The Frontier Line

Thought leadership and insights from Frontier

Issue 176 | **April 2021**

A peer into peers – who am I really comparing my performance to?

frontieradvisors.com.au

frontier

About us

Frontier has been at the forefront of institutional investment advice in Australia for over twenty five years and provides advice over more than $450 billion of assets across the superannuation, charity, public sector, insurance and university sectors.

Frontier's purpose is to empower our clients to advance prosperity for their beneficiaries through knowledge sharing, customisation, technology solutions and an alignment and focus unconstrained by product or manager conflict.

Donna Davis

Associate

Donna Davis joined Frontier as an Associate in 2019. She is a member of the Alternatives and Derivatives Team where she conducts quantitative analysis, manager and investment research. Prior to joining Frontier, Donna worked for AustralianSuper in their Options Management Team. She also has nine years banking experience with the Commonwealth Bank and ANZ in Corporate and Commercial Lending. Donna holds a Bachelor of Quantitative Finance from the University of South Australia and is currently completing the CFA program.

Scott Pappas

Principal Consultant

Scott Pappas joined Frontier in March 2021 as a Principal Consultant. He is responsible for leading Frontier's alternatives and derivatives solutions, research and advice program. Scott has over 15 years experience in the asset management industry and joined Frontier from Cbus, where he managed the fund's alternatives program. Prior to this, he worked at Vanguard as a member of the global investment strategy group. Scott started his asset management career at QIC in 2003 working predominately as a multi-asset derivatives trader and portfolio manager. Scott holds a PhD in Finance from Griffith University and is a CFA charter holder.

INTRODUCTION

Peer comparison and analysis

A key challenge faced with any peer comparison and assessment is determining "who are my peers?" A common basis for peer comparison in super fund products are self-reported categories. While these categories are useful, they do not incorporate the wealth of data available which can inform peer analysis. This paper describes how cluster analysis can be used to define and assess peer groups, as well as providing an additional, alternative perspective on peer relationships.

Our analysis shows peer relationships are diverse and vary over time. By analysing the data from a different perspective, asset owners can better understand and assess peer performance.

frontier

Risk-based groupings

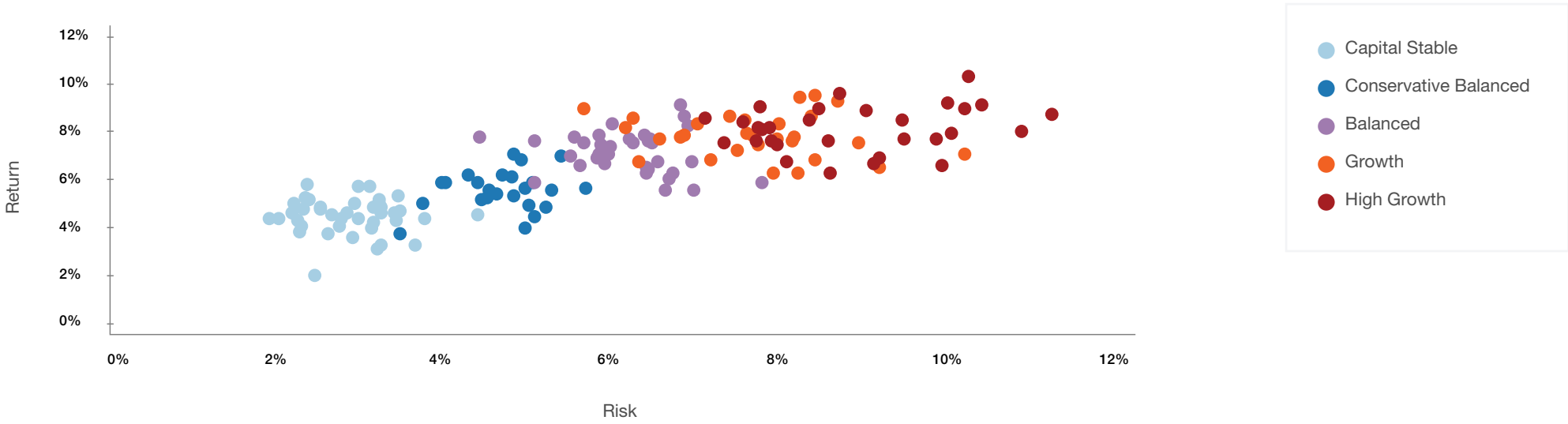
Data published by SuperRatings is commonly used for peer analysis. When comparing performance, funds categorise products by a measure of investment risk - being the mix of growth and defensive assets held by the product, as reported by funds (The defensive/growth labelling is a topic for another day!)[1]. In our analysis, we have selected five common product types – capital stable, conservative balanced, balanced, growth and high growth. We use these peer groups as a point of comparison for the alternative peer groups we describe and analyse later in the paper. Our analysis uses the SuperRatings performance data, which covers a universe of over 200 products and 50 funds.

