UNIVERSITY OF THE AEGEAN

DEPARTMENT OF FINANCIAL AND MANAGEMENT ENGINEERING

NETWORK ANALYSIS OF THE SPECIAL ISSUES EDITORIAL BOARDS IN MANAGEMENT OF TECHNOLOGY AND INNOVATION JOURNALS

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DIPLOMA THESIS

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February 15th 2018

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ΤΜΗΜΑ ΜΗΧΑΝΙΚΩΝ ΟΙΚΟΝΟΜΙΑΣ & ΔΙΟΙΚΗΣΗΣ

ΑΝΑΛΥΣΗ ΔΙΚΤΥΩΝ ΤΩΝ ΣΥΝΤΑΚΤΙΚΩΝ ΟΜΑΔΩΝ ΤΩΝ SPECIAL ISSUES ΣΤΑ ΠΕΡΙΟΔΙΚΑ ΔΙΟΙΚΗΣΗΣ ΤΕΧΝΟΛΟΓΙΑΣ ΚΑΙ ΚΑΙΝΟΤΟΜΙΑΣ

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ΔΡ. ΑΝΑΣΤΑΣΙΑ ΚΩΝΣΤΑΝΤΕΛΟΥ

SUMMARY

This diploma includes statistical analysis of 36 special issue journals that are published in the field of the Management of Technology and Innovation. The data which used in order to make this analysis were collected from SCImago Journal Rank list for 2015.

Thus, at start you will find a presentation of bibliometric characteristics of the special issues and afterwards you will find a brief descriptive statistical analysis for these journals which had common affiliations and editors.

Finally we created several networks of the journals that helped us analyze them. The characteristics of those networks (connectivity, degrees, centrality measures) are then analyzed.

ΠΕΡΙΛΗΨΗ

Στην παρούσα διπλωματική εργασία θα γίνει η στατιστική ανάλυση από 36 special issues επιστημονικών περιοδικών τα οποία έχουν δημοσιευθεί στην λίστα της SCImago Journal Rank στο πεδίο της διαχείριση τεχνολογίας και καινοτομίας για το έτος του 2015.

Αρχικά παρουσιάζουμε κάποια βιβλιογραφικά χαρακτηριστικά των περιοδικών και έπειτα ερευνούμε τις κοινές συγγραφικές επιτροπές αλλά και από που προέρχονται (δηλαδή που εργάζονται) οι συγγραφείς αυτών των περιοδικών με την χρήση της περιγραφικής στατιστικής.

Τέλος δημιουργήσαμε κάποια δίκτυα τα οποία μας βοήθησαν στην ανάλυση των περιοδικών. Τα χαρακτηριστικά αυτών των δικτύων είναι (connectivity, degrees, centrality measures).

ACKNOWLEDGMENTS

I would first like to express my deepest gratitudeto my thesis advisor Dr. Dimosthenis Drivaliaris of the Department of Financial and Management Engineering at University of the Aegean. Dr. Drivaliaris was always willing to help me with the problems that I phased in this diploma thesis. I would also like to thank the two fellow students Lila tsopelakou and Konstantinos Danelian who collected and checked with me the data we use in this diploma thesis. Finally I would like to thank my parents because without their help I would never be able to have the opportunity to spend the time that was needed in order to create this thesis.

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INTRODUCTION

This thesis examines the editorial boards, the journals and the affiliations of the special issues which are published from the scientific journals in the field of management of technology and innovation from the list of the SCImago 2015. The goal of this thesis is to make a brief statistical analysis of the journals in the category of management of technology and innovation for 2015 by analysing the journals network.

For the sake of a better understanding we shall explain exactly the steps which had been followed. At start we formed a team of three students, we together gathered a list from sci magor in the field of technology and innovation of the year 2015. Out of this list I collected the journals which had published at least one special issue paper during the year I when I had the information I needed I started the statistical analysis which will be shown afterwards in the thesis.

OVERVIEW OF THE THESIS

The diploma thesis is divided in three chapters. The first chapter is the introductory chapter. The second chapter is the special issues overview which elaborates the statistical analysis of the special issues that has been published during the year 2015 from the list of the SCImajo. Finally chapter 3 describes the network of the journals, in the SCImago list and examines which journals are more centralized, using different type of network measurements. Generally, the in order to tackle the most important journals in that field the most important measures calculated was degree, eigenvector and PageRank. SJR and H-Index rank are important as well.

CHAPTER 2

Special issues 2015 SCImago [management of technology and innovation].

In this chapter will be elaborated the statistical analysis of the special issues that has been published during the year 2015 from the list of the SCImajo. The first think that comes in mind is what a special issue is. Special issues contain collections of papers on a specific topic. They are compiled by editors who are responsible for the selection of contributions to a special issue. Note that all special issue papers can also be found as ordinary contributions in the economics discussion Paper series or as journal articles in economics [1]. Thus, the main reason that journals publish a special issue is because they want to give an answer to a specific problem that they face in the field of management of technology and innovation so it is clear that special issues are closer to real time publishing than the regular paper that every journal publishes.

(Tools we used for the analysis)

In order to move on with the analysis should be mentioned that in many cases we had to divide our data into quartiles in benefit of a better analyze of the data. 'In descriptive statistics, the quartiles of a ranked set of data values are the three points that divide the data set into four equal groups, each group comprising a quarter of the data. A quartile is a type of quantile. The first quartile (Q1) is defined as the middle number between the smallest number and the median of the data set. The second quartile (Q2) is the median of the data. The third quartile (Q3) is the middle value between the median and the highest value of the data set.'[2]. Thus, the quartiles we created are divided as their SJR-ranking from largest to smallest. 'The SCImago Journal & Country Rank is a publicly available portal that includes the journals and country scientific indicators developed from the information contained in the scopus database (Elsevier B.V.). These indicators can be used to assess and analyse scientific domains. Journals can be compared or analysed separately. Country rankings may also be compared or analysed separately. Journals can be grouped by subject area (27 major thematic areas), subject category (313 specific subject categories) or by country. Citation data is drawn from over 21,500 titles from more than 5,000 international publishers and country performance metrics from 239 countries worldwide. The SJCR allows you also to embed significative journal metrics into your web as a clickable image widget'[3]. Moreover, we used to programs so as to make the graphs of the analysis, the first is excel and the second one is R-programming. The graphs we used are (histograms, columns graphs, boxplots, line plots and scatter plots).

1. **Histogram**: A histogram is a graphical representation of the distribution of numerical data. It is an estimate of the probability distribution of a continuous variable (quantitative variable) and was first introduced by Karl Pearson. It is a kind

of bar graph To construct a histogram, the first step is to "bin" the range of values—that is, divide the entire range of values into a series of intervals—and then count how many values fall into each interval. The bins are usually specified as consecutive, non-overlapping intervals of a variable. The bins (intervals) must be adjacent, and are often (but are not required to be) of equal size [4].

2. **Columns graphs**: A bar chart or bar graph is a chart or graph that presents grouped data with rectangular bars with lengths proportional to the values that they represent. The bars can be plotted vertically or horizontally. A vertical bar chart is sometimes called a Line graph. A bar graph is a chart that uses either horizontal or vertical bars to show comparisons among categories. One axis of the chart shows the specific categories being compared, and the other axis represents a discrete value. Some bar graphs present bars clustered in groups of more than one [5].

3. **Boxplots**: In descriptive statistics, a Box-Plot or Box-and-Whiskers-Diagram is a convenient way of graphically depicting groups of numerical data through their quartiles. Box plots may also have lines extending vertically from the boxes (whiskers) indicating variability outside the upper and lower quartiles, hence the terms box-and-whisker plot and box-and-whisker diagram. Outliers may be plotted as individual points. Box plots are non-parametric: they display variation in samples of a statistical population without making any assumptions of the underlying statistical distribution. The spacings between the different parts of the box indicate the degree of dispersion (spread) and skewness in the data, and show outliers. In addition to the points themselves, they allow one to visually estimate various L-estimators, notably the interquartile range, midhinge, range, mid-range, and trimean. Box plots can be drawn either horizontally or vertically. Box plots received their name from the box in the middle [6].

4. **Line graph**: In the mathematical discipline of graph theory, the line graph of an undirected graph G is another graph L(G) that represents the adjacencies between edges of G. The name line graph comes from a paper by Harary & Norman (1960) although both Whitney (1932) and Krausz (1943) used the construction before this. Other terms used for the line graph include the covering graph, the derivative, the edge-to-vertex dual, the conjugate, the representative graph, and the 9-obrazom, as well as the edge graph, the interchange graph, the adjoint graph, and the derived graph [7].

5. **Scatter plot:** A scatter plot (also called a scatter graph, scatter chart, scattergram, or scatter diagram) is a type of plot or mathematical diagram using Cartesian coordinates to display values for typically two variables for a set of data. If the points are color-coded, one additional variable can be displayed. The data is displayed as a collection of points, each having the value of one variable determining the position on the horizontal axis and the value of the other variable determining the position on the vertical axis [8].

Purpose of the chapter

The aim of this chapter as was previously mentioned is to analyze these special issues. Before we start the analysis we should mention the way that these data were collected before gathered into tables. This information was not gathered into a database, thus a team from students was recruited during the year 2016 in order to form tables which gathered it, ending with a total number of 151 journals. In the next two pages there is the table that we formed in benefit of analysing the special issues. This table has 10 columns with the (title, publisher1, publisher 2, special issues, special issue papers, SJR, sjr-ranking, H-index, H-index ranking).

1. **Title:** is the name of the journal
2. **Publisher1,Publisher2:** are the publishing houses that publish the journals
3. **Special issues**: we explain what special issues are in first paragraph
4. **Special issue papers**: is the number of the papers that journals publish
5. **special issues papers pages :** is the number of the pages that the papers have.

(Results of the table of special issues)

The result that came out of the analysis of the table is that we have 78 special issues journals out of 151. That means that the 52% of the whole list's journals have at least published one special issue on the field of management of technology and innovation thus, one out of 2 journals has published at least one special issue.

Special issues analysis

(Special issues per journal)

Because some journals have more than one special issue we are going to examine the whole data together. In order to start the analysis for the special issues the first step we did to get closer to a deeper analysis was to make a graph with the number of the special issues that the journals published. Thus, below we can find the graph that we used in order to count how many special issues were published per journal during the year 2015. In the axis X we see the number of the special issues and on the axis Y we have the journals. We decided in the favor of a better explanation of our data that we should sort this list from largest to smallest. We see that most of the data has only publish 1 special issue, moreover second in population come the journals with 2 special issues, finally the rest journals are much smaller than the rest of the two other data thus.

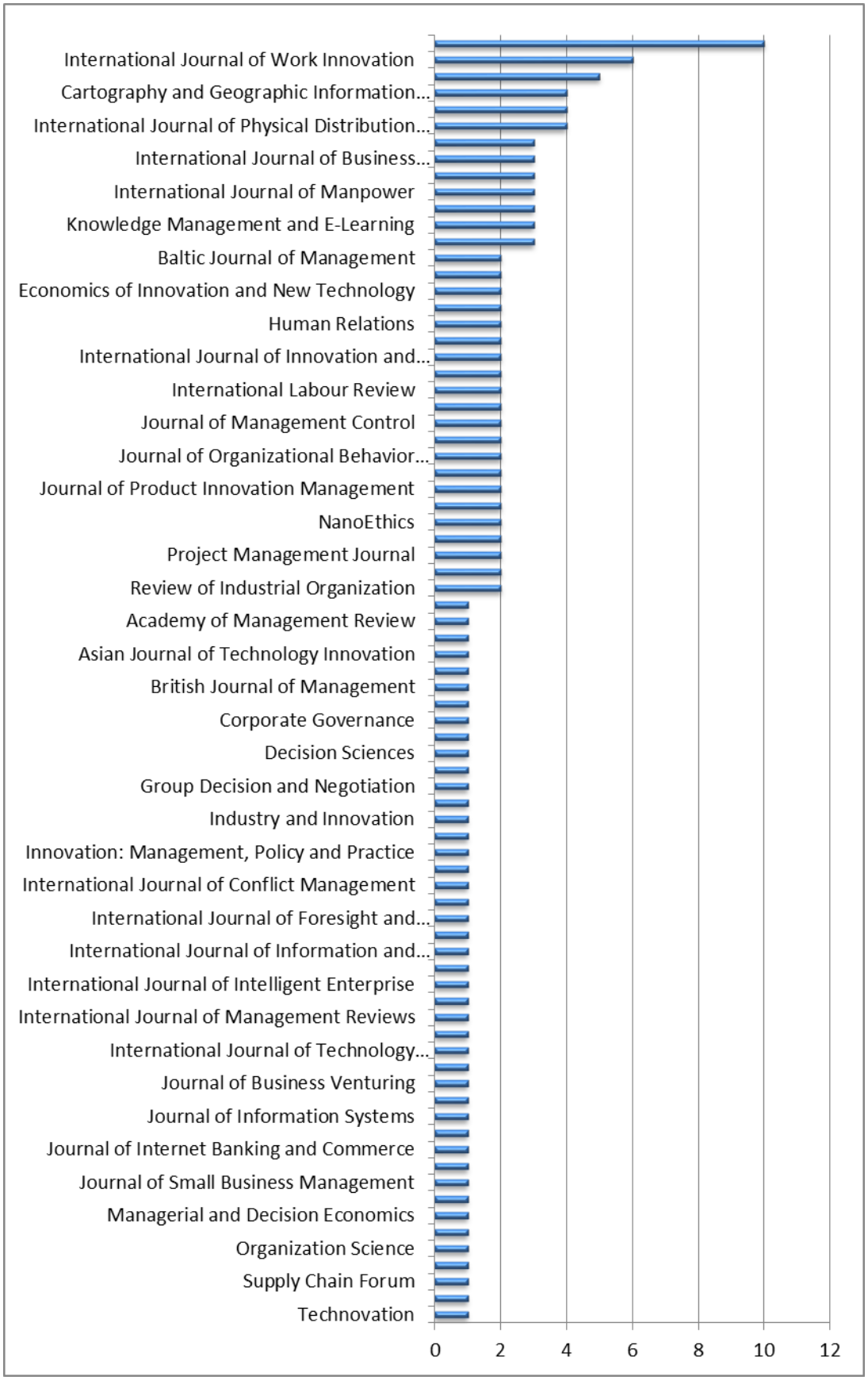


Figure 2.1. 1 special issues per journals

(Frequency of special issues)

From the analysis that was made before we saw how many special issues we have per journal but we could not understand exactly the how the data are distributed. Therefore we made a frequency diagram with the percentage so as to see exactly the distribution of the data. On the axis X we have 5 classes and on the axis Y we have the summary of the special issues. We noticed before they vast majority of our data (83% with 65 journals) have publish only 1or 2 special issue (12% with 10 journals) 2 or 4 special issues, moreover 4 to 6 special issues were published from only 2 journals 2.5%, additionally from 6 to 8 we had no publish, finally one journal (1.2%) was only published 8-10 special issues.

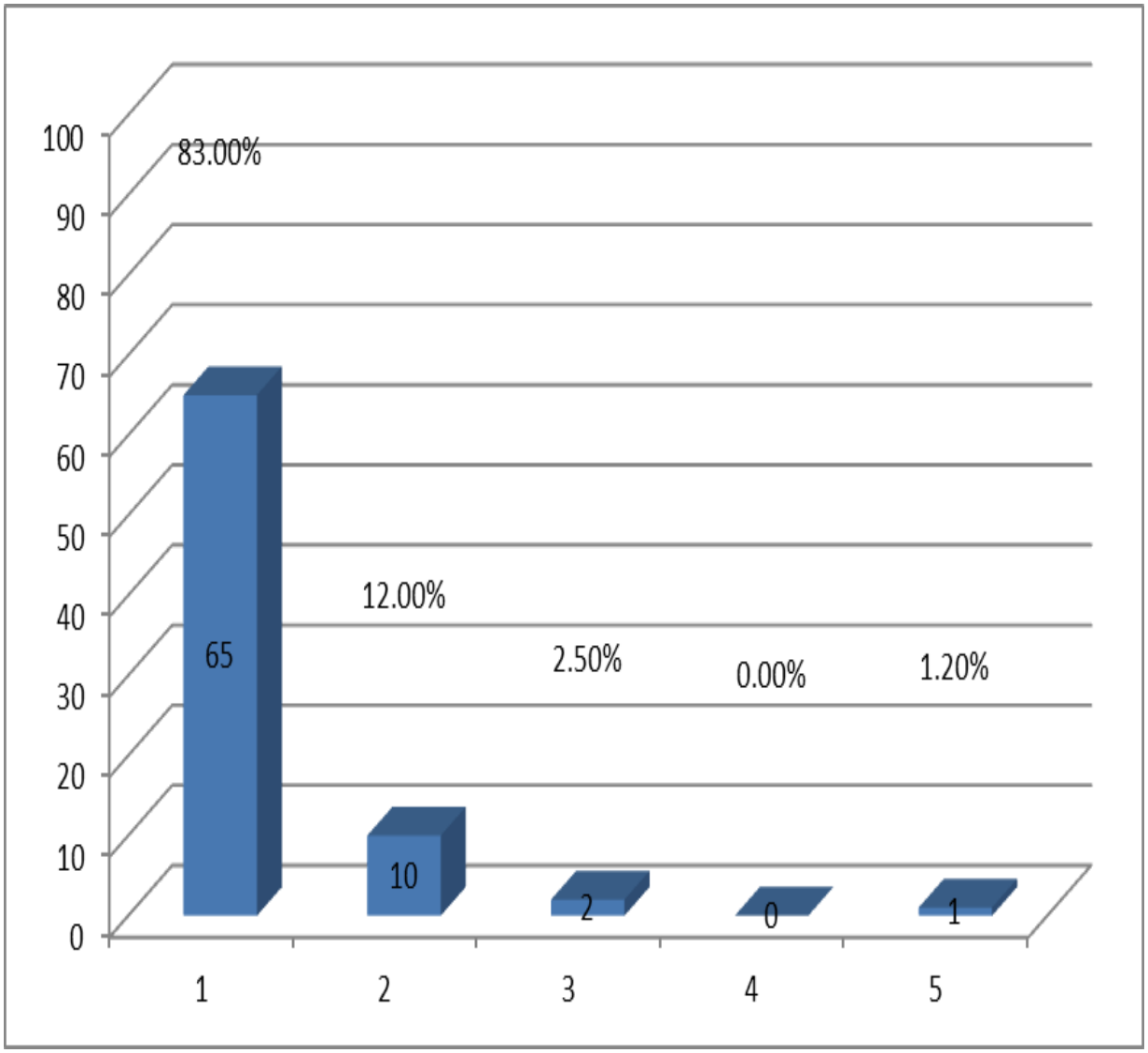


Figure 2.1. 2

1(0-2) 2(2-4) 3(4-6) 4(6-8) 5(8-10)

(Special issues papers per journal)

(Special Issue Papers count)

First of all we shall know what these papers which are published in this field are. A scientific paper is a written and published report describing original research results. That short definition must be qualified, however, by noting that a scientific paper must be written in a certain way and it must be published in a certain way, as defined by three centuries of developing tradition, editorial practice, scientific ethics, and the interplay of printing and publishing procedures [11]. The first step we did in order to analyse the papers of the special issues was to make the column chart with the number of the papers. On the axis X we have the number of the papers and on the axis Y we have the journals. Exactly like before we see that the greater part of the data has low number of papers.

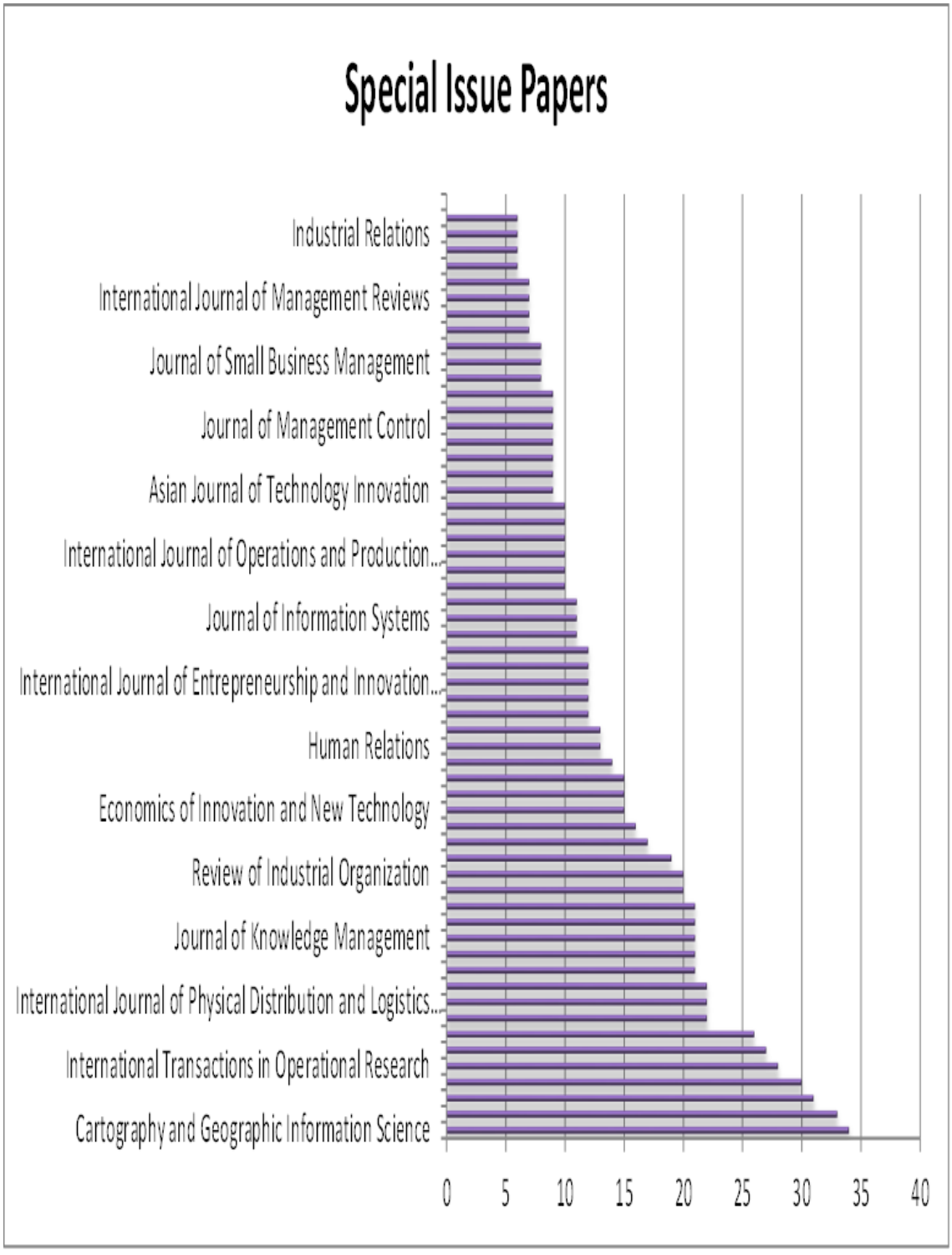

Special Issue Papers
Industrial Relations
International Journal of Management Reviews
Journal of Small Business Management
Journal of Management Control
Asian Journal of Technology Innovation
International Journal of Operations and Production...
Journal of Information Systems
International Journal of Entrepreneurship and Innovation...
Human Relations
Economics of Innovation and New Technology
Review of Industrial Organization
Journal of Knowledge Management
International Journal of Physical Distribution and Logistics...
International Transactions in Operational Research
Cartography and Geographic Information Science
0
5
10
15
20
25
30
35
40

Figure 2.1. 3

(Frequency Special Issue Papers count)

In addition, we made a frequency graph so as to make clear how the data is distributed because we obviously could not come to a safe conclusion with the previous analysis. Thus, from the frequency chart and the table below we come to the conclusion that the vast majority of the journals' papers are between 1 and 20 pages (76.9%), with 17 (21.5%).

(Frequency Chart with special issues papers)

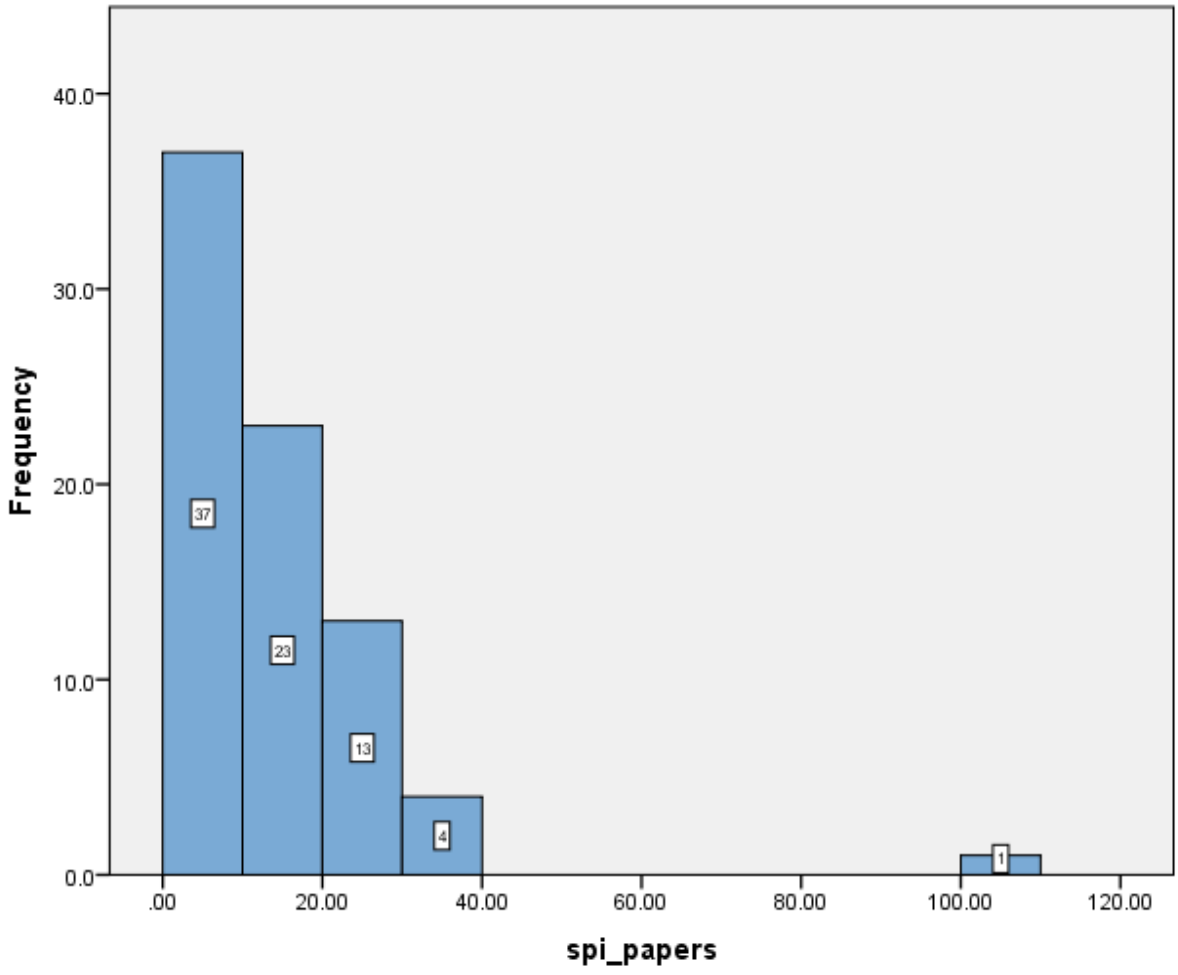


Figure 2.1 .4

Boxplots (special issues papers, regular issues papers)

What's more we want to check if the the special issues or the regular issues usually publish more papers. In order to see that we created two box plots to analyze them. Thus, with the help of the graph and the table below we came into the conclusion that special issues publish defiantly more papers than regular, to be more exact the median of the special issues papers is 10 when in the regular papers is 4.

(Table of the analysis)

	special papers	regular ALL papers
min	1	1
Q1	6	4
median	10	4
Q3	16.75	6
max	34	24

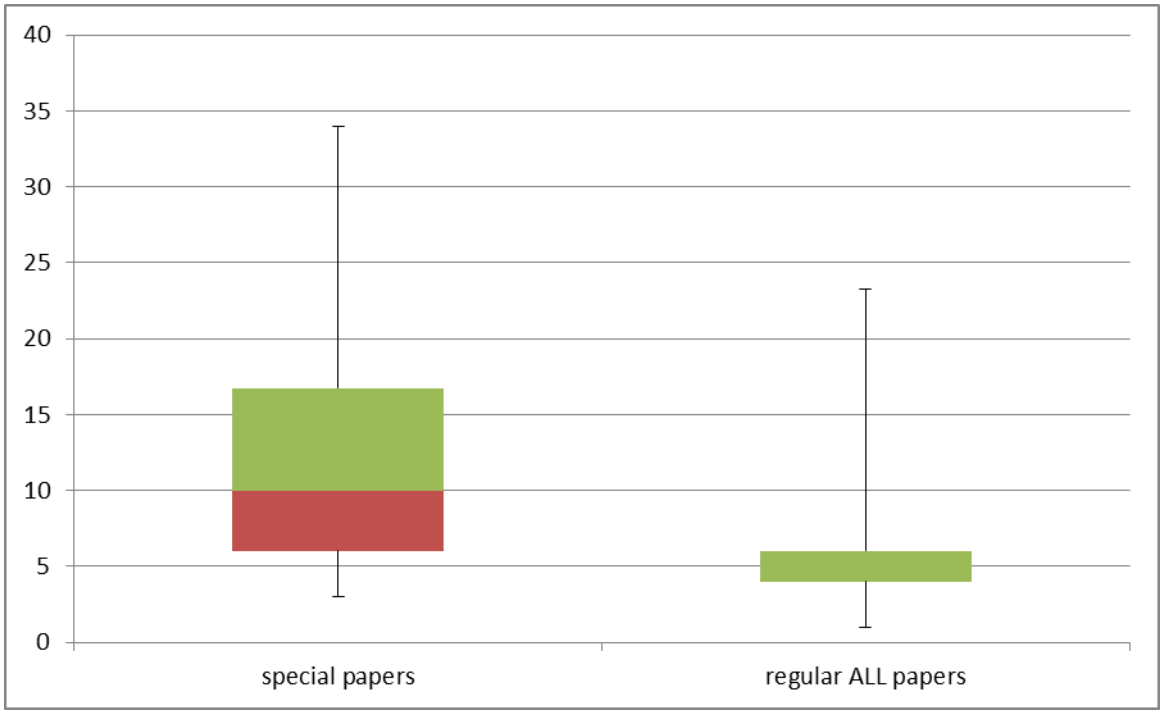


Figure 2.1 .5

(Special issue pages)

This time we have less 3 journals because we weren't able to find the pages of the special issues. On the axis X we have the number of the pages on the axis Y we have the journals' name. In the new page there is the graph where we have the analytic results. Now it is even more difficult to have an accurate analysis because this times we have pages thus, we are dealing with bigger numbers than before, although we can see that the tendency of the growth of numbers is much smaller than before.

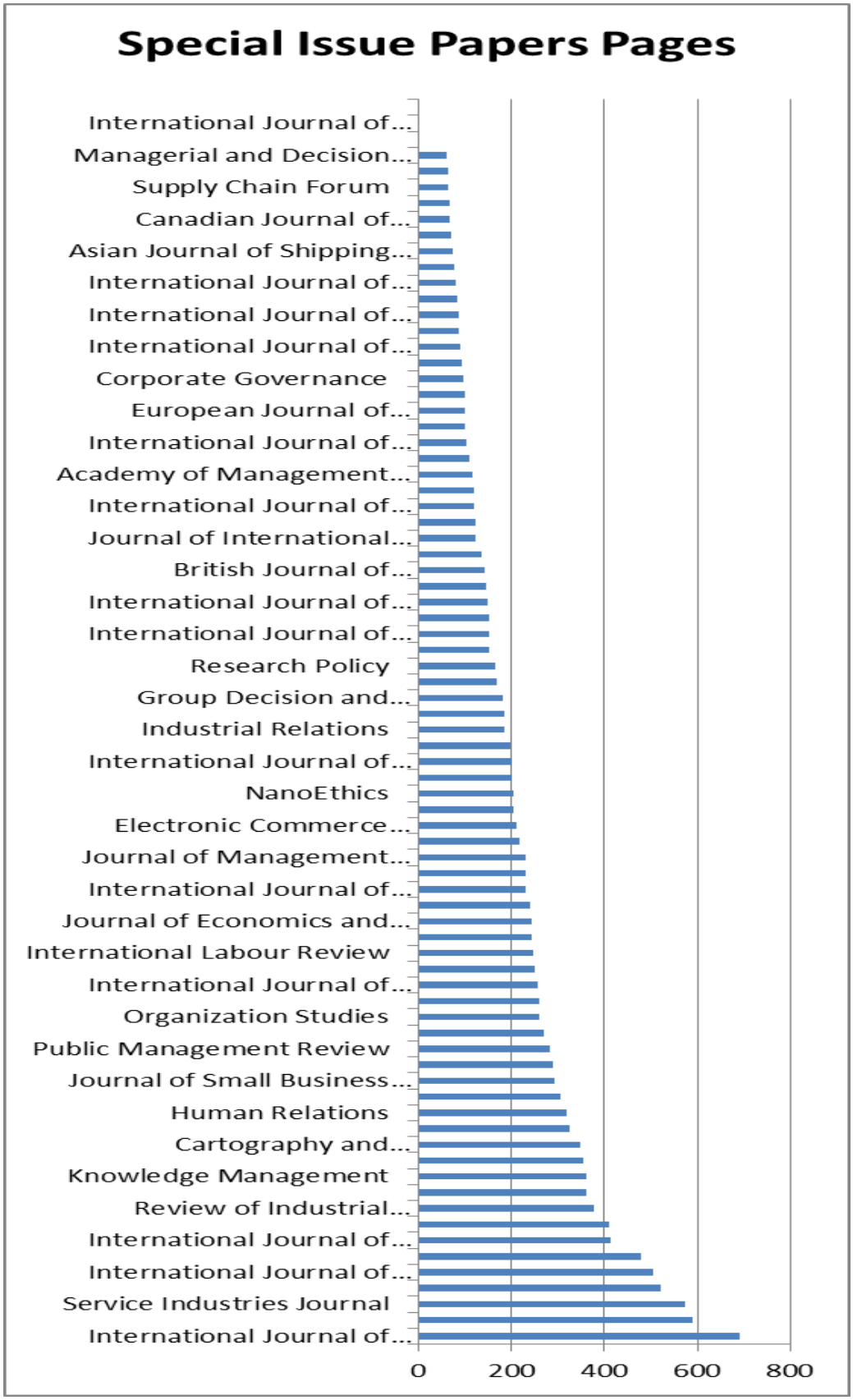

Special Issue Papers Pages
International Journal of...
Managerial and Decision...
Supply Chain Forum
Canadian Journal of...
Asian Journal of Shipping...
International Journal of...
International Journal of...
International Journal of...
Corporate Governance
European Journal of...
International Journal of...
Academy of Management...
International Journal of...
Journal of International...
British Journal of...
International Journal of...
International Journal of...
Research Policy
Group Decision and...
Industrial Relations
International Journal of...
NanoEthics
Electronic Commerce...
Journal of Management...
International Journal of...
Journal of Economics and...
International Labour Review
International Journal of...
Organization Studies
Public Management Review
Journal of Small Business...
Human Relations
Cartography and...
Knowledge Management
Review of Industrial...
International Journal of...
International Journal of...
Service Industries Journal
International Journal of...
0
200
400
600
800

Figure 2.1. 6

(Frequency table of pages)

As we notice from the frequency table below we see from normal distribution that we have most of our papers in the first 2 classes more specific in the first class we have 40 papers 0-200 pages (51%), 29 papers 200-400 (37.1%). Finally the last class has only 8% and we also see that there is one outlier here with 691 pages.

(Frequency table)

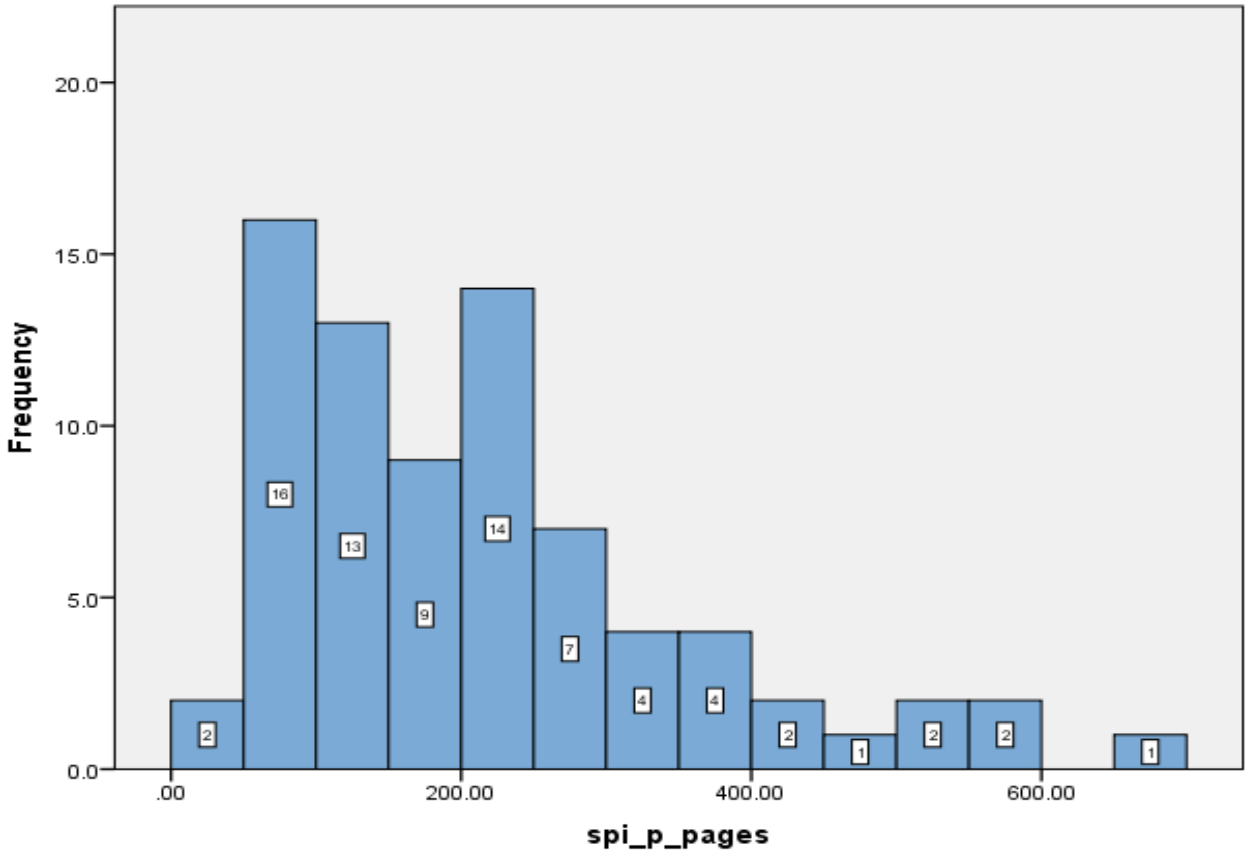


Figure 2.1. 7

CHAPTER 3 NETWORKS

Introduction

A network is, in its simplest form, is a collection of points joined together in pairs by lines. In the jargon of the field the points are referred to as vertices' or nodes and the lines are referred to as edges [12]. In this chapter a brief statistical analysis of two different networks was made the first network is an analysis between journals and editors and the second one is an analysis between journals and affiliations. First things first in order to gather the data we had to make an excel sheet which contained a table of three columns (Surname, journal, affiliation) and 314 editors out of this table we took the data in order to make the two networks below, in the end of the chapter you will find the tables in order to check the data by yourself. The first table with all the data is the fig. (3.1.1)

First network journals with editors

Undirected Unweight Network

Moreover, we needed to visualize the matrices so we used gephi (an open source free in public program). So as to make it happen we needed to create a 75x75 unweighted network. Finally the new update in gephi assorts the journals with connection thus, we ended up with a smaller table only with the journals we needed. It should be mentioned that our network consists of 3 edges and 6 nodes (fig 3.1.2). Furthermore we needed a visual analysis so, in order to make the network we used the Gephi and we choosed the force atlas layout.

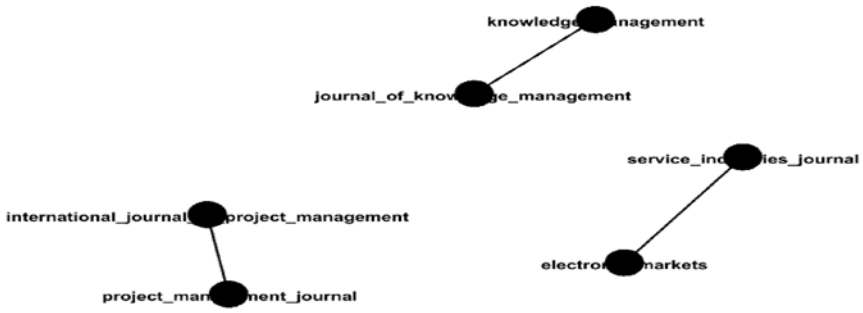


Figure 3.1. 1

Force atlas layout from Gephi network 1 journals-editors

Connected Components

A component is a network's subgroup that all its elements are connected. In this subgroup no other element can be added (vertex). According to Newman every network has the central component where most vertices are connected. In the next graph it is shown which journals are connected to each other and the central component will be visualized. In our case we have 3 small deferent components with only 2 journals in each team.

Degree

The variable degree distinguishes the centre and the periphery of our data. In our case we have equal amount of data in each group thus the degree is the same for all of our data so they all have 1 degree.

Eccentricity

Eccentricity is the max distance of the nodes which are connected to each other in the network. This time we also have equally distributed data thus they all have 1.

Closeness centrality

Closeness centrality of a node is a measure of centrality in a network, calculated as the sum of the length of the shortest paths between a node and all other nodes in the graph. That means the more central a node is, the closer it is to all other nodes. It can be regarded as a measure of how long it will take to an editor to interact with another editor. As before we notice that the data we have follow exactly the same path so we have closeness centrality same for all of our data 1 again.

