VSP

ValuStats Statistical Package

&

Business Solutions

Operations Manual

Contents

Introduction

VSP is the short form for ValuStats Statistical Package. It is a suite of programmes designed to offer cutting edge solutions to advanced statistical analysis for researchers, students, teachers, research coordinators as well as offer business planning and analytical solutions.

It is built with Python312 programming language with its advanced and powerful tools for scientific and business solutions.

Design Philosophy

VSP design philosophy is premised on four values:

The 4 values are portability, simplicity, robustness, and inclusiveness.

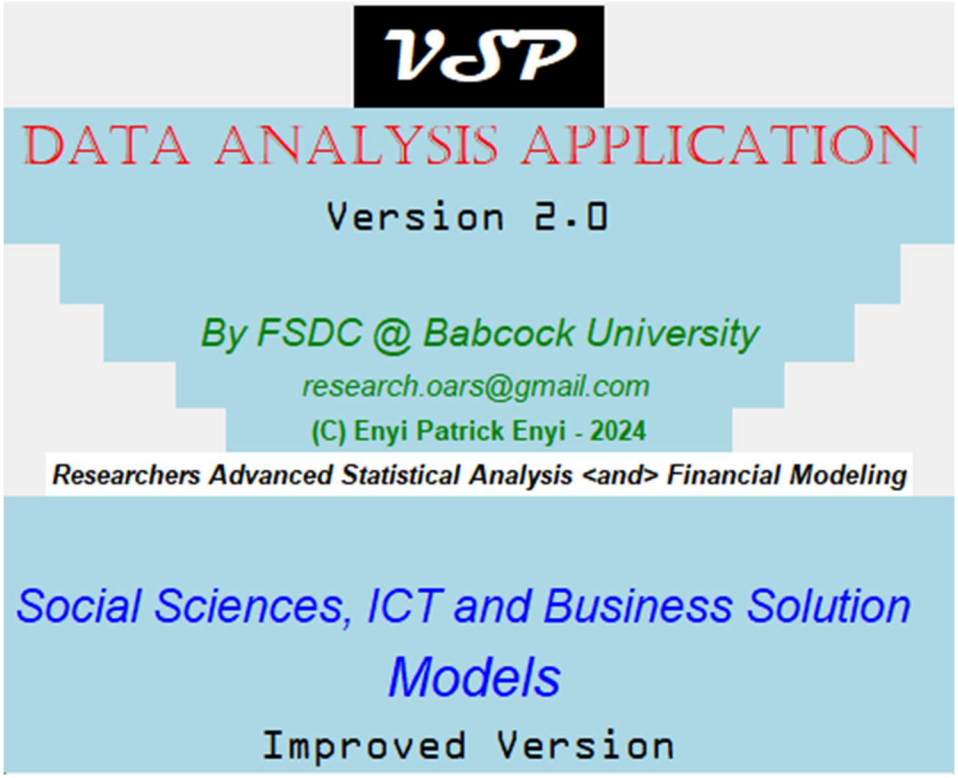
Portability ensures that the software can be deployed and used on any of the three major operating systems viz **Windows**, **macOS**, and **Linux**, as all issues of compatibility and command structuring have been resolved at the design and coding stage.

Simplicity assures the VSP user friendliness because:

i) It is implemented with menu driven options without the need for users to learn intricate commands to define functions and processing parameters and or input data structure.
ii) It is a GUI interface enhanced with input forms on simple dialog boxes.
iii) The dataset method adopted is the MS Excel spreadsheet because of its general ease of use and understanding and owing to its ubiquitous nature.
iv) The package adopts simple text files for the storage of outputs because text files can be ported easily across all OS platforms; and
v) Where necessary, graphical illustrations accompany the numerical outputs.

Robustness ensures that data are handled, processed, and analyzed with the highest level of accuracy reminiscent of the powerful Python processing ability integrating the most advanced data analytics methods and error indicators such as the eigenvalues, AIC, BIC, and Log Likelihood estimations.

Inclusiveness ensures that all aspects of the results needed for a particular analysis are included for the users to choose the most relevant to their analytical needs. In addition, this package provides the crucial link between data analysis and real-life business applications.



Applications covered by VSP version 2.0.

The applications covered by VSP version 2.0 (second release) are classed into two: *Research Solutions* and *Business Solutions*.

Research Solutions:

Research solutions typically cover the following modules >> OLS regression, Panel data regression, Cross-Sectional Analysis, Dynamic OLS regression, Autoregressive Distributed Lag (ARDL) modeling, Auto-Regressive Integrated Moving Averages (ARIMA), Generalized Method of Moments (GMM), Structural Equations Modeling (SEM), ANOVA, MANOVA, Repeated Measures ANOVA (RMA), LOGIT regression, Ordinal regression, Factor Analysis, Cronbach-alpha Pilot Test, Thematic Research Analysis, Hierarchical regression, Chi-square Analysis, Linear Programming, and Matrix manipulations.

Business Solutions:

Available business solutions in this release include >> Breakeven Analysis, Budget Planner, Discounted Cash Flow (DCF) Analysis, Estimated Credit Loss

(ECL) Analysis, Projects' Risk Analysis, Times Series Forecasts, Reciprocal Cost Allocations, Discriminant and Ratio Analyses.

Installing and Running the *VSP* Software:

The ***VSP*** program suite is designed to run in and store data and results of processing in the **C:\ValuStats**; or **/ValuStats/** folder. You must install the software from the original distribution list folder using the **vspw_installer.exe** for windows or **vspm_installer.exe** for macOS, and **vspl_installer.exe** for Linux operating system after purchase and download. The following steps should guide you:

1. Create a **Dist** folder on your system's root or main working directory.
2. Copy or download all the files to the '**Dist**' folder.
3. Open or go to the '**Dist**' folder.

4. **FOR Windows USERS**: Press the *Windows logo* button and letter *R* together (Win + R). Type **cmd** then press **Ctrl** + **Shift** + **Enter↵.** Type **'cd C:\Dist'** and press Enter.
5. **FOR macOS:** Press '**Command'** plus **Tab** to display the macOS Terminal (the equivalent of windows command prompt environment). Type '**cd /Dist'** and press Enter
6. At the command prompt or Terminal in the '**Dist**' folder:
    a. For Windows: **C:\Dist>**; Or C:\user\your name\Dist> (like **C:\user\Patrick Enyi\Dist**>), type **vspw_installer.exe** and press **Enter**.
    b. For **macOS/Linux**: **/Dist>**; Or **/user/your name/Dist>** (like **/user/Patrick Enyi/Dist>**), type **vspm_installer.exe** and press **Enter** (for macOS). Or **vspl_installer.exe** (for Linux OS).
7. Attend to any issues raised (if any).
8. Go to the C:\ValuStats folder in **Windows** environment and click vsp.exe to run the program. For **macOS**, open the Search folder and type **ValuStats**. This will show you the newly created ValuStats folder; click on it to reveal its contents. Then select the **vsp.exe**. You can transfer the file to **applications window** for easy accessibility.

