

# [Quantitative methods analysis essay](https://assignbuster.com/quantitative-methods-analysis-essay/)

Contents

* Index of economic system

### Recognition

On top of that thanks to My GOD ” the Godhead of everything ” . Secondly my Parents whose unobserved supplications and encouragements fuelled me. My instructors & A ; lsquo ; ‘ who made me from a grain of sand toward the bounds of skyline ” . Motivations of my Brother ( Usman ) who has supported me all the manner long. My Friendless Brother Zunnorrain has ever been a charming chap. My sister by giving me love, stating everlastingly Do n’t Worry. Intentionally, I am non adverting one really of import individual for me here, any manner thanks.

### Thanksall of you being our protagonists.

Given Datas

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Time | Yttrium( Gross saless ) | X2( Prise ) | X3 ( Marketing ) | X4( Index ) |
| 1 | 986 | 1. 8 | 0. 4 | 100 |
| 2 | 1025 | 1. 9 | 0. 4 | 103 |
| 3 | 1057 | 2. 1 | 0. 5 | 104 |
| 4 | 1248 | 2. 2 | 0. 7 | 106 |
| 5 | 1142 | 2. 2 | 0. 6 | 102 |
| 6 | 1150 | 2. 3 | 0. 7 | 103 |
| 7 | 1247 | 2. 4 | 0. 9 | 107 |
| 8 | 1684 | 2. 2 | 1. 1 | 108 |
| 9 | 1472 | 2. 3 | 0. 9 | 108 |
| 10 | 1385 | 2. 5 | 1. 1 | 107 |
| 11 | 1421 | 2. 5 | 1. 2 | 104 |
| 12 | 1210 | 2. 6 | 1. 4 | 99 |
| 13 | 987 | 2. 7 | 1. 1 | 97 |
| 14 | 940 | 2. 8 | 0. 8 | 98 |
| 15 | 1001 | 2. 9 | 0. 7 | 101 |
| 16 | 1025 | 2. 4 | 0. 9 | 104 |
| 17 | 1042 | 2. 4 | 0. 7 | 102 |
| 18 | 1210 | 2. 5 | 0. 9 | 104 |
| 19 | 1472 | 2. 7 | 1. 2 | 107 |
| 20 | 1643 | 2. 8 | 1. 3 | 111 |
|  |  |  |  |  |
|  |  |  |  |  |

Meanss of The given informations

Y & A ; macr ; = Summation of Y/20 = 1217. 35

X2 & A ; macr ; = Summation of X2/20 = 2. 41

X3 & A ; macr ; = Summation of X3/20 = 0. 875

X4 & A ; macr ; = Summation of X4/20 = 103. 75

Activity 1

### Question I:

From the Data provided, cipher the additive multiple arrested development equations for those points that influence gross revenues?

### Solution:

There are so many computations are involved for this inquiry and most of the computations has been done with the aid of computing machine bundles including PASW and Spread sheet. Data has been taken from these computations and set it here in the same format.

Linear Multiple Regression equations for gross revenues and prise.

First we will take prise as independent variable and sale as dependant

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| X-X2 & A ; macr ; | Y-Y & A ; macr ; | & A ; amount ; ( Y-Y & A ; macr ; ) & A ; sup2 ; | ( X-X2 & A ; macr ; ) & A ; sup2 ; | ( X-X2 & A ; macr ; ) \* ( Y-Y & A ; macr ; ) |
| -0. 61 | -231. 35 | 53522. 8225 | 0. 3721 | 141. 1235 |
| -0. 51 | -192. 35 | 36998. 5225 | 0. 2601 | 98. 0985 |
| -0. 31 | -160. 35 | 25712. 1225 | 0. 0961 | 49. 7085 |
| -0. 21 | 30. 65 | 939. 4225 | 0. 0441 | -6. 4365 |
| -0. 21 | -75. 35 | 5677. 6225 | 0. 0441 | 15. 8235 |
| -0. 11 | -67. 35 | 4536. 0225 | 0. 0121 | 7. 4085 |
| -0. 01 | 29. 65 | 879. 1225 | 0. 0001 | -0. 2965 |
| -0. 21 | 466. 65 | 217762. 2225 | 0. 0441 | -97. 9965 |
| -0. 11 | 254. 65 | 64846. 6225 | 0. 0121 | -28. 0115 |
| 0. 09 | 167. 65 | 28106. 5225 | 0. 0081 | 15. 0885 |
| 0. 09 | 203. 65 | 41473. 3225 | 0. 0081 | 18. 3285 |
| 0. 19 | -7. 35 | 54. 0225 | 0. 0361 | -1. 3965 |
| 0. 29 | -230. 35 | 53061. 1225 | 0. 0841 | -66. 8015 |
| 0. 39 | -277. 35 | 76923. 0225 | 0. 1521 | -108. 1665 |
| 0. 49 | -216. 35 | 46807. 3225 | 0. 2401 | -106. 0115 |
| -0. 01 | -192. 35 | 36998. 5225 | 0. 0001 | 1. 9235 |
| -0. 01 | -175. 35 | 30747. 6225 | 0. 0001 | 1. 7535 |
| 0. 09 | -7. 35 | 54. 0225 | 0. 0081 | -0. 6615 |
| 0. 29 | 254. 65 | 64846. 6225 | 0. 0841 | 73. 8485 |
| 0. 39 | 425. 65 | 181177. 9225 | 0. 1521 | 166. 0035 |