Harmonic closeness centrality

Harmonic closeness centrality can be described as the de normalized reciprocal of the arithmetic mean of distances, whereas harmonic centrality is the de normalized reciprocal of the harmonic mean of distances. The harmonic centrality reverses the sum and reciprocal operations in the definition of closeness centrality. In this example also we have the same results with the variable getting the price 1 so we are in the same range as before.

Betweeness centrality

Betweenness centrality is a measure of centrality in a graph based on shortest paths. For every pair of nodes in a connected graph, there is at least one shortest path between the nodes such as the number of edges. The betweenness centrality for each node is the number of the shortest paths for every node. Betweeness in this example in 0 for all the 6 journals we see that we have this weird result here because the nodes have the same distance from each other.

Page rank

PageRank is an algorithm created by google and it works by counting the number and quality of links to a page to determine a rough estimate of how important the website is, thus we see that these six journals are all of them at the same level.

Clustering Coefficient

In graph theory, a clustering coefficient is a measure of the degree to which nodes in a graph tend to cluster together. Evidence suggests that in most real-world networks, and in particular social networks, nodes tend to create tightly knit groups characterised by a relatively high density of ties; this likelihood tends to be greater than the average probability of a tie randomly established between two nodes thus, in this example we have no relations between our data [13].

Triangles

In the mathematical field of graph theory, the triangle graph is a planar undirected graph with 3 vertices and 3 edges,in the form of a triangle thus as it is noticeable from the network we have no triangles also [14].

Complonents

In mathematics and computer science, **connectivity** is one of the basic concepts of graph theory: it asks for the minimum number of elements (nodes or edges) that need to be removed to disconnect the remaining nodes from each other.It is closely

related to the theory of network flow problems. The connectivity of a graph is an important measure of its resilience as a network [15].

Modularity class

Modularity is one measure of the structure of networks or graphs. It was designed to measure the strength of division of a network into modules (also called groups, clusters or communities). Networks with high modularity have dense connections between the nodes within modules but sparse connections between nodes in different modules. Modularity is often used in optimization methods for detecting community structure in networks. Finally modularity is the fraction of the edges that fall within the given groups minus the expected fraction if edges were distributed at random [16]. In this case we notice that in the first 2 journals we have 0 modularity afterwards in the next 2 we have 1 and finally in the last 2 journals we end up with 2.

Second Network journals-affiliations

Undirected Unweight Network

In the second part of this chapter there will be one more network which include the variables ‘journals’ and ‘affiliations’. This time we are going to check how the journals are connected throughout the affiliations in our data. Now the journals are again the nodes and the edges are the affiliations. We have now 36 nodes and 37 edges (fig 3.1.3)

Component number

As it was mentioned before component is a network’s subgroup that all its elements are connected. In the next graph it is shown which journals are connected to each other and the central component will be visualized. We see now that we have 6 different groups with the total number of 36 journals. 0 have no connection between them the goup with the biggest count of journals is the group with number 1 with 22 journals which is 61% of the whole data.The second group with total 5 journals and 13.8%. in 3rd group has 3 so 8% of the data. Finally 3 other groups have only 2 journals thus we have 5% for each one.

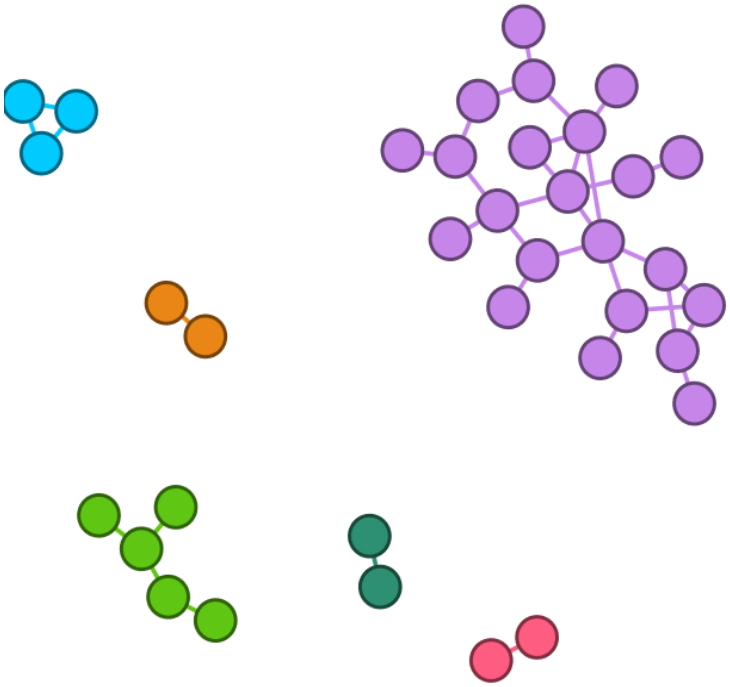
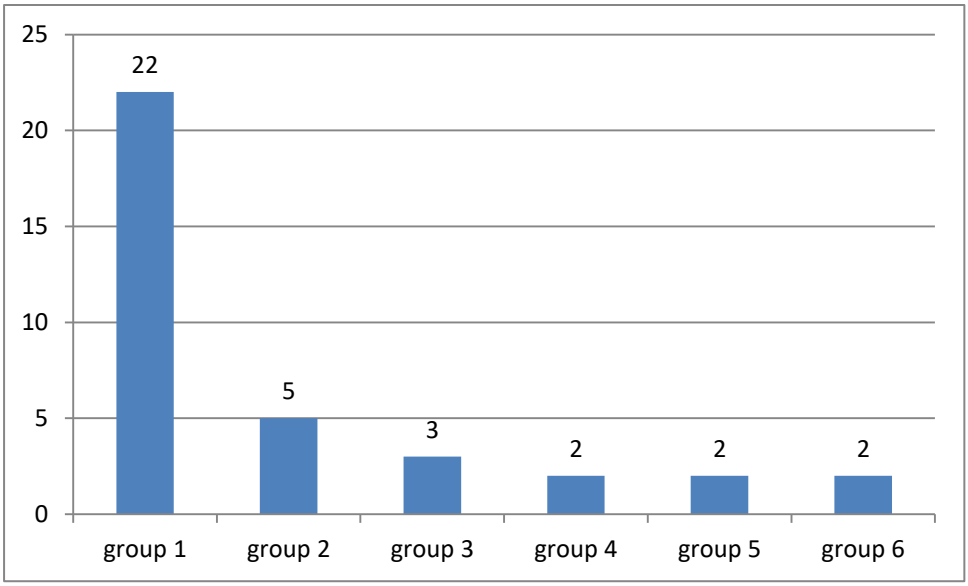


Figure 3.1. 2

gephi force atlas analysis network 2 journals-affiliations



Degree

Degree is a valuable variable which gives the number of edges lines. Thus now we will examine how many connections every journal has. As it is shown from the network bellow we have 5 different degrees.The vast majority of the journals (17 out of the 36 47.2%) has degree 1 that means that they have 1 only connection with other journals. Additionally 7 journals (19.4%) have degree 2, 8 (22.22%) have 8, only 1 with (2.77%) have 4 degree and 3 with (8.33%) have degree 5. We also see that the median is 2 the minimum is 1 the maximum is 5 and the vast majority of our data nearly 90% is between 1 and 3.

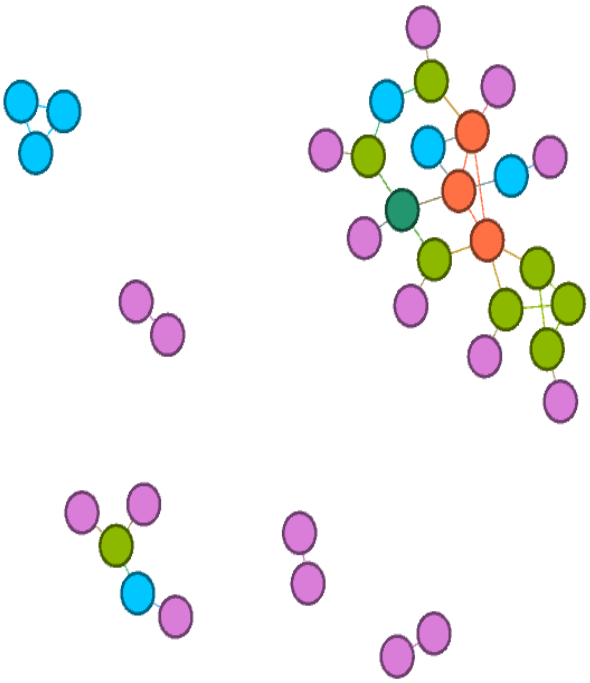


Figure 3.1. 3

Network colored based of degrees

degree	frequency of journals	percentages
1	17	47.22
2	7	19.44
3	8	22.22
4	1	2.77
5	3	8.33
sum	36	

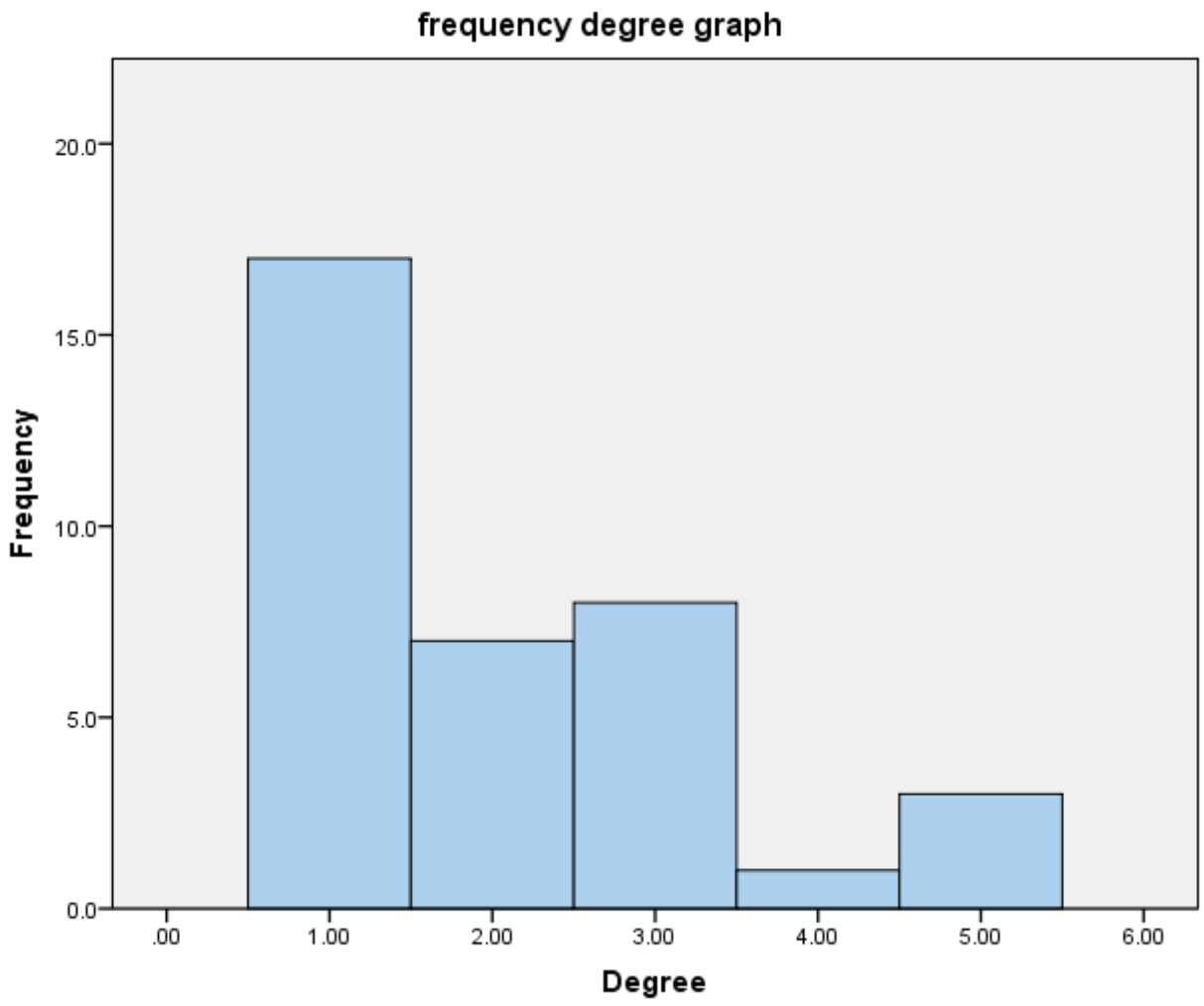


Figure 3.1. 4

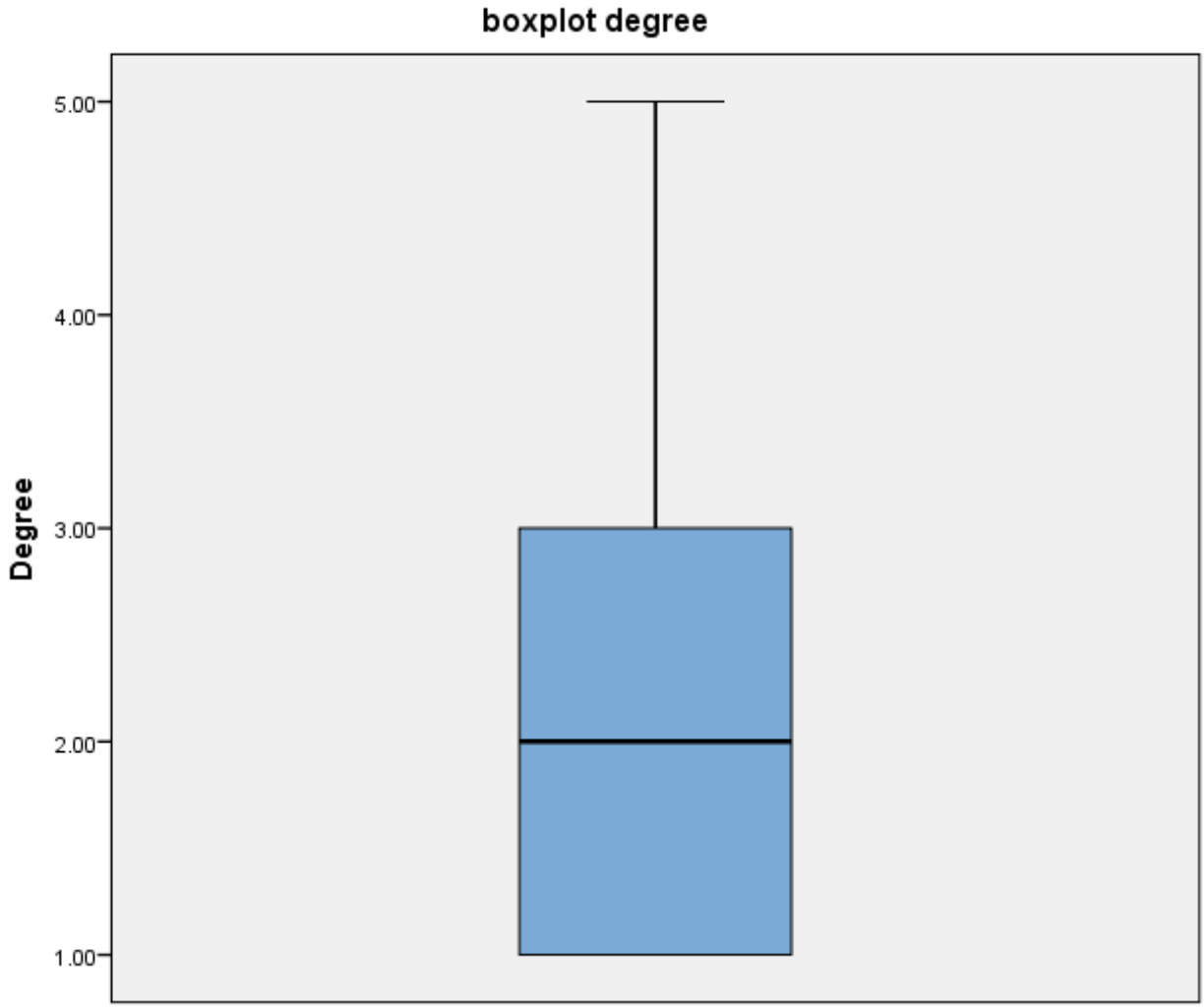


Figure 3.1. 5

Modularity

Modularity measures how a network is divided into modular communities. In this example we have 9 different communities. Community 0 has 11.11%, 1 has 19.44, 2 has 8.33, 3 has 16.66, 4 has 13.88, 5 has 13.88, (6, 7 and 8) have 5.55). bellow you will find the network, a table with the values, analytical tables(fig. 3.1.5) with journals and a bar graph of the modularity. From the boxplot we can see that the maximum value is 8 min value is 0 and median is 3.27.

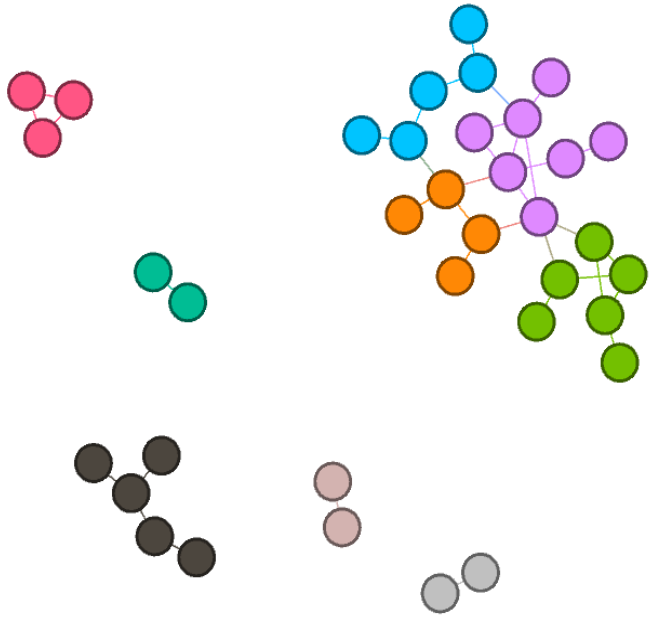


Figure 3.1. 6

Modularity network gephi

modularity_class	count	percentages	sum degree
0	4	11.11	9
1	7	19.44	21
2	3	8.33	6
3	6	16.66	14
4	5	13.88	10
5	5	13.88	8
6	2	5.55	2
7	2	5.55	2
8	2	5.55	2

sum journals	36

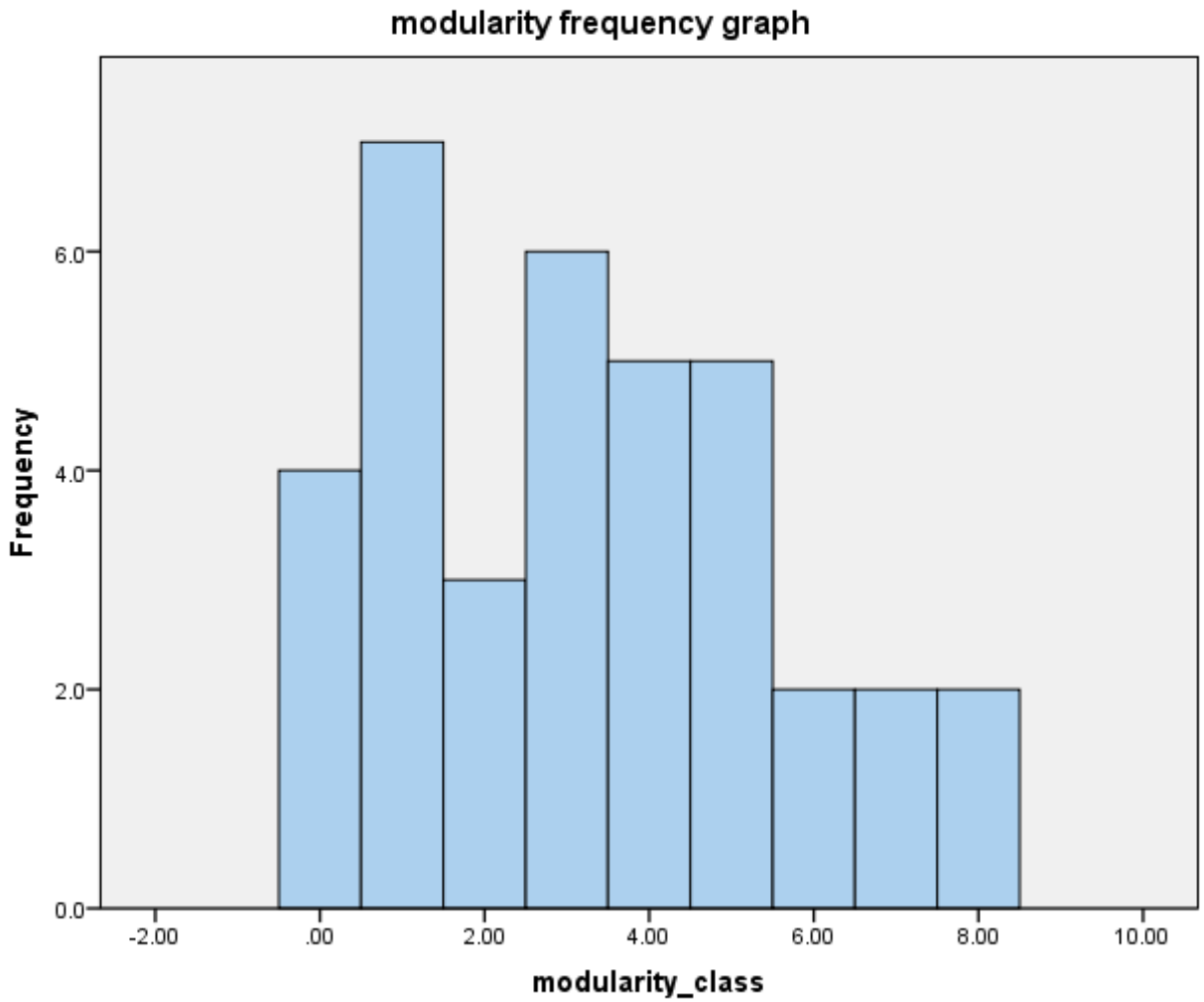


Figure 3.1. 7

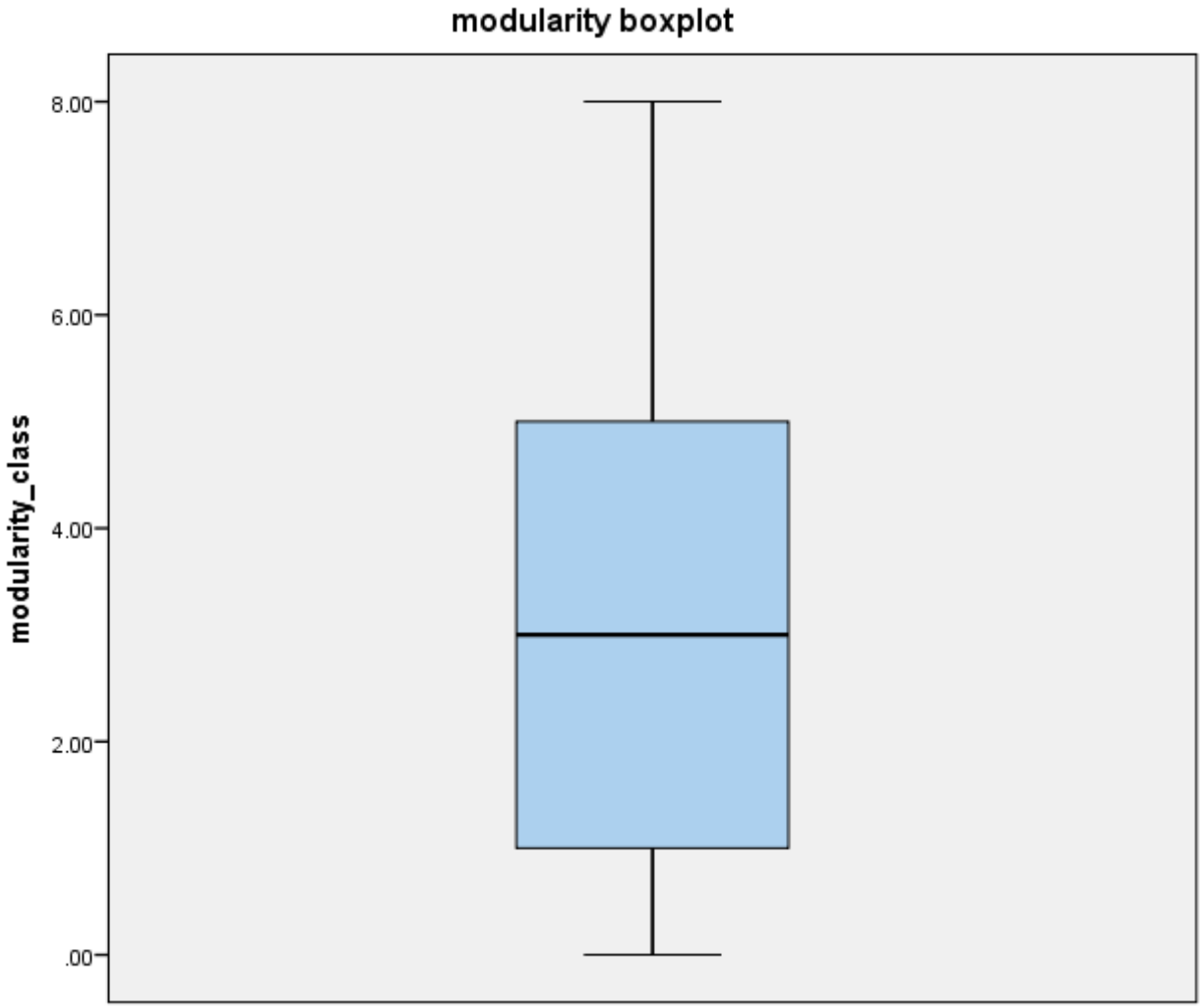


Figure 3.1. 8

Clustering or clustering coefficients

The clustering coefficient (Watts-Strogatz) is the average clustering coefficient over all of the nodes in the network. In effect, it measures the density of triangles in the networks and it is of interest because in many cases it is found to have values sharply different from what one would expect on the basis of chance.(1). The are two Two versions of this measure exist: the global and the local. The global version was designed to give an overall indication of the clustering in the network, whereas the local gives an indication of the embeddedness of single nodes[Wikipedia]. The number of triangles refers to global clustering and the clustering coefficient refers to local clustering. The global clustering coefficient is based on triplets of nodes. A triplet consists of three connected nodes. A triangle therefore includes three closed triplets, one centered on each of the nodes (this means the three triplets in a triangle come from overlapping selections of nodes). The global clustering coefficient is the number of closed triplets (or 3 x triangles) over the total number of triplets (both open and closed).

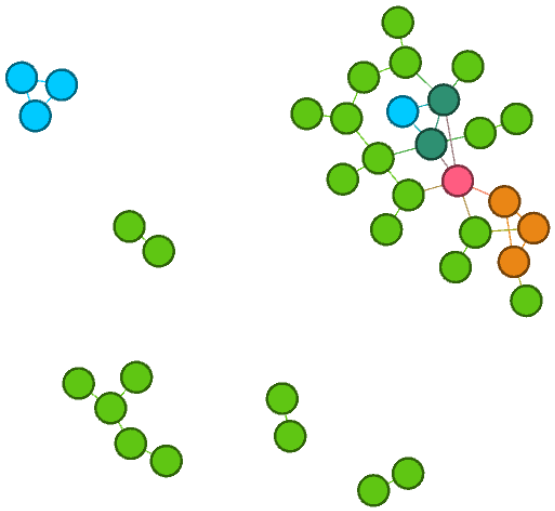


Figure 3.1. 9

Clustering coefficients network

Triangles

In order to check the distribution of the triangles we created a bar and a boxplot chart. We see that 22.22% have 1 triangle and 5.55% 2. From the boxplot we see that the max is 2 min is 0 mean 0.33 and median is 0.

triangles	count	percentage
0	26	72.22%
1	8	22.22%
2	2	5.55%

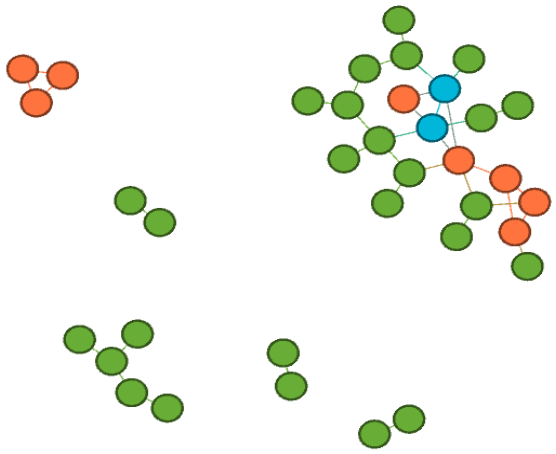


Figure 3.1. 10

Triangles gephi network

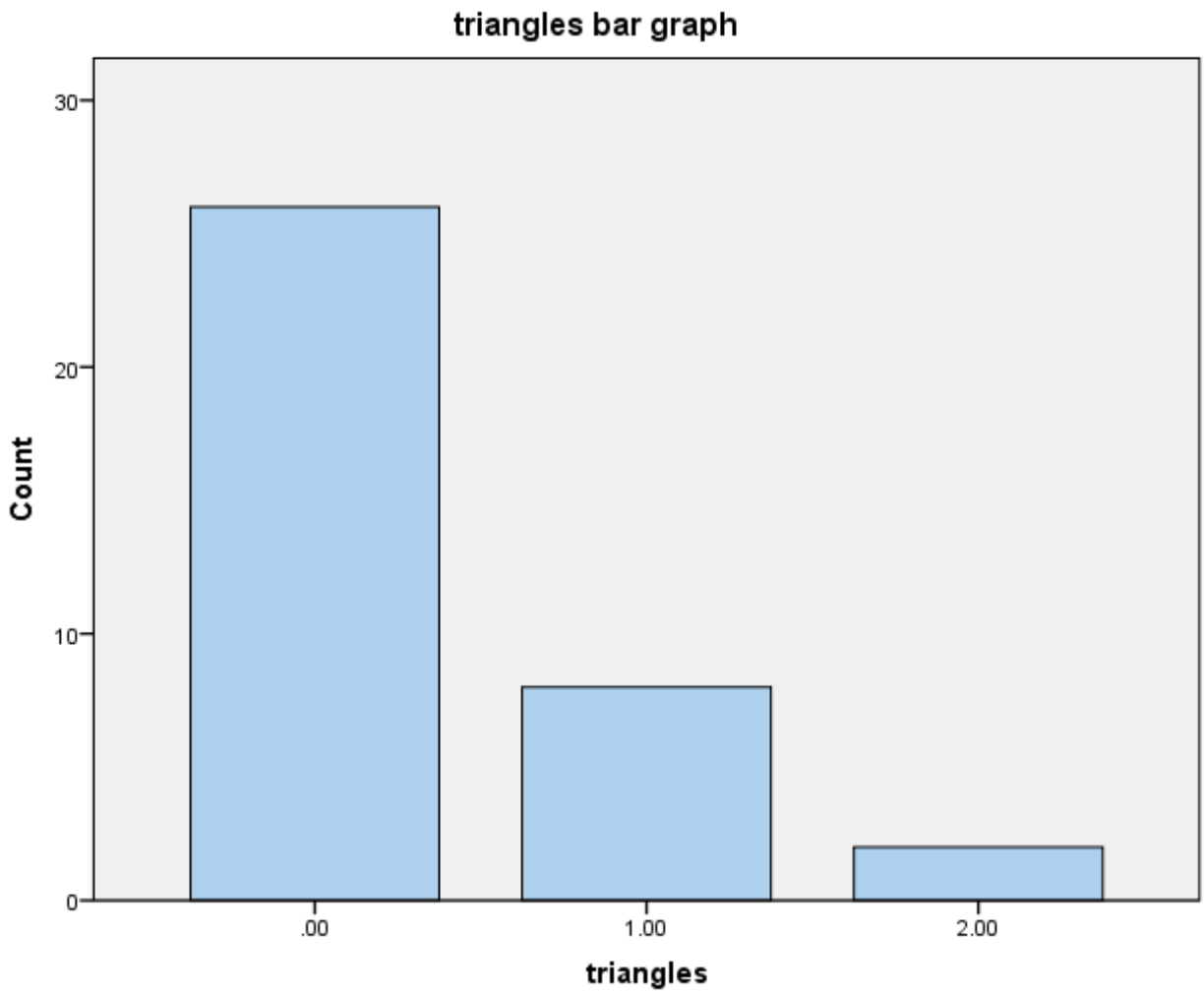


Figure 3.1. 11

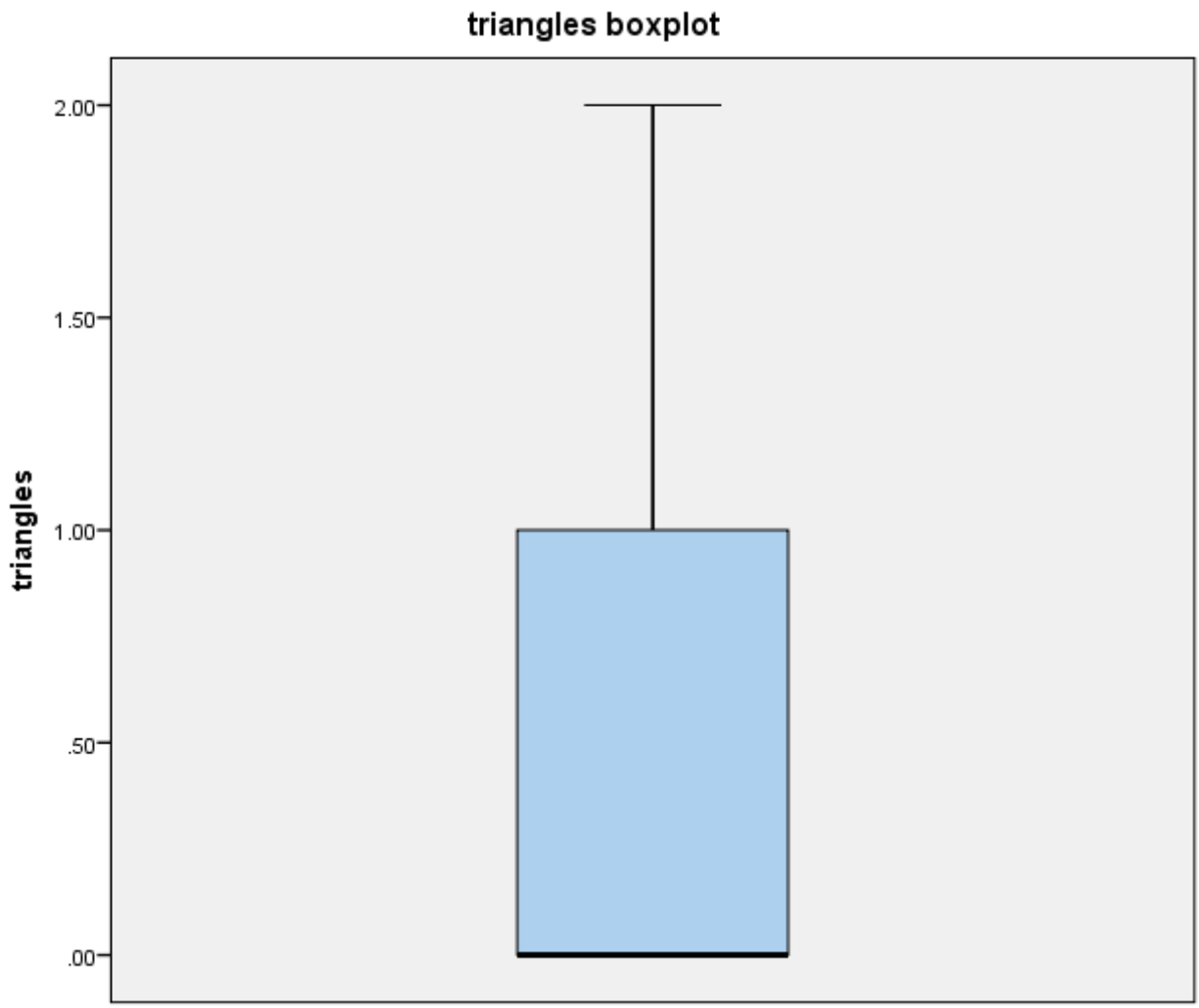


Figure 3.1. 12

Eccentricity

Now conversely with the first network we have different eccentricities. Eccentricity varies from 1 to 7 as it is shown in the network bellow. 9 out of 36 (25%) journals have eccentricity 1, 8 (22%) have eccentricity 5 and 6 while the max value in the data has eccentricity 7 with only 2 journals. You will find below a table with the frequency and the percentages as well as a histogram with the frequencies. There is an analytical view below with the range of the values that eccentricity takes. The range that eccentricity takes is from (1 to 7) 25% of the hole data have eccentricity 1 ,moreover 5.55% have eccentricity 2 that's 2 journals only, furthermore 3 journals 8.33% take the value 3, 4 11.11% take eccentricity 4 and finally 8 journals 22.22% take value 8 and equal amount of journals take the value 6 also. To end with only 2 journals have eccentricity 7 only 5.55%. From the box plot we can see that the minimum value of eccentricity is 1, the maximum is 7. Mean is 3.88 and median is 4.5. Even if the most of the data is 1 to 6 (95%) we have no outliers. Thus there is no value that has extremely bigger distance than the others. You will find the analytical eccentricity table below (fig. 3.1.7)

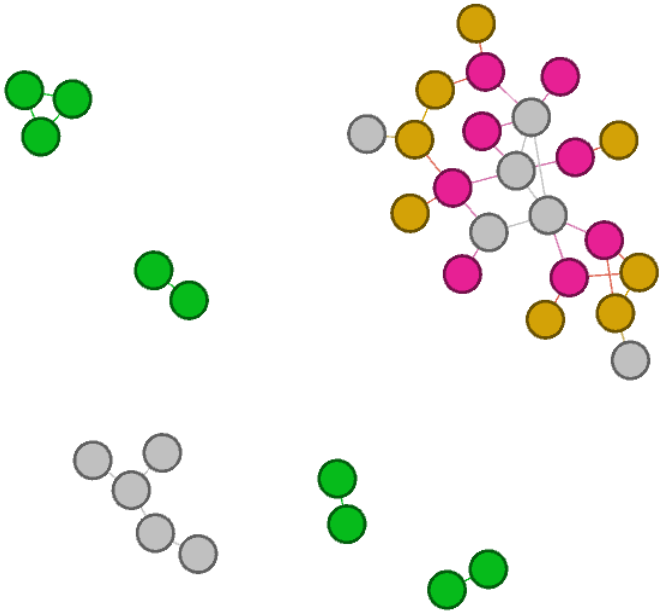


Figure 3.1. 13

eccentricity	frequency	percentage
1	9	25
2	2	5.55
3	3	8.33
4	4	11.11
5	8	22.22
6	8	22.22
7	2	5.55
sum	36	

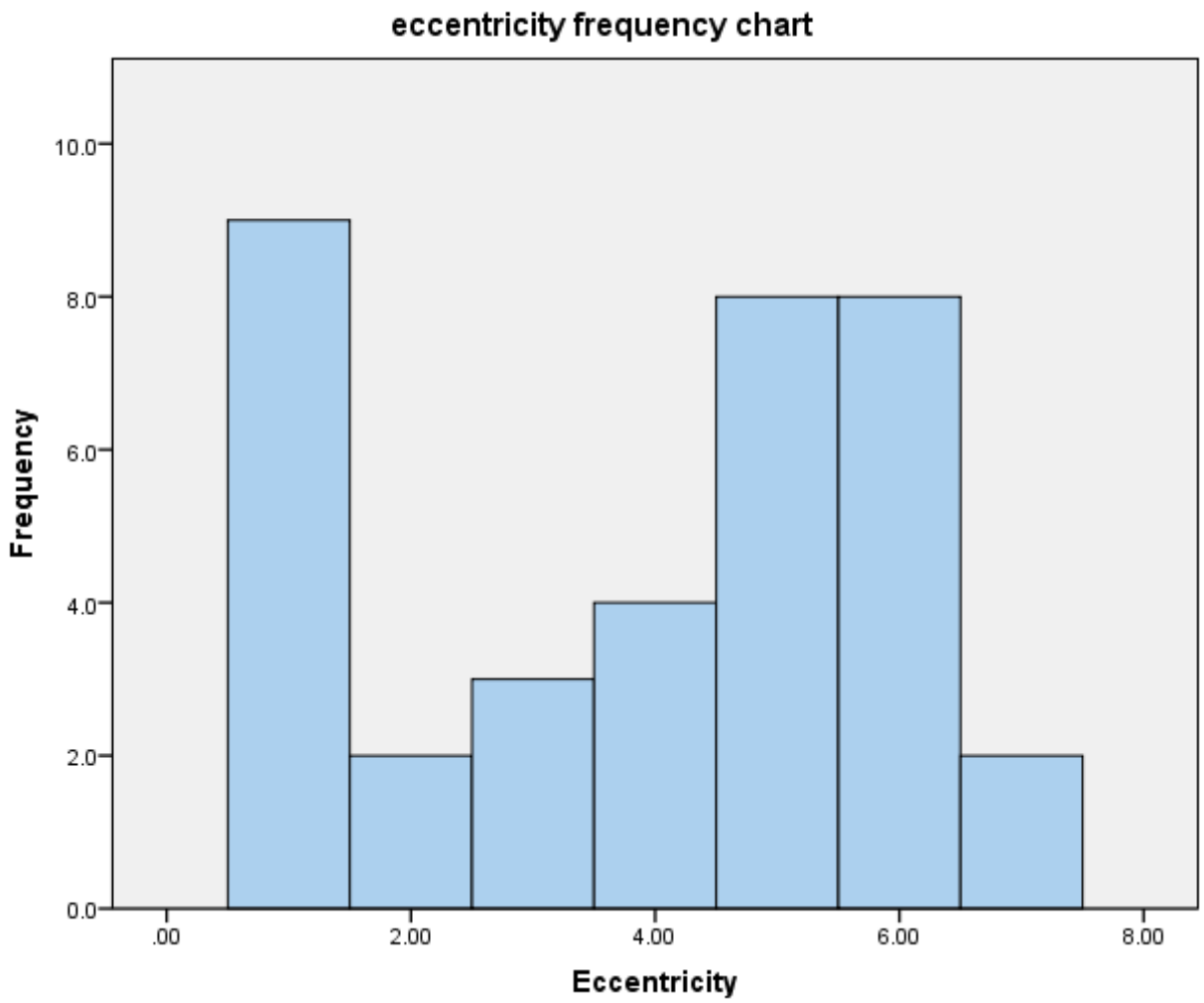

eccentricity frequency chart
Frequency
10.0
8.0
6.0
4.0
2.0
0.0
.00
2.00
4.00
6.00
8.00
Eccentricity

