

Who do heterodox economists think they are?

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Abstract:

This paper attempts to engage with the established debate on the nature of heterodox economics. However, it starts from the position that previous attempts to classify and identify heterodox economics have been biased towards *a priori* definition. The paper aims to inform the discussion of the nature of heterodoxy with some empirical analysis. The paper examines survey data collected from a small/medium-sized sample of AHE members on the core concepts in economics. The paper applies factor analysis to the data. It also applies principles of biological taxonomy, and thence cluster analysis to the problem. The paper finds that within the self-identified community of self-identified heterodox economists there is little agreement as to whether members are pluralist, or what their attitude is to the mainstream. Indeed, there is little agreement on any core concepts or principles. The paper argues that there is little structure to heterodox economics beyond that provided by pre-existing (or constituent) schools of thought. Based on this study, heterodox economics appears a complex web of interacting individuals and as a group is a fuzzy set. These results would lead us to question further strict distinctions between heterodox, mainstream and pluralist economists.

Keywords: heterodox economics, survey, factor analysis, cluster analysis

JEL classifications: B5, C19, C83

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Introduction

What is heterodox economics? The term is now established in the literature, arguably more firmly than at any other time. It was used originally in the 1930s and 1940s (Ayres, 1936; Commons, 1932, 1936; Gruchy, 1947, 1948) but has gained popularity mainly in the 1990s and beyond (see Lee, 2009 for a full historical treatment). The term is even being used by mainstream economists (heterodox approaches have their own JEL classification, B5). Projects are being funded to investigate how heterodox economics might enhance economics teaching and to develop resources to do this (for example, in the UK via the *Economics Network*). The *Association for Heterodox Economists* has now held 11 successful annual conferences plus numerous other events, including postgraduate training workshops and seminars. All of this suggests that the heterodox economics community is vibrant; and thus by extension, heterodox economics is strong.

At the same time though, there is considerable debate as to what exactly heterodox economics is. In the next section of the paper it will be briefly argued that there is no agreed concept of heterodox economics, only competing definitions based usually on totalising dualistic distinctions between orthodox (or mainstream) and heterodox. It is claimed that all existing treatments of heterodox are based on *a priori* definitions. This

¹ This paper has benefited from comments received at a session of the Association for Heterodox Economics conference at Kingston University, July 2009. Thanks go to the discussant at that session, Ioana Negru, and to Lynne Chester, Paul Downward and Don Webber for other comments. The usual disclaimer applies.

paper attempts to contribute to the debate by investigating the nature of heterodox economics empirically. The remainder of the paper will try to move away from this *a priori* approach and begin an investigation based on an empirical data. This treatment takes seriously the notion that heterodox economists know who they are and what heterodox economics is by asking them about their core beliefs in economics. A range of statistical techniques, including factor and cluster analysis, is then applied to the data. The results suggest that heterodox economics is difficult to define, and that the heterodox community is diverse complex of individuals, groups and ideas. Strict distinctions between heterodox and other approaches to economics seem unwarranted. However, more research is needed.

Heterodox economics

This section offers a very brief meta-analysis of definitions of heterodox economics. The literal meaning of heterodox is as ‘not orthodox’. Dequech (2007-8) offers a helpful analysis of existing definitions of heterodox and finds that it is difficult to arrive at one which adequately describes the current heterodox community other than ‘not orthodox’. This is rather unsatisfactory because it appears to undersell heterodox economics, which in its traditional composite elements, such as Marxism and Keynesianism, would appear to be more than merely critique. Both Marxism and Keynesianism, for example, contain constructive programmes of economic theory (albeit in an interdisciplinary way), economic method, logic, ontology, politics, ethics, etc. which differ from those espoused by the mainstream economics. However, even if the components of heterodox economics

have such characteristics, it does not follow that heterodox economics does. Nonetheless, perhaps aware of the agenda of not appearing merely critical, several economists have offered explicit or implicit definitions of heterodox economics.

Thus we have a range of definitions. Lee (2009) defines heterodox economics, rightly, as a concatenation of ideas, but identifies it as being based on the notion of an analysis of the provisioning process as being necessarily social, whereas mainstream economics views the provisioning process in asocial (individualistic) terms. Lawson (2006) goes to a different level to define mainstream economics in terms of the insistence on the use of mathematical modelling in economics and that heterodox economics entails the rejection of this approach. The composition of the *Association for Heterodox Economists* defines heterodoxy in terms of specific pre-existing schools of non-mainstream thought. Yet, the contents of George (2008) suggest heterodoxy being something very different. Others attempt to define the mainstream (and by implication, heterodoxy). Davis (2009) suggests support for Lee's definition by identifying the essence of mainstream economics as individualism, plus beliefs in the centrality of equilibrium and rationality. Arnsperger and Varoufakis (2009) define neo-classical economics somewhat similarly, in terms of methodological individualism, methodological instrumentalism and methodological equilibration. By implication, heterodox economics does not meet these criteria.

How well do these definitions describe the current heterodox communities? It could be argued that Lawson's definition does best, because it is true that none of the current heterodox communities insist on the use of mathematics. It is also strongly arguable that

the mainstream does insist on mathematical modelling; it is also true that such a movement is a powerful force in economics. Thus, Lawson's definition has some utility. However, in other ways it is rather unsatisfactory, perhaps because it appears rather narrow. The definition itself – although Lawson would acknowledge the wider nature of heterodoxy – also does not capture the notion identified by Lee as heterodox economics as a concatenation of ideas; in other words, a complex system. However, if we try to apply either Lee's (2009) or Davis' (2009) definitions, different problems are encountered. The most obvious anomaly is Austrian economists, who are regarded as heterodox in many ways. For example, they do not believe in individual rationality in the mainstream sense, see markets as non-equilibrium systems, note the importance of time, history and change, and emphasise uncertainty. They certainly do not fit into Davis' description of mainstream economics. However, neither do they accord with many aspects of heterodox groups: for instance, they neglect power, they tend to be politically different from other heterodox groups, and they view markets as essentially likely to be effective. They also hold individualism (albeit differently from mainstream economists). Thus they do not fit into Lee's category of heterodox economics either. Similar arguments could be made about many heterodox schools. One might argue that any literature which does not meet all of Davis' (or Arnsperger and Vaourfakis') criteria is heterodox; but then this tells us little.