We propose that additional insights can be gained by looking beyond risk-based peer groupings. To test this theory, we begin by plotting risk and return for the fund universe[2]. Chart 1 plots seven-year risk versus return, with each of the five peer groups represented by a specific colour[3].

The chart shows some of the groupings, for example, capital stable and conservative balanced, are well defined and distinct. For these groups, the self-reported categories appear to capture two distinct groups of products with identifiable differences in risk and return.

It is a different story, however, for the higher risk groupings – balanced, growth and high growth. These groupings are less distinct and tend to be more scattered about one another. Put another way, the standard peer groups for the higher risk groupings have less clearly defined differences between risk and return. While this is not necessarily a bad thing, it does suggest that taking a different perspective on peer analysis could provide further insights. This is where cluster analysis can provide an additional lens for viewing peer performance.

Chart 1: Seven-year risk and return



Source: Frontier, Super Ratings. Data covers the period July 2013 to June 2020.

[1] Along with risk, funds can specify groupings using a range of other factors such as size or industry.

[2] For the rest of this paper, risk refers to volatility.

[3] We use seven years covering the period ending June 2020 to align the analysis with the proposed Your Future Your Super assessment horizon.

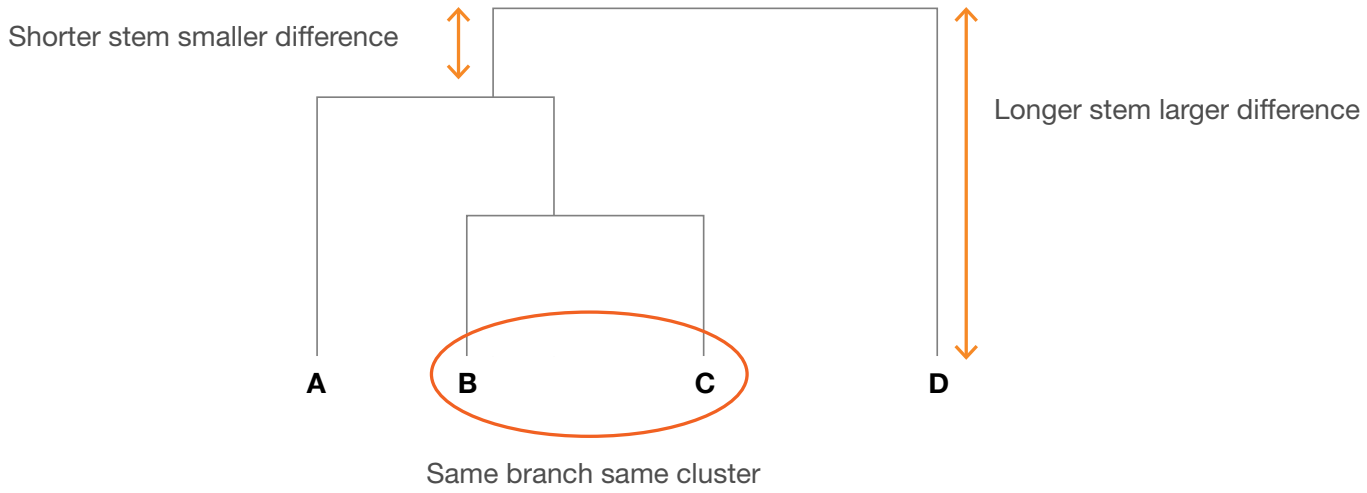
frontier

What is cluster analysis?

