the most powerful actor in the CAP legislation and the EP is not a real co-legislator.

The network analysis of the decision-making of CAP within the European Parliament is a new domain of research that might help to get a better and more sophisticated insight into a key segment of EU decision-making. This could be beneficial not only to political actors or scholars, but also to agricultural and food companies, interest groups of farmers and consumers and also to lobbyists.

This research is based on a newly elaborated database of the author, which contains all the open amendments tabled by the European Parliament to the CAP legislative proposals during the 2013 CAP reform. Within the framework of this research, those amendments form the basis of the analysis, which was tabled jointly by more than one Member of the European Parliament (MEP). These relationship of MEPs in the joint amendments – the so-called 'amendment coalitions' are assessed in this paper. In the dataset, MEPs' names are substituted by the EP party group affiliation and the nationality of the MEPs, which makes it possible to analyse the networks of EP groups and the networks of Member States embedded in the joint EP amendments.

The objectives of the research is twofold: on one hand it aims at identifying the key EP Groups and Member States, which were the most active both in tabling amendments and formulating amendment coalitions. Besides, the analysis will highlight the most powerful relationships between EP Groups as well as Member States in the joint amendments. Last, but not least, the analysis will also reveal which EP Groups as Member States play an intermediary role: a role to connect other EP group and Member States with the objective to jointly propose an amendment on a particular CAP issue.

2 Network analysis in political science and EU decision-making

In 2007, Schneider et al. (2007) listed more than 1.000 publications that covered political networks, showing the broad interest that networks have generated in political science and others disciplines that deal with networks in political contexts. Most of the related relevant literature focused on political networks in the US political setting (Porter et al. (2005), Fowler (2006)). In the European context, Villadsen (2011) analysed Danish political networks, while Schmid (2009) analysed networks related to the German Bundestag. Jurje (2010) focused on networks in the decision-making processes of EU politics at Member State level.

However, to date, the analysis of the political networks in the EU-level decision-making has been limited. Pappi & Henning (1999) analysed agricultural interest groups in EU Commission advisory groups, while Magetti & Gillardi (2012) analysed the relationship of EU-level and national decision-making. Decision-making in the European Parliament has only been the subject of network analysis by Patz (2013). He analysed the European network structures of the civil society and interest groups involved in the Common Fisheries Policy (CFP) based on expert and advisory committees of civil society organisations in the CFP.

3 Theoretical overview

The methods of social network analysis have attracted considerable interest and curiosity in recent decades. Social network analysis is based on an assumption of the

importance of relationships among interacting units. Relations defined by linkages among units are a fundamental component of network theories. Network models may be used to test theories about relational processes or structures. The key feature of social network theories or propositions is that they require concepts, definitions and processes in which social units are linked to one another by various relations. Both statistical and descriptive uses of network analysis are distinct from more standard social science analysis and require concepts and analytic procedures that are different from traditional statistics (Wasserman and Faust, 1994: 3-5). According to De Nooy (2003), social network analysis is a methodology that can detect patterns of formal and informal social relations within a social space.

Social network analysis is inherently an interdisciplinary endeavour. The concepts of social network analysis developed out of a propitious meeting of social theory and application, with formal mathematical, statistical and computing methodology (Wasserman and Faust, 1994:10). Social network analysis is explicitly interested in the interrelatedness of social units (Wasserman and Faust, 1994:16).

A social network consists of a finite set or sets of actors and the relation or relations defined on them. The presence of relational information is a critical and defining feature of a social network. Relation in this context means the collection of ties of a specific kind among the members of a group (Wasserman and Faust, 1994:20).

Nodes and arcs are the basic building blocks for social networks. In a graph, nodes represent actors and lines represent ties between actors. In graph theory, the nodes are also referred to as vertices or points, and the lines are also known as edges or arcs. (Wasserman and Faust, 1994:90-95).

Visual displays including sociograms and two or higher dimensional representations continue to be widely used by network analysts (Wasserman and Faust, 1994:12). The visual representation of data that a graph or sociogram offers often allows the researchers to uncover patterns that might otherwise go undetected (Wasserman and Faust, 1994:94).

A graph is a model for a social network with an undirected dichotomous relation. In a graph, nodes represent actors and lines represent ties between actors (Wasserman and Faust, 1994:94). In the network analytic framework, the ties may be any relationship existing between units (Wasserman and Faust, 1994:8).

