Assignment #3 - Simeng Li

Goals:

- Prepare the code for calculating the beginning of 2022 risk exposures of stocks in preparation for your BA870 Individual Project.
- Learn how to download monthly stock returns from WRDS for a large set of companies.
- Estimate the Fama-French Risk Factor exposures for a large number of stocks (Hint: using a loop in Python).
- Save the estimated Risk Factor exposures for the 100 stocks to a CSV file (for future use in your BA870 Project).
- Provide a report of your completed assignment and analysis using "Markdown" text boxes in Colab Notebook
- Share a Colab Notebook using shareable weblink.
- Print a completed and executed Colab Notebook and submit in PDF format.

Requirments:

Create a new Colab Notwbook with the name "Assignment #3 - YOUR NAME.ipynb". Your notebook should have comments and explanatory textbooks to do the following:

- (i) Install necessary packages and libraries.
- (ii) Read in the CSV file with monthly stock returns for 60 months (2017-2021) for the 100 stocks. This is the file you created in Step (3) [100-Stocks-Returns.csv"].
- (iii) Create a LOOP that will perform the following tasks for each of the 100 stocks:
 - (a) Merge the stocks returns (60 months) for each stock with the FF Risk Factor data ("FF-Factors-2017-2021.csv").
 - (b) Run an OLS regression for each stock (60 months) using FF 3-Factor model.
 - (c) Extract the following output items from the regression results:
 - TICKER symbol
 - R-squared of the regression
 - Adj. R-squared of the regression
 - Regression "alpha" (ie, const)
 - Coefficient on the variable mktrf
 - Coefficient on the variable smb
 - Coefficient on the variable hml

For additional help on extracting the regression items, please read the documentation:

https://www.statsmodels.org/dev/examples/notebooks/generated/ols.html (https://www.statsmodels.org/dev/examples/notebooks/generated/ols.html)

- (d) Store the above items (TICKER, R-squared, Adj. R-squared, const, mktrf, smb, hml) to a row in a dataframe.
- (e) Repeat (a)-(d) for all 100 stocks.

Import libraries and packages

In [3]:

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import statsmodels.api as sm
```

Upload Stocks Returns data

In [4]:

```
data = pd.read_csv('/content/100-Stocks-Returns.csv')
data.head(3)
```

Out[4]:

	PERMNO	date	TICKER	RET
0	10220	20170131	BWXT	0.045088
1	10220	20170228	BWXT	0.119306
2	10220	20170331	BWXT	0.026916

In [5]:

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6000 entries, 0 to 5999
Data columns (total 4 columns):
# Column Non-Null Count Dtype
--- 0 PERMNO 6000 non-null int64
1 date 6000 non-null int64
2 TICKER 6000 non-null object
3 RET 6000 non-null float64
dtypes: float64(1), int64(2), object(1)
memory usage: 187.6+ KB
```

Upload Fama-French monthly risk factor data

```
In [6]:
```

```
ff_factors = pd.read_csv('/content/FF-Factors-2017-2021.csv')
ff_factors.head(3)
```

Out[6]:

	dateff	mktrf	smb	hml	rf
0	20170131	0.0194	-0.0113	-0.0274	0.0004
1	20170228	0.0357	-0.0204	-0.0167	0.0004
2	20170331	0.0017	0.0113	-0.0333	0.0003

List varaibles in FF dataframe

```
In [7]:
```

```
ff factors.info()
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 60 entries, 0 to 59
Data columns (total 5 columns):
    Column Non-Null Count Dtype
 0
    dateff 60 non-null
                            int64
 1
    mktrf
            60 non-null
                            float64
    smb
            60 non-null
                            float64
    hml
            60 non-null
                            float64
            60 non-null
                           float64
dtypes: float64(4), int64(1)
memory usage: 2.5 KB
```

Rename date column to "date" to match WRDS data "date" column for Stocks Returns data

```
In [8]:
```

```
ff_factors.rename(columns={'dateff':'date'}, inplace=True)
ff_factors.head()
```

Out[8]:

	date	mktrf	smb	hml	rf
0	20170131	0.0194	-0.0113	-0.0274	0.0004
1	20170228	0.0357	-0.0204	-0.0167	0.0004
2	20170331	0.0017	0.0113	-0.0333	0.0003
3	20170428	0.0109	0.0072	-0.0213	0.0005
4	20170531	0.0106	-0.0252	-0.0375	0.0006

Create a LOOP that will perform the following tasks for each of the 100 stocks:

- (a) Merge the stocks returns (60 months) for each stock with the FF Risk Factor data ("FF-Factors-2017-2021.csv").
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- (c) Extract the following output items from the regression results:
 - TICKER symbol
 - R-squared of the regression
 - Adj. R-squared of the regression
 - Regression "alpha" (ie, const)
 - Coefficient on the variable mktrf
 - Coefficient on the variable smb
 - Coefficient on the variable hml

In [9]:

```
# Create blank list for the final output
ticker = []
r squared = []
adj r squared = []
alpha = []
bata mktrf = []
bata smb = []
bata hml = []
# Loop for extracting the output variables
for i in data.TICKER.unique().tolist():
 # Extract sub ticker data
 sub df = data.loc[data['TICKER'] == i]
 # Merge the sub ticker data with Fama-French monthly risk factor data
 merge df = pd.merge(sub df, ff factors, on='date', how='outer')
 # Show one line of the merged data
 print(merge df.head(1))
 # Define the inputs of the regression
 y = merge df["RET"] - merge df["rf"]
 X = merge_df[["mktrf","smb","hml"]]
  # Use statsmodels
 X = sm.add constant(X) # adding a constant
 model = sm.OLS(y, X).fit()
  # Extract the output of the model
 ticker.append(i)
  r squared.append(model.rsquared)
  adj r squared.append(model.rsquared adj)
 alpha.append(model.params[0])
 bata mktrf.append(model.params[1])
 bata smb.append(model.params[2])
 bata hml.append(model.params[3])
  #Print out regression statistics
  print(model.summary())
```

```
date TICKER
                           mktrf smb hml rf
  PERMNO
                       RET
 10220 20170131 BWXT 0.045088 0.0194 -0.0113 -0.0274 0.0004
                    OLS Regression Results
______
========
Dep. Variable:
                           R-squared:
                         У
0.320
Model:
                        OLS
                            Adj. R-squared:
0.283
Method:
                Least Squares F-statistic:
8.765
Date:
              Wed, 13 Apr 2022 Prob (F-statistic):
7.38e-05
Time:
                    02:52:01 Log-Likelihood:
76.894
No. Observations:
                           AIC:
                         60
-145.8
Df Residuals:
                         56
                           BIC:
-137.4
Df Model:
                         3
Covariance Type:
                   nonrobust
______
           coef std err
                            t P>|t|
0.9751
const
         -0.0085 0.010 -0.869 0.388 -0.028
0.011
mktrf
         1.0351 0.206 5.020
                                  0.000 0.622
1.448
smb
         -0.2555
                0.359
                         -0.711
                                  0.480
                                          -0.975
0.464
         -0.0253 0.257
hml
                          -0.099
                                  0.922
                                          -0.540
0.489
______
========
                      6.773 Durbin-Watson:
Omnibus:
1.853
                      0.034 Jarque-Bera (JB):
Prob(Omnibus):
7.162
Skew:
                      -0.476 Prob(JB):
0.0279
Kurtosis:
                       4.399
                            Cond. No.
41.0
______
=======
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
  PERMNO
          date TICKER
                      RET
                           mktrf smb
                                       hml
  10318 20170131 BCPC 0.015729 0.0194 -0.0113 -0.0274 0.0004
0
                   OLS Regression Results
______
========
                         y R-squared:
Dep. Variable:
0.151
Model:
                        ols
                           Adj. R-squared:
0.106
                 Least Squares F-statistic:
Method:
```

```
3.321
Date:
               Wed, 13 Apr 2022
                            Prob (F-statistic):
0.0262
Time:
                     02:52:01 Log-Likelihood:
82.236
No. Observations:
                            AIC:
                          60
-156.5
Df Residuals:
                         56
                             BIC:
-148.1
Df Model:
                          3
Covariance Type: nonrobust
_____
========
            coef std err
                             t P>|t|
                                           [0.025
0.9751
          0.0076 0.009 0.857 0.395 -0.010
const
0.025
         0.4775 0.189 2.532
mktrf
                                   0.014
                                            0.100
0.855
                  0.328
                           0.706
smb
           0.2320
                                    0.483
                                            -0.426
0.890
hml
           0.1227 0.235 0.522
                                    0.604
0.593
_____
========
                       2.525 Durbin-Watson:
Omnibus:
2.604
Prob(Omnibus):
                       0.283 Jarque-Bera (JB):
2.164
Skew:
                      -0.465 Prob(JB):
0.339
Kurtosis:
                       2.954 Cond. No.
______
=======
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
           date TICKER
                       RET mktrf smb
  PERMNO
                                         hml
   10866 20170131 CAL -0.063071 0.0194 -0.0113 -0.0274 0.0004
                    OLS Regression Results
_____
========
Dep. Variable:
                          y R-squared:
0.492
                         OLS
Model:
                            Adj. R-squared:
0.465
Method:
                 Least Squares F-statistic:
18.07
               Wed, 13 Apr 2022 Prob (F-statistic):
Date:
2.52e-08
Time:
                     02:52:01 Log-Likelihood:
36.473
No. Observations:
                         60
                            AIC:
-64.95
Df Residuals:
                         56
                             BIC:
-56.57
Df Model:
                          3
```

Covariance Ty	_	nonrobu			
=======		std err	t	P> t	[0.025
0.975]					
const 0.030	-0.0086	0.019	-0.452	0.653	-0.047
mktrf 2.821	2.0110	0.404	4.973	0.000	1.201
smb 3.102	1.6910	0.704	2.401	0.020	0.280
hml 2.111	1.1020	0.504	2.188	0.033	0.093
=========	=======	========	=======		=======
Omnibus: 2.628		1.9	063 Durbi	in-Watson:	
Prob(Omnibus):	0.3	375 Jarqı	ue-Bera (JB):	
Skew: 0.450		0.4	100 Prob	(JB):	
Kurtosis:		2.9	85 Cond	. No.	
=========	========	========	-=======	========	=======
=======					
Warnings: [1] Standard is correctly PERMNO 0 10874 20	y specified date TIC	• KER RE	T mktrf	smb -0.0113 -0.0	hml rf
		-	ression Re		
=========	=======	========	:=======	=========	=======
Dep. Variable	e:		y R-sqı	uared:	
Model: 0.594		C	DLS Adj.	R-squared:	
Method: 29.73		Least Squar	es F-sta	atistic:	
Date: 1.25e-11	Wee	d, 13 Apr 20)22 Prob	(F-statistic):
Time: 78.575		02:52:	01 Log-I	Likelihood:	
No. Observat: -149.2	ions:		60 AIC:		
Df Residuals -140.8	:		56 BIC:		
Df Model: Covariance Ty	ype:	nonrobu	3 ist		
=========			-=======		
0.975]	coef	std err	t	P> t	[0.025
const	-0.0014	0.009	-0.151	0.880	-0.020
0.018 mktrf	1.4468	0.200	7.217	0.000	1.045

				ent_3_Simeng_Li	
1.848					
smb	0.9686	0.349	2.774	0.008	0.269
1.668					
hml	0.3721	0.250	1.490	0.142	-0.128
0.872					
=======================================	=======	========	=======	========	=======
Omnibus:		0.8	361 Durbi	n-Watson:	
2.211			201 20121	ii waasaii	
Prob(Omnibus):	0.6	550 Jarqu	e-Bera (JB):	
0.861	,			,	
Skew:		-0.0)97 Prob(JB):	
0.650					
Kurtosis:		2.4	146 Cond.	No.	
41.0					
=======================================	========	========	=======	========	=======
Warnings: [1] Standard	Errora 200	umo that the	a governiena	o matrix of	the errorg
is correctl			e Covariano	e matrix or	the errors
PERMNO	date TIC		ET mktrf	smb	hml r
			_	-0.0113 -0.0	
			gression Re		-
	========		-	=======	=======
				_	
Dep. Variabl	e:		y R-squ	ared:	
0.333				_ 1	
Model:		(DLS Adj.	R-squared:	
0.298		Toogt Cours	E ata	+;a+;a,	
Method: 9.339		Least Squar	les r-sta	tistic:	
Date:	WA	d 13 Apr 20)22 Proh	(F-statistic	١.
4.21e-05	,,,	α, 15 hpi 20	722 1100	(1-564615616	, •
Time:		02:52	:01 Log-L	ikelihood:	
94.508					
No. Observat	ions:		60 AIC:		
-181.0					
Df Residuals	:		56 BIC:		
-172.6					
Df Model:			3		
Corrowionae m	1700	nonrohi			
				========	=======
	========	========			
=======================================	========	========		P> t	
	========	========			
=======================================	coef	std err	t	P> t	[0.025
======================================	coef	========	t	P> t	
0.975] 	coef 0.0023	std err	t 0.313	P> t 0.756	[0.025
0.975] 	coef 0.0023	std err	t 0.313	P> t 0.756	[0.025
0.975] const 0.017 mktrf 1.073	coef 0.0023 0.7647	std err 0.007 0.154	t 0.313 4.974	P> t 0.756 0.000	[0.025 -0.012 0.457
0.975] const 0.017 mktrf 1.073 smb	coef 0.0023 0.7647	std err	t 0.313 4.974	P> t 0.756 0.000	[0.025 -0.012 0.457
0.975] const 0.017 mktrf 1.073 smb 0.295	coef 0.0023 0.7647 -0.2413	std err 0.007 0.154 0.268	0.313 4.974 -0.901	P> t 0.756 0.000 0.371	[0.025
0.975] const 0.017 mktrf 1.073 smb 0.295	coef 0.0023 0.7647 -0.2413	std err 0.007 0.154	0.313 4.974 -0.901	P> t 0.756 0.000 0.371	[0.025
0.975] const 0.017 mktrf 1.073 smb 0.295 hml -0.102	coef 0.0023 0.7647 -0.2413 -0.4860	std err 0.007 0.154 0.268 0.191	0.313 4.974 -0.901 -2.538	P> t 0.756 0.000 0.371	[0.025
0.975] const 0.017 mktrf 1.073 smb 0.295 hml -0.102	coef 0.0023 0.7647 -0.2413 -0.4860	std err 0.007 0.154 0.268 0.191	0.313 4.974 -0.901 -2.538	P> t 0.756 0.000 0.371 0.014	[0.025
0.975] const 0.017 mktrf 1.073 smb 0.295 hml -0.102	coef 0.0023 0.7647 -0.2413 -0.4860	std err 0.007 0.154 0.268 0.191	0.313 4.974 -0.901 -2.538	P> t 0.756 0.000 0.371 0.014	[0.025
======================================	coef 0.0023 0.7647 -0.2413 -0.4860	std err 0.007 0.154 0.268 0.191	t 0.313 4.974 -0.901 -2.538	P> t 0.756 0.000 0.371 0.014	[0.025

2.512 Skew: -0.241 Prob(JB):

0.285

Kurtosis: 3.879 Cond. No.

41.0

=======

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smb hml rf
0 12515 20170131 BKU 0.019103 0.0194 -0.0113 -0.0274 0.0004
OLS Regression Results

========

Dep. Variable: y R-squared:

0.724

Model: OLS Adj. R-squared:

0.709

Method: Least Squares F-statistic:

48.90

Date: Wed, 13 Apr 2022 Prob (F-statistic):

1.18e-15

Time: 02:52:01 Log-Likelihood:

97.222

No. Observations: 60 AIC:

-186.4

Df Residuals: 56 BIC:

-178.1

========

Df Model: 3
Covariance Type: nonrobust

0.975]	coef	std err	t	P> t	[0.025
const	0.0026	0.007	0.369	0.714	-0.011
0.016					
mktrf	0.9712	0.147	6.610	0.000	0.677
1.266					
smb	0.8289	0.256	3.240	0.002	0.316
1.342					
hml	1.1793	0.183	6.444	0.000	0.813
1.546					

=======

Omnibus: 6.635 Durbin-Watson:

2.435

Prob(Omnibus): 0.036 Jarque-Bera (JB):

5.745

Skew: 0.641 Prob(JB):

0.0566

Kurtosis: 3.809 Cond. No.

41.0

=======

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors

is correctly specified.

PERMNO date TICKER RET mktrf smb hml rf
0 13260 20170131 BCOV -0.10559 0.0194 -0.0113 -0.0274 0.0004

/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of concat except for the argument 'objs' will be keyword-only

x = pd.concat(x[::order], 1)

/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of concat except for the argument 'objs' will be keyword-only

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/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of concat except for the argument 'objs' will be keyword-only

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/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of concat except for the argument 'objs' will be keyword-only

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/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of concat except for the argument 'objs' will be keyword-only

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/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of concat except for the argument 'objs' will be keyword-only

x = pd.concat(x[::order], 1)

/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of concat except for the argument 'objs' will be keyword-only

x = pd.concat(x[::order], 1)

=========	========	OLS Regre	essio	on Re	esults	=======
=======						
Dep. Variable: 0.164		2	7 F	R-squ	ared:	
Model:		OLS	5 <i>I</i>	Adj.	R-squared:	
0.120 Method:	:	Least Squares	5 E	F-sta	atistic:	
3.671 Date:	Wed	, 13 Apr 2022	2 I	Prob	(F-statistic):	
0.0174 Time:		02:52:01		roα−I	ikelihood:	
40.212					inciinoo u.	
No. Observatio -72.42	ns:	60) <i>E</i>	AIC:		
Df Residuals: -64.05		56	5 E	BIC:		
Df Model:						
Covariance Typ		nonrobust ========		====	-========	=======
=======		a.l. J. a.u.a		ı	D2 4	
0.975]	coei	std err		τ	P> t	[0.025
const	0.0097	0.018	0.5	539	0.592	-0.026
0.046 mktrf	0.4539	0.380	1.1	195	0.237	-0.307
1.215 smb	1.3783	0.662	2.0	083	0.042	0.053
2.704 hml		0.473		116		
1.476	0.5281	0.4/3	1.	110	0.269	-0.420
=======================================	=======	========	====	====		======
Omnibus:		5.859) [Durbi	n-Watson:	
2.039 Prob(Omnibus):		0.053	3 3	Jarqu	ue-Bera (JB):	
5.176						
Skew: 0.0752		0.518	3 I	Prob(JB):	
Kurtosis:		3.998	3 (Cond.	No.	
	=======	========		====	-=========	
=======						
		me that the d	covar	rianc	ce matrix of the	e errors
is correctly PERMNO	date TICK	ER RET	m}	ktrf	smb hm	l rf
0 13548 201	70131 BL	MN -0.051026 OLS Regre			-0.0113 -0.027	4 0.0004
=========	=======				=========	=======
======= Dep. Variable:		7	7 F	3_em	uared:	
0.423			, 1	.v-sqc	area.	
Model: 0.392		OLS	5 <i>I</i>	Adj.	R-squared:	
Method:	:	Least Squares	5 F	F-sta	atistic:	
13.71	Mo 4	12 700 202) 1	Drob	/E ctatiction	
Date:	wea	, 13 Apr 2022	i E	TOD	(F-statistic):	

```
8.13e-07
Time:
                   02:52:01
                          Log-Likelihood:
43.359
No. Observations:
                       60
                          AIC:
-78.72
Df Residuals:
                          BIC:
                       56
-70.34
Df Model:
Covariance Type:
                  nonrobust
_____
_____
           coef std err t P>|t| [0.025]
0.9751
______
const
        -0.0040 0.017 -0.234
                               0.816 -0.038
0.030
mktrf
       1.8012 0.361
                      4.996
                                0.000 1.079
2.523
         0.6640 0.628 1.057
smb
                                0.295 - 0.594
1.922
          0.8201 0.449
                        1.826
                                0.073
hml
                                        -0.080
1.720
______
========
Omnibus:
                     10.273 Durbin-Watson:
2.437
Prob(Omnibus):
                     0.006 Jarque-Bera (JB):
11.678
Skew:
                     0.716 Prob(JB):
0.00291
Kurtosis:
                     4.619 Cond. No.
______
========
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
          date TICKER RET mktrf smb hml rf
  PERMNO
  13604 20170131 BERY 0.047199 0.0194 -0.0113 -0.0274 0.0004
                  OLS Regression Results
_____
========
Dep. Variable:
                        y R-squared:
0.503
Model:
                       OLS Adj. R-squared:
0.476
Method:
               Least Squares F-statistic:
18.86
             Wed, 13 Apr 2022 Prob (F-statistic):
Date:
1.41e-08
Time:
                   02:52:01 Log-Likelihood:
84,463
No. Observations:
                       60
                          AIC:
-160.9
Df Residuals:
                       56
                          BIC:
-152.5
Df Model:
Covariance Type:
                 nonrobust
______
```

22/4/12 22.30			rissignine	nt_5_6imeng_Ei	
0.975]	coef	std err	t	P> t	[0.025
const	-0.0066	0.009	-0.767	0.446	-0.024
0.011 mktrf	1.2827	0.182	7.058	0.000	0.919
1.647 smb	-0.5694	0.317	-1.799	0.077	-1.203
0.065 hml 0.778	0.3247	0.226	1.434	0.157	-0.129
========	=======				
Omnibus:		0.9		n-Watson:	
Prob(Omnibus 0.321):	0.6	-	e-Bera (JB):	:
Skew: 0.852		-0.0	•	,	
Kurtosis: 41.0		J.J	339 Cond.		
=======					
PERMNO	y specified date TIC	KER RE FAM 0.01199	T mktrf 7 0.0194 - gression Res	smb -0.0113 -0.0 sults	hml rf
======= Dep. Variabl 0.239	e:		y R-squa	ared:	
Model: 0.198		C	DLS Adj. H	R-squared:	
Method: 5.869		Least Squar	es F-stat	tistic:	
Date: 0.00147	We	d, 13 Apr 20)22 Prob	(F-statistic	·):
Time: 67.366		02:52:	01 Log-Li	ikelihood:	
No. Observat	ions:		60 AIC:		
Df Residuals	:		56 BIC:		
Df Model: Covariance T	ype:	nonrobu	3 ıst		
=========					
0.975]	coef	std err	+	D>	
					-
		0.011			
const 0.023	0.0005	0.011	0.045	0.964	-0.022
const		0.011		0.964	-0.022

2/4/12 22:56			Assignmen	t_3_Simeng_Li	
1.114					
hml	-0.0089	0.301	-0.030	0.977	-0.612
0.594					
	=======	========	======	=======	=======
		10 000	5 1 ' .	**************************************	
Omnibus:		10.293	Durbin	-Watson:	
2.199	_	0.006	To	Dama (ID).	
Prob(Omnibus)	•	0.006	Jarque	-Bera (JB):	
12.072		0 607	D1- (7	TD.)	
Skew:		-0.697	Prob(J	в):	
0.00239		4 600	O a m al	N.	
Kurtosis: 41.0		4.699	Cond.	NO.	
========					
Warnings:					
-	Errors assu	me that the co	ovariance	matrix of	the errors
is correctly					
PERMNO	date TICK	ER RET	mktrf	smb	hml ı
0 13766 20	170131 В		0.0194 -	0.0113 -0.0	274 0.000
		OLS Regre	ssion Res	ults	
========	========	=========	======	=======	=======
=======					
Dep. Variable	:	У	R-squa	red:	
0.484					
Model:		OLS	Adj. R	-squared:	
0.457					
Method:		Least Squares	F-stat	istic:	
17.53					
Date:	Wed	, 13 Apr 2022	Prob (F-statistic):
3.79e-08					
Time:		02:52:01	Log-Li	kelihood:	
62.219					
No. Observati	ons:	60	AIC:		
-116.4					
Df Residuals:		56	BIC:		
-108.1					
Df Model:		3			
-	-	nonrobust			
	========	=======	======	=======	=======
=======	goof	std err	+	D> +	10 025
0.975]	COCI	Sca ell	C	17 6	[0.025
const	0.0094	0.012	0.758	0.452	-0.015
0.034					
mktrf	1.6082	0.263	6.108	0.000	1.081
2.136					
smb	0.4573	0.459	0.997	0.323	-0.461
1.376					
hml	0.4129	0.328	1.259	0.213	-0.244
1.070					
	=======	========	======	=======	=======
====== Omnibus:		2.487	Durbin	-Watson:	
0mnibus: 2.232		2.48/	חמדמדוו	-watson:	
2.232 Prob(Omnibus)	•	0.288	Tarana	-Bera (JB):	
1.959	•	0.200	Jarque	-nera (np):	
Skew:		0.441	Prob(J	'R) •	
DVCM.		0.441	TOD(1	٠,٠	

0.376

Kurtosis: 3.083 Cond. No.