Another way to form peer groups is to let the data determine groupings. Cluster analysis, a form of machine learning, is an analytical tool that allows similarities within a set of data to create groupings. It can provide structure to complex or large data sets and can highlight unseen relationships. A strength of the technique is that the user does not specify data structure or relationships – this is done by the data itself. This technique can help the user look beyond existing biases to identify groupings or relationships which may not have been previously noticed. When interpreting cluster analysis it is helpful to visualise the results using a tool such as a dendrogram.

A dendrogram, also known as a tree diagram, visually represents the clusters generated and the relationships between them[4]. The benefit of a dendrogram is it provides visual representation of relationships based on a quantitative measurement, as well as a ranking of these relationships. To interpret a dendrogram, it is important to understand the two component structures – horizontal *branches* and vertical *stems*. Branches join similar data points into clusters, while stems represent the differences between these clusters – the longer the stem, the larger the difference.

Figure 1: Example of a dendogram



Source: Frontier

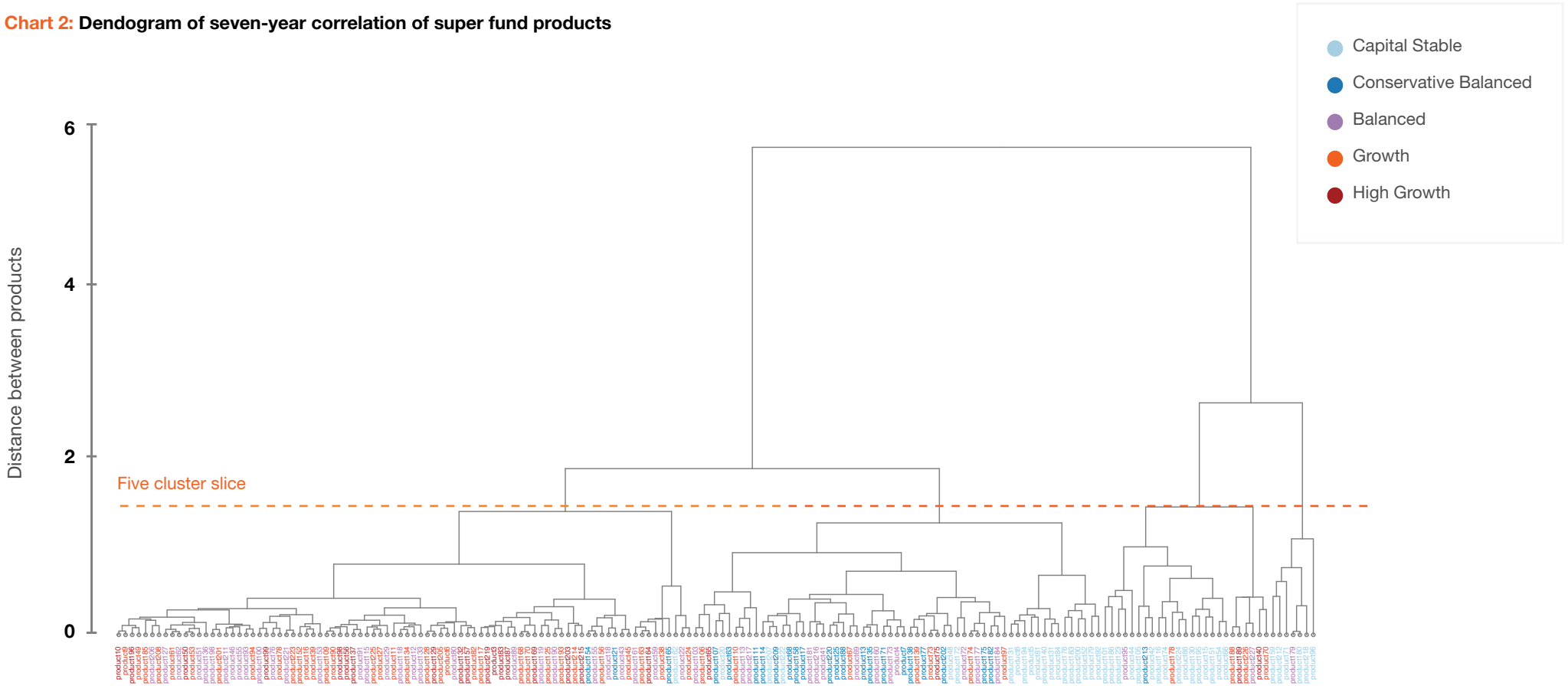
[4] For further details on cluster analysis, please refer to:
https://www.frontieradvisors.com.au/wp-content/uploads/2020/11/171-Frontier_Line_Issue_Cluster_Analysis.pdf