It is easy to see why Dequech (2007-8) might have reached his conclusion that apart from in their opposition to the mainstream, there is no way to define heterodox economics. It would seem that any adequate definition of heterodox must capture its nature as a

concatenation; but it must also be able to capture the current diversity of the heterodox community. These two requirements are in many ways contradictory. Another issue here is the question of what type of thing heterodox economics is. Many of the treatments implicitly employ set theory to define heterodox economics. Dequech explicitly uses the term empty set. Other authors seem to envisage heterodox economics as a crisp, closed set, strictly distinct from mainstream thought. Often, heterodox and mainstream thought seem to be all-encompassing categories (see Mearman, 2007). Indeed, it could be argued that their definitions are constructed in order to construct two mutually exclusive, often encompassing categories or sets.

One issue with sets is that their memberships depend utterly on their definition. There can though be different ways to arrive at these definitions. Some authors may take an Aristotelian or Lockean tack and look for some sort of essence of the object. Lawson's (2006) treatment can be interpreted as claiming that mainstream and heterodox economics have essential properties. Some writers reject such types of claim. Others may take a Wittgensteinian view that categories are based on 'family resemblances' and on uses. So, the term heterodox can be used to describe together groups which have some similarities but may or may not be essentially the same. Or, the meaning of heterodox varies according to use. There is some support for this view in noting that there are a number of ways to slice mainstream from heterodox economics, according the purpose of the writer. Someone, whose focus on policy, might well lump together Austrians and mainstream economists.

One criticism of the above approaches is that they are *a prioristic*. It is possible to define heterodox economics in terms of concepts; but equally it can be defined in terms of populations of self-defined heterodox economists. That way, one can identify heterodox economic ideas but also the make-up of a self-identified heterodox economist. Indeed, this is the approach taken in recent developments in zoological taxonomy: there has been a move away from thinking in terms of types to thinking in terms of populations of breeding creatures. This may generate an image unpleasant to some, of economists breeding. And of course, in some ways it is an inappropriate metaphor. In other ways, though, it might capture quite well the activities of economists exchanging ideas, acting in communities, borrowing on the genetics of the groups they are in, sharing common ancestors. Such an approach would require an historical account of individual economists, which is beyond the scope of this paper². However, one key idea present in the new zoological taxonomy is adopted here: that of gathering together a ‘breeding population’ – viz. self-identified heterodox economists – and then building up descriptions of heterodoxy from statements made by those economists about the fundamentals of economics. Such is the goal of this paper.

Data collection

Data was collected via a questionnaire. The questionnaire was received in three ways: first, questionnaires were distributed at the conference of the Association for Heterodox Economists (AHE) conference in Cambridge, UK in July 2008. An announcement was

² The scale of this task is illustrated by works which might be said to aim to do the same thing: e.g. histories of schools of thought (King, 2002); or works which link past economists to newer ideas, such as Critical Realism (see, for example, Fleetwood, 1996), or general equilibrium theory (Hollander, 1981).

made by the author at the conference for questionnaires to be completed. In order to capture people who did not complete the questionnaire at the time, and also to capture people who are self-identified heterodox economists by virtue of being AHE members, two further appeals were made to attract respondents via the AHE listserv. Respondents were able to either post or e-mail their responses to the author. It should be noted that in terms of data reliability this may raise concerns because of order effects (see, for example, Macauley, *et al*, 1971). However, soliciting responses from the listserv also reduces possible bias in the conference attendees.

The questionnaire can be viewed in the Appendix. It was headed ‘What are the core economic precepts?’ in order to deflect respondents from its main purpose; namely to ascertain a definition of heterodox economics. The heading also had the benefit of being usable in wider groups of economists. The questionnaire asks respondents to offer their degree of agreement with a series of statements. Respondents could agree completely (with a score of 10), disagree completely (score of 0) or offer partial agreement/disagreement or hedge their answers by choosing intermediate scores. Respondents answered on a sliding scale which had no numbers to guide them. This was done because it was felt that respondents might be driven to choose given numbers. In one particular case, where the score of 5 could have been shown, this may have been a specific concern, partly because it might reduce variation in the data³.

³ For the purpose of analysis, the numbers were converted to values between 0 and 1.

The questions were derived from the literature on heterodoxy and from schools regarded as traditionally heterodox. Principally two main criteria were used for selection: 1) mainstream concepts, in order to assess the extent to which heterodox economics is merely a rejection of the mainstream; and 2) concepts associated with heterodox economics from the literature. In order to reflect the literature, a mixture of methodological and theoretical points was included. Inevitably there will be concepts which were potentially includable which have been omitted. The most obvious candidate is any explicit reference to institutions; i.e. the concept of institutions was not used explicitly, although things which may be considered as institutions (e.g. money) were included. However, many of the concepts included (e.g. history and power) are of relevance to institutionalist economists. The intention in the balance of questions was to address key elements of mainstream economics plus other elements from other constituent schools of heterodox economics. Thus, the inclusion of class should score highly amongst Marxist and Post Keynesian economists, money should score highly with Post Keynesians, uncertainty with Post Keynesian and Austrians, power with Marxists and institutionalists, gender with feminists and perhaps institutionalists and Marxists, etc. However, it may also be true that many self-identified heterodox economists retain beliefs or use concepts held by the mainstream. This explains further the relevance of placing responses on a sliding scale rather than on a yes/no basis.