41.0

=======

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

=======

Dep. Variable: y R-squared:

0.228

Model: OLS Adj. R-squared:

0.186

Method: Least Squares F-statistic:

5.506

Date: Wed, 13 Apr 2022 Prob (F-statistic):

0.00219

Time: 02:52:01 Log-Likelihood:

34.676

No. Observations: 60 AIC:

-61.35

Df Residuals: 56 BIC:

-52.98

Df Model: 3
Covariance Type: nonrobust

=======

0.975]	coef	std err	t	P> t	[0.025
const	-0.0306	0.020	-1.556	0.125	-0.070
0.009					
mktrf	1.4605	0.417	3.505	0.001	0.626
2.295					
smb	0.6889	0.726	0.949	0.347	-0.765
2.143					
hml	-0.1568	0.519	-0.302	0.764	-1.197
0.883					

========

Omnibus: 4.642 Durbin-Watson:

1.876

Prob(Omnibus): 0.098 Jarque-Bera (JB):

4.489

Skew: 0.309 Prob(JB):

0.106

Kurtosis: 4.188 Cond. No.

41.0

========

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smb hml rf

```
14149 20170131 BNFT 0.018518 0.0194 -0.0113 -0.0274 0.0004
                  OLS Regression Results
_____
========
Dep. Variable:
                           R-squared:
0.292
                       OLS
Model:
                           Adj. R-squared:
0.255
               Least Squares
Method:
                          F-statistic:
7.716
             Wed, 13 Apr 2022
Date:
                         Prob (F-statistic):
0.000211
Time:
                   02:52:01
                         Log-Likelihood:
36.491
No. Observations:
                       60
                           AIC:
-64.98
Df Residuals:
                           BIC:
                       56
-56.61
Df Model:
Covariance Type:
                  nonrobust
______
========
           coef std err
                           t
                                P>|t| [0.025]
0.9751
______
        -0.0248 0.019 -1.301
                                0.198 -0.063
const
0.013
         1.3870 0.404
                        3.431
                                0.001
mktrf
                                        0.577
2.197
         1.4461 0.704
                        2.054
                                0.045
smb
                                        0.036
2.856
          hml
1.113
______
========
                    13.215 Durbin-Watson:
Omnibus:
2.178
Prob(Omnibus):
                     0.001 Jarque-Bera (JB):
15.384
Skew:
                     0.921 Prob(JB):
0.000456
                     4.662
                           Cond. No.
Kurtosis:
______
=======
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
          date TICKER
  PERMNO
                     RET mktrf
                                smb
                                     hml
  14181 20170131 BRX -0.001229 0.0194 -0.0113 -0.0274 0.0004
                  OLS Regression Results
_____
=======
Dep. Variable:
                        y R-squared:
0.625
                       OLS
                         Adj. R-squared:
Model:
0.605
Method:
                Least Squares F-statistic:
31.12
```

```
Wed, 13 Apr 2022
                             Prob (F-statistic):
Date:
5.69e-12
Time:
                     02:52:01
                            Log-Likelihood:
77.388
No. Observations:
                          60
                            AIC:
-146.8
Df Residuals:
                            BIC:
                          56
-138.4
Df Model:
                          3
Covariance Type:
                   nonrobust
______
========
           coef std err
                              t
                                    P>|t|
0.9751
         -0.0026 0.010 -0.270 0.788 -0.022
const.
0.017
mktrf
         1.3744 0.204 6.721 0.000 0.965
1.784
          0.8574
                 0.356
                           2.408
                                    0.019
                                            0.144
smb
1.571
                  0.255
          0.8584
                           3.370
                                    0.001
                                             0.348
hml
______
                       0.264 Durbin-Watson:
Omnibus:
2.558
Prob(Omnibus):
                       0.876 Jarque-Bera (JB):
0.451
Skew:
                       -0.084 Prob(JB):
0.798
Kurtosis:
                       2.610 Cond. No.
41.0
______
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
          date TICKER RET mktrf smb hml
  PERMNO
 14182 20170131 BURL -0.012389 0.0194 -0.0113 -0.0274 0.0004
                    OLS Regression Results
______
========
Dep. Variable:
                          y R-squared:
0.261
Model:
                         OLS
                            Adj. R-squared:
0.222
Method:
                 Least Squares F-statistic:
6.606
Date:
               Wed, 13 Apr 2022 Prob (F-statistic):
0.000669
Time:
                     02:52:01 Log-Likelihood:
75.096
No. Observations:
                          60 AIC:
-142.2
Df Residuals:
                            BIC:
                          56
-133.8
Df Model:
                          3
Covariance Type:
                    nonrobust
```

=========	:=======	.========		:========	=======
0.975]	coef	std err	t	P> t	[0.025
const	0.0145	0.010	1.448	0.153	-0.006
0.035	0 7000	0.010	2 450	0 001	0 207
mktrf	0.7330	0.212	3.450	0.001	0.307
1.159 smb	0.4091	0 270	1.106	0.274	-0.332
1.150	0.4091	0.370	1.106	0.2/4	-0.332
hml	0.2324	0.265	0.878	0.384	-0.298
0.763	0.2324	0.203	0.070	0.504	-0.290
==========	=======	-========	=======	:========	=======
========					
Omnibus:		2.059	9 Durbin	-Watson:	
2.254					
Prob(Omnibus):		0.35	7 Jarque	e-Bera (JB):	
1.615			-	, ,	
Skew:		0.228	B Prob(J	^т В):	
0.446					
Kurtosis:		2.33	B Cond.	No.	
41.0					
==========					

Warnings:

=======

^[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

```
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
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ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
```

```
date TICKER
                           mktrf smb hml
  PERMNO
                       RET
 14500 20170131 BRG -0.039602 0.0194 -0.0113 -0.0274 0.0004
                   OLS Regression Results
______
========
Dep. Variable:
                           R-squared:
                         У
0.159
Model:
                        OLS
                           Adj. R-squared:
0.114
Method:
                Least Squares F-statistic:
3.533
Date:
              Wed, 13 Apr 2022 Prob (F-statistic):
0.0204
Time:
                    02:52:02 Log-Likelihood:
32.838
No. Observations:
                           AIC:
                         60
-57.68
Df Residuals:
                         56
                           BIC:
-49.30
Df Model:
                         3
Covariance Type:
                   nonrobust
______
           coef std err
                             t P>|t|
0.9751
         0.0251 0.020 1.238
                                  0.221 -0.015
const
0.066
         0.6273 0.430 1.460
                                  0.150 -0.233
mktrf
1.488
                  0.748
smb
          0.8780
                          1.173
                                  0.246
                                          -0.621
2.377
                          1.806
                                          -0.105
hml
          0.9667 0.535
                                   0.076
2.039
_____
========
                      52.102 Durbin-Watson:
Omnibus:
1.462
                      0.000 Jarque-Bera (JB):
Prob(Omnibus):
336.805
Skew:
                      2.240 Prob(JB):
7.31e-74
Kurtosis:
                      13.708 Cond. No.
41.0
______
=======
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
  PERMNO
          date TICKER
                      RET
                           mktrf smb
                                       hml
  14543 20170131 BLBD 0.090615 0.0194 -0.0113 -0.0274 0.0004
0
                   OLS Regression Results
______
=======
                         y R-squared:
Dep. Variable:
0.350
Model:
                        ols
                           Adj. R-squared:
0.316
                 Least Squares F-statistic:
Method:
```

```
10.06
Date:
               Wed, 13 Apr 2022
                            Prob (F-statistic):
2.10e-05
Time:
                     02:52:02
                            Log-Likelihood:
54.994
No. Observations:
                            AIC:
                          60
-102.0
Df Residuals:
                         56
                             BIC:
-93.61
Df Model:
                          3
             nonrobust
Covariance Type:
_____
========
            coef std err
                             t P>|t|
                                           [0.025
0.9751
         -0.0005 0.014 -0.035 0.972 -0.029
const
0.028
         0.8559 0.297 2.882
mktrf
                                   0.006
                                           0.261
1.451
                  0.517
                           2.755
                                    0.008
smb
          1.4248
                                            0.389
2.461
hml
           0.6221 0.370 1.682
                                    0.098
1.363
_____
========
                       4.698 Durbin-Watson:
Omnibus:
2.283
Prob(Omnibus):
                       0.095 Jarque-Bera (JB):
3.761
Skew:
                      -0.479 Prob(JB):
0.153
Kurtosis:
                       3.765 Cond. No.
______
=======
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
           date TICKER
                       RET mktrf smb
  PERMNO
                                         hml
   14650 20170131 BWFG -0.098154 0.0194 -0.0113 -0.0274 0.0004
                    OLS Regression Results
_____
========
Dep. Variable:
                          y R-squared:
0.549
                         OLS
Model:
                            Adj. R-squared:
0.524
Method:
                 Least Squares F-statistic:
22.69
               Wed, 13 Apr 2022 Prob (F-statistic):
Date:
9.63e-10
Time:
                     02:52:02 Log-Likelihood:
83.083
No. Observations:
                         60
                            AIC:
-158.2
Df Residuals:
                         56
                             BIC:
-149.8
Df Model:
                          3
```

Covariance Ty		nonrobu	st		
0.975]	coef	std err	t	P> t	[0.025
 const	0.0089	0.009	1.012	0.316	-0.009
0.026 mktrf	0.4879	0.186	2.624	0.011	0.115
0.860 smb	0.7597	0.324	2.346	0.023	0.111
1.408 hml 1.837	1.3729	0.232	5.927	0.000	0.909
=========	:======:	========		=======	=======
 Omnibus: 2.401		1.1)5 Durbin	-Watson:	
Prob(Omnibus) 0.460	:	0.5	76 Jarque	-Bera (JB):	
Skew: 0.794		0.0	l1 Prob(J	В):	
Kurtosis: 41.0		3.43	29 Cond.	No.	
=======================================	:======:	========	=======		=======
Warnings: [1] Standard is correctly PERMNO 0 14925 20		KER RET CLI 0.11811 OLS Reg	mktrf 0.0194 -0 cession Res	smb h	ml rf 74 0.0004
======= Dep. Variable	. •		y P. cours	rod.	
0.041 Model:	::	0.	y R-squa		
-0.010 Method:		Least Square	_	-squared:	
0.8051 Date:	Mod	d, 13 Apr 20			١.
0.496 Time:	wet	02:52:		kelihood:)•
8.9101 No. Observati	ong •		50 AIC:	.keiinoou:	
-9.820					
Df Residuals:			56 BIC:		
Df Model: Covariance Ty	_				
=========		=======		=======	
0.975]		std err			-
const		0.020			
0.083	0.0229	0.030	0.757	0.452	-0.038

1.173					
smb	1.2445	1.115	1.116	0.269	-0.989
3.478					
hml	-0.9804	0.797	-1.229	0.224	-2.578
0.617					
========	=========	=======	:=======	:=======	========
========					
Omnibus:		6.2	270 Durbir	-Watson:	
2.327					
Prob(Omnib	us):	0.0)44 Jarque	e-Bera (JB):	
6.519					
Skew:		0.4	440 Prob(3	ſВ) :	
0.0384					
Kurtosis:		4.3	Cond.	No.	
41.0					
========		========	========		========

=======

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smb hml rf

/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of concat except for the argument 'objs' will be keyword-only

x = pd.concat(x[::order], 1)

/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of concat except for the argument 'objs' will be keyword-only

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/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of concat except for the argument 'objs' will be keyword-only

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/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of concat except for the argument 'objs' will be keyword-only

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/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of concat except for the argument 'objs' will be keyword-only

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/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of concat except for the argument 'objs' will be keyword-only

x = pd.concat(x[::order], 1)

/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of concat except for the argument 'objs' will be keyword-only

x = pd.concat(x[::order], 1)

/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of concat except for the argument 'objs' will be keyword-only

x = pd.concat(x[::order], 1)

OLS Regression Results

		OLS	Regre	ssi	on Re	esults	
=======================================	=======	======	=====	===	=====	:========:	======
Dep. Variable: 0.458			У		R-squ	uared:	
Model: 0.429			OLS		Adj.	R-squared:	
Method:		Least Sq	uares		F-sta	atistic:	
15.76 Date:	Wed	, 13 Apr	2022		Prob	(F-statistic):	
1.51e-07 Time:		02:	52:02		Log-I	ikelihood:	
40.642 No. Observation	ns:		60		AIC:		
-73.28 Df Residuals:			56		BIC:		
-64.91			2				
Df Model: Covariance Type	e :	nonr	3 obust				
					=====	-=========	=======
=======							
0.975]	coef	std err			t	P> t	[0.025
	-0.0092	0.018		-0.	514	0.609	-0.045
0.026				_			
mktrf 2.755	1.9993	0.377		5.	300	0.000	1.244
smb	1.2887	0.657		1.	961	0.055	-0.027
2.605							
hml	0.4997	0.470		1.	063	0.292	-0.442
1.441							
=======================================	=======	======	=====	===	=====	:========:	======
Omnibus:			4.511		Durbi	n-Watson:	
Prob(Omnibus): 3.581			0.105		Jarqu	ue-Bera (JB):	
Skew: 0.167			0.560		Prob	JB):	
Kurtosis:			3.420		Cond	No.	
41.0							
=======================================	=======	======	=====	===		:========	=======
========							
			the c	ova	ariano	ce matrix of the	e errors
is correctly a	specified. date TICK		RET	n	nktrf	smb hm	l rf
						-0.0113 -0.027	
		OLS	Regre	ssi	on Re	esults	
	=======	======	====	===	-====		=======
Dep. Variable:			37		D car	ared.	
0.476			У		v-sqt	uared:	
Model:			OLS		Adj.	R-squared:	
0.448							
Method:		Least Sq	uares		F-sta	atistic:	
16.98 Date:	Wed	, 13 Apr	2022		Prob	(F-statistic):	
Ducc.	wed	, 13 API	2022		1100	(1 -DCUCTBCIC):	

```
5.78e-08
Time:
                   02:52:02
                          Log-Likelihood:
31.060
No. Observations:
                       60
                          AIC:
-54.12
Df Residuals:
                          BIC:
                       56
-45.74
Df Model:
Covariance Type:
                  nonrobust
_____
_____
          coef std err t P>|t| [0.025]
0.9751
_____
         0.0267 0.021 1.277
                               0.207 -0.015
const
0.068
mktrf 2.4236 0.443 5.476
                                0.000 1.537
3.310
         1.7265 0.771 2.240
smb
                                0.029 0.182
3.271
                                0.408
          0.4592 0.551
                        0.833
hml
                                       -0.645
1.564
______
========
Omnibus:
                    41.553 Durbin-Watson:
2.102
Prob(Omnibus):
                     0.000 Jarque-Bera (JB):
175.948
Skew:
                     1.847 Prob(JB):
6.21e-39
Kurtosis:
                    10.532 Cond. No.
______
========
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
         date TICKER RET mktrf smb hml rf
  PERMNO
  14995 20170131 CALA 1.153846 0.0194 -0.0113 -0.0274 0.0004
                  OLS Regression Results
_____
========
Dep. Variable:
                        y R-squared:
0.110
Model:
                      OLS Adj. R-squared:
0.062
Method:
               Least Squares F-statistic:
2.307
             Wed, 13 Apr 2022 Prob (F-statistic):
Date:
0.0865
Time:
                   02:52:02 Log-Likelihood:
-0.32105
No. Observations:
                       60
                         AIC:
8.642
Df Residuals:
                       56
                          BIC:
17.02
Df Model:
Covariance Type:
                 nonrobust
______
```

=======						
0 0751	coef	std err		t	P> t	[0.025
0.975]						
const	-0.0325	0.035	-0	.922	0.361	-0.103
0.038						
mktrf	1.7918	0.747	2	.400	0.020	0.296
3.288			_			
smb	-0.0558	1.300	-0	.043	0.966	-2.661
2.549 hml	-1.2432	0.930	1	227	0 107	-3.106
0.620	-1.2432	0.930	-1	• 33/	0.187	-3.106
=========		========	=====	=====		
=======					_	
Omnibus:		36.	197	Durb	in-Watson:	
1.331	- \	0	000	T	D (TD)	
Prob(Omnibus	5):	0.0	000	Jarqı	ıe-Bera (JB):	
121.588 Skew:		1	666	Prob	/ TD \ •	
3.96e-27		1.	000	PLOD	(06):	
Kurtosis:		9.	127	Cond	. No.	
41.0				00110	,00	
=========		=======	=====	=====		
=======						
PERMNO	ly specified date TIC	KER R		mktrf		nml rf
=========	=========	OLS Re			-0.0113 -0.02 esults =======	274 0.0004
=======================================			gress	ion Re	esults =======	=======================================
======== =============================				ion Re		
======== =============================		OLS Re	gress ===== y	ion Re ===== R-squ	esults ======== uared:	
======== =============================		OLS Re	gress	ion Re ===== R-squ	esults =======	========
======================================		OLS Re	gress ===== y OLS	ion Re ===== R-squ Adj.	esults ======= uared: R-squared:	
======================================		OLS Re	gress ===== y OLS	ion Re ===== R-squ Adj.	esults ======= uared: R-squared:	
======== Dep. Variabl 0.306 Model: 0.269 Method:	 Le:	OLS Re	gress ===== y OLS res	ion Re ===== R-squ Adj. F-sta	esults ======= uared: R-squared:	
======================================	 Le:	OLS Rec	gress y OLS res	ion Re ===== R-squ Adj. F-sta	esults ====================================	
======================================	 Le:	OLS Rec	gress y OLS res	ion Re ===== R-squ Adj. F-sta	esults ======== uared: R-squared: atistic:	
======================================	 Le: We	OLS Rec	y OLS res 022	R-squ Adj. F-sta	esults ====================================	
Dep. Variable 0.306 Model: 0.269 Method: 8.245 Date: 0.000124 Time: 59.071 No. Observat	 Le: We	OLS Rec	gress y OLS res	ion Re ===== R-squ Adj. F-sta	esults ====================================	
Dep. Variable 0.306 Model: 0.269 Method: 8.245 Date: 0.000124 Time: 59.071 No. Observation 110.1	Le: We	OLS Rec	y OLS res 022 :02	R-squ Adj. F-sta Prob Log-l	esults ====================================	
Dep. Variable 0.306 Model: 0.269 Method: 8.245 Date: 0.000124 Time: 59.071 No. Observat	Le: We	OLS Rec	y OLS res 022	R-squ Adj. F-sta	esults ====================================	
======================================	Le: We	OLS Rec	y OLS res 022 :02	R-squ Adj. F-sta Prob Log-l	esults ====================================	
======================================	Le: We	OLS Rec	y OLS res 022 60 56 3	R-squ Adj. F-sta Prob Log-l	esults ====================================	
Dep. Variable 0.306 Model: 0.269 Method: 8.245 Date: 0.000124 Time: 59.071 No. Observation 10.1 Df Residuals 101.8 Df Model: Covariance 7	Le: We	OLS Received on the control of the c	gress y OLS res 022 60 56 3 ust	ion Re	esults ====================================	
Dep. Variable 0.306 Model: 0.269 Method: 8.245 Date: 0.000124 Time: 59.071 No. Observation 10.1 Df Residuals 101.8 Df Model: Covariance 7	Le: We Type:	OLS Rec	gress y OLS res 022 60 56 3 ust	ion Re	esults ===================================	:
======================================	Le: We Type:	OLS Received on the control of the c	gress y OLS res 022 60 56 3 ust	ion Re	esults ===================================	:
Dep. Variable 0.306 Model: 0.269 Method: 8.245 Date: 0.000124 Time: 59.071 No. Observate -110.1 Df Residuals -101.8 Df Model: Covariance Tempers	Le: We Type:	OLS Rec	gress y OLS res 022 60 56 3 ust	ion Re	esults ===================================	:
======================================	Le: We Type:	OLS Rec	gress y OLS res 022 60 56 3 ust	ion Re	esults ===================================	:
======================================	Le: We Type:	OLS Rec	gress y OLS res 022 60 56 3 ust	ion Re	esults ====================================	: : : : : : : : : : :
Dep. Variable 0.306 Model: 0.269 Method: 8.245 Date: 0.000124 Time: 59.071 No. Observate -110.1 Df Residuals -101.8 Df Model: Covariance 1 ====================================	Le: We Lions: Cype: coef	OLS Received and the second of	gress y OLS res 022 60 56 3 ust	ion Re	esults ====================================	: : : : : : : : : : : :
======================================	Le: We Lions: Cype: coef	OLS Received and the second of	gress y OLS res 022 60 56 3 ust 	ion Re	esults ====================================	: : : : : : : : : : : :
======================================	Le: We Lions: Cype: coef	OLS Recession OL	gress y OLS res 022 60 56 3 ust -0 4	ion Re ===== R-squ Adj. F-sta Prob Log-1 AIC: BIC:	esults ====================================	[0.025 -0.027

2/4/12 22:56			Assignme	nt_3_Simeng_Li	
1.322 hml 0.828	0.1352	0.346			
=======			_ ,,		
Omnibus:		2.335	Durbir	-Watson:	
2.255 Prob(Omnibus):		0.311	Jarque	e-Bera (JB):	
2.024		0.311	Jarque	e-bera (UD).	
Skew:		0.448	Prob(3	ГВ):	
0.364			,	•	
Kurtosis:		2.924	Cond.	No.	
41.0					
=======================================	=======	=======	======	=======	=======
Warnings: [1] Standard E is correctly PERMNO			ovariance mktrf		the errors
	170131 BP		0.0194 -	-0.0113 -0.0	
	-======		======		=======
======= Don Variable:			D 0000	rod.	
Dep. Variable: 0.149		У	R-squa	irea:	
Model:		OLS	Adi. F	R-squared:	
0.104		025	114,74	· bquarou.	
Method:		Least Squares	F-stat	istic:	
3.271					
Date:	Wed	, 13 Apr 2022	Prob (F-statistic):
0.0277					
Time:		02:52:02	Log-Li	kelihood:	
37.756 No. Observatio	nne•	60	AIC:		
-67.51)IIS •	00	AIC.		
Df Residuals:		56	BIC:		
-59.14					
Df Model:		3			
Covariance Typ					
========					
0.975]	coef	std err	t	P> t	[0.025
	0.0213	0.019	1.142	0.258	-0.016
0.059					
mktrf	0.5616	0.396	1.419	0.161	-0.231
1.355	1 E016	0 600	2 200	0 025	A 211
smb 2.973	1.3310	0.689	2.309	0.025	0.211
	-0.3179	0.493	-0.645	0.522	-1.306
0.670					
=======================================	:=======	========	=======	=======	=======
Omnibus:		0.211	Durbir	ı-Watson:	
2.011		0.211			
Prob(Omnibus):		0.900	Jarque	e-Bera (JB):	
0.016					
Skew:		0.037	Prob(3	ГВ):	

0.992

Kurtosis: 3.027 Cond. No.

41.0

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smb hml 15395 20170131 CABO 0.01713 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results

========

Dep. Variable: У R-squared:

0.333

Model: OLS Adj. R-squared:

0.297

Method: Least Squares F-statistic:

9.324

Date: Wed, 13 Apr 2022 Prob (F-statistic):

4.27e-05

02:52:02 Time: Log-Likelihood:

88.516

No. Observations: 60 AIC:

-169.0

Df Residuals: 56 BIC:

-160.7

Df Model: 3 Covariance Type: nonrobust

	coef	std err	t	P> t	[0.025
0.975]					
const	0.0037	0.008	0.460	0.647	-0.012
0.020					
mktrf	0.6659	0.170	3.920	0.000	0.326
1.006					
smb	-0.1149	0.296	-0.389	0.699	-0.708
0.478					
hml	-0.8680	0.212	-4.102	0.000	-1.292
-0.444					

========

3.982 Durbin-Watson: Omnibus:

2.156

Prob(Omnibus): 0.137 Jarque-Bera (JB):

2.216

Skew: 0.216 Prob(JB):

0.330

Kurtosis: 2.163 Cond. No.