Figure 3.1. 14

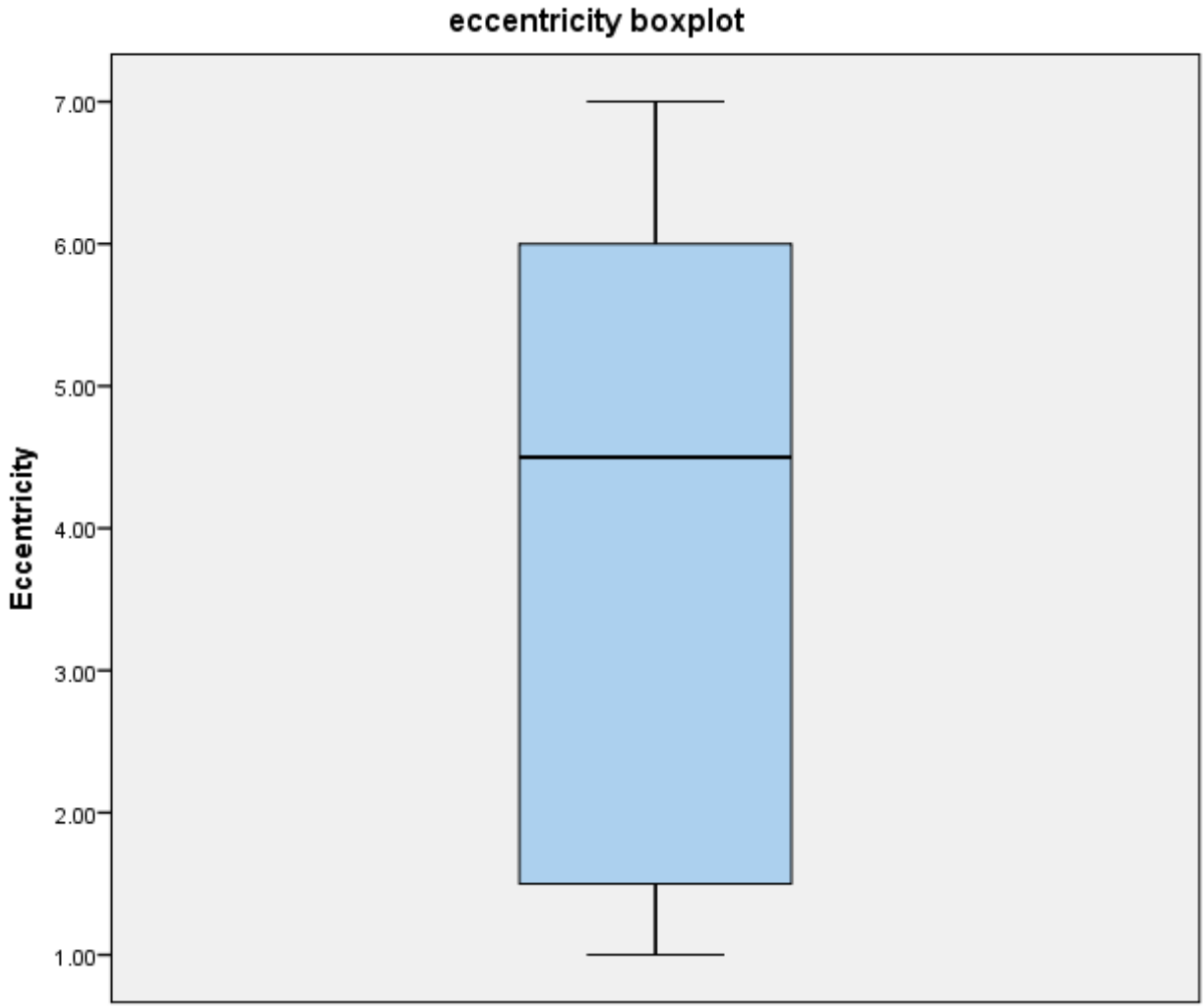

eccentricity boxplot
Eccentricity
7.00
6.00
5.00
4.00
3.00
2.00
1.00

Figure 3.1. 15

Betweeness Centrality

Betweeness centrality is the most efficient or the shortest path between two vertices. For every pair of these there is a shortest path in order to minimize the number of the edges. Generally we will see that the main concept for the betweeness centrality is that the higher the betweenness is the more prestigious the journal is. From the frequency graph bellow we see that the greatest proportion of the data has 0 bettweeness centrality and the rest of the data are from 20 to 70. In this variable we also have 3 outliers, the minimum value is 0 the maximum is 103.3 the median is 0 and mean is 14.2. In fig. 3.1.8 you will find the analytical table

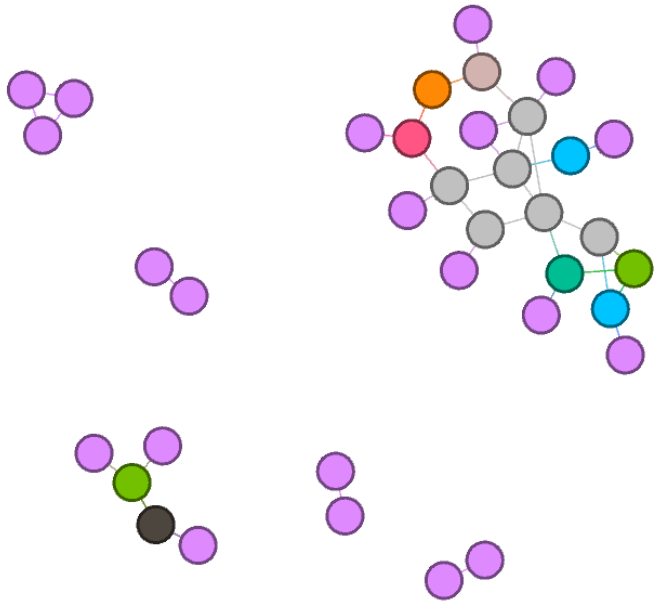


Figure 3.1. 16

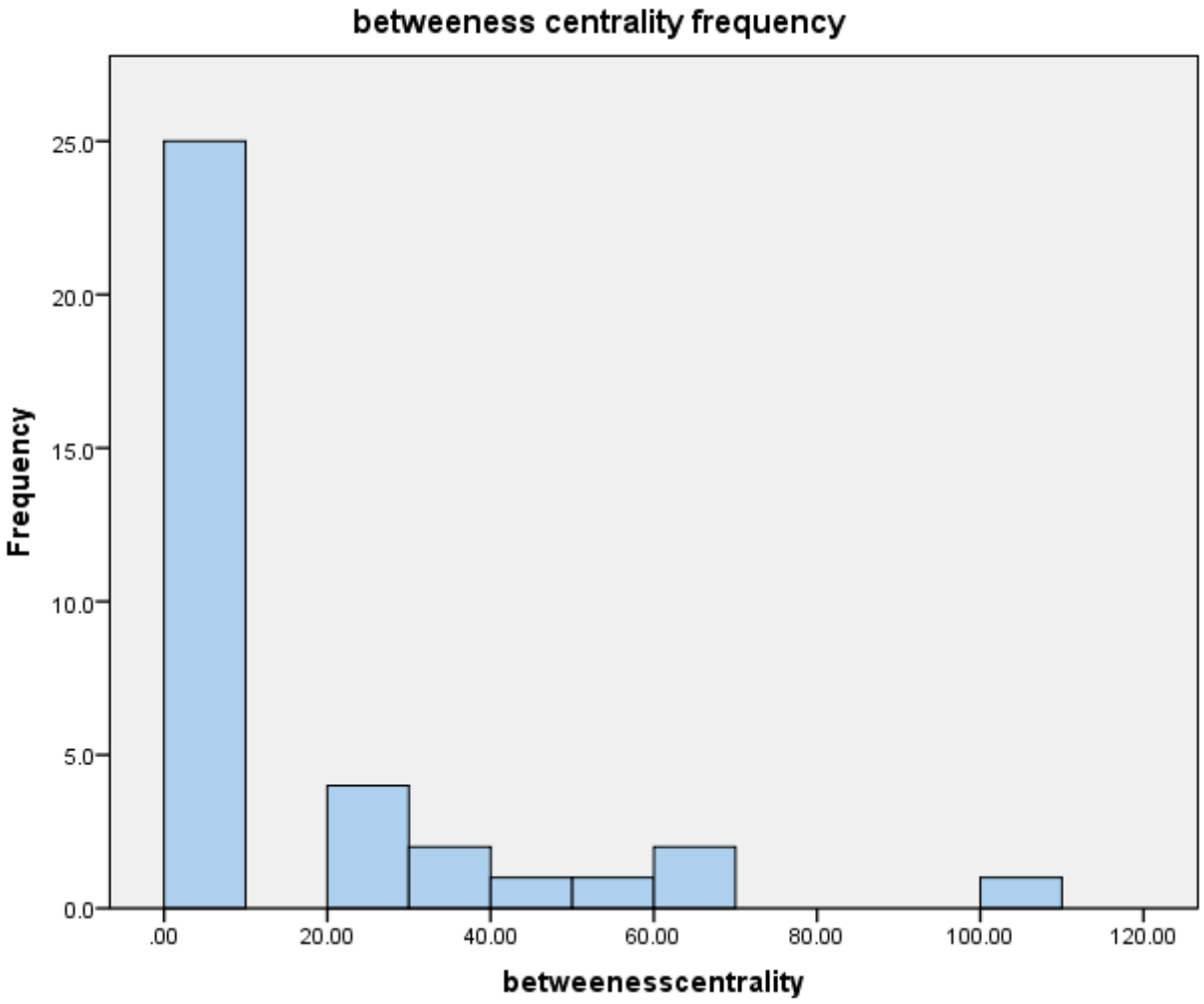

betweeness centrality frequency
Frequency
25.0
20.0
15.0
10.0
5.0
0.0
.00
20.00
40.00
60.00
80.00
100.00
120.00
betweenesscentrality

Figure 3.1. 17

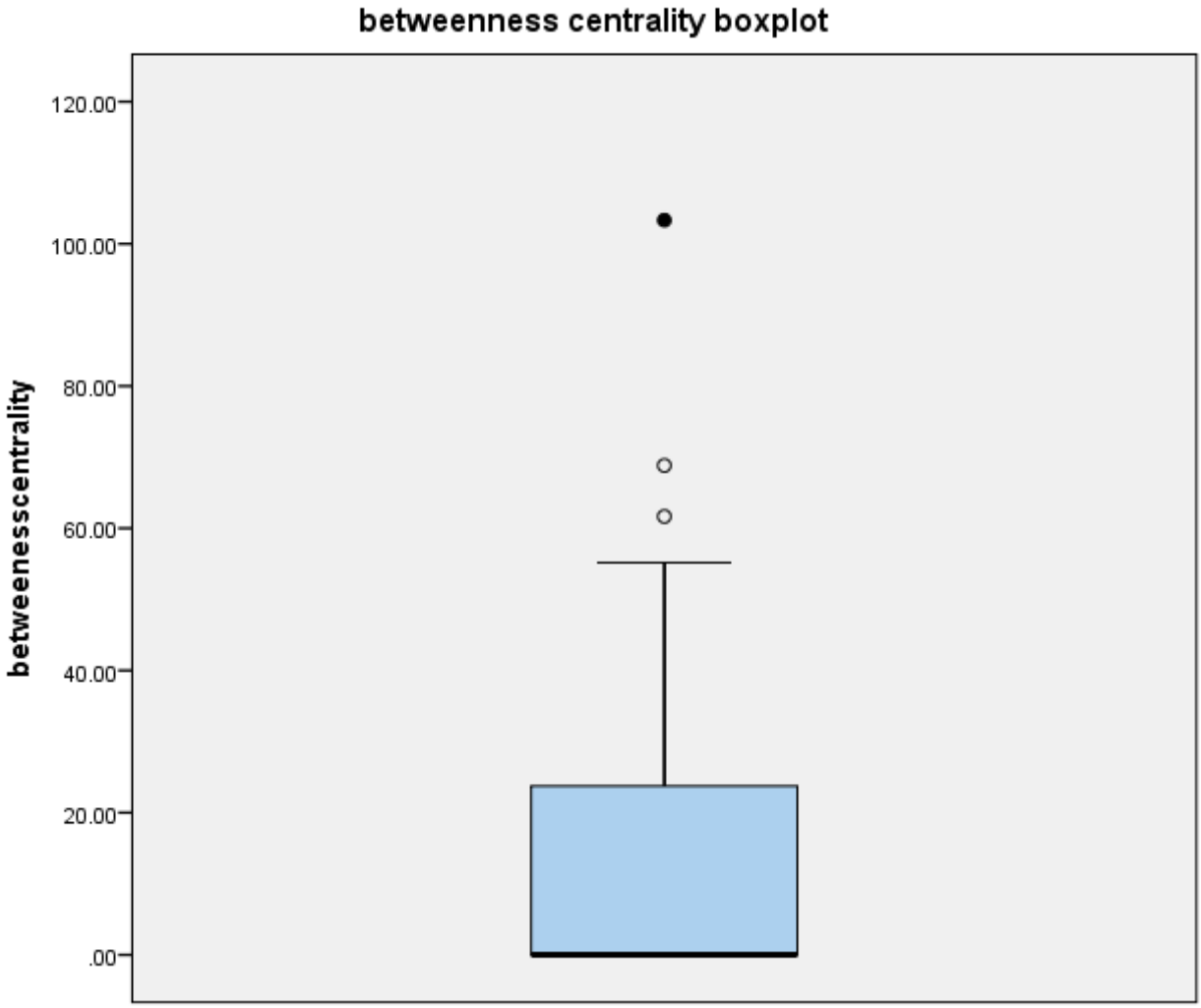

betweenness centrality boxplot
betweenesscentrality
120.00
100.00
80.00
60.00
40.00
20.00
.00

Figure 3.1. 18

Closeness Centrality

Closeness Centrality is the distance from a vertex to other vertices. That means that the more centralized a node is the closer to the other nodes is. From frequency graph we see that 0.2-0.3 is the 25%, 0.3-0.4 is the 27.77, 0.4-0.5 is the 11.11%, 0.5-0.6 is the 5.55%, 0.6-0.7 is the 2.77%, 0.7-0.8 is the 0%, 0.8-0.9 is the 2.77% and finaly 0.9-1 is the last 25%.finally from boxplot we can see that we have minimum 0.22 maximum 1 mean 0.53 and median 0.38. in fig. 3.1.7 you will find the analytical table with the data.

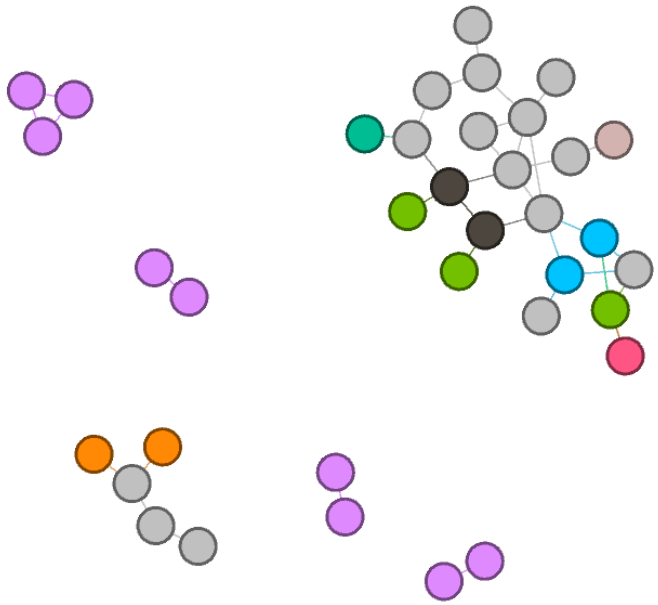


Figure 3.1. 19

Closeness centrality	count	percentages
0.2-0.3	9	25
0.3-0.4	10	27.77
0.4-0.5	4	11.11
0.5-0.6	2	5.55
0.6-0.7	1	2.77
0.7-0.8	0	0
0.8-0.9	1	2.77
0.9-1.0	9	25

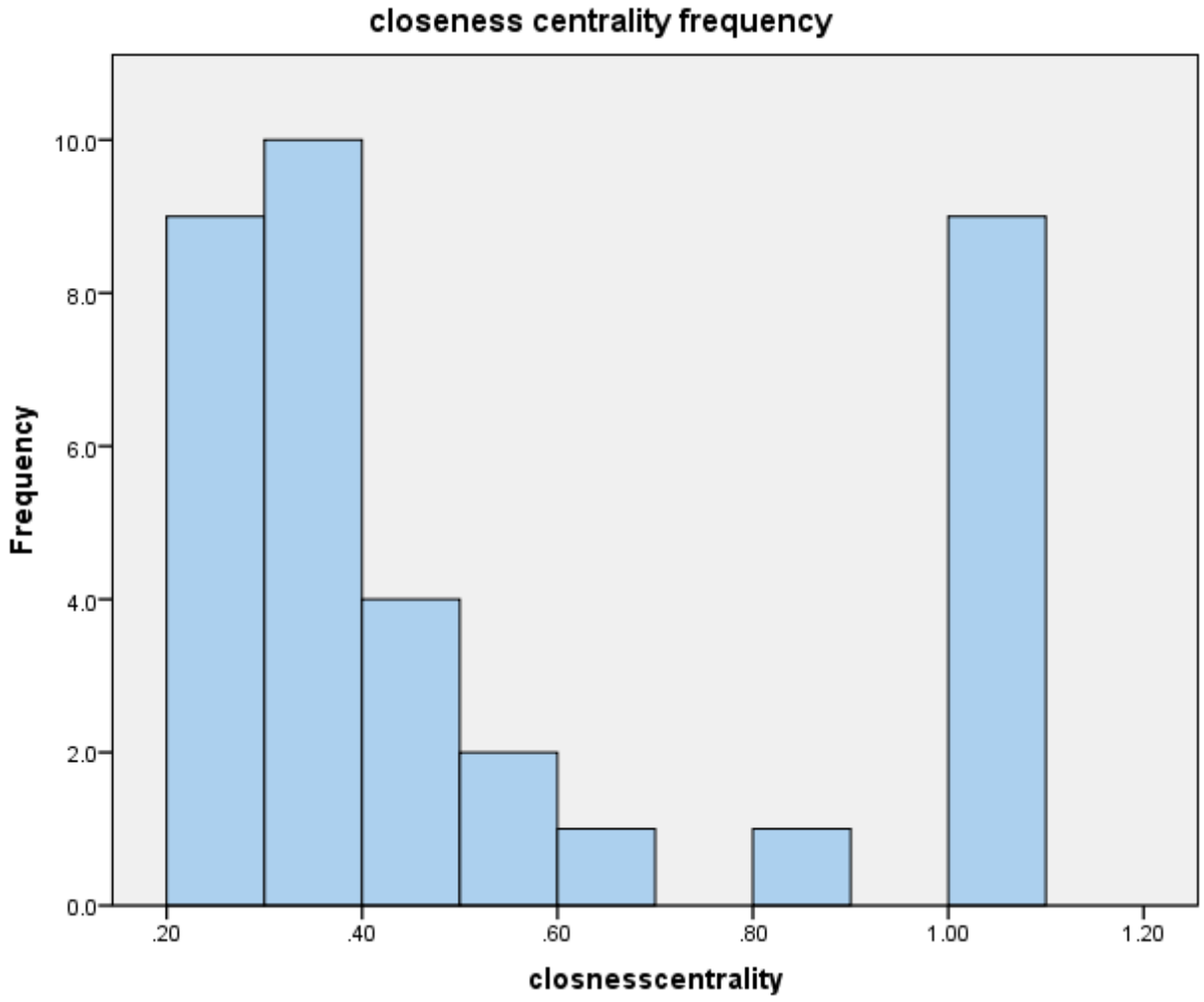


Figure 3.1. 20

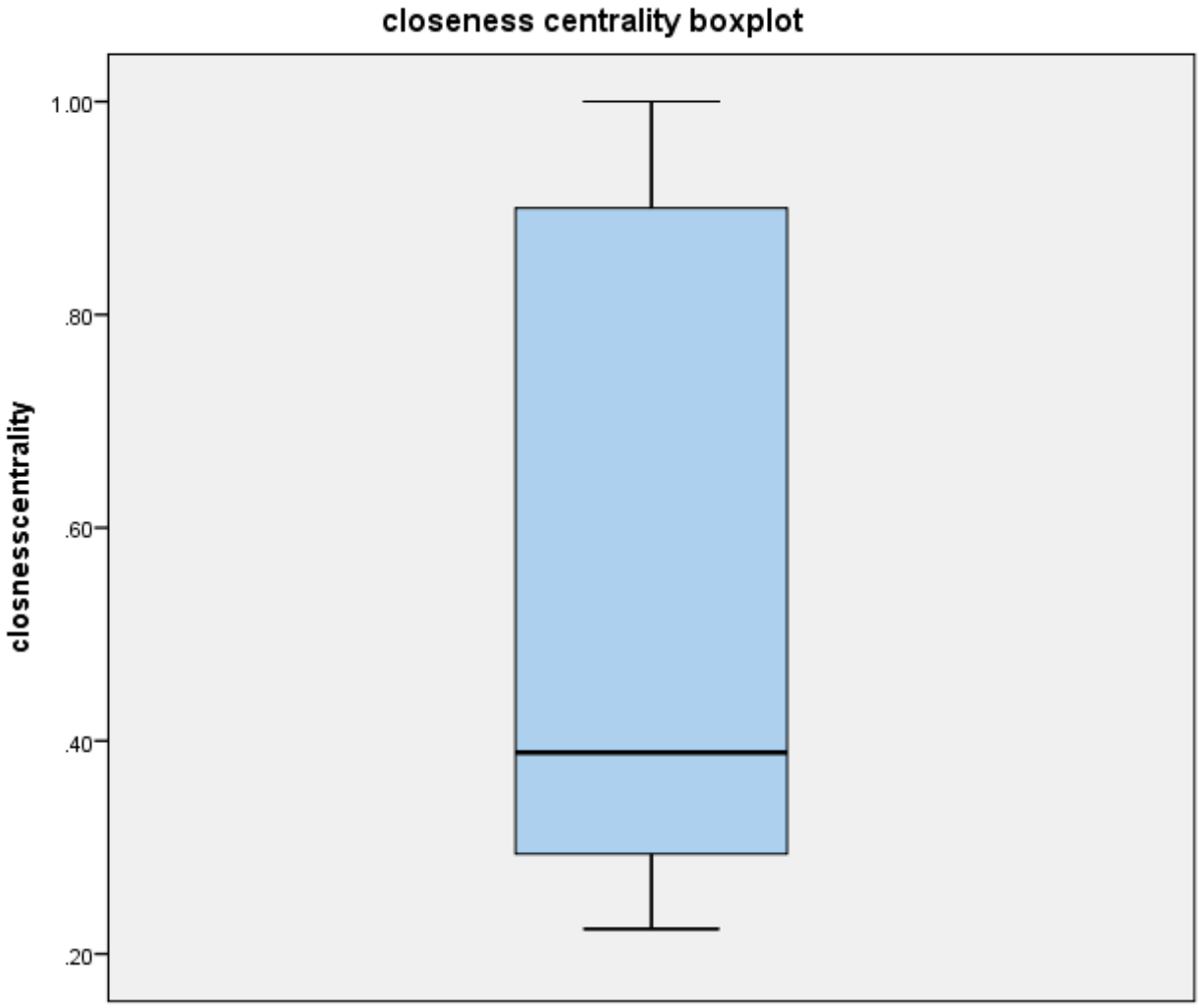

closeness centrality boxplot
closnesscentrality
1.00
.80
.60
.40
.20

Figure 3.1. 21

Harmonic Closeness Centrality

The main problem we phase with closeness centrality is that we cannot find which vertex is more or less central. For that reason we use harmonic closeness centrality because it is the same with closeness centrality with the only difference that this variable place emphasis to closer verticals than those which are in bigger distance. From frequency graph we notice that 0.2-0.3 we have 3 (8.33%), 0.3-0.4 we have 9 (25%), 0.4-0.5 we have 7 (19.4%), 0.5-0.6 we have 6 (16.6%), 0.6-0.7 we have 0, 0.7-0.8 and 0.8-0.9 we have one to each class (2.77%), 0.9-1 we have 9 (25%). From the boxplot we can see that the minimum is 0.28 and the maximum is 1 moreover the mean is 0.58 and the median is 0.47.

harmonicclosnesscentrality	count	percentage
0.2-0.3	3	8.33
03-0.4	9	25
0.4-0.5	7	19.4
0.5-0.6	6	16.6
0.6-0.7	0	0
0.7-0.8	1	2.77
0.8-0.9	1	2.77
0.9-1	9	25

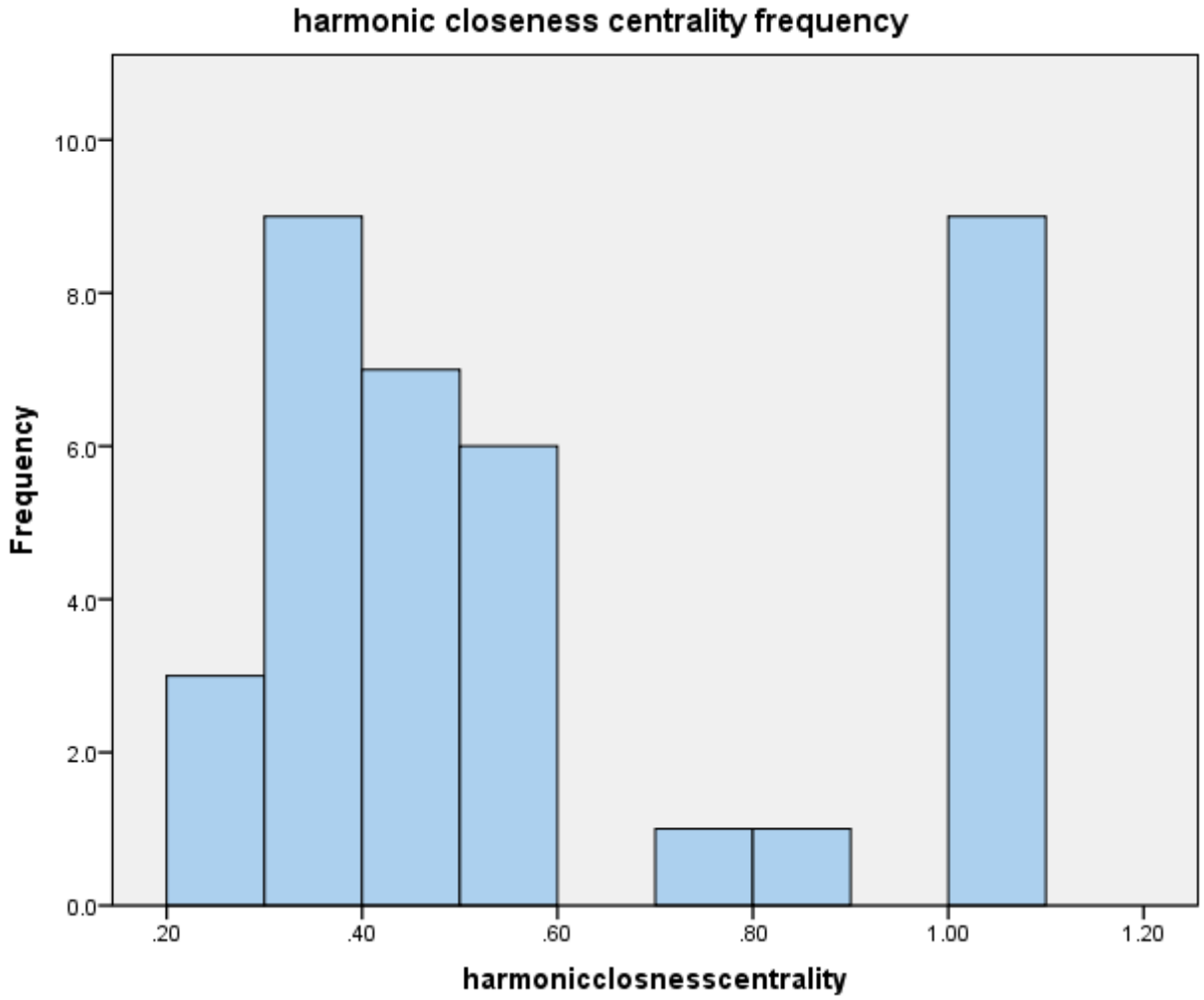

harmonic closeness centrality frequency
Frequency
10.0
8.0
6.0
4.0
2.0
0.0
.20
.40
.60
.80
1.00
1.20
harmonicclosnesscentrality

Figure 3.1. 22

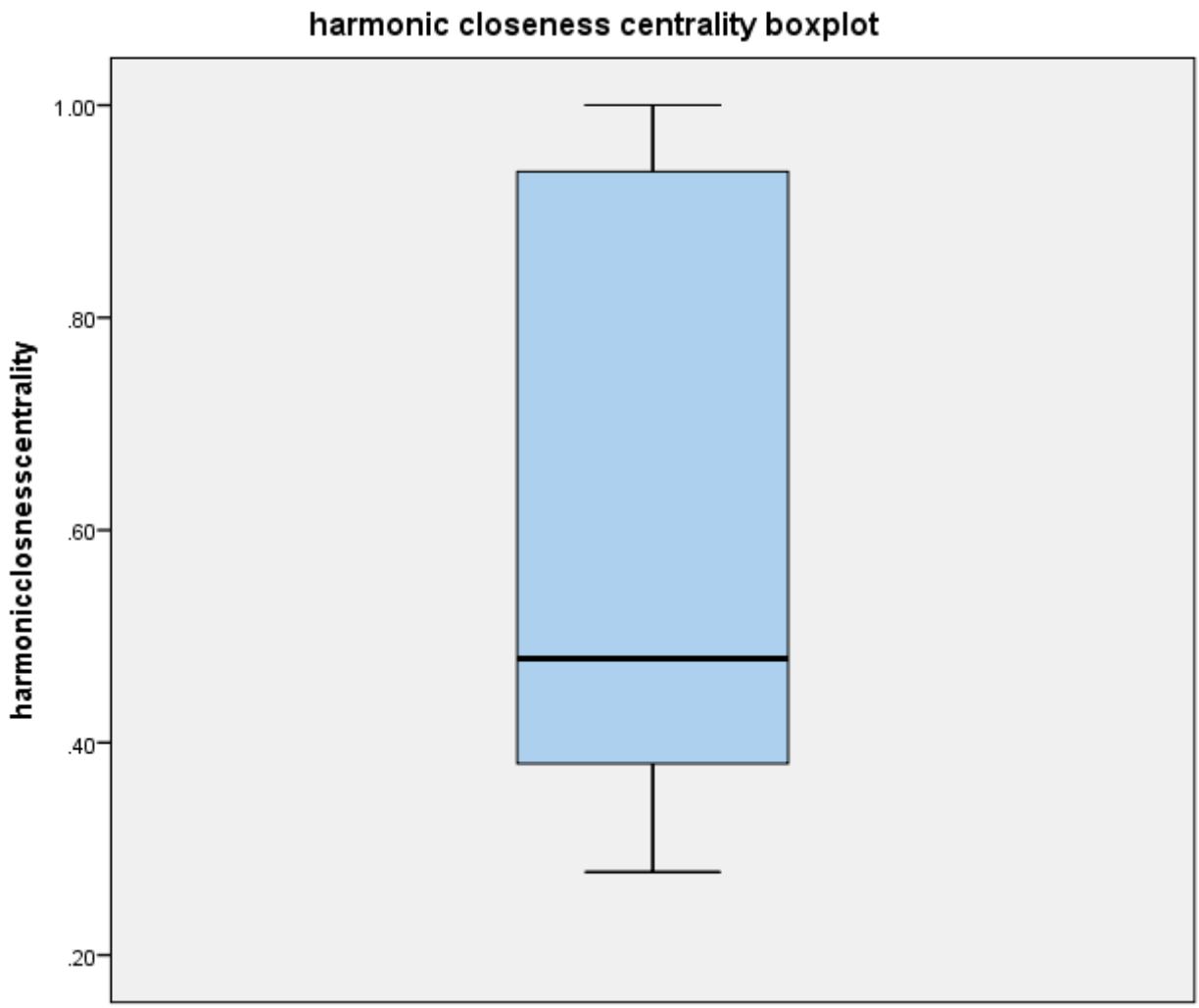

harmonic closeness centrality boxplot
harmonicclosnesscentrality
1.00
.80
.60
.40
.20

Figure 3.1. 23

Eigenvector Centrality

Eigenvector centrality is like degree centrality, the only difference is that eigenvector gives a proportional score by its neighbor's importance. From frequency chart we have 0-0.1 44.44%, 0.1-0.2 (13.88%), 0.2-0.3 (8.33%), 0.3-0.4 (11.11%), 0.4-0.5 (2.77%), 0.5-0.6 (11.11%), 0.6-0.9 (0%), 0.9-1 (5.55%), 1-1.1 (2.77%). From the boxplot we have the maximum 0.01 maximum 1 median 0.12 mean 0.25, also we have 3 outliers [journal of management studies (value 1), academy of management review (value 0.98), journal of organizational change management (value 0.92)].

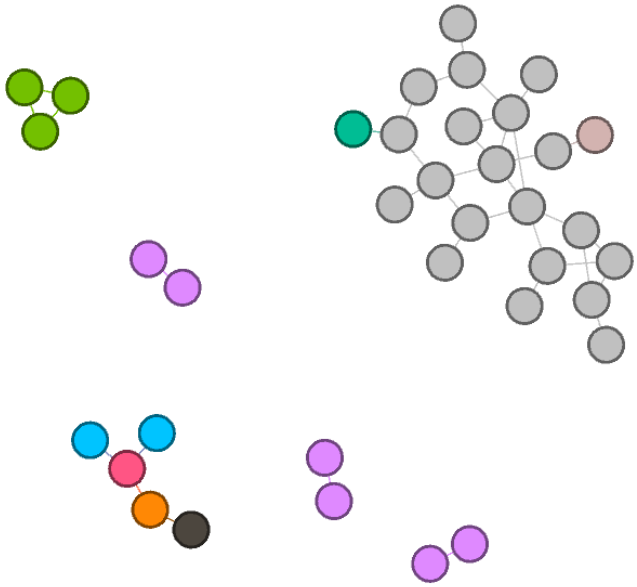


Figure 3.1. 24

eigencentrality	count	percentage
0-0.1	16	44.44
0.1-0.2	5	13.88
0.2-0.3	3	8.33
0.3-0.4	4	11.11
0.4-0.5	1	2.77
0.5-0.6	4	11.11
0.6-07	0	0
0.7-0.8	0	0
0.8-0.9	0	0
0.9-1	2	5.55
1-1.1	1	2.77

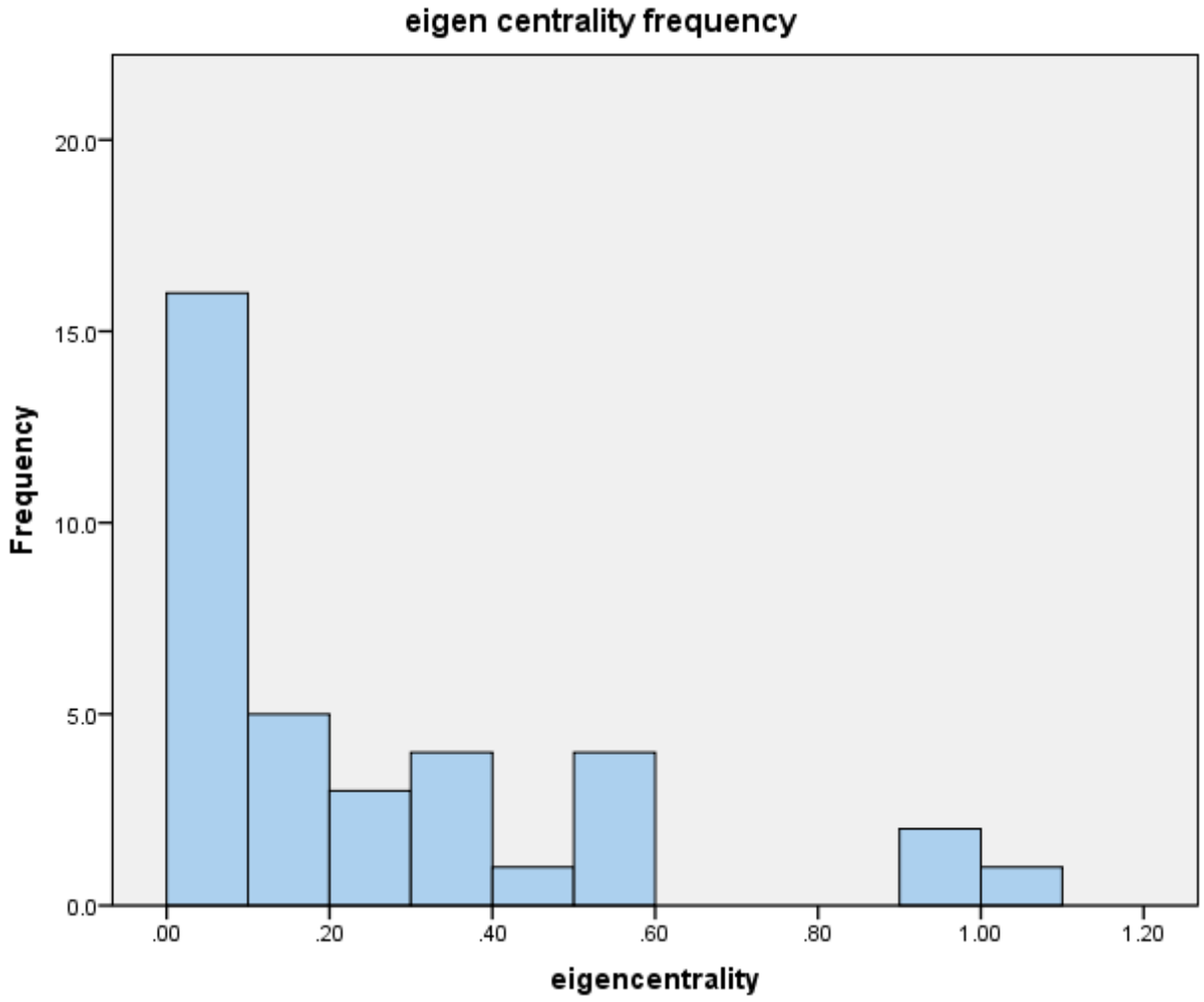


Figure 3.1. 25

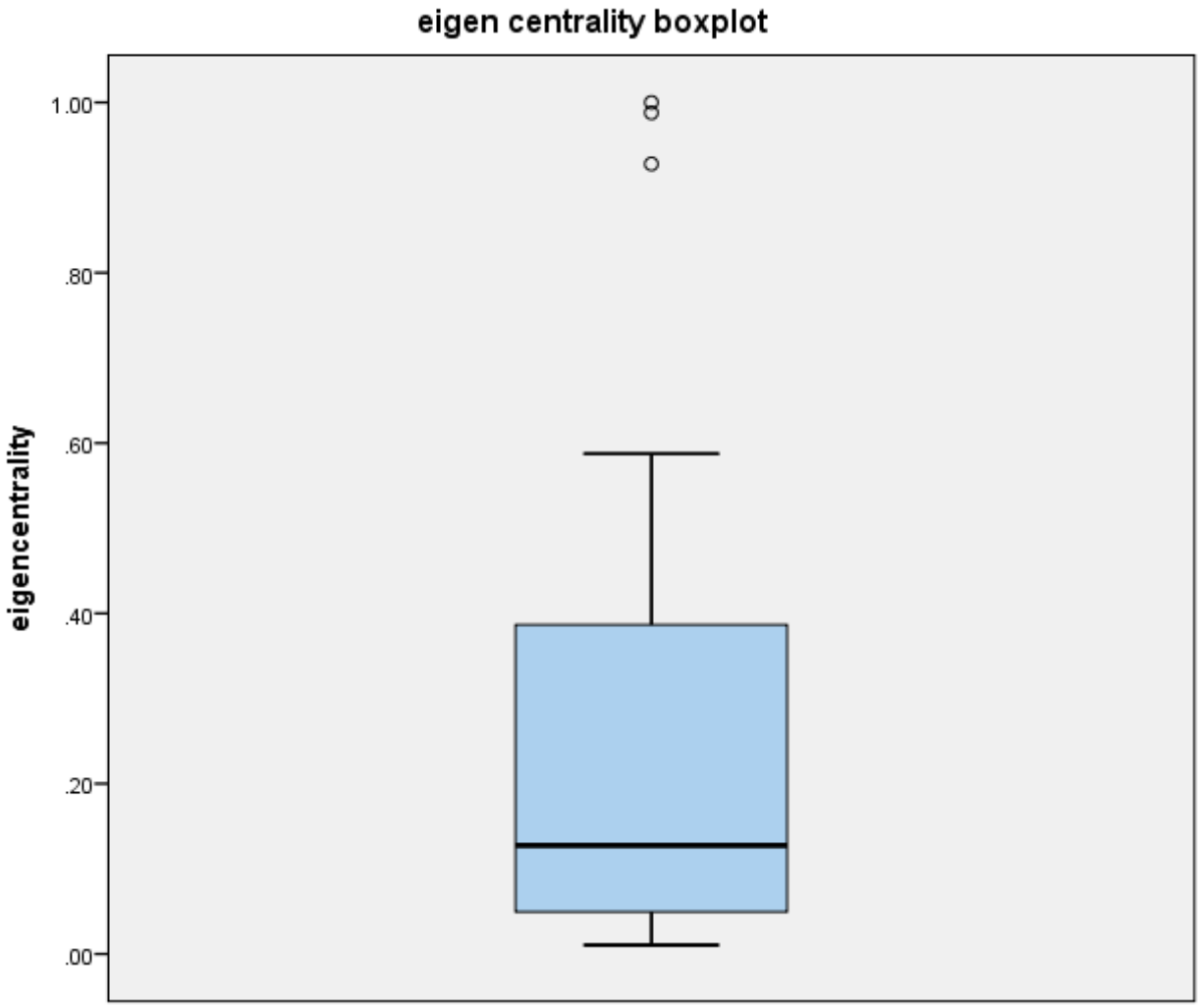

eigen centrality boxplot
eigencentrality
1.00
.80
.60
.40
.20
.00
8

Figure 3.1. 26

Hubs and Authorities

Hubs and authorities is a measurement that reveals the verticals which hold the most important information. Authorities can point the vertices and Hubs point the best Authorities but in this case we have undirected network thus they are equal as there is no direction to point. We have chosen authority for this network. In the frequency graph below we can see that more than the half data is between 0-0.1 we have 22 journals (61.1%) 0.1-0.2 we have 7 (19.44%) 0.2-0.3 we have 4 (11.11%) and finally 0.3-0.4 we have 3 (8.33%). From boxplot we exported the maximum value which is 0.45 the minimum is 0 the mean is 0.1 and median 0.05.