A directional relation can be represented by a directed graph or digraph for short. The difference between a graph and a directed graph is that in a directed graph the direction of the lines is specified. These oriented lines are called arcs (Wasserman and Faust, 1994:122). In a digraph, a node can be either adjacent to, or adjacent from another node, depending on the ’direction’ of the arc (Wasserman and Faust, 1994:125).

4 Metrics in social network analysis

The most frequently used indicators, metrics and definitions of the social networks are as follows:

- The degree of a node is the number of lines that are incident with it. Equivalently, the degree of a node is the number of nodes adjacent to it. A node with degree equal to 0 is called an isolate (Wasserman and Faust, 1994:100)
- The density of a graph is the proportion of possible lines that are actually present in the graph. It is the ratio of the number of lines present to the maximum possible (Wasserman and Faust, 1994:101).
- A path is a walk in which all nodes and all lines are distinct. The length of a path is the number of lines in it (Wasserman and Faust, 1994:107). The shortest path between two nodes is referred to as a geodesic. The geodesic distance or simply the distance between two nodes is defined as the length of a geodesic between them (Wasserman and Faust, 1994:110).
- Centrality indices are examples of measures of the prominence or importance of the actors in a social network. Prominent actors are those that are extensively involved in relationships with other actors. This involvement makes them visible to the other. We define a central actor as one involved in many ties (Wasserman and Faust, 1994:170-173). An actor in the network is central when involved – directly or indirectly – in many relations (Moschitz, 2009).
- Betweenness centrality: interactions between two nonadjacent across might depend on the other actors in the set of actors, especially the actors who lie on the paths between the two. These „other actors" potentially might have some control over the interaction between the two nonadjacent actors (Wasserman and Faust, 1994:189). Betweenness centrality describes the potential of a network actor to act as information broker and provides information about its overall activity level in the network (Moschitz, 2009).

5 Dataset

The European Commission tabled its legislative proposals regarding the Common Agricultural Policy in October 2011. These proposals were about to be the legislative framework of the CAP for the 2014-2020 EU financial programming period regarding the direct payments, the rural development, the single common market organisations and the horizontal regulations. The proposals – to which the EP amendments that are analysed in this paper were tabled – are as follows:

- Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy, COM(2011) 625 final/2, 2011/0280 (COD), Brussels, 19.10.2011
- Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a common organisation of the markets in agricultural products (Single CMO Regulation), COM(2011) 626 final/2, 2011/0281 (COD), Brussels, 19.10.2011

- Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on support for rural development by the European Agricultural Fund for Rural Development (EAFRD), COM(2011) 627 final/2, 2011/0282 (COD), Brussels, 19.10.2011
- Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the financing, management and monitoring of the common agricultural policy, COM(2011) 628 final/2, 2011/0288 (COD), Brussels, 19.10.2011

Again, the database of this research was elaborated using EP amendments that were proposed by more than one Member of the European Parliament. After the entry into force of the Treaty of Lisbon in 2009, the legislation of the Common Agricultural Policy falls under the co-decision – with its official name, ordinary legislative – procedure. In this procedure, after the Commission tables its legislative proposal in a text form, the EP is entitled to table textual amendments to it. As for the EP's internal procedure, there is a phase when all the Members of the EP – either alone or jointly with other MEPs – can make amendments. This is the so-called open amendment phase, and amendments tabled here can be called open amendments. This analysis is based on these open amendments tabled to the above four CAP legislative instruments. It is also important to note that unlike open amendments, other types of EP amendments – amendments tabled by the EP rapporteurs, amendments of opinion-giving committees as well as plenary amendments – can't form the basis of a network analysis, as no embedded MEP coalitions can be found in these types of amendments. The database contains almost 7.000 European parliamentary open amendments related to the 4 legislative proposals of the 2013 CAP reform.

In the database, the names of MEPs have been converted into their EP group affiliation and nationality. This makes it possible to analyse the networks among EP Groups and Member States.

Number of EP amendments tabled by one single MEP		Number of EP amendments tabled by MEPs from the same EP Group		Number of EP amendments tabled jointly by MEPs from different EP Groups
ALDE	478	ALDE	257	
ECR	289	ECR	375	
EFD	39	EFD	0	
EPP	1458	EPP	939	
GreenEFA	469	GreenEFA	3	
GUENGL	115	GUENGL	180	
PES	674	PES	652	
NI	134	NI	0	
Subtotal	3656		2406	687
			TOTAL	6749

Figure 1
The dataset broken down by EP Groups

MEPs from the following EP Groups tabled amendments:

ALDE – Alliance of Liberals and Democrats for Europe;

EPP – European People's Party;

ECR – European Conservatives and Reformists;

Greens-EFA – Greens – European Free Alliance;

GUE-NGL – European United Left - Nordic Green Left;

EFD – Europe of Freedom and Direct Democracy;

PES – Party of European Socialists;

NI – Non-Inscrits.