========

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smb hml rf

15397 20170131 BLD 0.042416 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results _____ ======== Dep. Variable: R-squared: 0.415 OLS Model: Adj. R-squared: 0.384 Least Squares Method: F-statistic: 13.24 Wed, 13 Apr 2022 Date: Prob (F-statistic): 1.20e-06 Time: 02:52:02 Log-Likelihood: 64.618 No. Observations: 60 AIC: -121.2 Df Residuals: BIC: 56 -112.9Df Model: Covariance Type: nonrobust ______ ======== coef std err t P>|t| [0.025] 0.9751 ______ 0.0151 0.012 1.262 0.212 -0.009 const 0.039 1.009 1.5162 0.253 5.993 0.000 mktrf 2.023 0.1218 0.441 0.276 0.783 smb -0.761 1.004 -0.4092 0.315 -1.298 0.199 -1.040hml 0.222 ______ ======== 0.865 Durbin-Watson: Omnibus: 1.725 0.649 Jarque-Bera (JB): Prob(Omnibus): 0.429 Skew: -0.192 Prob(JB): 0.807 3.154 Cond. No. Kurtosis: ______ ======= Warnings: [1] Standard Errors assume that the covariance matrix of the errors is correctly specified. date TICKER PERMNO RET mktrf smb hml 15996 20170131 BATRA -0.026354 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results _____ ======= Dep. Variable: y R-squared: 0.459 OLS Adj. R-squared: Model: 0.430 Method: Least Squares F-statistic: 15.84

22/4/12 22:56				Assignn	nent_3_Simeng_Li	
Date:	We	ed, 13 i	Apr 2022	Prob	(F-statistic):	;
1.41e-07						
Time:		(02:52:02	Log-	Likelihood:	
92.635						
No. Observat	cions:		60	AIC:		
-177.3						
Df Residuals	5 :		56	BIC:		
-168.9 Df Model:			2			
	ltrno.	n	3 onrobust			
Covariance T					=========	
========						
	coef	std 6	err	t	P> t	r0.025
0.975]	0001			· ·		[000=0
const	-0.0008	0.0	007	-0.105	0.917	-0.016
0.014						
mktrf	0.7252	0.3	159	4.572	0.000	0.407
1.043						
smb	0.7700	0.2	276	2.788	0.007	0.217
1.323						
hml	0.2873	0.1	198	1.454	0.152	-0.108
0.683						
	========	======	======	======	=========	
Omnibus:			0.054	Durh	in-Watson:	
2.062			0.034	Dulb.	III-wacson:	
Prob(Omnibus	:):		0.973	Jargi	ue-Bera (JB):	
0.054	, , •		0.773	ourq	uc-beru (ob).	
Skew:			0.045	Prob	(JB):	
0.973					` '	
Kurtosis:			2.882	Cond	. No.	
41.0						
========	-=======			======	=========	
=======						

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

	PERMNO	date	TICKER	RET	mktrf	smb	hml	rf
0	15997	20170131	BATRK	-0.029626	0.0194	-0.0113	-0.0274	0.0004

```
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
```

OLS Regression Results

	========	OLS Regr	essi	lon Re	esults 	=======
=======					_	
Dep. Variable	:		У	R-sqı	uared:	
0.469 Model:		OT	s	λdi	R-squared:	
0.441		OL	10	Auj.	K-squareu.	
Method:		Least Square	s	F-sta	atistic:	
16.50			_			
Date:	Wed	l, 13 Apr 202	2	Prob	(F-statistic):	
8.40e-08						
Time:		02:52:0	2	Log-1	Likelihood:	
94.220		_	_			
No. Observation	ons:	6	0	AIC:		
-180.4 Df Residuals:		5	6	BIC:		
-172.1		3	0	BIC:		
Df Model:			3			
Covariance Typ	oe:	nonrobus	_			
				=====	==========	=======
=======						
	coef	std err		t	P> t	[0.025
0.975]						
aonat	-0.0017	0 007	0	226	0.814	0 016
const 0.013	-0.0017	0.007	-0.	.230	0.814	-0.016
mktrf	0.7391	0.154	4.	785	0.000	0.430
1.049	0.7351	0.134	1.	. 703	0.000	0.430
smb	0.7470	0.269	2.	.777	0.007	0.208
1.286						
hml	0.2592	0.192	1.	347	0.183	-0.126
0.645						
==========	=======	========	====	=====	=========	=======
Omnibus:		0.11	8	Durb	in-Watson:	
2.081			_			
Prob(Omnibus)	:	0.94	3	Jarqı	ue-Bera (JB):	
0.076						
Skew:		0.07	5	Prob	(JB):	
0.963						
Kurtosis:		2.90	9	Cond	. No.	
41.0						
	=======	========	====	=====	=========	=======
=======						
Warnings:						
	Errors assu	me that the	cova	ariano	ce matrix of the	e errors
is correctly						
PERMNO	date TICK	ER RET		nktrf	smb hm	
0 16381 203	170131	BL -0.016287			-0.0113 -0.027	4 0.0004
		OLS Regr				
	=======	========	====	=====	=========	======
Dep. Variable:	•		у	R-sai	uared:	
0.296	•		Y	N-5q	aarea.	
Model:		ОТ	S	Adi.	R-squared:	
0.259		31		٠ ر	- 4	
Method:		Least Square	:S	F-sta	atistic:	
7.866		-				
Date:	Wed	l, 13 Apr 202	2	Prob	(F-statistic):	

```
0.000181
Time:
                   02:52:02
                          Log-Likelihood:
58.119
No. Observations:
                       60
                         AIC:
-108.2
Df Residuals:
                          BIC:
                       56
-99.86
Df Model:
Covariance Type:
                  nonrobust
_____
_____
          coef std err t P>|t| [0.025]
0.9751
_____
const
         0.0095 0.013 0.718
                               0.476 -0.017
0.036
mktrf
      0.8000 0.282 2.838
                                0.006 0.235
1.365
         1.3495 0.491 2.749
smb
                                0.008 0.366
2.333
         -0.9126 0.351 -2.599
hml
                                0.012
                                       -1.616
-0.209
______
========
Omnibus:
                     6.992 Durbin-Watson:
2.501
Prob(Omnibus):
                     0.030 Jarque-Bera (JB):
7.584
Skew:
                     0.480 Prob(JB):
0.0225
Kurtosis:
                     4.454 Cond. No.
______
========
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
          date TICKER RET mktrf smb hml rf
  PERMNO
  16505 20170131 BPOP 0.013921 0.0194 -0.0113 -0.0274 0.0004
                  OLS Regression Results
_____
========
Dep. Variable:
                        y R-squared:
0.624
                      OLS Adj. R-squared:
Model:
0.604
Method:
               Least Squares F-statistic:
31.03
             Wed, 13 Apr 2022 Prob (F-statistic):
Date:
5.98e-12
                   02:52:02 Log-Likelihood:
Time:
92,368
No. Observations:
                       60
                         AIC:
-176.7
Df Residuals:
                       56
                          BIC:
-168.4
Df Model:
Covariance Type:
                 nonrobust
______
```

=======	6			7 2. 1. 1	
0.975]	coei	std err	t	P> t	[0.025
const	0.0121	0.008	1.609	0.113	-0.003
0.027	0.0121	0.000	1.009	0.113	-0.003
mktrf	0.8568	0.159	5.378	0.000	0.538
1.176					
smb	0.2616	0.277	0.943	0.350	-0.294
0.817					
hml	1.2093	0.198	6.094	0.000	0.812
1.607					
	======	=========	======	========	========
Omnibus:		3.9	67 Durb	in-Watson:	
2.168					
Prob(Omnibus):	:	0.1	38 Jarq	ue-Bera (JB):	
4.059					
Skew:		-0.1	54 Prob	(JB):	
0.131		<u>.</u> -	a.c. = =		
Kurtosis:		4.2	36 Cond	. No.	
41.0					
=======					
=======================================	-======	_	ression R		
======= Dep. Variable:		_	======		
======= Dep. Variable: 0.719 Model:			y R-sq	========	
======= Dep. Variable: 0.719 Model: 0.704		0	y R-sq LS Adj.	uared: R-squared:	
Dep. Variable: 0.719 Model: 0.704 Method:			y R-sq LS Adj.	uared: R-squared:	
======= Dep. Variable: 0.719 Model: 0.704	:	O. Least Squar	y R-sq LS Adj. es F-st	uared: R-squared: atistic:	
======================================	:	0	y R-sq LS Adj. es F-st	uared: R-squared:	
Dep. Variable: 0.719 Model: 0.704 Method: 47.85 Date:	:	O. Least Squar	y R-sq LS Adj. es F-st 22 Prob	uared: R-squared: atistic:	
======================================	: We	On Least Squared, 13 Apr 20	y R-sq LS Adj. es F-st 22 Prob	uared: R-squared: atistic: (F-statistic	
======================================	: We	On Least Squared, 13 Apr 20	y R-sq LS Adj. es F-st 22 Prob	uared: R-squared: atistic: (F-statistic	
======================================	: We	O: Least Squared, 13 Apr 20	y R-sq LS Adj. es F-st 22 Prob 02 Log-	uared: R-squared: atistic: (F-statistic	
Dep. Variable: 0.719 Model: 0.704 Method: 47.85 Date: 1.82e-15 Time: 103.29 No. Observation—198.6 Df Residuals:	: We	O: Least Squared, 13 Apr 20	y R-sq LS Adj. es F-st 22 Prob	uared: R-squared: atistic: (F-statistic	
Dep. Variable: 0.719 Model: 0.704 Method: 47.85 Date: 1.82e-15 Time: 103.29 No. Observation -198.6 Df Residuals: -190.2	: We	O: Least Squared, 13 Apr 20	y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC:	uared: R-squared: atistic: (F-statistic	
Dep. Variable: 0.719 Model: 0.704 Method: 47.85 Date: 1.82e-15 Time: 103.29 No. Observation -198.6 Df Residuals: -190.2 Df Model:	: We	On Least Squared, 13 Apr 20	y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC:	uared: R-squared: atistic: (F-statistic	
Dep. Variable: 0.719 Model: 0.704 Method: 47.85 Date: 1.82e-15 Time: 103.29 No. Observation-198.6 Df Residuals: -190.2 Df Model: Covariance Type	: We ons:	Least Squared, 13 Apr 20 02:52:	y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC:	uared: R-squared: atistic: (F-statistic	;):
Dep. Variable: 0.719 Model: 0.704 Method: 47.85 Date: 1.82e-15 Time: 103.29 No. Observation-198.6 Df Residuals: -190.2 Df Model: Covariance Type	: We ons:	Least Squared, 13 Apr 20 02:52:	y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC:	uared: R-squared: atistic: (F-statistic Likelihood:	;):
Dep. Variable: 0.719 Model: 0.704 Method: 47.85 Date: 1.82e-15 Time: 103.29 No. Observation—198.6 Df Residuals: —190.2 Df Model: Covariance Type————————————————————————————————————	We ons:	Least Squar 20 02:52:	y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC:	uared: R-squared: atistic: (F-statistic Likelihood:	:):
Dep. Variable: 0.719 Model: 0.704 Method: 47.85 Date: 1.82e-15 Time: 103.29 No. Observation—198.6 Df Residuals: —190.2 Df Model: Covariance Type————————————————————————————————————	We ons:	Least Squar 20 02:52:	y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC:	uared: R-squared: atistic: (F-statistic: Likelihood:	:):
Dep. Variable: 0.719 Model: 0.704 Method: 47.85 Date: 1.82e-15 Time: 103.29 No. Observation -198.6 Df Residuals: -190.2 Df Model: Covariance Type====================================	We ons:	Least Squar 20 02:52:	y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC:	uared: R-squared: atistic: (F-statistic: Likelihood:	:):
======================================	we ons: coef	Deast Squared, 13 Apr 20 02:52: nonrobuestd err	y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC: 3	uared: R-squared: atistic: (F-statistic) Likelihood:	(0.025
======================================	we ons: coef	Deast Squared, 13 Apr 20 02:52: nonrobuestd err	y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC: 3	uared: R-squared: atistic: (F-statistic: Likelihood:	(0.025
======================================	we ons: coef	nonrobu std err 0.006	y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC: 3	uared: R-squared: atistic: (F-statistic: Likelihood: P> t	(0.025
======================================	wee: coef -0.0026	nonrobu std err 0.006	y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC: 3 st	uared: R-squared: atistic: (F-statistic: Likelihood: P> t	(0.025

2/4/12 22:36			Assignmei	it_3_Simeng_Li	
1.323					
hml	0.8832	0.165	5.340	0.000	0.552
1.215					
========	=======	========	======		=======
=======					
Omnibus:		6.808	Durbir	n-Watson:	
1.690					
Prob(Omnibus)	:	0.033	Jarque	e-Bera (JB):	
6.638					
Skew:		0.534	Prob(3	ГВ):	
0.0362					
Kurtosis:		4.230	Cond.	No.	
41.0					
=========		========	======		
Warnings:					
-	Errors assu	me that the c	ovariance	matrix of	the errors
is correctly		me chae che o	ovar ranoc	maciin oi	che criorb
PERMNO	date TICK	ER RET	mktrf	smb	hml r
		CO 0.078788	_		274 0.000
		OLS Regre			
========		========			=======
=======					
Dep. Variable	:	У	R-squa	ared:	
0.436					
Model:		OLS	Adj. F	R-squared:	
0.405					
Method:		Least Squares	F-stat	istic:	
14.41					
Date:	Wed	, 13 Apr 2022	Prob (F-statistic):
4.51e-07		00 50 00		1 . 1 . 1 1	
Time:		02:52:02	rog-r:	kelihood:	
58.394		60	7 T.C.		
No. Observati -108.8	ons:	60	AIC:		
Df Residuals:		56	BIC:		
-100.4		50	ыс:		
Df Model:		3			
Covariance Ty	me•	nonrobust			
_	_	=========	=======	:=======	=======
=======					
	coef	std err	t	P> t	[0.025
0.975]					
	-0.0003	0.013	-0.024	0.981	-0.027
0.026	1 4000	0.001	F 010	0.000	0.046
mktrf	1.4082	0.281	5.018	0.000	0.846
1.970	0 5010	0 400	1 100	0 220	0 200
smb	0.5812	0.489	1.189	0.239	-0.398
1.560	0 6070	0 250	1 060	0.054	0 012
hml 1.388	0.6878	0.350	1.968	0.054	-0.012
1.300	.=======		======	.=======	=======
========					
Omnibus:		11.278	Durhir	n-Watson:	
1.795					
Prob(Omnibus)	:	0.004	Jarque	e-Bera (JB):	
27.464			1	ζ- ,-	
Skew:		0.335	Prob(3	ГВ):	
			`	•	

1.09e-06

Kurtosis: 6.246 Cond. No.

41.0

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smbhml 18973 20170131 BRC -0.026498 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results

========

Dep. Variable: У R-squared:

0.283

Model: OLS Adj. R-squared:

0.245

Method: Least Squares F-statistic:

7.377

Date: Wed, 13 Apr 2022 Prob (F-statistic):

0.000299

02:52:02 Time: Log-Likelihood:

83.145

No. Observations: 60 AIC:

-158.3

Df Residuals: 56 BIC:

-149.9

Df Model: 3 Covariance Type: nonrobust

	coef	std err	t	P> t	[0.025
0.975]					
const	0.0010	0.009	0.113	0.910	-0.017
0.019					
mktrf	0.7202	0.186	3.877	0.000	0.348
1.092					
smb	0.1677	0.324	0.518	0.606	-0.480
0.816					
hml	0.2674	0.231	1.156	0.253	-0.196
0.731					

========

1.305 Durbin-Watson: Omnibus:

2.574

Prob(Omnibus): 0.521 Jarque-Bera (JB):

0.655

Skew: 0.188 Prob(JB):

0.721

Kurtosis: 3.348 Cond. No.

========

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smb hml rf

19393 20170131 BMY -0.152122 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results _____ ======== Dep. Variable: R-squared: 0.160 OLS Model: Adj. R-squared: 0.115 Least Squares Method: F-statistic: 3.562 Wed, 13 Apr 2022 Date: Prob (F-statistic): 0.0197 Time: 02:52:02 Log-Likelihood: 81.711 No. Observations: 60 AIC: -155.4Df Residuals: BIC: 56 -147.0Df Model: Covariance Type: nonrobust ______ ======== coef std err t P>|t| [0.025 0.9751 ______ -0.0032 0.009 -0.355 0.724 -0.021const 0.015 0.5916 0.190 3.109 0.003 0.210 mktrf 0.973 -0.0656 0.331 -0.198 0.844 smb -0.729 0.598 0.0339 0.237 0.143 0.887 -0.441 hml 0.509 ______ ======== 2.935 Durbin-Watson: Omnibus: 2.130 Prob(Omnibus): 0.231 Jarque-Bera (JB): 2.326 Skew: -0.182 Prob(JB): 0.313 3.893 Cond. No. Kurtosis: ______ ======= Warnings: [1] Standard Errors assume that the covariance matrix of the errors is correctly specified. date TICKER PERMNO RET mktrf smb hml 19561 20170131 BA 0.049717 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results _____ ======= Dep. Variable: y R-squared: 0.374 OLS Adj. R-squared: Model: 0.340 Method: Least Squares F-statistic: 11.14

```
Wed, 13 Apr 2022
                             Prob (F-statistic):
Date:
7.76e-06
Time:
                     02:52:02
                            Log-Likelihood:
54.423
No. Observations:
                          60
                            AIC:
-100.8
Df Residuals:
                          56
                            BIC:
-92.47
Df Model:
                          3
Covariance Type:
                   nonrobust
______
========
           coef std err
                              t
                                    P>|t|
0.9751
          0.0004 0.014 0.030 0.976 -0.028
const.
0.029
          1.2890 0.300 4.299 0.000 0.688
mktrf
1.890
          0.3208
                 0.522
                          0.614
                                    0.542
                                           -0.725
smb
1.367
                  0.373
hml
          0.8568
                           2.294
                                    0.026
                                            0.109
1.605
______
Omnibus:
                       1.499 Durbin-Watson:
2.241
Prob(Omnibus):
                       0.473 Jarque-Bera (JB):
0.795
Skew:
                       0.194 Prob(JB):
0.672
Kurtosis:
                       3.409 Cond. No.
41.0
______
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
          date TICKER RET mktrf smb hml
  PERMNO
 20512 20170131 CACI -0.012068 0.0194 -0.0113 -0.0274 0.0004
                    OLS Regression Results
______
========
Dep. Variable:
                          y R-squared:
0.376
Model:
                         OLS
                            Adj. R-squared:
0.342
Method:
                 Least Squares F-statistic:
11.24
Date:
               Wed, 13 Apr 2022 Prob (F-statistic):
7.05e-06
Time:
                     02:52:02 Log-Likelihood:
88.218
No. Observations:
                          60 AIC:
-168.4
Df Residuals:
                            BIC:
                          56
-160.1
Df Model:
                          3
Covariance Type:
                    nonrobust
```

========					
=======					
	coef	std err	t	P> t	[0.025
0.975]					
	0.0016		0 100	0.044	0.015
const	0.0016	0.008	0.198	0.844	-0.015
0.018 mktrf	0 0210	0 171	E 4 E 4	0 000	0 500
1.273	0.9310	0.171	5.454	0.000	0.589
smb	-0.0217	0.297	-0.073	0.942	-0.617
0.574	-0.0217	0.237	-0.075	0.742	-0.017
hml	0.0505	0.213	0.238	0.813	-0.375
0.476	0.0000	00220	0.120	00020	010,0
========		========		:	========
========					
Omnibus:		2.9	971 Durbin	-Watson:	
2.061					
Prob(Omnibu	ıs):	0.2	226 Jarque	-Bera (JB):	
2.536					
Skew:		-0.5	504 Prob(J	B):	
0.281					
Kurtosis:		2.9	997 Cond. 1	No.	
41.0					
========		========	-========	========	========

Warnings:

========

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

	PERMNO	date	TICKER	RET	mktrf	smb	hml	rf
0	20598	20170131	CALM	-0.056027	0.0194	-0.0113	-0.0274	0.0004

/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of co ncat except for the argument 'objs' will be keyword-only x = pd.concat(x[::order], 1)/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of co ncat except for the argument 'objs' will be keyword-only x = pd.concat(x[::order], 1)/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of co ncat except for the argument 'objs' will be keyword-only x = pd.concat(x[::order], 1)/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of co ncat except for the argument 'objs' will be keyword-only x = pd.concat(x[::order], 1)/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of co ncat except for the argument 'objs' will be keyword-only x = pd.concat(x[::order], 1)/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of co ncat except for the argument 'objs' will be keyword-only x = pd.concat(x[::order], 1)/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of co ncat except for the argument 'objs' will be keyword-only x = pd.concat(x[::order], 1)/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1 17: FutureWarning: In a future version of pandas all arguments of co ncat except for the argument 'objs' will be keyword-only x = pd.concat(x[::order], 1)

OLS Regression Results

	========	OLS Re	egress =====	ion Re	esults 	=======
=======						
Dep. Variable	::		У	R-squ	ared:	
0.078 Model:			OLS	74:	R-squared:	
0.028			ОПО	Auj.	K-squareu:	
Method:		Least Squa	ares	F-sta	atistic:	
1.570	•	Loube Eque		1 500	.0150101	
Date:	Wed	, 13 Apr 2	2022	Prob	(F-statistic):	
0.207					,	
Time:		02:52	2:02	Log-I	Likelihood:	
77.728						
No. Observati	ons:		60	AIC:		
-147.5						
Df Residuals:			56	BIC:		
-139.1			2			
Df Model:		nonwok	3			
Covariance Ty		nonrok 			=======================================	
========						
	coef	std err		t	P> t	[0.025
0.975]					1 1	·
const	-0.0008	0.010	-0	.087	0.931	-0.020
0.018						
mktrf	-0.1853	0.203	-0	.911	0.366	-0.593
0.222	0 (105	0.254	1	724	0.000	0 000
smb 1.320	0.6105	0.354	1	. / 24	0.090	-0.099
hml	_0 3431	0 253	_1	354	0.181	_0 850
0.164	-0.5451	0.255	-1	• 554	0.101	-0.050
	========	=======	-====	=====	.========	======
=======						
Omnibus:		6.	378	Durbi	ln-Watson:	
2.092						
Prob(Omnibus)	:	0.	041	Jarqu	ıe-Bera (JB):	
6.107		•	5 06	_ 1	· \	
Skew: 0.0472		0.	506	Prob((JB):	
Kurtosis:		4	.190	Cond	No	
41.0		4.	. 190	cona.	, NO.	
-	========	=======		=====	:========	=======
=======						
Warnings:						
[1] Standard	Errors assu	me that th	ne cov	ariano	ce matrix of the	e errors
is correctly	_					
PERMNO	date TICK			mktrf	smb hm	
0 20670 20	170131 CA	MP 0.0358			-0.0113 -0.027	4 0.0004
		OLS Re	_			
=========	=======	=======	-====	_=====	==========	
Dep. Variable	: :		У	R-sa	ared:	
0.604	· •		Ĭ	. bqt		
Model:			OLS	Adi.	R-squared:	
0.583				- 5 -	<u>.</u>	
Method:		Least Squa	ares	F-sta	atistic:	
28.49		_				
Date:	Wed	, 13 Apr 2	2022	Prob	(F-statistic):	

```
2.56e-11
Time:
                   02:52:02
                          Log-Likelihood:
56.858
No. Observations:
                       60
                         AIC:
-105.7
Df Residuals:
                          BIC:
                       56
-97.34
Df Model:
Covariance Type:
                  nonrobust
_____
_____
          coef std err t P>|t| [0.025]
0.9751
______
        -0.0273 0.014 -2.014
                               0.049 -0.055
const
-0.000
       2.1300 0.288 7.398
                                0.000 1.553
mktrf
2.707
         1.1062 0.501 2.206
smb
                                0.031 0.102
2.111
                 0.359
                        1.378
hml
          0.4943
                                0.174
                                       -0.224
1.213
______
========
Omnibus:
                     1.660 Durbin-Watson:
1.943
Prob(Omnibus):
                     0.436 Jarque-Bera (JB):
0.930
Skew:
                     0.221 Prob(JB):
0.628
Kurtosis:
                     3.419 Cond. No.
______
========
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
         date TICKER RET mktrf smb hml rf
  PERMNO
  21371 20170131 CAH 0.041545 0.0194 -0.0113 -0.0274 0.0004
                  OLS Regression Results
_____
========
Dep. Variable:
                        y R-squared:
0.273
Model:
                      OLS Adj. R-squared:
0.234
Method:
               Least Squares F-statistic:
7.013
             Wed, 13 Apr 2022 Prob (F-statistic):
Date:
0.000436
Time:
                   02:52:02 Log-Likelihood:
72.871
No. Observations:
                       60
                         AIC:
-137.7
Df Residuals:
                       56
                          BIC:
-129.4
Df Model:
Covariance Type:
                 nonrobust
______
```

