

# Is the relationship between equity issuance and market liquidity just a matter of region?

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This code has been written by Anh Nguyen and Sina Seyfi, for the course Empirical Corporate Finance 2021, assignment 3. We replicate results from the Paper Hanselaar, Rogier M, Rene M Stulz, and Mathijs A Van Dijk, 2019, Do firms issue more equity when markets become more liquid?, *Journal of Financial Economics* 133, 64–82.

For running the codes online [click here](#). If there are any questions contact authors.

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## 1 Introduction

```
[ ]: import numpy as np
import pandas as pd
import stat
import matplotlib.pyplot as plt
!pip install linearmodels

# Perform PooledOLS
from linearmodels import PooledOLS
import statsmodels.api as sm
from linearmodels import PanelOLS
```

In this part, we read the data. In order to be able to run the codes afterward, you need to change the path of the data to the excel file that we provided.

## 2 Table 2 - Replication

We define the Issues data, Liquidity and returns:

```
[ ]: path = '/content/drive/MyDrive/PhD/ECF/Hanselaar_Stulz_vanDijk_data/
      ↳Hanselaar_Stulz_vanDijk_data.xlsx'
Issues = pd.read_excel(path, sheet_name='Issues', skiprows=5)
Issues = Issues.set_index(['YearQuarter'])
Issues = Issues.diff()
```

```

Issues_1 = Issues.shift()
Issues_2 = Issues.shift(2)
Issues_3 = Issues.shift(3)

Liquidity = pd.read_excel(path, sheet_name='Liquidity', skiprows=5)
Liquidity = Liquidity.set_index(['YearQuarter'])
Liquidity = Liquidity.diff()
Liquidity_2p = Liquidity.shift(-2)
Liquidity_1p = Liquidity.shift(-1)
Liquidity_1 = Liquidity.shift(1)
Liquidity_2 = Liquidity.shift(2)
Liquidity_3 = Liquidity.shift(3)
Liquidity_4 = Liquidity.shift(4)
Liquidity_5 = Liquidity.shift(5)
Liquidity_6 = Liquidity.shift(6)

Market_returns = pd.read_excel(path, sheet_name='Market returns', skiprows=5)
Market_returns = Market_returns.set_index(['YearQuarter'])

Market_returns_1p = Market_returns.shift(-1)
Market_returns_1 = Market_returns.shift(1)
Market_returns_2 = Market_returns.shift(2)
Market_returns_3 = Market_returns.shift(3)
Market_returns_4 = Market_returns.shift(4)

names_of_variables = [Issues,
                      Liquidity_2p, Liquidity_1p, Liquidity,
                      Liquidity_1, Liquidity_2, Liquidity_3, Liquidity_4,
                      Liquidity_5, Liquidity_6,
                      Market_returns_1p, Market_returns, Market_returns_1,
                      Market_returns_2, Market_returns_3, Market_returns_4,
                      Issues_1, Issues_2, Issues_3]

list_of_variables = ['Issues',
                    'Liquidity_2p', 'Liquidity_1p', 'Liquidity',
                    'Liquidity_1', 'Liquidity_2', 'Liquidity_3', 'Liquidity_4',
                    'Liquidity_5', 'Liquidity_6',
                    'Market_returns_1p', 'Market_returns', 'Market_returns_1',
                    'Market_returns_2', 'Market_returns_3', 'Market_returns_4',
                    'Issues_1', 'Issues_2', 'Issues_3']

i = 0

```

```

for data in names_of_variables:
    data = pd.DataFrame(data.stack(dropna = False ),
    →columns=[list_of_variables[i]])
    data.index = data.index.set_names(['YearQuarter', 'Country'])
    if i == 0: new_name_of_variables = pd.DataFrame(index = data.index, columns=
    →list_of_variables)
    new_name_of_variables[list_of_variables[i]] = data
    i += 1

panel_data = pd.concat([new_name_of_variables,
                        pd.get_dummies(pd.DataFrame(new_name_of_variables.index.
    →get_level_values(0) % 10,
                        index = new_name_of_variables.
    →index)['YearQuarter'])], axis = 1)

panel_data

```

```

[ ]:
YearQuarter Country      Issues  Liquidity_2p  Liquidity_1p  ...  2  3  4
19901      ARG          NaN          NaN          NaN  ...  0  0  0
          AUS          NaN          NaN          NaN  ...  0  0  0
          AUT          NaN          NaN          NaN  ...  0  0  0
          BEL          NaN          NaN          NaN  ...  0  0  0
          BRA          NaN          NaN          NaN  ...  0  0  0
...
20144      SWE      1.498864          NaN          NaN  ...  0  0  1
          THA      1.521491          NaN          NaN  ...  0  0  1
          USANASDAQ  1.481866          NaN          NaN  ...  0  0  1
          USANYSE   0.079183          NaN          NaN  ...  0  0  1
          ZAF      2.606112          NaN          NaN  ...  0  0  1

```

[4000 rows x 23 columns]

```

[ ]: panel_data = panel_data.reset_index().set_index(['Country', 'YearQuarter'])

panel_data

```

```

[ ]:
Country YearQuarter      Issues  Liquidity_2p  Liquidity_1p  ...  2  3  4
ARG      19901          NaN          NaN          NaN  ...  0  0  0
AUS      19901          NaN          NaN          NaN  ...  0  0  0
AUT      19901          NaN          NaN          NaN  ...  0  0  0
BEL      19901          NaN          NaN          NaN  ...  0  0  0
BRA      19901          NaN          NaN          NaN  ...  0  0  0
...

```

SWE	20144	1.498864	NaN	NaN	...	0	0	1
THA	20144	1.521491	NaN	NaN	...	0	0	1
USANASDAQ	20144	1.481866	NaN	NaN	...	0	0	1
USANYSE	20144	0.079183	NaN	NaN	...	0	0	1
ZAF	20144	2.606112	NaN	NaN	...	0	0	1

[4000 rows x 23 columns]

### Summary Statistic

```
[ ]: panel_data.dropna()[['Issues', 'Liquidity', 'Liquidity_1',
                          'Market_returns', 'Market_returns_1', 'Issues_1']].
      →corr()
```

```
[ ]:      Issues  Liquidity  ...  Market_returns_1  Issues_1
Issues      1.000000   0.116113  ...      -0.031545 -0.661083
Liquidity    0.116113   1.000000  ...      -0.203004 -0.103994
Liquidity_1  -0.015939  -0.547862  ...      0.176800  0.113211
Market_returns  0.098701  0.178499  ...      0.047959 -0.051111
Market_returns_1 -0.031545 -0.203004  ...      1.000000  0.100155
Issues_1     -0.661083  -0.103994  ...      0.100155  1.000000
```

[6 rows x 6 columns]

### Panel regressions

## 2.1 table 2 model 1

```
[ ]: model = PanelOLS(panel_data.dropna().Issues,
                      panel_data.dropna().drop(columns=['Issues', 'Liquidity_2p',
                                                         'Liquidity_5', 'Liquidity_6',
                                                         →'Issues_2', 'Issues_3']))
res = model.fit()

print(res.summary)
```

### PanelOLS Estimation Summary

```
=====
Dep. Variable:      Issues      R-squared:      0.4747
Estimator:          PanelOLS    R-squared (Between): -0.3087
No. Observations:    3028      R-squared (Within):  0.4748
Date:                Wed, Jul 28 2021  R-squared (Overall):  0.4747
Time:                12:13:50    Log-likelihood        -4943.5
Cov. Estimator:      Unadjusted

F-statistic:      170.06
Entities:          40          P-value            0.0000
Avg Obs:           75.700      Distribution:        F(16,3011)
Min Obs:           0.0000
Max Obs:           89.000      F-statistic (robust): 169.09
P-value            0.0000
```