A different perspective

Below we show how cluster analysis and dendrograms can provide an additional perspective to the SuperRatings peer analysis. Chart 2 shows a dendrogram based on return correlations calculated using monthly returns for the seven-year period ending June 2020. To contrast the two approaches, we have colour coded each product based on the five SuperRatings groupings. If the alternative approaches to peer analysis are consistent, we would expect to see five distinct groups of uninterrupted colours – similar to a rainbow. This is not what we see!

Some of the groupings identified in the cluster analysis are similar to the standard SuperRatings groupings. For example, the capital stable products (those coloured sky blue) predominately cluster together at the right side of the chart. However, the distinction is less clear for the other product groupings. Rather than showing distinct, consistent groupings, the colours are scattered about, indicating potential cross over in the SuperRatings groups.

Chart 2: Dendogram of seven-year correlation of super fund products



Source: Frontier, SuperRatings. Dendrogram represents correlation matrix of monthly returns covering the period July 2013 to June 2020.

frontier

Comparing clusters across time

How can cluster analysis provide a more in-depth perspective on peer analysis? Let's drill deeper into the performance-based clusters. Viewed from top to bottom, the dendrogram in Chart 2 stratifies the data into progressively more detailed clusters. At the top of the chart, there is a single branch with two stems dividing the products into two clusters. The products on the right stem are mostly capital stable products while those on the left are typically riskier products. The length of the two stems differ considerably in size, indicating a large difference between the two groupings. This makes intuitive sense as capital stable products invest mostly in cash and low-risk instruments, while the diversified products hold varying degrees and types of risky assets. From here, the two stems continue branching out into progressively more exclusive clusters.

This provides further insights into the level of differentiation between products – clusters at the top of the chart are broad and inclusive while those closer to the bottom are narrow and exclusive. In addition to this information, the different stem lengths also provide insights into the clusters – the larger the difference in stem length, the bigger the difference between the clustered products. Returning to Chart 2, the top of the chart shows two clusters with unequal stem lengths indicating two broad clusters that are very different. The bottom of the chart shows over 200 stems (each representing a single product) that are very short (indicating each product is similar to its neighbour).

In between the two extremes is a wealth of information! Taking a 'slice' of the dendrogram at a particular horizontal layer can provide information about the different levels of clustering. For example, in Chart 2 above, we have sliced the dendrogram to show five clusters, the same number as the self-reported groups in our data set. The slice cuts through five stems, which we can analyse in more detail. As an example, we can study the stability of clusters over time. By running cluster analysis over different time horizons, we can analyse how clusters evolve during different periods. Table 1 shows the composition of the five clusters for each of the time horizons. For each cluster, we count the number of times a particular product type appears and report the predominant product type in the table. For any cluster where there is no clear majority (no single product type accounts for more than 35%), we denote the cluster name as indeterminate. Where a product type holds a strong majority (more than 80% of products within the cluster), this has been highlighted in orange.

There are several takeaways from the table. Capital stable funds comprise the predominant product type for clusters four and five, for all time horizons. That is, capital stable funds are consistently the most differentiated products within the dataset. For clusters one, two and three, the results are less consistent with the predominant product type differing across the different time horizons. These results raise questions about peer group stability, providing further insights on peer performance.