Four issues with the data should be noted. First, responses were measured off the page manually. This may generate some measurement and rounding error. Second, it may be argued that respondents' feelings may not be accurately measured by this scale. This is

unavoidable in such survey situations. In pilot draft of the questionnaire respondents were asked a supplementary question for each main question: ‘how confident are you in your answer?’ However, this led to what was judged to be an unreasonable level of detail and was removed. Third, some people may be serial high responders. This could bias the scores overall in favour of those people. It is possible to recalibrate these scores but it was decided that they should remain as recorded, because the strength of feeling expressed may well be reflected in the strength of feeling within the organisation. So, if specific groups of people tended to hold strong views, this would influence the tenor of debate within the larger group. This could be a finding *per se*. For this reason, as well as wanting to preserve the original data, raw data scores were kept⁴. Fourth, it should be recognised that the questions arguably address different types of thing. Just as Dow (2004) does, we can imagine schools of thought as layered. The concepts of pluralism and fallibility could be said to operate on a lower level than do schools of thought. It is not clear whether these two methodological drivers have the same impact on the school memberships. This affects our interpretation of the results. For example, we might view our regressions as nested equations rather than a single equation. Also, in terms of the interpretation of cluster analysis, the different types of variates matters. In taxonomy, cluster analysis is used to group objects on the basis of similarity in terms of characteristics in order to then assess genetic identity of the objects. Our variates may be said to combine characteristics and genetic factors. However, arguably the variates are all methodological rather than theoretical and can be regarded as comparable.

⁴ In results not shown here, descriptive statistics for each case were generated. Particular attention was paid to the mean and mode scores for each case, as well as standard deviation. Cases with means lower than 0.4 and higher than 0.6, SD higher than 0.4, and mode at either 0 or 1 were examined further. Although some tentative patterns may be found, such as that self-confessed Marxists often answered 0 or 1, and 0 for concepts such as rational and 1 for labour, power and class, no clear pattern emerged.

Data Analysis

The data has been analysed in a range of ways. Descriptive statistics, as ever can aid the narrative considerably. These are followed by a discussion of factor analysis and cluster analysis which were applied to the data.

Descriptive Statistics

43 responses were received. Based on an AHE membership of roughly 250⁵, this is a response rate of 17%. This can be considered somewhat disappointing although within the normal range for online surveys. One might conventionally interpret the rate and the low n as making the data poor and the results also. There are two main issues here. One is that the small sample makes inference difficult. All inferences to populations from samples should be done carefully and in this case the need is stronger. However, if we take the results are totally sample specific, then references to superpopulations and statistical significance become irrelevant. For our purposes, the sample *is* the population. Second, the small sample affects the efficacy of the techniques used. The results from the analysis should be viewed even more cautiously than necessary. As a final point, we should note that some of the questionnaires were not completed, with one or two questions unanswered. These missing values were filled by imputing values using SPSS.

⁵ No precise figure was available for AHE membership in 2008. The number was 167 in 2006, and 258 in 2007. Each year there are new members but also some memberships lapse. The figure of 250 is a rough estimate.

Table 1 here

Descriptive statistics are shown in Table 1. The descriptive statistics show some predictable and some more surprising results. The variation in responses is quite pronounced, although it differs between questions. There is a strong willingness to recognise oneself as heterodox (unsurprisingly in this context), and (to a lesser extent) as pluralist, perhaps reflecting that pluralism was the theme of a succession of AHE conferences. The score for mainstream is not high, yet clearly non-zero, suggesting that the heterodox group still recognises some mainstream label. There may be some key issues which cause disagreement in the heterodox community. E.g. labour and scarcity have large standard deviations. However, there were also high scores for history and power which are traditional heterodox concerns. The scores for uncertain and fallibility are also high, although for both (echoing the statistics for pluralist) variation of response is also quite high.

Table 2 here

Table 2 shows statistically significant correlations between variates. The first thing to note is that there is a strong negative correlation ($r = -.438$) between heterodox and mainstream. This statistic supports the thesis that heterodox is analytically defined (at least partly) as a rejection of mainstream economics. However, in an association such as the AHE, such an oppositional stance will inevitably also reflect sociological factors. Also possibly significant is that the opening questions were in terms of how the

respondent sees themselves, rather than in judging concepts. If we then look at the correlation between heterodox and mainstream *concepts*, the picture is less clear. Correlations between heterodox and concepts such as positive, rational, equilibrium, markets, maths and even scarcity are negative but small. There is stronger evidence of rejection of mainstream economic concepts in the stronger correlations between those concepts and specific traditionally heterodox concepts: for example, class is strongly negatively correlated with several mainstream concepts. History is strongly negatively correlated with equilibrium (echoing Robinson, 1974 perhaps), individuals and scarcity. Power has consistent negative correlation with mainstream concepts. Further, mainstream concepts are correlated with each other, as are several groups of traditionally heterodox concepts: for example, class is strongly positively correlated with power, labour, gender and negatively with individuals (not surprisingly), positive and markets. Uncertain is strongly correlated with fallibility, (negatively with) maths and, perhaps reflecting feminist thought, with gender.

Factor analysis

The correlations suggest (together with the practical need to reduce the data) factor analysis might be appropriate. Significantly, Table 2 suggests significant clusters of concepts which are correlated with each other. These associations can be readily assessed

by factor analysis, the results of which are shown in Table 3, which displays factors derived by principal components analysis after a varimax rotation⁶.

