6104641300
Nuntayod

```
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-------------------------------------------------
      name:  <unnamed>
       log:  C:\Users\User\Desktop\EE 426 stata\assignment 12 .log
  log type:  text
 opened on:  21 Apr 2021, 21:54:34

. use "C:\Users\User\Desktop\EE 426 stata\assign12.dta", clear

. reg y x1 x2 x3 x4

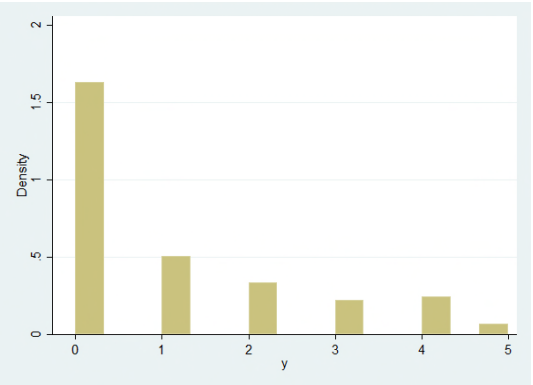
      Source |       SS           df       MS      Number of obs   =       232
-------------+----------------------------------   F(4, 227)       =      5.96
       Model |  44.7298499         4  11.1824625   Prob > F        =    0.0001
    Residual |  425.748598       227  1.87554449   R-squared       =    0.0951
-------------+----------------------------------   Adj R-squared   =    0.0791
       Total |  470.478448       231  2.03670324   Root MSE        =    1.3695

------------------------------------------------------------------------------
           y |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          x1 |   .1016201   .0435073     2.34   0.020     .0158904    .1873499
          x2 |   .1345044   .0462142     2.91   0.004     .0434407     .225568
          x3 |  -.0748194   .0480457    -1.56   0.121    -.1694919    .0198531
          x4 |   .1684563   .0688243     2.45   0.015     .0328401    .3040725
       _cons |   .9568064    .107007     8.94   0.000     .7459523     1.16766
------------------------------------------------------------------------------
```

1) Sign&meaning : x1, x2, and x4 have a positive correlation to y but x3 have a negative correlation to y
2)Overall test : The overall test is significant at 5% confidence level
3)GOF : R-square is very low
4)Individual test: All of independent variables are significant except x3.

2

```
. histogram y
(bin=15, start=0, width=.33333333)
```



From the histogram, we clearly seen that the data is not normally distributed which OLS estimator will be biased accordingly.


```
. poisson y x1 x2 x3 x4, ir nolog

Poisson regression                                Number of obs     =        232
                                                  LR chi2(4)        =      43.33
                                                  Prob > chi2       =     0.0000
Log likelihood = -342.88107                       Pseudo R2         =     0.0594

------------------------------------------------------------------------------
           y |        IRR   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          x1 |   1.102023   .0338059     3.17   0.002     1.037717    1.170314
          x2 |   1.138034   .0376594     3.91   0.000     1.066566    1.214291
          x3 |   .9309467   .0318548    -2.09   0.037     .8705599    .9955222
          x4 |   1.189399   .0603866     3.42   0.001     1.076742    1.313844
       _cons |   .8794245   .0746687    -1.51   0.130     .7446053    1.038654
------------------------------------------------------------------------------

. estat gof

         Deviance goodness-of-fit =  409.4921
         Prob > chi2(227)         =    0.0000

         Pearson goodness-of-fit  =  423.3541
         Prob > chi2(227)         =    0.0000
```

From Deviance goodness-of-fit and Pearson goodness-of-fit test, H0 is rejected which means that the poisson model is not an appropriated.

```
. mfx

Marginal effects after poisson
      y  = Predicted number of events (predict)
         =  .95621703
------------------------------------------------------------------------------
```

```
variable |      dy/dx    Std. Err.      z    P>|z|  [    95% C.I.   ]      X
---------+--------------------------------------------------------------------
      x1 |    .092894      .02882    3.22   0.001   .036403  .149385  -.317697
      x2 |   .1236411       .0308    4.01   0.000   .063277  .184005   .812709
      x3 |  -.0684205      .03246   -2.11   0.035   -.13204 -.004801  -.818103
      x4 |   .1658541      .04736    3.50   0.000   .073022  .258686   -.28275
------------------------------------------------------------------------------
```

1)Sign&meaning : From IRR, x1, x2, and x4 have a positive correlation to y but x3 have a negative correlation to y
2)Overall test : The overall test is significant at 5% confidence level
3)GOF : Pseudo R-square is very low
4)Individual test: All of independent variables are significant except x3.

