National College of Ireland

Configuration Manual

MSc Research Project
Fintech

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MSc Project Submission Sheet

School of Computing

Student Name: ……. EGHOSA ALEX ODIASE……

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Lecturer: ……Victor Del Rosal……..……..

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1. INTRODUCTION

My research report includes a configuration manual as an integral component of the MSC Fintech module. This manual covers the procedures used, describes the technologies and hardware setup, and acts as a reference for future study. Its goal is to instruct supervisors and fellow researchers on how to replicate the study's findings, ensuring transparency, and enabling knowledge progress in the field.

2. SYSTEM CONFIGURATION

This section goes over the system configuration needed to run the analysis.

2.1 Hardware of the System

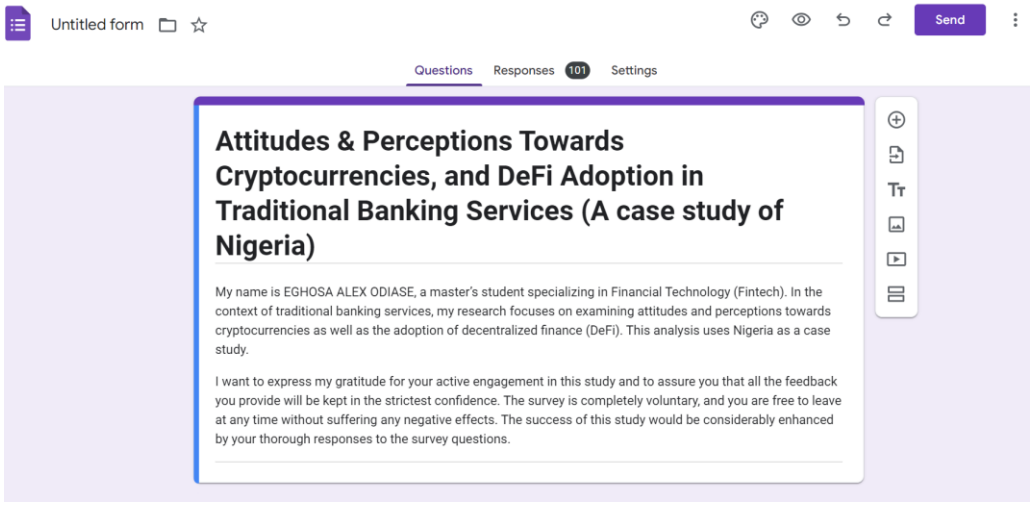
The research project was conducted on a Microsoft Windows 10 pro laptop.

- System Model HP EliteBook x360 1030 G2
- Processor Intel(R) Core (TM) i5-7300U CPU @ 2.60GHz, 2712 Mhz, 2 Core(s), 4
- Installed Physical Memory (RAM) 16.0 GB
- Available Physical Memory 8.86 GB
- Hardware Abstraction Layer Version = "10.0.19041.3636"
- System type 64-bit operating system, x64-based processor

2.2 Software and Tools

Goggle forms: Google Forms was used as the survey tools, making it easier to distribute questions and collect data. It provided a user-friendly environment for respondents to electronically submit their responses.

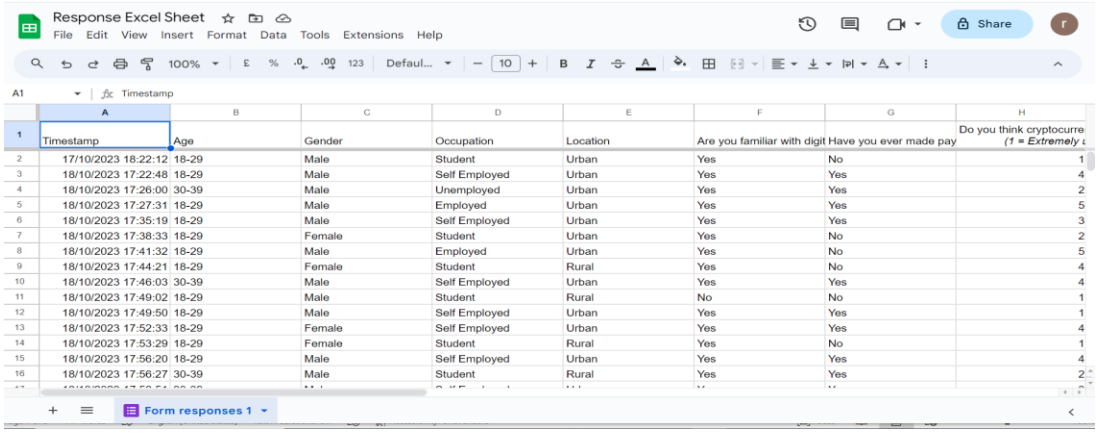
Figure. 1. Goggle form



2.3 Microsoft Excel

Data and responses from Google Forms were extracted into a xlsx file using Microsoft Excel. Following data preparation, the data was cleaned, and responses converted into binary format, ready for analysis.

Figure. 2. Responses on Excel



	Timestamp	Age	Gender	Occupation	Location	Are you familiar with digit	Have you ever made pay	Do you think cryptocurre (1 = Extremely
2	17/10/2023 18:22:12	18-29	Male	Student	Urban	Yes	No	1
3	18/10/2023 17:22:48	18-29	Male	Self Employed	Urban	Yes	Yes	4
4	18/10/2023 17:26:00	30-39	Male	Unemployed	Urban	Yes	Yes	2
5	18/10/2023 17:27:31	18-29	Male	Employed	Urban	Yes	Yes	5
6	18/10/2023 17:35:19	18-29	Male	Self Employed	Urban	Yes	Yes	3
7	18/10/2023 17:38:33	18-29	Female	Student	Urban	Yes	No	2
8	18/10/2023 17:41:32	18-29	Male	Employed	Urban	Yes	No	5
9	18/10/2023 17:44:21	18-29	Female	Student	Rural	Yes	No	4
10	18/10/2023 17:46:03	30-39	Male	Self Employed	Urban	Yes	Yes	4
11	18/10/2023 17:49:02	18-29	Male	Student	Rural	No	No	1
12	18/10/2023 17:49:50	18-29	Male	Self Employed	Urban	Yes	Yes	1
13	18/10/2023 17:52:33	18-29	Female	Self Employed	Urban	Yes	Yes	4
14	18/10/2023 17:53:29	18-29	Female	Student	Rural	Yes	No	1
15	18/10/2023 17:56:20	18-29	Male	Self Employed	Urban	Yes	Yes	4
16	18/10/2023 17:56:27	30-39	Male	Student	Rural	Yes	Yes	2

3. DATA SOURCE

Participants were recruited via a multi-channel strategy that included email invitations as well as online venues such as social media and forums. This comprehensive recruiting strategy intended to capture a diverse representation across demographics, contributing to the study's inclusivity and increasing the validity of the research findings by reflecting the diversity of experiences and perspectives in various geographic and social contexts.