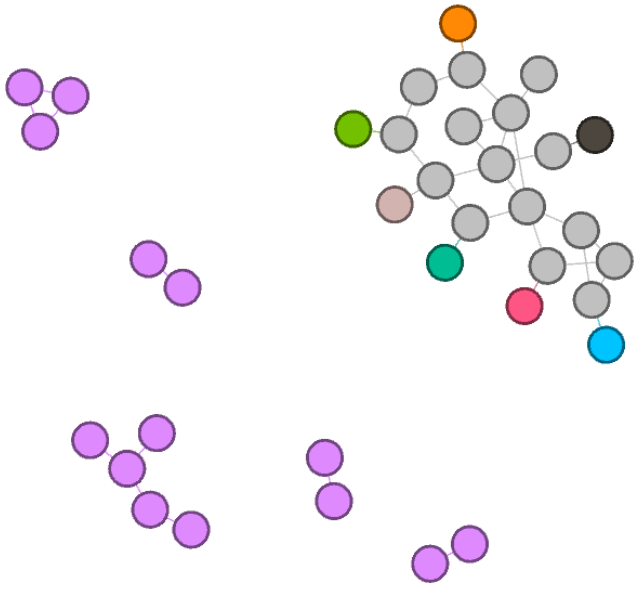


Figure 3.1. 27

frequency	count	percentage
0-0.1	22	61.11
0.1-0.2	7	19.44
0.2-0.3	4	11.11
0.3-0.4	3	8.33

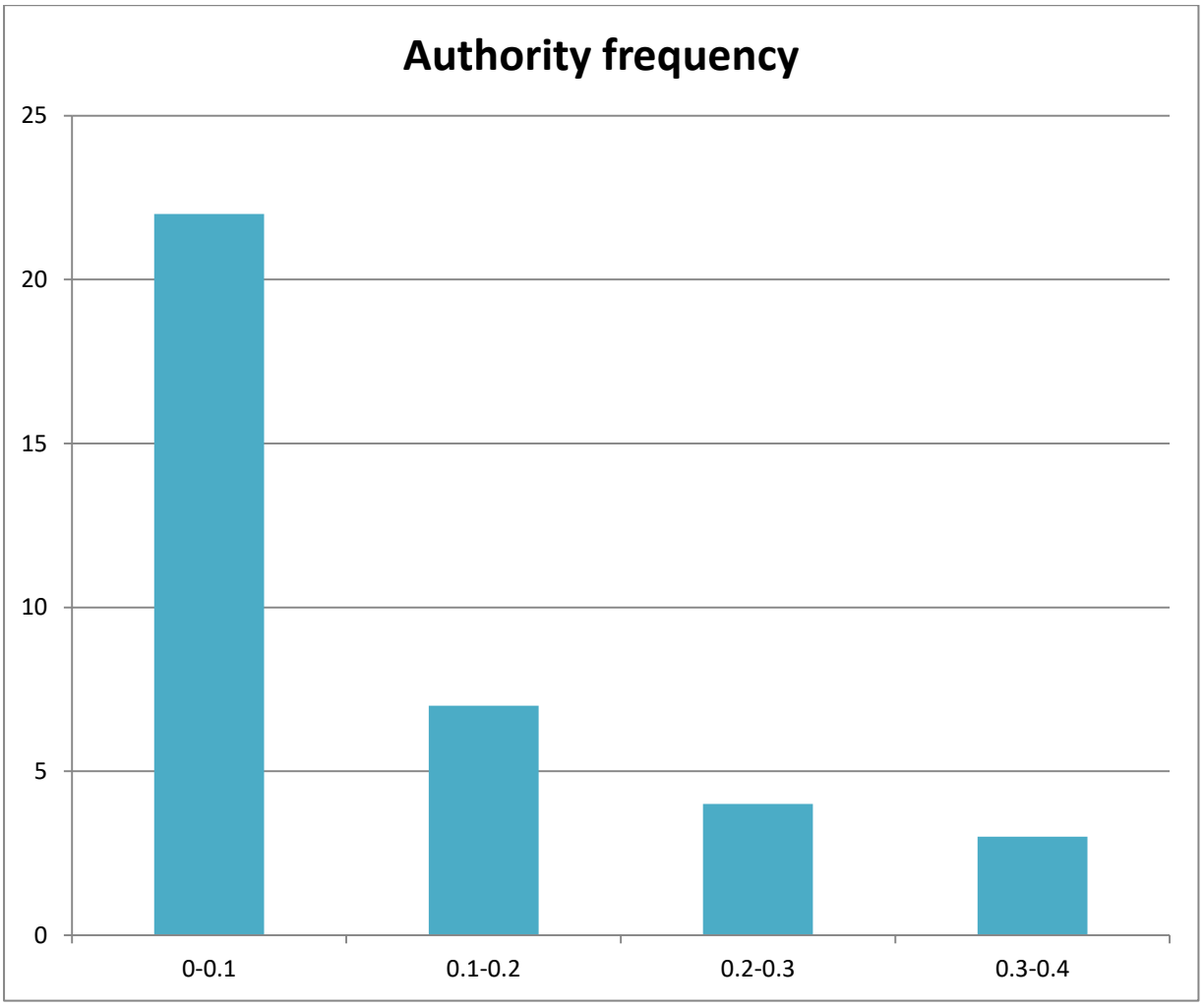


Figure 3.1. 28

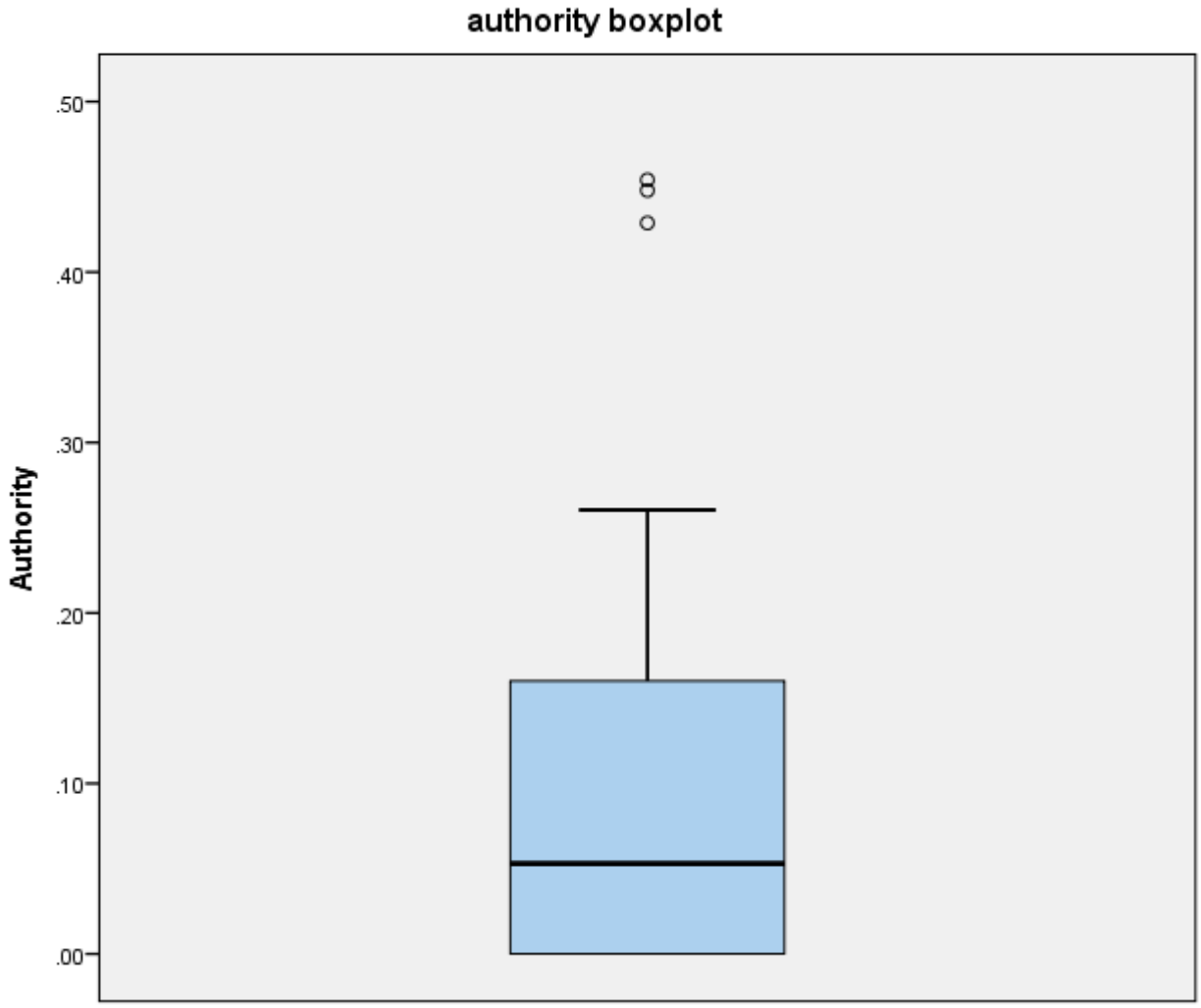


Figure 3.1. 29

Page rank

Page rank estimates the importance of the journals by counting the number and also the quality of the links. The frequency as you can see below from the graph and the table is 0.01-0.015 7(19.44%), 0.015-0.02 4(11.11%), 0.02-0.025 2(5.55%), 0.025-0.30 10(27.77%), 0.030-0.035 6(16.66%), 0.035-0.040 2(5.55%), 0.040-0.045 1(2.77%), 0.045-0.050 2(5.55%), 0.050-0.055 2 (5.55%). From the boxplot we have maximum 0.05 minimum 0.01 mean 0.0278 and median 0.0278.

pagerank	count	percentage
0.01-0.015	7	19.44
0.015-0.02	4	11.11
0.02-0.025	2	5.55
0.025-0.03	10	27.77
0.03-0.035	6	16.66
0.035-0.040	2	5.55
0.040-0.045	1	2.77
0.045-0.050	2	5.55
0.050-0.055	2	5.55

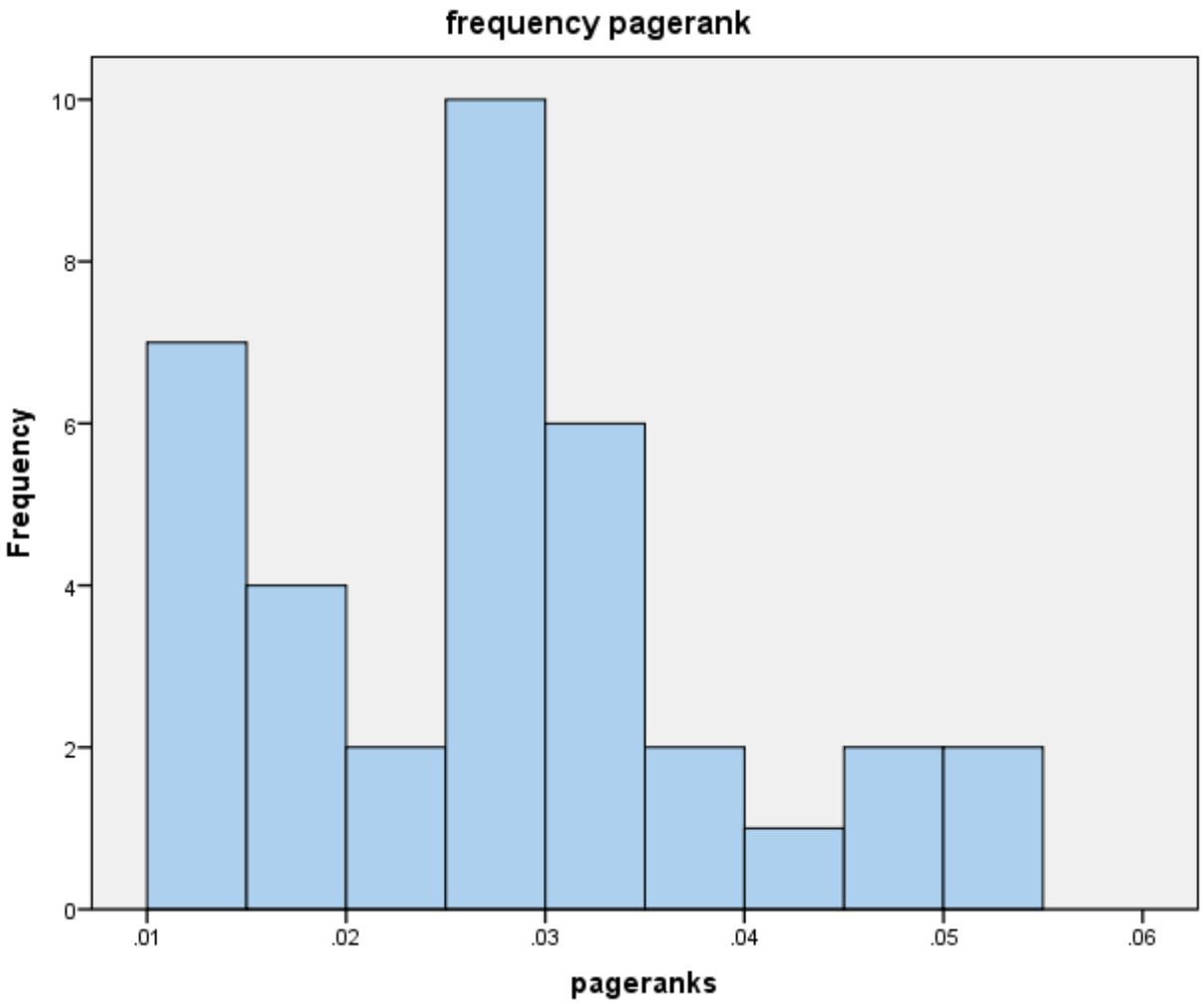

frequency pagerank
Frequency
10
8
6
4
2
0
.01
.02
.03
.04
.05
.06
pageranks

Figure 3.1. 30

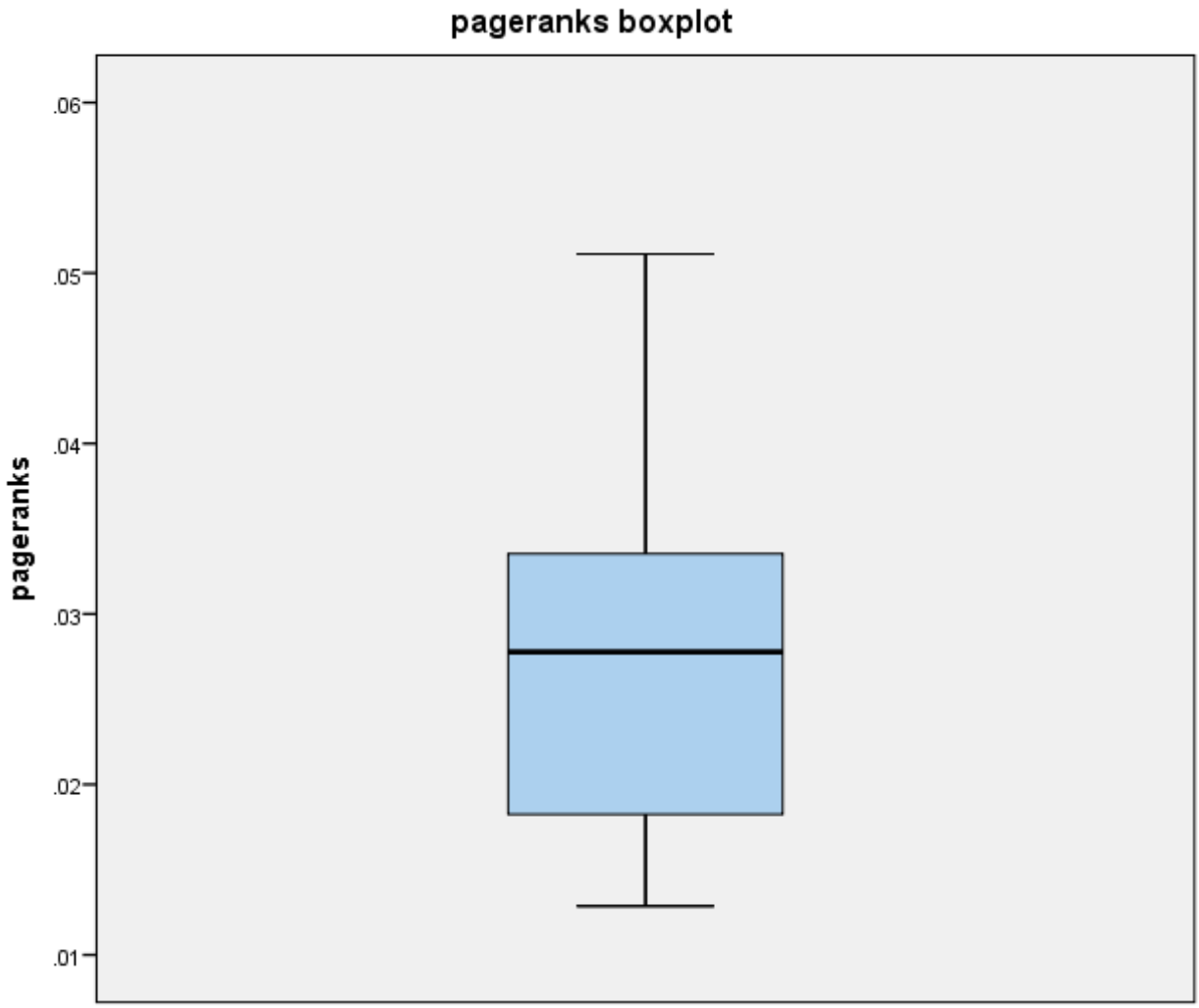


Figure 3.1. 31

Comparing different variables graphs

In this chapter we analyzed the variables alone. Now we are going to make comparisons between the variables we obtained from Gephi. In order to have statistical right graphs sometimes we had to use normalization because our values had different scales. To achieve this we used the normalization formula Ni= (Ai – min (A)) / (max (A)-min (A)). Should be mentioned that if in some scatterplots you notice that the circles are very few in terms of the data or in the boxplots we do not have minimum maximum or median that's because we have numbers that are repeating in our data, thus we couldn't form a usual boxplot or scatter.

Comparisons based on degree

In the first graph we see the boxplot, this graph is a bit weird because in many cases in the degree we had to exactly the same values thus we didn't have boxplots in many communities but only mean value. Only in 3rd and 7th community we see difference between the maximum, minimum and mean value. We also in the 4th community see an outlier.

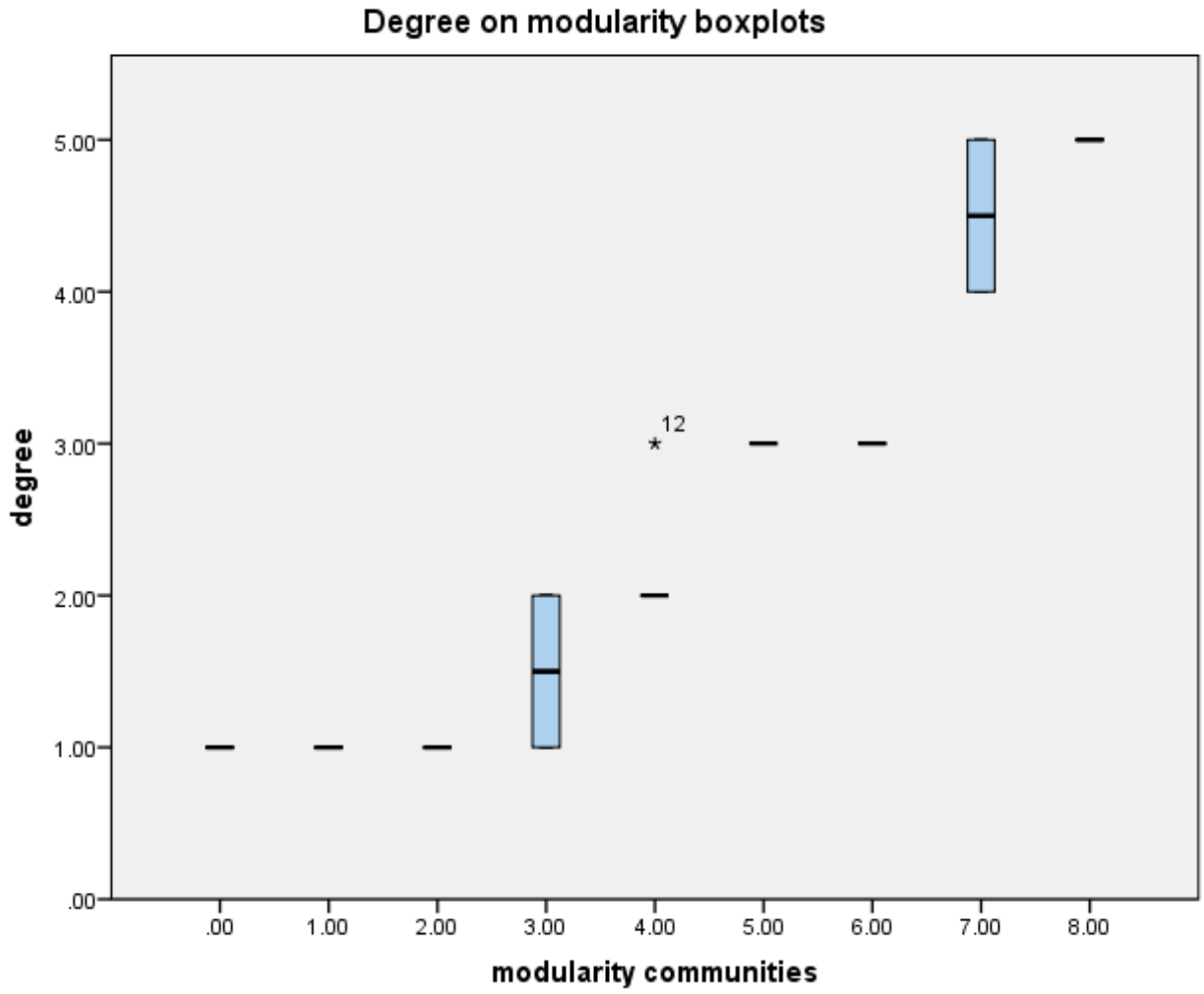


Figure 3.1. 32

Comparisons based on triangles

From the boxplot we see that all the values of the degree are in 0 triangles and only 2 with the same degree is in value 1. That's because we have only two triangles with 1 and all the other values are 0.

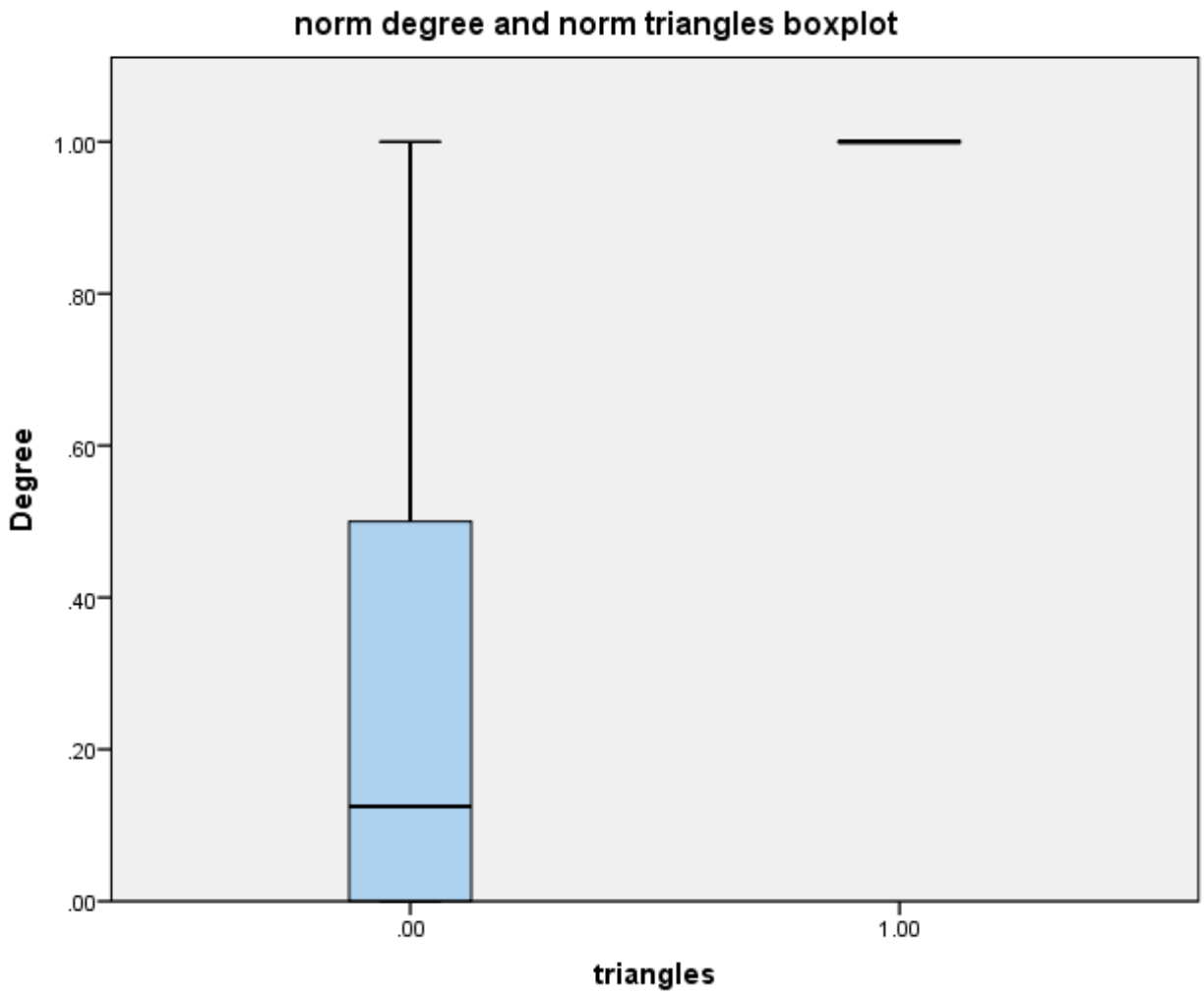


Figure 3.1. 33

The same distribution we observe with the communities of the modularity and the triangles we see that all the values are

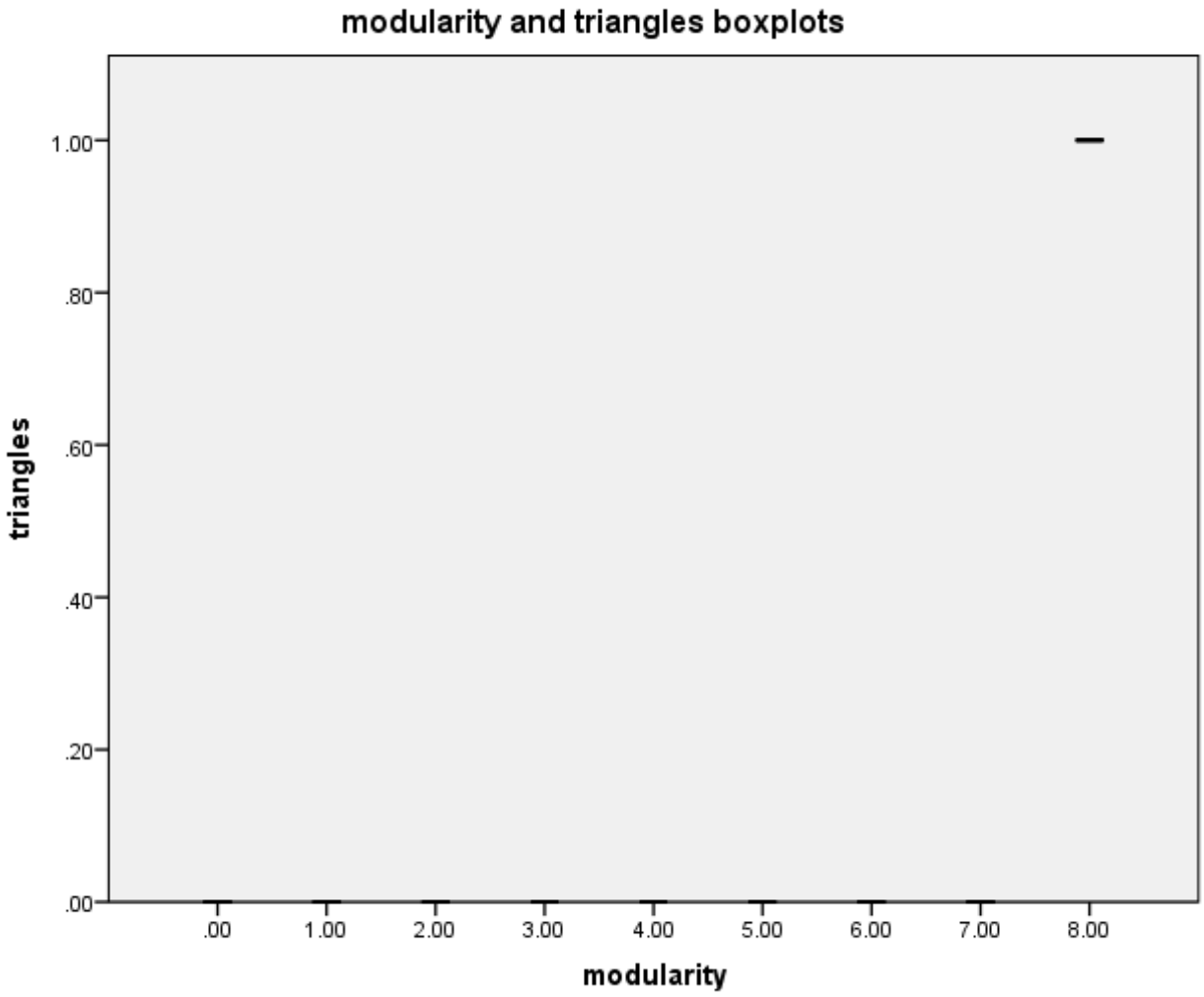


Figure 3.1. 34

Comparisons based on clustering

We now see more spread graph with the most values of degree still being in the 0 clustering.

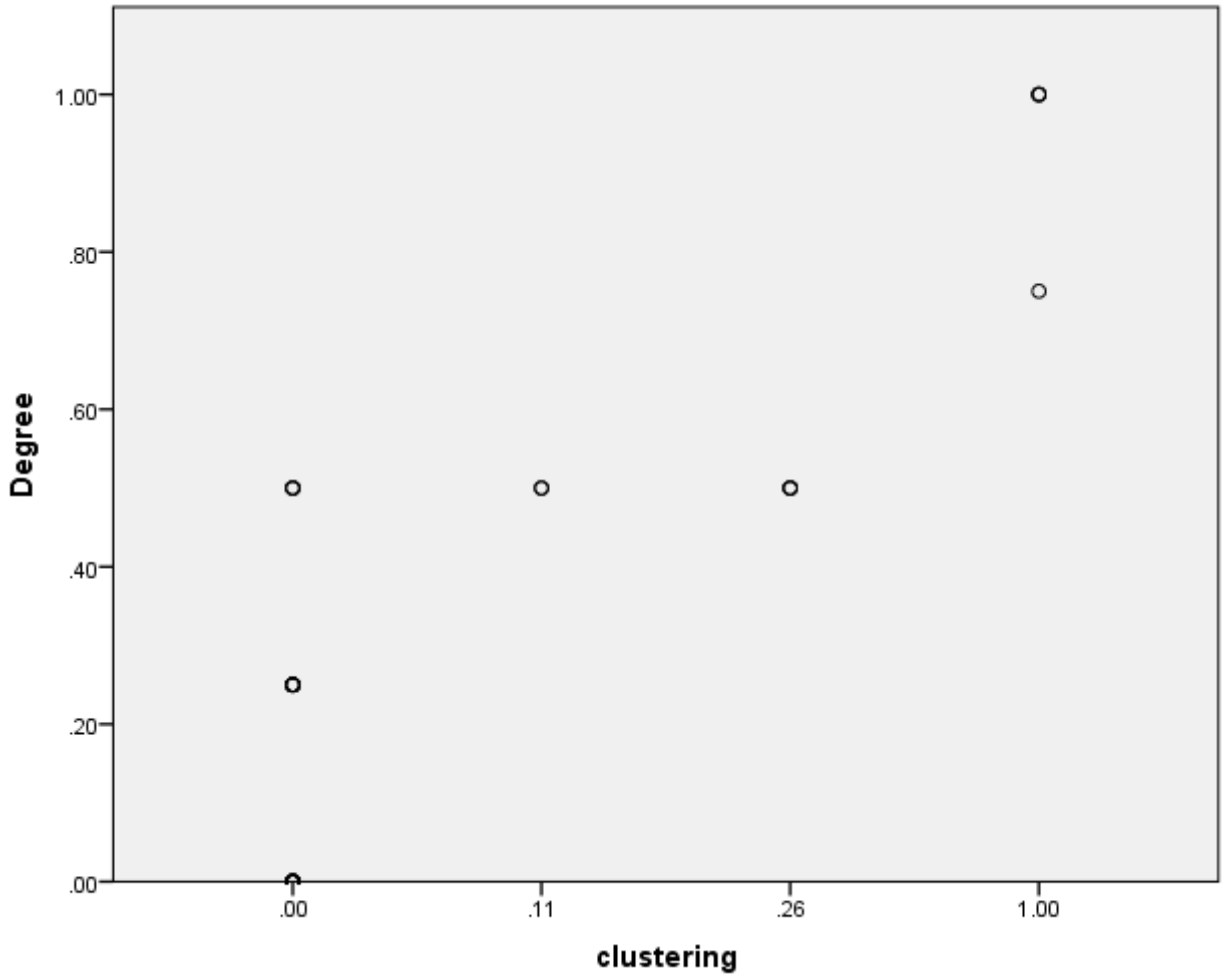


Figure 3.1. 35

We notice that only the fifth community has different data. In the other communities we have the same value. As we notice in every triangle scatterplot graph the vast majority of the values is in the value 0

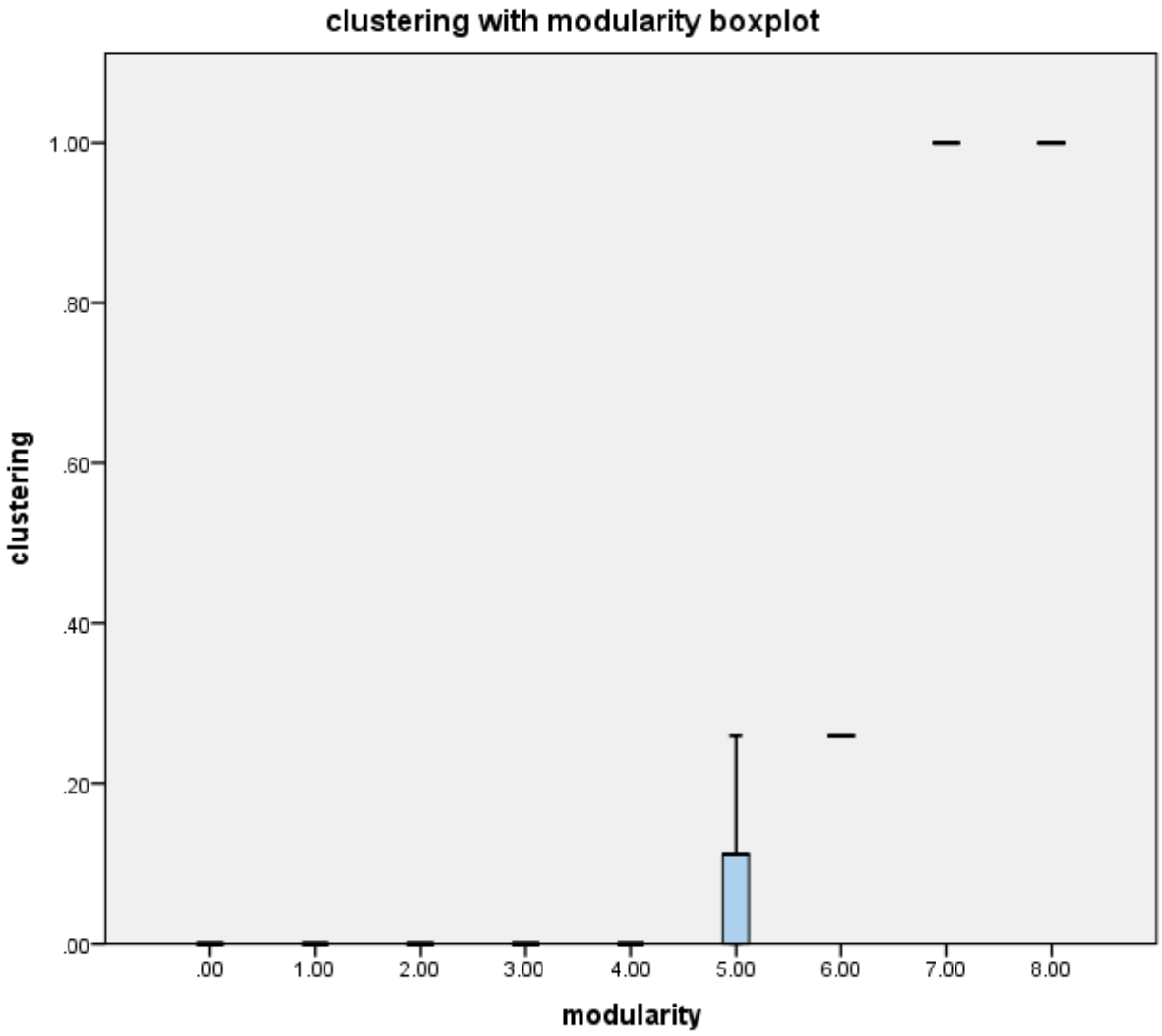


Figure 3.1. 36

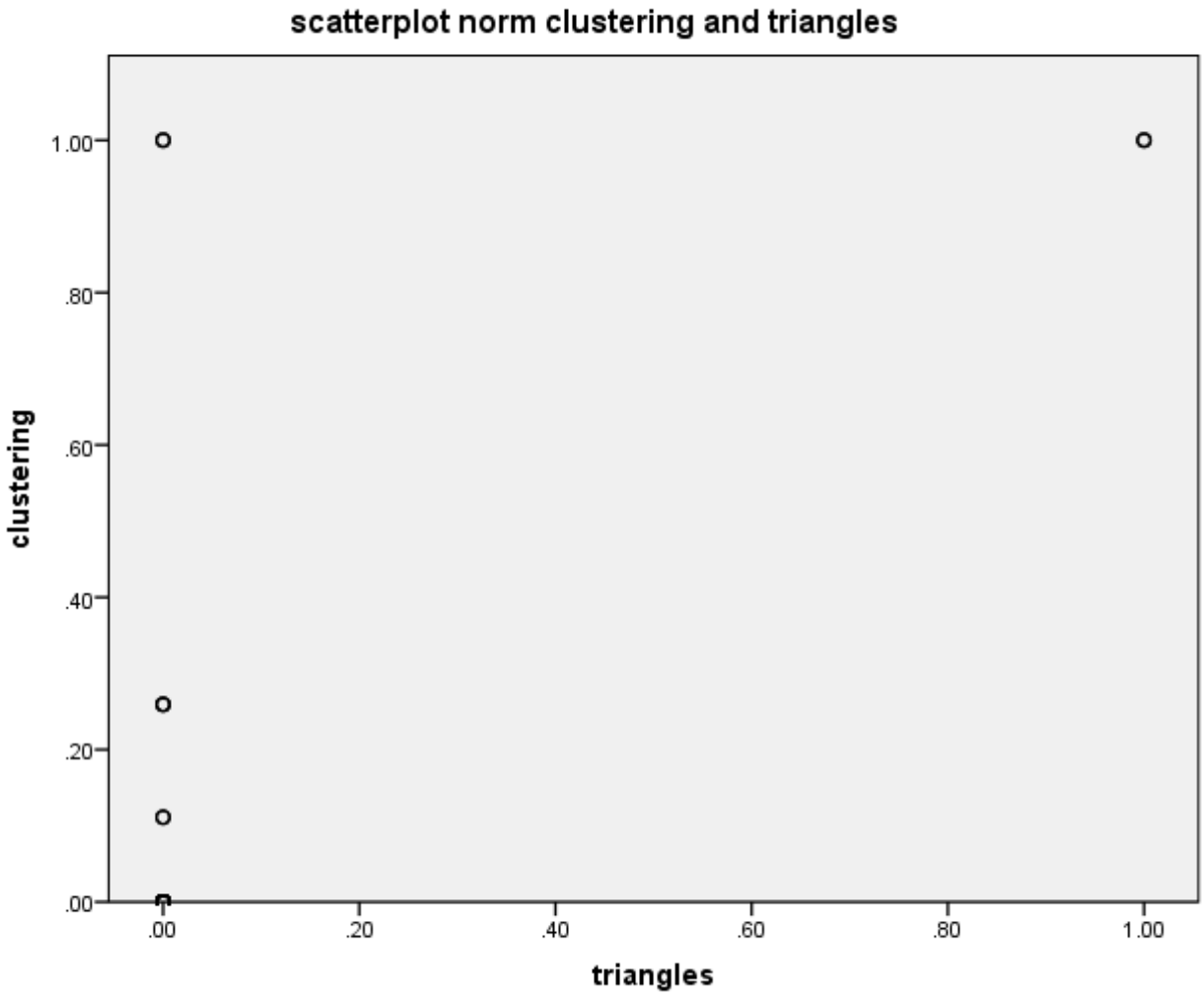

scatterplot norm clustering and triangles
clustering
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
triangles

Figure 3.1. 37

Comparisons based on eccentricity

We see in fig 3.1.38 that as the degree increases the eccentricity increases also.