Time periods: 98 Distribution: F(16,3011)  
 Avg Obs: 30.898  
 Min Obs: 0.0000  
 Max Obs: 38.000

Parameter Estimates

=====					
=====					
	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI					
-----					
-----					
Liquidity_1p	-0.0198	0.0231	-0.8548	0.3927	-0.0652
0.0256					
Liquidity	0.0954	0.0335	2.8473	0.0044	0.0297
0.1611					
Liquidity_1	0.1024	0.0381	2.6844	0.0073	0.0276
0.1772					
Liquidity_2	0.0305	0.0380	0.8033	0.4219	-0.0440
0.1050					
Liquidity_3	0.0388	0.0324	1.1975	0.2312	-0.0247
0.1023					
Liquidity_4	0.0077	0.0218	0.3517	0.7251	-0.0350
0.0504					
Market_returns_1p	-0.0357	0.0256	-1.3915	0.1642	-0.0860
0.0146					
Market_returns	0.0685	0.0254	2.6999	0.0070	0.0188
0.1182					
Market_returns_1	0.0888	0.0260	3.4131	0.0007	0.0378
0.1398					
Market_returns_2	-0.1576	0.0260	-6.0680	0.0000	-0.2085
-0.1067					
Market_returns_3	-0.0269	0.0260	-1.0327	0.3018	-0.0779
0.0242					
Market_returns_4	0.0172	0.0259	0.6666	0.5051	-0.0335
0.0680					
Issues_1	-0.6323	0.0142	-44.612	0.0000	-0.6601
-0.6045					
1	-0.3269	0.0469	-6.9675	0.0000	-0.4189
-0.2349					
2	0.2174	0.0472	4.6070	0.0000	0.1249
0.3100					
3	-0.0839	0.0479	-1.7529	0.0797	-0.1778
0.0100					
4	0.1856	0.0474	3.9168	0.0001	0.0927
0.2785					
=====					
=====					

```
[ ]: model = PanelOLS(panel_data.fillna(0).Issues,
                    panel_data.fillna(0).drop(columns=['Issues', 'Liquidity_2p',
                                                    'Liquidity_5', 'Liquidity_6',
                                                    'Issues_2', 'Issues_3']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues    R-squared:          0.4558
Estimator:              PanelOLS  R-squared (Between): -0.7399
No. Observations:      4000      R-squared (Within):  0.4558
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.4558
Time:                  12:13:50    Log-likelihood      -6209.1
Cov. Estimator:        Unadjusted

                               F-statistic:      208.49
Entities:               40          P-value       0.0000
Avg Obs:                100.000    Distribution:    F(16,3983)
Min Obs:                100.000
Max Obs:                100.000    F-statistic (robust): 208.43
                               P-value       0.0000
Time periods:           100      Distribution:    F(16,3983)
Avg Obs:                40.000
Min Obs:                40.000
Max Obs:                40.000
```

#### Parameter Estimates

```
=====
=====
Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Liquidity_1p    -0.0209    0.0188    -1.1149    0.2650    -0.0577
0.0159
Liquidity      0.0878    0.0264     3.3315    0.0009     0.0361
0.1395
Liquidity_1    0.1020    0.0301     3.3940    0.0007     0.0431
0.1610
Liquidity_2    0.0458    0.0301     1.5190    0.1288    -0.0133
0.1049
Liquidity_3    0.0514    0.0262     1.9629    0.0497    6.098e-05
0.1027
```

Liquidity_4	0.0069	0.0184	0.3740	0.7084	-0.0291
0.0429					
Market_returns_1p	-0.0292	0.0200	-1.4587	0.1447	-0.0684
0.0100					
Market_returns	0.0505	0.0199	2.5338	0.0113	0.0114
0.0895					
Market_returns_1	0.0728	0.0204	3.5657	0.0004	0.0328
0.1128					
Market_returns_2	-0.1222	0.0205	-5.9617	0.0000	-0.1623
-0.0820					
Market_returns_3	-0.0284	0.0206	-1.3768	0.1687	-0.0688
0.0120					
Market_returns_4	0.0332	0.0206	1.6099	0.1075	-0.0072
0.0736					
Issues_1	-0.6309	0.0124	-50.917	0.0000	-0.6552
-0.6066					
1	-0.2285	0.0373	-6.1320	0.0000	-0.3016
-0.1554					
2	0.1647	0.0378	4.3542	0.0000	0.0905
0.2388					
3	-0.0865	0.0378	-2.2897	0.0221	-0.1605
-0.0124					
4	0.1729	0.0376	4.6025	0.0000	0.0993
0.2466					

=====

=====

## 2.2 table 2 model 2

```
[ ]: model = PanelOLS(panel_data.dropna().Issues,
                    panel_data.dropna().drop(columns=['Issues', 'Liquidity_2p',
                                                    'Liquidity_5',
                                                    'Liquidity_6']))
res = model.fit()

print(res.summary)
```

PanelOLS Estimation Summary			
=====			
Dep. Variable:	Issues	R-squared:	0.6426
Estimator:	PanelOLS	R-squared (Between):	-0.2467
No. Observations:	3028	R-squared (Within):	0.6427
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.6426
Time:	12:13:50	Log-likelihood	-4360.4
Cov. Estimator:	Unadjusted		

Entities:	40	F-statistic:	300.56
Avg Obs:	75.700	P-value	0.0000
Min Obs:	0.0000	Distribution:	F(18,3009)
Max Obs:	89.000	F-statistic (robust):	299.30
		P-value	0.0000
Time periods:	98	Distribution:	F(18,3009)
Avg Obs:	30.898		
Min Obs:	0.0000		
Max Obs:	38.000		

### Parameter Estimates

	Parameter	Std. Err.	T-stat	P-value	Lower CI
Liquidity_1p 0.0137	-0.0237	0.0191	-1.2414	0.2145	-0.0612
Liquidity 0.1338	0.0796	0.0276	2.8797	0.0040	0.0254
Liquidity_1 0.1872	0.1255	0.0315	3.9873	0.0001	0.0638
Liquidity_2 0.1769	0.1153	0.0314	3.6662	0.0003	0.0536
Liquidity_3 0.1614	0.1087	0.0269	4.0449	0.0001	0.0560
Liquidity_4 0.0660	0.0307	0.0180	1.7036	0.0886	-0.0046
Market_returns_1p 0.0439	0.0023	0.0212	0.1091	0.9131	-0.0392
Market_returns 0.1106	0.0695	0.0210	3.3179	0.0009	0.0284
Market_returns_1 0.1375	0.0955	0.0215	4.4475	0.0000	0.0534
Market_returns_2 -0.0451	-0.0872	0.0215	-4.0546	0.0001	-0.1294
Market_returns_3 0.0043	-0.0379	0.0215	-1.7597	0.0786	-0.0801
Market_returns_4 -0.0239	-0.0660	0.0215	-3.0744	0.0021	-0.1081
Issues_1 -1.0415	-1.0740	0.0166	-64.613	0.0000	-1.1066
Issues_2 -0.7586	-0.8003	0.0213	-37.565	0.0000	-0.8421
Issues_3 -0.3889	-0.4216	0.0166	-25.336	0.0000	-0.4542