4

```
. nbreg y x1 x2 x3 x4, ir nolog

Negative binomial regression                    Number of obs     =        232
                                                LR chi2(4)        =      21.24
Dispersion     = mean                           Prob > chi2       =     0.0003
Log likelihood = -317.49278                     Pseudo R2         =     0.0324

------------------------------------------------------------------------------
           y |        IRR   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          x1 |   1.137182   .0576476     2.54   0.011     1.029627    1.255973
          x2 |   1.163009   .0589037     2.98   0.003     1.053105    1.284383
          x3 |   .9349279   .0450052    -1.40   0.162     .8507526    1.027432
          x4 |   1.188428    .084026     2.44   0.015     1.034641    1.365072
       _cons |   .8662692   .1019776    -1.22   0.223     .6877792     1.09108
-------------+----------------------------------------------------------------
    /lnalpha |   .0479945   .2389531                     -.4203449    .5163339
-------------+----------------------------------------------------------------
       alpha |   1.049165   .2507012                      .6568202    1.675872
------------------------------------------------------------------------------
Likelihood-ratio test of alpha=0:  chibar2(01) =   50.78 Prob>=chibar2 = 0.000
```

Since LR test is rejecteed h0, Negative Binomial regression model is not appropriated.

```
. mfx

Marginal effects after nbreg
      y  = Predicted number of events (predict)
         =  .94607122
------------------------------------------------------------------------------
variable |      dy/dx    Std. Err.      z    P>|z|  [    95% C.I.   ]      X
```

```
---------+--------------------------------------------------------------------
      x1 |   .1216207      .04796    2.54   0.011    .02763   .215611  -.317697
      x2 |   .1428671      .04796    2.98   0.003   .048862   .236872   .812709
      x3 |  -.0636573      .04556   -1.40   0.162  -.152956   .025642  -.818103
      x4 |   .1633214      .06686    2.44   0.015   .032269   .294374   -.28275
------------------------------------------------------------------------------
```

1)Sign&meaning : From IRR, x1, x2, and x4 have a positive correlation to y but x3 have a negative correlation to y
2)Overall test : The overall test is significant at 5% confidence level
3)GOF : Pseudo R-square is very low
4)Individual test: All of independent variables are significant except x3.


```
. zip y x1 x2 x3, inflate(x4) vuong

Fitting constant-only model:

Iteration 0:   log likelihood = -355.48956
Iteration 1:   log likelihood =  -321.8304
Iteration 2:   log likelihood = -317.80147
Iteration 3:   log likelihood = -317.79274
Iteration 4:   log likelihood = -317.79274

Fitting full model:

Iteration 0:   log likelihood = -317.79274
Iteration 1:   log likelihood = -312.73621
Iteration 2:   log likelihood =  -312.6159
Iteration 3:   log likelihood =  -312.6158
Iteration 4:   log likelihood =  -312.6158

Zero-inflated Poisson regression               Number of obs     =        232
                                               Nonzero obs       =        106
                                               Zero obs          =        126

Inflation model = logit                        LR chi2(3)        =      10.35
Log likelihood  = -312.6158                    Prob > chi2       =     0.0158

------------------------------------------------------------------------------
           y |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
y            |
          x1 |   .0805446   .0398159     2.02   0.043     .0025068    .1585824
          x2 |   .0857883   .0372107     2.31   0.021     .0128567    .1587199
          x3 |  -.0672468   .0357098    -1.88   0.060    -.1372367     .002743
       _cons |   .4589728   .1106031     4.15   0.000     .2421947    .6757508
```

```
-------------+----------------------------------------------------------------
inflate      |
          x4 |  -.2738532   .1212311    -2.26   0.024    -.5114618   -.0362446
       _cons |  -.3379298   .1908217    -1.77   0.077    -.7119334    .0360738
------------------------------------------------------------------------------
Vuong test of zip vs. standard Poisson:            z =     3.92  Pr>z = 0.0000

From Vuong test which rejected h0, ZIP model is appropriated
Interpretation
-Overall test: The model is significance at 5% level
-Individual test: All of independent variables are  significant except x3, but x3
still significant at 10% level.
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(6)

6) The most appropriate model is ZIP model according to the test GOF, LR test, and Voung test, and also all of the independent are significant at 10% level

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. log close
      name:  <unnamed>
       log:  C:\Users\User\Desktop\EE 426 stata\assignment 12 .log
  log type:  text
 closed on:  21 Apr 2021, 21:58:02
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