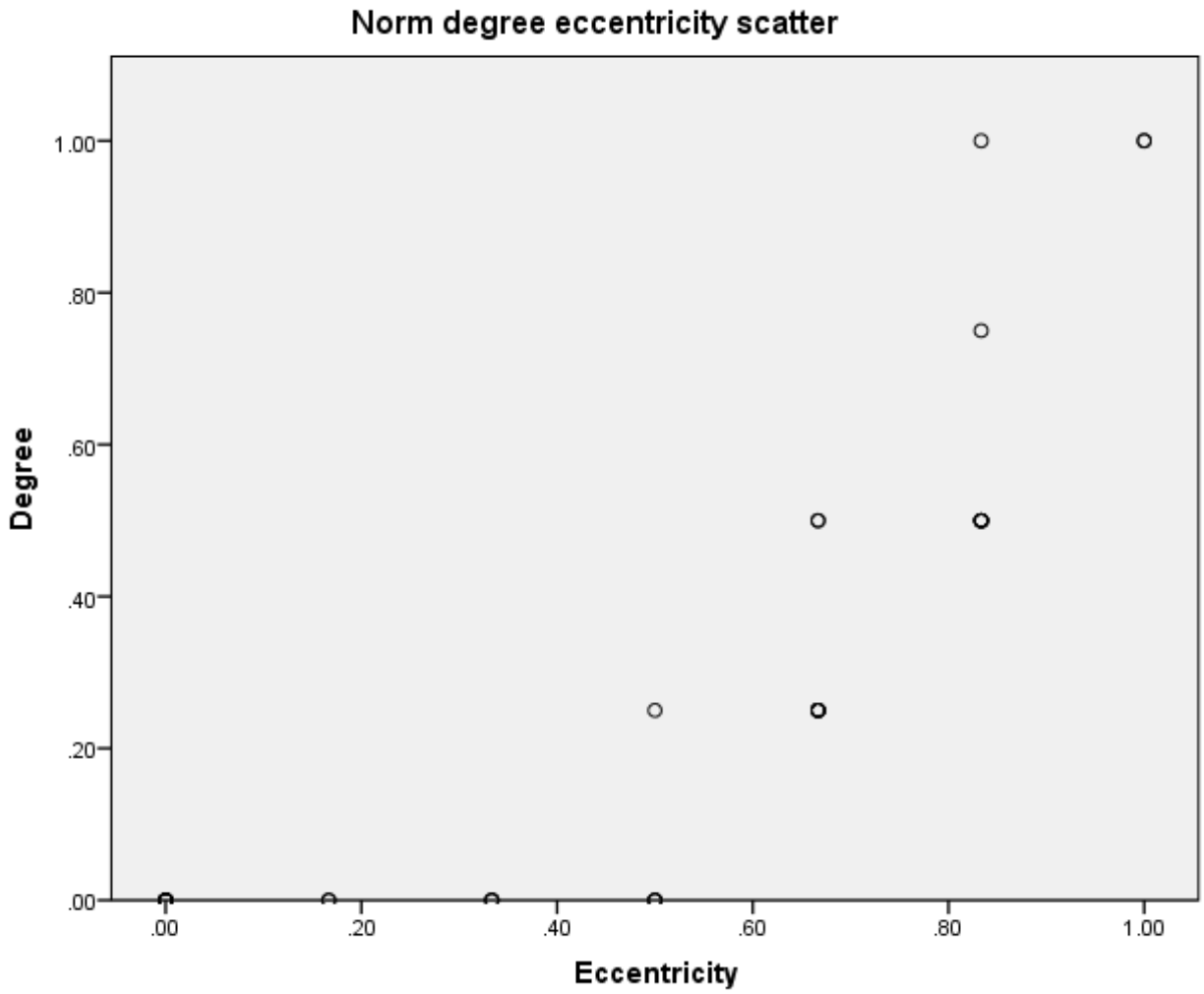


Figure 3.1. 38

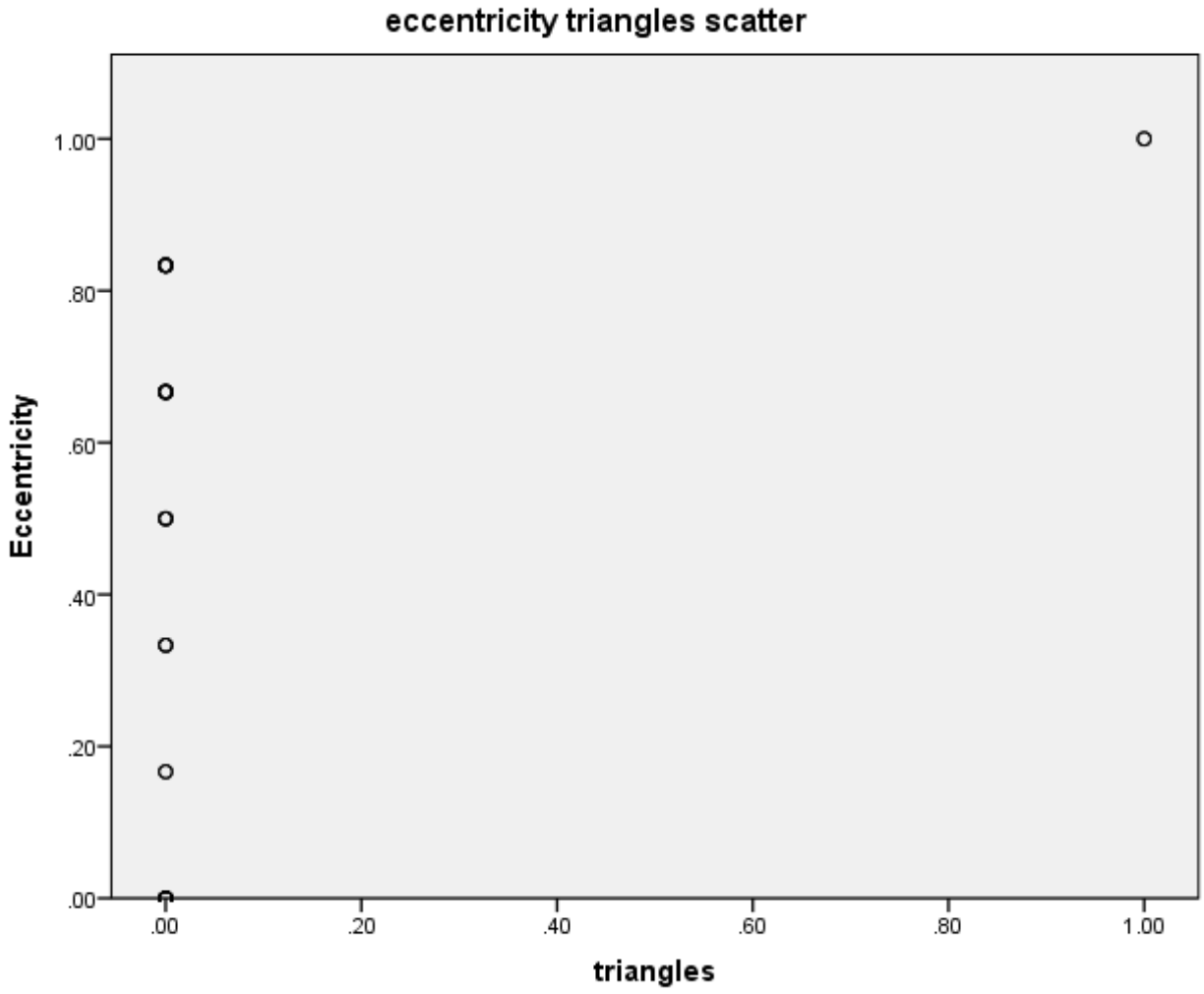

eccentricity triangles scatter
Eccentricity
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
triangles

Figure 3.1. 39

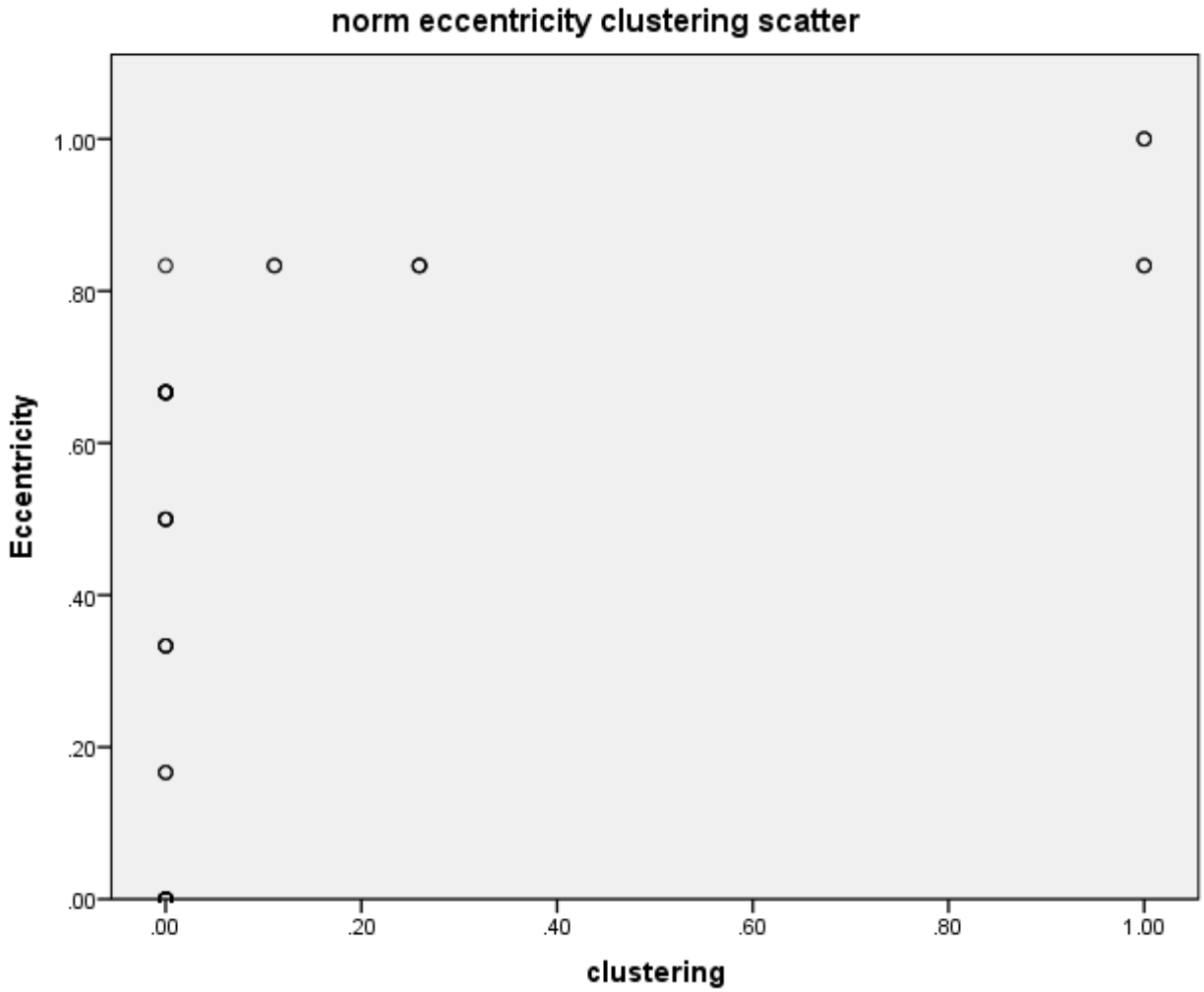

norm eccentricity clustering scatter
Eccentricity
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
clustering

Figure 3.1. 40

Comparisons based on betweeness

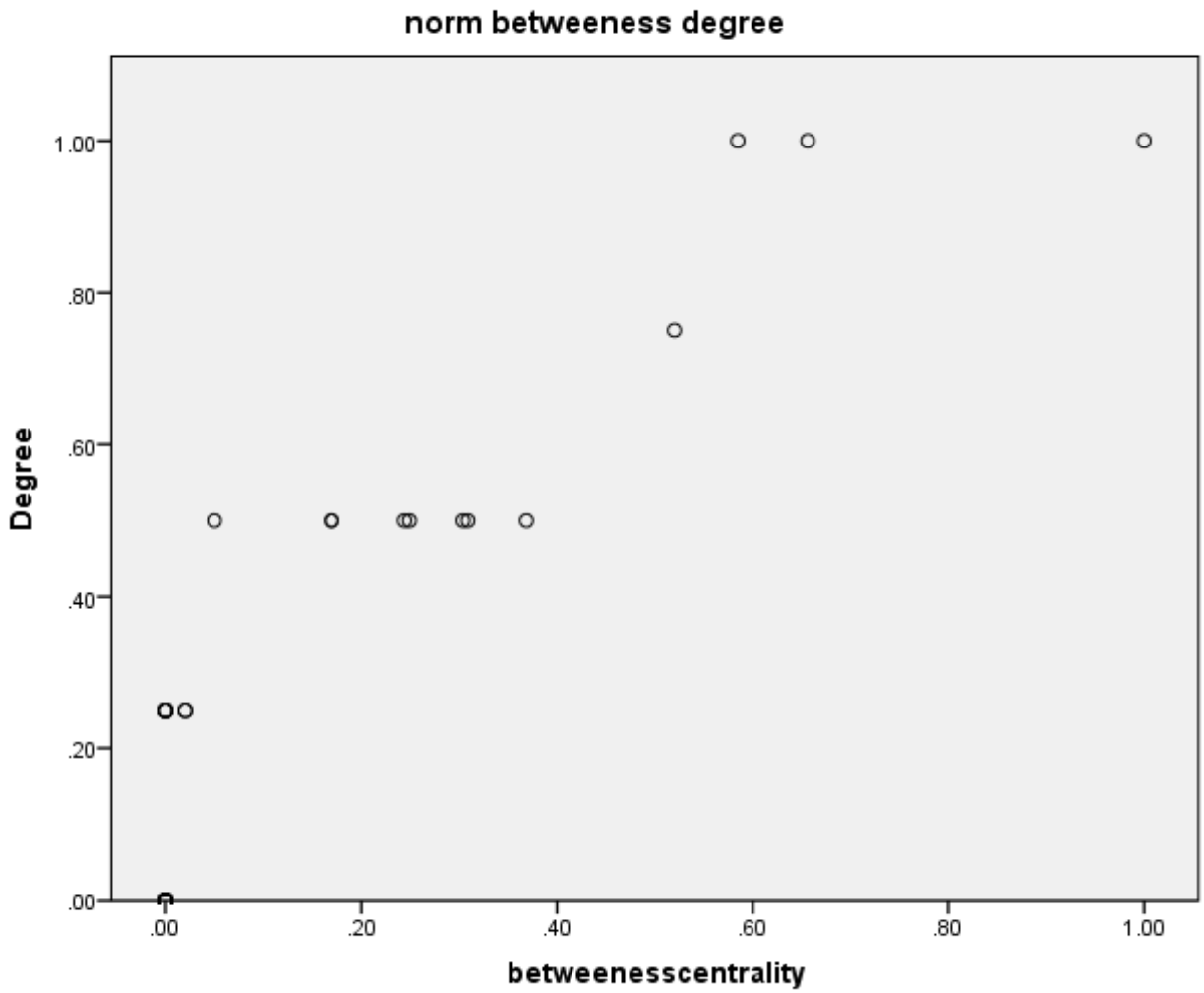


Figure 3.1. 41

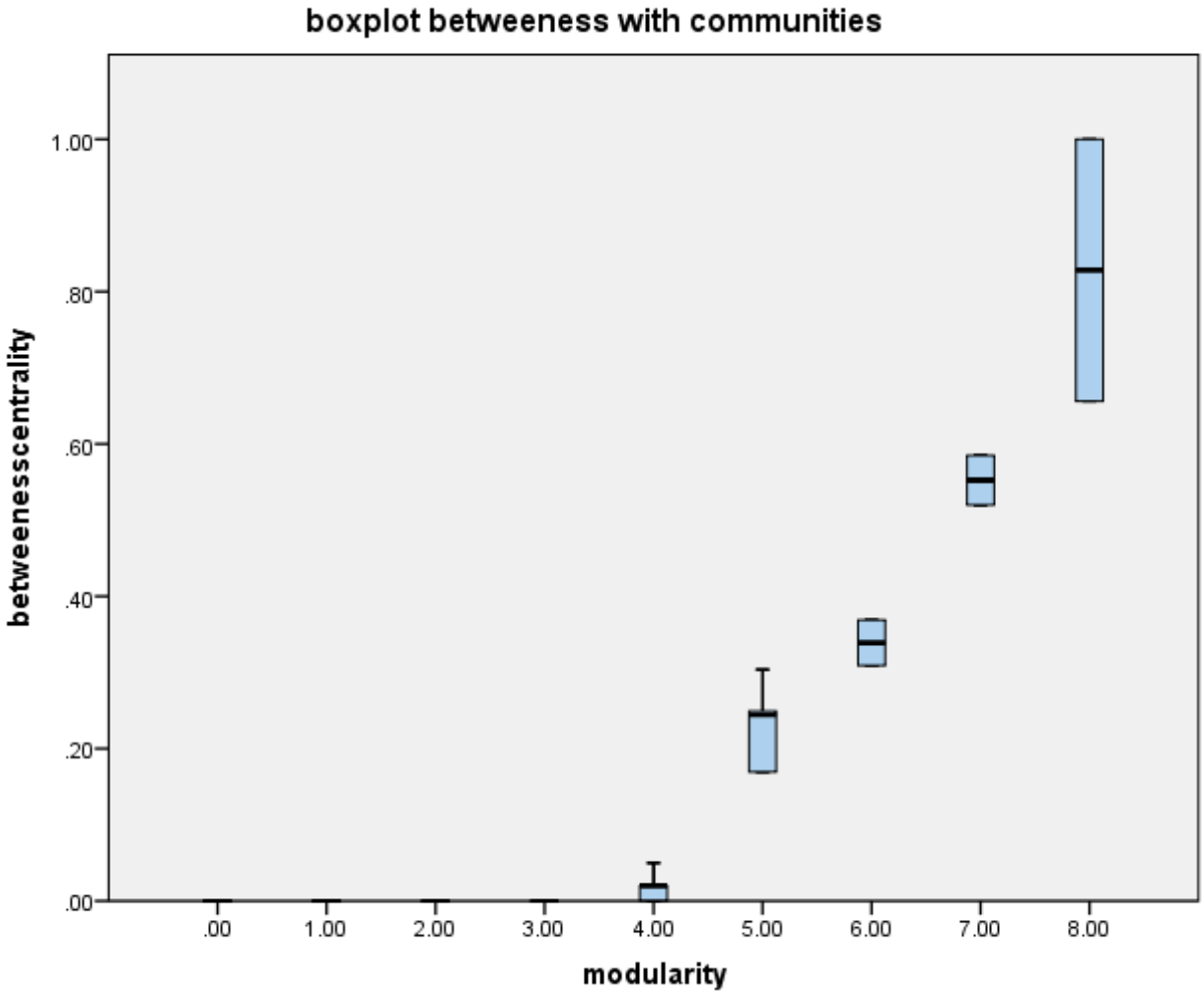

boxplot betweeness with communities
betweenesscentrality
1.00
.80
.60
.40
.20
.00
.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
modularity

Figure 3.1. 42

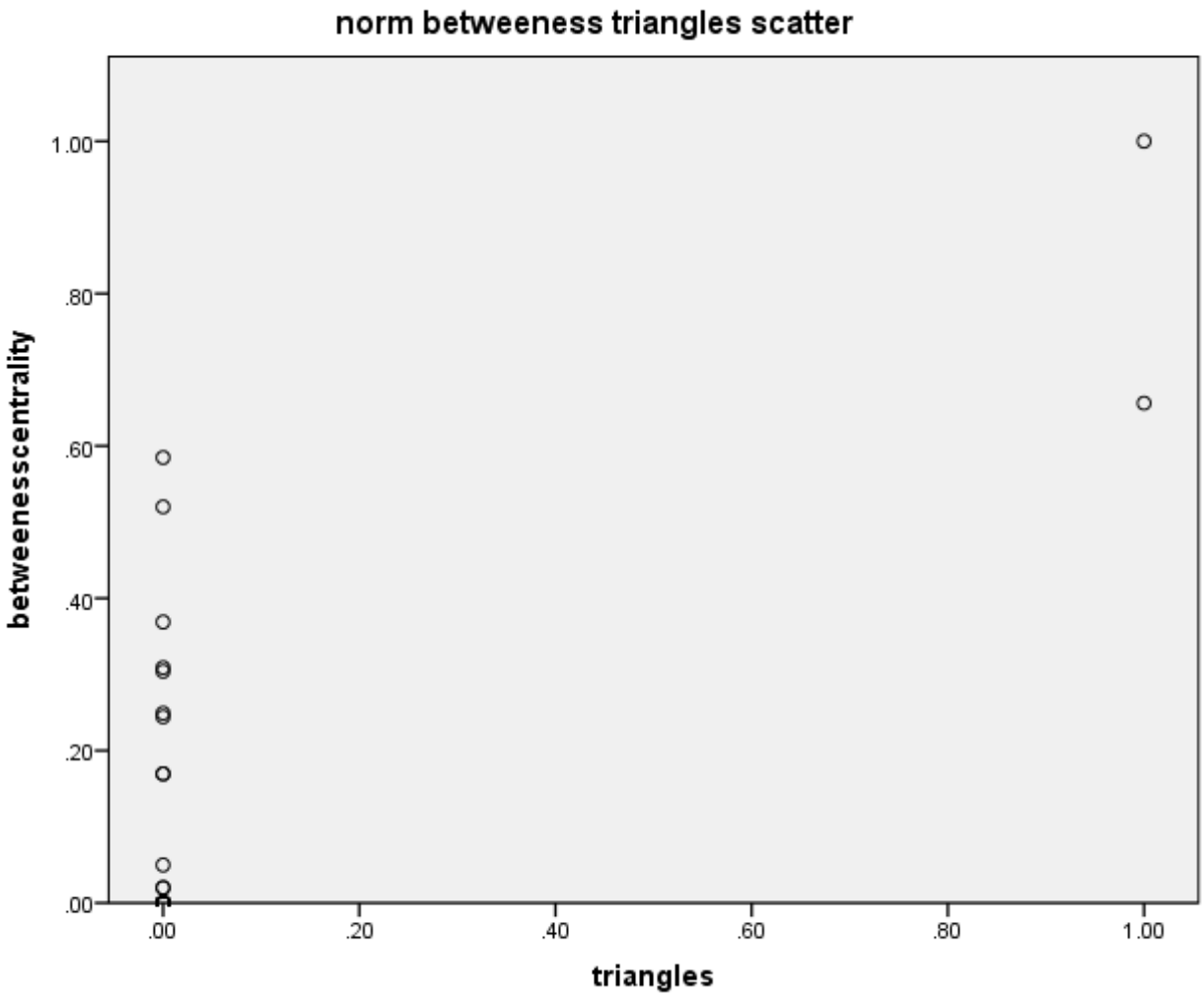

norm betweeness triangles scatter
betweenesscentrality
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
triangles

Figure 3.1. 43

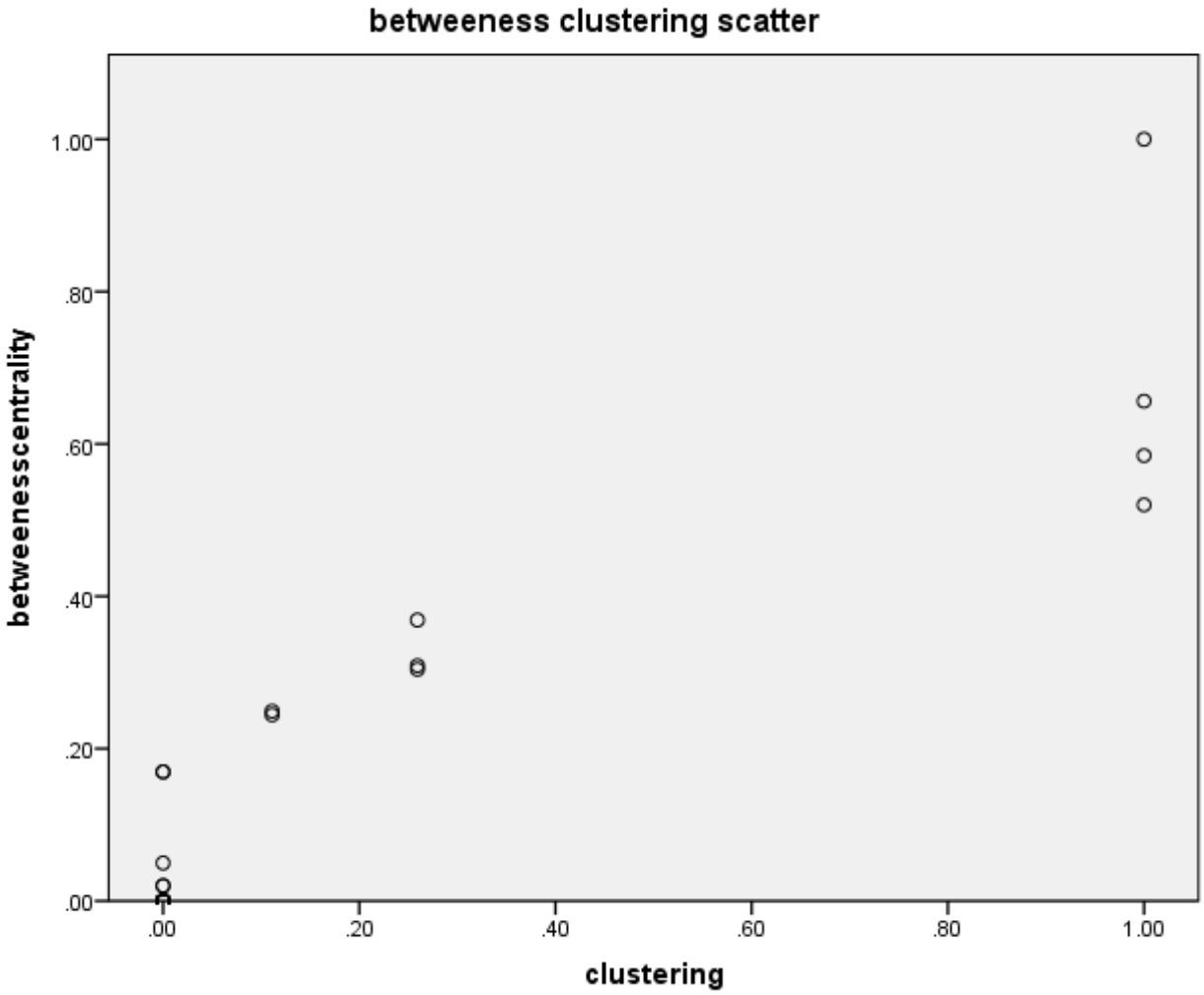

betweeness clustering scatter
betweenesscentrality
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
clustering

Figure 3.1. 44

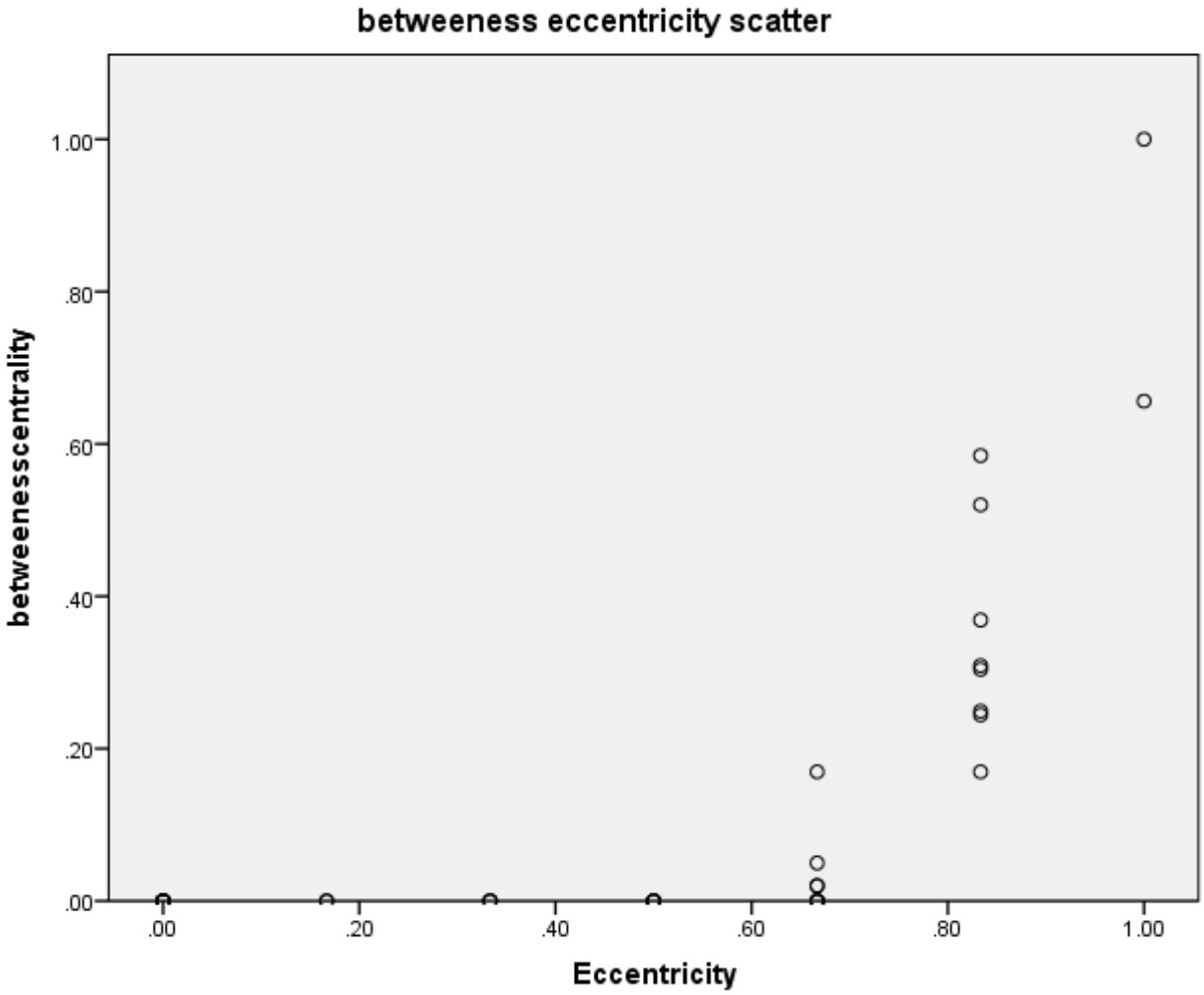

betweeness eccentricity scatter
betweenesscentrality
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
Eccentricity

Figure 3.1. 45

Comparisons based on closeness centrality

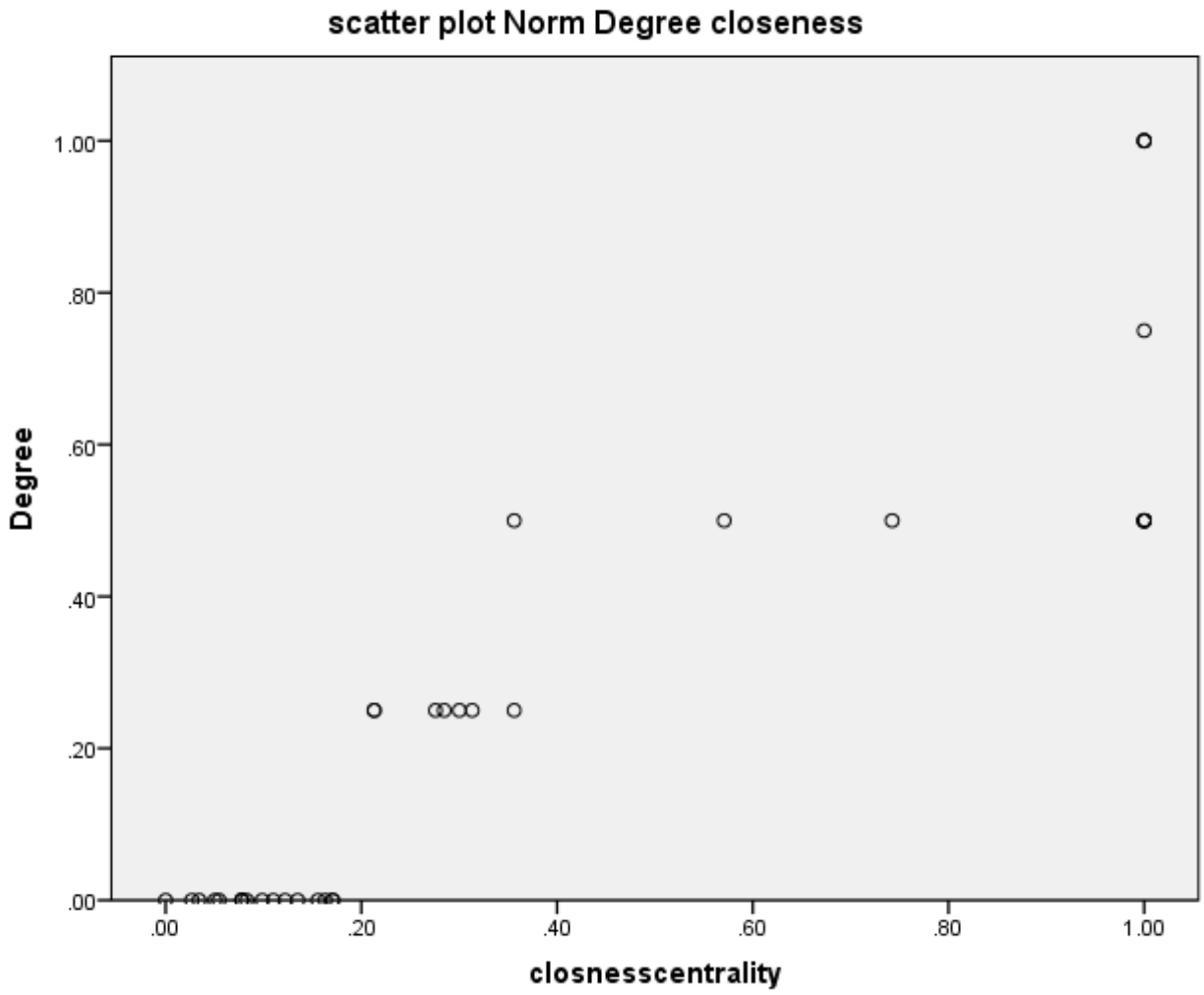


Figure 3.1. 46

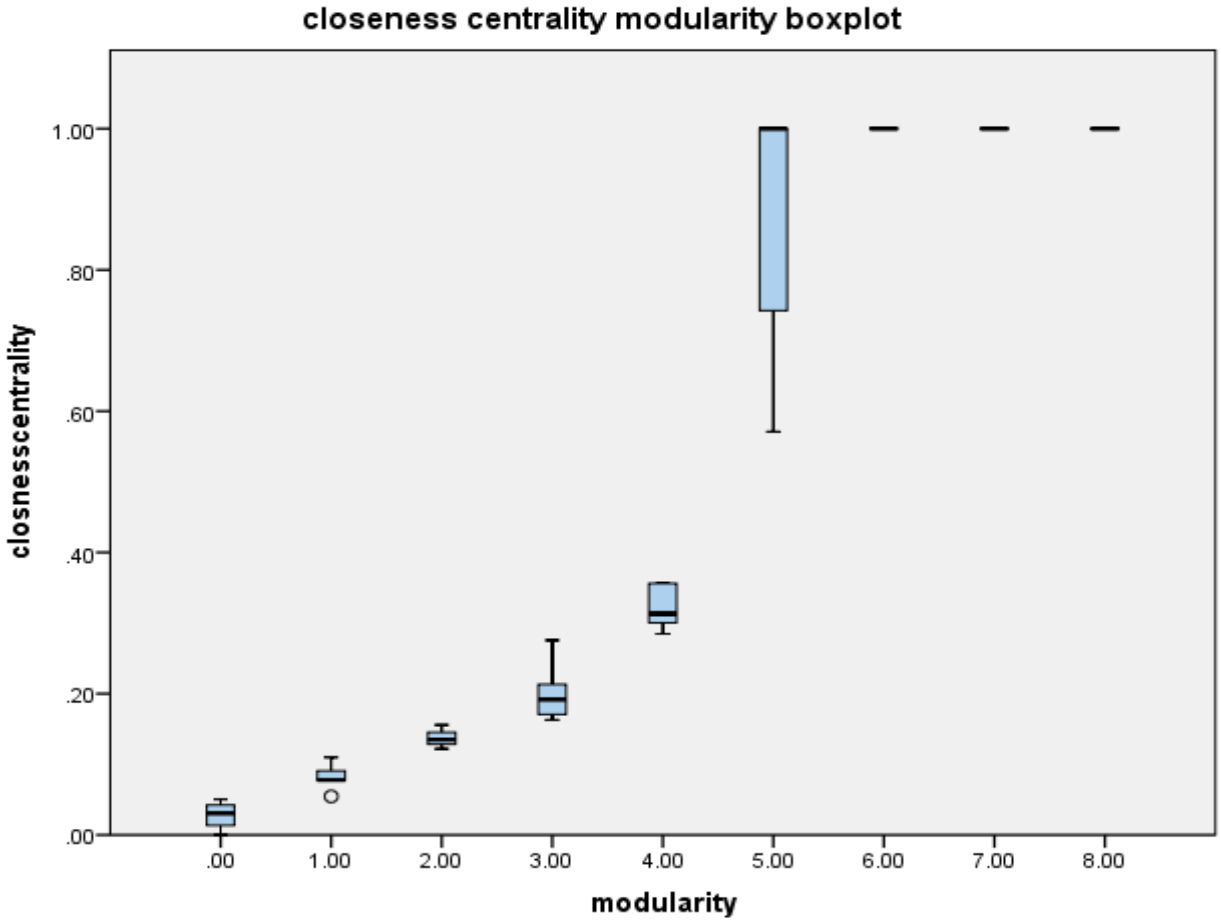

closeness centrality modularity boxplot
closnesscentrality
1.00
.80
.60
.40
.20
.00
.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
modularity

Figure 3.1. 47

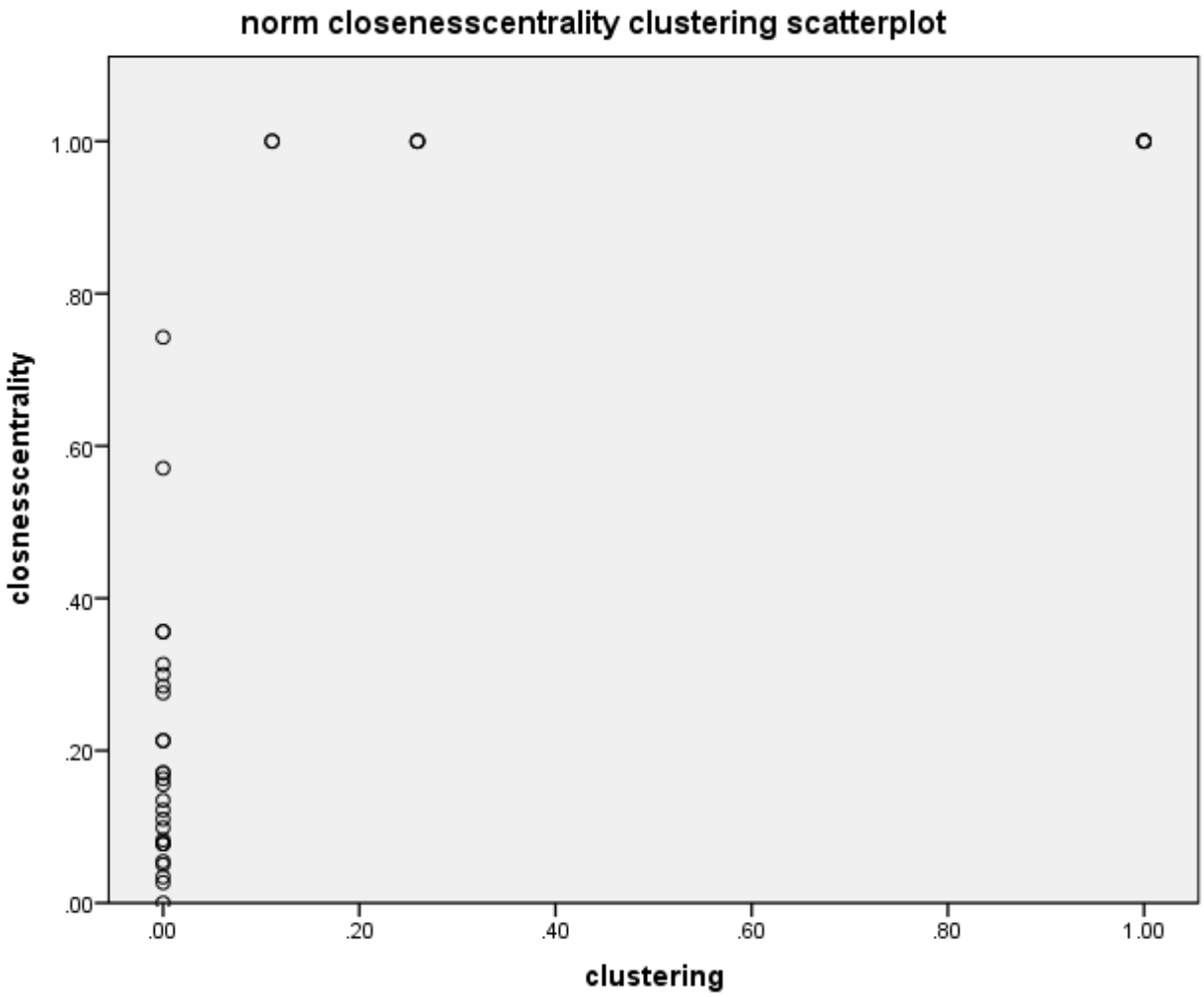

norm closenesscentrality clustering scatterplot
closnesscentrality
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
clustering