### Calculations( Gross saless and Prise )

|  |  |
| --- | --- |
| Formula | Consequence |
| & A ; amount ; ( Y-Y & A ; macr ; ) & A ; sup2 ; | 971124. 55 |
| & A ; amount ; ( X-X2 & A ; macr ; ) & A ; sup2 ; | 1. 658 |
| & A ; amount ; ( X-X2 & A ; macr ; ) \* ( Y-Y & A ; macr ; ) | 173. 33 |
| & A ; amount ; ( X-X2 & A ; macr ; ) \* ( Y-Y & A ; macr ; )  B = — — — — — — — — — — — — –  & A ; amount ; ( X-X2 & A ; macr ; ) & A ; sup2 ; | 104. 5416164 |
| a = ( Y & A ; macr ; – bX2 & A ; macr ; ) | 965. 4047045 |
| R ( Correlation coefficients ) =  & A ; amount ; ( X-X2 & A ; macr ; ) \* ( Y-Y & A ; macr ; )  — — — — — — — — — — — — — — — — –  Sqrt & A ; amount ; ( X-X2 & A ; macr ; ) & A ; sup2 ; \* & A ; amount ; ( Y-Y & A ; macr ; ) & A ; sup2 ; | 0. 136597895 |

The equation for sale and Prise will be

### Y= a + bX2

### Y= 965. 404 + 104. 541 X2

Here by seting the value of X2 we can acquire the predicted value of Y ( Sale ) .

### Correlation and Graph:

R = 0. 136 the relation between sale and prise is neither really strong nor really weak but of class there is some relation. As the value is more than & A ; lsquo ; 0 ‘ so its tendency is toward positive. We besides know that if r2 = 1 so explained and entire fluctuation are equal and unexplained variation= 0. The graph given below demoing hetroscedasticity because all the variable do non hold finite discrepancy.

Linear Multiple Regression equations for gross revenues and Selling.

First we will take Marketing spend as independent variable and sale as dependant

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| X-X3 & A ; macr ; | Y-Y & A ; macr ; | & A ; amount ; ( Y-Y & A ; macr ; ) & A ; sup2 ; | ( X-X3 & A ; macr ; ) & A ; sup2 ; | ( X-X3 & A ; macr ; ) \* ( Y-Y & A ; macr ; ) |
| -0. 475 | -231. 35 | 53522. 8225 | 0. 225625 | 109. 89125 |
| -0. 475 | – ] =. 35 | 36998. 5225 | 0. 225625 | 91. 36625 |
| -0. 375 | -160. 35 | 25712. 1225 | 0. 140625 | 60. 13125 |
| -0. 175 | 30. 65 | 939. 4225 | 0. 030625 | -5. 36375 |
| -0. 275 | -75. 35 | 5677. 6225 | 0. 075625 | 20. 72125 |
| -0. 175 | -67. 35 | 4536. 0225 | 0. 030625 | 11. 78625 |
| 0. 025 | 29. 65 | 879. 1225 | 0. 000625 | 0. 74125 |
| 0. 225 | 466. 65 | 217762. 2225 | 0. 050625 | 104. 99625 |
| 0. 025 | 254. 65 | 64846. 6225 | 0. 000625 | 6. 36625 |
| 0. 225 | 167. 65 | 28106. 5225 | 0. 050625 | 37. 72125 |
| 0. 325 | 203. 65 | 41473. 3225 | 0. 105625 | 66. 18625 |
| 0. 525 | -7. 35 | 54. 0225 | 0. 275625 | -3. 85875 |
| 0. 225 | -230. 35 | 53061. 1225 | 0. 050625 | -51. 82875 |
| -0. 075 | -277. 35 | 76923. 0225 | 0. 005625 | 20. 80125 |
| -0. 175 | -216. 35 | 46807. 3225 | 0. 030625 | 37. 86125 |
| 0. 025 | -192. 35 | 36998. 5225 | 0. 000625 | -4. 80875 |
| -0. 175 | -175. 35 | 30747. 6225 | 0. 030625 | 30. 68625 |
| 0. 025 | -7. 35 | 54. 0225 | 0. 000625 | -0. 18375 |
| 0. 325 | 254. 65 | 64846. 6225 | 0. 105625 | 82. 76125 |
| 0. 425 | 425. 65 | 181177. 9225 | 0. 180625 | 180. 90125 |