If you need place a shortcut icon of the vsp.exe on your **start menu**, **taskbar** or desktop, right-click the vsp.exe icon and select ***pin to taskbar, pin to start menu*** or ***send to desktop***.

IMPORTANT
Remember to load your Excel dataset files first to the C:\ValuStats folder before attempting to conduct any analysis.

PREPARING YOUR DATASET FILES

Due to the ease, ubiquity, and popularity of the MS Excel spreadsheet, ***VSP*** adopted it as its base dataset tool.

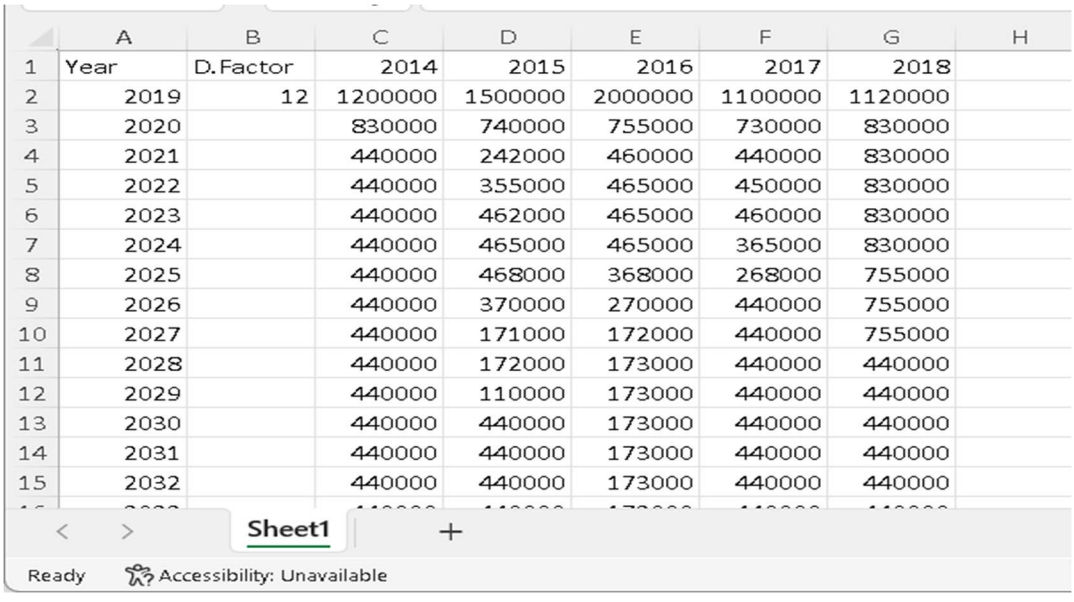
Research Solutions Datasets > All research solutions dataset files are by default designed to use the **.xlsx** Excel extension files. To define data heads, columns are named and used to identify the variables of the set. For instance, a typical dataset can have the following column names:

Column ID	A	B	C	D	E	F	G	H	I
Column Names	Obs	FirmID	TaxGrp	Pretax1	Pretax2	Pretax3	Pretax4	Comp	TaxPaid

The names of the columns and the data groups they represent MUST be remembered when you want to run the test. The names must be given to the ***vsp*** software the way they are written in the Excel sheet columns otherwise the system will not recognize them; for instance, 'TaxPaid' is not the same as 'taxpaid' or 'Taxpaid'.

Business Solutions Datasets > Some analysis like the Break Even, Time Series and Moving Averages, DCF and Risk analysis etc., datasets utilize the 1997/2003 Excel file format with the **.xls** extension instead of the .xlsx extensions used by the later versions of MS Excel. ***This implies that you MUST save your file as a 97/2003 Excel file when you generate your data for this category of analysis***. This is because using the wrong Excel file format will generate errors.

Another import thing to note here is that whereas you can place the variable name in any order with the columns in the **.xlsx** extension files, you MUST, however, arrange the variables' names of the business solutions in the order with which they shall be read and processed by the software codes. Sample dataset for DCF analysis:



	A	B	C	D	E	F	G	H
1	Year	D.Factor	2014	2015	2016	2017	2018	
2	2019	12	1200000	1500000	2000000	1100000	1120000	
3	2020		830000	740000	755000	730000	830000	
4	2021		440000	242000	460000	440000	830000	
5	2022		440000	355000	465000	450000	830000	
6	2023		440000	462000	465000	460000	830000	
7	2024		440000	465000	465000	365000	830000	
8	2025		440000	468000	368000	268000	755000	
9	2026		440000	370000	270000	440000	755000	
10	2027		440000	171000	172000	440000	755000	
11	2028		440000	172000	173000	440000	440000	
12	2029		440000	110000	173000	440000	440000	
13	2030		440000	440000	173000	440000	440000	
14	2031		440000	440000	173000	440000	440000	
15	2032		440000	440000	173000	440000	440000	

Sheet1

Ready Accessibility: Unavailable

RUNNING THE PROGRAMS

To run the **VSP** software, click or double click the **vsp.exe** icon, this will first display the opening or welcome splash screen for a few seconds, then it will take the user to the control module. The user can then select the menu of their choice and call up the module they want to use.

Once any module of the ***VSP*** programs is called up, the first thing it will show is a dialog box which will enable the user to proceed or review the dataset for correctness of format for the immediate processing need. Thereafter, it will present the user with the data definition form which will enable them to enter the processing parameters such as the name of the **outcome** or **dependent** variables in the appropriate box, followed by the names of the **predictors** or **independent** variables separated with comma with no space in between. If the analysis requires ***grouping*** and ***time separation*** as in the case of panel data, repeated measures ANOVA, and structural equations modeling, the group's column name and the time column must be indicated in the appropriate text boxes of the dialog box.

THE OUTSTANDING FEATURES OF VSP 2.0

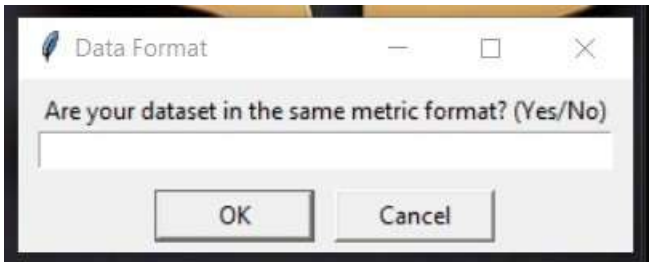
The five most outstanding features of VSP 2.0 are that:
1) it enables the multiple processing of many **Dependent** or **Outcome** variables.

2) it allows for data conversion from one format to another. For instance, it enables users the ability and choice to convert data from whole numbers to ratios or percentages, and from whole numbers or percentages to logged values using natural logarithms. This feature enables a level playing field for the analysis as well as the unification of the results for a better and more meaningful interpretation.

3) it automatically cleans the dataset for invalid entries like outliers, null and infinite numbers and replaces them with column means before processing.