1	-0.2398	0.0392	-6.1133	0.0000	-0.3166
-0.1629					
2	0.1417	0.0392	3.6138	0.0003	0.0648
0.2186					
3	-0.1158	0.0398	-2.9112	0.0036	-0.1938
-0.0378					
4	0.2047	0.0396	5.1677	0.0000	0.1271
0.2824					

=====

=====

```
[ ]: model = PanelOLS(panel_data.fillna(0).Issues,
                    panel_data.fillna(0).drop(columns=['Issues', 'Liquidity_2p',
                                                    'Liquidity_5',
                                                    'Liquidity_6']))
res = model.fit()

print(res.summary)
```

PanelOLS Estimation Summary

=====

Dep. Variable:	Issues	R-squared:	0.6273
Estimator:	PanelOLS	R-squared (Between):	-4.6129
No. Observations:	4000	R-squared (Within):	0.6276
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.6273
Time:	12:13:50	Log-likelihood	-5451.8
Cov. Estimator:	Unadjusted		
		F-statistic:	372.31
Entities:	40	P-value	0.0000
Avg Obs:	100.000	Distribution:	F(18,3981)
Min Obs:	100.000		
Max Obs:	100.000	F-statistic (robust):	372.22
		P-value	0.0000
Time periods:	100	Distribution:	F(18,3981)
Avg Obs:	40.000		
Min Obs:	40.000		
Max Obs:	40.000		

Parameter Estimates

=====

=====

	Parameter	Std. Err.	T-stat	P-value	Lower CI	Upper CI

-----

-----

Liquidity_1p 0.0071	-0.0234	0.0155	-1.5058	0.1322	-0.0539
Liquidity 0.1128	0.0700	0.0218	3.2079	0.0013	0.0272
Liquidity_1 0.1652	0.1164	0.0249	4.6777	0.0000	0.0676
Liquidity_2 0.1671	0.1181	0.0250	4.7216	0.0000	0.0690
Liquidity_3 0.1584	0.1157	0.0218	5.3170	0.0000	0.0731
Liquidity_4 0.0579	0.0281	0.0152	1.8446	0.0652	-0.0018
Market_returns_1p 0.0278	-0.0047	0.0166	-0.2845	0.7760	-0.0372
Market_returns 0.0862	0.0538	0.0165	3.2620	0.0011	0.0215
Market_returns_1 0.1123	0.0792	0.0169	4.6871	0.0000	0.0461
Market_returns_2 -0.0373	-0.0707	0.0170	-4.1556	0.0000	-0.1040
Market_returns_3 -0.0023	-0.0358	0.0171	-2.0949	0.0362	-0.0693
Market_returns_4 -0.0034	-0.0370	0.0171	-2.1589	0.0309	-0.0706
Issues_1 -1.0344	-1.0627	0.0144	-73.552	0.0000	-1.0911
Issues_2 -0.7545	-0.7907	0.0185	-42.799	0.0000	-0.8269
Issues_3 -0.3964	-0.4249	0.0145	-29.264	0.0000	-0.4533
1 -0.0991	-0.1601	0.0311	-5.1445	0.0000	-0.2211
2 0.1865	0.1248	0.0315	3.9672	0.0001	0.0631
3 -0.0379	-0.0996	0.0314	-3.1659	0.0016	-0.1612
4 0.2335	0.1719	0.0314	5.4758	0.0000	0.1104
=====					
=====					

## 2.3 table 2 model 3

```
[ ]: model = PanelOLS(panel_data.dropna().Issues,
                    panel_data.dropna().drop(columns=['Issues']))
res = model.fit()

print(res.summary)
```

### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues    R-squared:          0.6432
Estimator:              PanelOLS  R-squared (Between): -0.2894
No. Observations:      3028      R-squared (Within):  0.6433
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.6432
Time:                  12:13:51   Log-likelihood       -4357.8
Cov. Estimator:        Unadjusted

                               F-statistic:          258.06
Entities:              40        P-value          0.0000
Avg Obs:               75.700    Distribution:      F(21,3006)
Min Obs:               0.0000
Max Obs:               89.000    F-statistic (robust): 256.98
                               P-value          0.0000
Time periods:          98        Distribution:      F(21,3006)
Avg Obs:               30.898
Min Obs:               0.0000
Max Obs:               38.000
```

### Parameter Estimates

```
=====
=====
Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Liquidity_2p      0.0346    0.0187    1.8507    0.0643    -0.0021
0.0712
Liquidity_1p      0.0217    0.0289    0.7494    0.4537    -0.0351
0.0784
Liquidity         0.1305    0.0357    3.6575    0.0003    0.0606
0.2005
Liquidity_1       0.1789    0.0393    4.5501    0.0000    0.1018
0.2560
Liquidity_2       0.1708    0.0406    4.2119    0.0000    0.0913
0.2504
Liquidity_3       0.1633    0.0383    4.2624    0.0000    0.0882
0.2384
Liquidity_4       0.0815    0.0335    2.4362    0.0149    0.0159
0.1471
```

Liquidity_5 0.0973	0.0439	0.0273	1.6082	0.1079	-0.0096
Liquidity_6 0.0561	0.0197	0.0185	1.0643	0.2873	-0.0166
Market_returns_1p 0.0399	-0.0019	0.0213	-0.0900	0.9283	-0.0437
Market_returns 0.1181	0.0760	0.0215	3.5374	0.0004	0.0339
Market_returns_1 0.1403	0.0979	0.0216	4.5328	0.0000	0.0556
Market_returns_2 -0.0436	-0.0859	0.0216	-3.9791	0.0001	-0.1282
Market_returns_3 0.0079	-0.0344	0.0216	-1.5936	0.1111	-0.0768
Market_returns_4 -0.0197	-0.0619	0.0216	-2.8727	0.0041	-0.1042
Issues_1 -1.0423	-1.0749	0.0166	-64.668	0.0000	-1.1075
Issues_2 -0.7603	-0.8021	0.0213	-37.635	0.0000	-0.8439
Issues_3 -0.3903	-0.4230	0.0167	-25.398	0.0000	-0.4557
1 -0.1603	-0.2379	0.0396	-6.0092	0.0000	-0.3155
2 0.2170	0.1396	0.0395	3.5356	0.0004	0.0622
3 -0.0364	-0.1150	0.0401	-2.8689	0.0041	-0.1936
4 0.2819	0.2039	0.0398	5.1207	0.0000	0.1258

=====

=====

```
[ ]: model = PanelOLS(panel_data.fillna(0).Issues,
                    panel_data.fillna(0).drop(columns=['Issues']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues    R-squared:          0.6276
Estimator:              PanelOLS  R-squared (Between): -4.9267
No. Observations:      4000      R-squared (Within):  0.6278
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.6276
```

```

Time:                12:13:51   Log-likelihood                -5450.4
Cov. Estimator:      Unadjusted

                        F-statistic:                319.22
Entities:            40      P-value                0.0000
Avg Obs:            100.000   Distribution:                F(21,3978)
Min Obs:            100.000
Max Obs:            100.000   F-statistic (robust):        319.15
                                P-value                0.0000
Time periods:        100     Distribution:                F(21,3978)
Avg Obs:            40.000
Min Obs:            40.000
Max Obs:            40.000

```

#### Parameter Estimates