Table 3 here

Nonetheless, the results shown in Table 3 are intuitively sensible and reflect the results from the bivariate correlations shown in Table 2. The second factor has high loadings on class, power, labour, gender and (negatively) markets. Factor 2 might thus be called a ‘radical’ (or perhaps Marxist-feminist) grouping. Factor 3 might be an ‘Austrian’ grouping, associating uncertainty, individualism and fallibility. Factor 4 is perhaps a ‘Post Keynesian’ group which stresses money and history. Factor 5 suggests an ‘ecological economics’ group which stresses natural systems, but also the use of mathematics.

Factor 1 might be called a mainstream factor. Significantly, this factor groups rational, equilibrium and scarcity. This may reflect a bias within heterodox economics as to what constitutes the mainstream: i.e. if heterodox economists associate scarcity, equilibrium and rationality with the mainstream, they may reject them more easily. The finding also partly supports Davis’ (2009) definition of the mainstream in terms of equilibrium, rationality and individualism. However, the adoption of individualism by Austrian economists means that the adoption of individualism alone cannot be a definition of the mainstream; it also complicates the division between mainstream and heterodox. Further,

⁶ The results of this analysis must be treated with care, given the low sample size. There are sixteen variates shown here and only 43 cases. The ratio of cases to variates is thus lower than 3:1, whereas most treatments of factor analysis usually recommend a ratio of 5:1 or even 10:1 (Hair, et al, 2006: 122).

the mean scores for 'mainstream concepts', although consistently lower than heterodox concepts, are consistently non-zero. Also, although there was a significant negative correlation between mainstream and heterodox, the correlation coefficient was only |.438|, meaning that many respondents regard themselves as mainly as clearly defined heterodox economists – yet with important element of mainstream economics thrown in. Heterodox economists are a mixture of concepts and influences. An alternative interpretation is that heterodox and mainstream are overlapping categories. The other clear finding for this group is that in terms of concepts, heterodox economics remains a concatenation of ideas (echoing Lee's (2009) term) and groupings of individuals.

The factor analysis suggests robust and strong associations between sets of variables which are intuitively sensible: e.g. radical, mainstream, Austrian, PK and ecological economists. Cronbach's alpha statistics suggest that factors 1-3 are the most robust. This interpretation is questioned by the results from factor analysis including pluralist as a variate, wherein fallibility combines with pluralist rather than with factor 3. A decision must be made then about whether to choose five factors or six. In statistical terms (sizes of eigenvalues, amount of variance explained and Cronbach's alpha) there is little to choose. However, the first set of factors (shown) seemed intuitively more sensible than the second because they echo schools of thought. Furthermore, pluralist could be seen as more of an outcome variate than the others; and when the other outcome variates heterodox and mainstream were included they did not generate sensible factors: thus the factors in Table 3 were chosen as the workable solution.

Regression analysis

Conventionally, we might take investigate the determinants of heterodox economics via regression analysis. I.e., run a regression with heterodox as the dependent variable. When this was done (via OLS), the results were rather unconvincing. Again, this is subject to problems of sample size. Only one variate (money) was shown to be statistically significant. This would conventionally be regarded as a problem but given we are not inferring to the population, this is not necessarily a problem. However, the regression was also subject to other problems. It may also be argued that given that we have different types of variates on the right hand side of the equation – specifically some are methodological , some theoretical – it is possible that rather than analyse a single equation, we actually have a set of nested equations. In addition, there were problems of Normality of residuals, low explanatory power and multicollinearity; so the results are ignored.

Factor analysis can be, as shown above, a useful method for describing data. It is also useful (and perhaps is best known) as a data reduction technique. Here we can use factor analysis to reduce the number of independent variates in the regression. The analysis thus far has suggested some hints as to the definition of heterodox economics. This analysis can be taken a step further by examining OLS analysis of the determinants of heterodox economics. However, although statistically significant coefficients were found, they were all small; thus the regression analysis did not inform us much.

Factor analysis assesses relationships of interdependence between variates. However, it is arguable that this method looks at the data inappropriately. Here we might draw on the literature on taxonomy. This is apt because one of the things we are interested in is whether anything called heterodox economics coheres around individuals. This approach reflects the argument that heterodox economists are able to self-select and that by examining them we can divine what heterodox economics is. Alternatively, if we are confident of what heterodox economics is, we can group economists according to that definition. Such considerations are the concerns of taxonomy. In that discipline a move has occurred between typological descriptions of objects to one based on genetics (see, for example, Mayr, 1969; Goto, 1982). In new approaches, objects are grouped into phena (i.e. some similarities) and then genetic connections are sought. The latter approach therefore takes certain characteristics as ways of grouping objects (cases). In the literature this is described as *numerical taxonomy*. Such an approach would examine relationships between numerical measures of characteristics of each case. This stage of analysis would then lead to explanations of genetic relationships; which here would mean historical studies of people's education and influences. The principal goal of this section of the paper is to identify groupings of cases occur. For this purpose, *cluster analysis* shall be used. Cluster analysis involves the examination of relations between cases rather than between variates. Indeed, at this point, the paper shifts its focus from variates and very much onto cases.

Cluster analysis

Cluster analysis has several advantages.⁷ Its main advantage that it allows the data to speak – “the classification of data as suggested by natural groupings of the data themselves” (Hair et al, 2006: 559). Cluster analysis allows a variety of research goals to be pursued, and is particularly useful for basic description of complex data sets. Like factor analysis it can be a useful means of data reduction. This flexibility has allowed it to be used in a range of settings, and not just in zoology and related areas. However, there are some disadvantages of cluster analysis. Cluster analysis is not capable of inference, which *to some* limits its usefulness. The technique itself will always generate clusters, perhaps giving the impression that more structure is present than is actually the case. The principal disadvantage of the method is that each clustering identified is highly dependent on the cluster variables specified by the researcher. Thus, the extent to which the data speak for themselves is severely restricted. Cluster analysis therefore does not avoid the problem of *a priori* classification; although it could be said to mitigate it somewhat.