Figure 3. Location chart

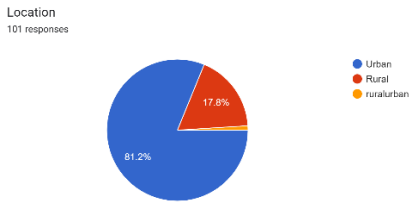
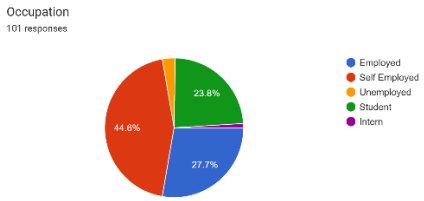


Figure 4. Occupation chart



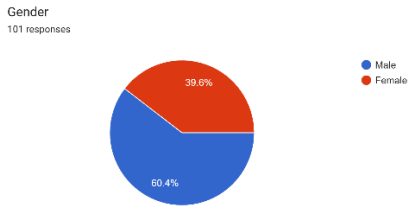


Figure 5. Gender chart

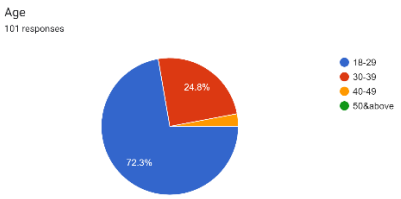
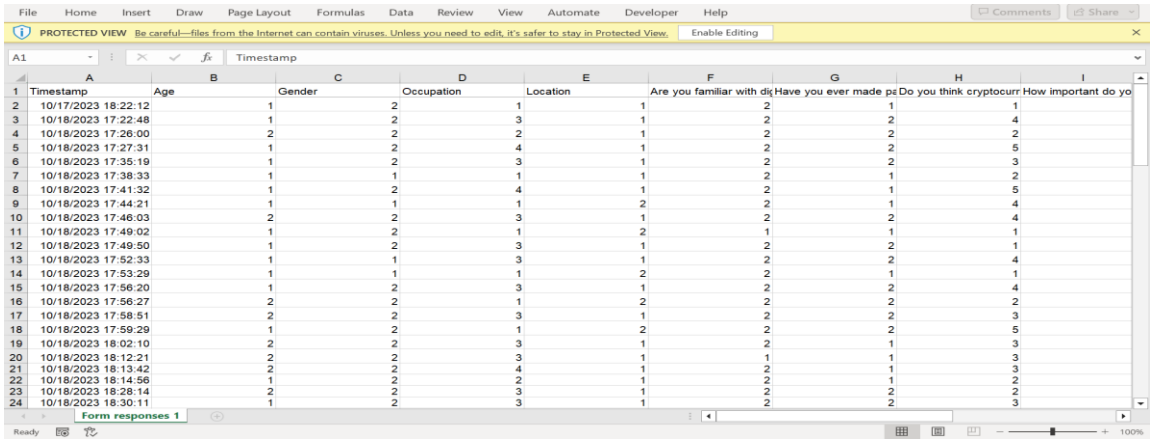


Figure 6. Age chart

4. DATA CLEANING AND PREPROCESSING

Data cleaning was comprehensive, encompassing the removal of missing values, superfluous observations, and outlier identification for compatibility with IBM SPSS. This resulted in a more refined dataset, which improved the analytical accuracy of the software.

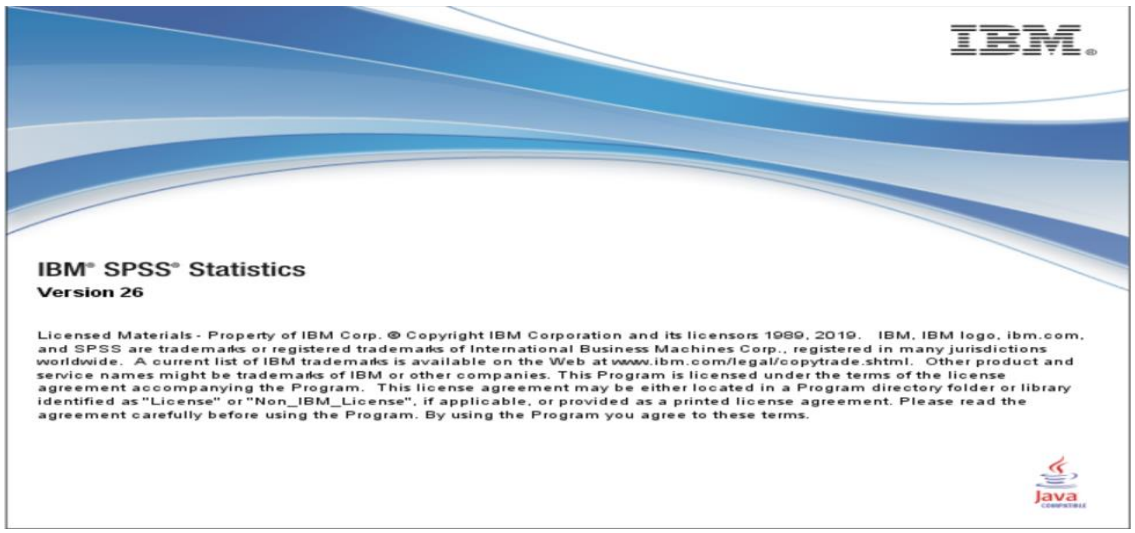
Figure. 7. Cleaned Data



4.1 Installation of SPSS Software

The SPSS program was installed in order to facilitate the analysis of the data and implementation of the statistical methods used in this investigation.

Figure. 8. Launching IBM SPSS



4.2 Importing the data

The revised dataset was loaded into SPSS once it had been cleaned. Each measuring variable item from the questionnaire was coded in SPSS. This strategic coding approach allowed the program to systematically analyze and interpret the data, providing a thorough knowledge of the research findings.

Figure 9. Coding data into SPSS (Variable view)