Number of EP amendments tabled by one single MEP		Number of EP amendments tabled by MEPs from the same Member State		Number of EP amendments tabled jointly by MEPs from different Member States
Austria	113	Austria	0	
Belgium	103	Belgium	2	
Bulgaria	150	Bulgaria	0	
Czech Republic	168	Czech Republic	0	
Denmark	88	Denmark	26	
Estonia	9	Estonia	0	
Finland	14	Finland	53	
France	352	France	118	
Germany	538	Germany	110	
Greece	14	Greece	39	
Hungary	66	Hungary	0	
Ireland	116	Ireland	68	
Italy	312	Italy	213	
Latvia	49	Latvia	0	
Lithuania	63	Lithuania	1	
Luxembourg	42	Luxembourg	0	
Netherlands	140	Netherlands	2	
Poland	81	Poland	143	
Portugal	246	Portugal	22	
Romania	157	Romania	49	
Slovakia	8	Slovakia	0	
Slovenia	5	Slovenia	0	
Spain	327	Spain	707	
Sweden	31	Sweden	29	
United Kingdom	464	United Kingdom	492	
Subtotal	3656		2074	1019
			TOTAL	6749

Figure 2
The dataset broken down by Member States

MEPs from the following Member States tabled amendments: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom.

6 Research questions and hypotheses

The main research question is what patterns influence the formulation of coalitions of MEPs when tabling EP amendments. Are MEPs from the EPP group – which has majority in the EP – the most active ones? Are the two large EP Groups – i.e. PES and

EPP – which have an overwhelming majority in the EP form the most frequent coalitions? Which EP Group plays a key intermediary role among other groups? Are MEPs from net contributor Member States – i.e. from Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Italy, Luxembourg, The Netherlands, Sweden, United Kingdom – want to influence the CAP policy the most, therefore formulate the most frequent coalitions to merge their efforts? Is the cooperation between MEPs mostly determined by ideological – in terms of EP Group affiliation – or national lines? MEPs from which country played the most active role in tabling amendments and forming coalitions of MEPs behind them?

Based on these question, the following hypotheses have been preliminary defined:

H1.MEPs from the EPP EP Group and Germany are the most active ones.

H2.The relationship between the PES and the EPP EP Group is the most frequent relationship.

H3.It is the liberal EP group (ALDE), which plays the most important role as an intermediary.

H4.MEPs from net contributor Member States form relationships with each other most frequently.

H5.Cooperation between MEPs are mostly determined by ideological lines, therefore, national affiliation is more a fragmenting factor.

7 The analysis

The above hypotheses can be analysed – either justified or rejected – by using the relevant network analysis indices: degree, weighted degree, betweenness centrality, graph density and average path length. In the dataset of this research, the relationship among the EP Groups as well as the Member States is undirected as there is no influence from one actor – node – to another: they are just ‘simply’ paired. In the context of this research, ‘node’ means the EP Groups or Member States, while ‘edges’ means the relationships among them. Regarding EP Groups, the number of nodes is 8, while the number of edges is 13. As for the Member States, the number of nodes is 26, while the number of edges is 73. The network analysis has been carried by using the free Gephi software.

Before the testing of the variables, it is worth to have a brief overview of the networks. For the network of EP Groups, the average degree value is 3,25, which means that an EP Group has a relationship on average with 3,25 EP Groups. The average weighted degree value is 271,5, which expresses that an EP Group has on average 271,5 connections with another EP Group. As for the network of Member States, the average degree is 5,62, expressing that a Member State has relationships on average with 5,62 other Member States. The average Weighted Degree is 166,85, which shows that on average, there is 166,85 connections between any of the two Member States.

The H1 hypothesis states that MEPs from the EPP EP Group and Germany are the most active ones. Activity of an MEP in this context can be expressed by the degree and weighted degree indices.