### Calculations( Gross saless and Selling )

|  |  |
| --- | --- |
| Formula | Consequences |
| & A ; amount ; ( Y-Y & A ; macr ; ) & A ; sup2 ; = | 971124. 55 |
| & A ; amount ; ( X-X3 & A ; macr ; ) & A ; sup2 ; = | 1. 6175 |
| & A ; amount ; ( X-X3 & A ; macr ; ) \* ( Y-Y & A ; macr ; ) = | 796. 875 |
| & A ; amount ; ( X-X3 & A ; macr ; ) \* ( Y-Y & A ; macr ; )  B = — — — — — — — — — — — — – =  & A ; amount ; ( X-X3 & A ; macr ; ) & A ; sup2 ; | 492. 6584235 |
| a = ( Y & A ; macr ; – bX3 & A ; macr ; ) = | 786. 2738794 |
| R ( Correlation coefficients ) =  & A ; amount ; ( X-X3 & A ; macr ; ) \* ( Y-Y & A ; macr ; )  — — — — — — — — — — — — — — – =  Sqrt & A ; amount ; ( X-X3 & A ; macr ; ) & A ; sup2 ; \* & A ; amount ; ( Y-Y & A ; macr ; ) & A ; sup2 ; | 0. 635814738 |

The equation for sale and Prise will be

### Y= a + bX

### Y= 786. 273 + 492. 658 Ten

Here by seting the value of X we can acquire the predicted value of Y ( Sale )

### Correlation and Graph:

R = 0. 6358 the relation between sale and selling is strong. As the value is near to & A ; lsquo ; 1 ‘ so its tendency is towards strong positive.

Linear Multiple Regression equations for Gross saless and Index of Economy

Here we will take Index of Economy as independent variable and sale as dependant

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| X-X4 & A ; macr ; | Y-Y & A ; macr ; | & A ; amount ; ( Y-Y & A ; macr ; ) & A ; sup2 ; | ( X-X4 & A ; macr ; ) & A ; sup2 ; | ( X-X4 & A ; macr ; ) \* ( Y-Y & A ; macr ; ) |
| -3. 75 | -231. 35 | 53522. 8225 | 14. 0625 | 867. 5625 |
| -0. 75 | -192. 35 | 36998. 5225 | 0. 5625 | 144. 2625 |
| 0. 25 | -160. 35 | 25712. 1225 | 0. 0625 | -40. 0875 |
| 2. 25 | 30. 65 | 939. 4225 | 5. 0625 | 68. 9625 |
| -1. 75 | -75. 35 | 5677. 6225 | 3. 0625 | 131. 8625 |
| -0. 75 | -67. 35 | 4536. 0225 | 0. 5625 | 50. 5125 |
| 3. 25 | 29. 65 | 879. 1225 | 10. 5625 | 96. 3625 |
| 4. 25 | 466. 65 | 217762. 2225 | 18. 0625 | 1983. 2625 |
| 4. 25 | 254. 65 | 64846. 6225 | 18. 0625 | 1082. 2625 |
| 3. 25 | 167. 65 | 28106. 5225 | 10. 5625 | 544. 8625 |
| 0. 25 | 203. 65 | 41473. 3225 | 0. 0625 | 50. 9125 |
| -4. 75 | -7. 35 | 54. 0225 | 22. 5625 | 34. 9125 |
| -6. 75 | -230. 35 | 53061. 1225 | 45. 5625 | 1554. 8625 |
| -5. 75 | -277. 35 | 76923. 0225 | 33. 0625 | 1594. 7625 |
| -2. 75 | -216. 35 | 46807. 3225 | 7. 5625 | 594. 9625 |
| 0. 25 | -192. 35 | 36998. 5225 | 0. 0625 | -48. 0875 |
| -1. 75 | -175. 35 | 30747. 6225 | 3. 0625 | 306. 8625 |
| 0. 25 | -7. 35 | 54. 0225 | 0. 0625 | -1. 8375 |
| 3. 25 | 254. 65 | 64846. 6225 | 10. 5625 | 827. 6125 |
| 7. 25 | 425. 65 | 181177. 9225 | 52. 5625 | 3085. 9625 |