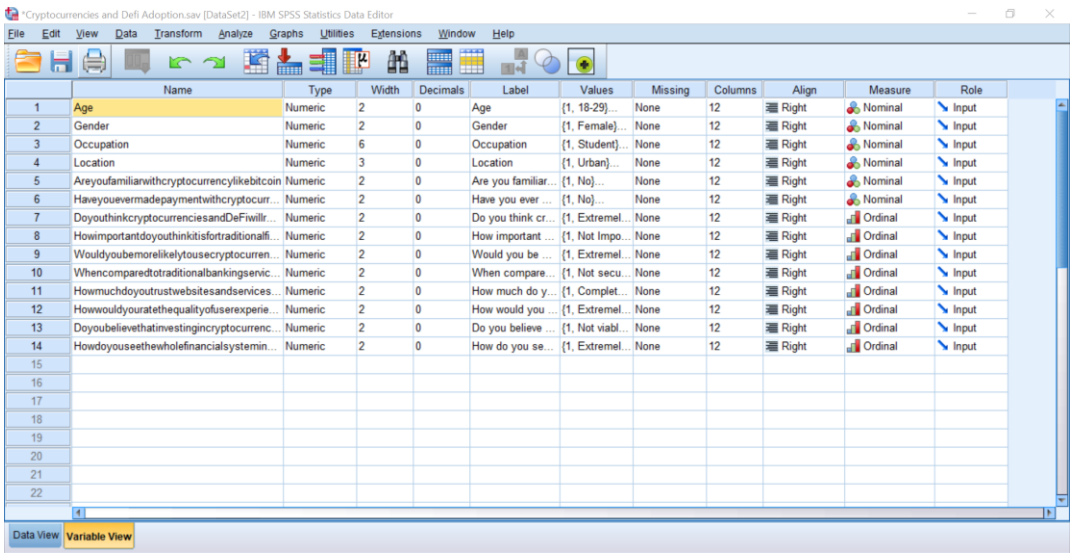
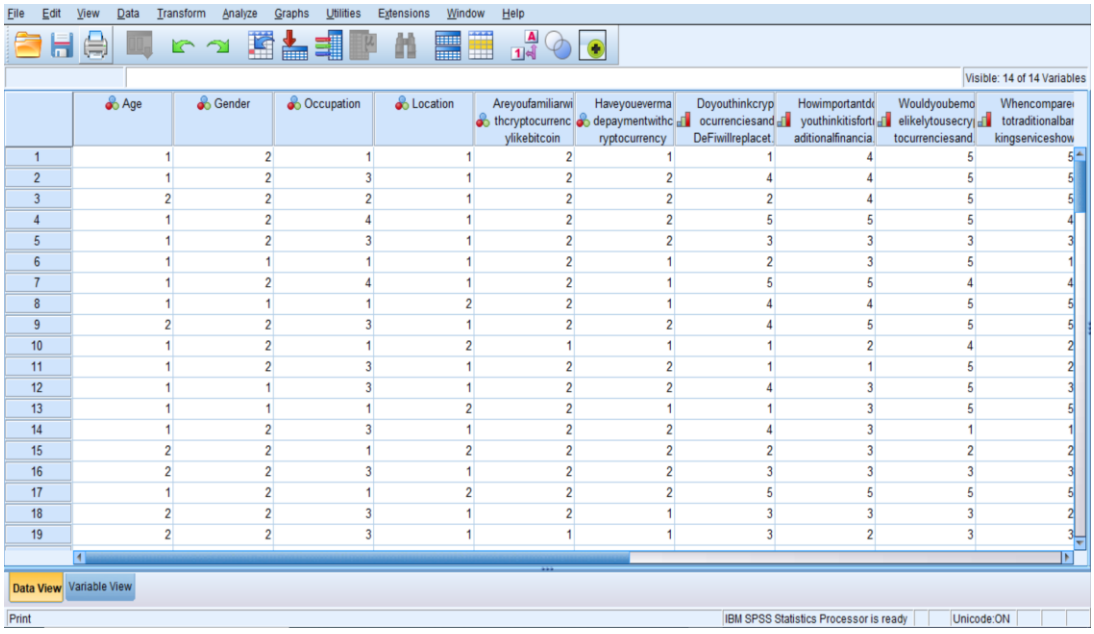


Figure 10. Coding data into SPSS (Data view)



5 TECHNIQUES USED

5.1 Data Encoding – To prepare dataset for analysis, the nominal and ordinal measures must be encoded to facilitate statistical analysis and enforce consistency for all data point.
Step 1: Click on the cell of the target variable in the "values" column, click on button with the 3 dots to load the "Value Labels" dialog box as shown in figure 11.
Step 2: On the value and label input fields provided, enter a value for a scale in the value input and the label for the target scale in the label input and click the add button to associate the value to the label.
Step 3: Repeat step 2 for all scale the target variable and click on the "Ok" button to save the encode for the target variable.

Figure 11. Value Labels dialog view

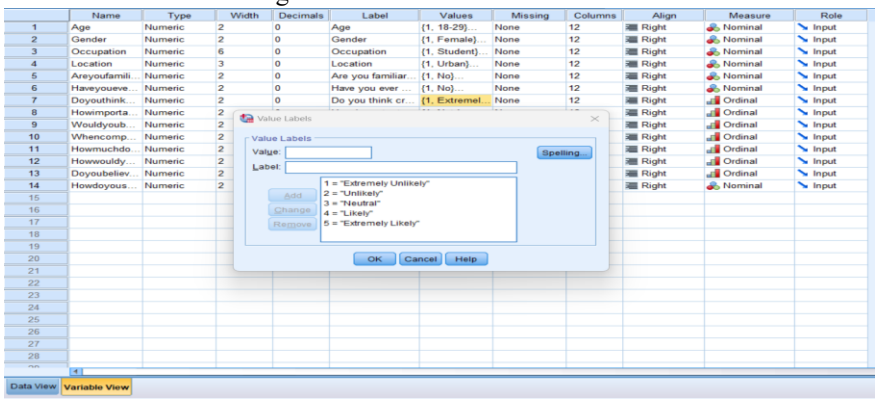
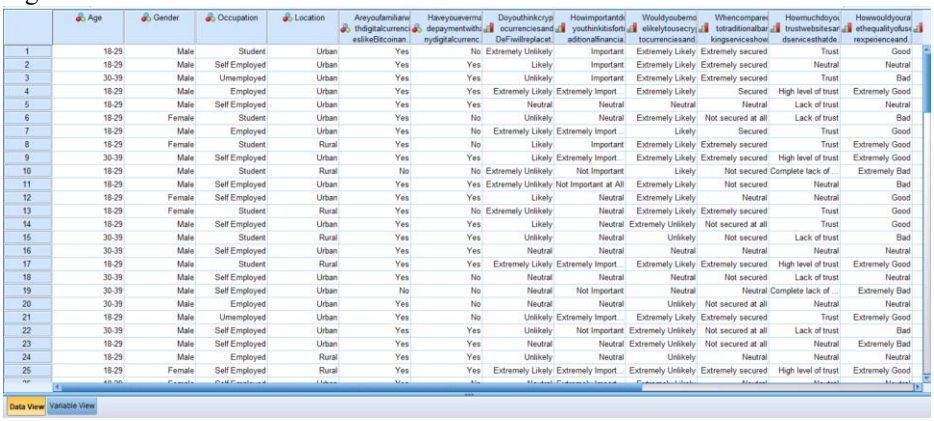


