PERCEPTION OF THE EURO IN THE EUROPEAN COUNTRIES – A CLUSTER ANALYSIS

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Abstract

A multi-speed Europe, a project that was little short of unthinkable just before the outbreak of the 2007-08 financial crunch, today seems to be a fairly pragmatic and realistic perspective. The euro area, built as a reflection of the optimum currency area proposed by Robert Mundell (1961), has seen many benefits from the euro introduction, but it is just as true that it has experienced major problems during the recent financial crisis. Although most Eurosceptics and pro-Europeans agree that, in its current form, it much resembles a half-built house, the former would rather dismantle it, while the latter will prescribe the creation of a fiscal union. The paper aims to highlight how much heterogeneity there exists in the economic performance and the perceptions of the euro across European countries. To this end, a body of data sourced from the European Commission, for the euro area as well as for non-euro area states, is examined using cluster analysis. At the same time, attitudes and perceptions toward the euro are shown as political and social, rather than economic, issues.

Key words: European integration, Eurozone, perception toward euro, hierarchical cluster analyses, dendrograms

JEL Code: E50, E52, E62, E71

Introduction

The establishment of the euro area and the adoption of a single currency by a group of eligible countries represented the third stage of the so called Economic and Monetary Union (EMU). The euro area, or Eurozone, was built as a reflection of the optimum currency area proposed by Robert Mundell (1961), and has seen many benefits from the introduction of a single currency, but at the same time experienced major problems, such as those triggered by the 2007-2008 financial crisis (see e. g. Giannellis et al., 2017).

The paper endeavors to highlight heterogeneity in the perceptions of the euro and its benefits across European countries. It reports the findings of two cluster analyses that employed data for the Eurozone as well as for non-Eurozone states, sourced from the European Commission and the European Central Bank. The first analysis involves economic indicators solely, illustrating the extent to which the countries being investigated (all EU member states except Denmark and the UK for which relevant data were not available) meet the convergence criteria set out in the Maastricht Treaty. The second analysis includes attitudes and perceptions toward the euro, to the effect that Eurozone membership is shown as a political and social as much as an economic issue.

Chapter one of the paper outlines the methodology of cluster analysis, while chapter two delivers and discusses the findings of two cluster analyses that were conducted in an attempt to inquire into the research problem. The final chapter brings up some tentative conclusions and delineates paths for further research.

1 Methodology: cluster analysis

Cluster analysis is a multivariate method whose objective is to classify objects into groups called clusters. It is a very commonly used statistical method (see e.g. Halkidi et al., 2001; Löster, 2017; Řezanková et al., 2013; Sobíšek et al., 2012; Mackovičová et al., 2012).

Cluster analysis looks for similarities in a set of data and attempts to group them into relatively homogeneous clusters (Řezanková et al., 2009; Löster, 2016). There are a plethora of methods and procedures to accomplish that, differentiated mostly by the criteria used for linkage (see e.g. Gan et al., 2007; Kráľ et al., 2009; Řezanková et al., 2011). Literature also typically makes a distinction between traditional methods and new approaches. Traditional, or standard, methods have been thoroughly researched and developed to a point where they can be widely applied and implemented in software products. The most popular types of hierarchical clustering include the nearest neighbor method, the farthest neighbor method, the average distance method, and the centroid method.

The nearest neighbor method is the oldest and simplest one. Under this approach, two objects are searched between which the distance is the shortest, and then a cluster is formed containing these two objects. Another cluster is created by linking the third closest object. The distance between two clusters is defined as the shortest distance between any point in the first cluster and any point in the other cluster (Gan et al., 2007).

The farthest neighbor method is based on the reverse of the principle that drives the nearest neighbor method. Its greatest advantage is that it yields small, compact and clearly separated clusters.

Under the average distance method, the criterion for combining clusters is the average distance between all objects in one cluster and all objects in another cluster. The outcomes that this method produces are not influenced by extreme values as is the case with the nearest and the farthest neighbor methods, because cluster fusions are dependent on all objects.

The centroid method involves a different criterion for cluster merges. Rather than on inter-cluster distances between objects in data sets, it focuses on distances between cluster centroids, where the centroid is designated as an average of the variables in each cluster. What determines that a pair of clusters will be merged is the minimum distance between their centroids. The advantage of this method is that remote objects do not have a significant effect on the outcomes.

The median method may be seen as an analog of the centroid method, while it differs in that, instead of the distance between cluster centroids, it uses the distance between the medians of those clusters. The median method hence eliminates the shortcomings of the centroid method by abandoning weights that, under the former approach, have to be assigned to dissimilarly sized clusters.