Table 1: Predominant product type in each cluster

Time (yrs)	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
7	Growth	Capital Stable	Balanced	Capital Stable	Capital Stable
5	Indeterminate	Balanced	Capital Stable	Capital Stable	Capital Stable
3	Balanced	Capital Stable	Balanced	Capital Stable	Capital Stable
1	Growth	Balanced	Capital Stable	Capital Stable	Capital Stable

Source: Frontier, SuperRatings. Table elements highlighted in orange indicate a predominant product type of > 80%. Clusters with no predominant product type greater than 35% are labelled "Indeterminate". Cluster analysis has been completed on monthly correlation data ending December 2020, for the number of years indicated in the table.

frontier

Peer relationships vary over time and markets

Further analysis can also highlight how consistent peer groups are over time. Put another way, is a particular peer group sufficiently distinct across different time horizons? Again, cluster analysis can help answer this question. Table 2 reports the percentage of a particular product type, as defined by SuperRatings, that is classified in the same cluster as its peers. The table shows results across different time horizons providing information on how consistent this relationship is over time. Capital stable products score a high percentage across all time periods examined. These products exhibit a clear level of differentiation from other products with limited cross over from other product types. They are also consistently well-defined across different time horizons and in different market conditions.

Results for the other product types, however, are less consistent. The conservative balanced, growth and high growth groupings report low or zero percentages for the majority of time periods, suggesting that individual products rarely identify with their designated peers. That is, there is a high degree of cross over in the peer groups of these product categories as they are defined by SuperRatings. The balanced classification is more consistent across time frames. Although for the one-year horizon, spanning the COVID-19 induced market stress, balanced products typically did not cluster with their SuperRatings peers. Overall, the results indicate peer groupings for the four higher risk product groups vary over time and across different market conditions, a key insight when considering peer relativities.

Table 2: Percentage of product type consistently classified

Time (yrs)	Capital Stable	Conservative Balanced	Balanced	Growth	High Growth
7	87%	0%	87%	8%	0%
5	84%	0%	87%	0%	0%
3	91%	0%	94%	0%	0%
1	91%	0%	6%	83%	0%

Source: Frontier, SuperRatings. Cluster analysis is based on correlation calculated for monthly data covering the number of years indicated in the column on the left finishing December 2020.