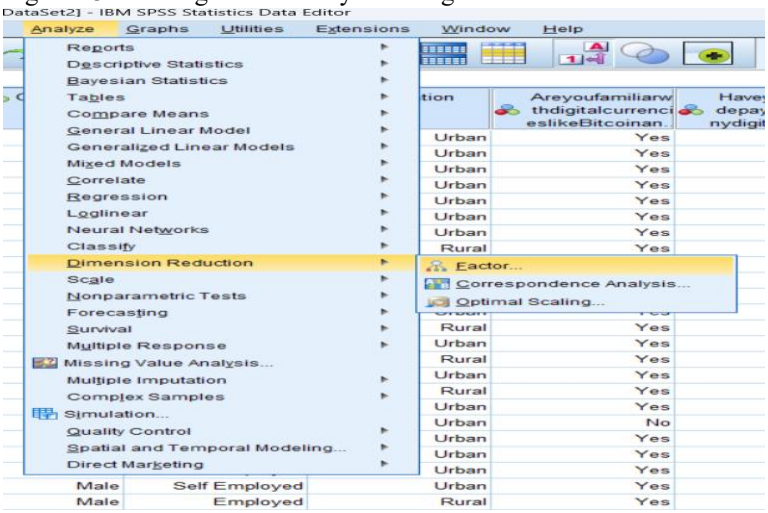
Figure 12. Coded dataset in data view



5.2 Factor Analysis – For the purpose of reduction of correlated variables into a smaller set of factors and simplifies the interpretation of the survey result, factor analysis was carried out.
Step 1: From the menu bar, select "Analyse", then "Dimension Reduction" and click on "Factor" as shown in figure 13 to load Factor Analysis dialog box.

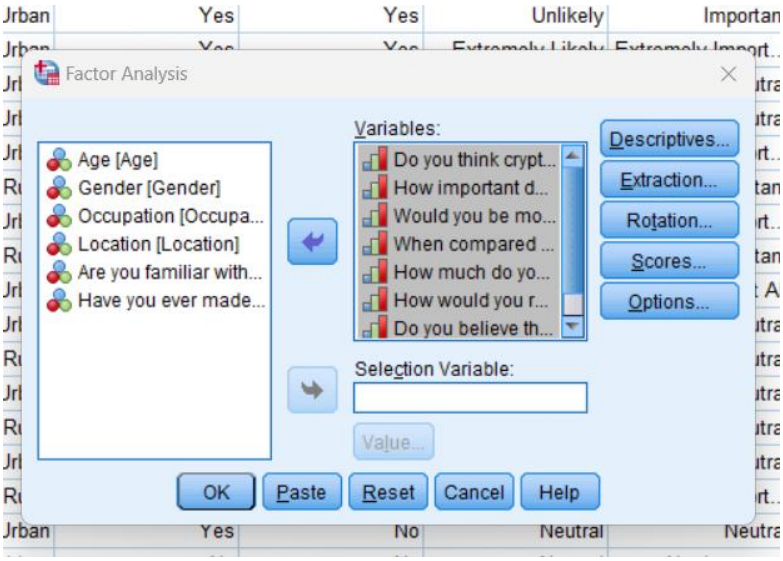
Step 2: On the loaded Analysis dialog box, select the group of variables to be analysed and move them into variables column.

Figure 13. Loading Factor Analysis dialog box from the menu bar



Step 3: From the list of configurations, apply all setting relevant to analysing factor as shown in figure 14 and click “OK” to perform the analysis.

Figure 14. Loaded Factor Analysis dialog box.



RESULTS:

Figure. 15. KMO and Bartlett's Test of Sphericity

Total Variance Explained

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	4.153	51.911	51.911
2	.786	9.821	61.733
3	.761	9.509	71.241
4	.705	8.813	80.054
5	.527	6.590	86.645
6	.438	5.476	92.120
7	.386	4.819	96.940
8	.245	3.060	100.000

Extraction Method: Principal Component Analysis.

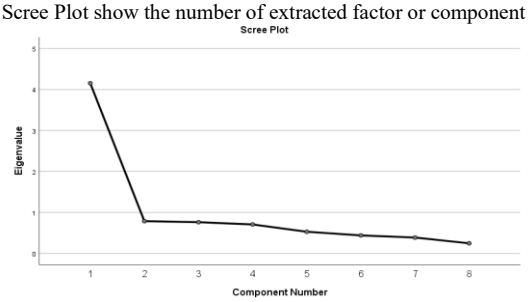
Figure. 16. Variance explained by components

Figure. 17. Scree Plot show the number of extracted factor or component

a. Determinant = .038

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.874
Bartlett's Test of Sphericity	Approx. Chi-Square	315.193
	df	28
	Sig.	.000



Factor Analysis Result – If Kaiser-Meyer-Olkin Measure of Sampling Adequacy is equal or greater than 0.60 and If Bartlett's test of sphericity is significant ($p < 0.05$), we should proceed with the Exploratory Factor Analysis.

From figure 16, KMO value is **0.874** and Bartlett's test of sphericity is significant, hence, the developed model is good.

Figures 17 shows the Scree plot which uses the Eigenvalue to determine the number of factors. From the plot it is observed that only 1 component is plotted above the eigenvalue of 1, hence only 1 component is extracted. The extracted component explains about **51.9** of the total variances in the model as shown in figure 15.

5.3 Reliability Test

Cronbach's alpha and other reliability tests evaluate the internal consistency of a group of survey questions.

Step 1: From the menu bar, select "Analyse", then "Scale" and click on "Reliability Analysis" as shown in figure 18 to load Reliability Analysis dialog box.

Figure 18. Loading Reliability Analysis dialog box from the menu bar

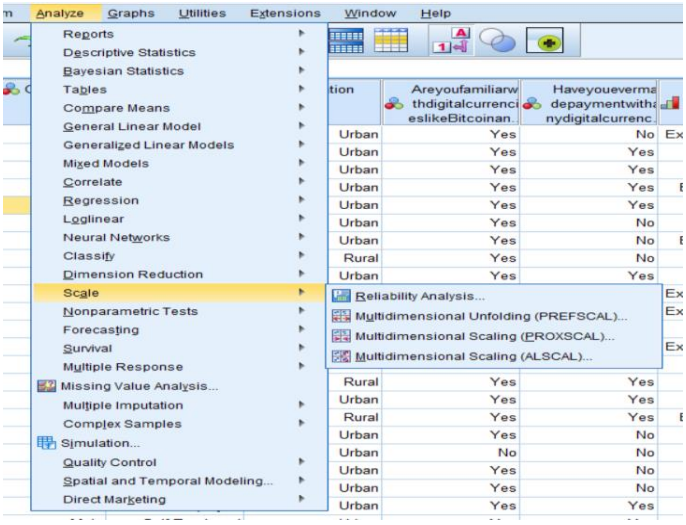


Figure. 19 Reliability Analysis dialog view

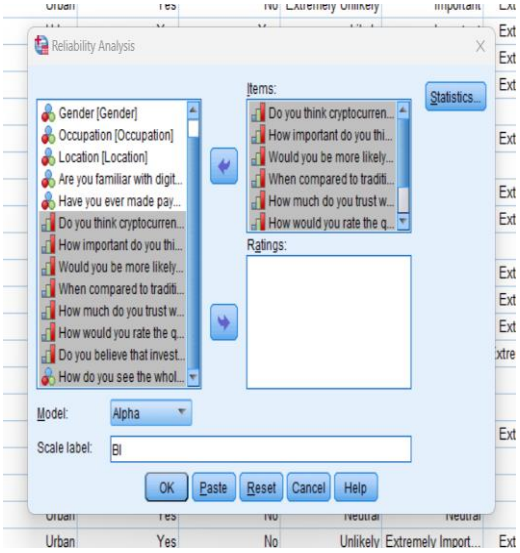


Figure. 20 Value Labels dialog view

Reliability

Scale: BI

Case Processing Summary

		N	%
Cases	Valid	101	100.0
	Excluded[a]	0	.0
	Total	101	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.862	8

Step 2: On the loaded Reliability Analysis dialog box, select the group of variables to be analysed and move them into item column, add scale label in the field provided and click "OK" as shown in figure 19.