0.975]	coef	std err		t	P> t	[0.025
const	-0.0122	0 010	_1	170	0.247	-0.033
0.009	-0.0122	0.010	-1.	. 1 / 0	0.247	-0.055
mktrf	0.9534	0.220	4 .	324	0.000	0.512
1.395	0.7301	0.220		.021	0.000	0.312
smb	-0.3786	0.384	-0.	986	0.328	-1.148
0.391						
hml	0.2154	0.275	0.	784	0.436	-0.335
0.766						
========			=====			
========						
Omnibus:		1.7	758	Durb	in-Watson:	
2.176						
Prob(Omnibus	5):	0.4	415	Jarqı	ıe-Bera (JB):	
1.471						
Skew:		-0.2	222	Prob	(JB):	
0.479						
Kurtosis:		2.3	375	Cond	. No.	
41.0						
========	=======	========	=====	-====	=========	=======
0 27887 2	20170121					
		OLS Reg	gressi	lon Re	-0.0113 -0.027 esults	
		OLS Reg	gressi	ion Re	esults 	
======== =============================		OLS Reg	gressi	ion Re	esults	
======== =============================		OLS Req	gressi ===== Y	lon Re ===== R-sqi	esults ========= uared:	
======== =============================		OLS Req	gressi =====	lon Re ===== R-sqi	esults 	
======================================		OLS Rec	gressi ===== Y OLS	R-squ	esults ======== uared: R-squared:	
======== Dep. Variabl 0.228 Model: 0.186 Method:		OLS Req	gressi ===== Y OLS	R-squ	esults ======== uared: R-squared:	
======================================	 Le:	OLS Reg	gressi ===== Y OLS res	R-squ Adj.	esults ======== uared: R-squared: atistic:	
======================================	 Le:	OLS Rec	gressi ===== Y OLS res	R-squ Adj.	esults ======= uared: R-squared:	
Dep. Variable 0.228 Model: 0.186 Method: 5.508 Date: 0.00219	 Le:	OLS Recent of the Control of the Con	gressi y OLS res	R-squ Adj. F-sta	esults ====================================	
======================================	 Le:	OLS Reg	gressi y OLS res	R-squ Adj. F-sta	esults ======== uared: R-squared: atistic:	
======================================	 Le: We	OLS Recent of the Control of the Con	gressi y OLS res 022	R-squ Adj. F-sta	esults ====================================	
Dep. Variable 0.228 Model: 0.186 Method: 5.508 Date: 0.00219 Time: 90.388 No. Observat	 Le: We	OLS Recent of the Control of the Con	gressi y OLS res	R-squ Adj. F-sta	esults ====================================	
======================================	le: We	OLS Recent of the Control of the Con	gressi y OLS res 022	R-squ Adj. F-sta	esults ====================================	
Dep. Variable 0.228 Model: 0.186 Method: 5.508 Date: 0.00219 Time: 90.388 No. Observation 172.8	le: We	OLS Recent of the Control of the Con	y OLS res 022 :02	R-squ Adj. F-sta Prob Log-l	esults ====================================	
======================================	le: We	OLS Recent of the Control of the Con	y OLS res 022 :02	R-squ Adj. F-sta Prob Log-l	esults ====================================	
======================================	Le: We	OLS Recent of the Control of the Con	gressi ====== y OLS res 022 :02 60 56 3	R-squ Adj. F-sta Prob Log-l	esults ====================================	
Dep. Variable 0.228 Model: 0.186 Method: 5.508 Date: 0.00219 Time: 90.388 No. Observate -172.8 Df Residuals -164.4 Df Model: Covariance Telegraphs	Le: We Lions: G:	OLS Recent of the control of the con	gressi y OLS res 022 60 56 3	R-squ Adj. F-sta Prob Log-l AIC:	esults ====================================	
Dep. Variable 0.228 Model: 0.186 Method: 5.508 Date: 0.00219 Time: 90.388 No. Observate -172.8 Df Residuals -164.4 Df Model: Covariance Telegraphs	Le: We Lions: S: Type:	OLS Red	gressi ====== y OLS res 022 :02 60 56 3	R-squ Adj. F-sta Prob Log-1 AIC:	esults ===================================	
======================================	Le: We Lions: S: Type:	OLS Red	gressi ====== y OLS res 022 :02 60 56 3	R-squ Adj. F-sta Prob Log-1 AIC:	esults uared: R-squared: atistic: (F-statistic): Likelihood:	
Dep. Variable 0.228 Model: 0.186 Method: 5.508 Date: 0.00219 Time: 90.388 No. Observate -172.8 Df Residuals -164.4 Df Model: Covariance Telescope - 188	Le: We Lions: S: Type:	OLS Recent of the control of the con	gressi y OLS res 022 60 56 3 ast =====	R-squ Adj. F-sta Prob Log-l AIC:	esults ===================================	
======================================	Le: We Lions: S: Type:	OLS Red	gressi y OLS res 022 60 56 3 ast =====	R-squ Adj. F-sta Prob Log-l AIC:	esults ===================================	
======================================	Le: We Lions: Cype: coef	OLS Recession OL	gressi ====== y OLS res 022 :02 60 56 3	R-squ Adj. F-sta Prob Log-1 AIC:	esults ===================================	[0.025
======================================	Le: We Lions: S: Type:	OLS Recession OL	gressi ====== y OLS res 022 :02 60 56 3	R-squ Adj. F-sta Prob Log-1 AIC:	esults ===================================	[0.025
======================================	Le: We Lions: Cype: coef	OLS Recession OL	gressi y OLS res 022 :02 60 56 3 ust ======	R-squ Adj. F-sta Prob Log-l AIC: BIC:	esults ====================================	[0.025
======================================	Type: coef .0.0019	OLS Red ====================================	gressi y OLS res 022 :02 60 56 3 ust ======	R-squ Adj. F-sta Prob Log-l AIC: BIC:	esults ====================================	[0.025

2/4/12 22:56			Assignmen	t_3_Simeng_Li	
0.308					
hml	-0.2022	0.205	-0.986	0.329	-0.613
0.209					
========	=======	========	=======	========	=======
Omnibus:		2.531	Durbin	-Watson:	
2.153					
Prob(Omnibus):		0.282	Jarque	-Bera (JB):	
1.675					
Skew:		-0.322	Prob(J	B):	
0.433					
Kurtosis:		3.505	Cond.	No.	
41.0					
=========	=======	========	======	========	======
=======					
Warnings.					
Warnings:	*****************	ma +ba+ +ba a		matrin of .	the emmen
[1] Standard E		me that the C	Ovarrance	matrix or	cue error
is correctly PERMNO	date TICK	ER RET	mktrf	smb]	hm1
		OM 0.006309	_	0.0113 -0.03	
0 33823 201	/0131 BO	OLS Regre			2/4 0.00
=========	=======	OLS Regle			=======
=======					
Dep. Variable:		у	R-squa	red:	
0.298		-	-		
Model:		OLS	Adi. R	-squared:	
0.261		020	110,01	bquulou.	
Method:		Least Squares	F-stat	istic.	
7.932		nease bquares	I –B Ca C	IBCIC.	
Date:	Wod	12 Apr 2022	Drob (F-statistic	١.
	wea	, 13 Apr 2022) dole	r-Statistic) :
0.000170		02.52.02	T T .	leal i baad.	
Time:		02:52:02	rog-r1	kelihood:	
36.009					
No. Observation	ns:	60	AIC:		
-64.02					
Df Residuals:		56	BIC:		
-55.64					
Df Model:		3			
Covariance Typ	e:	nonrobust			
=========	=======	=======	======	========	======
=======	coef	std err	+	D> +	rn n25
0.975]	COCI	Sta ell	C	17 0	[0.023
const	0.0223	0.019	1.162	0.250	-0.016
0.061					
mktrf	0.6926	0.408	1.700	0.095	-0.124
1.509					
smb	2.3333	0.710	3.288	0.002	0.911
3.755					
hml	0.6753	0.508	1.330	0.189	-0.342
1.692					
=========	=======		======	========	
=======					
Omnibus:		12.722	Durbin	-Watson:	
1.922					
Prob(Omnibus):		0.002	Jarque	-Bera (JB):	
13.343					
Skew:		1.088	Prob(J	B):	

0.00127

Kurtosis: 3.774 Cond. No.

41.0

=======

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

========

Dep. Variable: y R-squared:

0.554

Model: OLS Adj. R-squared:

0.530

Method: Least Squares F-statistic:

23.19

Date: Wed, 13 Apr 2022 Prob (F-statistic):

6.90e-10

Time: 02:52:02 Log-Likelihood:

90.376

No. Observations: 60 AIC:

-172.8

Df Residuals: 56 BIC:

-164.4

Df Model: 3
Covariance Type: nonrobust

=======

0.975]	coef	std err	t	P> t	[0.025
	· -				
const	-0.0041	0.008	-0.525	0.602	-0.020
0.011					
mktrf	0.9712	0.165	5.897	0.000	0.641
1.301					
smb	0.1571	0.287	0.548	0.586	-0.417
0.732					
hml	0.8174	0.205	3.985	0.000	0.406
1.228					

========

Omnibus: 0.596 Durbin-Watson:

2.285

Prob(Omnibus): 0.742 Jarque-Bera (JB):

0.681

Skew: -0.010 Prob(JB):

0.712

Kurtosis: 2.479 Cond. No.

11 (

=======

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smb hml rf

39642 20170131 BDX 0.070915 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results _____ ======== Dep. Variable: R-squared: 0.271 OLS Model: Adj. R-squared: 0.232 Least Squares Method: F-statistic: 6.951 Wed, 13 Apr 2022 Date: Prob (F-statistic): 0.000466 Time: 02:52:02 Log-Likelihood: 91.684 No. Observations: 60 AIC: -175.4Df Residuals: BIC: 56 -167.0Df Model: Covariance Type: nonrobust ______ ======== coef std err t P>|t| [0.025] 0.975] ______ -0.0025 0.008 -0.329 0.744 -0.018const 0.013 0.7345 0.161 4.559 0.000 mktrf 0.412 1.057 -0.2711 0.281 -0.966 smb 0.338 -0.833 0.291 -0.1437 0.201 -0.716 0.477 -0.546hml 0.258 ______ ======== 9.506 Durbin-Watson: Omnibus: 2.817 0.009 Jarque-Bera (JB): Prob(Omnibus): 12.207 Skew: -0.583 Prob(JB): 0.00223 4.877 Cond. No. Kurtosis: ______ ======= Warnings: [1] Standard Errors assume that the covariance matrix of the errors is correctly specified. date TICKER PERMNO RET mktrf smb hml 39693 20170131 B 0.014973 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results _____ ======= Dep. Variable: y R-squared: 0.445 OLS Adj. R-squared: Model: 0.415 Method: Least Squares F-statistic: 14.97

22/4/12 22:36				Assignm	ent_3_Simeng_Li	
Date:	We	d, 13 Apr 20)22 1	Prob	(F-statistic):	:
2.86e-07						
Time:		02:52:	:02]	Log-I	ikelihood:	
77.924						
No. Observa	tions:		60 2	AIC:		
-147.8						
Df Residual	s:		56 I	BIC:		
-139.5						
Df Model:	_		3			
Covariance		nonrobu				
	========	========	=====	=====	:========	=======
=======	goof	atd orr		+	P> t	ro 025
0.975]	coei	sta err		L	P> C	[0.025
0.975]						
const	-0.0070	0.010	-0.	737	0.464	-0.026
0.012						
mktrf	1.0050	0.203	4.9	959	0.000	0.599
1.411						
smb	0.5754	0.353	1.6	630	0.109	-0.132
1.282						
hml	0.4678	0.252	1.8	853	0.069	-0.038
0.974						
========	========	========	-====	====	=========	
Omnibus:		5.2	262 I	Durbi	.n-Watson:	
1.963				_		
Prob(Omnibu	s):	0.0)72	Jarqu	e-Bera (JB):	
4.282		0 5	:E0 1	Dwob (TD \ •	
Skew: 0.118		-0.5	100	Prob(00):	
Kurtosis:		3.7	708 (Cond.	No	
41.0		3.7			110 •	
=========	========	========		====	:========	
=======						

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

	PERMNO	date	TICKER	RET	mktrf	smb	hml	rf
0	49656	20170131	BK	_0 051921	0 0194	_0 0113	-0 0274	0 0004

```
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
```

OLS Regression Results

=========		OLS Regr	essi	ion Re	esults 	
=======						
Dep. Variable	2:		У	R-sq	uared:	
0.650 Model:		OT	S	744	R-squared:	
0.631		OLI	5	Auj.	K-squareu:	
Method:		Least Square	s	F-sta	atistic:	
34.67		Loube Equate		1 500	20150101	
Date:	Wed	l, 13 Apr 202	2	Prob	(F-statistic):	
8.41e-13		· -			,	
Time:		02:52:0	2	Log-	Likelihood:	
106.88						
No. Observati	lons:	6	0	AIC:		
-205.8		_	_	D.T.C.		
Df Residuals: -197.4	i	5	О	BIC:		
Df Model:			3			
Covariance Ty	me:	nonrobus	_			
						=======
=======						
	coef	std err		t	P> t	[0.025
0.975]						
	0.0000	0.006	•	5 6 0	0.550	0.015
const	-0.0033	0.006	-0.	.568	0.573	-0.015
0.008 mktrf	1.0288	0.125	0	225	0.000	0.778
1.279	1.0200	0.125	0.	. 223	0.000	0.776
smb	-0.0992	0.218	-0.	455	0.651	-0.535
0.337	0.0332	0.210	0.	. 155	0.031	0.303
hml	0.6202	0.156	3 .	.981	0.000	0.308
0.932						
			====	=====		
		0 53	-	December 1	in-Watson:	
Omnibus: 2.228		0.52	3	Dulb.	III-watson:	
Prob(Omnibus)	•	0.76	9	Jargi	ue-Bera (JB):	
0.613	. •	0.70		ourq	ac 2014 (02):	
Skew:		-0.20	5	Prob	(JB):	
0.736					` ,	
Kurtosis:		2.72	1	Cond	. No.	
41.0						
=========	-=======	:========	====	=====	==========	=======
=======						
F7						
Warnings:	Errorg aggi	mo that the	9017	rian	ce matrix of the	orrore
is correctly			COVE	arrand	se macrix or cm	e ellois
PERMNO	date TICK		n	nktrf	smb hm:	l rf
		MI 0.043302		-	-0.0113 -0.027	
		OLS Regr				
		_				=======
=======						
Dep. Variable	: :		У	R-squ	uared:	
0.331			_		_	
Model:		OL	S	Adj.	R-squared:	
0.295		Longt Comme	_	T7 - '		
Method: 9.233		Least Square	5	r-Sta	atistic:	
9.233 Date:	Wed	l, 13 Apr 202	2	Proh	(F-statistic):	
Date.	wec	., 13 API 202	_	1100	(r-scattstit):	

```
4.67e-05
Time:
                   02:52:02
                         Log-Likelihood:
83.292
No. Observations:
                       60
                         AIC:
-158.6
Df Residuals:
                         BIC:
                       56
-150.2
Df Model:
Covariance Type:
                 nonrobust
_____
_____
          coef std err t P>|t| [0.025]
0.9751
_____
const
        0.0129 0.009 1.481
                               0.144 -0.005
0.030
mktrf 0.5803 0.185 3.131
                                0.003 0.209
0.952
         0.9513 0.323 2.948
smb
                                0.005 0.305
1.598
         0.0655 0.231
                        0.284
                                0.778
hml
                                       -0.397
0.528
______
========
Omnibus:
                     1.496 Durbin-Watson:
2.412
Prob(Omnibus):
                     0.473 Jarque-Bera (JB):
0.792
Skew:
                     0.042 Prob(JB):
0.673
Kurtosis:
                     3.557 Cond. No.
______
========
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
         date TICKER RET mktrf smb hml rf
  PERMNO
  56274 20170131 CAG -0.006574 0.0194 -0.0113 -0.0274 0.0004
                 OLS Regression Results
_____
========
Dep. Variable:
                       y R-squared:
0.213
Model:
                      OLS Adj. R-squared:
0.171
Method:
               Least Squares F-statistic:
5.062
             Wed, 13 Apr 2022 Prob (F-statistic):
Date:
0.00358
Time:
                   02:52:02 Log-Likelihood:
70.521
No. Observations:
                       60
                         AIC:
-133.0
Df Residuals:
                       56
                         BIC:
-124.7
Df Model:
Covariance Type:
                 nonrobust
______
```

========					
	coef	std err	t	P> t	[0.025
0.975]					
const	-0.0072	0.011	-0.670	0.506	-0.029
0.014	-0.0072	0.011	-0.070	0.300	-0.023
mktrf	0.8248	0.229	3.597	0.001	0.366
1.284					
smb	-0.5369	0.399	-1.345	0.184	-1.337
0.263					
hml	0.2665	0.286	0.933	0.355	-0.306
0.839					
========	-=======	========	=======	========	========
		7 (200 Duwhi	n Wataan.	
Omnibus: 1.844		/ • 8	308 Durbi	n-Watson:	
Prob(Omnibu	1G \ •	0 ()20 Jarqu	o Pora (TP)	•
15.690	15):	0.0	ozo barqu	e-Bera (JB)	•
Skew:		0 ()16	.TR) •	
0.000392		0.0)10 110D(05).	
Kurtosis:		5.5	505 Cond.	No.	
41.0		3.5	oo cona.	140.	
========	-=======	=========		========	========
========					
is correct PERMNO	ed Errors ass cly specified date TIC 20170131	• KER RET	r mktrf		nml rf
			gression Re		2/4 0.0004
=======					========
=======================================			gression Re	sults =======	========
Dep. Variab				sults =======	========
Dep. Variab		OLS Rec	gression Re ====== y R-squ	sults ======== ared:	========
Dep. Variab 0.304 Model:		OLS Rec	gression Re ====== y R-squ	sults =======	========
Dep. Variab 0.304 Model: 0.266		OLS Rec	gression Re ====== y R-squ DLS Adj.	sults ======== ared: R-squared:	========
Dep. Variab 0.304 Model: 0.266 Method:		OLS Rec	gression Re ====== y R-squ DLS Adj.	sults ======== ared:	========
Dep. Variab 0.304 Model: 0.266 Method: 8.145	======== ole:	OLS Rec	y R-squ DLS Adj.	sults ====================================	======
Dep. Variab 0.304 Model: 0.266 Method: 8.145 Date:	======== ole:	OLS Rec	y R-squ DLS Adj.	sults ======== ared: R-squared:	======
Dep. Variab 0.304 Model: 0.266 Method: 8.145 Date: 0.000137	======== ole:	OLS Rec	y R-squ DLS Adj. res F-sta	sults ====================================	======
Dep. Variab 0.304 Model: 0.266 Method: 8.145 Date: 0.000137 Time:	======== ole:	OLS Rec	y R-squ DLS Adj. res F-sta	sults ====================================	======
Dep. Variab 0.304 Model: 0.266 Method: 8.145 Date: 0.000137 Time: 57.580	 ole: We	OLS Rec	y R-squ DLS Adj. ces F-sta D22 Prob 102 Log-L	sults ====================================	======
Dep. Variab 0.304 Model: 0.266 Method: 8.145 Date: 0.000137 Time:	 ole: We	OLS Rec	y R-squ DLS Adj. ces F-sta D22 Prob 102 Log-L	sults ====================================	======
Dep. Variable 0.304 Model: 0.266 Method: 8.145 Date: 0.000137 Time: 57.580 No. Observa	ole: We	OLS Rec	y R-squ DLS Adj. ces F-sta D22 Prob 102 Log-L	sults ====================================	======
Dep. Variable 0.304 Model: 0.266 Method: 8.145 Date: 0.000137 Time: 57.580 No. Observation 107.2	ole: We	OLS Rec	y R-squ DLS Adj. res F-sta D22 Prob 102 Log-L 60 AIC:	sults ====================================	======
Dep. Variable 0.304 Model: 0.266 Method: 8.145 Date: 0.000137 Time: 57.580 No. Observation of Residual	ole: We	OLS Rec	y R-squ DLS Adj. res F-sta D22 Prob 102 Log-L 60 AIC:	sults ====================================	======
Dep. Variable 0.304 Model: 0.266 Method: 8.145 Date: 0.000137 Time: 57.580 No. Observation of Residual -98.78	ole: We	OLS Rec	y R-squ DLS Adj. res F-sta 122 Prob 102 Log-L 103 AIC: 104 AIC: 105 AIC: 106 AIC: 107 AIC: 108 AIC:	sults ====================================	======
Dep. Variable 0.304 Model: 0.266 Method: 8.145 Date: 0.000137 Time: 57.580 No. Observation of Residual -98.78 Df Model: Covariance	ole: We	OLS Recession OLS Recession OLS Recession OC CONTRACT CON	y R-squ DLS Adj. res F-sta 122 Prob 102 Log-L 103 AIC: 104 AIC: 105 AIC: 106 AIC: 107 AIC: 108 AIC:	sults ====================================	======
Dep. Variable 0.304 Model: 0.266 Method: 8.145 Date: 0.000137 Time: 57.580 No. Observation of Residual -98.78 Df Model: Covariance	Type:	OLS Recessive OLS Recessive OLS Recessive OLS Recessive OCS	y R-squ DLS Adj. res F-sta D22 Prob 102 Log-L 103 AIC: 104 AIC: 105 AIC: 1	sults ====================================	======================================
Dep. Variable 0.304 Model: 0.266 Method: 8.145 Date: 0.000137 Time: 57.580 No. Observation of Residual -98.78 Df Model: Covariance ====================================	Type:	OLS Recession OLS Recession OLS Recession OC CONTRACT CON	y R-squ DLS Adj. res F-sta D22 Prob 102 Log-L 103 AIC: 104 AIC: 105 AIC: 1	sults ====================================	======================================
Dep. Variable 0.304 Model: 0.266 Method: 8.145 Date: 0.000137 Time: 57.580 No. Observation of Residual -98.78 Df Model: Covariance ====================================	Type:	OLS Recessive OLS Recessive OLS Recessive OLS Recessive OCS	y R-squ DLS Adj. res F-sta D22 Prob 102 Log-L 103 AIC: 104 AIC: 105 AIC: 1	sults ====================================	======================================
Dep. Variable 0.304 Model: 0.266 Method: 8.145 Date: 0.000137 Time: 57.580 No. Observation of Residual -98.78 Df Model: Covariance ====================================	Type:	OLS Recessive OLS Recessive OLS Recessive OLS Recessive OCS	y R-squ DLS Adj. res F-sta D22 Prob 102 Log-L 103 AIC: 104 AIC: 105 AIC: 1	sults ====================================	======================================
Dep. Variable 0.304 Model: 0.266 Method: 8.145 Date: 0.000137 Time: 57.580 No. Observation of Residual -98.78 Df Model: Covariance	Type: coef	OLS Recession OLS Recession OLS Recession OLS Recession OCS The Control of the Co	y R-squ DLS Adj. res F-sta D22 Prob 102 Log-L 60 AIC: 56 BIC: 3 1st	sults ====================================	[0.025
Dep. Variable 0.304 Model: 0.266 Method: 8.145 Date: 0.000137 Time: 57.580 No. Observation of Residual -98.78 Df Model: Covariance ====================================	Type: coef	OLS Recessive OLS Recessive OLS Recessive OLS Recessive OCS	y R-squ DLS Adj. res F-sta D22 Prob 102 Log-L 60 AIC: 56 BIC: 3 1st	sults ====================================	======================================
Dep. Variable 0.304 Model: 0.266 Method: 8.145 Date: 0.000137 Time: 57.580 No. Observation of the control of th	Type: coef	OLS Recession OL	y R-squ DLS Adj. res F-sta D22 Prob 102 Log-L 60 AIC: 56 BIC: 3 1st	sults ====================================	[0.025 -0.009
Dep. Variable 0.304 Model: 0.266 Method: 8.145 Date: 0.000137 Time: 57.580 No. Observation of Residual -98.78 Df Model: Covariance ====================================	Type: coef	OLS Recession OLS Recession OLS Recession OLS Recession OCS The Control of the Co	y R-squ DLS Adj. res F-sta D22 Prob 102 Log-L 60 AIC: 56 BIC: 3 1st	sults ====================================	[0.025

74/12 22:56				Assignme	ent_3_Simeng_Li	
1.317						
hml	0.6370	0.354	1.	.798	0.078	-0.073
1.347						
=========	=======	========	====	=====	========	=======
Omnibus:		11.10	4	Durbi	n-Watson:	
2.633		0.00		-		
Prob(Omnibus):	1	0.004	4	Jarqu	e-Bera (JB):	
13.012		0.75	2	Deach (TD \ .	
Skew: 0.00149		0.75	5	Prob(JB):	
Kurtosis:		4.70	=	Cond.	No	
41.0		4.70.	,	cona.	NO.	
	:=======	=========		=====	=========	=======
=======						
Warnings:						
[1] Standard H	Errors assu	me that the	cova	arianc	e matrix of t	he errors
is correctly	specified.					
PERMNO	date TICK			nktrf		ml r
0 57568 201	170131 B				-0.0113 -0.02	74 0.000
		OLS Regre				
		========	====	=====	=======	======
======== Don Wonichlo		_		D =====		
Dep. Variable:	•	-	Y	R-squ	area:	
0.178		OT 9		74 -	D gguarod.	
Model: 0.134		OLS	5	Adj.	R-squared:	
Method:		Least Squares	2	F_c+a	tistic.	
4.031		nease bquare.	5	r-sca	CISCIC.	
Date:	Wed	. 13 Apr 2023	2	Prob	(F-statistic)	•
0.0115		, 10 1191 202.	_	1100	(1 500015010)	•
Time:		02:52:02	2	Log-L	ikelihood:	
85.974				- 3		
No. Observatio	ons:	60	0	AIC:		
-163.9						
Df Residuals:		50	6	BIC:		
-155.6						
Df Model:		;	3			
Covariance Typ	e:	nonrobus	t			
=========		========	====	=====	========	======
=======					- 1.1	
0 0751	coei	std err		t	P> t	[0.025
0.975]						
const	0.0068	0.008	0.	.813	0.420	-0.010
0.024		0.000			0.120	3.010
mktrf	0.5690	0.177	3.	.211	0.002	0.214
0.924	-					
smb	-0.3890	0.309	-1.	.260	0.213	-1.007
0.229						
hml	-0.3612	0.221	-1.	.636	0.107	-0.803
0.081						
=========		========	====	=====	========	======
=======			_			
Omnibus:		0.860	Ó	Durbi	n-Watson:	
1.763		0.00	.	T = · ·	- De (75)	
Prob(Omnibus):		0.649	y	Jarqu	e-Bera (JB):	
0.885 Skew:		0.26	a	Drob/	TD\.	
DVGM:		0.269	7	Prob(100):	

0.643

Kurtosis: 2.748 Cond. No.