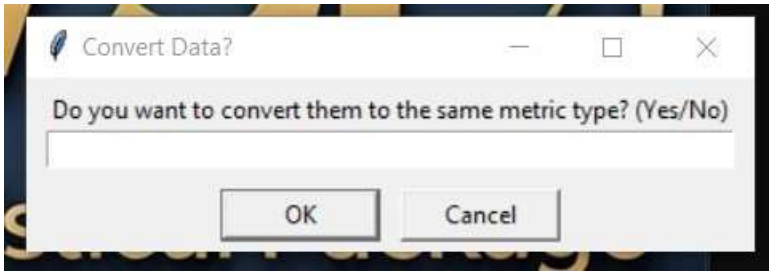
4) it enables users to introduce Control variables – which are variables designed to test the effect of predictors on the outcome variables. The VSP allows users to introduce as many control variables as can be possibly desired.

5) it enables users to introduce Moderating variables – are variables designed *to test the strength and direction of the predictor variables on the outcome variables* after adjusting for a joint or combined effects on the predictor variables.

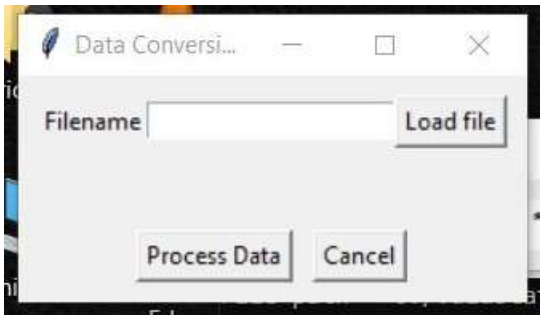


When you open the ***Research Data Analysis*** menu, this dialog box will pop up after some initialization. The question here is ***Are your dataset in the same metric format? (Yes/No)***. This question enables you to ascertain if the data in the dataset to be analysed are in the same metric format. Often, researchers collect data with different metric formats. It creates problem of clarity and inaccuracy when data of different metric formats are regressed against each other, for instance, exceptionally large number cannot be regressed against ratios or percentages without the problem of spurious interpretation. Therefore, it will be better to convert the entire data to be regressed into the same data metric format. If your data are

already in the same metric format, type Y and click Ok else type **N** to convert it.



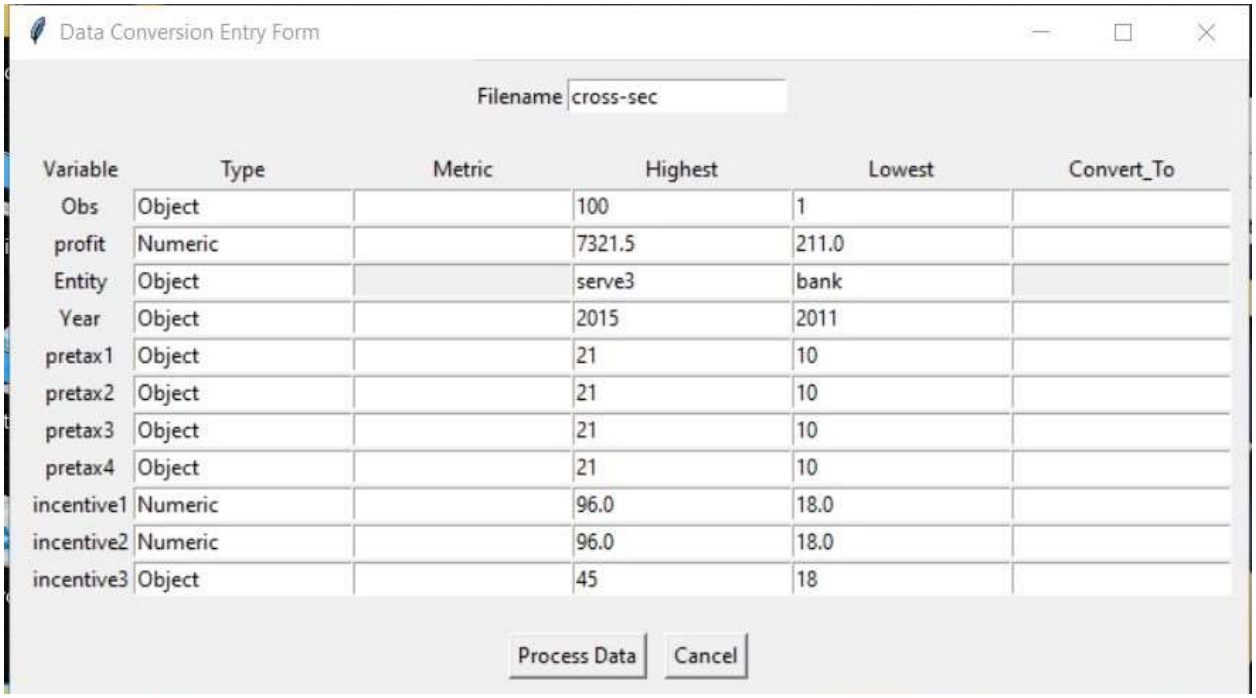
After you have elected to convert data at the first dialog box, this second box will appear for you to confirm your choice. This time around type **Yes**, to proceed with the data conversion.



After you have chosen to convert your data, this dialog will appear. Simply enter the dataset filename without the .xlsx extension and click ***Load file***. For instance, if your dataset filename is **cross-sec.xlsx**, just type **cross-sec** and click ***Load file***.

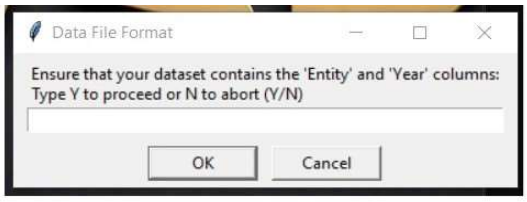
This will load the file if it exists, and the file attributes will be displayed under 6 column heads as shown below:
Variable: *The names of the variables are displayed under this heading.*
Type: *The type of variable will be displayed under this heading. The type can be* ***Numeric*** *or String or object.*
Metric: *Metric defines the type of metric used if defined during initiation. Metric can* ***log, percent, ratio*** *or* ***normal number.***
Highest: *This column shows the highest value of that variable group to guide the user when performing the data conversion process.*
Lowest: *This column shows the lowest value of that variable group.*

Convert To: *Is used to tell VSP what to convert the value to – the two options to convert to are –* ***log*** *and* ***ratio*****. Note that ratio is the same as percentage.**