```

=====
=====

```

	Parameter	Std. Err.	T-stat	P-value	Lower CI	Upper CI
Liquidity_2p	0.0177	0.0152	1.1624	0.2451	-0.0121	
0.0475						
Liquidity_1p	-0.0024	0.0221	-0.1064	0.9152	-0.0457	
0.0410						
Liquidity	0.0933	0.0265	3.5170	0.0004	0.0413	
0.1453						
Liquidity_1	0.1414	0.0292	4.8420	0.0000	0.0841	
0.1986						
Liquidity_2	0.1452	0.0302	4.8019	0.0000	0.0859	
0.2045						
Liquidity_3	0.1445	0.0291	4.9683	0.0000	0.0875	
0.2015						
Liquidity_4	0.0577	0.0263	2.1941	0.0283	0.0061	
0.1092						
Liquidity_5	0.0283	0.0222	1.2774	0.2015	-0.0151	
0.0717						
Liquidity_6	0.0141	0.0157	0.9005	0.3679	-0.0166	
0.0449						
Market_returns_1p	-0.0062	0.0166	-0.3705	0.7111	-0.0387	
0.0264						
Market_returns	0.0569	0.0168	3.3794	0.0007	0.0239	
0.0899						
Market_returns_1	0.0798	0.0170	4.7000	0.0000	0.0465	
0.1130						
Market_returns_2	-0.0708	0.0171	-4.1490	0.0000	-0.1042	
-0.0373						
Market_returns_3	-0.0349	0.0171	-2.0391	0.0415	-0.0685	
-0.0013						

Market_returns_4	-0.0356	0.0172	-2.0710	0.0384	-0.0693
-0.0019					
Issues_1	-1.0631	0.0145	-73.564	0.0000	-1.0914
-1.0347					
Issues_2	-0.7916	0.0185	-42.824	0.0000	-0.8278
-0.7554					
Issues_3	-0.4256	0.0145	-29.289	0.0000	-0.4541
-0.3971					
1	-0.1604	0.0314	-5.1110	0.0000	-0.2219
-0.0989					
2	0.1226	0.0316	3.8762	0.0001	0.0606
0.1847					
3	-0.0987	0.0317	-3.1182	0.0018	-0.1608
-0.0367					
4	0.1729	0.0315	5.4850	0.0000	0.1111
0.2348					

=====

=====

## 2.4 table 2 model 4

```
[ ]: model = PanelOLS(panel_data.dropna().Issues,
                    panel_data.dropna().drop(columns=['Issues', 'Liquidity_2p',
                                                    'Liquidity_1p', 'Liquidity_4',
                                                    'Liquidity_5', 'Liquidity_6',
                                                    'Market_returns_1p']))
res = model.fit()
print(res.summary)
```

PanelOLS Estimation Summary			
=====			
Dep. Variable:	Issues	R-squared:	0.6419
Estimator:	PanelOLS	R-squared (Between):	-0.2519
No. Observations:	3028	R-squared (Within):	0.6420
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.6419
Time:	12:13:51	Log-likelihood	-4363.2
Cov. Estimator:	Unadjusted		
		F-statistic:	359.98
Entities:	40	P-value	0.0000
Avg Obs:	75.700	Distribution:	F(15,3012)
Min Obs:	0.0000		
Max Obs:	89.000	F-statistic (robust):	354.52
		P-value	0.0000
Time periods:	98	Distribution:	F(15,3012)

Avg Obs: 30.898  
 Min Obs: 0.0000  
 Max Obs: 38.000

Parameter Estimates

=====					
=====					
	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI					
-----					
----					
Liquidity	0.0958	0.0181	5.2852	0.0000	0.0602
0.1313					
Liquidity_1	0.1276	0.0246	5.1938	0.0000	0.0794
0.1758					
Liquidity_2	0.1003	0.0246	4.0754	0.0000	0.0520
0.1485					
Liquidity_3	0.0832	0.0183	4.5363	0.0000	0.0472
0.1191					
Market_returns	0.0741	0.0208	3.5588	0.0004	0.0333
0.1149					
Market_returns_1	0.1067	0.0207	5.1659	0.0000	0.0662
0.1472					
Market_returns_2	-0.0826	0.0213	-3.8756	0.0001	-0.1245
-0.0408					
Market_returns_3	-0.0388	0.0214	-1.8126	0.0700	-0.0809
0.0032					
Market_returns_4	-0.0690	0.0213	-3.2469	0.0012	-0.1107
-0.0274					
Issues_1	-1.0726	0.0166	-64.617	0.0000	-1.1051
-1.0400					
Issues_2	-0.7989	0.0213	-37.552	0.0000	-0.8406
-0.7572					
Issues_3	-0.4195	0.0166	-25.274	0.0000	-0.4521
-0.3870					
1	-0.2431	0.0392	-6.2008	0.0000	-0.3200
-0.1662					
2	0.1396	0.0388	3.6007	0.0003	0.0636
0.2156					
3	-0.1160	0.0395	-2.9356	0.0034	-0.1934
-0.0385					
4	0.2091	0.0393	5.3247	0.0000	0.1321
0.2861					
=====					
=====					

```
[ ]: model = PanelOLS(panel_data.fillna(0).Issues,
                    panel_data.fillna(0).drop(columns=['Issues', 'Liquidity_2p',
                                                    'Liquidity_1p', 'Liquidity_4',
                                                    'Liquidity_5', 'Liquidity_6',
                                                    'Market_returns_1p']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues    R-squared:          0.6266
Estimator:              PanelOLS  R-squared (Between): -4.5186
No. Observations:      4000      R-squared (Within):  0.6269
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.6266
Time:                  12:13:51  Log-likelihood      -5455.5
Cov. Estimator:        Unadjusted

                               F-statistic:      445.78
Entities:              40        P-value       0.0000
Avg Obs:               100.000   Distribution:   F(15,3984)
Min Obs:               100.000
Max Obs:               100.000   F-statistic (robust): 445.67
                               P-value       0.0000
Time periods:          100      Distribution:   F(15,3984)
Avg Obs:               40.000
Min Obs:               40.000
Max Obs:               40.000
```

#### Parameter Estimates

```
=====
====
               Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Liquidity      0.0857    0.0151    5.6834    0.0000    0.0561
0.1152
Liquidity_1    0.1194    0.0201    5.9554    0.0000    0.0801
0.1587
Liquidity_2    0.1060    0.0201    5.2665    0.0000    0.0665
0.1455
Liquidity_3    0.0937    0.0153    6.1209    0.0000    0.0637
0.1237
Market_returns 0.0569    0.0164    3.4657    0.0005    0.0247
0.0891
Market_returns_1 0.0881    0.0164    5.3727    0.0000    0.0560
0.1203
```



Market_returns_2	-0.0679	0.0169	-4.0157	0.0001	-0.1011
-0.0348					
Market_returns_3	-0.0357	0.0170	-2.0956	0.0362	-0.0691
-0.0023					
Market_returns_4	-0.0383	0.0171	-2.2479	0.0246	-0.0718
-0.0049					
Issues_1	-1.0615	0.0144	-73.543	0.0000	-1.0898
-1.0332					
Issues_2	-0.7897	0.0185	-42.772	0.0000	-0.8259
-0.7535					
Issues_3	-0.4237	0.0145	-29.211	0.0000	-0.4521
-0.3952					
1	-0.1619	0.0311	-5.2003	0.0000	-0.2229
-0.1008					
2	0.1251	0.0311	4.0280	0.0001	0.0642
0.1860					
3	-0.1001	0.0314	-3.1904	0.0014	-0.1616
-0.0386					
4	0.1746	0.0312	5.6026	0.0000	0.1135
0.2357					

=====

=====

## 2.5 table 2 model 6