Ward's method deploys an original clustering procedure that makes it different from methods seeking to optimize distances between clusters. Wards method is designed to minimize the heterogeneity of clusters, i.e. in forming clusters it aims at maximizing intra-group homogeneity. The measure of cluster homogeneity is called the minimum variance criterion, or Ward's criterion, and is conceived as the intra-group sum of squares of deviations in values from the cluster average. The criterion for linking clusters is founded on the idea that in each clustering step a minimum increment of intra-group variance is pursued. Ward's method is capable of creating clusters of approximately the same size, while small clusters are few or none.

Detailed descriptions of the different methods and formulas used for clustering can be found e.g. in Řezanková et al. (2009), Gan et al. (2007) and Dias (2017).

2 Findings from the analysis of empirical data

The analysis involves both EMU member states and non-member states and aims at clustering those that exhibit similar characteristics in terms of economic performance as well as in terms of societal attitudes toward the adoption of the euro.

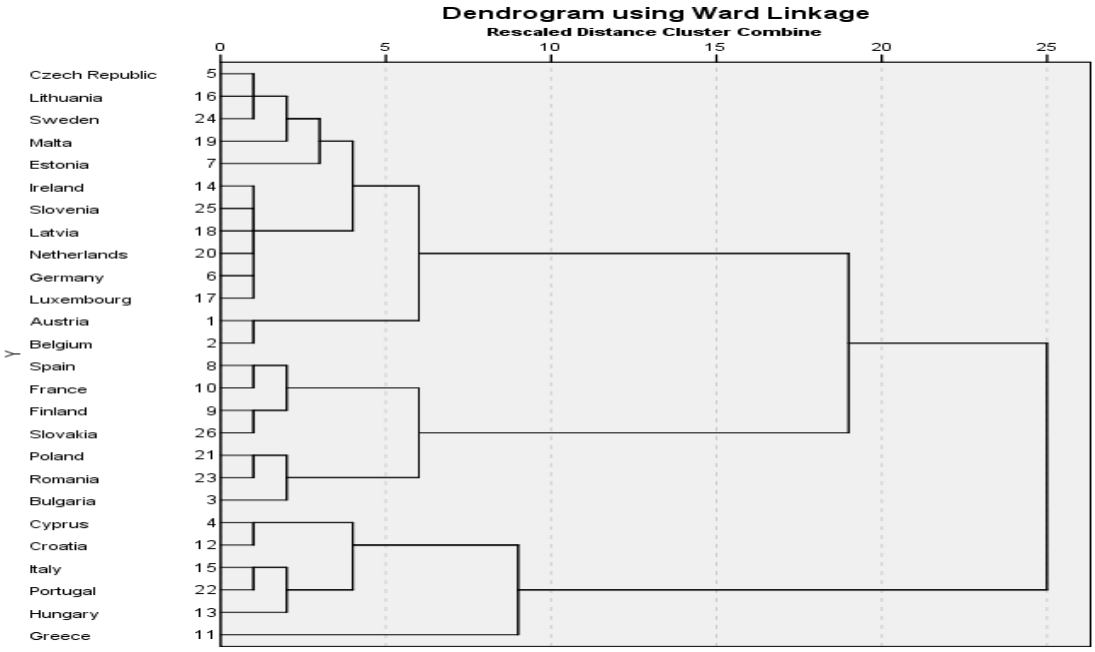
The countries' economic performance is assessed against the Maastricht criteria (despite criticisms that they do not fully reflect or support convergence). Thus, inflation is measured by the harmonized index of consumer prices, while the estimates of long-term interest rates are based on yields on government bonds with a maturity of 10 years. Two other measures – primary balance over gross domestic product and public debt over gross domestic product – are assumed to be indicative of the fiscal performance of respective countries. The relevant data were sourced from the Statistical Data Warehouse of the European Central Bank (ECB).

The prevalent perceptions of the euro are gauged using two Eurobarometer reports: Flash Eurobarometer 446 of December 2016 for the EMU countries, and Flash Eurobarometer 453 of April 2017 – for non-adopters. The 2016 survey data were employed, since these were available for all of the countries covered by the study.

The Ward´s method was applied to process the data, involving a normalization step prior to an attempt at clustering. First, the economic data were examined solely, for both the euro area countries and non-members, and then survey findings on the perception of the euro were incorporated on top of the economic parameters. All computations have been performed in the statistical systems IBM SPSS Statistics and MS Excel. Two dendrograms were produced as a result, shown in Figures 1 and 2.