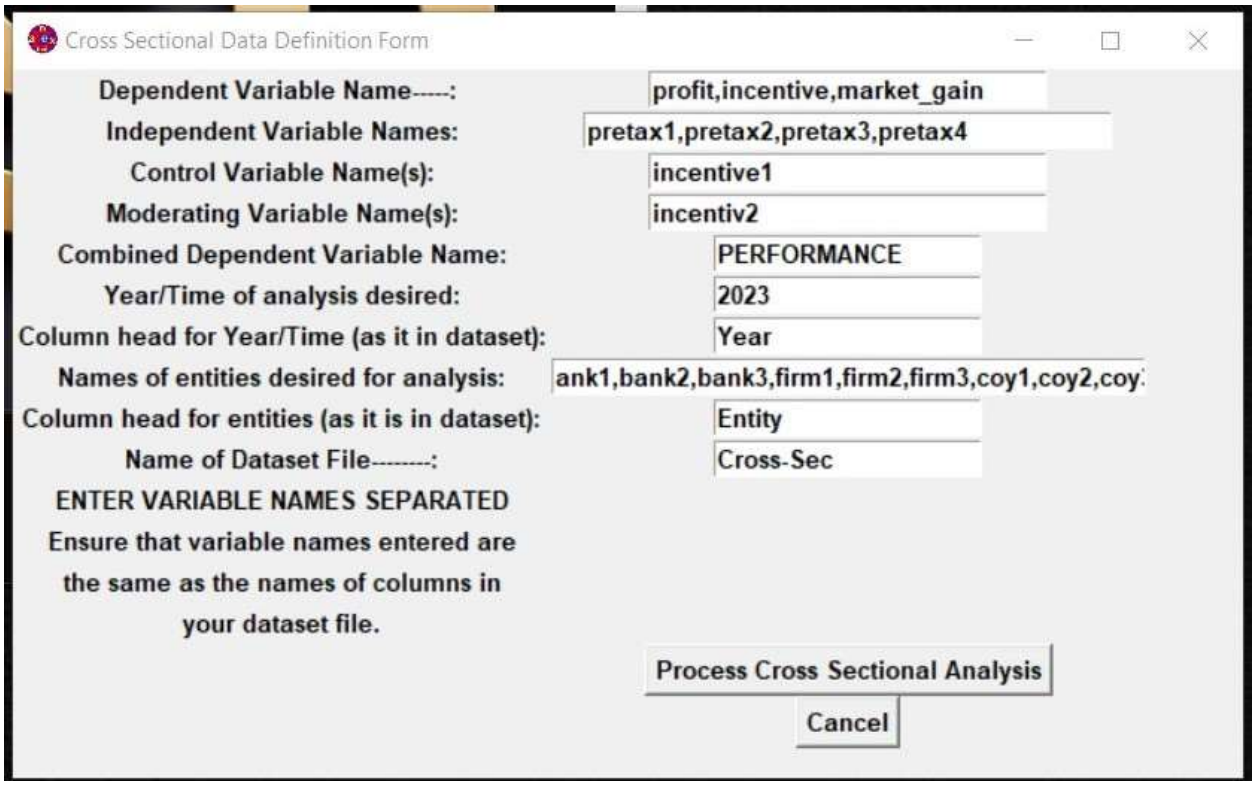
PANEL and CROSS-SECTIONAL DATA

For panel data and cross-sectional data analysis, the first dialog box that will show up is:



Because the panel and cross-sectional data analysis makes use of **Entity** and **Time**, it is essential that the dataset contains this two sensitive information (as part of the variables). This dialog box is to remind the user of the need to include them. If you are sure that your dataset contains them, type **Y** and click OK to proceed, else, go back and correct them. It is more appropriate to give the name **Entity** and **Year** to the Entity and Time variables' columns (instead of Firm and Period or Time) to align with the suggestions presented by the data definition form.

For the cross-sectional analysis, the data definition form/dialog will look like the one below:

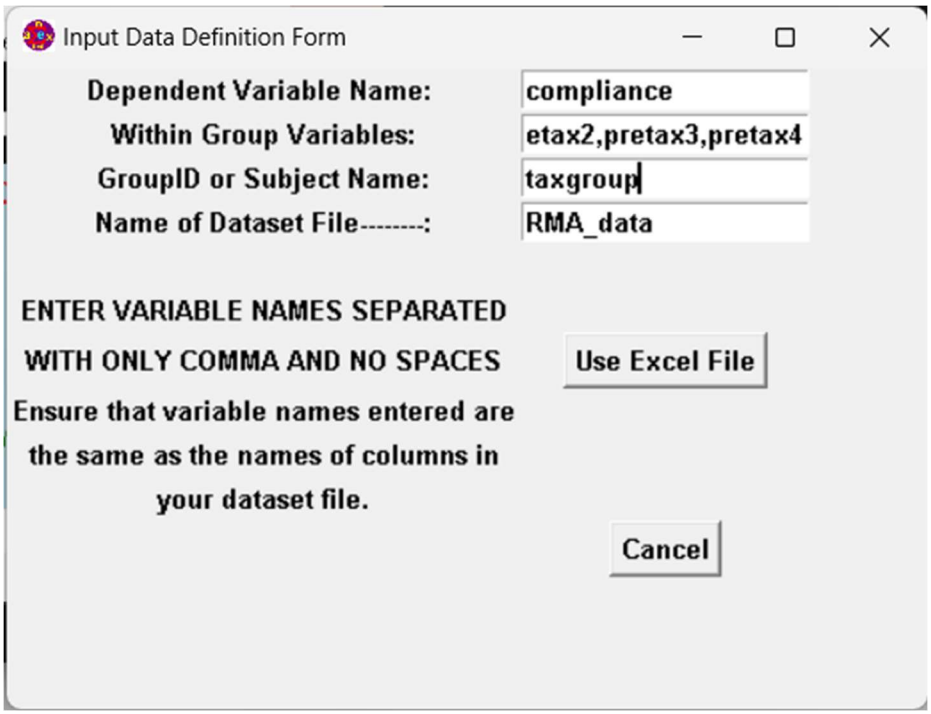


In the above form, 3 dependent variables have been entered. This implies that the main objective function's ***outcome variable*** is proxied by three sub-dependent variables named – profit, incentive, and market_gain. These 3 variables are then represented as ***PERFORMANCE*** in the '*Combined Dependent Variable Name*' which forms the outcome variable for the major objective function.

From the form, it was also observable that there 4 predictors or *independent variables* named – pretax1, pretax2, pretax3, pretax4. This was followed by the **control variable** named *incentive1* and the **moderating variable** named *incentiv2*. With VSP 2.0, it is possible to use both *control* and *moderating variables* as part of the data analysis control parameters, thereby enhancing the robustness of the analysis.

Names of entities desired assume that not all the firms or entities in the dataset will be used for the analysis. If, however, the user intends to use all the entities or firms in the dataset, then the entry will be '**ALL**' instead of the individual entity names as listed.

Example of Data Definition for Repeated Measures ANOVA:



For Repeated Measures ANOVA (RMA), 3 ingredients must be present in the dataset – the *Dependent Variable Name*, the *Within Groups Variable names* (just like the predictors), and the *GroupID or Subjects' name*. While the within group variables are the repeated tests or measures which the analysis want to compare their effects on the dependent variable, the last variable is what is used to organize the performance according to the subject matters or individuals involved in the test. For instance, the within group variables can be the different combinations of certain drugs (e.g. comb1, comb2, comb3, comb4, etc.), while the dependent variable can be the rate of response to treatment by the named individuals which are identified under the GroupID column of the dataset.