```
[ ]: model = PanelOLS(panel_data.dropna().Issues,
                    panel_data.dropna().drop(columns=['Issues', 'Liquidity_2p',
                                                    'Liquidity_5', 'Liquidity_6',
                                                    'Market_returns',
                                                    'Market_returns_1p',
                                                    'Market_returns_1', 'Market_returns_2',
                                                    'Market_returns_3',
                                                    'Market_returns_4']))
res = model.fit()

print(res.summary)
```

PanelOLS Estimation Summary			
=====			
Dep. Variable:	Issues	R-squared:	0.6357
Estimator:	PanelOLS	R-squared (Between):	-0.3229
No. Observations:	3028	R-squared (Within):	0.6358
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.6357
Time:	12:13:51	Log-likelihood	-4389.2
Cov. Estimator:	Unadjusted		

		F-statistic:	438.48
Entities:	40	P-value	0.0000
Avg Obs:	75.700	Distribution:	F(12,3015)
Min Obs:	0.0000		
Max Obs:	89.000	F-statistic (robust):	424.21
		P-value	0.0000
Time periods:	98	Distribution:	F(12,3015)
Avg Obs:	30.898		
Min Obs:	0.0000		
Max Obs:	38.000		

#### Parameter Estimates

	Parameter	Std. Err.	T-stat	P-value	Lower CI	Upper CI
Liquidity_1p	-0.0279	0.0176	-1.5832	0.1135	-0.0624	0.0066
Liquidity	0.1167	0.0246	4.7361	0.0000	0.0684	0.1649
Liquidity_1	0.2047	0.0279	7.3377	0.0000	0.1500	0.2594
Liquidity_2	0.1907	0.0282	6.7731	0.0000	0.1355	0.2460
Liquidity_3	0.1645	0.0250	6.5762	0.0000	0.1155	0.2136
Liquidity_4	0.0497	0.0178	2.7870	0.0054	0.0147	0.0847
Issues_1	-1.0726	0.0166	-64.515	0.0000	-1.1052	-1.0400
Issues_2	-0.7988	0.0213	-37.567	0.0000	-0.8405	-0.7571
Issues_3	-0.4207	0.0167	-25.183	0.0000	-0.4535	-0.3880
1	-0.2032	0.0391	-5.2003	0.0000	-0.2798	-0.1266
2	0.1246	0.0389	3.2053	0.0014	0.0484	0.2009
3	-0.1212	0.0391	-3.1014	0.0019	-0.1977	-0.0446
4	0.1925	0.0392	4.9161	0.0000	0.1157	0.2693

```
[ ]: model = PanelOLS(panel_data.fillna(0).Issues,
                      panel_data.fillna(0).drop(columns=['Issues', 'Liquidity_2p',
                                                         'Liquidity_5', 'Liquidity_6',
                                                         'Market_returns',
                                                         'Market_returns_1p',
                                                         'Market_returns_1', 'Market_returns_2',
                                                         'Market_returns_3',
                                                         'Market_returns_4']))
res = model.fit()
print(res.summary)
```

#### PanelOLS Estimation Summary

Dep. Variable:	Issues	R-squared:	0.6220
----------------	--------	------------	--------

```

Estimator:                PanelOLS      R-squared (Between):      -4.7676
No. Observations:         4000          R-squared (Within):       0.6223
Date:                     Wed, Jul 28 2021  R-squared (Overall):      0.6220
Time:                     12:13:52          Log-likelihood            -5480.1
Cov. Estimator:           Unadjusted

                               F-statistic:      546.78
Entities:                  40                P-value              0.0000
Avg Obs:                   100.000            Distribution:         F(12,3987)
Min Obs:                   100.000
Max Obs:                   100.000            F-statistic (robust):   544.77
                               P-value              0.0000
Time periods:              100              Distribution:         F(12,3987)
Avg Obs:                   40.000
Min Obs:                   40.000
Max Obs:                   40.000

```

#### Parameter Estimates

	Parameter	Std. Err.	T-stat	P-value	Lower CI	Upper CI
Liquidity_1p	-0.0303	0.0146	-2.0750	0.0380	-0.0590	-0.0017
Liquidity	0.0932	0.0200	4.6531	0.0000	0.0540	0.1325
Liquidity_1	0.1709	0.0228	7.5027	0.0000	0.1263	0.2156
Liquidity_2	0.1660	0.0231	7.2004	0.0000	0.1208	0.2112
Liquidity_3	0.1494	0.0207	7.2262	0.0000	0.1089	0.1900
Liquidity_4	0.0406	0.0152	2.6819	0.0074	0.0109	0.0703
Issues_1	-1.0613	0.0144	-73.462	0.0000	-1.0897	-1.0330
Issues_2	-0.7905	0.0184	-42.853	0.0000	-0.8267	-0.7543
Issues_3	-0.4241	0.0146	-29.122	0.0000	-0.4527	-0.3956
1	-0.1349	0.0310	-4.3445	0.0000	-0.1958	-0.0740
2	0.1225	0.0311	3.9341	0.0001	0.0615	0.1836
3	-0.1119	0.0310	-3.6052	0.0003	-0.1727	-0.0510
4	0.1584	0.0312	5.0806	0.0000	0.0973	0.2195

## 2.6 table 2 model 7

```

[ ]: model = PanelOLS(panel_data.dropna().Issues,
                      panel_data.dropna().drop(columns=['Issues', 'Liquidity_2p',
→'Liquidity_1p', 'Liquidity',
                                                    'Liquidity_1', 'Liquidity_2',
→'Liquidity_3', 'Liquidity_4',
                                                    'Liquidity_5', 'Liquidity_6']))
res = model.fit()

```

```
print(res.summary)
```

### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues    R-squared:          0.6371
Estimator:              PanelOLS  R-squared (Between): -0.3072
No. Observations:      3028      R-squared (Within):  0.6372
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.6371
Time:                  12:13:52   Log-likelihood       -4383.6
Cov. Estimator:        Unadjusted

                               F-statistic:          441.05
Entities:              40        P-value          0.0000
Avg Obs:               75.700    Distribution:      F(12,3015)
Min Obs:               0.0000
Max Obs:               89.000    F-statistic (robust): 439.19
                               P-value          0.0000
Time periods:          98        Distribution:      F(12,3015)
Avg Obs:               30.898
Min Obs:               0.0000
Max Obs:               38.000
```

### Parameter Estimates

```
=====
=====
Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Market_returns_1p  -0.0019    0.0204   -0.0917    0.9270   -0.0418
0.0380
Market_returns     0.1062    0.0201    5.2770    0.0000    0.0667
0.1456
Market_returns_1   0.1139    0.0201    5.6682    0.0000    0.0745
0.1533
Market_returns_2  -0.1169    0.0200   -5.8325    0.0000   -0.1562
-0.0776
Market_returns_3  -0.0568    0.0201   -2.8238    0.0048   -0.0962
-0.0173
Market_returns_4  -0.0923    0.0201   -4.5999    0.0000   -0.1316
-0.0529
Issues_1          -1.0728    0.0166  -64.524    0.0000   -1.1054
-1.0402
Issues_2          -0.7973    0.0213  -37.405    0.0000   -0.8391
-0.7555
Issues_3          -0.4166    0.0166  -25.077    0.0000   -0.4492
-0.3840
1                 -0.2454    0.0390   -6.2980    0.0000   -0.3218
```

```

-0.1690
2          0.1520      0.0390      3.9012      0.0001      0.0756
0.2284
3          -0.1179     0.0397     -2.9704     0.0030     -0.1957
-0.0401
4          0.2016      0.0391      5.1510      0.0000      0.1248
0.2783
=====
=====