Figure 20 shows the Cronbach's Alpha of **0.862** which confirms the instrument's trustworthiness and conformity with the predetermined criteria. Cronbach's Alpha reliability coefficient of 0.70 or higher is considered acceptable

5.4 Compute Behavioural Intention (BI) variable

The 'Compute Variable' tool in SPSS allows users to construct new dataset variables by performing mathematical operations on existing data, allowing for analysis and insight development based on one or more pre-existing variables."

Step 1: From the menu bar, select “Transform” and click on “Compute Variable” as shown in figure 21 to load Compute Variable dialog box.

Figure. 21. Loading Compute Variable dialog box from the menu bar

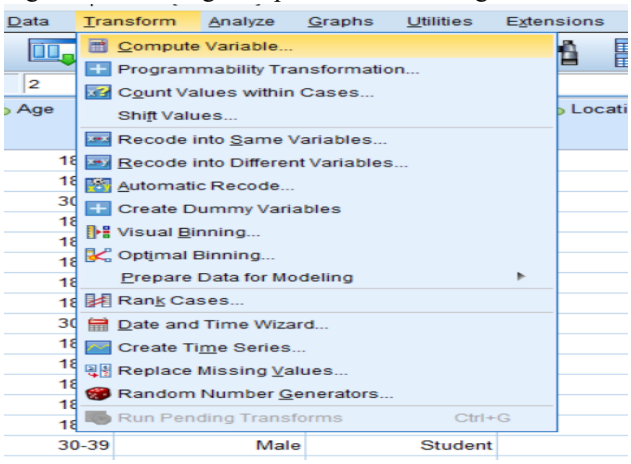
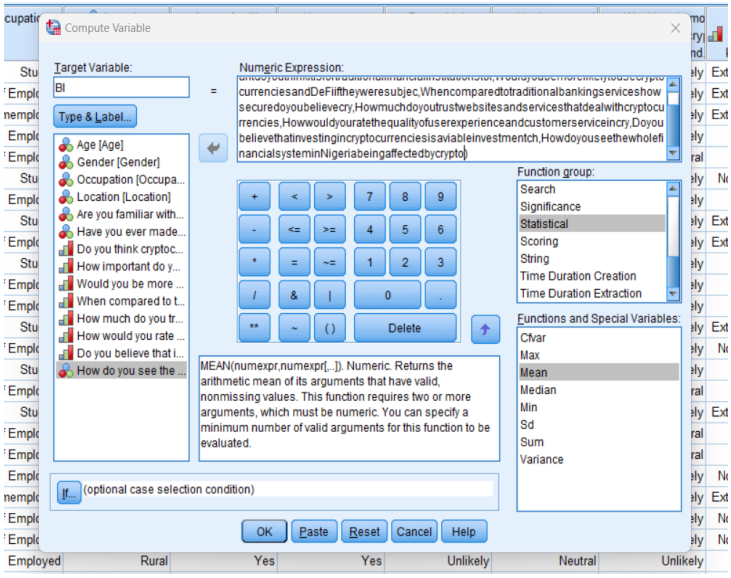


Figure. 22. Compute Variable dialog box

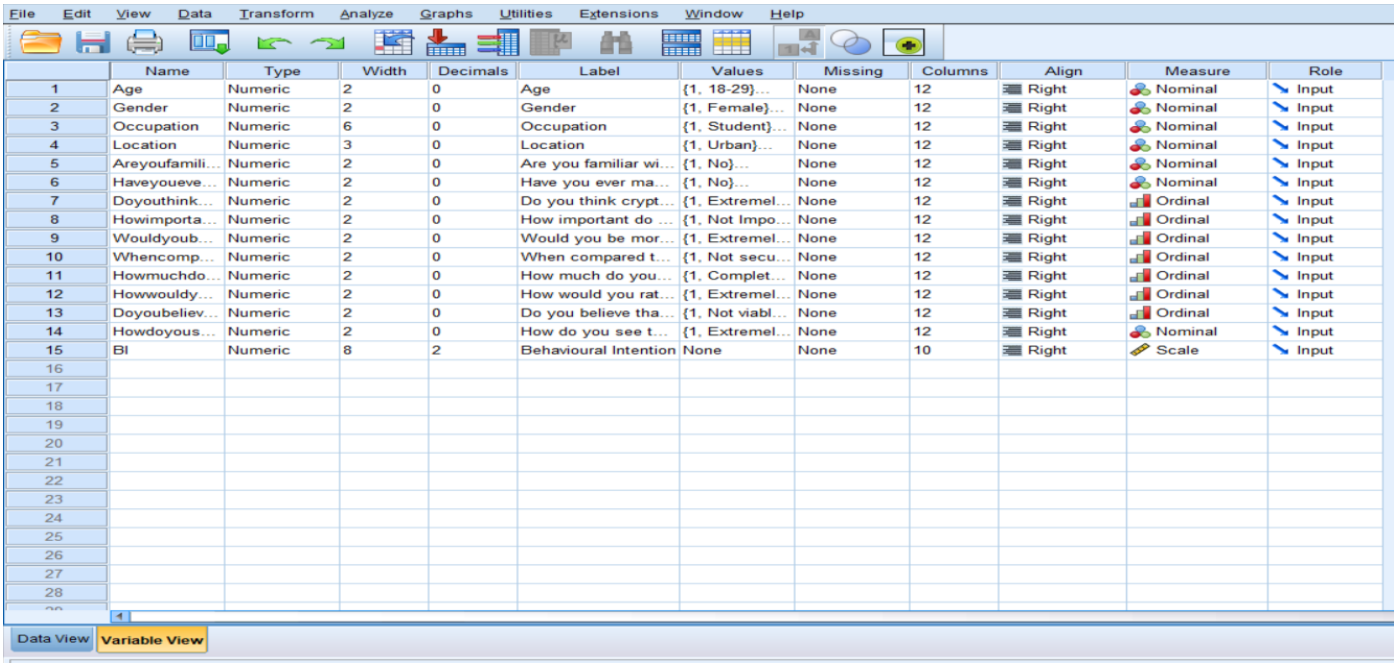


Step 2: On the loaded Compute Variable dialog box, select the “Statistical” from the “Function group” column and “Mean” from the “Functions and Special Variable” column to load the Mean function into “Numeric Expression” column.