Clusters are formed on the basis of either similarity or dissimilarity. Either way, some measure of (dis)similarity is necessary. There are two main schools of thought on this question: to use distance measures or correlational measures. The correlational approach suggests that we simply correlate between cases rather than variables. This may allow us to find groupings based on association. Often this is done to identify what might be described as outliers. In this paper these correlations constitute a significant piece of analysis because they allow us to examine the existence of groups.

⁷ Hair, et al (2006, ch. 8) discuss the key concepts in cluster analysis. Much of this discussion draws on that source. Interested readers should consult Hair et al.

Table 4 summarises the set of bivariate correlations between cases across responses to all questions. A strong correlation is one which is greater than $|0.5|^8$. It shows that 29 of the 43 cases are strongly correlated with at least 21 other cases. 12 cases have strong correlations with at least 31 others. That suggests that there is a core set of cases which have a degree of disagreement across issues of concern. However, although many of the correlations of these cases with others were with other core members, not all were. Take case 3 as an example. It had the (joint) highest number of strong correlations with other cases, 33. Of these 33, 10 were with other 'core' cases; but one was with a 'marginal' case (with 10 or fewer strong correlations) and many more (22) were with cases in the middle. Case 14 also had 33 strong correlations which were distributed in a similar way (11, 1, 21). The consistency of this result is of course contingent on the $r = 0.5$ threshold for strong correlations and on 31 strong correlations being the threshold for core membership (for example, 6 cases had exactly 30 strong correlations). Subject to these caveats, some conclusions can be drawn about the sample. It suggests that the heterodox community displays contradictory facets: on the one hand it may be seen to have a strong core; but on the other hand there is a variety of views within it and perhaps some rather peripheral members. In between there are large numbers of people in intermediate agreement with the core.

Table 4 here

⁸ This figure may be considered arbitrary – and indeed it is somewhat – but in this case the figure filters out even correlations which are statistically significant at the 5% level so is quite strict. Further the findings from this technique are compared with others, so any loss from arbitrariness is mitigated.

In addition to looking at this overall picture, one can examine the so-called marginal or peripheral members. These are those with 10 strong correlations or fewer. The correlations between peripheral members are shown in Table 5. Analysing these peripheral members suggests several things. In some instances, mini clusters form, e.g. between cases 16, 18, and 31. More often, what emerges is a complex picture. There are cases which appear outliers yet which are strongly connected to some others, and in some cases to core cases. On this basis, the community of heterodox economics then looks like a complex system of interconnections.

Table 5 here

Correlational methods look at patterns in the cases but not the distances between them, so they are perhaps less able to identify (dis)similarity. The distance method allows us to begin forming clusters on the basis of (dis)similarity in terms of distance. In hierarchical cluster methods, this occurs iteratively, as the most similar (least dissimilar) observations are progressively grouped together⁹. Ultimately, one cluster may form (unless we choose to specify the number of clusters which will form). In this sense, cluster analysis is usually agglomerative¹⁰. Also, though, because it is iterative, we arrive at hierarchical clusters in which the early clusters have closer relationships between cases than the later ones do.

⁹ It is also possible to have non-hierarchical cluster methods such as *k-means* methods which pre-determine a number of clusters (see Hair *et al.*, 2006: 581, 585).

¹⁰ As Hair *et al.* (2006: 584) note, cluster formation can be divisive, i.e. it begins with all cases in a single cluster and then breaks that down into smaller groups of cases. Most computer packages appear to be agglomerative: SPSS takes that approach.

Several options are available when distance measures are used, but perhaps the most popular is the Squared Euclidean distance (SqED). It has a number of advantages (see Hair et al, 2006: 575). Then one must choose a clustering algorithm. There are several options available, all with advantages and disadvantages, mainly in terms of their ability to form clusters. Ward's method, for example, is more likely to construct clusters of roughly equal sizes. It is susceptible to outliers but in our data set that is not much of an issue. However, all hierarchical methods do have problems, for instance of the persistence of early clusters and the influence of outliers. Hair et al (591) recommend that some trial and error is used, to test whether the structures identified would change if outliers are excluded. Here it was decided, as an exploratory move, to use Ward's method.

Once measure and clustering algorithm have been selected, one must choose grouping variates. In zoology, for instance, some (set of) characteristics has to be chosen as the basis for grouping cases. These might be in terms of size or colour. Some *a priori* choice must be made as to how to group the cases. The debate between typology (species as ideal types) and species as empirically breeding populations is thus undercut. The judgement of the investigator is thus crucial.

Cluster analysis requires that the variates used are independent of each other (without altering the fact that cluster analysis is an interdependence technique). There is some debate about the merits of using factors extracted from the data (as above) (see Hair et al, p. 582); their chief benefit being that they ensure independence of variates. An alternative

method is to take variables from each of the factors as the clustering characteristics. In small samples, multicollinearity problems may make the clusters generated very sensitive to the data. That caveat applies here and adds another degree of caution to our analysis. However, in data analysis, a correlation between variates of $r > |0.7|$ is often used as a rough indicator of multicollinearity; in our sample no correlations are that high. That suggests multicollinearity may not be present. Also, the Variance Inflation Factors generated by the OLS regression with all variates as independents did not indicate strong multicollinearity problems. In this instance, all the variates were left in the grouping algorithm¹¹.