41.0

=======

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smb hml rf 0 59408 20170131 BAC 0.024434 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results

========

Dep. Variable: y R-squared:

0.830

Model: OLS Adj. R-squared:

0.821

Method: Least Squares F-statistic:

91.29

Date: Wed, 13 Apr 2022 Prob (F-statistic):

1.51e-21

Time: 02:52:02 Log-Likelihood:

118.95

No. Observations: 60 AIC:

-229.9

Df Residuals: 56 BIC:

-221.5

Df Model: 3
Covariance Type: nonrobust

=======

0.975]	coef	std err	t	P> t	[0.025
	-				
const	0.0042	0.005	0.872	0.387	-0.005
0.014					
mktrf	1.2973	0.102	12.684	0.000	1.092
1.502					
smb	-0.1111	0.178	-0.624	0.535	-0.468
0.246					
hml	0.9485	0.127	7.445	0.000	0.693
1.204					

========

Omnibus: 1.429 Durbin-Watson:

2.183

Prob(Omnibus): 0.489 Jarque-Bera (JB):

1.103

Skew: 0.052 Prob(JB):

0.576

Kurtosis: 2.344 Cond. No.

41.0

========

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smb hml rf

61946 20170131 BKH 0.019726 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results _____ ======== Dep. Variable: R-squared: 0.149 OLS Model: Adj. R-squared: 0.104 Least Squares Method: F-statistic: 3.280 Wed, 13 Apr 2022 Date: Prob (F-statistic): 0.0274 Time: 02:52:02 Log-Likelihood: 94.274 No. Observations: 60 AIC: -180.5 Df Residuals: BIC: 56 -172.2Df Model: Covariance Type: nonrobust ______ ======== coef std err t P>|t| [0.025] 0.9751 ______ 0.0013 0.007 0.183 0.856 -0.013 const 0.016 0.4119 0.103 0.154 2.669 0.010 mktrf 0.721 -0.1928 0.269 -0.717 0.476 smb -0.731 0.346 0.2296 0.192 1.195 hml 0.237 - 0.1550.615 ______ ======== 0.580 Durbin-Watson: Omnibus: 1.856 0.748 Jarque-Bera (JB): Prob(Omnibus): 0.711 Skew: -0.192 Prob(JB): 0.701 2.630 Cond. No. Kurtosis: ______ ======= Warnings: [1] Standard Errors assume that the covariance matrix of the errors is correctly specified. PERMNO date TICKER RET mktrf smb hml 62156 20170131 BXMT 0.013967 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results _____ ======= Dep. Variable: y R-squared: 0.649 OLS Adj. R-squared: Model: 0.630 Method: Least Squares F-statistic: 34.52

```
Wed, 13 Apr 2022
                             Prob (F-statistic):
Date:
9.12e-13
Time:
                     02:52:02
                            Log-Likelihood:
96.051
No. Observations:
                          60
                            AIC:
-184.1
Df Residuals:
                            BIC:
                          56
-175.7
Df Model:
                          3
Covariance Type:
                   nonrobust
______
========
           coef std err
                              t
                                    P>|t|
0.9751
         -0.0009 0.007 -0.127 0.900 -0.015
const.
0.013
          1.1593 0.150 7.738 0.000 0.859
mktrf
1.459
          0.2658
                  0.261
                           1.019
                                    0.313
                                           -0.257
smb
0.789
           0.7111 0.187
hml
                           3.810
                                    0.000
                                            0.337
1.085
______
Omnibus:
                       17.549 Durbin-Watson:
2.696
Prob(Omnibus):
                       0.000 Jarque-Bera (JB):
32.756
Skew:
                       -0.906 Prob(JB):
7.71e-08
Kurtosis:
                       6.134 Cond. No.
41.0
______
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
          date TICKER RET mktrf smb hml
  PERMNO
 63467 20170131 BRO -0.060856 0.0194 -0.0113 -0.0274 0.0004
                   OLS Regression Results
______
========
Dep. Variable:
                          y R-squared:
0.361
Model:
                         OLS
                            Adj. R-squared:
0.327
Method:
                 Least Squares F-statistic:
10.55
Date:
               Wed, 13 Apr 2022 Prob (F-statistic):
1.34e-05
Time:
                     02:52:02 Log-Likelihood:
100.81
No. Observations:
                          60 AIC:
-193.6
Df Residuals:
                            BIC:
                          56
-185.2
Df Model:
                          3
Covariance Type:
                    nonrobust
```

0.975]					
0.975]					
0.973]	coef	std err	t	P> t	[0.025
const	0.0098	0.007	1.499	0.139	-0.003
0.023					
mktrf	0.7621	0.138	5.506	0.000	0.485
1.039	0 5471	0 241	2 270	0 027	1 020
smb -0.064	-0.5471	0.241	-2.270	0.027	-1.030
hml	0.0171	0.172	0.099	0.921	-0.328
0.362	0.0171	0.172	0.033	0.721	0.320
==========		========	=======	========	=======
=======					
Omnibus:		0.2	94 Durb	in-Watson:	
2.276					
Prob(Omnibus):	:	0.8	63 Jarq	ue-Bera (JB):	
0.034		0 0	1.C Deck	(TD) -	
Skew: 0.983		0.0	46 Prob	(JB):	
Kurtosis:		3.0	72 Cond	. No.	
41.0		3.0	72 COIIG	. 110.	
=======================================		.========	=======	========	======
PERMNO 0 67467 201	date TIC 170131		r mktrf 2 0.0194	smb h -0.0113 -0.02	ml r 74 0.000
· -		BIG -0.00418	2 0.0194 ression R	-0.0113 -0.02	74 0.000
0 67467 201	170131	BIG -0.00418	2 0.0194 ression R	-0.0113 -0.02 esults =======	74 0.000
0 67467 201 ======== Dep. Variable:	170131	BIG -0.00418	2 0.0194 ression R	-0.0113 -0.02 esults	74 0.000
0 67467 201 ========= ======= Dep. Variable: 0.328	170131	BIG -0.00418 OLS Reg	2 0.0194 ression R y R-sq	-0.0113 -0.02 esults ======== uared:	74 0.000
0 67467 201 ======== Dep. Variable: 0.328 Model:	170131	BIG -0.00418 OLS Reg	2 0.0194 ression R y R-sq	-0.0113 -0.02 esults =======	74 0.000
0 67467 201 ========= ======= Dep. Variable: 0.328 Model: 0.292	170131	OLS Reg:	2 0.0194 ression R ====== y R-sq LS Adj.	-0.0113 -0.02 esults ====================================	74 0.000
0 67467 201 ========= Dep. Variable: 0.328 Model: 0.292 Method:	170131	BIG -0.00418 OLS Reg	2 0.0194 ression R ====== y R-sq LS Adj.	-0.0113 -0.02 esults ====================================	74 0.000
0 67467 201 ======== Dep. Variable: 0.328 Model: 0.292 Method: 9.098	170131 	OLS Reg	2 0.0194 ression R ====== y R-sq LS Adj. es F-st	-0.0113 -0.02 esults ====================================	74 0.000
0 67467 201 ======== Dep. Variable: 0.328 Model: 0.292 Method: 9.098 Date: 5.32e-05	170131 	OLS Reg: OLS	2 0.0194 ression R ====== y R-sq LS Adj. es F-st	-0.0113 -0.02 esults ====================================	74 0.000
0 67467 201 ========= Dep. Variable: 0.328 Model: 0.292 Method: 9.098 Date: 5.32e-05 Time:	170131 	OLS Reg	2 0.0194 ression R ====== y R-sq LS Adj. es F-st	-0.0113 -0.02 esults ====================================	74 0.000
0 67467 201 ======== Dep. Variable: 0.328 Model: 0.292 Method: 9.098 Date: 5.32e-05 Time: 30.356	170131 	OLS Reg: OLS Re	2 0.0194 ression R ====== y R-sq LS Adj. es F-st 22 Prob	-0.0113 -0.02 esults ====================================	74 0.000
0 67467 201 ========= Dep. Variable: 0.328 Model: 0.292 Method: 9.098 Date: 5.32e-05 Time: 30.356 No. Observation	170131 	OLS Reg: OLS Re	2 0.0194 ression R ====== y R-sq LS Adj. es F-st	-0.0113 -0.02 esults ====================================	74 0.000
0 67467 201 ========= Dep. Variable: 0.328 Model: 0.292 Method: 9.098 Date: 5.32e-05 Time: 30.356 No. Observation-52.71	170131 	OLS Reg: OLS Re	2 0.0194 ression R ====== y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC:	-0.0113 -0.02 esults ====================================	74 0.000
0 67467 201 ========= Dep. Variable: 0.328 Model: 0.292 Method: 9.098 Date: 5.32e-05 Time: 30.356 No. Observation -52.71 Df Residuals:	170131 	OLS Reg: OLS Re	2 0.0194 ression R ====== y R-sq LS Adj. es F-st 22 Prob	-0.0113 -0.02 esults ====================================	74 0.000
0 67467 201 ========= Dep. Variable: 0.328 Model: 0.292 Method: 9.098 Date: 5.32e-05 Time: 30.356 No. Observation -52.71 Df Residuals: -44.33	170131 	OLS Reg: OLS Re	2 0.0194 ression R ====== y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC:	-0.0113 -0.02 esults ====================================	74 0.000
0 67467 201 ========= Dep. Variable: 0.328 Model: 0.292 Method: 9.098 Date: 5.32e-05 Time: 30.356 No. Observation -52.71 Df Residuals: -44.33 Df Model:		OLS Reg: OLS Re	2 0.0194 ression R ======= y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC:	-0.0113 -0.02 esults ====================================	74 0.000
0 67467 201 ========= Dep. Variable: 0.328 Model: 0.292 Method: 9.098 Date: 5.32e-05 Time: 30.356 No. Observation -52.71 Df Residuals: -44.33 Df Model: Covariance Type====================================		OLS Reg: OLS Re	2 0.0194 ression R ======= y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC: 3	-0.0113 -0.02 esults ====================================	74 0.000
0 67467 201 ========= Dep. Variable: 0.328 Model: 0.292 Method: 9.098 Date: 5.32e-05 Time: 30.356 No. Observation -52.71 Df Residuals: -44.33 Df Model: Covariance Type	T70131 We Ons:	OLS Reg: OLS Re	2 0.0194 ression R ======= y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC: 3 st =======	-0.0113 -0.02 esults ====================================	74 0.000 =======
0 67467 201 ========= Dep. Variable: 0.328 Model: 0.292 Method: 9.098 Date: 5.32e-05 Time: 30.356 No. Observation -52.71 Df Residuals: -44.33 Df Model: Covariance Type====================================	T70131 We Ons:	OLS Reg: OLS Re	2 0.0194 ression R ======= y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC: 3 st =======	-0.0113 -0.02 esults ====================================	74 0.000 =======
0 67467 201 ========= Dep. Variable: 0.328 Model: 0.292 Method: 9.098 Date: 5.32e-05 Time: 30.356 No. Observation -52.71 Df Residuals: -44.33 Df Model: Covariance Type====================================	T70131 We Ons:	OLS Reg: OLS Re	2 0.0194 ression R ======= y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC: 3 st =======	-0.0113 -0.02 esults ====================================	74 0.000 =======
0 67467 201 ========= Dep. Variable: 0.328 Model: 0.292 Method: 9.098 Date: 5.32e-05 Time: 30.356 No. Observation -52.71 Df Residuals: -44.33 Df Model: Covariance Type====================================	T70131 We Ons:	OLS Reg: OLS Re	2 0.0194 ression R ======= y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC: 3 st =======	-0.0113 -0.02 esults ====================================	74 0.000 =======
0 67467 201 ========= Dep. Variable: 0.328 Model: 0.292 Method: 9.098 Date: 5.32e-05 Time: 30.356 No. Observation -52.71 Df Residuals: -44.33 Df Model: Covariance Type====================================	T70131 We Ons: coef	OLS Reg: OLS Re	2 0.0194 ression R ======= y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC: 3 st ========	-0.0113 -0.02 esults ====================================	74 0.000 =======
0 67467 201 ========= Dep. Variable: 0.328 Model: 0.292 Method: 9.098 Date: 5.32e-05 Time: 30.356 No. Observation -52.71 Df Residuals: -44.33 Df Model: Covariance Type====================================	T70131 We ons: coef -0.0161	DLS Reg: OLS Re	2 0.0194 ression R ======= y R-sq LS Adj. es F-st 22 Prob 02 Log- 60 AIC: 56 BIC: 3 st ======= t	-0.0113 -0.02 esults ====================================	74 0.000 ======= [0.025

2/4/12 22:56			Assignr	ment_3_Simeng_Li	
smb 2.382	0.8194	0.780	1.051	0.298	-0.743
hml 0.949	-0.1687	0.558	-0.302	0.763	-1.286
========	========	=======	======	========	
Omnibus:		20.7	24 Durb	in-Watson:	
1.772 Prob(Omnibu	s):	0.0	00 Jarq	ue-Bera (JB):	:
30.581 Skew: 2.29e-07		1.2	58 Prob	(JB):	
Xurtosis: 41.0		5.4	29 Cond	. No.	
=======================================	=========	=======	======	========	========
	d Errors assu ly specified. date TICK				the errors
0 70121	20170131 В	DN -0.01514 OLS Reg	2 0.0194 ression R	-0.0113 -0.0 esults	0.000
=======================================	========	=======	=======	========	
Dep. Variab	le:		y R-sq	uared:	
Model:		0	LS Adj.	R-squared:	
0.482 Method:		Least Squar	es F-st	atistic:	
19.33 Date:		, 13 Apr 20		(F-statistic	c):
9.96e-09 Time:		02:52:	03 Log-	Likelihood:	
91.365 No. Observa	tions:		60 AIC:		
-174.7					
Df Residual -166.4	s:		56 BIC:		
	Type:				
=======					
0.975]	coei	sta err	t 	P> t	[0.025
const	-0.0086	0.008	-1.129	0.264	-0.024
0.007 mktrf				0.000	0.698
1.347 smb		0.282		0.666	
0.687					
hml 0.839				0.035	
=======	========				===
Omnibus:		5.5	27 Durb	in-Watson:	
2.576 Prob(Omnibu			63 Jarq	ue-Bera (JB):	

Skew: -0.347 Prob(JB):

0.0526

Kurtosis: 4.369 Cond. No.

41.0

=======

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smb hml rf
0 70519 20170131 C -0.060575 0.0194 -0.0113 -0.0274 0.0004
OLS Regression Results

=======

Dep. Variable: y R-squared:

0.781

Model: OLS Adj. R-squared:

0.770

Method: Least Squares F-statistic:

66.71

Date: Wed, 13 Apr 2022 Prob (F-statistic):

1.75e-18

Time: 02:52:03 Log-Likelihood:

98.465

No. Observations: 60 AIC:

-188.9

Df Residuals: 56 BIC:

-180.6

Df Model: 3
Covariance Type: nonrobust

0.975]	coef	std err	t	P> t	[0.025
const	-0.0078	0.007	-1.150	0.255	-0.021
0.006					
mktrf	1.5345	0.144	10.662	0.000	1.246
1.823					
smb	0.3036	0.251	1.211	0.231	-0.199
0.806					
hml	1.0044	0.179	5.603	0.000	0.645
1.364					

========

Omnibus: 0.533 Durbin-Watson:

1.800

Prob(Omnibus): 0.766 Jarque-Bera (JB):

0.281

Skew: -0.167 Prob(JB):

0.869

Kurtosis: 3.030 Cond. No.

41.0

========

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

0	PERMNO 76038	date 20170131					smb	hml	
				OLS R	egres	ssion Re	esults		
	=======		=====	-=====	=====	======	======	======	======
_	o. Varia	ole:			У	R-sq	uared:		
	250 del:				OLS	Adj.	R-square	ed:	
	210 thod:		Т.с	act San	arec	F_c+:	atistic:		
	226		100	abe bqu	urcs	1 500			
_	te: 00100		Wed,	13 Apr	2022	Prob	(F-stati	lstic):	
Tir	me:			02:5	2:03	Log-	Likelihoo	od:	
	.117 . Observa	ations:			60	AIC:			
	0.23 Residual	ls:			56	BIC:			
	1.86				_				
	Model:	Type:		nonro	3 bust				
		========					=======	======	======
===	======	COS	af c	td err		+	P> t	- 1	rn n25
0.9	975]	206	5L S	cu eli		C	1> (-1	[0.025
	nst	0.039	91	0.025		1.535	0.13	30	-0.012
	090 trf	1.560)2	0.540		2.889	0.00)5	0.478
	642							-	
smb	b	1.956	52	0.941		2.080	0.04	12	0.072
	840								
hm]	l .146	-1.493	34	0.673	-	-2.220	0.03	30	-2.841
===	======	=======	=====		=====		=======		======
	====== nibus:			15	.178	Durh	in-Watsor	. •	
_	928			13	•170	Duib.	III-wacsoi	ı •	
	ob(Omnibu .863	ıs):		0	.001	Jarq	ue-Bera ((JB):	
Ske				1	.066	Prob	(JB):		
	000132								
Ku:	rtosis: .0			4	.613	Cond	. No.		
			======		:=====	=====:			
===	======								
	rnings:	. 1 -		. 1	1				
-	-	rd Errors		e that t	ne co	ovarian	ce matrix	of the	errors
Τ\$		tly specif)	RET	mk+rf	amh	hml	rf

	PERMNO	date	TICKER	RET	mktrf	smb	hml	rf
0	76224	20170131	BHE	0.003279	0.0194	-0.0113	-0.0274	0.0004

```
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
```

OLS Regression Results

		OLS Regr	ess	ion Re	esults	
=======================================	=======	=======	===:	=====	=======================================	=======
Dep. Variable:			У	R-squ	uared:	
Model: 0.407		OL	S	Adj.	R-squared:	
Method: 14.52		Least Square	s	F-sta	atistic:	
Date:	Wed	, 13 Apr 202	2	Prob	(F-statistic)	:
4.11e-07 Time: 77.202		02:52:0	3	Log-I	Likelihood:	
No. Observation -146.4	ns:	6	0	AIC:		
Df Residuals: -138.0		5	6	BIC:		
Df Model:			3			
Covariance Type		nonrobus		=====		=======
=======		_				
0.975]	coef	std err		t	P> t	[0.025
const - 0.017	-0.0024	0.010	-0	.244	0.808	-0.022
mktrf 1.157	0.7462	0.205	3	.638	0.001	0.335
smb 1.595	0.8798	0.357	2	.463	0.017	0.164
hml 1.234	0.7224	0.256	2	.828	0.006	0.211
	=======	========	===:	=====		=======
 Omnibus: 1.992		1.99	5	Durbi	in-Watson:	
Prob(Omnibus): 1.244		0.36	9	Jarqu	ıe-Bera (JB):	
Skew: 0.537		-0.30	3	Prob((JB):	
Kurtosis:		3.36	2	Cond.	. No.	
=======================================		=======	===	=====	-========	
Warnings: [1] Standard En			cova	arianc	ce matrix of th	ne errors
is correctly s	specified. date TICK		1	mktrf	smb hr	nl rf
		IB -0.022357 OLS Regr	0	.0194	-0.0113 -0.027	
==========	=======	_				=======
======= Dep. Variable:			У	R-squ	ıared:	
0.086 Model:		OL	s	Adj.	R-squared:	
0.037 Method:		Least Square	s	F-sta	atistic:	
1.752 Date:	Wed	, 13 Apr 202	2	Prob	(F-statistic)	:

```
0.167
Time:
                   02:52:03
                          Log-Likelihood:
56.629
No. Observations:
                       60
                          AIC:
-105.3
Df Residuals:
                          BIC:
                       56
-96.88
Df Model:
Covariance Type:
                  nonrobust
_____
_____
           coef std err t P>|t| [0.025]
0.9751
______
const
        -0.0067 0.014 -0.492
                               0.625 -0.034
0.021
mktrf 0.4203 0.289 1.454
                                0.151 -0.159
0.999
         0.5726 0.503 1.138
smb
                                0.260
1.581
         -0.4661 0.360 -1.295
hml
                                0.201
                                       -1.187
0.255
______
========
Omnibus:
                     4.066 Durbin-Watson:
1.981
Prob(Omnibus):
                     0.131 Jarque-Bera (JB):
3.957
Skew:
                     0.221 Prob(JB):
0.138
Kurtosis:
                     4.178 Cond. No.
______
========
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
          date TICKER RET mktrf smb hml rf
  PERMNO
  76892 20170131 BOKF -0.009634 0.0194 -0.0113 -0.0274 0.0004
                  OLS Regression Results
_____
========
Dep. Variable:
                        y R-squared:
0.797
Model:
                      OLS
                         Adj. R-squared:
0.786
Method:
               Least Squares F-statistic:
73.15
             Wed, 13 Apr 2022 Prob (F-statistic):
Date:
2.30e-19
                   02:52:03 Log-Likelihood:
Time:
105.08
No. Observations:
                       60
                         AIC:
-202.2
Df Residuals:
                       56
                          BIC:
-193.8
Df Model:
Covariance Type:
                 nonrobust
______
```