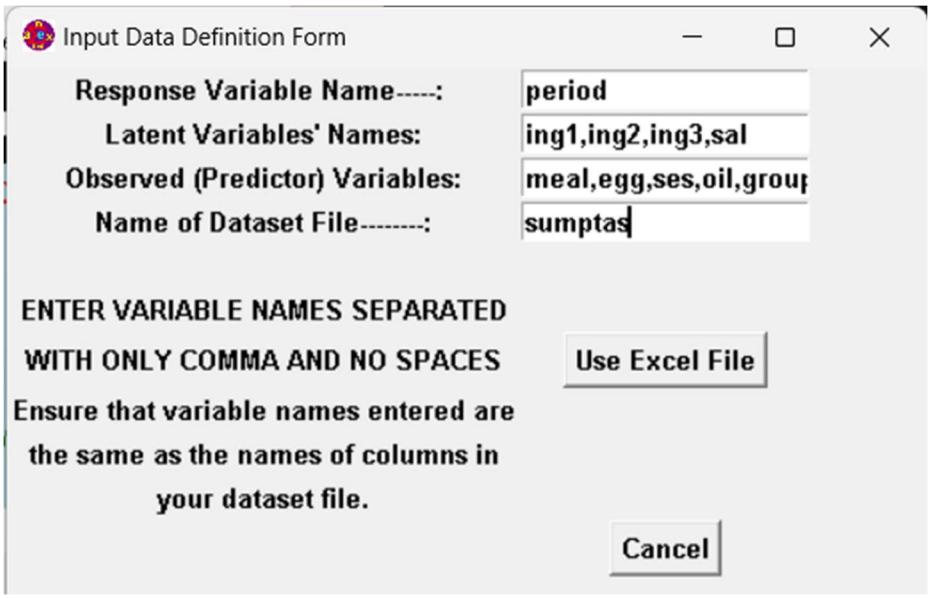
NOTE ESPECIALLY:

The software might take some time before displaying the **input data form**, this is because it must go through some initialization process. Some of the modules combine ***console entry*** with data forms usage.

For **Structural Equation Modeling (SEM)**, there are three groups of variables to be defined – the **outcome** or **response** variable, the **latent variables**, and the **predictor variables**. These variables must be

predetermined and identified with the needs of the user or analyzer. Once this is done, the data groups can then be entered into the boxes where they belong separated from each other with commas (no space in between).

Structural Equations Modeling (SEM) example



The structural equations modeling is used to test the effects of mediating variables on both the dependent variable and the predictor variables. It is a test which links the dependent variable with the independent variables and shows graphically how the link connects to each other. SEM shows which predictors have direct effects on outcome variables and which predictors are indirectly linked.

In the above form, **period** is the dependent variable, while **ing1, ing2, ing3, and sal** are the *mediating variables* which are also known as **latent variables**. The predictor or observed variables are listed as **meal, egg, ses, oil, group**, while the dataset filename is **sumptas.xlsx** (but simply listed as **sumptas**) in line with the VSP datafile name protocol.

Naming, Saving, and Loading Dataset Files

The data input method adopted for VSP is a combination of keyboard/console input (where standard dialog form is not implemented), use of standard data definition forms, and direct input from saved dataset files.

When preparing your dataset file, you are allowed to give it any name that you can remember provided that the file is saved in the **C:\ValuStats** (or

/ValuStats for macOS and Linux) folder thereafter. However, there are 2 analysis modules that you MUST save their dataset files as it is given below (otherwise the system will not process them):

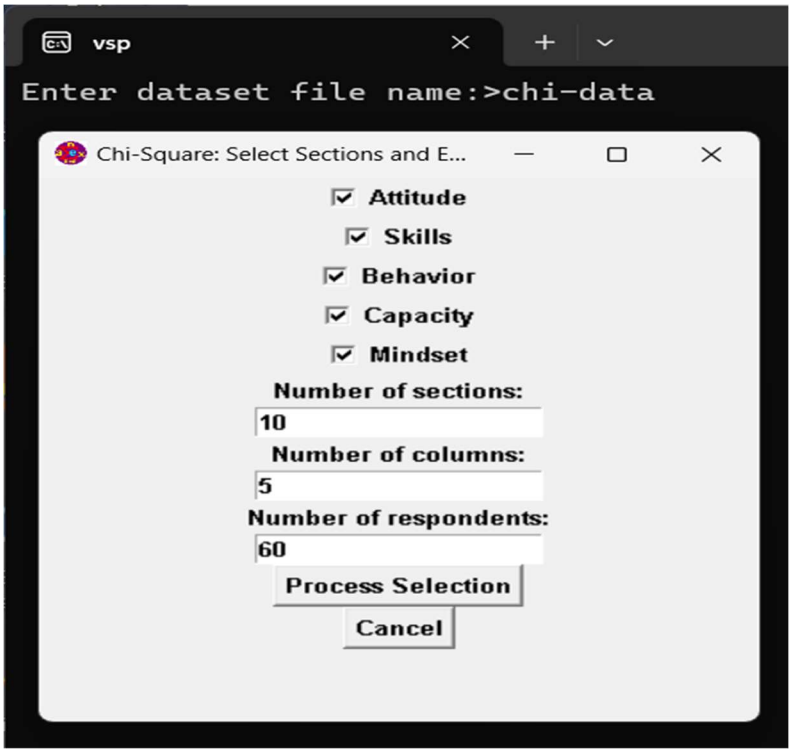
S/N	Module	Dataset File Name (to be used)
1	Reciprocal Allocation	C:\ValuStats**RecAlloc.xlsx**
2	DCF Analysis (Non VBU)	C:\ValuStats**Dcf-Data.xlsx**

Use **/ValuStats/filename e.g. **/ValuStats/Dcf-Data.xlsx** for Mac and Linux

Chi-Square and One-way ANOVA data definition forms

To call up the data definition form dialog boxes for Chi-Square and One-way ANOVA, run the VSP module, open the ***Statistics*** menu, make your selection; The two modules use the **command prompt console** to request for the data file name. The command prompt will appear on your console (screen) like this:

At the appearance of this, type in the name of the data file you saved earlier in the ValuStats folder and press enter. This will bring up the form. You can then make your selections and fill it as in the example following:



The Chi-square and One-way ANOVA data entry forms are designed to display the column heads or variable names of the data in the dataset. All the user is expected to do is to select the variables to be used for the analysis. The One-way ANOVA data input definition form for this category of analysis looks like this:

The **Desc** column must be included in your dataset and selected as part of the data to be processed. It is the column that describes the dataset groups for the understanding of the computer during processing.

