The Investigation on the Impact of Financial Crisis on Bursa Malaysia using Minimal Spanning Tree

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ABSTRACT

In recent years, there has been a growing interest in financial network. The financial network helps to visualize the complex relationship between stocks traded in the market. This paper investigates the stock market network in Bursa Malaysia during the 2008 global financial crisis. The financial network is based on the top hundred companies listed on Bursa Malaysia. Minimal spanning tree (MST) is employed to construct the financial network and uses cross-correlation as an input. The impact of the global financial crisis on the companies is evaluated using centrality measurements such as degree, betweenness, closeness and eigenvector centrality . The results indicate that there are some changes on the linkages between securities after the financial crisis, that can have some significant effect in investment decision making.

BACKGROUND

PROBLEM

The correlation between stocks are not easy to visualize as a whole if the number of stocks involved is huge and it will lead to becoming a complex system.
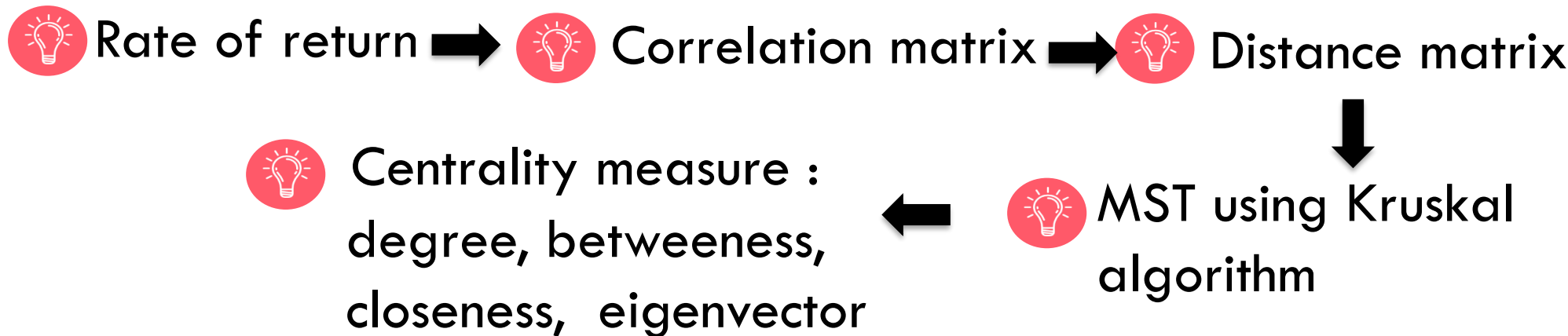
RESEARCH QUESTION

1. How to construct the financial network to display the correlation between the stocks?
2. Is there any effect towards the correlation before, during and after the crisis?
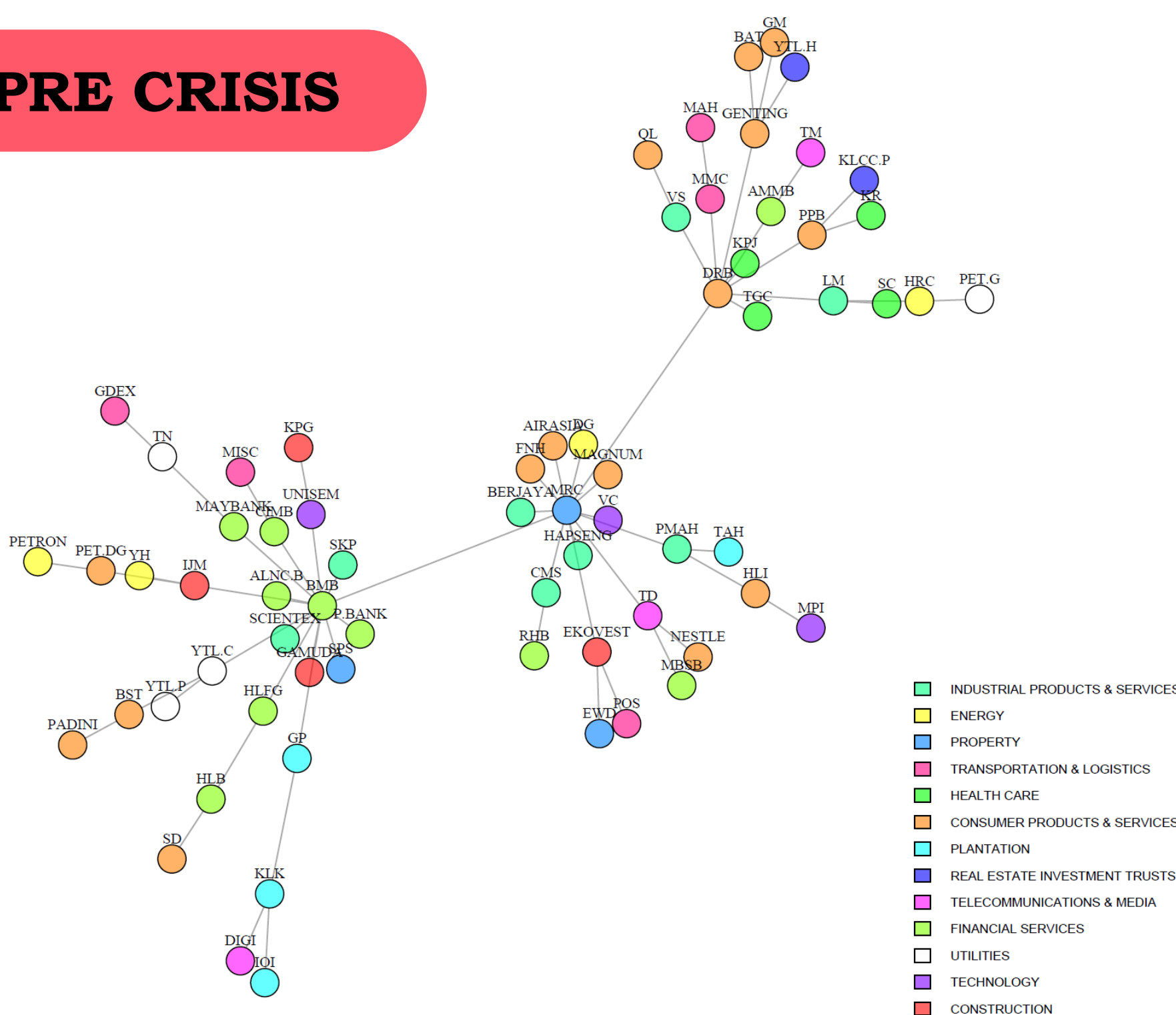
OBJECTIVE