2/4/12 22.30			113315	illient_5_billieng_Ei	
0.975]	coef	std err	t	P> t	[0.025
const	0.0028	0.006	0.465	0.644	-0.009
0.015 mktrf	1.0858	0.129	8.424	0.000	0.828
1.344	1.0050	0.129	0.424	0.000	0.020
smb	1.0290	0.224	4.585	0.000	0.579
1.479					
hml	1.1163	0.161	6.953	0.000	0.795
1.438					
========					
Omnibus:		2.46	4 Dur	bin-Watson:	
2.230					
Prob(Omnibus):		0.29	2 Jar	que-Bera (JB)	:
2.274		0.00		>	
Skew: 0.321		0.39	1 Pro	b(JB):	
Kurtosis:		2.45	3 Con	d. No.	
41.0		2.10	5 0011	a. 110.	
=========	======	=========	======	=========	:
0 77584 201		OLS Regi	ession	4 -0.0113 -0.0 Results ========	
======================================			_	_	
Dep. Variable: 0.392			y R-s	quared:	
Model:		OI	S Adj	. R-squared:	
0.360			,	-	
Method:		Least Square	s F-s	tatistic:	
12.04	**.	1 12 7 . 000	0 5		
Date: 3.43e-06	We	d, 13 Apr 202	2 Pro	b (F-statistic	c):
7:me:		02:52:0	3 Loa	-Likelihood:	
53.357		021021			
No. Observatio	ns:	6	0 AIC	:	
-98.71					
Df Residuals:		5	6 BIC	:	
-90.34 Df Model:			3		
Covariance Typ	e:	nonrobus	_		
=======================================				========	
=======					
0.055-	coef	std err	t	P> t	[0.025
0.975]					
const	0.0242	0.014	1.678	0.099	-0.005
0.053					
mktrf					
	0.6145	0.305	2.013	0.049	
1.226 smb	0.6145 2.2335				

2/4/12 22:56				Assignmer	nt_3_Simeng_Li	
3.298 hml 1.317	0.5559	0.380			0.149	-0.206
=======================================		========	====	======	========	:======
Omnibus:		9 5	577	Durhir	n-Watson:	
2.123		9 • •	, , ,	Dulbii	i-wacson.	
Prob(Omnibus):	•	0.0	800	Jarque	e-Bera (JB):	
9.365			, , ,	ourque	2014 (02)	
Skew:		0.7	792	Prob(3	rв):	
0.00926				- (,	
Kurtosis:		4.1	112	Cond.	No.	
41.0						
=========		=======		=====	========	======
=======						
Warnings:						_
[1] Standard H		me that the	e cov	ariance	matrix of t	he errors
is correctly	_			1		7
PERMNO 0 77605 201	date TICK			mktrf	smb h -0.0113 -0.02	ml r
0 77605 201	1/0131 B	OLS Rec				74 0.000
==========	=======	_				:=======
=======						
Dep. Variable:	:		У	R-squa	red:	
0.338			-	-		
Model:		C	OLS	Adj. F	R-squared:	
0.303					_	
Method:		Least Squar	ces	F-stat	istic:	
9.546						
Date:	Wed	, 13 Apr 20)22	Prob (F-statistic)	:
3.45e-05						
Time:		02:52:	:03	Log-Li	kelihood:	
90.117						
No. Observation	ons:		60	AIC:		
-172.2						
Df Residuals:			56	BIC:		
-163.9			2			
Df Model:			3			
Covariance Typ						
========						
	coef	std err		t.	P> t	[0.025
0.975]				_	- 1-1	[
const	-0.0006	0.008	-0	.072	0.943	-0.016
0.015						
mktrf	0.8675	0.165	5	.245	0.000	0.536
1.199						
	-0.1452	0.288	-0	.504	0.616	-0.722
0.432						
	-0.1002	0.206	-0	.486	0.629	-0.513
0.313						
		=======		======	=======	======
====== Omnibus:		2 1	101	Durhi	n-Watson:	
0mnibus: 1.860		۷. ا	LOI	חתדמדו	-wacson:	
Prob(Omnibus):	•	0 3	336	Jarque	e-Bera (JB):	
1.801	•	0.5	, 50	Jurque	. Deta (OD):	
Skew:		-0.2	280	Prob(3	ГВ):	
		· · ·	- •	(0	, -	

```
0.406
```

Kurtosis: 2.363 Cond. No.

41.0

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smb hml 77659 20170131 BBBY -0.007136 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results

========

Dep. Variable: У R-squared:

0.291

Model: OLS Adj. R-squared:

0.253

Method: Least Squares F-statistic:

7.647

Date: Wed, 13 Apr 2022 Prob (F-statistic):

0.000227

02:52:03 Time: Log-Likelihood:

14.176

No. Observations: 60 AIC:

-20.35

BIC: Df Residuals: 56

-11.97

Df Model: 3 Covariance Type: nonrobust

	coef	std err	t	P> t	[0.025
0.975]					
const	-0.0046	0.028	-0.165	0.870	-0.060
0.051					
mktrf	1.1411	0.586	1.946	0.057	-0.034
2.316					
smb	3.5079	1.021	3.435	0.001	1.462
5.554					
hml	0.2782	0.730	0.381	0.705	-1.185
1.741					
=========			.========		========

========

12.895 Durbin-Watson: Omnibus:

2.289

Prob(Omnibus): 0.002 Jarque-Bera (JB):

18.962

Skew: 0.744 Prob(JB):

7.63e-05

Kurtosis: 5.318 Cond. No.

========

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smb hml rf

```
77660 20170131 CACC -0.056227 0.0194 -0.0113 -0.0274 0.0004
                   OLS Regression Results
_____
========
Dep. Variable:
                           R-squared:
0.332
                       OLS
Model:
                           Adj. R-squared:
0.296
               Least Squares
Method:
                          F-statistic:
9.273
             Wed, 13 Apr 2022
Date:
                          Prob (F-statistic):
4.49e-05
Time:
                    02:52:03
                          Log-Likelihood:
66.673
No. Observations:
                        60
                           AIC:
-125.3
Df Residuals:
                           BIC:
                        56
-117.0
Df Model:
Covariance Type:
                  nonrobust
______
========
           coef std err
                            t
                                 P>|t| [0.025]
0.9751
______
         0.0125 0.012 1.080 0.285 -0.011
const
0.036
          0.9902
                 0.244
                         4.050
                                 0.000
mktrf
                                         0.500
1.480
          0.4750 0.426
                         1.116
                                 0.269
smb
                                        -0.378
1.328
          0.4140 0.305 1.360 0.179 -0.196
hml
1.024
______
========
                      4.784 Durbin-Watson:
Omnibus:
1.662
Prob(Omnibus):
                      0.091 Jarque-Bera (JB):
3.814
Skew:
                     -0.503 Prob(JB):
0.148
                      3.717 Cond. No.
Kurtosis:
______
========
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
          date TICKER
  PERMNO
                      RET mktrf
                                 smb
                                      hml
  77902 20170131 CAKE 0.006346 0.0194 -0.0113 -0.0274 0.0004
                   OLS Regression Results
_____
=======
Dep. Variable:
                        y R-squared:
0.582
Model:
                       OLS
                          Adj. R-squared:
0.560
Method:
                Least Squares F-statistic:
26.02
```

2/4/12 22:56							Assignn	nent_3_Simeng_Li	
Date:		Wed,	13	Apr	2022		Prob	(F-statistic):	
1.13e-10									
Time:				02:5	2:03		Log-I	Likelihood:	
70.011									
No. Observat:	ions:				60		AIC:		
-132.0									
Df Residuals	:				56		BIC:		
-123.6									
Df Model:					3				
Covariance Ty	ype: ======	====			bust	===	=====		======
=======									
	coef	\$	std	err			t	P> t	[0.025
0.975]									
const	-0.0085		0.	011		-0	.784	0.436	-0.030
0.013			_			_			
mktrf	1.2412		0.	.231		5	. 368	0.000	0.778
1.704	1 1477		0	402		2	050	0.006	0.341
smb	1.1477		0.	403		2 .	.850	0.006	0.341
1.954 hml	1.0338		0	288		2	.589	0.001	0.457
1.611	1.0336		0.	200		٠ د	. 309	0.001	0.437
	======	====	====			===	=====		======
Omnibus:				2	2.583		Durb	in-Watson:	
2.249									
Prob(Omnibus):			(.275		Jarqu	ue-Bera (JB):	
1.969	,						-	` '	
Skew:				-(.438		Prob	(JB):	
0.374									
Kurtosis:				3	3.148		Cond	No.	
41.0									

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

	PERMNO	date	TICKER	RET	mktrf	smb	hml		rf
0	77920	20170131	BT.X	_0_06301	0 0194	_0 0113	_0 0274	0	0004

```
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
```

========		OLS Regre	essi	ion Re	esults	
=======						
Dep. Variabl	.e:	7	7	R-squ	uared:	
Model: 0.603		OLS	5	Adj.	R-squared:	
Method: 30.83		Least Squares	5	F-sta	atistic:	
Date: 6.67e-12	Wed	, 13 Apr 2022	2	Prob	(F-statistic):	
Time: 90.550		02:52:03	3	Log-I	Likelihood:	
No. Observat	ions:	60)	AIC:		
-173.1 Df Residuals	s :	56	5	BIC:		
-164.7 Df Model:		;	3			
Covariance T	lype:	nonrobust				
=========		========	====	=====		======
0.975]	coef	std err		t	P> t	[0.025
const	-0.0105	0.008	-1.	353	0.181	-0.026
0.005 mktrf	1.1121	0.164	6.	.772	0.000	0.783
1.441 smb	0.4996	0.286	1.	.747	0.086	-0.073
1.072 hml	0.7831	0.205	3.	.829	0.000	0.373
1.193						
========				_		
Omnibus: 1.838		0.894	ł	Durb	in-Watson:	
Prob(Omnibus	;):	0.640)	Jarqı	ue-Bera (JB):	
0.581 Skew:		-0.240	`	Prob	(TD) •	
0.748		-0.240	,	PLOD	(06):	
Kurtosis: 41.0		3.03	7	Cond	No.	
========		========	-===	=====		======
=======						
		me that the d	cova	ariano	ce matrix of the	e errors
PERMNO	y specified. date TICK	ER RET	n	nktrf	smb hm	l rf
0 79072 2					-0.0113 -0.027	4 0.0004
========						======
Dep. Variabl	.e:	3	7	R-squ	ıared:	
0.772 Model:		OLS	5	Adj.	R-squared:	
0.760 Method:		Least Squares	5	F-sta	atistic:	
63.28		_				
Date:	Wed	, 13 Apr 2022	2	Prob	(F-statistic):	

```
5.47e-18
Time:
                   02:52:03
                          Log-Likelihood:
106.92
No. Observations:
                       60
                         AIC:
-205.8
Df Residuals:
                          BIC:
                       56
-197.5
Df Model:
Covariance Type:
                 nonrobust
_____
_____
          coef std err t P>|t| [0.025]
0.9751
_____
         0.0049 0.006 0.833
const
                               0.408 -0.007
0.017
mktrf 1.0459 0.125 8.367
                                0.000 0.795
1.296
         0.6190 0.218 2.843
smb
                                0.006 0.183
1.055
                 0.156
                        7.013
                                0.000
                                        0.780
hml
         1.0920
1.404
______
========
Omnibus:
                     3.807 Durbin-Watson:
2.174
Prob(Omnibus):
                     0.149 Jarque-Bera (JB):
3.063
Skew:
                    -0.542 Prob(JB):
0.216
Kurtosis:
                     3.224 Cond. No.
______
========
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
         date TICKER RET mktrf smb hml rf
  PERMNO
  79249 20170131 BBSI -0.062246 0.0194 -0.0113 -0.0274 0.0004
                 OLS Regression Results
_____
========
Dep. Variable:
                        y R-squared:
0.477
Model:
                      OLS Adj. R-squared:
0.449
Method:
               Least Squares F-statistic:
17.03
             Wed, 13 Apr 2022 Prob (F-statistic):
Date:
5.57e-08
                   02:52:03 Log-Likelihood:
Time:
69.214
No. Observations:
                       60
                         AIC:
-130.4
Df Residuals:
                       56
                         BIC:
-122.1
Df Model:
Covariance Type:
                 nonrobust
______
```

0.975]	coef	std err		t	P> t	[0.025
	0.0054	0 011	0	401	0 (25	0 020
const	-0.0054	0.011	-0.	491	0.625	-0.028
0.017			_			
mktrf	1.2616	0.234	5.	384	0.000	0.792
1.731			_			
smb	0.5226	0.408	1.	281	0.206	-0.295
1.340						
hml	0.6660	0.292	2.	282	0.026	0.081
1.251						
========		========		=====		=======
		1 0	\ .	5 1		
Omnibus:		1.0)50	Durb	in-Watson:	
1.838						
Prob(Omnibus	5):	0.5	592	Jarqı	ue-Bera (JB):	
0.426						
Skew:		0.0	76	Prob	(JB):	
0.808						
Kurtosis:		3.3	384	Cond	. No.	
41.0						
is correctl PERMNO	y specified. date TIC	KER RE	ET m	ktrf	smb hm	l rf
		D 0.0002		0171	0.0110 0.017	4 0.0004
		OLS Reg	gressi	on Re	esults	
		OLS Reg	gressi	on Re		
=======		OLS Reg	gressi =====	on Re	esults 	
====== Dep. Variabl		OLS Reg	gressi =====	on Re	esults	
====== Dep. Variabl 0.594		OLS Reg	gressi ===== Y	on Re ==== R-squ	esults ======== uared:	
Dep. Variabl 0.594 Model:		OLS Reg	gressi ===== Y	on Re ==== R-squ	esults 	
Dep. Variabl 0.594 Model: 0.572		OLS Reg	gressi ===== y DLS	on Re ===== R-squ Adj.	esults ======= uared: R-squared:	
Dep. Variabl 0.594 Model: 0.572 Method:		OLS Reg	gressi ===== y DLS	on Re ===== R-squ Adj.	esults ======= uared: R-squared:	
Dep. Variabl 0.594 Model: 0.572 Method: 27.28	-====== .e:	OLS Reg	gressi ===== Y OLS	on Re ===== R-squ Adj. F-sta	esults ======== uared: R-squared: atistic:	
Dep. Variabl 0.594 Model: 0.572 Method: 27.28 Date:	-====== .e:	OLS Reg	gressi ===== Y OLS	on Re ===== R-squ Adj. F-sta	esults ======= uared: R-squared:	
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11	-====== .e:	OLS Recommend of the second of	y DLS ces	on Re ===== R-squ Adj. F-sta	esults ====================================	
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11 Time:	-====== .e:	OLS Reg	y DLS ces	on Re ===== R-squ Adj. F-sta	esults ======== uared: R-squared: atistic:	
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11	-====== .e:	OLS Recommend of the second of	y DLS ces	on Re ===== R-squ Adj. F-sta	esults ====================================	
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11 Time:	.e: We	OLS Recommend of the second of	y OLS Ces 022	on Re ===== R-squ Adj. F-sta	esults ====================================	
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11 Time: 85.360	.e: We	OLS Recommend of the second of	y OLS Ces 022	on Re	esults ====================================	
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11 Time: 85.360 No. Observat	e: We	OLS Recommend of the second of	y OLS ces 022 03	on Re	esults ====================================	
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11 Time: 85.360 No. Observation 162.7	e: We	OLS Recommend of the second of	y OLS ces 022 :03	on Re ===== R-squ Adj. F-sta Prob Log-I	esults ====================================	
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11 Time: 85.360 No. Observate-162.7 Df Residuals	e: We	OLS Recommend of the second of	y OLS ces 022 :03	on Re ===== R-squ Adj. F-sta Prob Log-I	esults ====================================	
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11 Time: 85.360 No. Observate -162.7 Df Residuals -154.3	.e: We	OLS Reg	y DLS 1022 103 100 100 100 100 100 10	on Re ===== R-squ Adj. F-sta Prob Log-I	esults ====================================	
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11 Time: 85.360 No. Observate -162.7 Df Residuals -154.3 Df Model: Covariance Telegraphs - 154.3	e: We ions:	OLS Recommend of the second of	y OLS ces 022 03 60 56 3	on Re ===== R-squ Adj. F-sta Prob Log-I AIC: BIC:	esults ====================================	
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11 Time: 85.360 No. Observate -162.7 Df Residuals -154.3 Df Model: Covariance Telegraphs - 154.3	e: We ions:	OLS Recommend of the second of	y OLS ces 022 03 60 56 3	on Re ===== R-squ Adj. F-sta Prob Log-I AIC: BIC:	esults ====================================	
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11 Time: 85.360 No. Observate -162.7 Df Residuals -154.3 Df Model: Covariance Telescope - 154.3	e: We ions:	OLS Recessive OL	y DLS Ces 022 03 60 56 3 1st	on Re	esults ====================================	
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11 Time: 85.360 No. Observate -162.7 Df Residuals -154.3 Df Model: Covariance Telescope - 154.3	e: We ions:	OLS Recessive OL	y DLS Ces 022 03 60 56 3 1st	on Re	esults ===================================	
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11 Time: 85.360 No. Observate -162.7 Df Residuals -154.3 Df Model: Covariance Telescope - 154.3 Covariance Telescope - 154.3	e: We ions:	OLS Recommend of the structure of the st	y DLS Ces 022 03 60 56 3 1st	on Re	esults ====================================	
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11 Time: 85.360 No. Observate -162.7 Df Residuals -154.3 Df Model: Covariance Telescope - 154.3 Covariance Telescope - 154.3	e: We ions:	OLS Recommend of the structure of the st	y DLS ces 3 60 56 3 ist	on Re	esults ====================================	
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11 Time: 85.360 No. Observate -162.7 Df Residuals -154.3 Df Model: Covariance Telescope - 154.3 Covariance Telescope - 154.3	we descriptions: Cype: coef	OLS Recessive OL	y DLS ces 3 60 56 3 1st	on Re	esults ====================================	======= [0.025
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11 Time: 85.360 No. Observate-162.7 Df Residuals-154.3 Df Model: Covariance Teles-154.3	we descriptions: Cype: coef	OLS Recessive OL	y DLS ces 3 60 56 3 1st	on Re	esults ===================================	======= [0.025
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11 Time: 85.360 No. Observate -162.7 Df Residuals -154.3 Df Model: Covariance Telescope	we descriptions: Cype: coef	OLS Recommend of the state of t	y OLS ces 022 :03 60 56 3 ist	on Re	esults ====================================	======= [0.025
Dep. Variable 0.594 Model: 0.572 Method: 27.28 Date: 5.25e-11 Time: 85.360 No. Observation -162.7 Df Residuals -154.3 Df Model: Covariance Telescope	Type: coef -0.0063	OLS Recommend of the state of t	y OLS ces 022 :03 60 56 3 ist	on Re ===== R-squ Adj. F-sta Prob Log-1 AIC: BIC: ===== t	esults ====================================	======= [0.025

2/4/12 22:56			Assignmer	nt_3_Simeng_Li	
0.914					
hml	0.6666	0.223	2.989	0.004	0.220
1.113					
========	:=======	=========	=======	========	=======
=======					
Omnibus:		3.334	Durbir	-Watson:	
2.258					
Prob(Omnibus):		0.189	Jarque	e-Bera (JB):	
2.560					
Skew:		-0.489	Prob(J	ГВ) :	
0.278					
Kurtosis:		3.260	Cond.	No.	
41.0					
=========	:=======				
=======					
Warnings:					_
[1] Standard E		me that the co	ovariance	e matrix of	the errors
is correctly	_				_
PERMNO	date TICK		mktrf		hml r
0 79558 201	.70131 B	FS -0.039183			274 0.000
		OLS Regre			
=======================================	:=======	========	=======	:=======	=======
		**	D com	rod.	
Dep. Variable: 0.499		У	R-squa	ireu:	
		OT C	7 d ÷ T) agus mod.	
Model: 0.472		OLS	Adj. F	R-squared:	
		Toogt Courses	E atat		
Method:		Least Squares	r-Stat	.istic:	
18.59	We d	12 7 2022	Deach (T statistic	\ -
Date:	wea	, 13 Apr 2022	Prob (F-Statistic):
1.72e-08		02.52.02	T T -	11-21	
Time:		02:52:03	rog-r1	kelihood:	
85.629		60	3.7.0		
No. Observatio	ns:	60	AIC:		
-163.3		F.C.	DIG		
Df Residuals:		56	BIC:		
-154.9		2			
Df Model:		3			
Covariance Typ					
	·=======		=======		
	coef	std err	+	D> +	10 025
0.975]	COEI	sta eli	L	P> C	[0.023
const	-0.0041	0.008	-0.488	0.628	-0.021
0.013	010011		00100	0.020	01022
mktrf	0.8637	0.178	4.846	0.000	0.507
1.221					
smb	0.4499	0.310	1.449	0.153	-0.172
1.072				-	
hml	0.7726	0.222	3.480	0.001	0.328
1.217	- · · - v				
	:=======	========	=======		=======
=======					
Omnibus:		0.260	Durbir	-Watson:	
2.017					
Prob(Omnibus):		0.878	Jarque	e-Bera (JB):	
0.451			_	, ,	
Skew:		0.041	Prob(3	ГВ):	
= **		0.011	- 32 (0	,	

0.798

Kurtosis: 2.583 Cond. No.

41.0

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

smb PERMNO date TICKER RET mktrf hml rf 79668 20170131 BDC 0.022736 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results

========

Dep. Variable: У R-squared:

0.359

Model: OLS Adj. R-squared:

0.324

Method: Least Squares F-statistic:

10.44

Date: Wed, 13 Apr 2022 Prob (F-statistic):

1.47e-05

02:52:03 Time: Log-Likelihood:

61.312

No. Observations: 60 AIC:

-114.6

Df Residuals: BIC: 56

-106.2

Df Model: 3 Covariance Type: nonrobust

0.975]	coef	std err	t	P> t	[0.025
const	-0.0106	0.013	-0.844	0.402	-0.036
0.015					
mktrf	1.1428	0.267	4.275	0.000	0.607
1.678					
smb	0.7553	0.466	1.623	0.110	-0.177
1.688					
hml	0.3075	0.333	0.924	0.360	-0.360
0.975					

========

0.739 Durbin-Watson: Omnibus:

2.314

Prob(Omnibus): 0.691 Jarque-Bera (JB):

0.544

Skew: -0.232Prob(JB):

0.762

Kurtosis:

2.957

Cond. No.

======== Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smb hml rf

79758 20170131 BYD 0.007437 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results _____ ======== Dep. Variable: R-squared: 0.608 OLS Model: Adj. R-squared: 0.587 Least Squares Method: F-statistic: 28.92 Wed, 13 Apr 2022 Date: Prob (F-statistic): 1.99e-11 Time: 02:52:03 Log-Likelihood: 67.174 No. Observations: 60 AIC: -126.3Df Residuals: BIC: 56 -118.0Df Model: Covariance Type: nonrobust ______ ======== coef std err t P>|t| [0.025] 0.9751 ______ 0.0051 0.011 0.448 0.656 -0.018 const 0.028 1.8339 1.348 0.242 7.565 0.000 mktrf 2.320 0.8230 0.422 1.949 0.056 smb -0.023 1.669 0.4486 0.302 1.486 0.143 -0.156 hml 1.054 ______ ======== 5.210 Durbin-Watson: Omnibus: 2.361 0.074 Jarque-Bera (JB): Prob(Omnibus): 4.807 Skew: 0.693 Prob(JB): 0.0904 Kurtosis: 3.026 Cond. No. ______ ======== Warnings: [1] Standard Errors assume that the covariance matrix of the errors is correctly specified. date TICKER PERMNO RET mktrf smb hml 80193 20170131 BZH 0.07218 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results _____ ======= Dep. Variable: y R-squared: 0.456 OLS Adj. R-squared: Model: 0.427 Method: Least Squares F-statistic: 15.66

22/4/12 22:36			Assignm	ent_3_Simeng_Li	
Date:	We	d, 13 Apr 202	2 Prob	(F-statistic)	:
1.63e-07					
Time:		02:52:0	3 Log-L	ikelihood:	
48.266 No. Observation	ong•	6	0 AIC:		
-88.53	5115 •	0	o Aic.		
Df Residuals:		5	6 BIC:		
-80.15					
Df Model:			3		
Covariance Typ		nonrobus			
=======================================					
	coef	std err	t	P> t	[0.025
0.975]					
const	0.0049	0.016	0.315	0.754	-0.026
0.036	0.0049	0.010	0.313	0.754	-0.020
mktrf	1.6298	0.332	4.906	0.000	0.964
2.295					
smb	0.6301	0.579	1.089	0.281	-0.529
1.789	1 1005	0 414	0 505		0 004
hml 1.962	1.1327	0.414	2.737	0.008	0.304
1.902	=======	=========	=======	:========	:=======
=======					
Omnibus:		5.35	1 Durbi	n-Watson:	
1.906					
Prob(Omnibus)	:	0.06	9 Jarqu	e-Bera (JB):	
4.449 Skew:		0.63	1 Prob(TD \ •	
0.108		0.03	4 Prob(00).	
Kurtosis:		3.41	6 Cond.	No.	
41.0					
=========	=======	========	=======	========	:=======
=======					

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

	PERMNO	date	TICKER	RET	mktrf	smb	hml	rf
0	80306	20170131	BCRX	_0 004739	0 0194	_0 0113	-0 0274	0.0004

```
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
```

=========	:=======	OLS Regre	ession R	esults =======	=======
======= Dep. Variable:		7	/ R-sq	uared:	
0.394		07.0	_		
Model: 0.361		OLS	Adj.	R-squared:	
Method:		Least Squares	s F-st	atistic:	
12.13					
Date: 3.17e-06	Wed	, 13 Apr 2022	2 Prob	(F-statistic):	
Time:		02:52:03	B Log-	Likelihood:	
20.906 No. Observatio	ons:	60) AIC:		
-33.81 Df Residuals:		56	5 BIC:		
-25.43		50	bic.		
Df Model:		3	3		
Covariance Typ		nonrobust			
=========	=======	========	======	=========	=======
0.975]	coef	std err	t	P> t	[0.025
const	0.0101	0.025	0.409	0.684	-0.039
0.060 mktrf	1.9747	0.524	3.767	0.000	0.925
3.025 smb	2.7787	0.913	3.044	0.004	0.950
4.607 hml	0.4419	0.653	0.677	0.501	-0.866
1.750					
========					
Omnibus:		10.225	5 Durb	in-Watson:	
1.913		0.004		D (TD)	
Prob(Omnibus): 11.106		0.006	o Jarq	ue-Bera (JB):	
Skew:		0.745	5 Prob	(JB):	
0.00388					
Kurtosis: 41.0		4.490) Cond	. No.	
	=======	========	======	=========	======
=======					
		me that the d	covarian	ce matrix of th	e errors
is correctly PERMNO	date TICK	ER RET	mktrf	smb hm	l rf
· -			_	-0.0113 -0.027	
		OLS Regre	ession R	esults	
	=======	========		=========	======
Dep. Variable:		2	y R-sq	uared:	
0.658 Model:		OLS	S Adj.	R-squared:	
0.640 Method:		Least Squares	s F-st	atistic:	
35.96 Date:	Мед	, 13 Apr 2022) Proh	(F-statistic):	
	weu	, 10 1121 2022		(1 200012010).	

```
4.33e-13
Time:
                   02:52:03
                          Log-Likelihood:
99.072
No. Observations:
                       60
                         AIC:
-190.1
Df Residuals:
                          BIC:
                       56
-181.8
Df Model:
Covariance Type:
                  nonrobust
_____
_____
          coef std err t P>|t| [0.025]
0.9751
_____
         0.0015 0.007 0.230
                               0.819 -0.012
const
0.015
mktrf 0.8436 0.142 5.921
                                0.000 0.558
1.129
         0.7126 0.248 2.872
smb
                                0.006 0.216
1.210
                0.177
                        5.161
                                0.000
                                         0.560
hml
          0.9159
1.271
______
========
Omnibus:
                     0.890 Durbin-Watson:
2.761
Prob(Omnibus):
                     0.641 Jarque-Bera (JB):
0.306
Skew:
                    -0.010 Prob(JB):
0.858
Kurtosis:
                     3.349 Cond. No.
______
========
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
         date TICKER RET mktrf smb hml
  PERMNO
  84062 20170131 BJRI -0.09542 0.0194 -0.0113 -0.0274 0.0004
                  OLS Regression Results
_____
========
Dep. Variable:
                        y R-squared:
0.412
Model:
                      OLS Adj. R-squared:
0.381
Method:
               Least Squares F-statistic:
13.10
             Wed, 13 Apr 2022 Prob (F-statistic):
Date:
1.36e-06
Time:
                   02:52:03 Log-Likelihood:
38.853
No. Observations:
                       60
                         AIC:
-69.71
Df Residuals:
                       56
                          BIC:
-61.33
Df Model:
Covariance Type:
                 nonrobust
______
```

	coef	std err		t	P> t	[0.025
0.975]						
const	-0.0097	0.018	-0.	530	0.599	-0.046
0.027						
mktrf	1.8152	0.389	4.	670	0.000	1.037
2.594	1 0660	0 677		071	0.067	0 000
smb 2.623	1.2668	0.677	1.	871	0.067	-0.089
hml	0.5956	0.484	1.	230	0.224	-0.374
1.565	0.000	0.101			0.221	00071
=======================================		=======	=====	====	==========	
Omnibus:		13.2	79	Durb	in-Watson:	
2.127						
Prob(Omnibus	5):	0.0	01	Jarqı	ue-Bera (JB):	
16.879						
Skew:		0.8	58	Prob	(JB):	
0.000216		4 0	E 1	Com -1	. No.	
Kurtosis: 41.0		4.9	51	Cona	. NO.	
=========	-=======	=======	=====	====		
=======						
		BXP 0.04070 OLS Reg	ressi		-0.0113 -0.0274 esults	0.0004
=======						
Dep. Variabl	Le:		У	R-sqı	uared:	
0.519				- 1 '		
Model:		O			_	
0.493 Method:			LS .	Adj.	R-squared:	
20.15		Least Squar		_	_	
		Least Squar		_	_	
Date:	We	Least Squar d, 13 Apr 20	es	F-sta	_	
Date: 5.55e-09	We		es	F-sta	atistic:	
Time:	We		es 22	F-sta	atistic:	
5.55e-09 Time: 88.889		d, 13 Apr 20	es 22 03	F-sta Prob Log-1	atistic: (F-statistic):	
5.55e-09 Time: 88.889 No. Observat		d, 13 Apr 20	es 22 03	F-sta	atistic: (F-statistic):	
5.55e-09 Time: 88.889 No. Observat -169.8	cions:	d, 13 Apr 20	es 22 03	F-sta Prob Log-I	atistic: (F-statistic):	
5.55e-09 Time: 88.889 No. Observat	cions:	d, 13 Apr 20	es 22 03	F-sta Prob Log-1	atistic: (F-statistic):	
5.55e-09 Time: 88.889 No. Observat -169.8 Df Residuals -161.4 Df Model:	cions:	d, 13 Apr 20	es 22 03	F-sta Prob Log-I	atistic: (F-statistic):	
5.55e-09 Time: 88.889 No. Observat -169.8 Df Residuals -161.4 Df Model: Covariance T	cions: S: Type:	d, 13 Apr 20 02:52: nonrobu	es 22 03 60 56 3	F-sta Prob Log-I AIC: BIC:	atistic: (F-statistic): Likelihood:	
5.55e-09 Time: 88.889 No. Observat -169.8 Df Residuals -161.4 Df Model: Covariance T	cions: S: Type:	d, 13 Apr 20 02:52: nonrobu	es 22 03 60 56 3	F-sta Prob Log-I AIC: BIC:	atistic: (F-statistic):	
5.55e-09 Time: 88.889 No. Observat -169.8 Df Residuals -161.4 Df Model: Covariance T	cions: S: Type:	02:52: nonrobu	es 22 03 60 56 3	F-sta Prob Log-1 AIC: BIC:	atistic: (F-statistic): Likelihood:	
5.55e-09 Time: 88.889 No. Observat -169.8 Df Residuals -161.4 Df Model: Covariance T	cions: S: Type:	02:52: nonrobu	es 22 03 60 56 3	F-sta Prob Log-1 AIC: BIC:	atistic: (F-statistic): Likelihood:	
5.55e-09 Time: 88.889 No. Observat -169.8 Df Residuals -161.4 Df Model: Covariance T ====================================	cions: Type: coef	nonrobu	es 22 03 60 56 3 st =====	F-sta Prob Log-1 AIC: BIC:	atistic: (F-statistic): Likelihood: P> t	[0.025
5.55e-09 Time: 88.889 No. Observat -169.8 Df Residuals -161.4 Df Model: Covariance T ====================================	cions: Type: coef	nonrobu	es 22 03 60 56 3 st =====	F-sta Prob Log-1 AIC: BIC:	atistic: (F-statistic): Likelihood:	[0.025
5.55e-09 Time: 88.889 No. Observat -169.8 Df Residuals -161.4 Df Model: Covariance T ====================================	cions: Type: coef	nonrobu	es 22 03 60 56 3 st0.	F-sta Prob Log-1 AIC: BIC:	P> t	[0.025
5.55e-09 Time: 88.889 No. Observat -169.8 Df Residuals -161.4 Df Model: Covariance T ====================================	cions: Type: coef -0.0063	nonrobu ======= std err 0.008	es 22 03 60 56 3 st0.	F-sta Prob Log-I AIC: BIC:	P> t 0.433 0.000	[0.025
5.55e-09 Time: 88.889 No. Observat -169.8 Df Residuals -161.4 Df Model: Covariance T ====================================	cions: Type: coef -0.0063	nonrobu ======= std err 0.008	es 22 03 60 56 3 st ===== -0. 5.	F-sta Prob Log-I AIC: BIC:	P> t 0.433 0.000	[0.025 -0.022

/4/12 22:56			Assigni	ment_3_Simeng_Li	
0.691					
hml	0.6499	0.210	3.090	0.003	0.229
1.071					
=======================================	=======	=======	=======	========	=======
Omnibus:		13.4	05 Durb	in-Watson:	
2.500		13.1	05 Duib	III Wacboii.	
Prob(Omnibus)):	0.0	01 Jarq	ue-Bera (JB):	•
22.787	•		_	•	
Skew:		0.6	98 Prob	(JB):	
1.13e-05					
Kurtosis:		5.6	77 Cond	. No.	
41.0					
========					
Warnings:					
[1] Standard	Errors assu	me that the	covarian	ce matrix of	the errors
is correctly	y specified.				
PERMNO	date TICK				hml i
0 85259 20	0170131 B.	AM 0.04756		-0.0113 -0.0	0.000
========		_	ression R	esuits ========	
=======					
Dep. Variable	e:		y R-sq	uared:	
0.564					
Model:		C	LS Adj.	R-squared:	
0.541					
Method:		Least Squar	es F-st	atistic:	
24.15 Date:	Wod	, 13 Apr 20	22 Brob	(F-statistic	7).
3.70e-10	wea	, 13 Apr 20	ZZ PIOD	(r-statistic	-)·
Time:		02:52:	03 Log-	Likelihood:	
92.601					
No. Observati	ions:		60 AIC:		
-177.2					
Df Residuals:	:		56 BIC:		
-168.8			•		
Df Model:		nonwohi	3		
Covariance Ty	_			=========	========
=======					
	coef	std err	t	P> t	[0.025
0.975]					
const	0 0059	0.007	0 788	0.434	-0.009
0.021	0.0033	0.007	0.700	0.434	-0.009
mktrf	1.1922	0.159	7.513	0.000	0.874
1.510					
smb	-0.0251	0.276	-0.091	0.928	-0.579
0.528					
hml	0.3637	0.198	1.840	0.071	-0.032
0.760	====		===		
=========		=	=	========	======
Omnibus:		13.1	96 Durb	in-Watson:	
2.554					
2.554					
):	0.0	01 Jarq	ue-Bera (JB)	:
Prob(Omnibus) 24.745 Skew:):		-	ue-Bera (JB):	

4.23e-06

Kurtosis: 5.881 Cond. No.

41.0

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

smb PERMNO date TICKER RET mktrf hml rf 85332 20170131 BHB -0.084513 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results

========

Dep. Variable: У R-squared:

0.460

Model: OLS Adj. R-squared:

0.431

Method: Least Squares F-statistic:

15.92

Date: Wed, 13 Apr 2022 Prob (F-statistic):

1.33e-07

02:52:03 Time: Log-Likelihood:

80.881

No. Observations: 60 AIC:

-153.8

BIC: Df Residuals: 56

-145.4

Df Model: 3 Covariance Type: nonrobust

	coef	std err	t	P> t	[0.025
0.975]					
const	0.0016	0.009	0.179	0.858	-0.017
0.020					
mktrf	0.5778	0.193	2.995	0.004	0.191
0.964					
smb	1.0704	0.336	3.186	0.002	0.397
1.743					
hml	0.7828	0.240	3.257	0.002	0.301
1.264					

========

12.342 Durbin-Watson: Omnibus:

2.455

0.002 Prob(Omnibus): Jarque-Bera (JB):

14.967

Skew: 0.824 Prob(JB):

0.000562

Kurtosis:

4.808

Cond. No.

========

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smb hml rf

```
85418 20170131 CAC -0.061642 0.0194 -0.0113 -0.0274 0.0004
                   OLS Regression Results
_____
========
Dep. Variable:
                           R-squared:
0.670
                       OLS
Model:
                           Adj. R-squared:
0.652
                Least Squares
Method:
                          F-statistic:
37.91
              Wed, 13 Apr 2022
Date:
                          Prob (F-statistic):
1.64e-13
Time:
                    02:52:03
                          Log-Likelihood:
108.96
No. Observations:
                        60
                           AIC:
-209.9
Df Residuals:
                           BIC:
                        56
-201.5
Df Model:
Covariance Type:
                  nonrobust
______
========
           coef std err
                            t
                                 P>|t| [0.025]
0.9751
______
         0.0020 0.006 0.352 0.726 -0.009
const
0.013
          0.6486
                 0.121
                         5.368
                                 0.000
mktrf
                                         0.407
0.891
          0.8098 0.210
                         3.849
                                  0.000
smb
                                          0.388
1.231
          0.7984 0.150 5.305
hml
                                 0.000
                                          0.497
1.100
______
========
                      5.723 Durbin-Watson:
Omnibus:
2.337
                      0.057
Prob(Omnibus):
                          Jarque-Bera (JB):
4.987
Skew:
                      0.516 Prob(JB):
0.0826
                      3.965
                           Cond. No.
Kurtosis:
______
=======
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
          date TICKER
  PERMNO
                      RET mktrf
                                 smb
                                       hml
 85860 20170131 BRKL -0.039634 0.0194 -0.0113 -0.0274 0.0004
                  OLS Regression Results
_____
=======
Dep. Variable:
                         y R-squared:
0.622
                       OLS
                          Adj. R-squared:
Model:
0.602
Method:
                Least Squares F-statistic:
30.77
```

```
Wed, 13 Apr 2022
                             Prob (F-statistic):
Date:
6.92e-12
Time:
                     02:52:03
                            Log-Likelihood:
103.68
No. Observations:
                          60
                            AIC:
-199.4
Df Residuals:
                            BIC:
                          56
-191.0
Df Model:
                          3
Covariance Type:
                   nonrobust
______
========
           coef std err
                              t
                                    P>|t|
0.9751
          0.0046 0.006 0.746 0.459 -0.008
const.
0.017
mktrf
         0.4413 0.132 3.345 0.001 0.177
0.706
          0.9148
                  0.230
                           3.982
                                    0.000
                                             0.455
smb
1.375
                  0.164
hml
           0.9427
                           5.736
                                    0.000
                                             0.614
______
Omnibus:
                       17.056 Durbin-Watson:
2.235
Prob(Omnibus):
                       0.000 Jarque-Bera (JB):
27.300
Skew:
                       -0.962 Prob(JB):
1.18e-06
Kurtosis:
                       5.687 Cond. No.
41.0
______
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
          date TICKER RET mktrf smb hml
  PERMNO
 85914 20170131 BBY 0.043356 0.0194 -0.0113 -0.0274 0.0004
                    OLS Regression Results
______
========
Dep. Variable:
                          y R-squared:
0.456
Model:
                         OLS
                            Adj. R-squared:
0.427
Method:
                 Least Squares F-statistic:
15.63
Date:
               Wed, 13 Apr 2022 Prob (F-statistic):
1.67e-07
Time:
                     02:52:03 Log-Likelihood:
69.831
No. Observations:
                          60 AIC:
-131.7
Df Residuals:
                            BIC:
                          56
-123.3
Df Model:
                          3
Covariance Type:
                    nonrobust
```

	========		========	
coef	std err	t	P> t	[0.025
0002	200 011	· ·	101	[000=0
0 0007	0 011	0.061	0.050	0 001
0.0007	0.011	0.061	0.952	-0.021
1.4951	0.232	6.446	0.000	1.030
-0.1368	0.404	-0.339	0.736	-0.946
0.1440	0.289	0.498	0.620	-0.435
0.1110	0.203	0.150	0.020	0.103
	0.5	700 5 1 1	** · · · · ·	
	0.	728 Durbin	-watson:	
ıs) :	0.6	595 Jarque	-Bera (JB):	
	-0.2	247 Prob(J	B):	
		•	,	
	2.8	332 Cond.	No.	
	2.0	JJZ COHA.	.,	
	0.0007 1.4951	1.4951 0.232 -0.1368 0.404 0.1440 0.289	0.0007 0.011 0.061 1.4951 0.232 6.446 -0.1368 0.404 -0.339 0.1440 0.289 0.498	0.0007 0.011 0.061 0.952 1.4951 0.232 6.446 0.000 -0.1368 0.404 -0.339 0.736 0.1440 0.289 0.498 0.620 0.728 Durbin-Watson: 0.695 Jarque-Bera (JB): -0.247 Prob(JB): 2.832 Cond. No.

========

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

	PERMNO	date	TICKER	RET	mktrf	smb	hml		rf
٥	9612/	20170131	витс	0 0//8/	0 0194	0 0113	0 0274	0	0004

```
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
```

OLS Regression Results

		OLS Reg	res	sion Re		
=======================================	=======	========	===	======		=======
Dep. Variable: 0.642			У	R-squ	uared:	
Model:		C	LS	Adj.	R-squared:	
0.623 Method:		Least Squar	es	F-sta	atistic:	
33.47 Date:	Wed	l, 13 Apr 20	22	Prob	(F-statistic):	
1.58e-12 Time:		02:52:	03	Log-I	Likelihood:	
102.06 No. Observation	ns:		60	AIC:		
-196.1 Df Residuals:			56	BIC:		
-187.7 Df Model:			3	2200		
Covariance Type	e :	nonrobu				
==========	=======	=======	===	======		=======
0.975]	coef	std err		t	P> t	[0.025
const	0.0064	0.006		0.997	0.323	-0.006
0.019 mktrf	0.5123	0.136		3.780	0.000	0.241
0.784 smb	0.6328	0.236		2.681	0.010	0.160
1.106 hml	1.1617	0.169		6.881	0.000	0.823
1.500						
=======================================	=======	=======	===	======		======
Omnibus:		6.7	81	Durbi	n-Watson:	
Prob(Omnibus): 6.111		0.0	34	Jarqu	ne-Bera (JB):	
Skew: 0.0471		0.6	00	Prob((JB):	
Kurtosis:		4.0	03	Cond.	No.	
41.0	=======	:=======	===	======		=======
=======						
Warnings: [1] Standard E			co	variano	ce matrix of th	ne errors
is correctly (specified. date TICF		T	mktrf	smb hm	ıl rf
• •		FB 0.03139	2	0.0194	-0.0113 -0.027	
==========	=======	OLS Reg			esults ========	=======
=======						
Dep. Variable: 0.314			У	R-squ	ared:	
Model: 0.277		C	LS	Adj.	R-squared:	
Method:		Least Squar	es	F-sta	atistic:	
8.548 Date:	Wed	l, 13 Apr 20	22	Prob	(F-statistic):	

```
9.14e-05
Time:
                   02:52:03
                          Log-Likelihood:
39.268
No. Observations:
                       60
                          AIC:
-70.54
Df Residuals:
                          BIC:
                       56
-62.16
Df Model:
Covariance Type:
                  nonrobust
_____
_____
           coef std err t P>|t| [0.025]
0.9751
______
const
        -0.0129 0.018 -0.708
                               0.482 -0.049
0.024
mktrf 1.2131 0.386 3.143
                                0.003 0.440
1.986
         1.1858 0.672 1.764
smb
                                0.083 -0.161
2.532
         0.8754 0.481
                        1.821
                                0.074
hml
                                       -0.088
1.839
______
========
Omnibus:
                     3.285 Durbin-Watson:
2.364
Prob(Omnibus):
                     0.193 Jarque-Bera (JB):
2.544
Skew:
                    -0.281 Prob(JB):
0.280
Kurtosis:
                     3.838 Cond. No.
______
========
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
          date TICKER RET mktrf smb hml
  PERMNO
  86382 20170131 BUSE -0.04386 0.0194 -0.0113 -0.0274 0.0004
                  OLS Regression Results
_____
========
Dep. Variable:
                        y R-squared:
0.726
Model:
                      OLS
                         Adj. R-squared:
0.711
Method:
               Least Squares F-statistic:
49.38
             Wed, 13 Apr 2022 Prob (F-statistic):
Date:
9.68e-16
Time:
                   02:52:03 Log-Likelihood:
112.83
No. Observations:
                       60
                         AIC:
-217.7
Df Residuals:
                       56
                          BIC:
-209.3
Df Model:
Covariance Type:
                 nonrobust
______
```

LI-11 12 22.30			rissignine	nt_5_6imeng_Ei	
0.975]	coef	std err	t	P> t	[0.025
const	-0.0009	0.005	-0.167	0.868	-0.012
0.010	0 7270	0 112	6 426	0.000	0 501
mktrf 0.955	0.7279	0.113	6.426	0.000	0.501
smb	0.6068	0.197	3.076	0.003	0.212
1.002		00257	000,0		0.222
hml	0.9661	0.141	6.847	0.000	0.683
1.249					
=========	:=======	========	-=======	=======	========
Omnibus:		1.3	251 Durbin	n-Watson:	
2.868		1.02	.si buibii	i-wacson.	
Prob(Omnibus)	:	0.5	35 Jarque	e-Bera (JB):	
0.598					
Skew:		-0.1	l58 Prob(3	JB):	
0.741					
Kurtosis: 41.0		3.3	373 Cond.	NO.	
=========	=======	========	:=======	========	:=======
	specified date TIC	•	ET mktrf		hml ri
		OLS Rec	gression Res		
========				=======	
Dep. Variable	::		y R-squa	ared:	
0.423					
Model:		(DLS Adj. I	R-squared:	
0.392		Toogt Course	D atat		
Method: 13.66		Least Squar	res F-stat	cistic:	
Date:	We	d, 13 Apr 20)22 Prob ((F-statistic	:):
8.43e-07		w,		(- 2000-20-0	.,,
Time:		02:52	:03 Log-Li	ikelihood:	
51.780					
No. Observati	ons:		60 AIC:		
-95.56			F.C. D.T.C.		
Df Residuals: -87.18			56 BIC:		
Df Model:			3		
Covariance Ty	pe:	nonrobu	_		
==========	:=======	========	:=======		:=======
=======	_			_ 1.1	
0.0753	coef	std err	t	P> t	[0.025
0.975]					
			 		
const	-0.0053	0.015	-0.359	0.721	-0.035
0.024					
mktrf	1.3372	0.313	4.268	0.000	0.710
1.965	1 5247	0 546	2 012	0 007	0 442
smb	1.5347	0.546	2.812	0.007	0.442

2/4/12/22:36			Assignmen	it_3_Simeng_Li	
2.628					
hml	0.3592	0.390	0.920	0.361	-0.423
1.141					
=======	=========	=========	=======	:=======	========
=======					
Omnibus:		12.486	Durbir	-Watson:	
1.951					
Prob(Omnib	us):	0.002	Jarque	e-Bera (JB):	
15.909					
Skew:		0.801	Prob(3	ГВ) :	
0.000351					
Kurtosis:		4.948	Cond.	No.	
41.0					
=======	=========	=========	=======	:=======	========
=======					
Warnings:					
[1] Standa	rd Errors ass	ume that the co	ovariance	matrix of	the errors
is correct	tly specified	•			
PERMNO	date TIC	KER RET	mktrf	smb 1	hml rf
0 87014	20170131 B	SRR 0.011659	0.0194 -	-0.0113 -0.0	274 0.0004
		OLS Regres	ssion Res	sults	
=======	========	=========	=======	========	=======
========					
Dep. Varial	ble:	У	R-squa	red:	
0.675					
Model:		OLS	Adj. F	R-squared:	
0.657					
Method:		Least Squares	F-stat	istic:	
38.75					
Date:	We	d, 13 Apr 2022	Prob (F-statistic):
1.09e-13					
Time:		02:52:03	Log-Li	kelihood:	
100.43					
No. Observa	ations:	60	AIC:		
-192.9					
Df Residua	ls:	56	BIC:		
-184.5					
Df Model:		3			
Covariance	Type:	nonrobust			
========	========	==========	=======	:=======	========
=======					
	coef	std err	t	P> t	[0.025
0.975]					
	5.085e-05	0.007	0.008	0.994	-0.013
0.013					
mktrf	0.9071	0.139	6.513	0.000	0.628
1.186					
smb	0.2896	0.243	1.194	0.238	-0.196
0.775					
hml	1.0776	0.173	6.212	0.000	0.730
1.425					
========					
Omnibus:		5.666	Durbir	-Watson:	
2.409					
Prob(Omnib	us):	0.059	Jarque	e-Bera (JB):	
7.926					
Skew:		0.141	Prob(3	ſВ):	

0.0190

Kurtosis: 4.758 Cond. No.