Step 3: Add the group of variables required compute the new variable delimited by comma in the MEAN function loaded into the “Numeric Expression” column, enter new variable in the “Target

Variable" column as shown in figure 22 and click "OK" to create variable. Figure 23 shows the variable view of the dataset with the newly created BI variable included.

Figure. 23. Variable view of analysis dataset show the new created BI variable



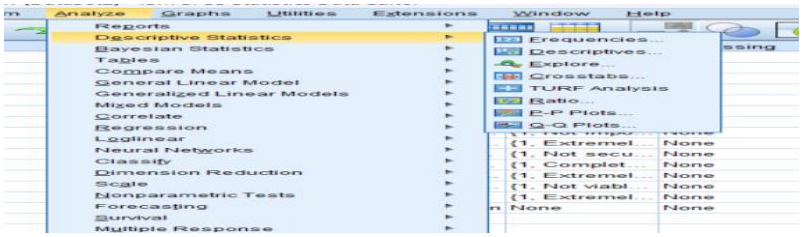
	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Age	Numeric	2	0	Age	{1, 18-29}...	None	12	Right	Nominal	Input
2	Gender	Numeric	2	0	Gender	{1, Female}...	None	12	Right	Nominal	Input
3	Occupation	Numeric	6	0	Occupation	{1, Student}...	None	12	Right	Nominal	Input
4	Location	Numeric	3	0	Location	{1, Urban}...	None	12	Right	Nominal	Input
5	Areyoufamili...	Numeric	2	0	Are you familiar wi...	{1, No}...	None	12	Right	Nominal	Input
6	Haveyoueve...	Numeric	2	0	Have you ever ma...	{1, No}...	None	12	Right	Nominal	Input
7	Doyouthink...	Numeric	2	0	Do you think crypt...	{1, Extremel...	None	12	Right	Ordinal	Input
8	Howimporta...	Numeric	2	0	How important do ...	{1, Not Impo...	None	12	Right	Ordinal	Input
9	Wouldyoub...	Numeric	2	0	Would you be mor...	{1, Extremel...	None	12	Right	Ordinal	Input
10	Whencomp...	Numeric	2	0	When compared t...	{1, Not secu...	None	12	Right	Ordinal	Input
11	Howmuchdo...	Numeric	2	0	How much do you...	{1, Complet...	None	12	Right	Ordinal	Input
12	Howwouldy...	Numeric	2	0	How would you rat...	{1, Extremel...	None	12	Right	Ordinal	Input
13	Doyoubeliev...	Numeric	2	0	Do you believe tha...	{1, Not viabl...	None	12	Right	Ordinal	Input
14	Howdoyous...	Numeric	2	0	How do you see t...	{1, Extremel...	None	12	Right	Nominal	Input
15	BI	Numeric	8	2	Behavioural Intention	None	None	10	Right	Scale	Input
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											

5.5 Descriptive Statistics

Descriptive statistics provide insights into the central tendency, variability, and distribution of the data. The BI variable is a continuous variable and will the analysing the Mean, Minimum and Maximum using measures of central tendency.

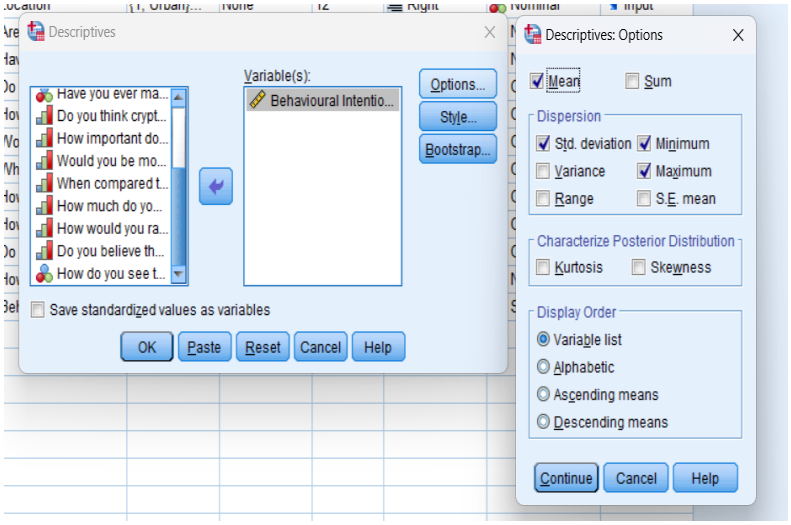
Step 1: From the menu bar, select "Analyse", then "Descriptive Statistics" and click on "Descriptives" as shown in figure 24 to load Descriptives dialog box.

Figure. 24. Loading Descriptive Statistic dialog box



Step 2: On the loaded Descriptives dialog box, select the BI variable to be analysed and move it into "Variable(s)" column, click on options button and select all relevant properties as shown in figure 25, click continue and click "OK" to run analysis.

Figure. 25. Descriptive Statistic dialog box



RESULTS:

Figure. 26. Value Labels dialog view

Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Behavioural Intention	101	1.00	5.00	3.3255	.91704
Valid N (listwise)	101				

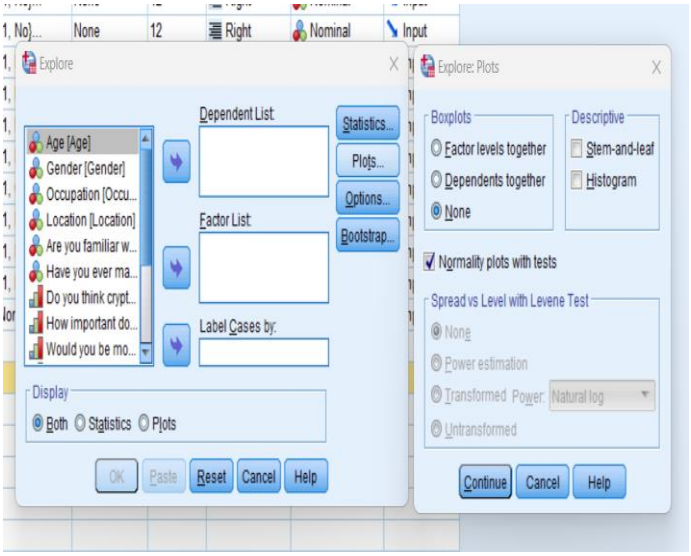
5.6 Normality Test for Behavioural Intention (BI) variable

A normality test is statistical tool used to assesses if a dataset approximates a normal distribution, which is crucial for parametric statistical tests involving scale data, affecting analysis validity.

Step 1: From the menu bar, select “Analyse”, then “Descriptive Statistics” and click on “Explore” as shown in figure 27 to load Explore dialog box.

Step 2: On the loaded Explore dialog box, select the BI variable to be analysed and move it into “Dependent List” column, click on statistics button and select all relevant properties as shown in figure 28, click continue and click “OK” to run analysis.

