

## **ABSTRACT**

### **DETERMINATION AND INTERPRETATION OF MULTIVARIATE CANONIC FUNCTIONS WITH CANONIC CORRELATION ANALYSIS TECHNIQUES**

**By**

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Canonical correlation analysis is a multivariate statistical method that is used to examine and measure the level of linear relationship between two sets of variables, the set of dependent variables (Y) and the set of independent variables (X). This study focuses on getting the canonical correlation coefficient value between the linear combination of the set of dependent variables and the set of independent variables, determining the canonical function, testing the canonical correlation significance simultaneously and partially, explaining the magnitude of variance proportion of each variable, and interpreting the canonical function based on canonical weight, canonical loadings, and canonical cross-loadings. The data used is the set of variables of the Farmer's Exchange Rate Index (Y) which consists of 2 variables and the set of variables of the Farmer's Exchange Rate (X) which consists of 6 variables. Based on the analysis, it was found that the assumptions of multivariate normality, non-multicollinearity, and linearity are fulfilled. There are 2 canonical functions formed, the first function has a correlation coefficient of 0.896 with a variance proportion of 95.02% and the second function has a correlation coefficient of 0.420 with a variance proportion of 4.98%. The results of the significance test shows that only the first function can be interpreted. Based on canonical weights, canonical loadings, and canonical cross-loadings, the order of contributions to the dependent canonical variables is  $Y_2$  dan  $Y_1$  then the order of contributions to the independent canonical variables is  $X_3$  dan  $X_1$ .

**Keywords:** Canonical Correlation Analysis, Canonical Function, Canonical Weight  
Canonical loadings, Canonical Cross-Loadings.

## ABSTRAK

### PENENTUAN DAN INTERPRETASI FUNGSI KANONIK MULTIVARIAT DENGAN TEKNIK ANALISIS KORELASI KANONIK

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Analisis korelasi kanonik merupakan metode statistika multivariat untuk menelaah dan mengukur tingkat keeratan hubungan linear antar dua himpunan variabel yaitu himpunan variabel dependen ( $Y$ ) dengan himpunan variabel independen ( $X$ ). Penelitian ini berfokus untuk mendapatkan nilai koefisien korelasi kanonik antara kombinasi linear dari himpunan variabel dependen dengan himpunan variabel independen, menentukan fungsi kanonik, melakukan pengujian signifikansi korelasi kanonik secara simultan dan parsial, menerangkan besarnya proporsi keragaman setiap variabel, dan menginterpretasi fungsi kanonik berdasarkan bobot kanonik, muatan kanonik, dan muatan silang kanonik. Data yang digunakan yaitu himpunan variabel Indeks Nilai Tukar Petani ( $Y$ ) yang terdiri dari 2 variabel dan himpunan variabel Nilai Tukar Petani ( $X$ ) yang terdiri dari 6 variabel. Berdasarkan analisis, diperoleh bahwa asumsi normalitas multivariat, *non*-multikolinearitas, dan linearitas terpenuhi. Terdapat 2 fungsi kanonik terbentuk, fungsi pertama memiliki koefisien korelasi sebesar 0,896 dengan proporsi keragaman sebesar 95,02% dan fungsi kedua memiliki koefisien korelasi sebesar 0,420 dengan proporsi keragaman sebesar 4,98%. Hasil pengujian signifikansi menunjukkan bahwa hanya fungsi pertama yang dapat diinterpretasi. Berdasarkan bobot kanonik, muatan kanonik, dan muatan silang kanonik, urutan kontribusi pada variabel kanonik dependen yaitu  $Y_2$  dan  $Y_1$  kemudian urutan kontribusi pada variabel kanonik independen yaitu  $X_3$  dan  $X_1$ .

**Kata kunci:** Analisis Korelasi Kanonik, Fungsi Kanonik, Bobot Kanonik, Muatan Kanonik, Muatan Silang Kanonik.