The first graph, offering a purely economic perspective and presenting the outcomes of the cluster analysis conducted on economic performance indicators vis-à-vis the euro convergence criteria, demonstrates that most, albeit not all, of the economies performed well enough in 2016, fulfilling the convergence requirements for euro area membership. Deviations from the overall positive outlook seem emblematic of the global economic slump following in the wake of the 2007-08 financial crunch and affecting some of the more vulnerable European economies more severely than others.

Fig. 1: Hierarchical clustering of EU countries: an economic perspective (not incl. perceptions on the euro)



Source: own.

The analysis revealed that, in 2016, the average inflation of European countries was slightly above zero, with Belgium closest to, but not exceeding, the ECB target rate of 2%; one that is considered favorable to economy, unlike negative inflation (i.e. deflation) observed in a number of European states (Bulgaria, Croatia, Cyprus, Ireland, Italy, Romania, Slovenia, Spain, and two of the Visegrad Group [V4] countries: Poland and Slovakia).

The government budget deficit remained below the ceiling of 3% in a vast majority of the countries being examined, with the spectacular exception of Greece and, to a lesser extent, Cyprus and Malta. The mean deficit was hence at a fairly safe level of 1%, even though it varied within a rather broad range of 5.4% (between Greece's highest deficit and Romania's highest surplus).

The government debt-to-GDP target of below 60%, clearly the toughest and unattainable for many European governments, was not met by a significant number of countries, including several euro area member states, such as Belgium, Cyprus, Italy, Portugal, Spain and, notably, Greece. As a result, both the mean and the median debt ratios for the states being investigated climbed above 60%.

Looking at the average assessments of their economic performance, the countries could be arranged into in three clusters, with high performers forming cluster one (including

Austria, Belgium, the Czech Republic, Estonia, Germany, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Slovenia, and Sweden), moderate or ambiguous performers making up cluster two (including Bulgaria, Finland, France, Poland, Romania, Slovakia, and Spain), and low or non-performers falling into cluster three (including Croatia, Cyprus, Hungary, Italy, Portugal, and Greece outlying on all accounts). Interestingly enough, cluster one and two comprise some countries that have not yet adopted the euro (e.g. the Czech Republic, Sweden, Bulgaria, Poland, Romania), although they do meet the entry criteria already or, arguably, could meet them over a reasonably short term. This implies that there must exist non-economic reasons for their continued resolve to stay outside the Eurozone.

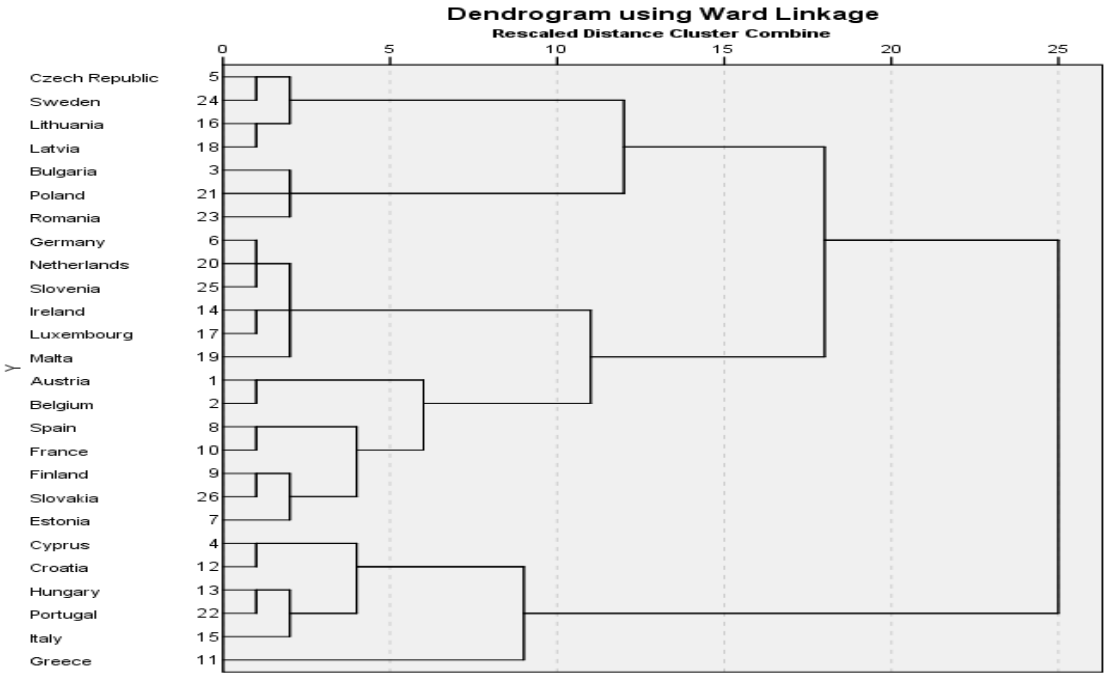
Consequently, the authors chose to look at Eurobarometer reports in an attempt to find out whether eligible countries' refusal to join the Eurozone correlates with the societies' perceptions of, and attitudes toward, the euro. The relevant data were then included in the cluster analysis to arrive at another dendrogram, illustrating how the country groupings are altered if such factors are brought into the picture.