Figure. 28. Explore dialog box



Step 3: To get the histogram, select “Analyse”, Descriptives, then frequencies, then chart, select histogram and tick the “show normal curve on histogram.

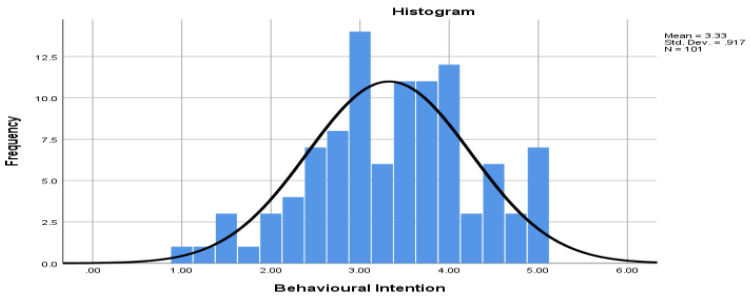
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Behavioural Intention	.055	101	.200*	.984	101	.243

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Figure. 30. Histogram chart for Behavioural Intention variable with normal distribution curve

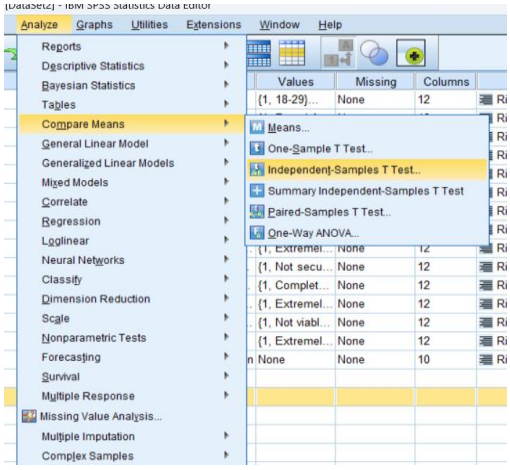


5.7 Independent Samples T–Test

Independent Sample T-Test is a statistical hypothesis test used to ascertain whether there is a significant difference between the means of two independent groups, also called the two-sample t-test.

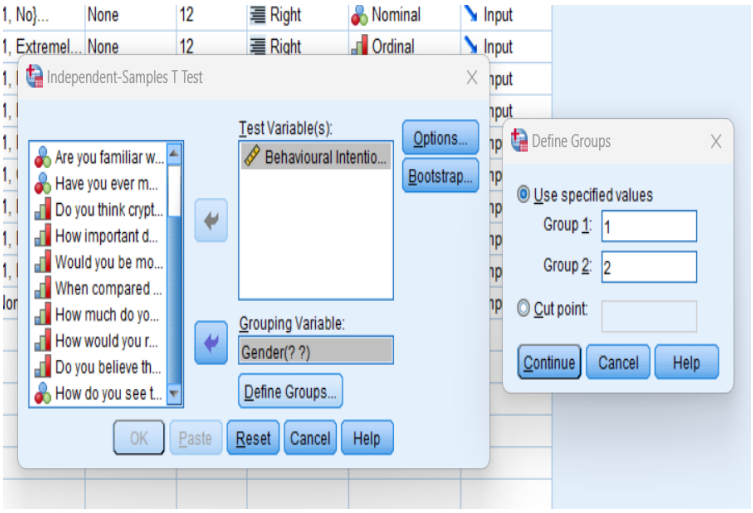
Step 1:From the menu bar, select “Analyse”, then “Compare Means” and click on “Independent Sample T Test” as shown in figure 26 to load Independent Sample T Test dialog box.

Figure. 31. Loading Independent Sample T Test dialog box



Step 2: On the loaded Analysis dialog box, select the BI variable to be analysed and move it into “Test Variable(s)” column.

Figure. 32. . Independent Sample T Test dialog box



Step 3: Move Gender variable into “Grouping Variable” column, click on define groups button to set values for the two group, click continue and click “OK” to perform analysis.The summary of the analysis will be generated on the output workspace. Repeat the same analysis for Location variable.

RESULTS:

Figure. 33. Independent Samples T–Test comparing the means of the male and female gender

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Behavioural Intention	Female	40	3.3719	1.01609	.16066
	Male	61	3.2951	.85331	.10926

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Behavioural Intention	Equal variances assumed	1.278	.261	.410	99	.683	.07679	.18736	-.29496	.44855
	Equal variances not assumed			.395	73.233	.694	.07679	.19429	-.31040	.46399

Figure. 34. Independent Samples T–Test comparing the means of the urban and rural location

Group Statistics

	Location	N	Mean	Std. Deviation	Std. Error Mean
Behavioural Intention	Urban	82	3.3430	.83329	.09202
	Rural	18	3.2708	1.27349	.30017

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Behavioural Intention	Equal variances assumed	12.032	.001	.300	98	.765	.07215	.24071	-.40554	.54985
	Equal variances not assumed			.230	20.308	.821	.07215	.31395	-.58211	.72641

5.8 ANOVA Analysis

Analysis of Variance is a statistical technique used to analyse the differences among the means of two or more groups or treatments in a dataset.

Step 1:From the menu bar, select "Analyse", then "Compare Means" and click on "One-Way ANOVA" as shown in figure 35 to load One-Way ANOVA dialog box.

Figure. 35. Loading the One-Way ANOVA dialog box

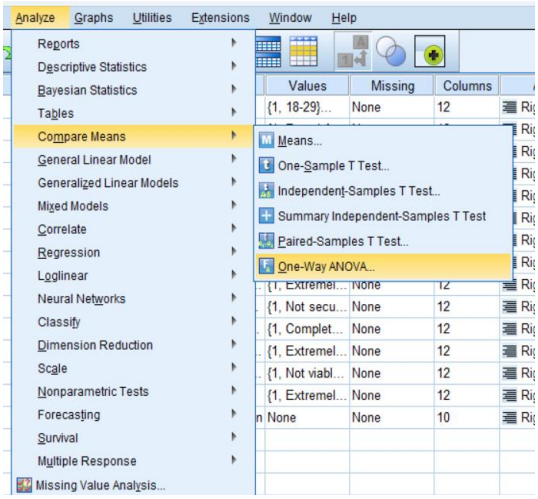
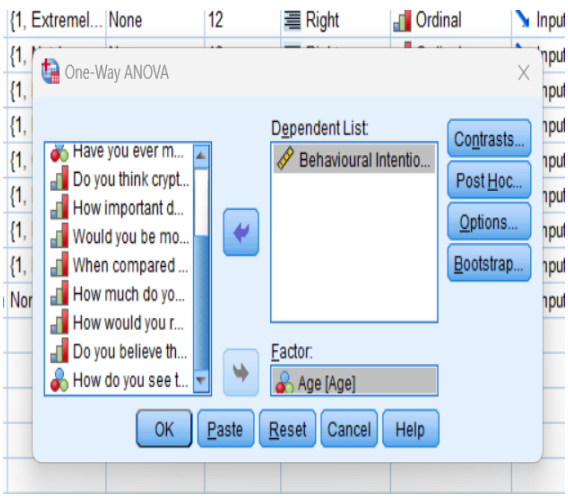


Figure. 36. One-Way ANOVA dialog box



Step 2: On the loaded One-Way ANOVA dialog box, select the BI variable to be analysed and move it into "Dependent List" column.