### Calculations( Gross saless and Index of Economy )

|  |  |
| --- | --- |
| Formulas | Consequences |
| & A ; amount ; ( Y-Y & A ; macr ; ) & A ; sup2 ; = | 971124. 55 |
| & A ; amount ; ( X-X4 & A ; macr ; ) & A ; sup2 ; = | 255. 75 |
| & A ; amount ; ( X-X4 & A ; macr ; ) \* ( Y-Y & A ; macr ; ) = | 12930. 75 |
| & A ; amount ; ( X-X4 & A ; macr ; ) \* ( Y-Y & A ; macr ; )  B = — — — — — — — — — — — — – =  & A ; amount ; ( X-X4 & A ; macr ; ) & A ; sup2 ; | 50. 56011 |
| a = ( Y & A ; macr ; – bX4 & A ; macr ; ) = | -4028. 26217 |
| R ( Correlation coefficients ) =  & A ; amount ; ( X-X4 & A ; macr ; ) \* ( Y-Y & A ; macr ; )  — — — — — — — — — — — — — — — – =  Sqrt & A ; amount ; ( X-X4 & A ; macr ; ) & A ; sup2 ; \* & A ; amount ; ( Y-Y & A ; macr ; ) & A ; sup2 ; | 0. 820499702 |

The equation for sale and Prise will be

### Y= a + bX4

### Y=- 4028. 26217 + 50. 56011 X4

Here by seting the value of X4 we can acquire the predicted value of Y ( Sale )

### Correlation and Graph:

R = 0. 8204 and r2 = . 6730 mean 67 % of original fluctuation in sale has been explanined. The relation between sale and economic system index is really strong. As the value of & A ; lsquo ; R ‘ is near to & A ; lsquo ; 1 ‘ so its tendency is towards strong positive. In my point of position and harmonizing to the observations this is the best fit line. The graph given below is expressions similar Homoscedasticity as variables are non holding a large discrepancy.

### Note:

The line on the X and Y plane is get downing from the value of Y when X is 0 in the equation. On the other words it is the value of & A ; lsquo ; ‘ a ” . And this line passes through the point of X & A ; macr ; and Y & A ; macr ; . Respectively for best tantrum.

The analysis by PASW

### Variables Entered/Removedb

|  |  |  |  |
| --- | --- | --- | --- |
| Model | Variable Entered | Variable Removed | Method Used |
| 1 | index, prise, marketinga |  | Enter |

All requested variables entered and dependent Variable is gross revenues. This is demoing that the method is enter besides called coincident method. However there are some other methods like forward choice, backward choice and stepwise method

### Model Summary

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Model | Roentgen | R Square | Adjusted R Square | Std Error of the Estimate |
| 1 | . 939a | . 882 | . 860 | 84. 54356 |

Forecasters ( Constants ) are index, prise, selling. Adjusted R Square value tells us that our theoretical account histories for 88. 2 % of discrepancy. A really good theoretical account

### ANOVAb

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Model | Sum of Squares | df | Mean Square | F | Sig/p |
| Arrested development  Residual  Entire | 856762. 731  114361. 819  971124. 550 | 3  16  19 | 285587. 577  7147. 614 | 39. 956 | . 000a |

Forecasters are ) , index, prise, selling and dependant Variable are gross revenues. This tabular array reports an ANOVA, which assesses the overall significance of our theoretical account. As P & A ; lt ; 0. 05 our theoretical account is important.