EP Group	Degree	Weighted Degree	Member States	Degree	Weighted Degree
EPP	***4***	***850***	France	11	518
PES	5	452	***Germany***	***14***	***512***
EFD	3	396	Ireland	16	505
ALDE	4	283	Austria	10	425
ECR	4	100	United Kingdom	9	421
NI	1	53	Sweden	7	261
GreenEFA	3	25	Belgium	2	220
GUENGL	2	13	Portugal	4	181

Source: own calculation

Figure 3

Activity of MEPs by EP group and Member States (ranked by weighted degree)

Figure 3. summarises the 'degree' and 'weighted degree' values for all EP Groups and for the most active Member States. From the results it can be seen that the EPP group is the most active in terms of the weighted degree (number of connections with other groups). EPP is the second – in tie with ALDE and ECR – in the ranking of degrees having connections with 4 other EP Groups (after PES). In sum, it can be fairly confirmed that in line with the hypothesis, EPP is the most active EP group.

As for the Member States, Germany is an active country, but not the most active one: it is in the second place both in terms of number of countries connected (degree) and the frequency of relationships with these Member States (weighted degree). In the first case, Ireland takes the lead, in the second case, France tops the ranking. In sum, this part of the hypothesis is rejected. These results have been visualised in Figure 4.

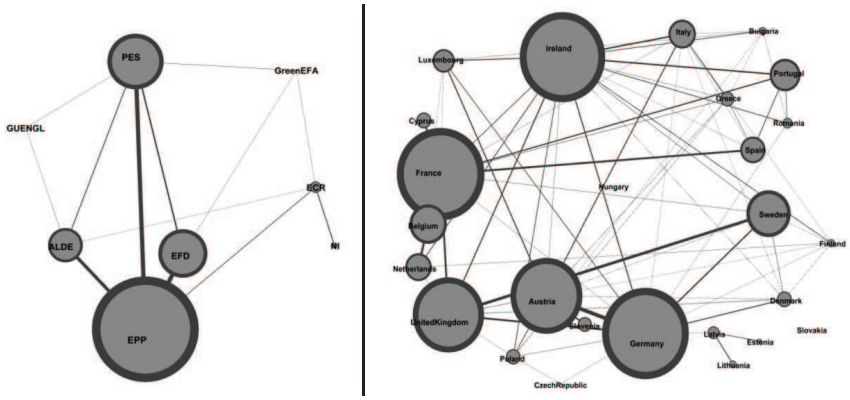

Figure 4

Network of EP Gropus and Member States by weighted degree

The H2. hypothesis states that the relationship between the PES and the EPP EP Group is the most frequent relationship. This hypothesis can be justified by calculating the number of edges (relationship) between the nodes (EP Groups).

Source	Target	Weight
EPP	EFD	299
PES	EPP	290
ALDE	EPP	224
PES	EFD	91
ECR	NI	53
ALDE	PES	50
EPP	ECR	37
PES	Green-EFA	13
GUE-NGL	PES	8
Green-EFA	ECR	6
Green-EFA	EFD	6
ALDE	GUE-NGL	5
ALDE	ECR	4

Source: own calculation

Figure 5
The number of edges between EP Gorups

The results show the EPP-EFD relationship is the most frequent one in this network. The EPP-PES relationship takes the second place in the ranking. Therefore, the H2 hypothesis is rejected. It is important to note that EPP is part of the first three inter-group relationships in this network. These results are also reflected in Figure 4., where the edges between the EPP-EFD and the EPP-PES relationships are the 'thickest'.

The H3. hypothesis suggest that the ALDE EP group plays the most important role as an intermediary. This hypothesis can be checked by calculating the betweenness centrality index for each of the EP Groups. The results are summarised in Figure 6. below.

EP Groups	Betweenness Centrality
ECR	6,83
PES	3,83
ALDE	3,16
EPP	2,16
GreenEFA	1,66
EFD	0.33
NI	0.0
GUENGL	0.0

Source: own calculation

Figure 6
The role of EP Groups as intermediaries

It can be concluded from the results that unlike stated in the hypothesis, the ECR – European Conservatives and Reformists – Group plays the key intermediary –bridging – role from the EP Groups. The results mean that the ECR Group is most frequently on the possible shortest path between two nodes. Therefore, the H3 hypothesis can be rejected. As low betweenness centrality in this context can be interpreted as being peripheral, it can also be concluded that GUE-NGL, Non-Inscrits and EFD MEPs play a peripheral role. The above results are visualised on Figure 7 below.