Step 3: Move Age variable into "Factor" column and click "OK" to perform analysis. The summary of the analysis will be generated on the output workspace. Repeat the same analysis for Occupation variable.

RESULTS:

Figure. 37. ANOVA analysis summary table for comparing the mean difference in Age variable

ANOVA

Behavioural Intention

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.198	2	2.099	2.574	.081
Within Groups	79.899	98	.815		
Total	84.096	100			

Figure. 38. Descriptive stats summary table for comparing the mean difference in Age variable using ANOVA

Descriptives

Behavioural Intention

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
18-29	73	3.4503	.89286	.10450	3.2420	3.6587	1.13	5.00
30-39	25	2.9800	.94764	.18953	2.5888	3.3712	1.00	4.88
40-49	3	3.1667	.68845	.39747	1.4565	4.8769	2.38	3.63
Total	101	3.3255	.91704	.09125	3.1445	3.5065	1.00	5.00

Figure. 39. ANOVA analysis summary table for comparing the mean difference in Occupation variable

ANOVA

Behavioural Intention

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.430	3	1.143	1.364	.258
Within Groups	80.461	96	.838		
Total	83.891	99			

Figure. 40. Descriptive stats summary table for comparing the mean difference in Occupation variable using ANOVA

Descriptives

Behavioural Intention

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Student	24	3.4844	.98447	.20095	3.0687	3.9001	1.50	5.00
Umemployed	3	3.6667	.68845	.39747	1.9565	5.3769	3.00	4.38
Self Employed	45	3.4028	.83338	.12423	3.1524	3.6532	1.50	5.00
Employed	28	3.0446	.99374	.18780	2.6593	3.4300	1.00	4.88
Total	100	3.3300	.92054	.09205	3.1473	3.5127	1.00	5.00

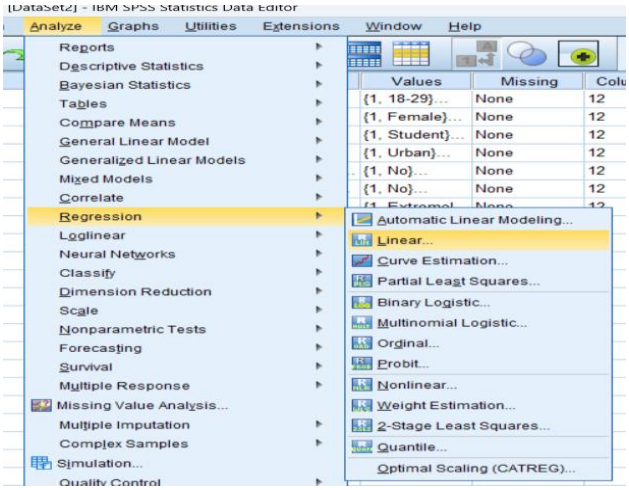
5.9 Regression Analysis

This is a statistical tool used to model the relationship between a dependent variable and one or more independent variables. In this analysis, we aim to determine how change in Age, Occupation, Gender, Location, VAR1 or VAR2 is associated with changes in the BI variable. Hence, the regression model is given as

$BI = \beta0 + \beta1*Age + \beta2*$ Occupation $+ \beta3*$Gender $+ \beta4*$ Location $+ \beta5*$ VAR1 $+ \beta6*$ VAR2 $+ \varepsilon$

Step 1:From the menu bar, select “Analyse”, then “Regression” and click on “Linear” as shown in figure 41 to load Linear Regression dialog box.

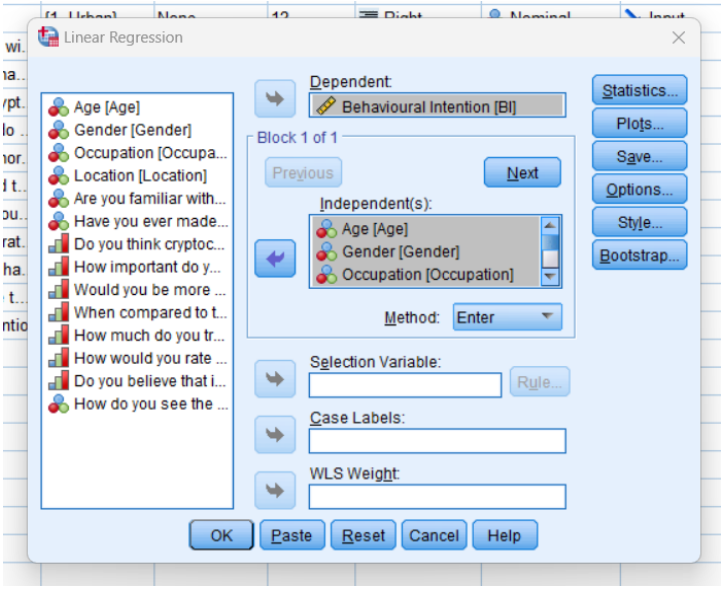
Figure. 41. Loading Regression dialog box



Step 2: On the loaded Linear Regression dialog box, select the BI variable to be analysed and move it into “Dependent” column.

Step 3: Move Age, Occupation, Gender, Location, VAR1 and VAR2 variables into “Independent” column and click “OK” to perform analysis as shown in figure 42.

Figure. 43. Linear Regression dialog box



RESULTS:

Figure. 44. Model Summary and ANOVA table for the regression model

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.412[a]	.170	.116	.86535

a. Predictors: (Constant), Have you ever made payment with any digital currency?, Occupation, Age, Location, Are you familiar with digital currencies like Bitcoin and Ethereum?, Gender

b. Dependent Variable: Behavioural Intention

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.251	6	2.375	3.172	.007[b]
	Residual	69.640	93	.749		
	Total	83.891	99			

a. Dependent Variable: Behavioural Intention

b. Predictors: (Constant), Have you ever made payment with any digital currency?, Occupation, Age, Location, Are you familiar with digital currencies like Bitcoin and Ethereum?, Gender

Figure. 45. Value Labels dialog view

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.474	.781		3.169	.002
	Age	-.290	.180	-.165	-1.612	.110
	Gender	-.126	.205	-.067	-.612	.542
	Occupation	-.098	.085	-.118	-1.158	.250
	Location	-.194	.238	-.081	-.814	.417
	Are you familiar with digital currencies like Bitcoin and Ethereum?	.900	.309	.295	2.913	.004
	Have you ever made payment with any digital currency?	.153	.207	.084	.739	.462

a. Dependent Variable: Behavioural Intention