|  |
| --- |
|  |

### Coefficients

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Model | Unstandardized Coefficients | Standardized Coefficients | T | Sig. |  | |  | Bacillus | Std. Mistake | Beta |  |  | | Changeless  prise selling  index | -2871. 140  -174. 471  472. 557  39. 474 | 662. 531  92. 032  96. 736  5. 813 | -. 228  . 610  . 641 | -4. 334  -1. 896  4. 885  6. 791 | . 001  . 076  . 000  . 000 |  |  | | --- | |  |   The Standardized Beta Coefficients give a step of the part of each variable to the theoretical account. A big value indicates that a unit alteration in this forecaster variable has a big consequence on the standard variable. The T and Sig ( P ) values give a unsmooth indicant of the impact of each forecaster variable a large absolute T value and little P value suggests that a forecaster variable is holding a big impact on the standard variable. |

### Question II:

Using the consequences and any extra statistics you require, remark on whether the anticipations from your equation will give a good prognosis?

### Solution:

There are so many methods for anticipation and forcasting including clip series, quantitative methods and some causal based. All have their ain pros and cons but harmonizing to the given inquiry we are working with the additive multiple arrested development analysis. We have given the 3 independent variables like prise, selling and index of economic system. By commanding the independent variables we can command the dependant variable which is sale here. The equations derived from the above informations are as given below.

Y = 965. 404 + 104. 541 X2 ( Prise )

R = 0. 136597895

Y = 786. 273 + 492. 658 X3 ( Marketing )

R = 0. 635814738

Y = – 4028. 26217 + 50. 56011 X4 ( Index of Economy )

R = 0. 820499702

The above equations have been derived with the aid of computing machine package on possible degree of mistake free. They will give a good prognosis but remainders are ever in arrested developments which need to be purified by the aid fo typical methods.

### Question Three:

In your commentary say what jobs you looked for in the consequences and statistics used to prove each job?

### Solution:

1. Data is Limited to prove
2. The term & A ; lsquo ; ‘ Index of economic system ” has non been cleared.
3. There might be more factors set uping sale beside merely these three.
4. The values of Index of Economy are much higher than the prise and selling.
5. The value of & A ; lsquo ; ‘ a ” in marketing index is negative.

Activity 2:

### Use the 2 variables that have the highest explanatory power and explain

### Question 1:

How and why would you take them?

### Solution:

There are many important trial that can be performed by taking the variable from a large set of available independent variables set uping the dependant variable. For each independent variable it is hypothesized that the true value of its coefficient is zero. A important trial is carried for each variable and if the hypothesis is rejected this variable must hold truly consequence on the dependant variable. And if the hypothesis is accepted so we can exclude the variable from he preparation.

Other trial can be carried out including multi co one-dimensionality in which more than one independent variables are extremely correlated and difficult to happen a the difference. They consequence on the dependant variable with about same extent. We can decide this by taking merely one if the variables or doing set of two variables or to replace one of the variables with a new variable independent of the other.

In the given inquiry the selling and the index of economic system are the variables with the higher explanatory values. These two independent variable have a large consequence on the sale and with the aid of coefficient correlativity, there is a strong relation between the variables. This is the ground that we have chosen these variables.

### Question2.

What are the major jobs that arise in the usage of multiple arrested development techniques?

### Solution:

Correlations of all variables in a matrix signifier.

s

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Entire Number of Observations 20 | Sale | prise | selling | Index of economic system |
| Sale | 1 | 0. 13659 | 0. 63581 | 0. 82049 |
| Prise | 0. 13659 | 1 | 0. 65643 | -0. 0558 |
| Selling | 0. 63581 | 0. 65643 | 1 | 0. 2741 |
| Index of economic system | 0. 82049 | -0. 0558 | 0. 2741 | 1 |

1. That the relation between variables is additive is non ever true.
2. Premise that residuary are ever usually distributed. many trials are rather robust with respect to misdemeanors of this premise.
3. Determine relationship but ne’er gives a strong hint about causal mechanism.
4. No bounds of adding variables even we can set undistinguished variables
5. Multi carbon monoxide one-dimensionality
6. Suiting centred multinomial theoretical account. The adjustment of higher-order multinomials of an independent variable with a average non equal to zero can make hard multi co one-dimensionality jobs.
7. The Importance of Residual Analysis.