```

```

[ ]: model = PanelOLS(panel_data.fillna(0).Issues,
                    panel_data.fillna(0).drop(columns=['Issues', 'Liquidity_2p',
→'Liquidity_1p', 'Liquidity',
                                                    'Liquidity_1', 'Liquidity_2',
→'Liquidity_3', 'Liquidity_4',
                                                    'Liquidity_5', 'Liquidity_6']))
res = model.fit()
print(res.summary)

```

#### PanelOLS Estimation Summary

```

=====
Dep. Variable:          Issues      R-squared:          0.6213
Estimator:              PanelOLS    R-squared (Between): -4.2910
No. Observations:      4000         R-squared (Within):  0.6215
Date:                  Wed, Jul 28 2021 R-squared (Overall): 0.6213
Time:                  12:13:52      Log-likelihood      -5484.0
Cov. Estimator:        Unadjusted

                               F-statistic:          545.05
Entities:              40          P-value          0.0000
Avg Obs:               100.000     Distribution:      F(12,3987)
Min Obs:               100.000
Max Obs:               100.000     F-statistic (robust): 544.93
                               P-value          0.0000
Time periods:          100         Distribution:      F(12,3987)
Avg Obs:               40.000
Min Obs:               40.000
Max Obs:               40.000

```

#### Parameter Estimates

```

=====
=====
Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----

```

```

-----
Market_returns_1p  -0.0087    0.0161   -0.5415    0.5882   -0.0403
0.0229
Market_returns      0.0826    0.0160    5.1546    0.0000    0.0512
0.1140
Market_returns_1    0.0956    0.0161    5.9441    0.0000    0.0640
0.1271
Market_returns_2   -0.0914    0.0161   -5.6658    0.0000   -0.1230
-0.0598
Market_returns_3   -0.0505    0.0162   -3.1129    0.0019   -0.0823
-0.0187
Market_returns_4   -0.0643    0.0163   -3.9494    0.0001   -0.0962
-0.0324
Issues_1            -1.0608    0.0145   -73.317    0.0000   -1.0892
-1.0325
Issues_2            -0.7863    0.0185   -42.502    0.0000   -0.8226
-0.7501
Issues_3            -0.4193    0.0145   -28.887    0.0000   -0.4478
-0.3909
1                   -0.1672    0.0311   -5.3795    0.0000   -0.2282
-0.1063
2                    0.1327    0.0314    4.2270    0.0000    0.0712
0.1943
3                   -0.0963    0.0315   -3.0567    0.0023   -0.1580
-0.0345
4                    0.1710    0.0312    5.4767    0.0000    0.1098
0.2322
=====
=====

```

### 3 Table 3 - replication

Again we need to define our data.

```

[ ]: # Defining Volatility, and its lags
Volatility = pd.read_excel(path, sheet_name='Volatility', skiprows=5)
Volatility = Volatility.set_index(['YearQuarter'])
Volatility = Volatility.diff()
Volatility_1p = Volatility.shift(-1)
Volatility_1 = Volatility.shift(1)
Volatility_2 = Volatility.shift(2)
Volatility_3 = Volatility.shift(3)
Volatility_4 = Volatility.shift(4)

v = [Volatility_1p, Volatility, Volatility_1,

```

```

        Volatility_2, Volatility_3, Volatility_4]
names = ['Volatility_1p', 'Volatility', 'Volatility_1',
        'Volatility_2', 'Volatility_3', 'Volatility_4']
i = 0
for data in v:
    v[i] = pd.DataFrame(data.stack(dropna = False ), columns= [names[i]])
    v[i].index = v[i].index.set_names(['YearQuarter', 'Country'])
    v[i] = v[i].reset_index().set_index(['Country', 'YearQuarter'])
    i += 1
[Volatility_1p, Volatility, Volatility_1,
    Volatility_2, Volatility_3, Volatility_4] = v

# Defining Turnover, and its lags
Turnover = pd.read_excel(path, sheet_name='Turnover', skiprows=5)
Turnover = Turnover.set_index(['YearQuarter'])
Turnover = Turnover.diff()
Turnover_1p = Turnover.shift(-1)
Turnover_1 = Turnover.shift(1)
Turnover_2 = Turnover.shift(2)
Turnover_3 = Turnover.shift(3)
Turnover_4 = Turnover.shift(4)

v = [Turnover_1p, Turnover, Turnover_1,
     Turnover_2, Turnover_3, Turnover_4]
names = ['Turnover_1p', 'Turnover', 'Turnover_1',
        'Turnover_2', 'Turnover_3', 'Turnover_4']
i = 0
for data in v:
    v[i] = pd.DataFrame(data.stack(dropna = False ), columns= [names[i]])
    v[i].index = v[i].index.set_names(['YearQuarter', 'Country'])
    v[i] = v[i].reset_index().set_index(['Country', 'YearQuarter'])
    i += 1
[Turnover_1p, Turnover, Turnover_1,
    Turnover_2, Turnover_3, Turnover_4] = v

# Defining Liquidity_risk, and its lags
Liquidity_risk = pd.read_excel(path, sheet_name='Liquidity risk', skiprows=5)
Liquidity_risk = Liquidity_risk.set_index(['YearQuarter'])
Liquidity_risk = Liquidity_risk.diff()
Liquidity_risk_1p = Liquidity_risk.shift(-1)
Liquidity_risk_1 = Liquidity_risk.shift(1)
Liquidity_risk_2 = Liquidity_risk.shift(2)
Liquidity_risk_3 = Liquidity_risk.shift(3)

```

```

Liquidity_risk_4 = Liquidity_risk.shift(4)

v = [Liquidity_risk_1p, Liquidity_risk, Liquidity_risk_1,
      Liquidity_risk_2, Liquidity_risk_3, Liquidity_risk_4]
names = ['Liquidity_risk_1p', 'Liquidity_risk', 'Liquidity_risk_1',
          'Liquidity_risk_2', 'Liquidity_risk_3', 'Liquidity_risk_4']
i = 0
for data in v:
    v[i] = pd.DataFrame(data.stack(dropna = False ), columns= [names[i]])
    v[i].index = v[i].index.set_names(['YearQuarter', 'Country'])
    v[i] = v[i].reset_index().set_index(['Country', 'YearQuarter'])
    i += 1
[Liquidity_risk_1p, Liquidity_risk, Liquidity_risk_1,
 Liquidity_risk_2, Liquidity_risk_3, Liquidity_risk_4] = v

# Defining MB_ratio, and its lags
MB_ratio = pd.read_excel(path, sheet_name='Market-to-book ratio', skiprows=5)
MB_ratio = MB_ratio.set_index(['YearQuarter'])
MB_ratio = MB_ratio.diff()
MB_ratio_1p = MB_ratio.shift(-1)
MB_ratio_1 = MB_ratio.shift(1)
MB_ratio_2 = MB_ratio.shift(2)
MB_ratio_3 = MB_ratio.shift(3)
MB_ratio_4 = MB_ratio.shift(4)

v = [MB_ratio_1p, MB_ratio, MB_ratio_1,
      MB_ratio_2, MB_ratio_3, MB_ratio_4]
names = ['MB_ratio_1p', 'MB_ratio', 'MB_ratio_1',
          'MB_ratio_2', 'MB_ratio_3', 'MB_ratio_4']
i = 0
for data in v:
    v[i] = pd.DataFrame(data.stack(dropna = False ), columns= [names[i]])
    v[i].index = v[i].index.set_names(['YearQuarter', 'Country'])
    v[i] = v[i].reset_index().set_index(['Country', 'YearQuarter'])
    i += 1
[MB_ratio_1p, MB_ratio, MB_ratio_1,
 MB_ratio_2, MB_ratio_3, MB_ratio_4] = v

# Defining price_earning, and its lags
price_earning = pd.read_excel(path, sheet_name='Price earnings ratio',
                               skiprows=5)
price_earning = price_earning.set_index(['YearQuarter'])
price_earning = price_earning.diff()