Linear Programming

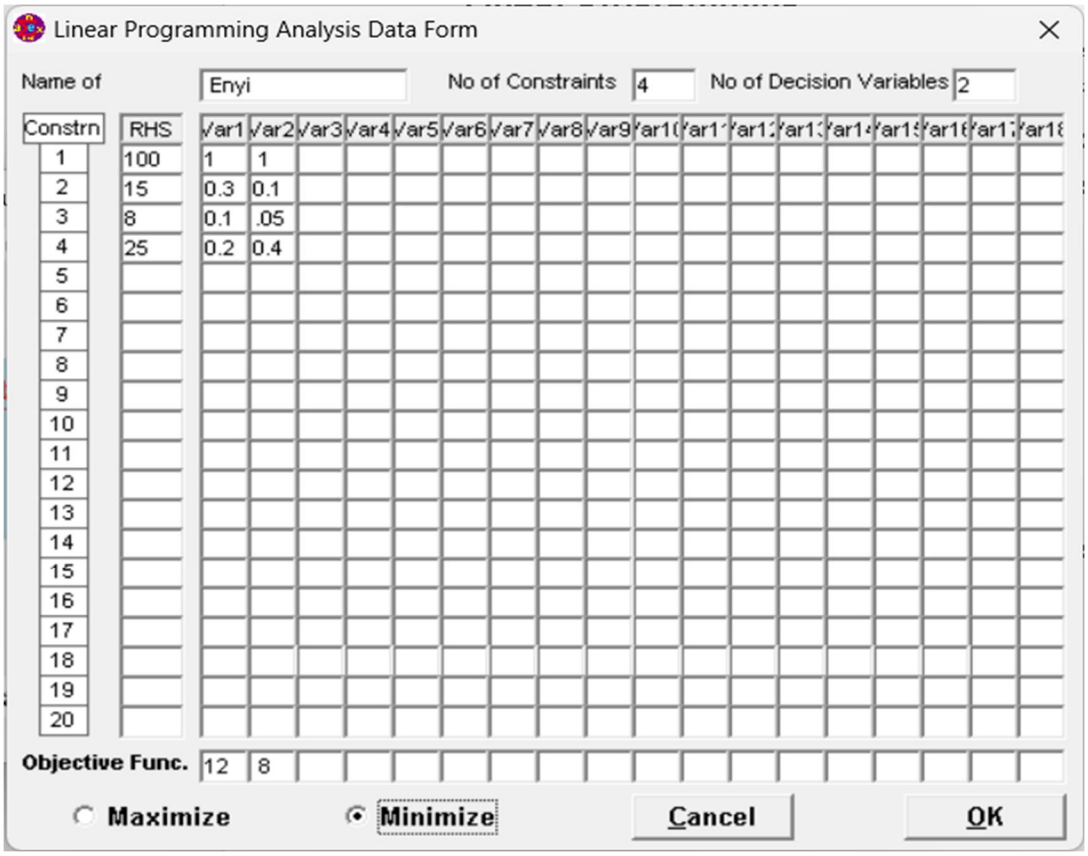
To use the Linear Programming module, open the Mathematical Tools menu, select Linear Programming and use the form displayed to enter your defined model. The LP module uses the simplex algorithmic solution technique to optimize. For instance, assuming the user defined the following model:

Minimize Z: 12A + 8B

Subject to:

$$A + B \geq 100$$
$$0.3A + 0.1B \geq 15$$
$$0.1A + 0.05B \geq 8$$
$$0.2A + 0.4B \geq 25$$
$$<A \geq 0; B \geq 0>$$

The data are then entered in the form as follows:



The LP analysis result is given as follows:

```
THE INITIAL SIMPLEX TABLEAU
---------------------------
ROW| x1    x2    x3    x4|  S1  S2|  Z
-----------------------------------------
1  | 1     0.3   0.1   0.2 |1   0 | 12
2  | 1     0.1   0.05  0.4 |0   1 | 8
-----------------------------------------
QTY| 100   15    8     25|  0   0 | 0
-----------------------------------------

THE FINAL SOLUTION TABLEAU
--------------------------
ROW|    x1       x2       x3       x4|       S1       S2|         Z
-------------------------------------------------------------------
1  |    0.       4.       1.       -4. |     20.      -20. |     80.
2  |    1.       -0.1     0.       0.6 |     -1.      2. |       4.
-------------------------------------------------------------------
QTY|    0.       -7.      0.       -3.|      -60.     -40. |     -1040.
-------------------------------------------------------------------


THE INTERPRETATION
------------------
The best resource combination to achieve the programme objective is:-
Choose 60. for x1
Choose 40. for x2

The Least Value of this combination will result to: [60 x 12.] + [40 x 8.] = 1040.
```

For Help, press F1

Matrix Manipulations

Matrices to be manipulated must be saved as text files. The matrix array elements must be demarcated with only a space in between. Examples:

MatrixA.txt =
2 4
4 8

MatrixB.txt =
3 8
4 2

MatrixC.txt =
22 24
44 48

MatrixD.txt =
3 4 10
2 7 11

MatrixE.txt =
3 2 1 11
1 3 1 8
4 1 2 15

To **multiply** two matrices, first define and save them as text files to the C:\ValuStats folder. Then start the **vsp.exe** and open the ***Mathematical Tools*** menu, select Matrix -> Matrix Multiplication. When the first definition form shows up **click OK**. This will take you to the system prompt cursor. Type the name of the file you used to save the first matrix and press Enter. Do the same for the second matrix; and if all went well with your data, your results would appear immediately.
Note: You can only multiply two matrices of equal rows and equal columns OR if the first matrix has 3 columns (notwithstanding the number of rows) while the second has 3 rows (notwithstanding the number of columns).

To **divide** two matrices, repeat the initial process as with multiplication, then type the name of the *numerator matrix* and press Enter, then type the

name of the *denominator matrix* and press Enter. If no data error is encountered, your result would appear instantly.
Note: The two matrices must be of equal dimensions.

To find the **inverse** of a matrix: First define and save the matrix. Then start up the vsp.exe (if it is not already running), select Mathematical Tools -> Matrix -> Matrix Inverse. Click Ok when the form is displayed. Type in the name of the matrix file and press Enter. The result will appear instantly.

To perform **Simultaneous Equations** computations: Define the equations and save them as a matrix text file in C:\ValuStats, then start ***vsp.exe*** (if it is not already running); select Mathematical Tools -> Simultaneous Equation. At the opening of the form, enter the number of rows (row size) and the number of columns (column size), then enter the name of the matrix file, click Ok.
Your simultaneous equation results will be displayed in a matrix format with the last column displaying the solution vector to the variables of the equations in the following order:
Row 1, last column f or variable 1
Row 2, last column f or variable 2
Row 3, last column f or variable 3
Row 4, last column f or variable 4
.
.
.
Row n, last column for variable n.
Note:
To perform a simultaneous equation with matrix, the number of columns must be greater than the number of rows by 1. That is, you must have either [2R, 3C] or [3R, 4C] or [4R, 5C], etc.
The matrix method can conveniently manipulate any number of equations (such as 50**x**51, 100**x**101, etc.) so long as the computer memory can carry the volume of values to be generated.