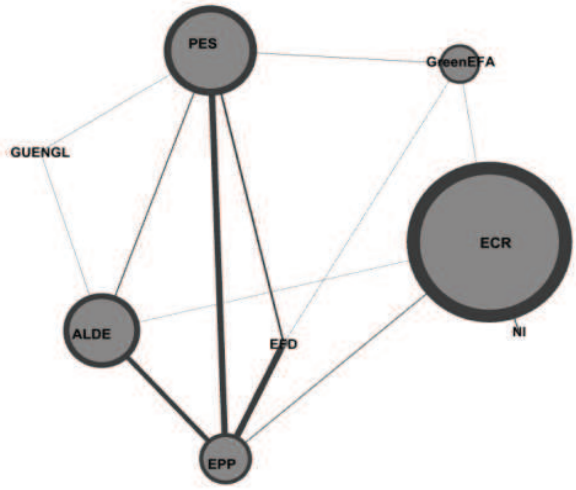

Figure 7
The relationship between EP Groups by betweenness centrality

According to the H4. hypothesis, MEPs from net contributor Member States form relationships with each other most frequently. This hypothesis can be justified by calculating the number of edges (relationship) between the nodes (Member States). The calculations in Figure 8. show that in the first 15 most frequent inter-group relationship only 4 Member States – Spain, Ireland, Slovenia, Portugal – can be found, which are not net contributor ones. The first 5 most frequent pairs, only net contributor Member States can be found. Therefore, it can be fairly stated that the relationships between net contributor Member States are the most frequent. It is interesting to note that all Member States on the first 15 places are members of the Eurozone and none of them is a Member States, which joined the EU in or after 2004. These results are also confirmed by Figure 4., where the strongest relationships between these pairs of Member States are visualised by the thickness of the relationship.

Source	Target	Weight
Austria	Germany	196
Sweden	United Kingdom	149
France	Belgium	110
Netherlands	Belgium	110
France	*Spain*	99
United Kingdom	France	99
United Kingdom	Germany	92
France	Cyprus	87
Austria	*Slovenia*	72
Ireland	Portugal	72
Italy	*Ireland*	70
Sweden	Germany	66
France	*Portugal*	58
Ireland	United Kingdom	55
Austria	Luxembourg	52

Source: own calculation

Figure 8
The number of edges between Member States

The H5. hypothesis states that cooperation between MEPs are mostly determined by ideological lines, therefore, national affiliation is a more fragmenting factor. With the tools of the network analysis, this statement can be best approached by comparing the 'graph density' and 'average path length' indices of each of the networks, i.e. the network of EP Groups as well as Member States.

As the results in Figure 9 show, both indices can be interpreted that the network of EP groups has a higher internal cohesion, i.e. the network of EP Groups are less fragmented. Higher graph density (0,464) in this case shows that EP Groups cooperate with each other more frequently in spite of ideological differences. Lower level of average path length also expresses that EP Groups are 'closer' to each other. On the other hand, this means that national differences – interest – can be better considered to be a fragmenting factor in the networks compared to ideological differences. In sum, H5 hypothesis is justified by the results.

Indicators	EP Groups	Member States
Graph Density	0,464	0,225
Average Path Length	1,64	2,04

Source: own calculation

Figure 9
Indicators to measure the internal cohesion of networks

8 Conclusions

The social network analysis of the decision-making of the European Parliament is a new experiment. However, the first results of this paper reveal that the role of the EP in EU legislation can be analysed with network analysis methods and these results can be interpreted in real life environment. The results make it possible to get a better insight into the role of EP in decision-making, both with regards the EP groups and also considering the nationality of the Members of the European Parliament.

The main conclusions of the analysis in this paper are that the most active EP group of the EP in the 2013 CAP reform was the EPP Group. As for Member States, although Germany was the second most active Member State, Ireland and France topped the two related rankings, respectively.

EPP was also the most active group in terms of the frequency of its relations with other EP Groups. EPP's relationships with EFD, PES and ALDE were the first three regarding the number of connections between two EP Groups. EPP was involved in almost 80% of all pairwise relationship between two EP Groups.

As for the bridging, or intermediary role of the EP Groups, surprisingly, the ECR Group was the most important EP Group in this particular aspect, overriding the socialist and liberal EP Groups.

Regarding the frequency of relationships between the Member States, the hypothesis has been confirmed that net contributor Member States dominate the EP decision-making. Out of the 15 most frequent relationship between MSs, in ten cases there were

not net beneficiary Member States. None of the net beneficiary MSs can be found in the top 5 relationship. Important to note that in the first 15 relationships, all the MSs are members of the Eurozone, and none of them is a new Member State (i.e. a Member State, which joined the EU in or after 2004).

Finally, the comparison of the network of EP Groups with that of the Member States' revealed that cooperation between EP Groups is more frequent than between Member States.

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