```



```

price_earning_1p = price_earning.shift(-1)
price_earning_1 = price_earning.shift(1)
price_earning_2 = price_earning.shift(2)
price_earning_3 = price_earning.shift(3)
price_earning_4 = price_earning.shift(4)

v = [price_earning_1p, price_earning, price_earning_1,
      price_earning_2, price_earning_3, price_earning_4]
names = ['price_earning_1p', 'price_earning', 'price_earning_1',
          'price_earning_2', 'price_earning_3', 'price_earning_4']
i = 0
for data in v:
    v[i] = pd.DataFrame(data.stack(dropna = False ), columns= [names[i]])
    v[i].index = v[i].index.set_names(['YearQuarter', 'Country'])
    v[i] = v[i].reset_index().set_index(['Country', 'YearQuarter'])
    i += 1
[price_earning_1p, price_earning, price_earning_1,
 price_earning_2, price_earning_3, price_earning_4] = v

# Defining Dividend_yield, and its lags
Dividend_yield = pd.read_excel(path, sheet_name='Dividend yield', skiprows=5)
Dividend_yield = Dividend_yield.set_index(['YearQuarter'])
Dividend_yield = Dividend_yield.diff()
Dividend_yield_1p = Dividend_yield.shift(-1)
Dividend_yield_1 = Dividend_yield.shift(1)
Dividend_yield_2 = Dividend_yield.shift(2)
Dividend_yield_3 = Dividend_yield.shift(3)
Dividend_yield_4 = Dividend_yield.shift(4)

v = [Dividend_yield_1p, Dividend_yield, Dividend_yield_1,
      Dividend_yield_2, Dividend_yield_3, Dividend_yield_4]
names = ['Dividend_yield_1p', 'Dividend_yield', 'Dividend_yield_1',
          'Dividend_yield_2', 'Dividend_yield_3', 'Dividend_yield_4']
i = 0
for data in v:
    v[i] = pd.DataFrame(data.stack(dropna = False ), columns= [names[i]])
    v[i].index = v[i].index.set_names(['YearQuarter', 'Country'])
    v[i] = v[i].reset_index().set_index(['Country', 'YearQuarter'])
    i += 1
[Dividend_yield_1p, Dividend_yield, Dividend_yield_1,
 Dividend_yield_2, Dividend_yield_3, Dividend_yield_4] = v

Dividend_yield

```

```

[]:          Dividend_yield
Country  YearQuarter

```

ARG	19901	NaN
AUS	19901	NaN
AUT	19901	NaN
BEL	19901	NaN
BRA	19901	NaN
...		...
SWE	20144	0.253131
THA	20144	-0.012640
USANASDAQ	20144	NaN
USANYSE	20144	NaN
ZAF	20144	0.851638

[4000 rows x 1 columns]

### 3.1 Table 3 model 1

```
[ ]: panel3 = panel_data[['Issues', 'Liquidity_1p', 'Liquidity', 'Liquidity_1',
    ↳ 'Liquidity_2',
    ↳ 'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
    ↳ 'Market_returns',
    ↳ 'Market_returns_1', 'Market_returns_2',
    ↳ 'Market_returns_3', 'Market_returns_4', 'Issues_1',
    ↳ 1, 2, 3, 4]]
```

panel3

```
[ ]:
Country    YearQuarter    Issues    Liquidity_1p    Liquidity    ...    2    3    4
ARG        19901            NaN        NaN            NaN    ...    0    0    0
AUS        19901            NaN        NaN            NaN    ...    0    0    0
AUT        19901            NaN        NaN            NaN    ...    0    0    0
BEL        19901            NaN        NaN            NaN    ...    0    0    0
BRA        19901            NaN        NaN            NaN    ...    0    0    0
...        ...            ...        ...            ...    ...    ...    ...
SWE        20144            1.498864    NaN            0.195308    ...    0    0    1
THA        20144            1.521491    NaN            0.514388    ...    0    0    1
USANASDAQ  20144            1.481866    NaN            -0.651659    ...    0    0    1
USANYSE    20144            0.079183    NaN            -0.432412    ...    0    0    1
ZAF        20144            2.606112    NaN            -2.069796    ...    0    0    1
```

[4000 rows x 20 columns]

```
[ ]: model = PanelOLS(panel3.dropna().Issues,
    ↳ panel3.dropna().drop(columns = ['Issues']))
res = model.fit()
```

```
print(res.summary)
```

### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues    R-squared:                0.6421
Estimator:              PanelOLS  R-squared (Between):      0.3458
No. Observations:      3087      R-squared (Within):       0.6421
Date:                  Wed, Jul 28 2021  R-squared (Overall):      0.6421
Time:                  12:13:56    Log-likelihood            -4438.8
Cov. Estimator:        Unadjusted

                               F-statistic:                305.74
Entities:              40        P-value                0.0000
Avg Obs:               77.175    Distribution:           F(18,3068)
Min Obs:               0.0000
Max Obs:               92.000    F-statistic (robust):    304.54
                               P-value                0.0000
Time periods:          99        Distribution:           F(18,3068)
Avg Obs:               31.182
Min Obs:               0.0000
Max Obs:               38.000
```

### Parameter Estimates

```
=====
=====
Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Liquidity_1p      -0.0237    0.0188   -1.2595    0.2080   -0.0606
0.0132
Liquidity         0.0817    0.0273    2.9953    0.0028    0.0282
0.1352
Liquidity_1       0.1301    0.0312    4.1715    0.0000    0.0689
0.1912
Liquidity_2       0.1253    0.0310    4.0471    0.0001    0.0646
0.1861
Liquidity_3       0.1165    0.0264    4.4075    0.0000    0.0647
0.1683
Liquidity_4       0.0335    0.0178    1.8872    0.0592   -0.0013
0.0684
Market_returns_1p  0.0019    0.0210    0.0902    0.9282   -0.0393
0.0431
Market_returns     0.0696    0.0208    3.3492    0.0008    0.0289
0.1104
Market_returns_1  0.0936    0.0212    4.4118    0.0000    0.0520
0.1352
Market_returns_2  -0.0881    0.0213   -4.1345    0.0000   -0.1299
```

-0.0463					
Market_returns_3	-0.0323	0.0213	-1.5158	0.1297	-0.0741
0.0095					
Market_returns_4	-0.0616	0.0211	-2.9135	0.0036	-0.1031
-0.0201					
Issues_1	-1.0721	0.0164	-65.196	0.0000	-1.1044
-1.0399					
Issues_2	-0.8022	0.0210	-38.206	0.0000	-0.8433
-0.7610					
Issues_3	-0.4245	0.0165	-25.770	0.0000	-0.4568
-0.3922					
1	-0.2372	0.0389	-6.0955	0.0000	-0.3136
-0.1609					
2	0.1422	0.0389	3.6521	0.0003	0.0658
0.2185					
3	-0.1159	0.0387	-2.9920	0.0028	-0.1919
-0.0400					
4	0.2046	0.0393	5.2025	0.0000	0.1275
0.2817					

=====

=====