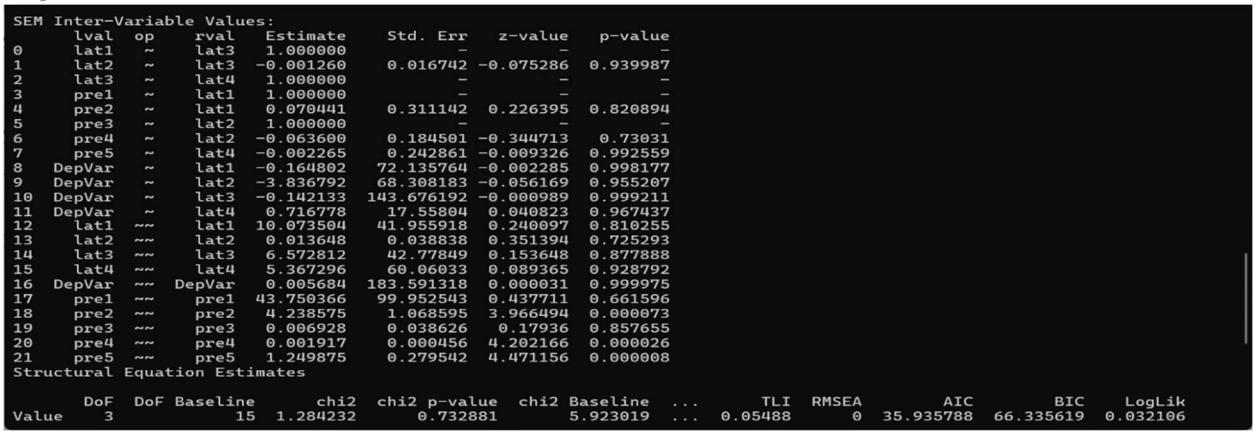
General Note
You don't need to enter file name extensions when you type the name of a dataset file. Simply type the name: example ***MatrixA*** instead of ***MatrixA,txt***

or ***taxdata*** instead of ***taxdata.xlsx***. Unlike variable names, dataset file names are not case sensitive, that means you can type the file names with either lower or upper case and it will be accepted.

RESULTS AND GRAPHS

Every module in VSP has been configured to generate all possible results and plots which are displayed on the screen and saved to the various files on disk. The users are at liberty to choose any of the plots and results portions that they deem relevant to their research needs.

Below are some of the results and plots generated from different tests. The dark screen output and the immediate succeeding graph are from the results of **Structural Equations Modeling** analysis, the results on the white background are from the **Dynamic OLS** analysis, while the graphs that followed later were from the **logit regression** analysis and the **repeated measures ANOVA**:



SEM Inter-Variable Values:

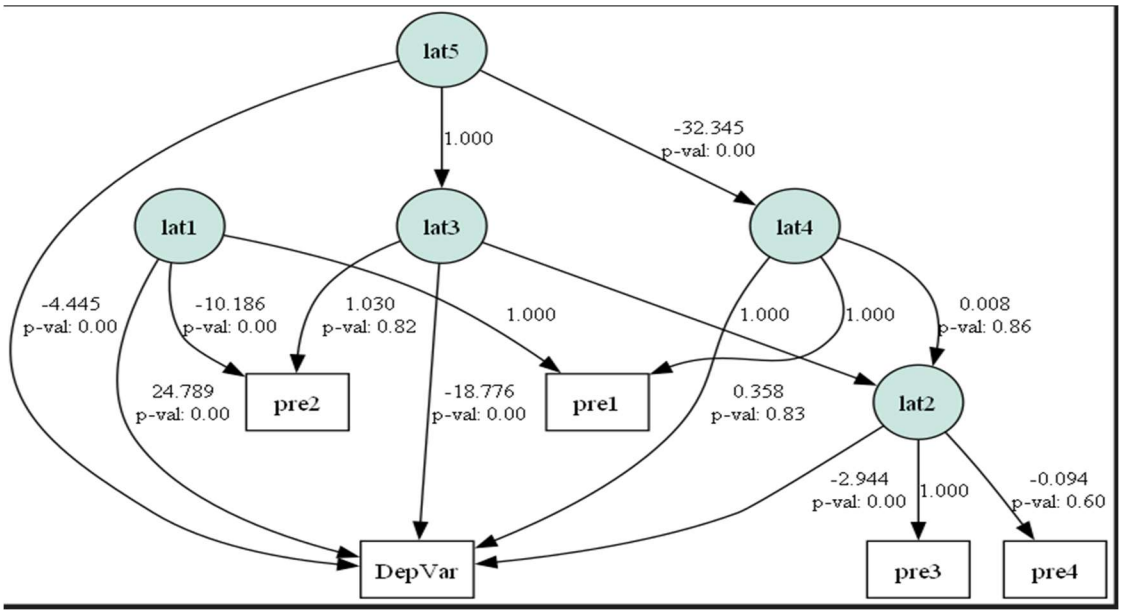
	lval	op	rval	Estimate	Std. Err	z-value	p-value
0	lat1	~	lat3	1.000000	-	-	-
1	lat2	~	lat3	-0.001260	0.016742	-0.075286	0.939987
2	lat3	~	lat4	1.000000	-	-	-
3	pre1	~	lat1	1.000000	-	-	-
4	pre2	~	lat1	0.070441	0.311142	0.226395	0.820894
5	pre3	~	lat2	1.000000	-	-	-
6	pre4	~	lat2	-0.063600	0.184501	-0.344713	0.73031
7	pre5	~	lat4	-0.002265	0.242861	-0.009326	0.992559
8	DepVar	~	lat1	-0.164802	72.135764	-0.002285	0.998177
9	DepVar	~	lat2	-3.836792	68.308183	-0.056169	0.955207
10	DepVar	~	lat3	-0.142133	143.676192	-0.000989	0.999211
11	DepVar	~	lat4	0.716778	17.55804	0.040823	0.967437
12	lat1	~~	lat1	10.073504	41.955918	0.240097	0.810255
13	lat2	~~	lat2	0.013648	0.038838	0.351394	0.725293
14	lat3	~~	lat3	6.572812	42.77849	0.153648	0.877888
15	lat4	~~	lat4	5.367296	60.06033	0.089365	0.928792
16	DepVar	~~	DepVar	0.005684	183.591318	0.000031	0.999975
17	pre1	~~	pre1	43.750366	99.952543	0.437711	0.661596
18	pre2	~~	pre2	4.238575	1.068595	3.966494	0.000073
19	pre3	~~	pre3	0.006928	0.038626	0.17936	0.857655
20	pre4	~~	pre4	0.001917	0.000456	4.202166	0.000026
21	pre5	~~	pre5	1.249875	0.279542	4.471156	0.000008