When cluster analysis is performed, a dendrogram is produced, which gives a visual sketch of relations between cases¹². The dendrogram is shown in Figure 1. In the dendrogram cases which are most similar are located next to each other. The tree like diagram shows the connection between the cases. The lines show groupings. The closeness of cases is shown by the position of the vertical line. The further to the right is that line, the less similar the cases are. So, for example, case 26 is closely related to case 36; it may be said to be in the same group as case 29 or even case 30, but is further away

¹¹ As insurance against these problems, clusters were also estimated with factors as grouping variates, and with different combinations of factors and raw variates. Comparing these solutions, there was a degree of commonality: 24 cases seemed to remain in the same cluster whatever the grouping variates. However, this small number did not allow much further exploration. Further, it could be argued that by selecting raw variates (from different factors) the problem of multicollinearity is addressed but the problem of a priori definition of the groups is reintroduced. If the clusters derived from selected variates are thus rejected, we are left to choose between using all the variates and just the factors. However, the latter course resulted in even less structure (six clusters from 43 cases). Thus, it was decided to explore further the original solution using all the variates.

¹² Dendrograms resemble cladograms but are interpreted differently. Cladograms infer similarity from recency of descent. However, as Mayr (1969) notes, this is generally regarded as unsatisfactory. Dendrograms do not have this meaning.

from them than from case 26. The furthest vertical line indicates that eventually the hierarchical cluster method always generates a single cluster.

Figure 1 here

At this point the judgement of the investigator is crucial in deciding how many clusters there are in the data. Effectively a cut must be made at what is considered an appropriate point. In Figure 1 this cut would appear at a distance of roughly eight. That indicates that there are four clusters in the data: from cases 26 to 24, then 5 to 11, then 19 to 23, and finally 9 to 35. These clusters have membership sizes twenty, four, eleven and eight respectively, which bears similarity to the correlational data above. Further, we can see that cases 16, 18, 21, 31 and 35 are all part of the bottom cluster, which appears highly distinct from the other three¹³. On this basis, the original Ward's clusters will be investigated further.

Table 6 shows mean scores for all variables for each cluster. Obviously there are difficulties of comparing different sized samples. Nonetheless, a few key points can be made. Cluster A, the largest, is characterised by a rejection of the label 'mainstream' and to some extent of mainstream concepts (apart from individuals and markets). The second feature of cluster 1 is an acceptance of the label as heterodox and pluralist and a matching acceptance of general heterodox concepts such as class, uncertainty, fallibility, power,

¹³ However, there are anomalies, such as cases 1 and 9 both of which had many strong correlations with other cases. In support of the clusters, though, a second cluster analysis using average linkage method largely confirms the original clusters: cluster D is split into two, cluster A loses one member (case 17, who goes to B, which otherwise remains intact) and cluster C loses two members (cases 12 and 40).

money and history. It could be argued that this cluster exemplifies the recently developing picture of heterodoxy as being non-mainstream but pluralist, with a concern for methodological issues. Almost all of the female respondents to the survey are in this group, although it is far from clear why this would occur. Cluster B is rather different, exhibiting much stronger rejection of the mainstream and its concepts, maximum scores for class and labour and much lower scores than the other clusters for uncertainty and fallibility. Methodologically this group did score much higher than cluster 1 on the need for maths in economics. Cluster B seems like a Marxist group and indeed its cluster members are self-identified radicals.

Cluster C is different from clusters 1 and 2 in that it does not reject the label of being mainstream, whilst accepting the labels of heterodox and pluralist. This is an interesting finding because this cluster rejects the strict distinctions between the three categories. Further, although this cluster accepts many of the traditional heterodox concepts such as power, labour and class, it also accepts mainstream notions such as rational, equilibrium, positive, maths and crucially, scarcity. Above when factor analysis was conducted, a factor was extracted which was labelled 'mainstream' whereas the view of cluster 3 suggests instead this use of mainstream concepts alongside heterodox ones is another exhibition of pluralism. This cluster is similar to cluster A but more pluralist.

Unfortunately these individuals are difficult to identify from the information gleaned so it is difficult to draw too many conclusions. It should also be noted that in the dendrogram, arguably cluster C might have been split into two, so perhaps not too much coherence should be expected. Cluster D is in some ways the most interesting cluster because it

contains most of the cases identified as outliers. The cluster score for mainstream is similar to cluster C, but the score for heterodox is lower. Accordingly, scores for core heterodox concepts such as class, power, gender and particularly labour are clearly lower than for the other clusters. As a corollary, cluster D's scores for individuals, markets and rational are much higher than for the other clusters. Looking at the cases who are members of this cluster, they appear to be members of underrepresented elements of heterodox thought, such as behavioural economics, Austrian economics, associative economics and American institutionalism.

Conclusions

The data examined here suggests that the group which calls itself heterodox economics is a complex object. Some key factors can be identified: a belief that history, natural systems, uncertainty and power are all important to understanding economics. There is some rejection of mainstream label and associated concepts although the data suggests that heterodox economics is not merely a rejection of the mainstream. However, even surrounding these general conclusions, there was considerable diversity and little evidence of structure. Overall, it seems that heterodox economics is not a monolith.

Clearly there are reasons to be cautious about these findings, not least because of the sample size, and that there is only one drawing from the group. Further, the data only reveal patterns in nominal data – at best we have identified only nominal essences. More work must be done to establish the natures of these groups. Drawing on biological

literature, a next step is to establish the genealogy of the cases and groups of cases and draw on existing literature in the history of economic thought, plus conduct deeper analysis on individual cases. This work would try to ascertain with whom these economists are ‘breeding’ (their ideas) and who their (intellectual) descendants were. Clearly the analysis here needs to be complemented by historical and social analyses found in, for example, Lee (2009). Future research might apply the same method to a group of mainstream economists. In addition, the criticism should be borne in mind that the responses to the questions do not exhaust the nature of heterodox economists: their membership of groups and their political and work environments (i.e. whether they are disadvantaged when searching for employment) will also matter.