Figure 3.1. 48

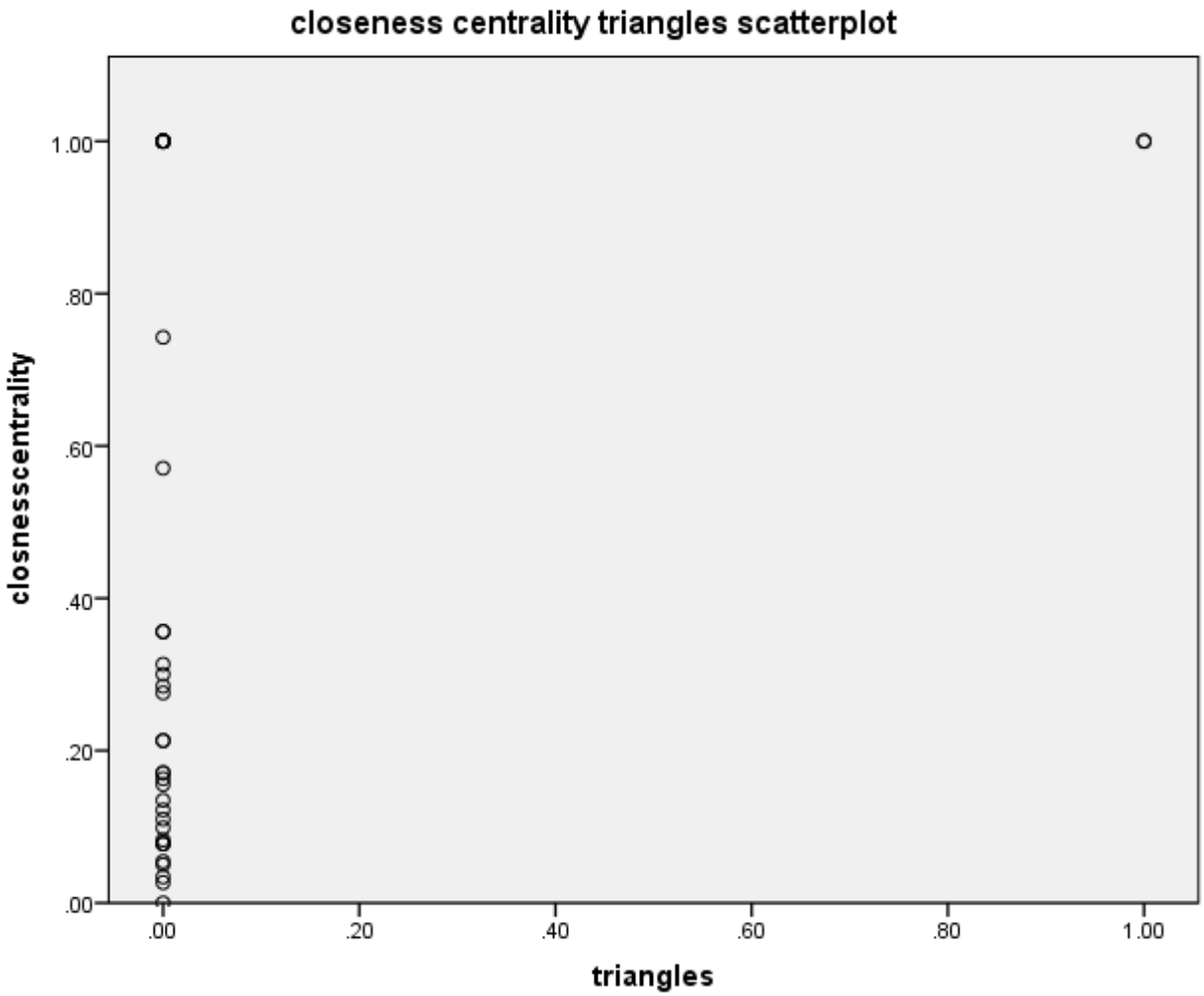

closeness centrality triangles scatterplot
closnesscentrality
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
triangles

Figure 3.1. 49

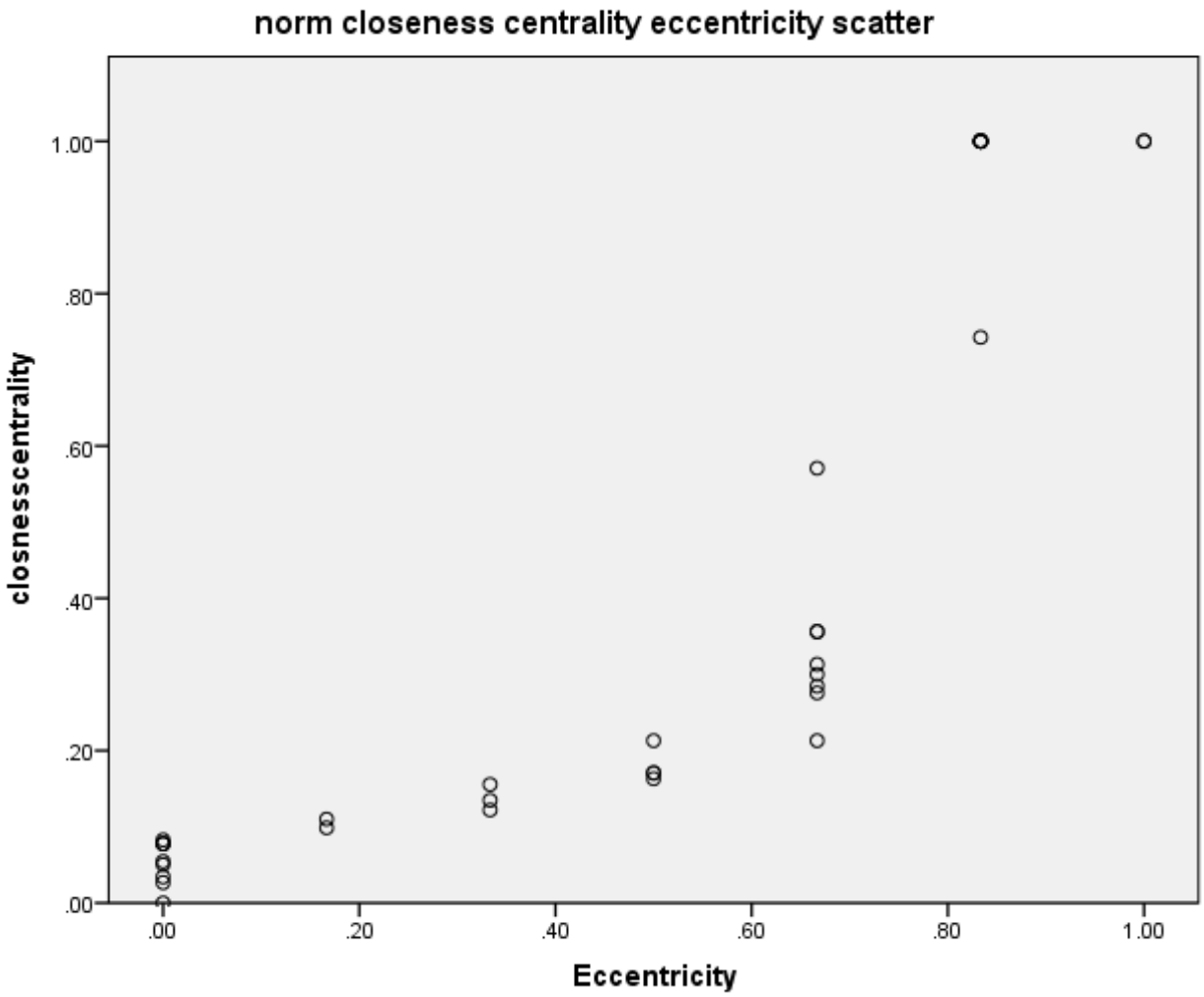

norm closeness centrality eccentricity scatter
closnesscentrality
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
Eccentricity

Figure 3.1. 50

Comparisons based on harmonic closeness centrality

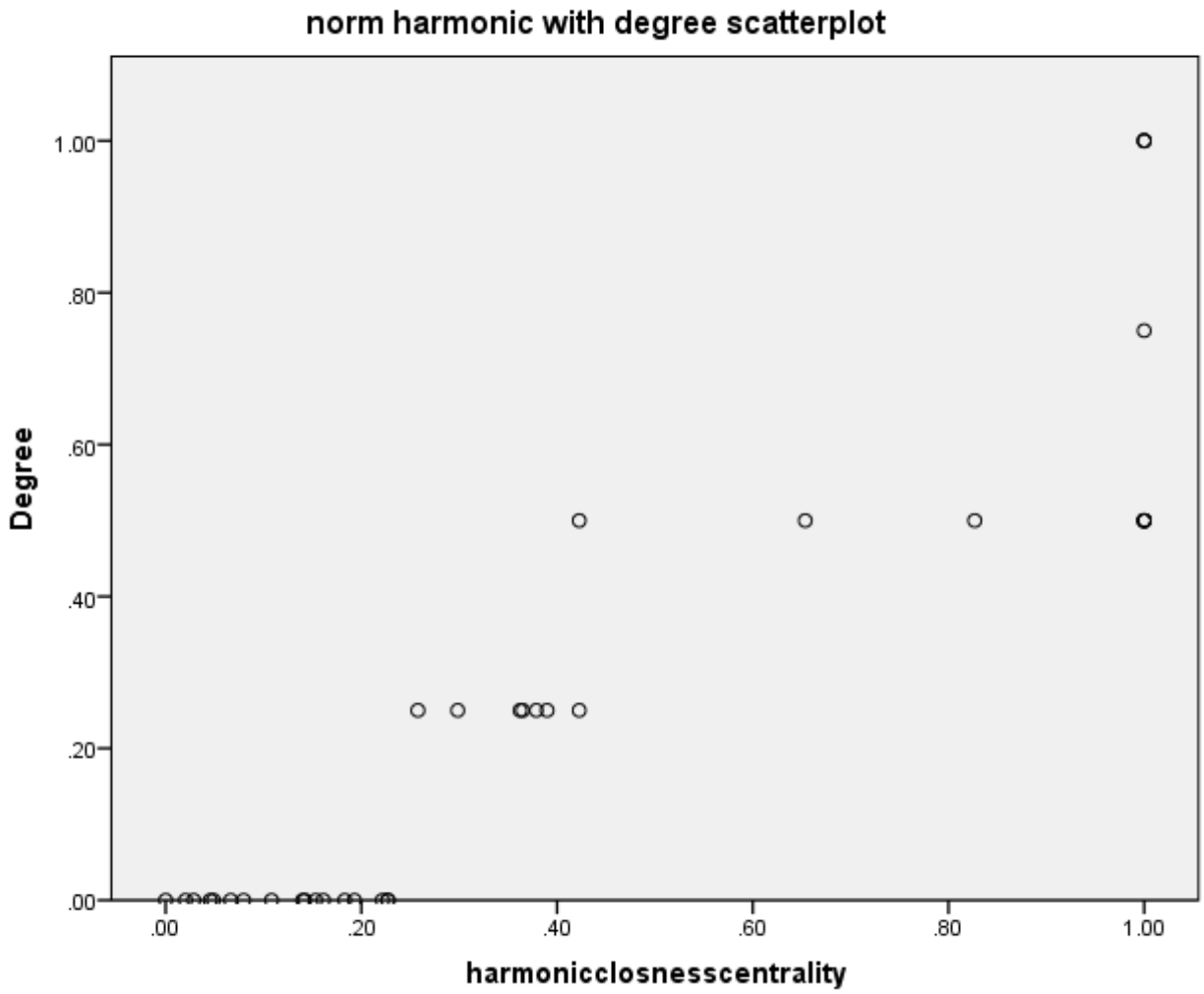


Figure 3.1. 51

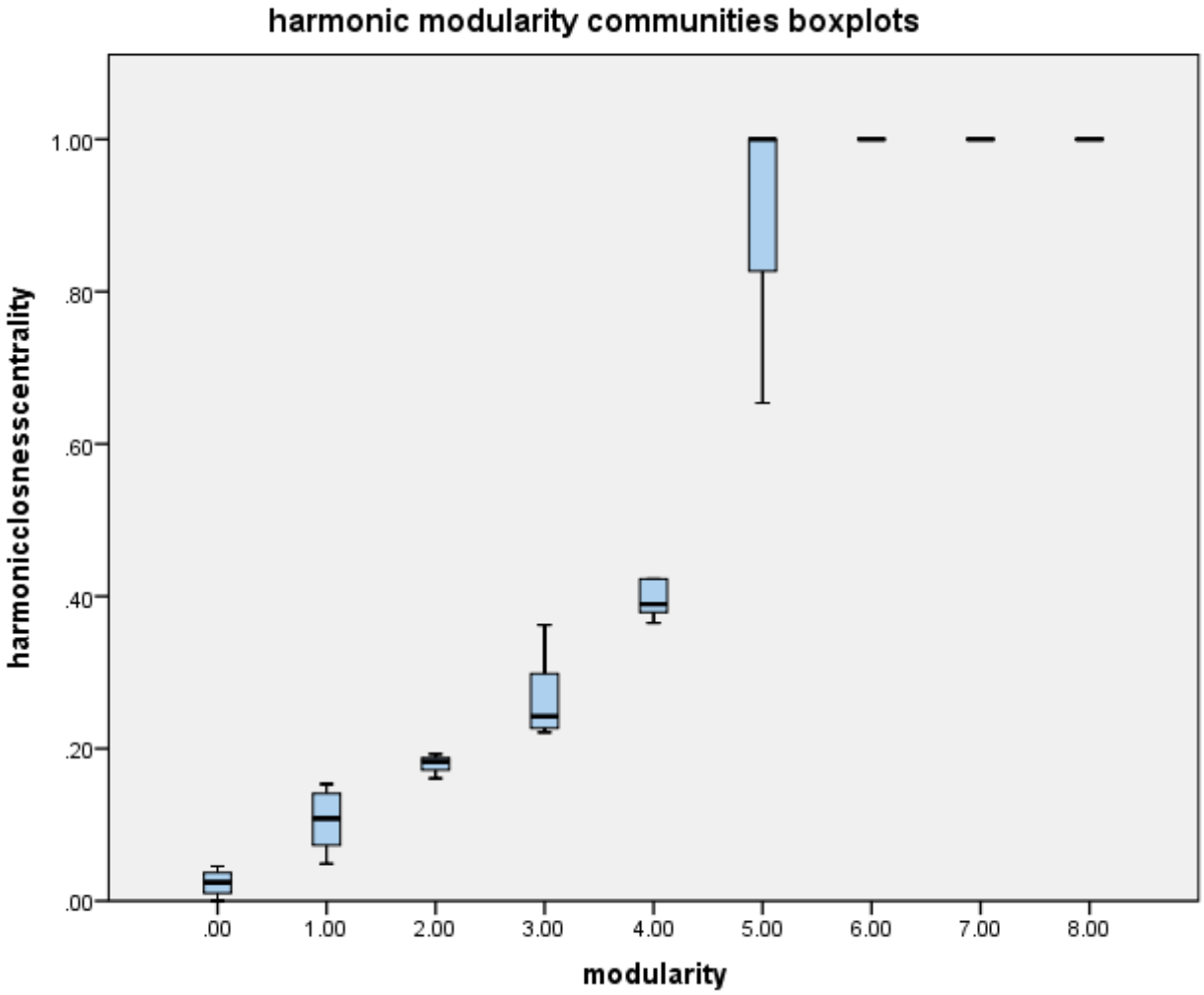

harmonic modularity communities boxplots
harmonicclosnesscentrality
1.00
.80
.60
.40
.20
.00
.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
modularity

Figure 3.1. 52

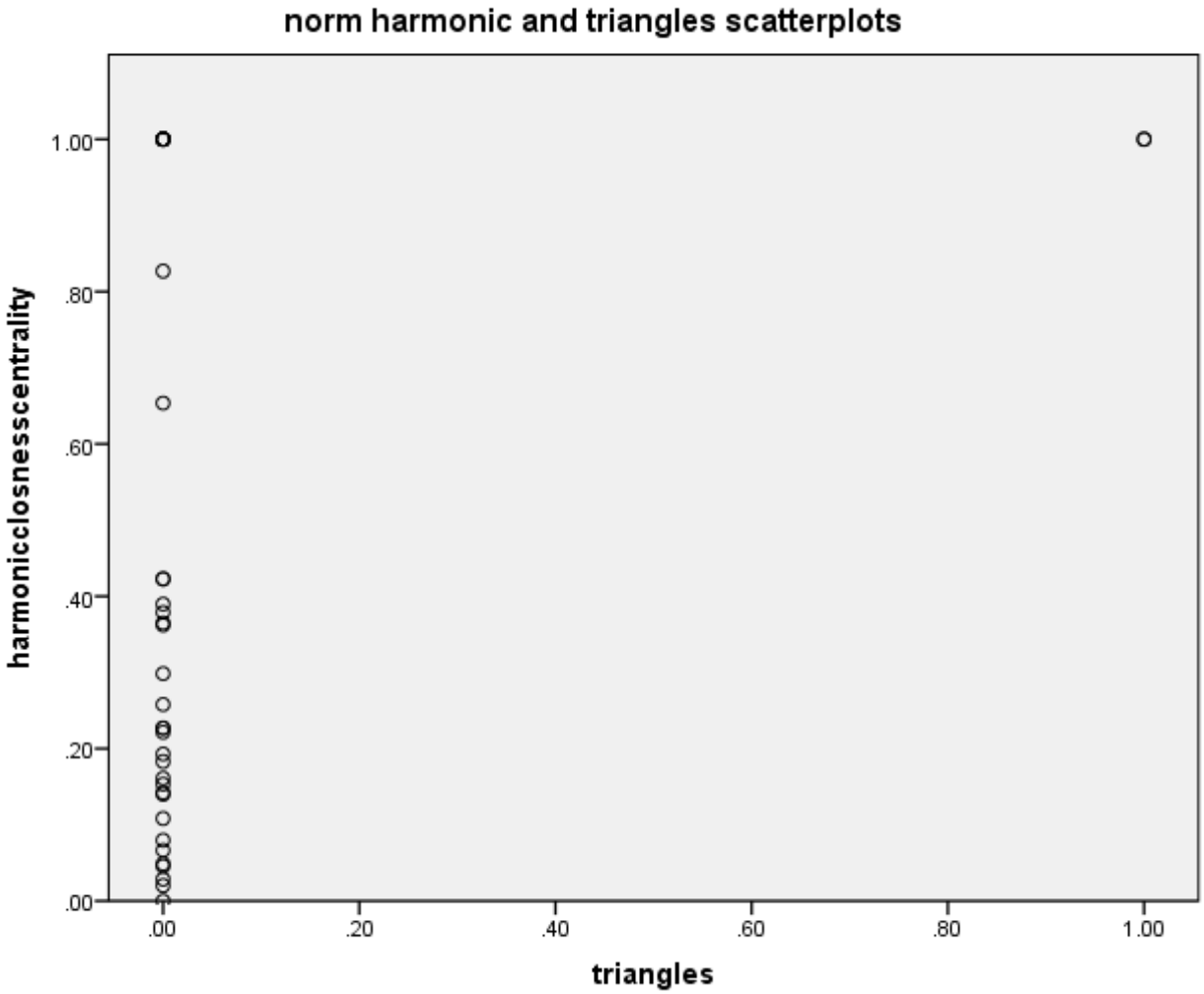

norm harmonic and triangles scatterplots
harmonicclosnesscentrality
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
triangles

Figure 3.1. 53

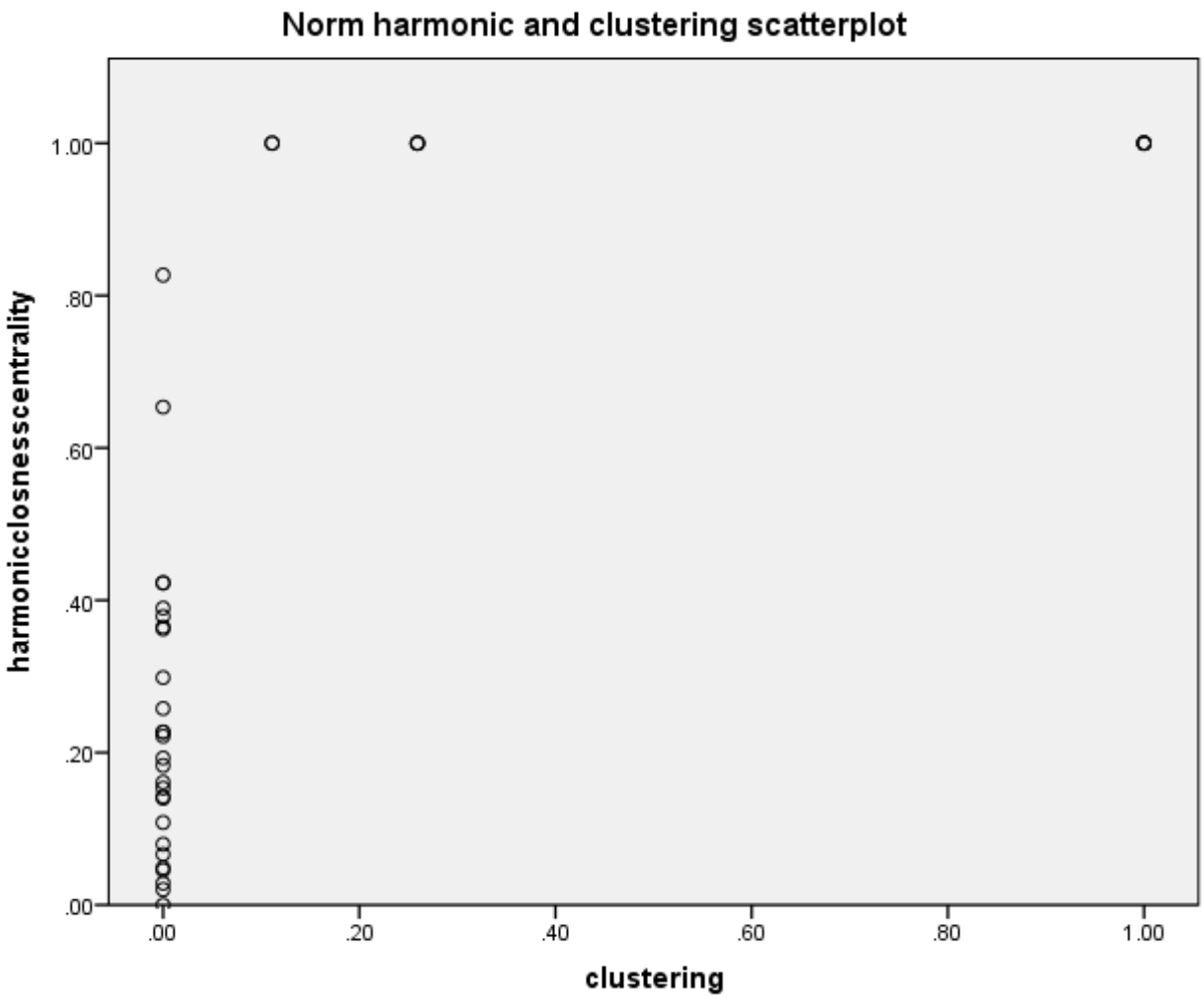

Norm harmonic and clustering scatterplot
harmonicclosnesscentrality
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
clustering

Figure 3.1. 54

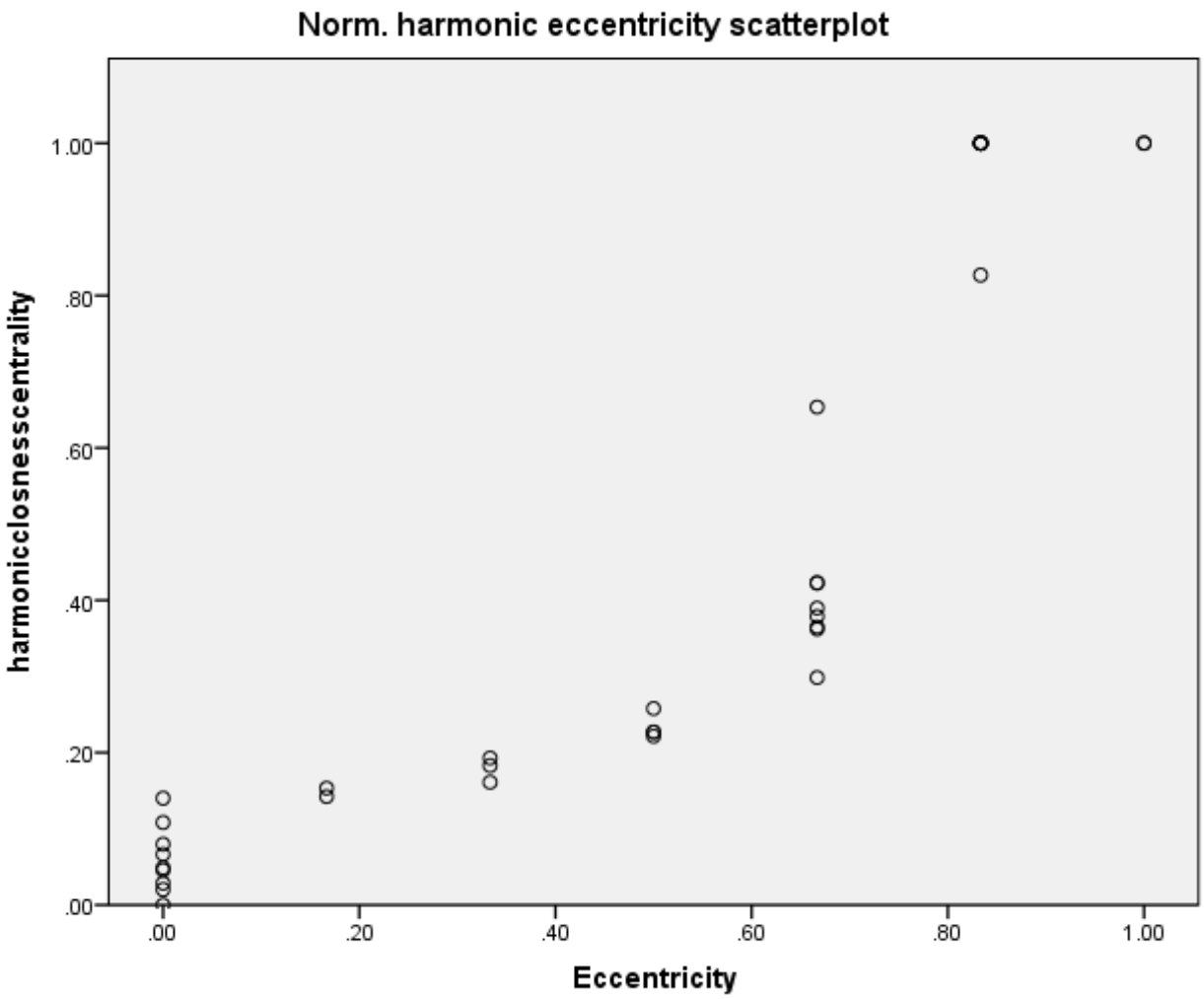

Norm. harmonic eccentricity scatterplot
harmonicclosnesscentrality
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
Eccentricity

Figure 3.1. 55

Comparisons based on eigen centrality

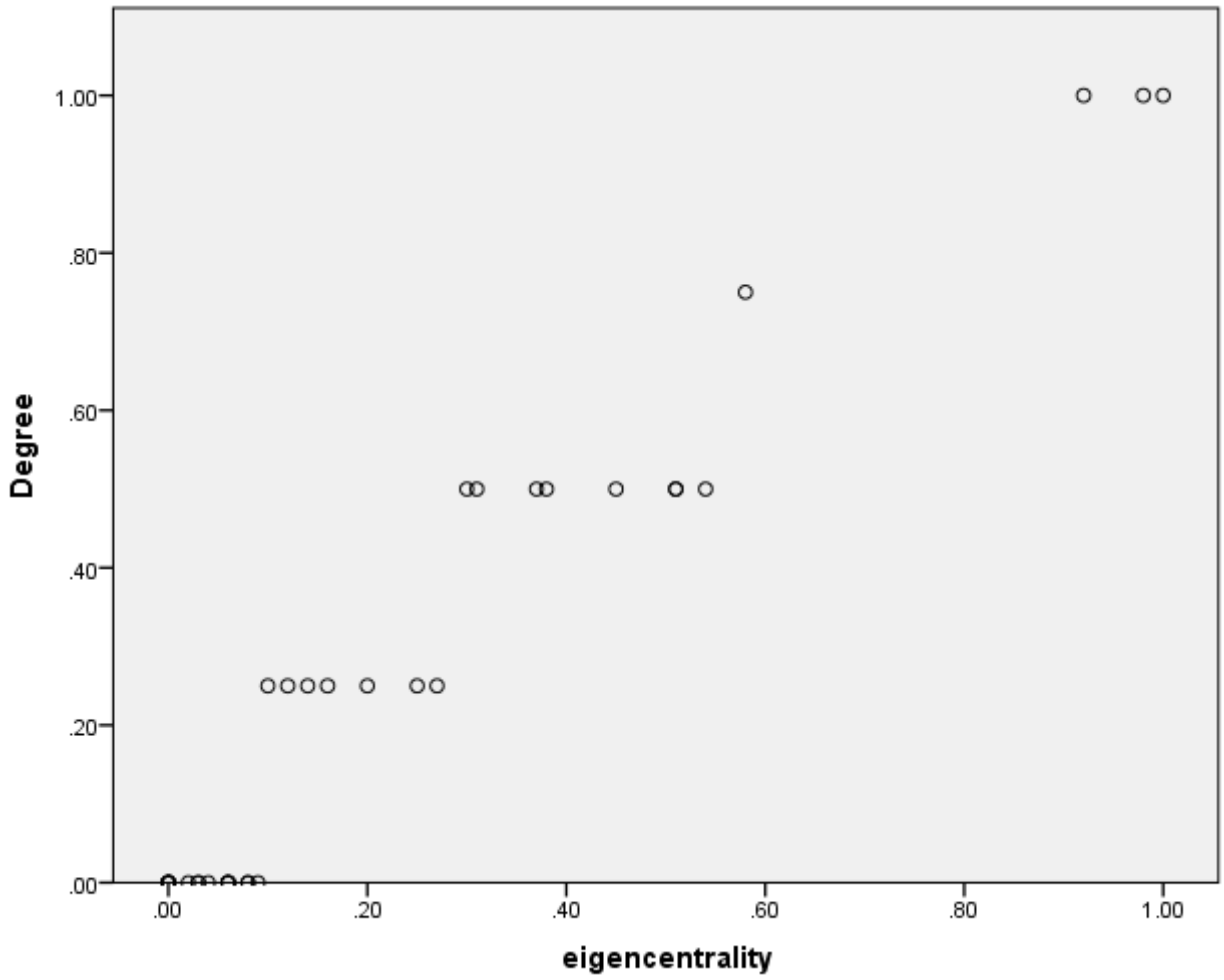


Figure 3.1. 56

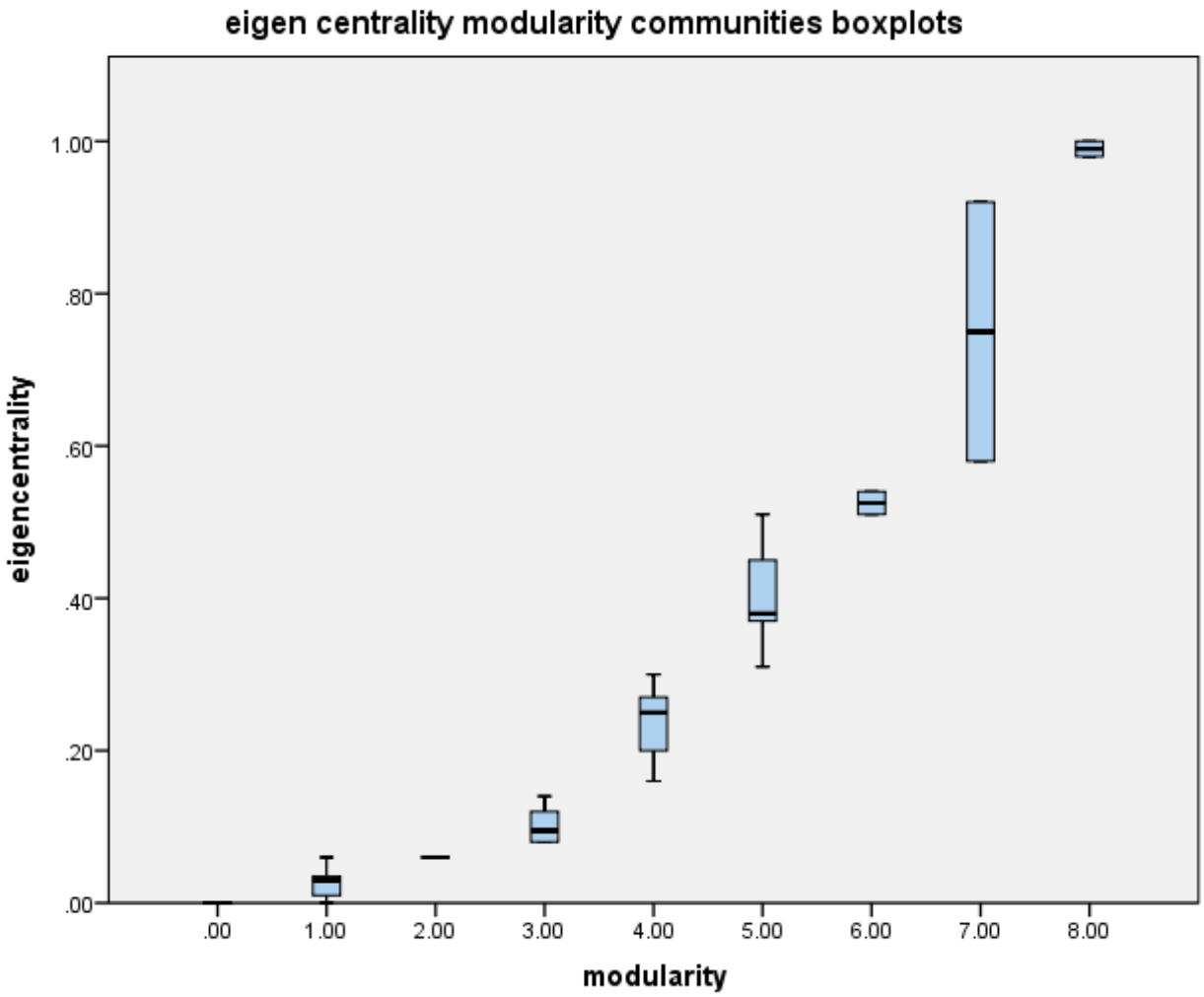

eigen centrality modularity communities boxplots
eigencentrality
1.00
.80
.60
.40
.20
.00
.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
modularity

Figure 3.1. 57

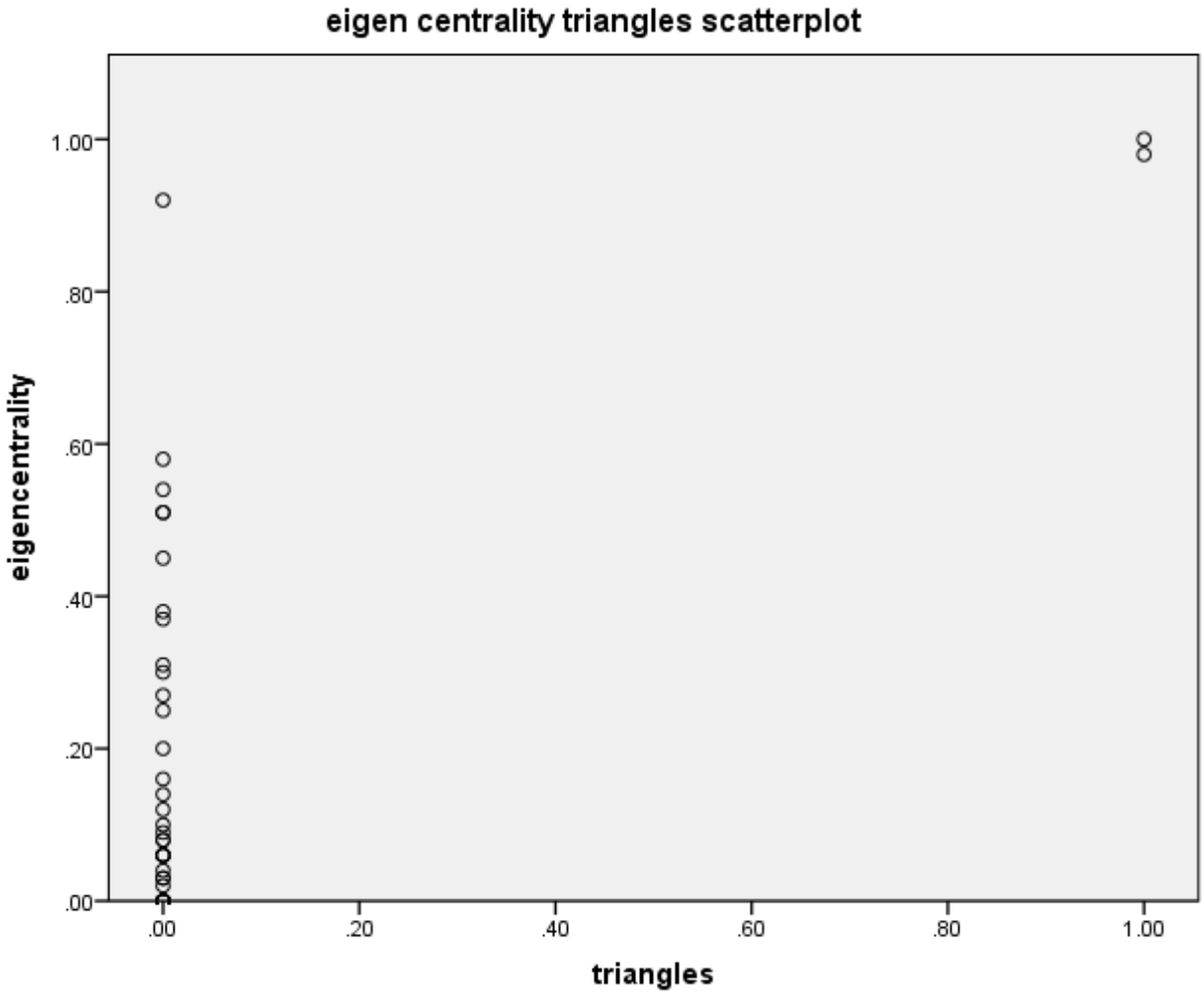

eigen centrality triangles scatterplot
eigencentrality
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
triangles

Figure 3.1. 58

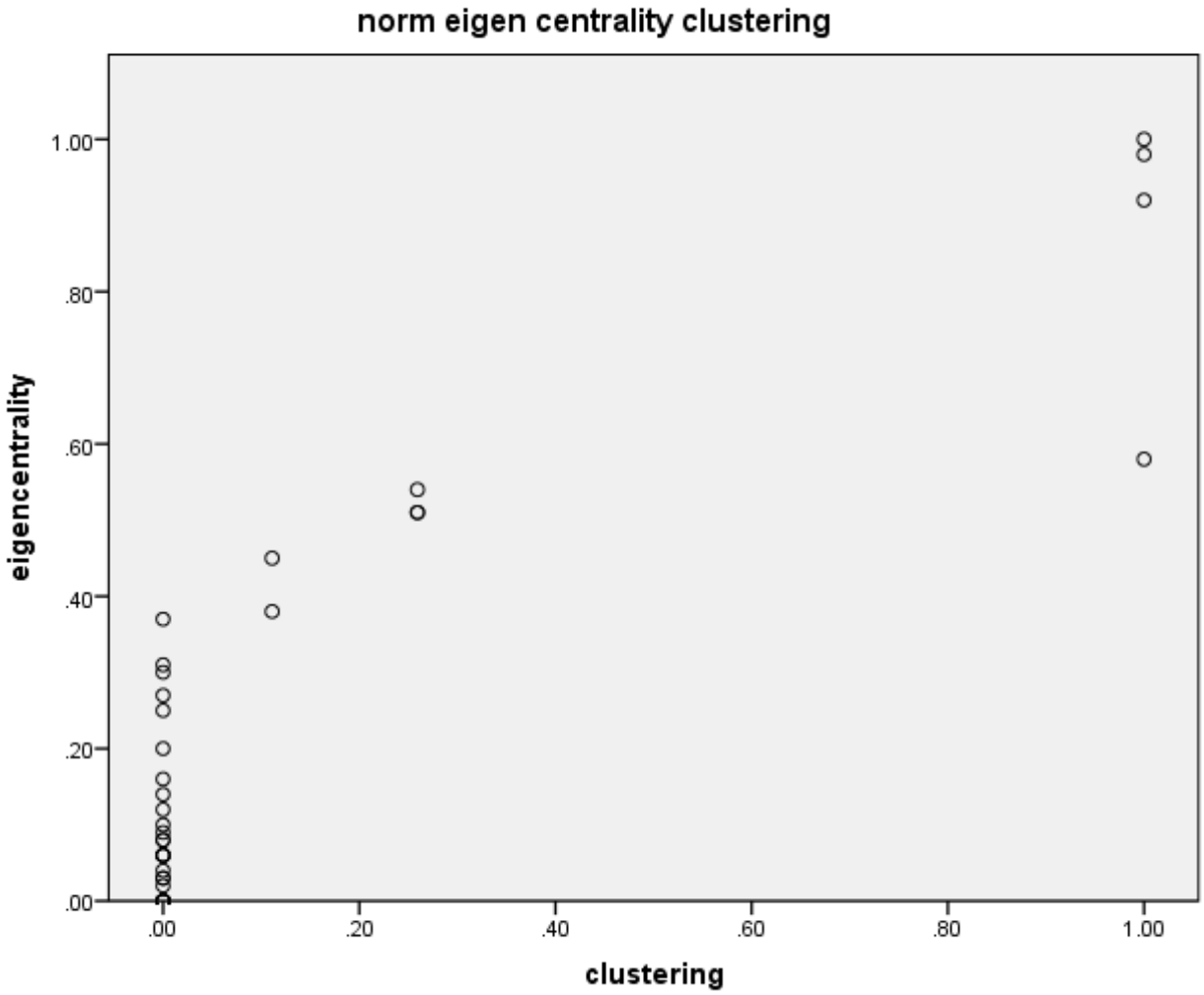

norm eigen centrality clustering
eigencentrality
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
clustering