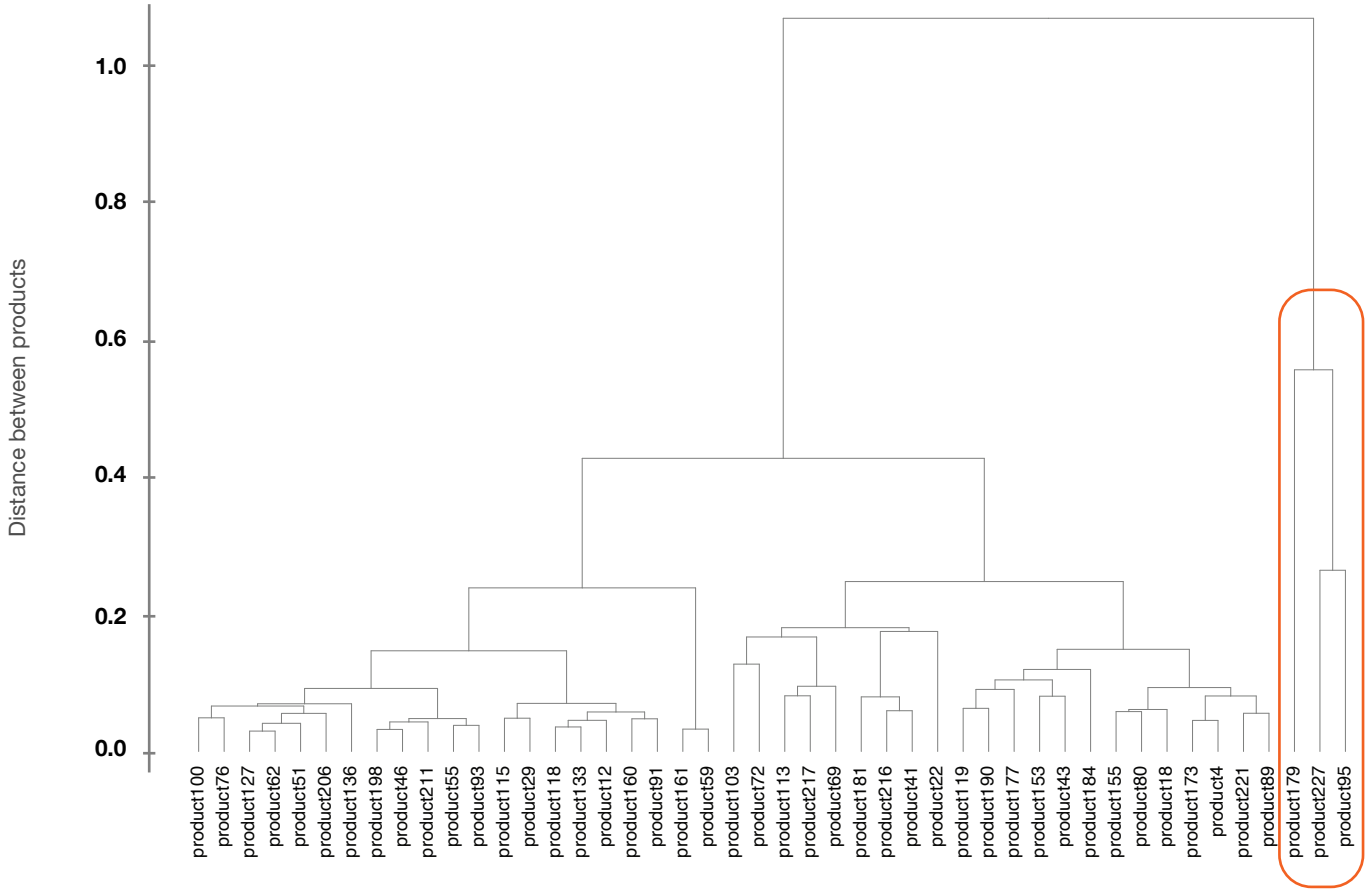
frontier

Analysing within clusters

The previous discussion highlighted how cluster analysis can be used to analyse unsorted data. Similarly, it can be used to analyse data already sorted by other methods. Chart 3 shows a sub-set of the fund universe based on the balanced products. Several long stems highlight product clusters which appear distinct from the rest of the products, for example, product 179 (third from the right) and the group of products circled.

By looking at the data in a more granular way, we can identify the level of differentiation between products. These differences can be investigated and analysed to determine how they may impact peer comparison metrics. Understanding the causes of difference within a peer group can assist in understanding the composition of a peer universe and how to best interpret peer comparison metrics.

Chart 3: Dendrogram of seven-year correlation of balanced super fund products



Source: Frontier, SuperRatings. Dendrogram is based on correlation of monthly returns for the seven-year period ending December 2020

frontier

The final word

In peer analysis it is vital to understand the composition of the peer universe and how best to interpret comparison metrics. Peer groups based on traditional risk groupings are a useful starting point, but further, more detailed insights can be gained through deeper analysis. Tools such as cluster analysis can provide new and valuable insights which may not be available through standard peer analysis. If you would like a different perspective on peer performance, Frontier has developed a range of tools that can help.

Want to learn more?

Please reach out to Frontier if you have any questions or visit frontieradvisors.com.au for more information.

frontier

Frontier

Level 17/130 Lonsdale St, Melbourne VIC 3000

Tel +61 3 8648 4300

Frontier is one of Australia's leading asset consultants. We offer a range of services and solutions to some of the nation's largest institutional investors including superannuation funds, charities, government / sovereign wealth funds and universities. Our services range from asset allocation and portfolio configuration advice, through to fund manager research and rating, investment auditing and assurance, quantitative modelling and analysis and general investment consulting advice. We have been providing investment advice to clients since 1994. Our advice is fully independent of product, manager, or broker conflicts which means our focus is firmly on tailoring optimal solutions and opportunities for our clients.

Frontier Advisors Pty Ltd ABN 21 074 287 406 AFS Licence No. 241266