However, another pertinent question is whether or not to regard the groups within the heterodox population, or indeed heterodox and mainstream, as separate. In the taxonomy literature, a distinction is often made between ‘lumpers’ and ‘splitters’ – those whose instinct is to, respectively, lump together similar but different cases, or emphasise the differences and split them up. Whenever a category is made, there is a dynamic between the desire to analyse and the desire to lump. The desire to analyse is reinforced by a desire to split. The difference between lumpers and splitters is defined by their emphasis of similarity or of difference. The empirical evidence here supports either urge: it suggests considerable heterogeneity in that little structure can be found within the community of self-identified heterodox economists. However, in other ways, there are reasons to lump: there is a shared dislike of the mainstream; and concepts such as history are almost universally held. It would seem that there has been a tendency in the

methodological literature discussed at the start of the paper to split. Splitting is something humans like to do; whether this act is helpful or not is debatable. Given the apparent fuzziness of the categories involved, it seems that splitting ought to be done cautiously, provisionally and open to revision.

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Tables and Figures

Table 1a: Descriptive statistics of survey data

	N	Mode	Mean	SD
mainstream	43	.00	.1341	.17317
heterodox	43	1.00	.8221	.19436
pluralist	43	1.00	.7105	.29207
rational	43	.00, .10	.2186	.21906
equilibrium	43	.00	.1773	.22206
class	43	1.00	.6701	.26847
positive	43	.00	.2047	.24344
natural	43	.90	.7166	.24807
uncertain	43	.90	.7291	.25053
fallibility	43	.90	.7093	.31496
power	43	.90	.8047	.25816
labour	43	1.00	.6839	.32363
scarcity	43	.00	.3651	.30910
gender	43	.50	.5558	.30437
maths	43	.20	.3488	.28316
individuals	43	.20	.2139	.23055
markets	43	.20	.3058	.25523
money	43	.50	.5416	.29516
history	43	.90	.9081	.12580
Sex	43		.19	

Table 1b: Age statistics

	n	min	max	mean
total	42	27	77	49.83
Age up to 44	17			
Age 45-59	13			
Age 60 or over	12			

Table 2: Correlations between variables

	he	p	r	e	c	ps	n	un	fa	pw	la	sc	ge	mt	in	mk	mo	hi
Mm	-.44									-.52	-.37	.42						
He									-.38		.32						.43	
Pl									.52									
Ra				.40		.36						.31				.33		
Eq						.70						.34			.36			-.33
Cl						-.32				.59	.70		.61	.35	-.35	.48		
Ps								-.39				.40	-.55					
Na										.37				.33				
Un									.46				.38	-.32				
Fa																		
Pw											.44	-.34	.48			-.36		
La													.36			-.41		
Sc																		
Ge																		
Mt																		
In																.43		-.39
Mk																		
Mo																		
Hi																		

Table 3: Factor Analysis results

	Factor				
	1	2	3	4	5
positive	.859				
equilibrium	.853				
scarcity	.564				
rational	.515				
class		.871			
labour		.866			
power		.652			
markets		-.626			
gender		.551			
fallibility			.775		
uncertain			.773		
individuals			.616		
natural				.830	
maths				.666	
money					.835
history					.650
Cronbach's alpha	.723	.542	.614	.488	.353
Eigenvalues	4.219	2.284	1.992	1.436	1.297
% Variance explained	26.370	14.277	12.448	8.977	8.104

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Kaiser-Meyer-Olkin Measure of Sampling Adequacy: .640
Bartlett's Test of Sphericity: Approx. Chi-Square 269.198 ($p = .000$)

Table 4: Correlations between cases: Summary

No. of large correlations	No. of cases	Case numbers
0-10 ('marginal')	8	4, 12, 16, 18, 21, 31, 35, 40
11-20	6	2, 19, 27, 30, 37, 38
21-30	17	1, 5, 7, 8, 9, 11, 15, 20, 23, 24, 25, 26, 28, 33, 36, 41, 43
31+ ('core')	12	3, 6, 10, 13, 14, 17, 22, 29, 32, 34, 39, 42