Figure 3.1. 59

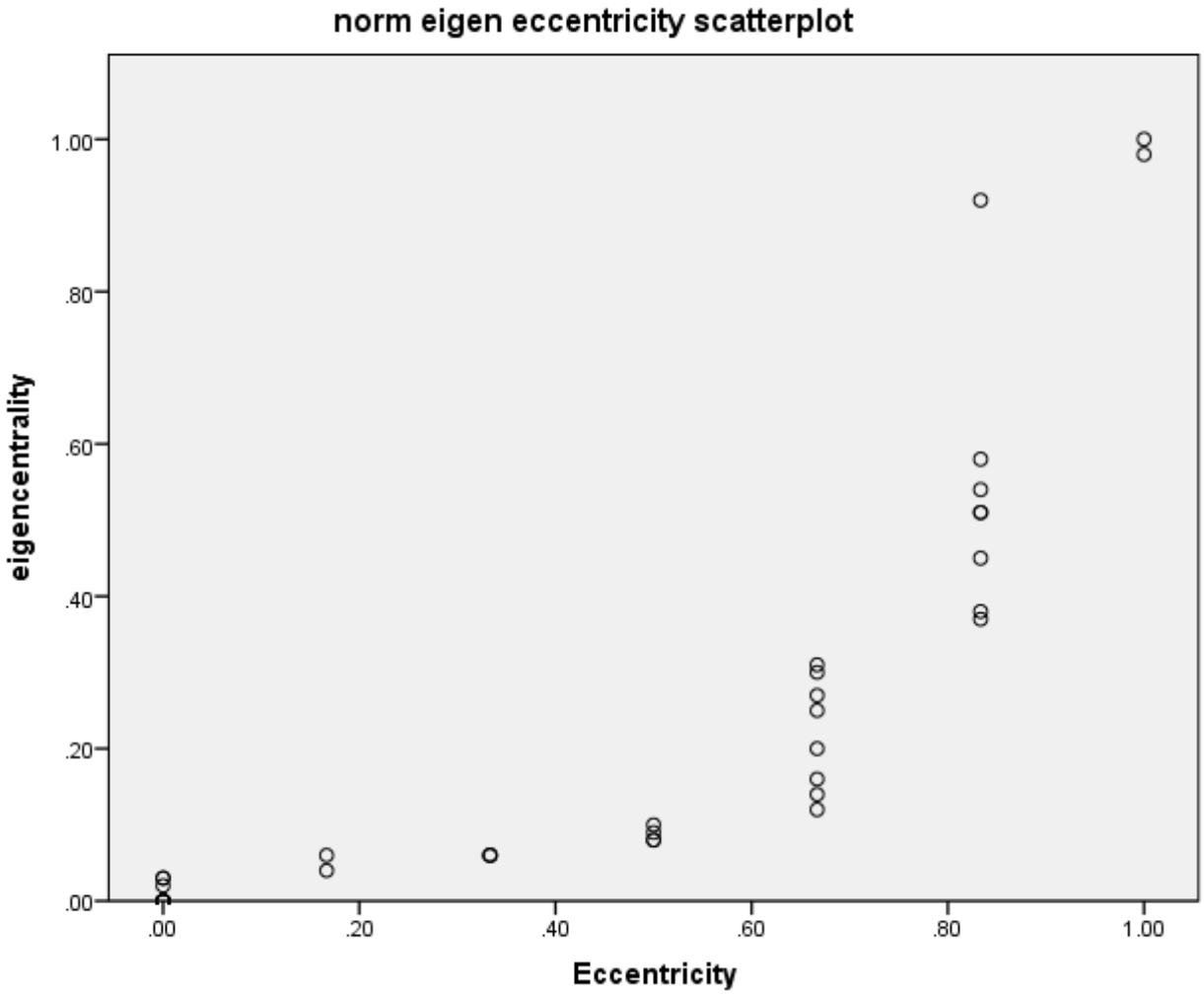

norm eigen eccentricity scatterplot
eigencentrality
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
Eccentricity

Figure 3.1. 60

Comparisons based on Hubs

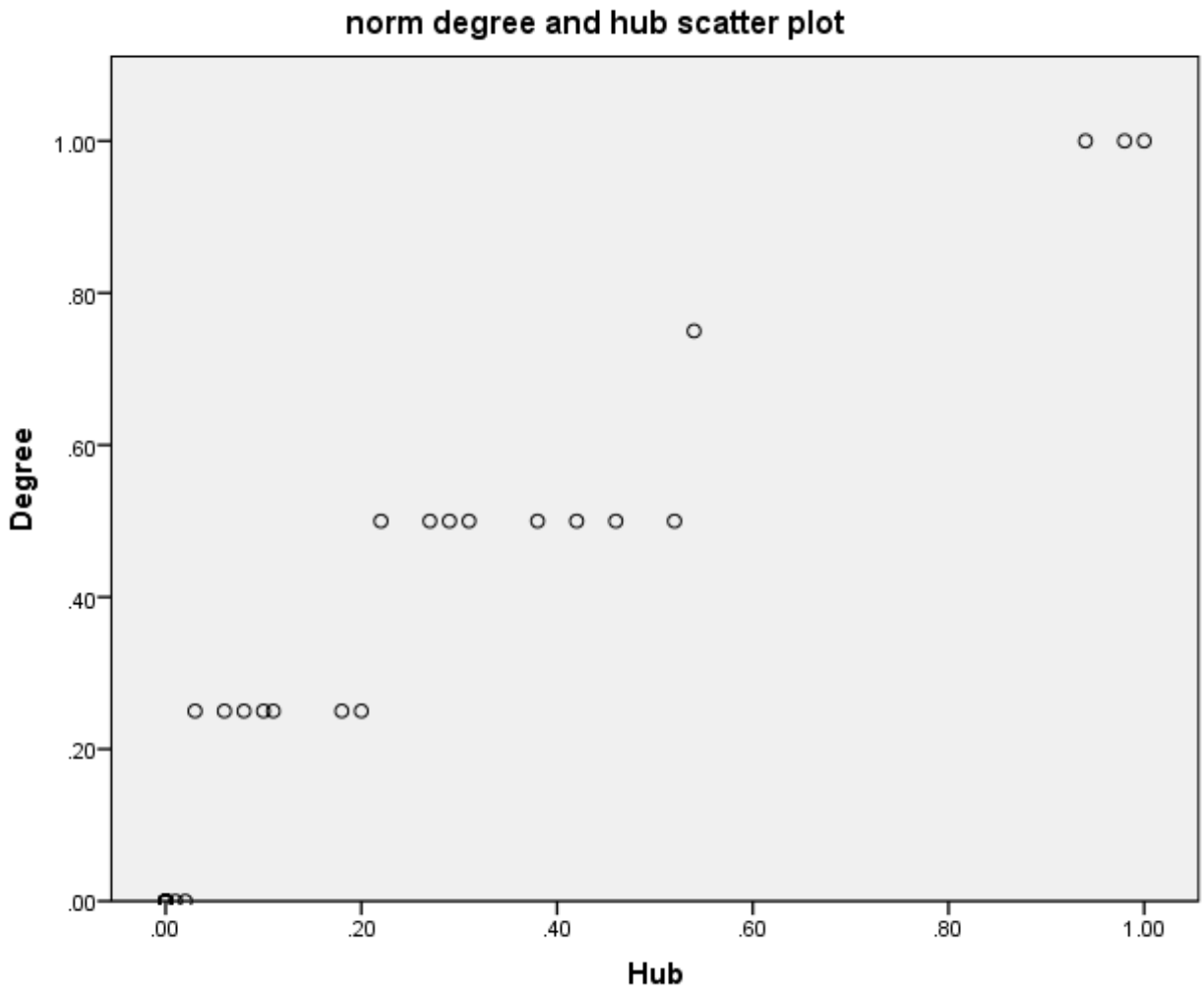


Figure 3.1. 61

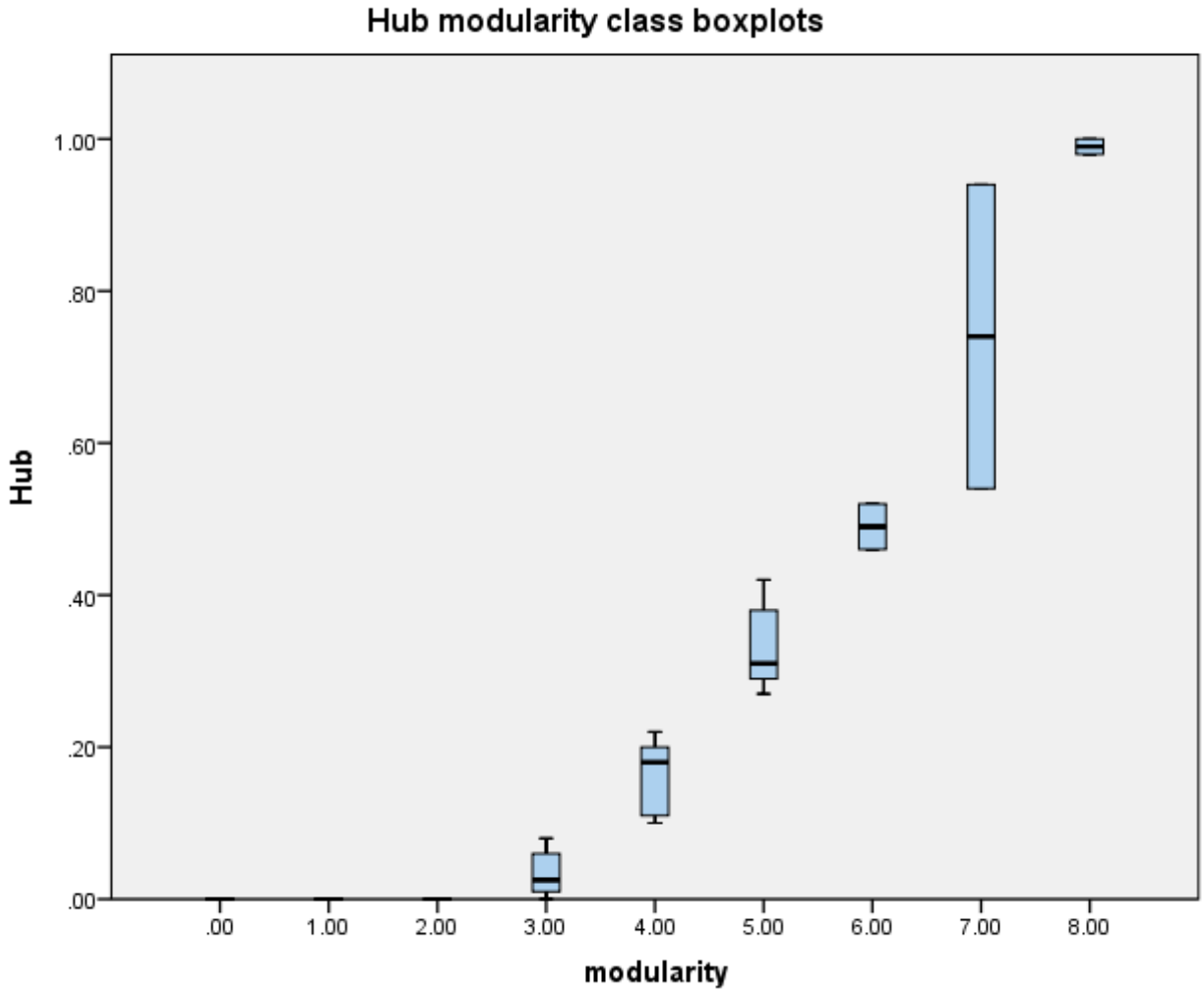

Hub modularity class boxplots
Hub
1.00
.80
.60
.40
.20
.00
.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
modularity

Figure 3.1. 62

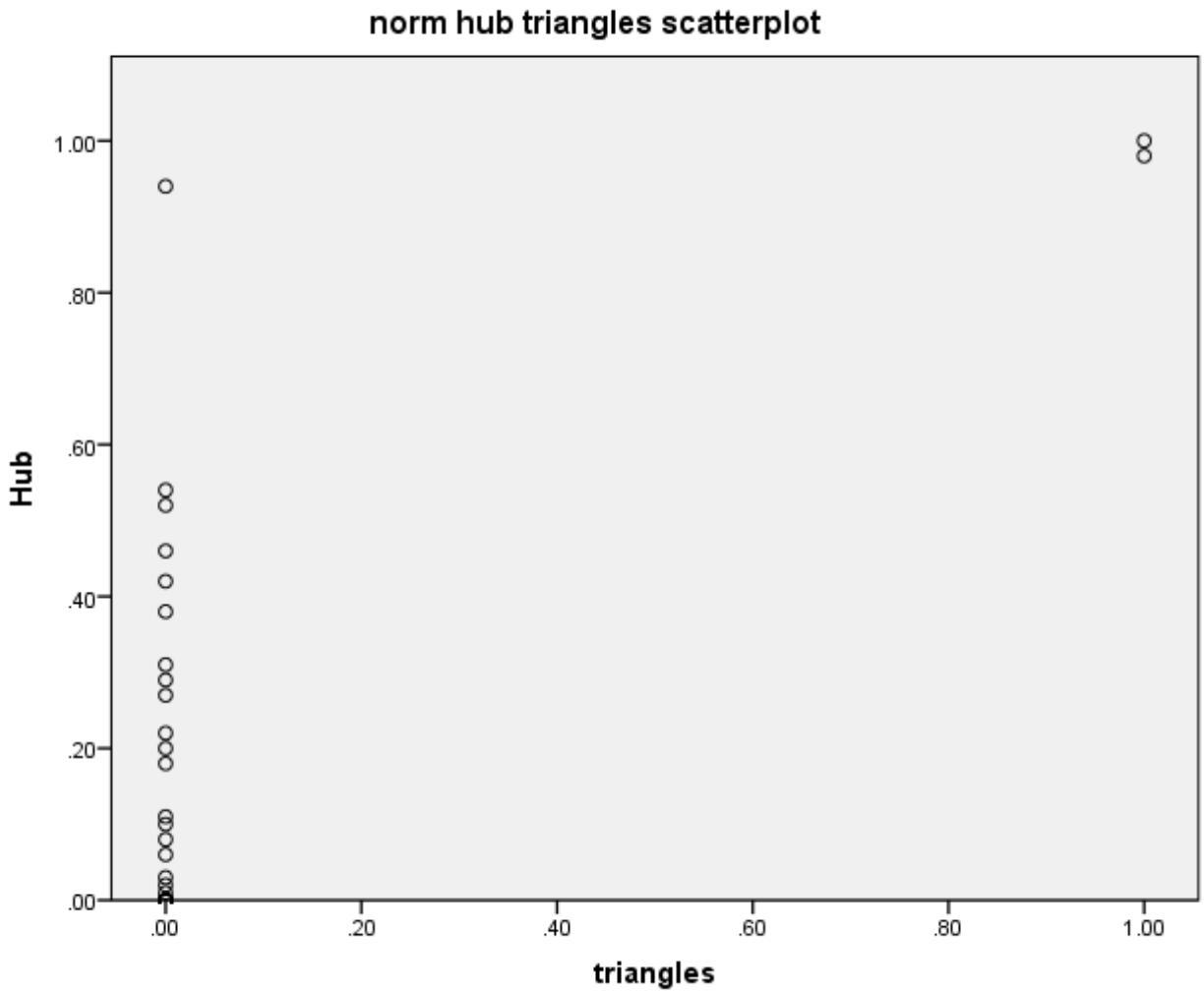

norm hub triangles scatterplot
Hub
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
triangles

Figure 3.1. 63

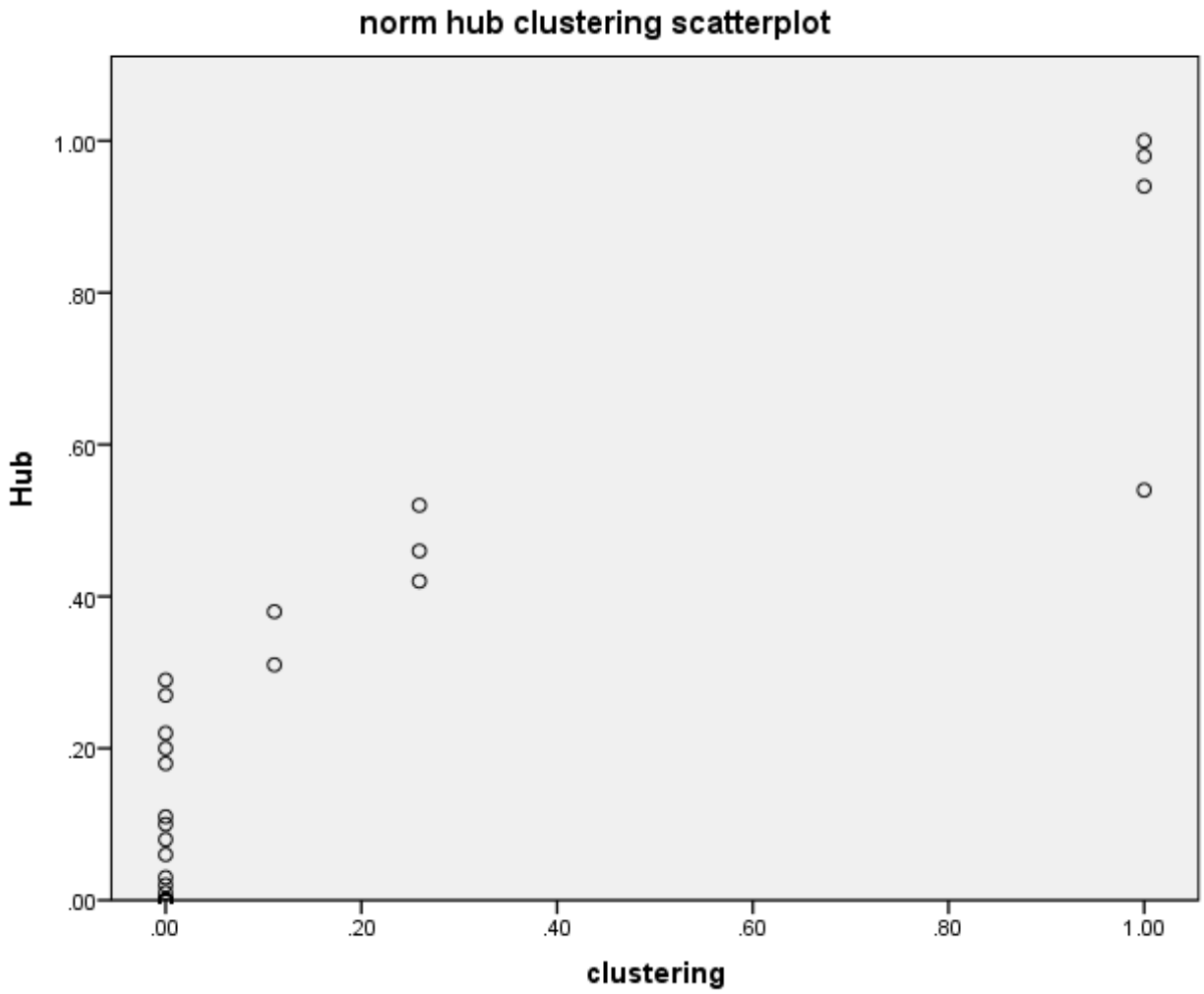

norm hub clustering scatterplot
Hub
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
clustering

Figure 3.1. 64

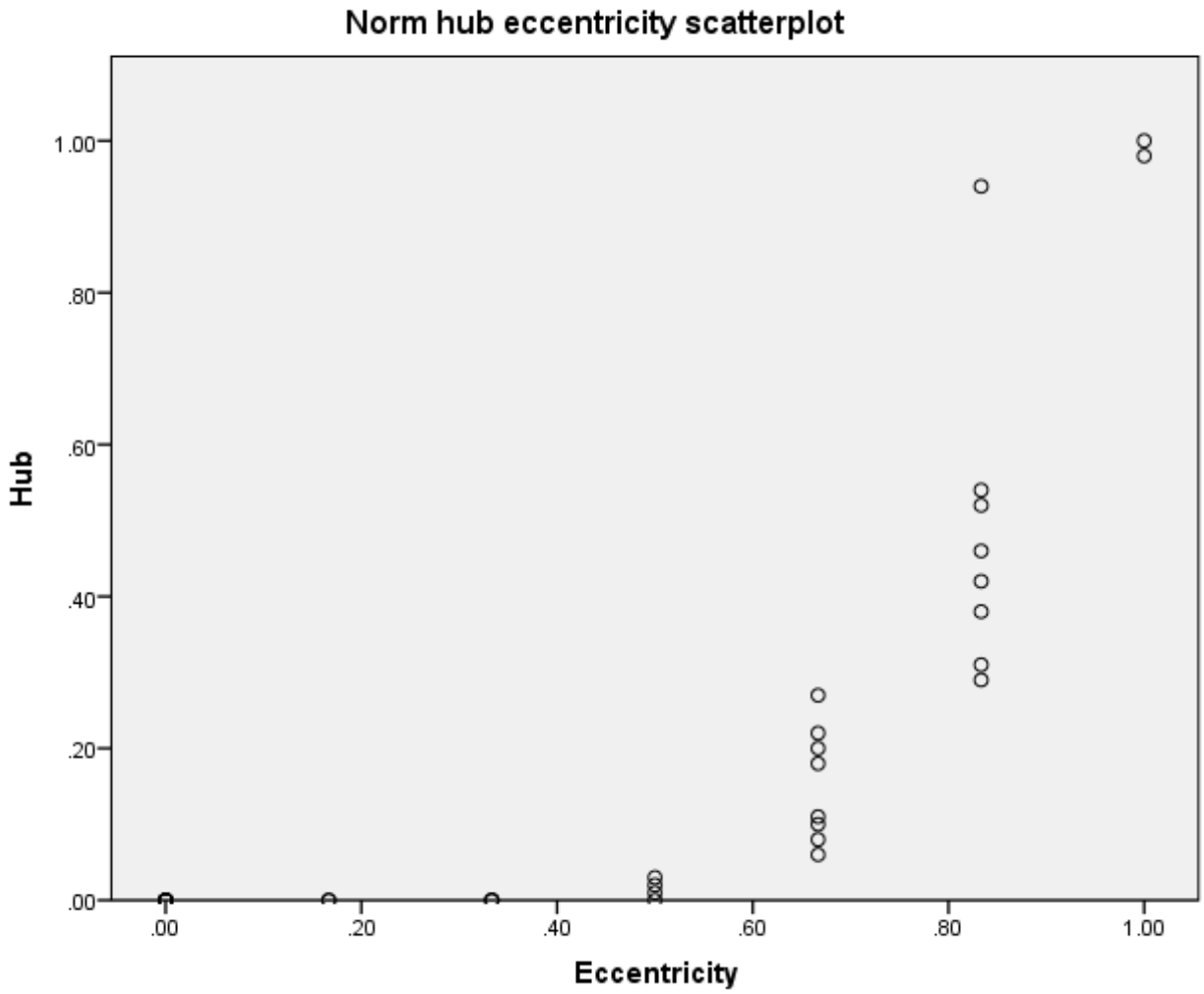

Norm hub eccentricity scatterplot
Hub
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
Eccentricity

Figure 3.1. 65

Comparisons based on page

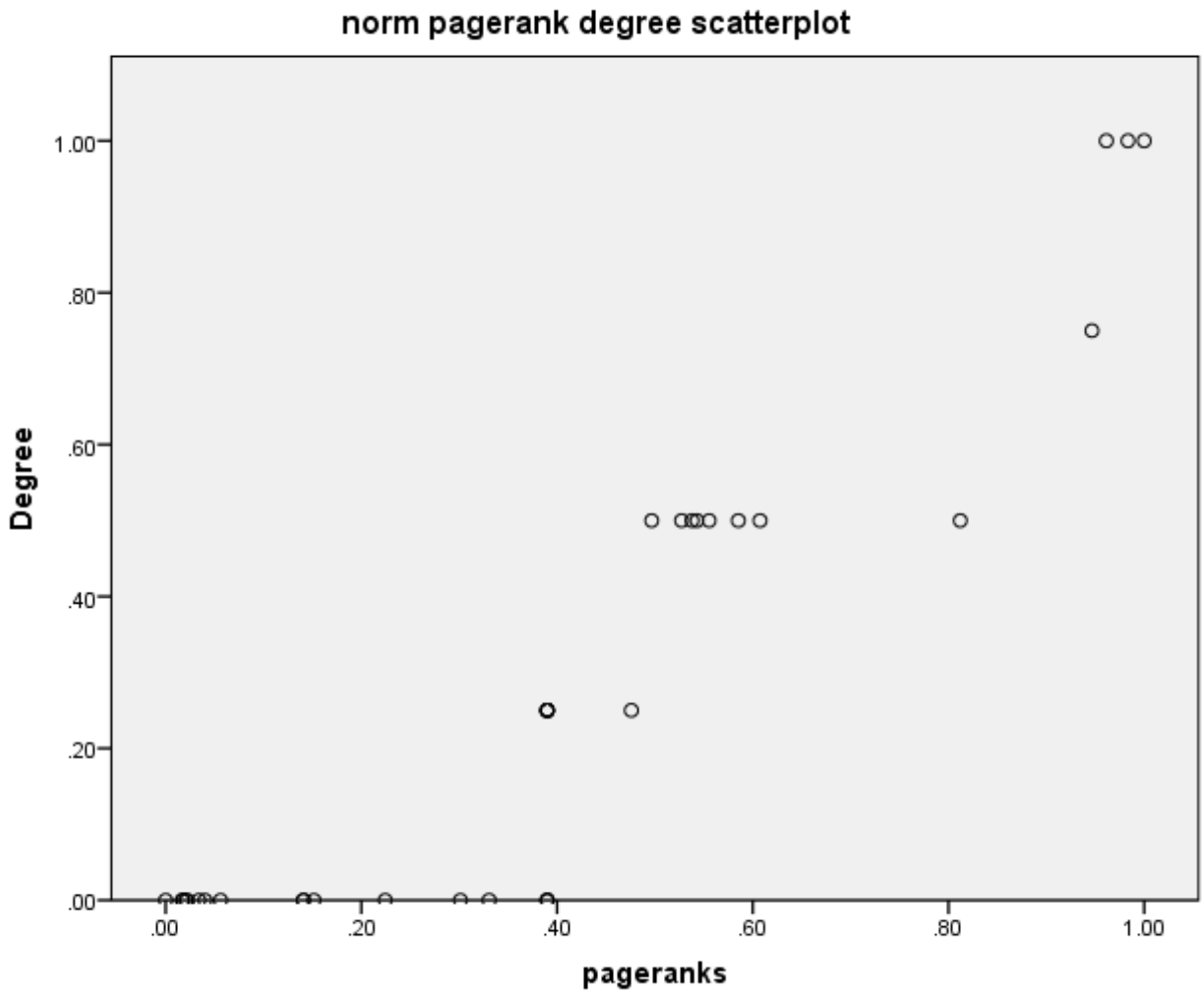


Figure 3.1. 66

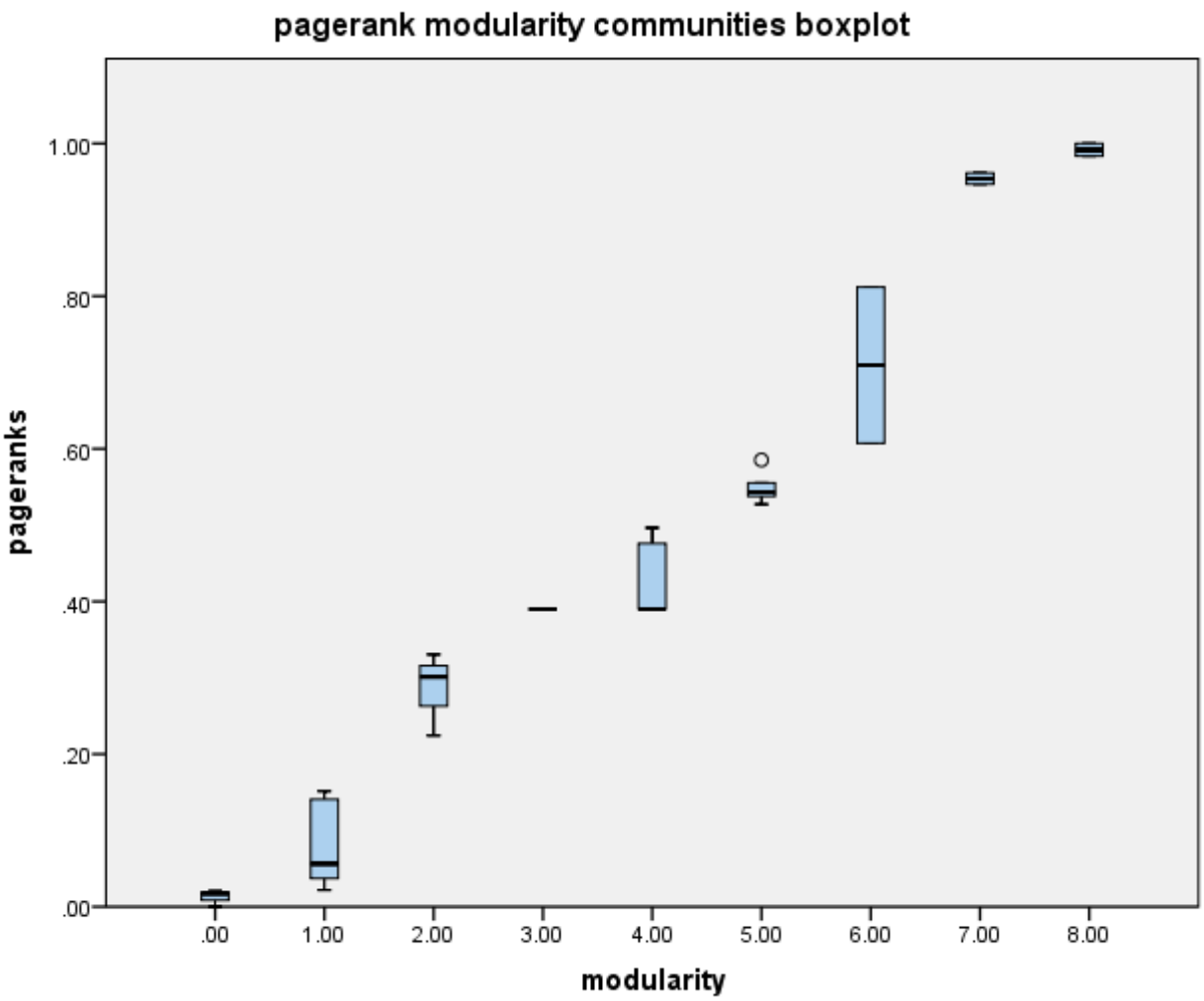
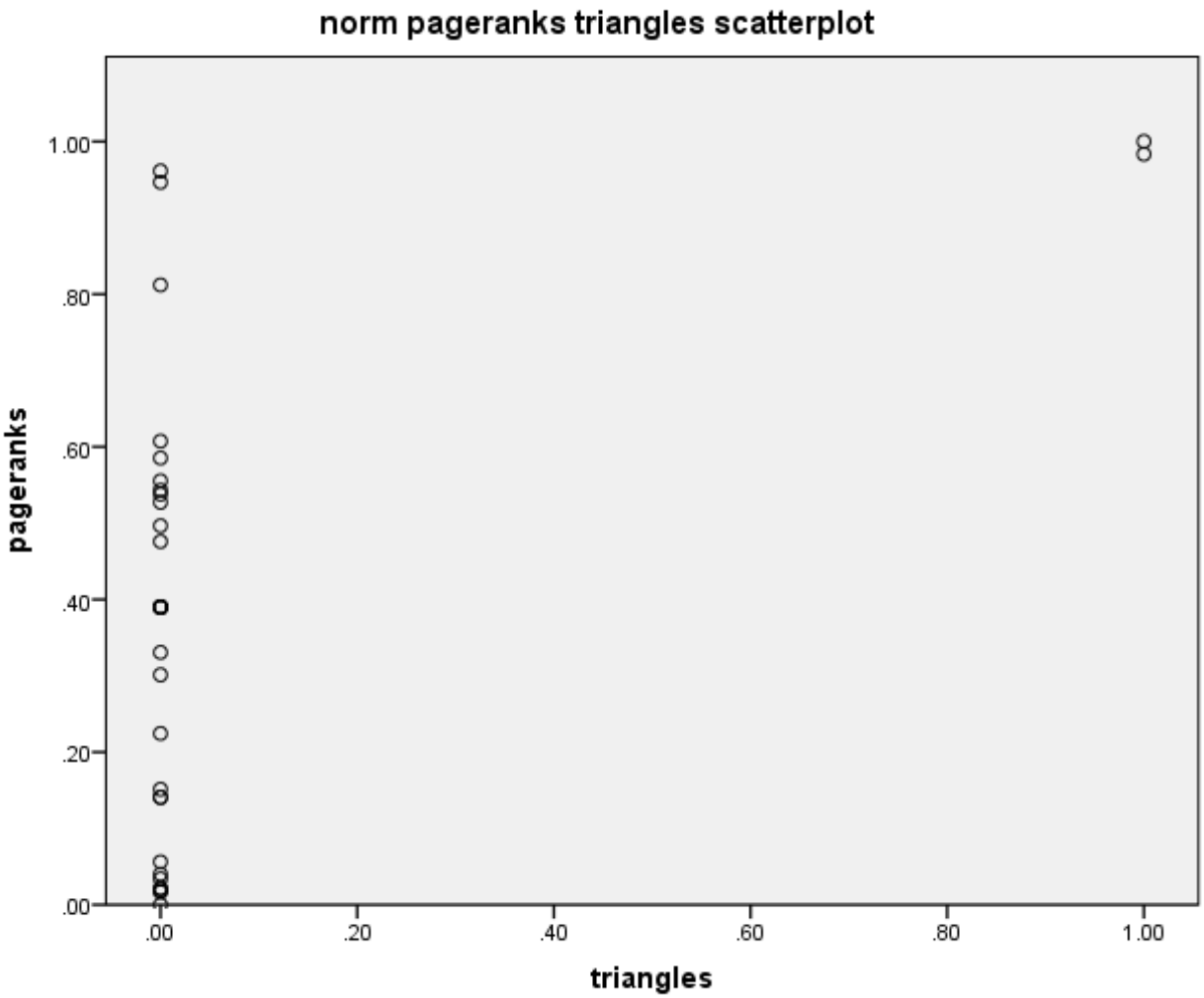

pagerank modularity communities boxplot
pageranks
1.00
.80
.60
.40
.20
.00
.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
modularity

Figure 3.1. 67


norm pageranks triangles scatterplot
pageranks
1.00
.80
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.40
.20
.00
.00
.20
.40
.60
.80
1.00
triangles

Figure 3.1. 68

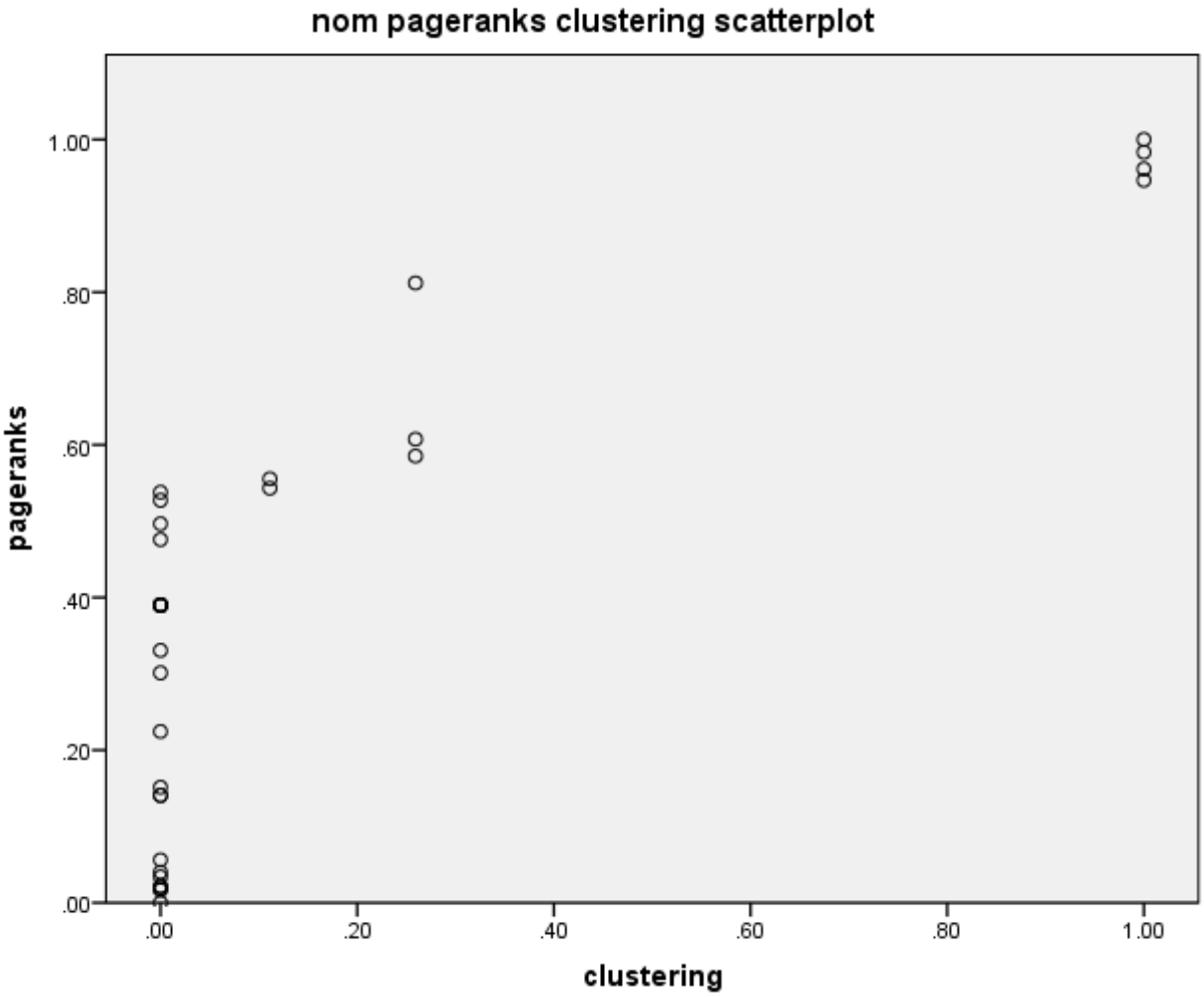
nom pageranks clustering scatterplot
pageranks
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
clustering

Figure 3.1. 69

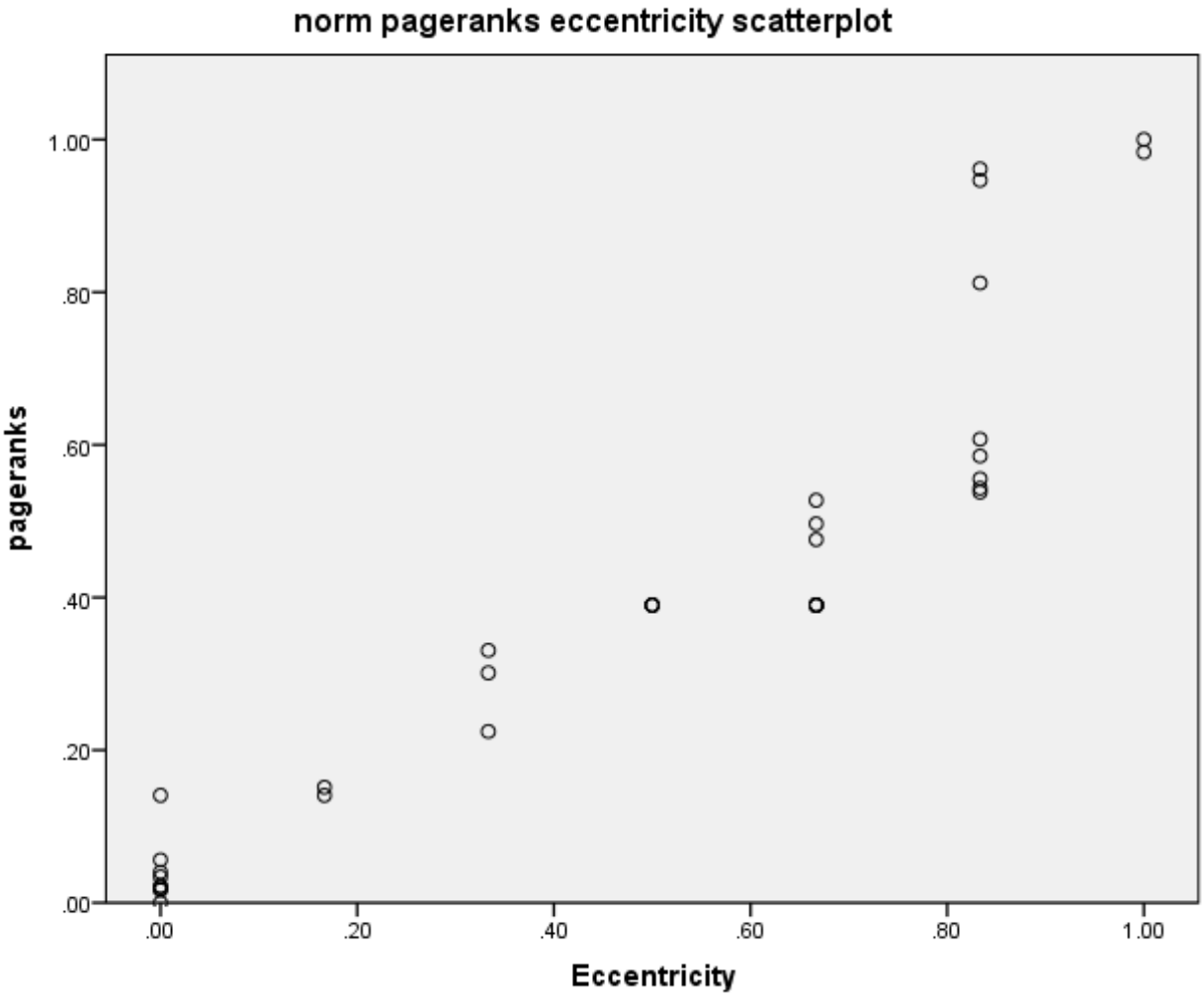
norm pageranks eccentricity scatterplot
pageranks
1.00
.80
.60
.40
.20
.00
.00
.20
.40
.60
.80
1.00
Eccentricity

Figure 3.1. 70

Tables

(chapter 3)

Id	Degree	Eccentricity	closnesscent	harmonicclos	betweenesscen	pageranks	component	modularity_
electronic_m	1	1	1	1	0	0.166667	0	0
service_indu	1	1	1	1	0	0.166667	0	0
internationa	1	1	1	1	0	0.166667	1	1
project_man	1	1	1	1	0	0.166667	1	1
journal_of_kr	1	1	1	1	0	0.166667	2	2
knowledge_r	1	1	1	1	0	0.166667	2	2

The variables we exported from Gephi are (degree, eccentricity, closnesscentrality, harmonic closeness centrality, betweeness centrality, pageranks, clustering, triangles, componentnumber, modularityclass).