to examine the effect of a global financial crisis towards Bursa Malaysia by using minimal spanning tree.
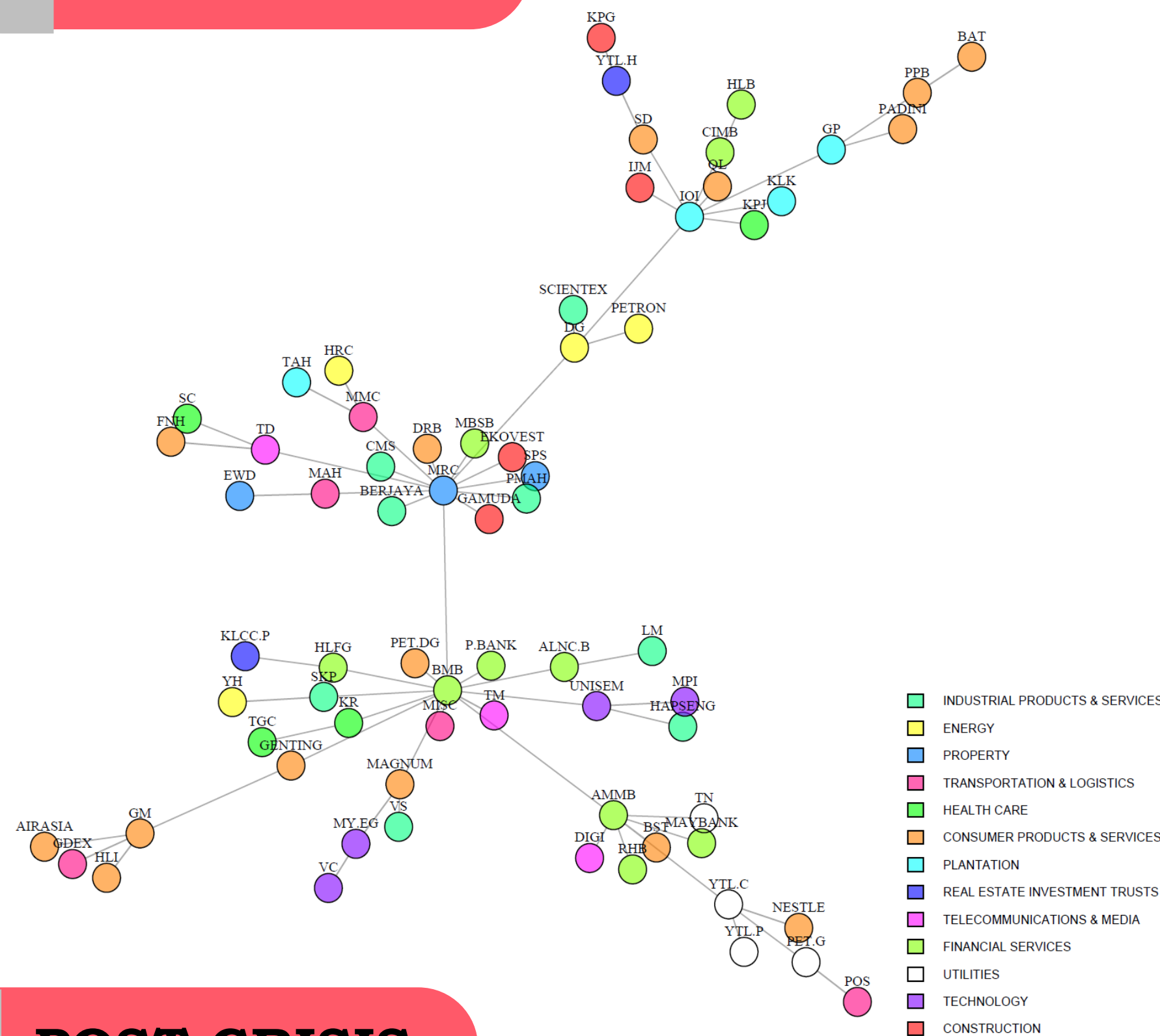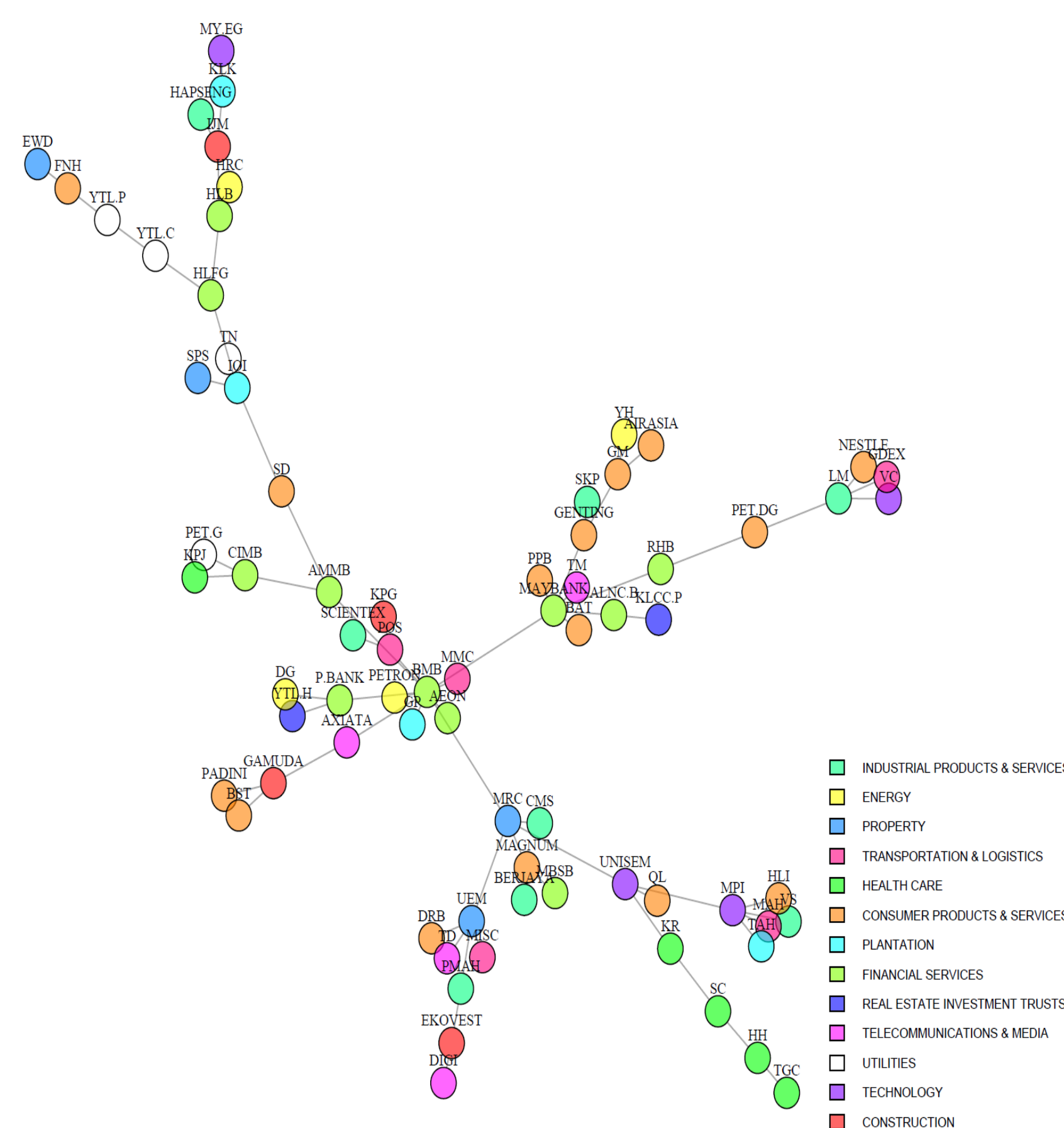
METHODOLOGY

Rate of return ➡ Correlation matrix ➡ Distance matrix

⬇

Centrality measure : degree, betweeness, closeness, eigenvector ⬅ MST using Kruskal algorithm

RESULTS

01 PRE CRISIS

02 CRISIS

03 POST CRISIS

CONCLUSIONS

In general, minimal spanning tree topology changes for each period. Before the crisis, the stocks clustered clearly into three groups and during the crisis, the stocks are dispersed into four groups. However, the stocks are scattered throughout the map after the financial crisis. The results were further assessed using degree, betweeness, closeness and eigenvector centrality. The empirical evidence shows that Malaysian Resources Corporation (MRC) and Bursa Malaysia (BMB) are the most crucial stocks before, during and after the crisis.