Structural Equation Estimates

	DoF	DoF Baseline	chi2	chi2 p-value	chi2 Baseline	...	TLI	RMSEA	AIC	BIC	LogLik
Value	3	15	1.284232	0.732881	5.923019	...	0.05488	0	35.935788	66.335619	0.032106

```
Details of SEM Estimates
========================
Chi-square------------------------------ |chi2:--------|1.284232
Degree of Freedom----------------------- |Df:----------|3.000000
DoF Baseline---------------------------- |Df_Baseline:-|15.000000
Chi2 p-value---------------------------- |P-Value:-----|0.732881
Chi2 DoF Ratio-------------------------- |CDR:---------|5.923019
Root Mean Square Error of Approximation |RMSEA:-------|0.810976
Standardized Root Mean Square Residual- |SRMR:--------|0.783179
Comparative Fit Index------------------- |CFI:---------|-0.084103
Tucker-Lewis Index---------------------- |TLI:---------|0.783179
Incremental Fit Index------------------- |IFI:---------|0.054880
Goodness-of-Fit Index------------------- |GFI:---------|0.000000
Akaike Information Criterion------------ |AIC:---------|35.935788
Bayesian Information Criterion---------- |BIC:---------|66.335619
Log Likelihood-------------------------- |LogLik:------|0.032106

Your Structural Equation Modeling RESULTS are saved in <C:\ValuSta
```



DOLS Model Summary:

OLS Regression Results

==========

Dep. Variable:	meal	R-squared:	0.047
Model:	OLS	Adj. R-squared:	-0.033
Method:	Least Squares	F-statistic:	0.5857
Date:	Tue, 23 Apr 2024	Prob (F-statistic):	0.628

Time:	05:11:49	Log-Likelihood:	-139.56
No. Observations:	40	AIC:	287.1
Df Residuals:	36	BIC:	293.9
Df Model:	3		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	120.8090	18.702	6.460	0.000	82.880	158.739
ing1	-106.3608	100.932	-1.054	0.299	-311.060	98.339
ing2	-32.8718	29.888	-1.100	0.279	-93.488	27.744
ing3	-0.0359	0.123	-0.292	0.772	-0.286	0.214

Omnibus:	3.125	Durbin-Watson:	1.868
Prob(Omnibus):	0.210	Jarque-Bera (JB):	2.146
Skew:	-0.548	Prob(JB):	0.342
Kurtosis:	3.293	Cond. No.	4.20e+03

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
[2] The condition number is large, 4.2e+03. This might indicate that there are strong multicollinearity or other numerical problems.

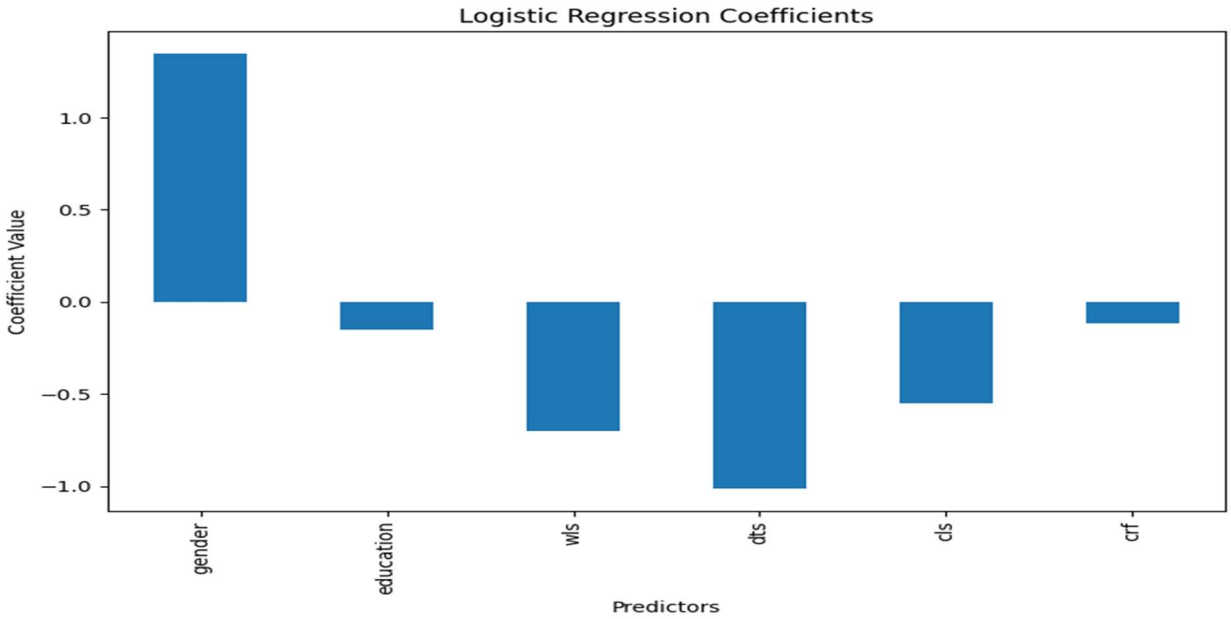
Unit Root Test (Phillips-Perron):
Test Statistic: -6.368466
P-Value: 0.000000

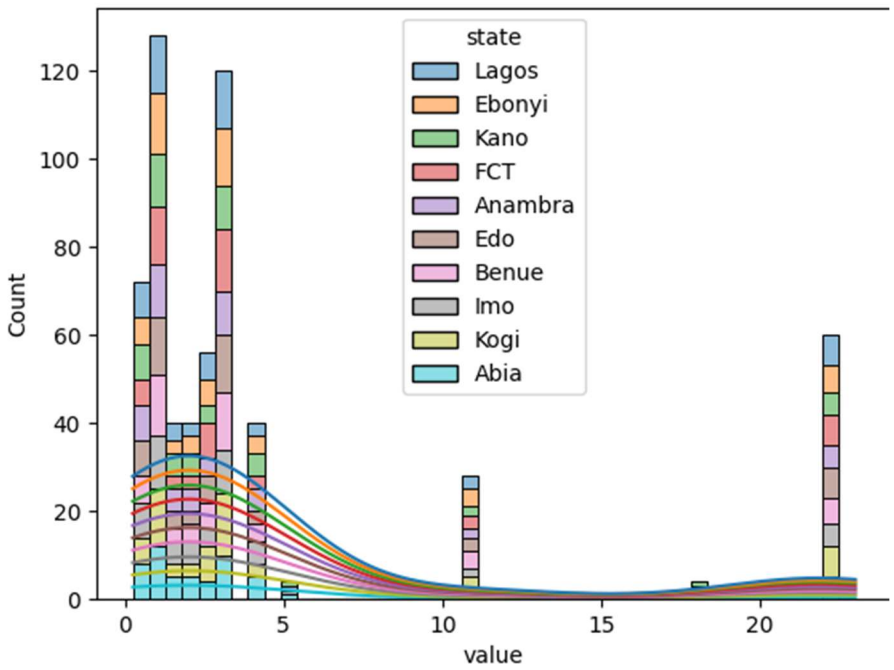
Breusch-Pagan test statistic: 3.798060
Breusch-Pagan p-value: 0.284112

Variance Inflation Factors:

Variables	VIF

0	const	200.518812
1	ing1	1.211498
2	ing2	1.206556
3	ing3	1.005063





DISPLAYING STATISTICAL TABLES

VSP comes with inbuilt statistical tables for t, z, F1, F5, and Chi-square distributions. This is an additional feature for those who would like to interpret their own results and significance tests manually. To display any of the tables, start VSP, select Statistics -> Statistical Tables -> (any of t, z, F1, F5, or Chi-square) and this will be displayed pronto.