41.0

=======

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smb hml rf 0 87056 20170131 BMRN 0.057822 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results

=======

Dep. Variable: y R-squared:

0.177

Model: OLS Adj. R-squared:

0.132

Method: Least Squares F-statistic:

4.003

Date: Wed, 13 Apr 2022 Prob (F-statistic):

0.0119

Time: 02:52:03 Log-Likelihood:

69.601

No. Observations: 60 AIC:

-131.2

Df Residuals: 56 BIC:

-122.8

Df Model: 3
Covariance Type: nonrobust

=======

0.975]	coef	std err	t	P> t	[0.025
	-				
const	-0.0049	0.011	-0.447	0.657	-0.027
0.017					
mktrf	0.4165	0.233	1.789	0.079	-0.050
0.883					
smb	0.9318	0.405	2.298	0.025	0.120
1.744					
hml	-0.4390	0.290	-1.514	0.136	-1.020
0.142					

========

Omnibus: 47.403 Durbin-Watson:

1.981

Prob(Omnibus): 0.000 Jarque-Bera (JB):

243.341

Skew: -2.087 Prob(JB):

1.44e-53

Kurtosis: 11.939 Cond. No.

/1 C

========

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smb hml rf

87267 20170131 BLK -0.017239 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results _____ ======== Dep. Variable: R-squared: 0.616 OLS Model: Adj. R-squared: 0.596 Least Squares Method: F-statistic: 30.01 Wed, 13 Apr 2022 Date: Prob (F-statistic): 1.06e-11 Time: 02:52:03 Log-Likelihood: 105.99 No. Observations: 60 AIC: -204.0Df Residuals: BIC: 56 -195.6 Df Model: Covariance Type: nonrobust ______ ======== coef std err t P>|t| [0.025] 0.9751 ______ 0.0027 0.006 0.449 0.655 -0.009 const 0.015 0.127 1.1426 0.888 9.001 0.000 mktrf 1.397 -0.1983 0.221 -0.897 0.374 smb -0.641 0.245 0.1288 0.158 0.815 0.419 -0.188 hml 0.446 ______ ======== 0.758 Durbin-Watson: Omnibus: 2.354 0.684 Jarque-Bera (JB): Prob(Omnibus): 0.695 Skew: 0.252 Prob(JB): 0.706 Kurtosis: 2.843 Cond. No. ______ ======= Warnings: [1] Standard Errors assume that the covariance matrix of the errors is correctly specified. date TICKER PERMNO RET mktrf smb hml 87476 20170131 BMRC -0.036559 0.0194 -0.0113 -0.0274 0.0004 OLS Regression Results _____ ======= Dep. Variable: y R-squared: 0.500 OLS Adj. R-squared: Model: 0.474 Method: Least Squares F-statistic: 18.69

```
Wed, 13 Apr 2022
                             Prob (F-statistic):
Date:
1.60e-08
Time:
                     02:52:03
                            Log-Likelihood:
101.68
No. Observations:
                          60
                            AIC:
-195.4
Df Residuals:
                          56
                            BIC:
-187.0
Df Model:
                          3
Covariance Type:
                   nonrobust
______
========
           coef std err
                              t
                                    P>|t|
0.9751
          0.0009 0.006 0.147 0.884 -0.012
const.
0.014
          0.5642 0.136 4.137 0.000 0.291
mktrf
0.837
          0.4633
                  0.238
                           1.951
                                    0.056
                                           -0.013
smb
0.939
                  0.170
                           3.970
hml
           0.6746
                                    0.000
                                            0.334
1.015
______
                        0.077 Durbin-Watson:
Omnibus:
1.982
Prob(Omnibus):
                       0.962 Jarque-Bera (JB):
0.151
Skew:
                        0.080 Prob(JB):
0.927
Kurtosis:
                        2.812 Cond. No.
41.0
______
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
          date TICKER RET mktrf smb hml
  PERMNO
 87487 20170131 BGCP 0.082111 0.0194 -0.0113 -0.0274 0.0004
                    OLS Regression Results
______
========
Dep. Variable:
                          y R-squared:
0.607
Model:
                         OLS
                            Adj. R-squared:
0.586
Method:
                 Least Squares F-statistic:
28.85
Date:
               Wed, 13 Apr 2022 Prob (F-statistic):
2.07e-11
Time:
                     02:52:03 Log-Likelihood:
66.762
No. Observations:
                          60 AIC:
-125.5
Df Residuals:
                            BIC:
                          56
-117.1
Df Model:
                           3
Covariance Type:
                    nonrobust
```

=========		========		========	========
=======					
	coef	std err	t	P> t	[0.025
0.975]					·
const	-0.0030	0.012	-0.260	0.796	-0.026
0.020		00011	0.200	01,20	00020
mktrf	1.4386	0.244	5.893	0.000	0.950
1.928	10100	0.211	3.030	0.000	0.750
smb	0.6434	0.425	1.514	0.136	-0.208
1.495	0.0131	0.423	1.314	0.130	-0.200
hml	1.4400	0.304	4.736	0.000	0.831
2.049	1.4400	0.304	4.750	0.000	0.031
2.049					
========					
Omnibus:		0 (958 Durbin	-Watson:	
		0.5	956 DULDIN	-watson:	
2.038		0	10 -	D (TD)	
Prob(Omnibus	5):	0.6	519 Jarque	-Bera (JB):	
0.419					
Skew:		-0.1	l60 Prob(J	B):	
0.811					
Kurtosis:		3.2	256 Cond.	No.	
41.0					
=========		========		=========	========

========

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

	PERMNO	date	TICKER	RET	mktrf	smb	hml	rf
0	88280	20170131	BHLB	-0.039349	0.0194	-0.0113	-0.0274	0.0004

```
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
```

OLS Regression Results

		OLS Regr	ess	sion Re	esults	
==========	=======	:=======	===		=========	======
					_	
Dep. Variable:			У	R-squ	ared:	
0.539						
Model:		OL	ıS	Adj.	R-squared:	
0.515						
Method:	I	Least Square	s	F-sta	atistic:	
21.87						
Date:	Wed,	13 Apr 202	2	Prob	(F-statistic):	
1.68e-09						
Time:		02:52:0	3	Log-I	Likelihood:	
65.381						
No. Observation	ns:	6	0	AIC:		
-122.8						
Df Residuals:		5	6	BIC:		
-114.4						
Df Model:			3			
Covariance Typ	e :	nonrobus	t			
===========	========					=======
=======						
	coef	std err		t	P> t	[0.025
0.975]						
const	0.0081	0.012	C	0.684	0.497	-0.016
0.032						
mktrf	0.6635	0.250	2	2.656	0.010	0.163
1.164						
smb	1.2285	0.435	2	2.824	0.007	0.357
2.100						
hml	1.6795	0.311	5	5.398	0.000	1.056
2.303						
=========	========	:=======	===	======	:=======:	=======
=======						
Omnibus:		28.52	8	Durbi	in-Watson:	
2.038						
Prob(Omnibus):		0.00	0	Jarqu	ıe-Bera (JB):	
82.080						
Skew:		-1.30	9	Prob((JB):	
1.50e-18						
Kurtosis:		8.09	7	Cond.	No.	
41.0						
=========	========	:=======	===	======	:=======:	=======
=======						
Warnings:						
[1] Standard E	rrors assum	ne that the	COV	arianc	ce matrix of the	e errors
is correctly	specified.					
PERMNO	date TICKE	ER RET		mktrf	smb hm	l rf
0 88504 201	70131 BRF	KR 0.120397	C	0.0194	-0.0113 -0.027	4 0.0004
		OLS Regr	ess	sion Re	esults	
=========	=======		===			=======
=======						
Dep. Variable:			У	R-squ	ared:	
0.483						
Model:		OL	ıS	Adj.	R-squared:	
0.455						
Method:	I	Least Square	s	F-sta	atistic:	
17.42						
Date:	Wed,	13 Apr 202	2	Prob	(F-statistic):	

```
4.12e-08
Time:
                   02:52:04
                          Log-Likelihood:
86.270
No. Observations:
                       60
                         AIC:
-164.5
Df Residuals:
                         BIC:
                       56
-156.2
Df Model:
Covariance Type:
                 nonrobust
_____
_____
          coef std err t P>|t| [0.025]
0.9751
_____
const
         0.0099 0.008 1.189
                               0.240 -0.007
0.027
mktrf 1.1459 0.176 6.498
                                0.000 0.793
1.499
         0.2405 0.307 0.783
smb
                                0.437 -0.375
0.856
                0.220
                        0.241
                               0.810
hml
         0.0529
0.493
______
========
Omnibus:
                     0.588 Durbin-Watson:
1.861
Prob(Omnibus):
                     0.745 Jarque-Bera (JB):
0.170
Skew:
                     0.093 Prob(JB):
0.919
Kurtosis:
                     3.182 Cond. No.
______
========
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
         date TICKER RET mktrf smb hml rf
  PERMNO
  89138 20170131 BG -0.041944 0.0194 -0.0113 -0.0274 0.0004
                 OLS Regression Results
_____
========
Dep. Variable:
                       y R-squared:
0.288
Model:
                      OLS Adj. R-squared:
0.250
Method:
               Least Squares F-statistic:
7.568
             Wed, 13 Apr 2022 Prob (F-statistic):
Date:
0.000246
Time:
                   02:52:04 Log-Likelihood:
80.360
No. Observations:
                       60
                         AIC:
-152.7
Df Residuals:
                       56
                         BIC:
-144.3
Df Model:
Covariance Type:
                 nonrobust
______
```

0.975]	coef	std err		t	P> t	[0.025
const	0.0071	0.009	0	.778	0.440	-0.011
0.026						
mktrf	0.5234	0.195	2	.690	0.009	0.134
0.913						
smb	-0.2149	0.339	-0	.634	0.529	-0.894
0.464	0 0010	0.040	2	200	0.001	0 226
hml 1.307	0.8212	0.242	3	.388	0.001	0.336
=======================================	=======	========	====	=====		=======
Omnibus:		16.3	35	Durb	in-Watson:	
2.200						
Prob(Omnibus):	0.0	00	Jarqı	ue-Bera (JB):	
20.253						
Skew:		1.1	01	Prob	(JB):	
4.00e-05						
Kurtosis:		4.8	03	Cond	. No.	
41.0	====	====			=====	====
========						
PERMNO	date TIC			mktrf		nl rf
0 89445 2	0170131 B	OLS Reg				74 0.0004
======== =============================	=======			ion Re		74 0.0004
=======================================	=======	OLS Reg	ress	ion Re ===== R-sq	esults 	74 0.0004
======== =============================	=======	OLS Reg ======= O	ress ====: y LS	ion Re ===== R-squ Adj.	esults ======= uared: R-squared:	74 0.0004
======== =============================	=======	OLS Reg	ress ====: y LS	ion Re ===== R-squ Adj.	esults ======= uared: R-squared:	74 0.0004
======== =============================	======== e:	OLS Reg	ress ====: Y LS es	ion Re ===== R-squ Adj. F-sta	esults ====================================	
======================================	======== e:	OLS Reg ======= O	ress ====: Y LS es	ion Re ===== R-squ Adj. F-sta	esults ======= uared: R-squared:	
======================================	======== e:	OLS Reg	ress. ====: Y LS es	ion Re ===== R-sq Adj. F-sta	esults ====================================	
======================================	======== e:	OLS Reg	ress. ====: Y LS es	ion Re ===== R-sq Adj. F-sta	esults ====================================	
======================================	======= e: We	OLS Reg OLS Reg OLS Reg OLS Reg OLS Reg OLS Reg	ress ====: Y LS es	ion Re ===== R-sq Adj. F-sta	esults ====================================	
======================================	e: We	OLS Reg OLS Reg OLS Reg OLS Reg OLS Reg	y LS es 22	R-squ Adj. F-sta Prob Log-1	esults ====================================	
======================================	e: We	OLS Reg OLS Reg OLS Reg OLS Reg OLS Reg	y LS es 22	R-squ Adj. F-sta	esults ====================================	
======================================	e: We	OLS Reg OLS Reg OLS Reg OLS Reg OLS Reg	ress. y LS es 22 04 60	R-squ Adj. F-sta Prob Log-1	esults ====================================	
======================================	e: Wedions:	OLS Reg	y LS es 22 04 60 56	R-squ Adj. F-sta Prob Log-1	esults ====================================	
Dep. Variabl 0.089 Model: 0.041 Method: 1.831 Date: 0.152 Time: 34.396 No. Observat -60.79 Df Residuals -52.41 Df Model: Covariance T	e: We ions: :	OLS Reg	ress. y LS es 22 04 60 56 3 st	ion Re	esults ====================================	
Dep. Variabl 0.089 Model: 0.041 Method: 1.831 Date: 0.152 Time: 34.396 No. Observat -60.79 Df Residuals -52.41 Df Model: Covariance T	e: We ions: :	OLS Reg	ress. y LS es 22 04 60 56 3 st	ion Re	esults ====================================	
Dep. Variabl 0.089 Model: 0.041 Method: 1.831 Date: 0.152 Time: 34.396 No. Observat -60.79 Df Residuals -52.41 Df Model: Covariance T	e: We ions: :	OLS Reg OLS Reg OLS Reg OLS Reg OLS Reg	ress. y LS es 22 04 60 56 3 st	ion Re	esults ====================================	:
======================================	e: We ions: :	OLS Reg OLS Reg OLS Reg OLS Reg OLS Reg	ress. y LS es 22 04 60 56 3 st	ion Re	esults ===================================	:
======================================	e: We ions: :	OLS Reg	ress. y LS es 22 04 60 56 3 st	ion Re	esults ===================================	[0.025
======================================	e: Wedions: : 'ype: coef 0.0076	OLS Reg	ress. y LS es 22 04 60 56 3 st ====:	ion Remarks ion Reserved in Re	esults ====================================	[0.025
======================================	e: We ions: coef	OLS Reg	ress. y LS es 22 04 60 56 3 st ====:	ion Re	esults ====================================	[0.025

2/4/12 22:56			Assignme	nt_3_Simeng_Li	
2.163					
hml	-0.0925	0.521	-0.177	0.860	-1.137
0.952					
=======================================	========	========	======	========	=======
Omnibus:		4.878	R Durhi	n-Watson:	
2.104		4.076	b Duibi.	II-wacsoli:	
Prob(Omnibus)	•	0.087	7 Jargu	e-Bera (JB):	
3.898	•	0.00	, ourqu	e bera (ob).	
Skew:		0.568	B Prob(JB):	
0.142			(,-	
Kurtosis:		3.519	Cond.	No.	
41.0					
=========	========	========	======	========	=======
=======					
Warnings:					
[1] Standard		me that the o	covarianc	e matrix of	the errors
is correctly	-		.1	1	1 1
PERMNO	date TICK		mktrf		hml r
0 89482 201	1/0131 BA	NC -0.089337	0.0194 ession Re		2/4 0.000
=========	========				========
=======					
Dep. Variable	:	<u> </u>	y R-squ	ared:	
0.647		-			
Model:		OLS	S Adj.	R-squared:	
0.628					
Method:		Least Squares	s F-sta	tistic:	
34.16					
Date:	Wed	, 13 Apr 2022	2 Prob	(F-statistic):
1.10e-12					
Time:		02:52:04	4 Log-L	ikelihood:	
76.425					
No. Observation	ons:	60	AIC:		
-144.8		-			
Df Residuals:		56	BIC:		
-136.5					
Df Model: Covariance Typ	n o.		3		
======================================	_				
========					
	coef	std err	t	P> t	[0.025
0.975]				1 1	•
const	-0.0012	0.010	-0.127	0.900	-0.021
0.018					
mktrf	1.2308	0.208	5.923	0.000	0.815
1.647	1 (000	0.363	4 400	0.000	0.000
smb	1.6232	0.362	4.486	0.000	0.898
2.348	0 7720	0.250	2 006	0 004	0.254
hml 1.291	0.//29	0.259	2.900	0.004	0.254
	========	=========	=======	========	=======:
=======		·	· -	-	_ .
Omnibus:		7.433	3 Durbi:	n-Watson:	
2.291					
Prob(Omnibus)	:	0.024	4 Jarqu	e-Bera (JB):	
7.312			-	. ,	
Skew:		0.586	f Prob(JB):	
			·		

0.0258

Kurtosis: 4.246 Cond. No.

41.0

=======

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

========

Dep. Variable: y R-squared:

0.368

Model: OLS Adj. R-squared:

0.334

Method: Least Squares F-statistic:

10.85

Date: Wed, 13 Apr 2022 Prob (F-statistic):

1.01e-05

Time: 02:52:04 Log-Likelihood:

80.010

No. Observations: 60 AIC:

-152.0

Df Residuals: 56 BIC:

-143.6

Df Model: 3
Covariance Type: nonrobust

=======

0.975]	coef	std err	t	P> t	[0.025
const	-0.0072	0.009	-0.776	0.441	-0.026
0.011					
mktrf	0.9313	0.196	4.758	0.000	0.539
1.323					
smb	0.5310	0.341	1.558	0.125	-0.152
1.214					
hml	-0.0471	0.244	-0.193	0.848	-0.535
0.441					

========

Omnibus: 2.229 Durbin-Watson:

1.883

Prob(Omnibus): 0.328 Jarque-Bera (JB):

1.423

Skew: -0.311 Prob(JB):

0.491

Kurtosis: 3.428 Cond. No.

11 C

========

Warnings:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

PERMNO date TICKER RET mktrf smb hml rf

```
90353 20170131 BECN -0.049924 0.0194 -0.0113 -0.0274 0.0004
                   OLS Regression Results
_____
========
Dep. Variable:
                           R-squared:
0.636
                       OLS
Model:
                           Adj. R-squared:
0.616
               Least Squares
Method:
                          F-statistic:
32.56
             Wed, 13 Apr 2022
Date:
                          Prob (F-statistic):
2.58e-12
Time:
                    02:52:04
                          Log-Likelihood:
72.145
No. Observations:
                        60
                           AIC:
-136.3
Df Residuals:
                           BIC:
                        56
-127.9
Df Model:
Covariance Type:
                  nonrobust
______
========
           coef std err
                           t
                                P>|t| [0.025
0.9751
______
         -0.0078 0.011 -0.745 0.460 -0.029
const
0.013
                                         1.328
         1.7747 0.223
                         7.953
                                 0.000
mktrf
2.222
          0.0886 0.389
                         0.228
                                 0.820
smb
                                        -0.690
0.867
          0.9715 0.278 3.495 0.001 0.415
hml
1.528
______
========
                      1.720 Durbin-Watson:
Omnibus:
1.760
                      0.423 Jarque-Bera (JB):
Prob(Omnibus):
1.114
Skew:
                      0.316 Prob(JB):
0.573
                      3.212 Cond. No.
Kurtosis:
______
========
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
          date TICKER
 PERMNO
                      RET mktrf
                                 {\tt smb}
                                      hml
 90718 20170131 BFIN -0.091093 0.0194 -0.0113 -0.0274 0.0004
                  OLS Regression Results
_____
=======
Dep. Variable:
                        y R-squared:
0.329
                       OLS Adj. R-squared:
Model:
0.294
Method:
                Least Squares F-statistic:
9.170
```

```
Wed, 13 Apr 2022
                             Prob (F-statistic):
Date:
4.96e-05
Time:
                     02:52:04
                            Log-Likelihood:
90.170
No. Observations:
                          60
                            AIC:
-172.3
Df Residuals:
                            BIC:
                          56
-164.0
Df Model:
                          3
Covariance Type:
                   nonrobust
______
========
           coef std err
                              t
                                    P>|t|
0.9751
         -0.0039 0.008 -0.502 0.617 -0.020
const.
0.012
         0.4364 0.165 2.641 0.011 0.105
mktrf
0.767
          0.5762
                 0.288
                          2.002
                                    0.050
                                           -0.000
smb
1.153
                  0.206
                           2.502
hml
           0.5149
                                    0.015
                                            0.103
0.927
______
Omnibus:
                       0.472 Durbin-Watson:
2.173
Prob(Omnibus):
                       0.790 Jarque-Bera (JB):
0.553
Skew:
                       -0.196 Prob(JB):
0.758
Kurtosis:
                       2.740 Cond. No.
41.0
______
Warnings:
[1] Standard Errors assume that the covariance matrix of the errors
is correctly specified.
          date TICKER RET mktrf smb hml
  PERMNO
 90720 20170131 BLDR -0.019143 0.0194 -0.0113 -0.0274 0.0004
                   OLS Regression Results
______
========
Dep. Variable:
                          y R-squared:
0.552
Model:
                         OLS
                            Adj. R-squared:
0.528
Method:
                 Least Squares F-statistic:
23.01
Date:
               Wed, 13 Apr 2022 Prob (F-statistic):
7.78e-10
Time:
                     02:52:04 Log-Likelihood:
57.931
No. Observations:
                          60 AIC:
-107.9
Df Residuals:
                          56
                            BIC:
-99.49
Df Model:
                          3
Covariance Type:
                    nonrobust
```

=========	=======	:========	=======	========	========
0.975]	coef	std err	t	P> t	[0.025
const 0.043	0.0166	0.013	1.244	0.219	-0.010
mktrf	2.0912	0.283	7.394	0.000	1.525
smb 1.236	0.2496	0.493	0.507	0.614	-0.737
hml 1.083	0.3778	0.352	1.072	0.288	-0.328
==========	-======	:========	=======	========	=======
======= Omnibus: 1.759		1.190	O Durbin	-Watson:	
Prob(Omnibus):	:	0.55	l Jarque	-Bera (JB):	
Skew: 0.558		0.318	8 Prob(J	B):	
Kurtosis:		2.75	Cond.	No.	
==========				========	

========

^[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

```
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:1
17: FutureWarning: In a future version of pandas all arguments of co
ncat except for the argument 'objs' will be keyword-only
  x = pd.concat(x[::order], 1)
```

In [10]:

In [11]:

df

Out[11]:

	ticker	r_squared	adj_r_squared	alpha	bata_mktrf	bata_smb	bata_hml
0	BWXT	0.319518	0.283063	-0.008452	1.035051	-0.255460	-0.025344
1	BCPC	0.151024	0.105543	0.007626	0.477501	0.231980	0.122664
2	CAL	0.491911	0.464692	-0.008616	2.010956	1.691033	1.102032
3	ВС	0.614279	0.593615	-0.001431	1.446841	0.968595	0.372144
4	BAH	0.333477	0.297770	0.002267	0.764677	-0.241293	-0.486009
95	BANC	0.646651	0.627721	-0.001240	1.230841	1.623205	0.772896
96	BLKB	0.367581	0.333701	-0.007162	0.931270	0.530980	-0.047068
97	BECN	0.635610	0.616089	-0.007835	1.774667	0.088601	0.971480
98	BFIN	0.329431	0.293508	-0.003914	0.436431	0.576216	0.514933
99	BLDR	0.552135	0.528142	0.016584	2.091193	0.249562	0.377770

100 rows × 7 columns

In [12]:

```
# Save the final output to .csv file
df.to_csv('/content/Assign3-Output.csv')
```