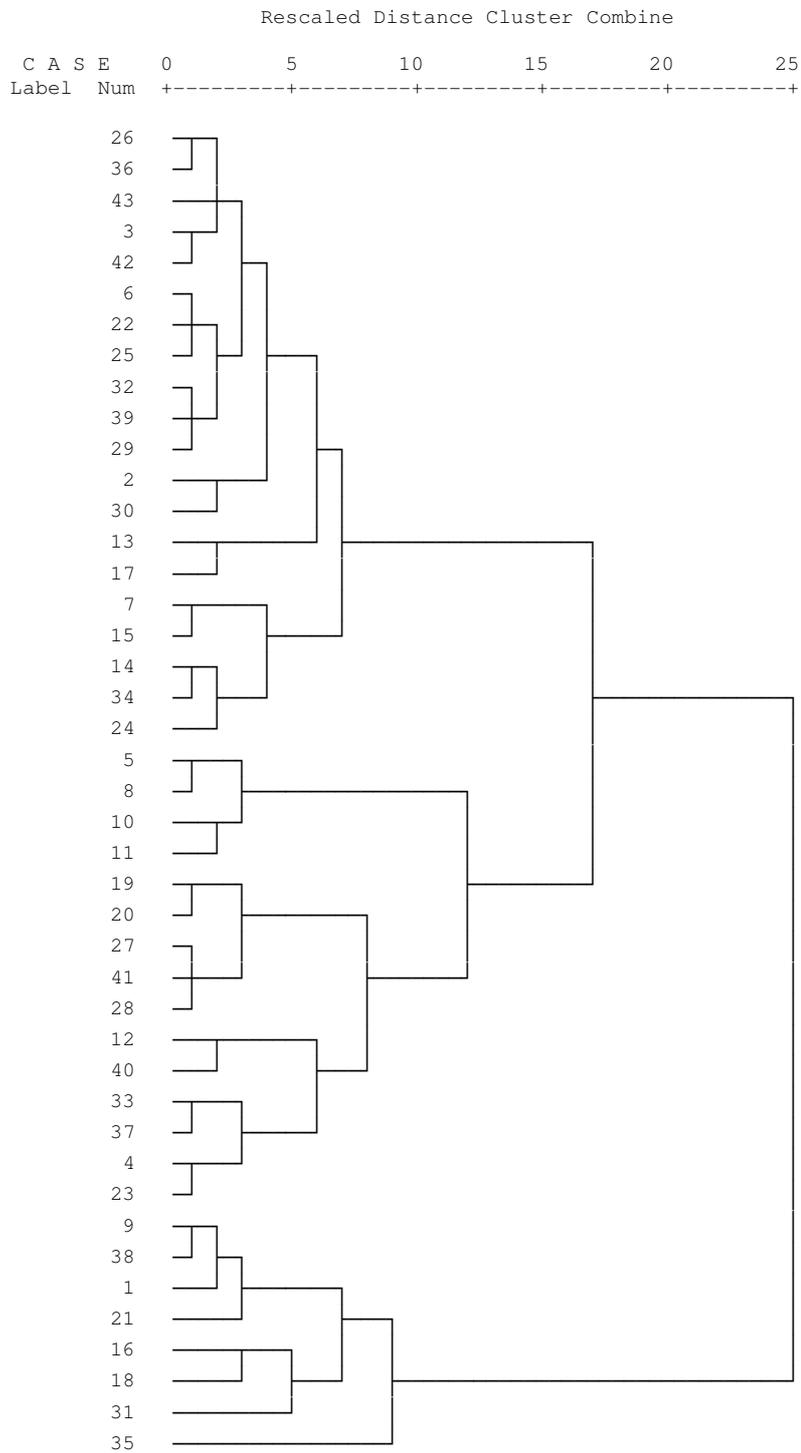
Table 5: Strong correlations between 'marginal' cases

	4	12	16	18	21	31	35	40	With 'core'	Other (n)	Total
4							x		3	6	10
12								x	0	1	2
16				x		x			0	4	6
18			x						0	0	1
21									3	4	7
31			x						3	4	8
35	x								2	1	4
40		x							4	4	9

Table 6: Variable means by cluster

	Cluster A (n = 20)	Cluster B (n = 4)	Cluster C (n = 11)	Cluster D (n = 8)
mainstream	.0708	.0000	.2136	.2500
heterodox	.8750	.8625	.8045	.6938
pluralist	.7425	.4250	.7909	.6625
rational	.1625	.1250	.2455	.3688
equilibrium	.1086	.0250	.3182	.2313
class	.7482	1.0000	.6818	.2938
positive	.1075	.0000	.3864	.3000
natural	.7350	.7500	.6922	.6875
uncertain	.9050	.4875	.5045	.7188
fallibility	.8825	.1375	.7091	.5625
power	.9050	.9750	.8091	.4625
labour	.7675	1.0000	.7736	.1938
scarcity	.2200	.0875	.6364	.4938
gender	.6550	.8000	.5000	.2625
maths	.2850	.5750	.5545	.1125
individuals	.2425	.0250	.1680	.3000
markets	.3575	.0250	.2091	.4500
money	.6523	.5875	.4175	.4125
history	.9450	.9375	.9091	.8000
age	48.75	54.50	47.40	53.25
sex	.35	.0000	.09	.00

Figure 1: Dendrogram; Ward's method; cluster variates: all variates



Appendix: Questionnaire tool

WHAT ARE THE CORE ECONOMIC PRECEPTS?

This survey is being conducted by Andrew Mearman (Bristol Business School, UWE). It is an investigation into the concepts and methods which economists regard as core. **Please indicate on the sliding scale between 0 and 10 the extent to which you agree with the statement (0 = completely disagree, 10 = agree completely).** All responses will be treated anonymously. The questionnaire should not take more than 5 minutes to complete. **Thank you for your time.**

	Disagree	Agree
Example: Elephants are grey	0 _____	_____ 10
1. I consider myself a ‘mainstream’ economist	0 _____	_____ 10
2. I consider myself a ‘heterodox’ economist	0 _____	_____ 10
3. I consider myself a ‘pluralist’ economist	0 _____	_____ 10
4. Economic agents are rational (usually maximisers)	0 _____	_____ 10
5. Economic systems tend towards equilibrium	0 _____	_____ 10
6. Class is an essential factor in understanding economic outcomes	0 _____	_____ 10
7. Economics is a positive science	0 _____	_____ 10
8. Economics should explicitly take into account natural systems	0 _____	_____ 10
9. Economic outcomes are inherently (non-probabilistically) uncertain	0 _____	_____ 10
10. All economic theories, methods and approaches are fallible: a variety is needed	0 _____	_____ 10
11. Power is an essential factor in understanding economic outcomes	0 _____	_____ 10
12. Labour inputs are an essential determinant of the value of a product	0 _____	_____ 10
13. Economics is the study of scarcity and choice	0 _____	_____ 10
14. Gender is an essential factor in understanding economic outcomes	0 _____	_____ 10
15. Economic enquiry requires the use of mathematical methods	0 _____	_____ 10
16. Economics is primarily concerned with individuals	0 _____	_____ 10
17. Markets are generally the best way to ensure that wants and needs are met efficiently	0 _____	_____ 10
18. Money is a determinant of real economic activity	0 _____	_____ 10
19. In understanding economics, history and time are of crucial importance	0 _____	_____ 10
20. Which journal would you consider the ‘best’ in which you could attempt to publish? (please state) _____		
21. What is your age? _____		
22. What is your sex? _____		
23. What is your institution? _____		

All responses will be treated anonymously.
Thank you for taking your time to complete this questionnaire.