Table 3.1. 1

2nd network after analysis from gephi

(in order of a better understanding we divided this table in 3 smaller)

A (id, degree, modularity,wighted degree, eccentricity)

Id	Degree	modular	Weighte	Eccentricity
academy_of_management_journal	1	0	2	5
international_journal_of_human_resource_manage	3	0	6	4
academy_of_management_review	5	1	10	4
electronic_commerce_research_and_applications	2	1	4	5
journal_of_management_studies	5	1	10	4
journal_of_organizational_change_management	5	1	10	4
negotiation_journal	2	1	4	5
organization_studies	4	0	8	5
baltic_journal_of_management	1	3	2	7
journal_of_international_business_studies	3	3	6	6
cartography_and_geographic_information_science	2	2	4	1
corporate_governance	2	2	4	1
technological_forecasting_and_social_change	2	2	4	1
creativity_and_innovation_management	3	3	6	5
economics_of_innovation_and_new_technology	3	3	6	6
international_transactions_in_operational_researcl	1	3	2	6
research_policy	3	3	6	5
international_journal_of_innovation_and_learning	1	1	2	6
electronic_markets	3	4	6	6
international_journal_of_business_information_syst	1	4	2	7
service_industries_journal	2	4	4	6
innovation	1	4	2	6
journal_of_information_systems	3	4	6	5
international_journal_of_entrepreneurship_and_inr	1	5	2	3
review_of_industrial_organization	3	5	6	2
international_journal_of_foresight_and_innovation_	1	6	2	1
international_journal_of_technology_management_	1	6	2	1
international_journal_of_management_reviews	2	5	4	2
organization	1	5	2	3
international_journal_of_manpower	1	1	2	5
international_journal_of_project_management	1	7	2	1
project_management_journal	1	7	2	1
journal_of_business_venturing	1	0	2	6
journal_of_knowledge_management	1	8	2	1
knowledge_management	1	8	2	1
journal_of_product_innovation_management	1	5	2	3

B (id, closeness centrality, harmonic closeness centrality, betweenness, Authority.)

Id	closnes	harmoni	betweer	Authority
academy_of_management_journal	0.2838	0.3262	0	0.067028
international_journal_of_human_resource_manage	0.3889	0.4643	34	0.227202
academy_of_management_review	0.4565	0.5516	68.833	0.454058
electronic_commerce_research_and_applications	0.3281	0.3944	20	0.146723
journal_of_management_studies	0.4667	0.5595	103.33	0.447913
journal_of_organizational_change_management	0.4375	0.5397	61.667	0.428813
negotiation_journal	0.3443	0.4103	0	0.260459
organization_studies	0.3889	0.4937	55.167	0.255201
baltic_journal_of_management	0.2234	0.2782	0	0.035155
journal_of_international_business_studies	0.2838	0.381	20	0.119165
cartography_and_geographic_information_science	1	1	0	0
corporate_governance	1	1	0	0
technological_forecasting_and_social_change	1	1	0	0
creativity_and_innovation_management	0.3559	0.4421	28	0.195012
economics_of_innovation_and_new_technology	0.2877	0.3889	5	0.155582
international_transactions_in_operational_research	0.2658	0.3135	0	0.057531
research_policy	0.3559	0.4421	40	0.213195
international_journal_of_innovation_and_learning	0.25	0.2929	0	0.043285
electronic_markets	0.3182	0.4175	27.5	0.108499
international_journal_of_business_information_syst	0.2442	0.2989	0	0.032009
service_industries_journal	0.3	0.3794	8	0.080568
innovation	0.2625	0.3111	0	0.048559
journal_of_information_systems	0.35	0.4381	33.5	0.1646
international_journal_of_entrepreneurship_and_inr	0.5	0.5833	0	0
review_of_industrial_organization	0.8	0.875	5	0
international_journal_of_foresight_and_innovation_	1	1	0	0
international_journal_of_technology_management	1	1	0	0
international_journal_of_management_reviews	0.6667	0.75	3	0
organization	0.4444	0.5417	0	0
international_journal_of_manpower	0.3088	0.3563	0	0.126506
international_journal_of_project_management	1	1	0	0
project_management_journal	1	1	0	0
journal_of_business_venturing	0.2838	0.3357	0	0.075288
journal_of_knowledge_management	1	1	0	0
knowledge_management	1	1	0	0
journal_of_product_innovation_management	0.5	0.5833	0	0

C) (id, Hub, pagerank, components clustering, triangles, eigen vector.)

Id	Hub	pagerar	compon	clustering	triangles	eigence
academy_of_management_journal	0.067	0.0136	0	0	0	0.1532
international_journal_of_human_resource_manage	0.2272	0.0334	0	0	0	0.5156
academy_of_management_review	0.4541	0.0505	0	0.2	2	0.9879
electronic_commerce_research_and_applications	0.1467	0.0255	0	0	0	0.3173
journal_of_management_studies	0.4479	0.0491	0	0.1	1	1
journal_of_organizational_change_management	0.4288	0.0511	0	0.2	2	0.9278
negotiation_journal	0.2605	0.0214	0	1	1	0.5529
organization_studies	0.2552	0.0439	0	0	0	0.5877
baltic_journal_of_management	0.0352	0.0137	0	0	0	0.1015
journal_of_international_business_studies	0.1192	0.0336	0	0.333333	1	0.3151
cartography_and_geographic_information_science	0	0.0278	1	1	1	0.0706
corporate_governance	0	0.0278	1	1	1	0.0706
technological_forecasting_and_social_change	0	0.0278	1	1	1	0.0706
creativity_and_innovation_management	0.195	0.033	0	0	0	0.4583
economics_of_innovation_and_new_technology	0.1556	0.0319	0	0.333333	1	0.3953
international_transactions_in_operational_research	0.0575	0.0135	0	0	0	0.1382
research_policy	0.2132	0.0311	0	0.333333	1	0.5153
international_journal_of_innovation_and_learning	0.0433	0.015	0	0	0	0.095
electronic_markets	0.1085	0.0361	0	0	0	0.2824
international_journal_of_business_information_syst	0.032	0.0144	0	0	0	0.0936
service_industries_journal	0.0806	0.0244	0	0	0	0.2105
innovation	0.0486	0.0142	0	0	0	0.1169
journal_of_information_systems	0.1646	0.0353	0	0	0	0.3779
international_journal_of_entrepreneurship_and_inr	0	0.0182	2	0	0	0.0404
review_of_industrial_organization	0	0.0496	2	0	0	0.0757
international_journal_of_foresight_and_innovation_	0	0.0278	3	0	0	0.0104
international_journal_of_technology_management	0	0.0278	3	0	0	0.0104
international_journal_of_management_reviews	0	0.0341	2	0	0	0.0587
organization	0	0.0187	2	0	0	0.0318
international_journal_of_manpower	0.1265	0.0129	0	0	0	0.2677
international_journal_of_project_management	0	0.0278	4	0	0	0.0104
project_management_journal	0	0.0278	4	0	0	0.0104
journal_of_business_venturing	0.0753	0.0135	0	0	0	0.1774
journal_of_knowledge_management	0	0.0278	5	0	0	0.0104
knowledge_management	0	0.0278	5	0	0	0.0104
journal_of_product_innovation_management	0	0.0182	2	0	0	0.0404

Table 3.1. 2

table with degrees

Label	Degree
journal_of_knowledge_management	1
knowledge_management	1
international_journal_of_project_management	1
project_management_journal	1
international_journal_of_foresight_and_innovation_policy	1
international_journal_of_technology_management_._sustainable_development	1
international_journal_of_entrepreneurship_and_innovation	1
review_of_industrial_organization	3
international_journal_of_management_reviews	2
organization	1
journal_of_product_innovation_management	1
cartography_and_geographic_information_science	2
corporate_governance	2
technological_forecasting_and_social_change	2
academy_of_management_journal	1
international_journal_of_human_resource_management	3
academy_of_management_review	5
electronic_commerce_research_and_applications	2
journal_of_management_studies	5
journal_of_organizational_change_management	5
negotiation_journal	2
organization_studies	4
baltic_journal_of_management	1
journal_of_international_business_studies	3
creativity_and_innovation_management	3
economics_of_innovation_and_new_technology	3
international_transactions_in_operational_research	1
research_policy	3
international_journal_of_innovation_and_learning	1
electronic_markets	3
international_journal_of_business_information_systems	1
service_industries_journal	2
innovation	1
journal_of_information_systems	3
international_journal_of_manpower	1
journal_of_business_venturing	1

Table 3.1. 3

Fig 3.1.5 (0-8 communites analytical with journals)

community 8
journal_of_knowledge_management
knowledge_management

Table 3.1. 4

community 7
international_journal_of_project_management
project_management_journal

Table 3.1. 5

community 6
international_journal_of_foresight_and_innovation_policy
international_journal_of_technology_management_._sustainable_development

Table 3.1. 6

community 5
international_journal_of_entrepreneurship_and_innovation
review_of_industrial_organization
international_journal_of_management_reviews
organization
journal_of_product_innovation_management

Table 3.1. 7

community 4
electronic_markets
international_journal_of_business_information_systems
service_industries_journal
innovation
journal_of_information_systems

Table 3.1. 8

community 3
baltic_journal_of_management
journal_of_international_business_studies
creativity_and_innovation_management
economics_of_innovation_and_new_technology
international_transactions_in_operational_research
research_policy

Table 3.1. 9

community 2
cartography_and_geographic_information_science
corporate_governance
technological_forecasting_and_social_change

Table 3.1. 10

community 1
academy_of_management_review
electronic_commerce_research_and_applications
journal_of_management_studies
journal_of_organizational_change_management
negotiation_journal
international_journal_of_innovation_and_learning
international_journal_of_manpower

Table 3.1. 11

community 0
academy_of_management_journal
international_journal_of_human_resource_management
organization_studies
journal_of_business_venturing

Table 3.1. 12

clustering analytical table

id	clustering
negotiation_journal	1
cartography_and_geographic_information_science	1
corporate_governance	1
technological_forecasting_and_social_change	1
journal_of_international_business_studies	0.33
economics_of_innovation_and_new_technology	0.33
research_policy	0.33
academy_of_management_review	0.2
journal_of_organizational_change_management	0.2
journal_of_management_studies	0.1
academy_of_management_journal	0
international_journal_of_human_resource_management	0
electronic_commerce_research_and_applications	0
organization_studies	0
baltic_journal_of_management	0
creativity_and_innovation_management	0
international_transactions_in_operational_research	0
international_journal_of_innovation_and_learning	0
electronic_markets	0
international_journal_of_business_information_systems	0
service_industries_journal	0
innovation	0
journal_of_information_systems	0
international_journal_of_entrepreneurship_and_innovation	0
review_of_industrial_organization	0
international_journal_of_foresight_and_innovation_policy	0
international_journal_of_technology_management_._sustainable_development	0
international_journal_of_management_reviews	0
organization	0
international_journal_of_manpower	0
international_journal_of_project_management	0
project_management_journal	0
journal_of_business_venturing	0
journal_of_knowledge_management	0
knowledge_management	0
journal_of_product_innovation_management	0

Table 3.1. 13

triangles

Id	triangles
academy_of_management_review	2
journal_of_organizational_change_management	2
journal_of_management_studies	1
negotiation_journal	1
journal_of_international_business_studies	1
cartography_and_geographic_information_science	1
corporate_governance	1
technological_forecasting_and_social_change	1
economics_of_innovation_and_new_technology	1
research_policy	1
academy_of_management_journal	0
international_journal_of_human_resource_management	0
electronic_commerce_research_and_applications	0
organization_studies	0
baltic_journal_of_management	0
creativity_and_innovation_management	0
international_transactions_in_operational_research	0
international_journal_of_innovation_and_learning	0
electronic_markets	0
international_journal_of_business_information_systems	0
service_industries_journal	0
innovation	0
journal_of_information_systems	0
international_journal_of_entrepreneurship_and_innovation	0
review_of_industrial_organization	0
international_journal_of_foresight_and_innovation_policy	0
international_journal_of_technology_management_._sustainable_development	0
international_journal_of_management_reviews	0
organization	0
international_journal_of_manpower	0
international_journal_of_project_management	0
project_management_journal	0
journal_of_business_venturing	0
journal_of_knowledge_management	0
knowledge_management	0
journal_of_product_innovation_management	0

Table 3.1. 14

eccentricity

Id	Eccentricity
baltic_journal_of_management	7
international_journal_of_business_information_systems	7
journal_of_international_business_studies	6
economics_of_innovation_and_new_technology	6
international_transactions_in_operational_research	6
international_journal_of_innovation_and_learning	6
electronic_markets	6
service_industries_journal	6
innovation	6
journal_of_business_venturing	6
academy_of_management_journal	5
electronic_commerce_research_and_applications	5
negotiation_journal	5
organization_studies	5
creativity_and_innovation_management	5
research_policy	5
journal_of_information_systems	5
international_journal_of_manpower	5
international_journal_of_human_resource_management	4
academy_of_management_review	4
journal_of_management_studies	4
journal_of_organizational_change_management	4
international_journal_of_entrepreneurship_and_innovation	3
organization	3
journal_of_product_innovation_management	3
review_of_industrial_organization	2
international_journal_of_management_reviews	2
cartography_and_geographic_information_science	1
corporate_governance	1
technological_forecasting_and_social_change	1
international_journal_of_foresight_and_innovation_policy	1
international_journal_of_technology_management_._sustainable_development	1
international_journal_of_project_management	1
project_management_journal	1
journal_of_knowledge_management	1
knowledge_management	1

Table 3.1. 15

betweeness centrality

Id	betweenesscentrality
journal_of_management_studies	103.333333
academy_of_management_review	68.833333
journal_of_organizational_change_management	61.666667
organization_studies	55.166667
research_policy	40
international_journal_of_human_resource_management	34
journal_of_information_systems	33.5
creativity_and_innovation_management	28
electronic_markets	27.5
electronic_commerce_research_and_applications	20
journal_of_international_business_studies	20
service_industries_journal	8
economics_of_innovation_and_new_technology	5
review_of_industrial_organization	5
international_journal_of_management_reviews	3
academy_of_management_journal	0
negotiation_journal	0
baltic_journal_of_management	0
cartography_and_geographic_information_science	0
corporate_governance	0
technological_forecasting_and_social_change	0
international_transactions_in_operational_research	0
international_journal_of_innovation_and_learning	0
international_journal_of_business_information_systems	0
innovation	0
international_journal_of_entrepreneurship_and_innovation	0
international_journal_of_foresight_and_innovation_policy	0
international_journal_of_technology_management_._sustainable_development	0
organization	0
international_journal_of_manpower	0
international_journal_of_project_management	0
project_management_journal	0
journal_of_business_venturing	0
journal_of_knowledge_management	0
knowledge_management	0
journal_of_product_innovation_management	0

Table 3.1. 16

closeness centrality

Id	closnesscentrality
cartography_and_geographic_information_science	1
corporate_governance	1
technological_forecasting_and_social_change	1
international_journal_of_foresight_and_innovation_policy	1
international_journal_of_technology_management_._sustainable_development	1
international_journal_of_project_management	1
project_management_journal	1
journal_of_knowledge_management	1
knowledge_management	1
review_of_industrial_organization	0.8
international_journal_of_management_reviews	0.666667
international_journal_of_entrepreneurship_and_innovation	0.5
journal_of_product_innovation_management	0.5
journal_of_management_studies	0.466667
academy_of_management_review	0.456522
organization	0.444444
journal_of_organizational_change_management	0.4375
international_journal_of_human_resource_management	0.388889
organization_studies	0.388889
creativity_and_innovation_management	0.355932
research_policy	0.355932
journal_of_information_systems	0.35
negotiation_journal	0.344262
electronic_commerce_research_and_applications	0.328125
electronic_markets	0.318182
international_journal_of_manpower	0.308824
service_industries_journal	0.3
economics_of_innovation_and_new_technology	0.287671
academy_of_management_journal	0.283784
journal_of_international_business_studies	0.283784
journal_of_business_venturing	0.283784
international_transactions_in_operational_research	0.265823
innovation	0.2625
international_journal_of_innovation_and_learning	0.25
international_journal_of_business_information_systems	0.244186
baltic_journal_of_management	0.223404

Table 3.1. 17

harmonic closeness centrality

Id	harmonicclosnesscentrality
cartography_and_geographic_information_science	1
corporate_governance	1
technological_forecasting_and_social_change	1
international_journal_of_foresight_and_innovation_policy	1
international_journal_of_technology_management_._sustainable_development	1
international_journal_of_project_management	1
project_management_journal	1
journal_of_knowledge_management	1
knowledge_management	1
review_of_industrial_organization	0.875
international_journal_of_management_reviews	0.75
international_journal_of_entrepreneurship_and_innovation	0.583333
journal_of_product_innovation_management	0.583333
journal_of_management_studies	0.559524
academy_of_management_review	0.551587
organization	0.541667
journal_of_organizational_change_management	0.539683
organization_studies	0.493651
international_journal_of_human_resource_management	0.464286
creativity_and_innovation_management	0.442063
research_policy	0.442063
journal_of_information_systems	0.438095
electronic_markets	0.41746
negotiation_journal	0.410317
electronic_commerce_research_and_applications	0.394444
economics_of_innovation_and_new_technology	0.388889
journal_of_international_business_studies	0.380952
service_industries_journal	0.379365
international_journal_of_manpower	0.356349
journal_of_business_venturing	0.335714
academy_of_management_journal	0.32619
international_transactions_in_operational_research	0.313492
innovation	0.311111
international_journal_of_business_information_systems	0.298866
international_journal_of_innovation_and_learning	0.292857
baltic_journal_of_management	0.278231

Table 3.1. 18

eigenvector centrality

Id	eigencentrality
journal_of_management_studies	1
academy_of_management_review	0.987923
journal_of_organizational_change_management	0.927783
organization_studies	0.587672
negotiation_journal	0.552898
international_journal_of_human_resource_management	0.515631
research_policy	0.515329
creativity_and_innovation_management	0.458271
economics_of_innovation_and_new_technology	0.395339
journal_of_information_systems	0.37785
electronic_commerce_research_and_applications	0.317256
journal_of_international_business_studies	0.315124
electronic_markets	0.282412
international_journal_of_manpower	0.26772
service_industries_journal	0.210461
journal_of_business_venturing	0.177401
academy_of_management_journal	0.15323
international_transactions_in_operational_research	0.138238
innovation	0.116863
baltic_journal_of_management	0.101468
international_journal_of_innovation_and_learning	0.094995
international_journal_of_business_information_systems	0.093598
review_of_industrial_organization	0.075653
cartography_and_geographic_information_science	0.070636
corporate_governance	0.070636
technological_forecasting_and_social_change	0.070636
international_journal_of_management_reviews	0.058665
international_journal_of_entrepreneurship_and_innovation	0.040413
journal_of_product_innovation_management	0.040413
organization	0.03178
international_journal_of_foresight_and_innovation_policy	0.010445
international_journal_of_technology_management_._sustainable_development	0.010445
international_journal_of_project_management	0.010445
project_management_journal	0.010445
journal_of_knowledge_management	0.010445
knowledge_management	0.010445

Table 3.1. 19

hubs and authorities

Id	Authority	Hub
academy_of_management_review	0.454058	0.454058
journal_of_management_studies	0.447913	0.447913
journal_of_organizational_change_management	0.428813	0.428813
negotiation_journal	0.260459	0.260459
organization_studies	0.255201	0.255201
international_journal_of_human_resource_management	0.227202	0.227202
research_policy	0.213195	0.213195
creativity_and_innovation_management	0.195012	0.195012
journal_of_information_systems	0.1646	0.1646
economics_of_innovation_and_new_technology	0.155582	0.155582
electronic_commerce_research_and_applications	0.146723	0.146723
international_journal_of_manpower	0.126506	0.126506
journal_of_international_business_studies	0.119165	0.119165
electronic_markets	0.108499	0.108499
service_industries_journal	0.080568	0.080568
journal_of_business_venturing	0.075288	0.075288
academy_of_management_journal	0.067028	0.067028
international_transactions_in_operational_research	0.057531	0.057531
innovation	0.048559	0.048559
international_journal_of_innovation_and_learning	0.043285	0.043285
baltic_journal_of_management	0.035155	0.035155
international_journal_of_business_information_systems	0.032009	0.032009
cartography_and_geographic_information_science	0	0
corporate_governance	0	0
technological_forecasting_and_social_change	0	0
international_journal_of_entrepreneurship_and_innovation	0	0
review_of_industrial_organization	0	0
international_journal_of_foresight_and_innovation_policy	0	0
international_journal_of_technology_management_._sustainable_development	0	0
international_journal_of_management_reviews	0	0
organization	0	0
international_journal_of_project_management	0	0
project_management_journal	0	0
journal_of_knowledge_management	0	0
knowledge_management	0	0
journal_of_product_innovation_management	0	0

Table 3.1. 20

page rank

Id	pageranks
journal_of_organizational_change_management	0.051121
academy_of_management_review	0.050486
review_of_industrial_organization	0.049641
journal_of_management_studies	0.049077
organization_studies	0.043929
electronic_markets	0.036099
journal_of_information_systems	0.035251
international_journal_of_management_reviews	0.034109
journal_of_international_business_studies	0.033639
international_journal_of_human_resource_management	0.033439
creativity_and_innovation_management	0.033034
economics_of_innovation_and_new_technology	0.03186
research_policy	0.031068
cartography_and_geographic_information_science	0.027778
corporate_governance	0.027778
technological_forecasting_and_social_change	0.027778
international_journal_of_foresight_and_innovation_policy	0.027778
international_journal_of_technology_management_._sustainable_development	0.027778
international_journal_of_project_management	0.027778
project_management_journal	0.027778
journal_of_knowledge_management	0.027778
knowledge_management	0.027778
electronic_commerce_research_and_applications	0.025505
service_industries_journal	0.024383
negotiation_journal	0.02144
organization	0.018651
international_journal_of_entrepreneurship_and_innovation	0.018244
journal_of_product_innovation_management	0.018244
international_journal_of_innovation_and_learning	0.015006
international_journal_of_business_information_systems	0.014395
innovation	0.014155
baltic_journal_of_management	0.013698
academy_of_management_journal	0.013641
international_transactions_in_operational_research	0.013526
journal_of_business_venturing	0.013501
international_journal_of_manpower	0.012857

Table 3.1. 21

Id	normalized degree
academy_of_management_review	1
journal_of_management_studies	1
journal_of_organizational_change_management	1
organization_studies	0.75
international_journal_of_human_resource_management	0.5
journal_of_international_business_studies	0.5
creativity_and_innovation_management	0.5
economics_of_innovation_and_new_technology	0.5
research_policy	0.5
electronic_markets	0.5
journal_of_information_systems	0.5
review_of_industrial_organization	0.5
electronic_commerce_research_and_applications	0.25
negotiation_journal	0.25
cartography_and_geographic_information_science	0.25
corporate_governance	0.25
technological_forecasting_and_social_change	0.25
service_industries_journal	0.25
international_journal_of_management_reviews	0.25
academy_of_management_journal	0
baltic_journal_of_management	0
international_transactions_in_operational_research	0
international_journal_of_innovation_and_learning	0
international_journal_of_business_information_systems	0
innovation	0
international_journal_of_entrepreneurship_and_innovation	0
international_journal_of_foresight_and_innovation_policy	0
international_journal_of_technology_management_._sustainable_development	0
organization	0
international_journal_of_manpower	0
international_journal_of_project_management	0
project_management_journal	0
journal_of_business_venturing	0
journal_of_knowledge_management	0
knowledge_management	0
journal_of_product_innovation_management	0

Table 3.1. 22

NORMALIZED MODULARITY

Id	norm modularity
journal_of_knowledge_management	1
knowledge_management	1
international_journal_of_project_management	0.85
project_management_journal	0.85
international_journal_of_foresight_and_innovation_policy	0.71
international_journal_of_technology_management_._sustainable_development	0.71
international_journal_of_entrepreneurship_and_innovation	0.57
international_journal_of_management_reviews	0.57
journal_of_product_innovation_management	0.57
organization	0.57
review_of_industrial_organization	0.57
electronic_markets	0.42
innovation	0.42
international_journal_of_business_information_systems	0.42
journal_of_information_systems	0.42
service_industries_journal	0.42
baltic_journal_of_management	0.28
creativity_and_innovation_management	0.28
economics_of_innovation_and_new_technology	0.28
international_transactions_in_operational_research	0.28
journal_of_international_business_studies	0.28
research_policy	0.28
cartography_and_geographic_information_science	0.14
corporate_governance	0.14
technological_forecasting_and_social_change	0.14
academy_of_management_review	0
electronic_commerce_research_and_applications	0
international_journal_of_innovation_and_learning	0
international_journal_of_manpower	0
journal_of_management_studies	0
journal_of_organizational_change_management	0
negotiation_journal	0
organization_studies	0
international_journal_of_human_resource_management	0
academy_of_management_journal	0
journal_of_business_venturing	0

Table 3.1. 23

Id	norm eccentricity
baltic_journal_of_management	1
international_journal_of_business_information_systems	1
economics_of_innovation_and_new_technology	0.83
electronic_markets	0.83
innovation	0.83
international_journal_of_innovation_and_learning	0.83
international_transactions_in_operational_research	0.83
journal_of_business_venturing	0.83
journal_of_international_business_studies	0.83
service_industries_journal	0.83
academy_of_management_journal	0.66
creativity_and_innovation_management	0.66
electronic_commerce_research_and_applications	0.66
international_journal_of_manpower	0.66
journal_of_information_systems	0.66
negotiation_journal	0.66
organization_studies	0.66
research_policy	0.66
academy_of_management_review	0.5
international_journal_of_human_resource_management	0.5
journal_of_management_studies	0.5
journal_of_organizational_change_management	0.5
international_journal_of_entrepreneurship_and_innovation	0.33
journal_of_product_innovation_management	0.33
organization	0.33
international_journal_of_management_reviews	0.16
review_of_industrial_organization	0.16
cartography_and_geographic_information_science	0
corporate_governance	0
international_journal_of_foresight_and_innovation_policy	0
international_journal_of_project_management	0
international_journal_of_technology_management_._sustainable_development	0
journal_of_knowledge_management	0
knowledge_management	0
project_management_journal	0
technological_forecasting_and_social_change	0

Table 3.1. 24

NORMALIZED CLOSNESS CENTRALITY

Id	norm closness centrality
cartography_and_geographic_information_science	1
corporate_governance	1
international_journal_of_foresight_and_innovation_policy	1
international_journal_of_project_management	1
international_journal_of_technology_management_._sustainable_development	1
journal_of_knowledge_management	1
knowledge_management	1
project_management_journal	1
technological_forecasting_and_social_change	1
review_of_industrial_organization	0.74
international_journal_of_management_reviews	0.57
international_journal_of_entrepreneurship_and_innovation	0.35
journal_of_product_innovation_management	0.35
journal_of_management_studies	0.31
academy_of_management_review	0.3
organization	0.28
journal_of_organizational_change_management	0.27
international_journal_of_human_resource_management	0.21
organization_studies	0.21
creativity_and_innovation_management	0.17
research_policy	0.17
journal_of_information_systems	0.16
negotiation_journal	0.15
electronic_commerce_research_and_applications	0.13
electronic_markets	0.12
international_journal_of_manpower	0.1
service_industries_journal	0.09
economics_of_innovation_and_new_technology	0.08
academy_of_management_journal	0.07
journal_of_business_venturing	0.07
journal_of_international_business_studies	0.07
innovation	0.05
international_transactions_in_operational_research	0.05
international_journal_of_innovation_and_learning	0.03
international_journal_of_business_information_systems	0.02
baltic_journal_of_management	0

Table 3.1. 25

NORMALIZED HARMONIC CLOSENESS CENTRALITY

Id	norm harmonic closeness centrality
cartography_and_geographic_information_science	1
corporate_governance	1
international_journal_of_foresight_and_innovation_policy	1
international_journal_of_project_management	1
international_journal_of_technology_management_._sustainable_development	1
journal_of_knowledge_management	1
knowledge_management	1
project_management_journal	1
technological_forecasting_and_social_change	1
review_of_industrial_organization	0.82
international_journal_of_management_reviews	0.65
international_journal_of_entrepreneurship_and_innovation	0.42
journal_of_product_innovation_management	0.42
journal_of_management_studies	0.38
academy_of_management_review	0.37
journal_of_organizational_change_management	0.36
organization	0.36
international_journal_of_human_resource_management	0.25
creativity_and_innovation_management	0.22
journal_of_information_systems	0.22
research_policy	0.22
organization_studies	0.2
electronic_markets	0.19
negotiation_journal	0.18
electronic_commerce_research_and_applications	0.16
economics_of_innovation_and_new_technology	0.15
journal_of_international_business_studies	0.14
service_industries_journal	0.14
international_journal_of_manpower	0.1
journal_of_business_venturing	0.07
academy_of_management_journal	0.06
innovation	0.04
international_transactions_in_operational_research	0.04
international_journal_of_business_information_systems	0.02
international_journal_of_innovation_and_learning	0.02
baltic_journal_of_management	0

Table 3.1. 26

NORMALIZED BETWEENESS CENTRALITY

Id	norm betweeness centrality
academy_of_management_journal	0
academy_of_management_review	0.65
baltic_journal_of_management	0
cartography_and_geographic_information_science	0
corporate_governance	0
creativity_and_innovation_management	0.24
economics_of_innovation_and_new_technology	0.019
electronic_commerce_research_and_applications	0.16
electronic_markets	0.24
innovation	0
international_journal_of_business_information_systems	0
international_journal_of_entrepreneurship_and_innovation	0
international_journal_of_foresight_and_innovation_policy	0
international_journal_of_human_resource_management	0.3
international_journal_of_innovation_and_learning	0
international_journal_of_management_reviews	0
international_journal_of_manpower	0
international_journal_of_project_management	0
international_journal_of_technology_management_._sustainable_development	0
international_transactions_in_operational_research	0
journal_of_business_venturing	0
journal_of_information_systems	0.3
journal_of_international_business_studies	0.16
journal_of_knowledge_management	0
journal_of_management_studies	1
journal_of_organizational_change_management	0.58
journal_of_product_innovation_management	0
knowledge_management	0
negotiation_journal	0
organization	0
organization_studies	0.51
project_management_journal	0
research_policy	0.36
review_of_industrial_organization	0.019
service_industries_journal	0.04
technological_forecasting_and_social_change	0

Table 3.1. 27

NORMALIZED NORMALIZED AUTHORITY

Id	norm authority
academy_of_management_review	1
journal_of_management_studies	0.98
journal_of_organizational_change_management	0.94
negotiation_journal	0.54
organization_studies	0.52
international_journal_of_human_resource_management	0.46
research_policy	0.42
creativity_and_innovation_management	0.38
journal_of_information_systems	0.31
economics_of_innovation_and_new_technology	0.29
electronic_commerce_research_and_applications	0.27
international_journal_of_manpower	0.22
journal_of_international_business_studies	0.2
electronic_markets	0.18
service_industries_journal	0.11
journal_of_business_venturing	0.1
academy_of_management_journal	0.08
international_transactions_in_operational_research	0.06
innovation	0.03
international_journal_of_innovation_and_learning	0.02
baltic_journal_of_management	0.01
cartography_and_geographic_information_science	0
corporate_governance	0
international_journal_of_business_information_systems	0
international_journal_of_entrepreneurship_and_innovation	0
international_journal_of_foresight_and_innovation_policy	0
international_journal_of_management_reviews	0
international_journal_of_project_management	0
international_journal_of_technology_management_._sustainable_development	0
journal_of_knowledge_management	0
journal_of_product_innovation_management	0
knowledge_management	0
organization	0
project_management_journal	0
review_of_industrial_organization	0
technological_forecasting_and_social_change	0

Table 3.1. 28

NORMALIZED PAGE RANKS

Id	norm page ranks
journal_of_organizational_change_management	1
academy_of_management_review	0.98
review_of_industrial_organization	0.96
journal_of_management_studies	0.94
organization_studies	0.81
electronic_markets	0.6
journal_of_information_systems	0.58
international_journal_of_management_reviews	0.55
journal_of_international_business_studies	0.54
international_journal_of_human_resource_management	0.53
creativity_and_innovation_management	0.52
economics_of_innovation_and_new_technology	0.49
research_policy	0.47
journal_of_product_innovation_management	0.4
cartography_and_geographic_information_science	0.38
corporate_governance	0.38
international_journal_of_foresight_and_innovation_policy	0.38
international_journal_of_project_management	0.38
international_journal_of_technology_management_._sustainable_development	0.38
journal_of_knowledge_management	0.38
knowledge_management	0.38
project_management_journal	0.38
technological_forecasting_and_social_change	0.38
electronic_commerce_research_and_applications	0.33
service_industries_journal	0.3
negotiation_journal	0.22
organization	0.15
international_journal_of_entrepreneurship_and_innovation	0.14
international_journal_of_innovation_and_learning	0.05
international_journal_of_business_information_systems	0.04
innovation	0.03
academy_of_management_journal	0.02
baltic_journal_of_management	0.02
international_transactions_in_operational_research	0.01
journal_of_business_venturing	0.01
international_journal_of_manpower	0

Table 3.1. 29

Id	norm component number
academy_of_management_journal	0
academy_of_management_review	0
baltic_journal_of_management	0.75
cartography_and_geographic_information_science	0
corporate_governance	0
creativity_and_innovation_management	0
economics_of_innovation_and_new_technology	0
electronic_commerce_research_and_applications	0
electronic_markets	0
innovation	0.75
international_journal_of_business_information_systems	0
international_journal_of_entrepreneurship_and_innovation	0.5
international_journal_of_foresight_and_innovation_policy	0
international_journal_of_human_resource_management	0
international_journal_of_innovation_and_learning	0.25
international_journal_of_management_reviews	0
international_journal_of_manpower	0.25
international_journal_of_project_management	0
international_journal_of_technology_management_._sustainable_development	0
international_transactions_in_operational_research	1
journal_of_business_venturing	1
journal_of_information_systems	0
journal_of_international_business_studies	0
journal_of_knowledge_management	0
journal_of_management_studies	0
journal_of_organizational_change_management	0
journal_of_product_innovation_management	0.25
knowledge_management	0
negotiation_journal	0.25
organization	0.5
organization_studies	0
project_management_journal	0
research_policy	0
review_of_industrial_organization	0
service_industries_journal	0.25
technological_forecasting_and_social_change	0

Table 3.1. 30

NORMALIZED CLUSTERING

Id	norm clustering
cartography_and_geographic_information_science	1
corporate_governance	1
negotiation_journal	1
technological_forecasting_and_social_change	1
economics_of_innovation_and_new_technology	0.25
journal_of_international_business_studies	0.25
research_policy	0.25
academy_of_management_review	0.11
journal_of_organizational_change_management	0.11
academy_of_management_journal	0
baltic_journal_of_management	0
creativity_and_innovation_management	0
electronic_commerce_research_and_applications	0
electronic_markets	0
innovation	0
international_journal_of_business_information_systems	0
international_journal_of_entrepreneurship_and_innovation	0
international_journal_of_foresight_and_innovation_policy	0
international_journal_of_human_resource_management	0
international_journal_of_innovation_and_learning	0
international_journal_of_management_reviews	0
international_journal_of_manpower	0
international_journal_of_project_management	0
international_journal_of_technology_management_._sustainable_development	0
international_transactions_in_operational_research	0
journal_of_business_venturing	0
journal_of_information_systems	0
journal_of_knowledge_management	0
journal_of_management_studies	0
journal_of_product_innovation_management	0
knowledge_management	0
organization	0
organization_studies	0
project_management_journal	0
review_of_industrial_organization	0
service_industries_journal	0

Table 3.1. 31

NORMALIZED TRIANGLES

Id	norm triangles
corporate_governance	1
economics_of_innovation_and_new_technology	1
academy_of_management_journal	0
academy_of_management_review	0
baltic_journal_of_management	0
cartography_and_geographic_information_science	0
creativity_and_innovation_management	0
electronic_commerce_research_and_applications	0
electronic_markets	0
innovation	0
international_journal_of_business_information_systems	0
international_journal_of_entrepreneurship_and_innovation	0
international_journal_of_foresight_and_innovation_policy	0
international_journal_of_human_resource_management	0
international_journal_of_innovation_and_learning	0
international_journal_of_management_reviews	0
international_journal_of_manpower	0
international_journal_of_project_management	0
international_journal_of_technology_management_._sustainable_development	0
international_transactions_in_operational_research	0
journal_of_business_venturing	0
journal_of_information_systems	0
journal_of_international_business_studies	0
journal_of_knowledge_management	0
journal_of_management_studies	0
journal_of_organizational_change_management	0
journal_of_product_innovation_management	0
knowledge_management	0
negotiation_journal	0
organization	0
organization_studies	0
project_management_journal	0
research_policy	0
review_of_industrial_organization	0
service_industries_journal	0
technological_forecasting_and_social_change	0

Table 3.1. 32

NORMALIZED EIGEN CENTRALITY

Id	norm eigen centrality
journal_of_management_studies	1
journal_of_international_business_studies	0.98
academy_of_management_journal	0.92
electronic_commerce_research_and_applications	0.58
international_journal_of_human_resource_management	0.54
creativity_and_innovation_management	0.51
economics_of_innovation_and_new_technology	0.51
academy_of_management_review	0.45
journal_of_organizational_change_management	0.38
journal_of_information_systems	0.37
research_policy	0.31
international_transactions_in_operational_research	0.3
electronic_markets	0.27
international_journal_of_manpower	0.25
service_industries_journal	0.2
journal_of_business_venturing	0.16
corporate_governance	0.14
organization_studies	0.12
innovation	0.1
baltic_journal_of_management	0.09
international_journal_of_business_information_systems	0.08
international_journal_of_innovation_and_learning	0.08
cartography_and_geographic_information_science	0.06
negotiation_journal	0.06
review_of_industrial_organization	0.06
technological_forecasting_and_social_change	0.06
international_journal_of_management_reviews	0.04
international_journal_of_entrepreneurship_and_innovation	0.03
journal_of_product_innovation_management	0.03
organization	0.02
international_journal_of_foresight_and_innovation_policy	0
international_journal_of_project_management	0
international_journal_of_technology_management_._sustainable_development	0
journal_of_knowledge_management	0
knowledge_management	0
project_management_journal	0

Table 3.1. 33

NORMALIZED HUB

id	norm hub
academy_of_management_review	1
journal_of_management_studies	0.98
journal_of_organizational_change_management	0.94
negotiation_journal	0.54
organization_studies	0.52
international_journal_of_human_resource_management	0.46
research_policy	0.42
creativity_and_innovation_management	0.38
journal_of_information_systems	0.31
economics_of_innovation_and_new_technology	0.29
electronic_commerce_research_and_applications	0.27
international_journal_of_manpower	0.22
journal_of_international_business_studies	0.2
electronic_markets	0.18
service_industries_journal	0.11
journal_of_business_venturing	0.1
academy_of_management_journal	0.08
international_transactions_in_operational_research	0.06
innovation	0.03
international_journal_of_innovation_and_learning	0.02
baltic_journal_of_management	0.01
cartography_and_geographic_information_science	0
corporate_governance	0
international_journal_of_business_information_systems	0
international_journal_of_entrepreneurship_and_innovation	0
international_journal_of_foresight_and_innovation_policy	0
international_journal_of_management_reviews	0
international_journal_of_project_management	0
international_journal_of_technology_management_._sustainable_development	0
journal_of_knowledge_management	0
journal_of_product_innovation_management	0
knowledge_management	0
organization	0
project_management_journal	0
review_of_industrial_organization	0
technological_forecasting_and_social_change	0

Table 3.1. 34

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