The second dendrogram offers an economic-attitudinal perspective on the adoption of the euro, and represents the authors' effort at exploring links between public opinion on the common currency and Eurozone membership, and possibly addressing the question of whether some countries' decision to not adopt the common currency (or indecision to adopt it) may be underpinned by factors of non-economic nature.

To reflect the perceptions of the euro in specific countries, the cluster analysis incorporated two Eurobarometer questions: "Having the euro is a good or a bad thing for your country" – for the euro area countries (Eurobarometer, 2016); and "Generally speaking, are you personally more in favor or against the idea of introducing the euro in your country?" – for the non-Eurozone states (Eurobarometer, 2017).

This iteration of the analysis again divided the countries into three clusters. Yet, the first cluster now contained states where adherence to rigid economic discipline was not combined with positive attitudes toward the euro or its immediate adoption. The cluster includes such countries as Bulgaria, the Czech Republic, Latvia, Lithuania, Poland, Romania, and Sweden – most of which have indeed opted for non-adoption of the common currency. These are, tentatively, the cases to be studied in-depth in search of inhibitors that have been keeping some countries outside the Eurozone notwithstanding their fairly close economic convergence with the euro area.

Fig. 2: Hierarchical clustering of EU countries: an economic-attitudinal perspective (incl. perceptions on the euro)



Source: own.

Cluster two comprises countries where sound economic policy went hand in hand with the most positive attitudes toward the euro. Not surprisingly, the cluster includes the most prosperous economies – Austria, Belgium, Estonia, Germany, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, and Slovenia – alongside France and Spain, whose presence in this group is due to the prevalence of favorable attitudes toward the euro rather than to their close alignment with the Maastricht-stipulated economic indicators.

Cluster three puts together countries such as Cyprus or Italy, whose failure to match the economic convergence criteria was associated with reluctance toward the euro (possibly indicating disappointment with the common currency), alongside those whose rather positive perception of the euro could not offset inferior economic performance, such as Croatia, Hungary, and Portugal. Cluster three includes also Greece whose failure to match the economic convergence criteria is extraordinary. It has to be noted, however, that the Greeks' perception of the euro was not negative at all, standing slightly above either the mean or the median value for the countries being examined.

Conclusion

The cluster analyses presented in this paper aimed to highlight heterogeneity in the perceptions of the euro across European countries and to begin exploring its relationships with economic performance, viz. the countries' ability to meet the Eurozone convergence criteria.

The research findings have demonstrated that, on the one hand, there are many states whose strong economic standing is coupled with positive attitudes toward the common currency while, on the other, that an economic downturn need not be associated with negative perceptions of the euro – which is evidenced by the examples of Greece and, to a lesser degree, Portugal or Spain. At the same time, the analyses singled out a few countries that have so far refrained from joining the Eurozone even though their thriving economies already make them eligible or could easily make them so (e.g. the Czech Republic, Poland, Sweden).

Reasons for some countries' non-entry are still grossly vague under these analyses and, apparently, should be sought elsewhere, primarily in political factors. In Poland or in the Czech Republic, for example, euro adoption has never been on the governing party's agenda, with hardly any significant political actors declaring advocacy or even demanding attention to the issue. Not only has it been virtually absent from public debate in Poland, but there have been no consistent attempts by major political players to stimulate discussion and few voices vowing explicit support for the adoption of the euro. By this token, it is small wonder that the tide of public opinion is against the common currency, as all humans intrinsically tend to fear the unknown.

In the case of the Czech Republic, it well may be that its non-commitment to the adoption of the single currency unveils the weakness of Czech European policy, standing in stunning contrast with the nation's aspiration to play a role on the continent and its confidence in the country's firm anchorage in western European culture.

Although a more in-depth treatment of these questions is beyond the scope of this study, it might become the objective of further research initiatives engaging political science scholars.

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