```
[ ]: model = PanelOLS(panel3.fillna(0).Issues,
                    panel3.fillna(0).drop(columns = ['Issues']))
res = model.fit()

print(res.summary)
```

PanelOLS Estimation Summary

=====

Dep. Variable:	Issues	R-squared:	0.6273
Estimator:	PanelOLS	R-squared (Between):	-4.6129
No. Observations:	4000	R-squared (Within):	0.6276
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.6273
Time:	12:13:57	Log-likelihood	-5451.8
Cov. Estimator:	Unadjusted		
		F-statistic:	372.31
Entities:	40	P-value	0.0000
Avg Obs:	100.000	Distribution:	F(18,3981)
Min Obs:	100.000		
Max Obs:	100.000	F-statistic (robust):	372.22
		P-value	0.0000
Time periods:	100	Distribution:	F(18,3981)
Avg Obs:	40.000		
Min Obs:	40.000		

Max Obs: 40.000

Parameter Estimates					
=====					
=====	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI	-----				
-----					
Liquidity_1p 0.0071	-0.0234	0.0155	-1.5058	0.1322	-0.0539
Liquidity 0.1128	0.0700	0.0218	3.2079	0.0013	0.0272
Liquidity_1 0.1652	0.1164	0.0249	4.6777	0.0000	0.0676
Liquidity_2 0.1671	0.1181	0.0250	4.7216	0.0000	0.0690
Liquidity_3 0.1584	0.1157	0.0218	5.3170	0.0000	0.0731
Liquidity_4 0.0579	0.0281	0.0152	1.8446	0.0652	-0.0018
Market_returns_1p 0.0278	-0.0047	0.0166	-0.2845	0.7760	-0.0372
Market_returns 0.0862	0.0538	0.0165	3.2620	0.0011	0.0215
Market_returns_1 0.1123	0.0792	0.0169	4.6871	0.0000	0.0461
Market_returns_2 -0.0373	-0.0707	0.0170	-4.1556	0.0000	-0.1040
Market_returns_3 -0.0023	-0.0358	0.0171	-2.0949	0.0362	-0.0693
Market_returns_4 -0.0034	-0.0370	0.0171	-2.1589	0.0309	-0.0706
Issues_1 -1.0344	-1.0627	0.0144	-73.552	0.0000	-1.0911
Issues_2 -0.7545	-0.7907	0.0185	-42.799	0.0000	-0.8269
Issues_3 -0.3964	-0.4249	0.0145	-29.264	0.0000	-0.4533
1 -0.0991	-0.1601	0.0311	-5.1445	0.0000	-0.2211
2 0.1865	0.1248	0.0315	3.9672	0.0001	0.0631
3 -0.0379	-0.0996	0.0314	-3.1659	0.0016	-0.1612
4 0.2335	0.1719	0.0314	5.4758	0.0000	0.1104
=====					

=====

### 3.2 Table 3 model 2

```
[ ]: panel3 = panel_data[['Issues', 'Liquidity_1p', 'Liquidity', 'Liquidity_1', 'Liquidity_2',
                        'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
                        'Market_returns', 'Market_returns_1', 'Market_returns_2',
                        'Market_returns_3', 'Market_returns_4', 'Issues_1', 'Issues_2',
                        'Issues_3'], 1, 2, 3, 4]]

panel3 = pd.concat([panel3.drop(columns= ['Issues_1', 'Issues_2',
                                         'Issues_3'], 1, 2, 3, 4)),
                  Volatility_1p, Volatility, Volatility_1,
                  Volatility_2, Volatility_3, Volatility_4,
                  panel3[['Issues_1', 'Issues_2', 'Issues_3'], 1, 2, 3, 4]], axis = 1)

panel3
```

```
[ ]:
Country    YearQuarter    Issues    Liquidity_1p    Liquidity    ...    2    3    4
ARG        19901         NaN         NaN         NaN    ...    0    0    0
AUS        19901         NaN         NaN         NaN    ...    0    0    0
AUT        19901         NaN         NaN         NaN    ...    0    0    0
BEL        19901         NaN         NaN         NaN    ...    0    0    0
BRA        19901         NaN         NaN         NaN    ...    0    0    0
...        ...         ...         ...         ...    ...    ...    ...
SWE        20144        1.498864         NaN         0.195308    ...    0    0    1
THA        20144        1.521491         NaN         0.514388    ...    0    0    1
USANASDAQ  20144        1.481866         NaN        -0.651659    ...    0    0    1
USANYSE    20144        0.079183         NaN        -0.432412    ...    0    0    1
ZAF        20144        2.606112         NaN        -2.069796    ...    0    0    1
```

[4000 rows x 26 columns]

```
[ ]: model = PanelOLS(panel3.dropna().Issues,
                    panel3.dropna().drop(columns=['Issues']))
res = model.fit()

print(res.summary)
```

PanelOLS Estimation Summary

=====

Dep. Variable:	Issues	R-squared:	0.6436
Estimator:	PanelOLS	R-squared (Between):	0.3594
No. Observations:	3087	R-squared (Within):	0.6436
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.6436
Time:	12:13:57	Log-likelihood	-4432.2
Cov. Estimator:	Unadjusted		
		F-statistic:	230.40
Entities:	40	P-value	0.0000
Avg Obs:	77.175	Distribution:	F(24,3062)
Min Obs:	0.0000		
Max Obs:	92.000	F-statistic (robust):	229.49
		P-value	0.0000
Time periods:	99	Distribution:	F(24,3062)
Avg Obs:	31.182		
Min Obs:	0.0000		
Max Obs:	38.000		

#### Parameter Estimates

```
=====
=====
=====
```

	Parameter	Std. Err.	T-stat	P-value	Lower CI	Upper CI
-----						
-----						
Liquidity_1p	-0.0131	0.0193	-0.6788	0.4973	-0.0510	
0.0248						
Liquidity	0.0885	0.0281	3.1475	0.0017	0.0334	
0.1436						
Liquidity_1	0.1358	0.0322	4.2212	0.0000	0.0727	
0.1988						
Liquidity_2	0.1357	0.0321	4.2280	0.0000	0.0728	
0.1986						
Liquidity_3	0.1314	0.0278	4.7261	0.0000	0.0769	
0.1859						
Liquidity_4	0.0498	0.0188	2.6461	0.0082	0.0129	
0.0866						
Market_returns_1p	0.0104	0.0222	0.4715	0.6373	-0.0330	
0.0539						
Market_returns	0.0659	0.0219	3.0118	0.0026	0.0230	
0.1088						
Market_returns_1	0.0864	0.0223	3.8823	0.0001	0.0428	
0.1300						
Market_returns_2	-0.0805	0.0223	-3.6038	0.0003	-0.1243	
-0.0367						
Market_returns_3	-0.0348	0.0223	-1.5577	0.1194	-0.0785	
0.0090						
Market_returns_4	-0.0603	0.0221	-2.7320	0.0063	-0.1035	
-0.0170						

Volatility_1p 0.0782	0.0383	0.0203	1.8826	0.0599	-0.0016
Volatility 0.0927	0.0318	0.0311	1.0236	0.3061	-0.0291
Volatility_1 0.0918	0.0205	0.0364	0.5628	0.5736	-0.0509
Volatility_2 0.1132	0.0422	0.0362	1.1649	0.2441	-0.0288
Volatility_3 0.0974	0.0379	0.0303	1.2490	0.2118	-0.0216
Volatility_4 0.0875	0.0495	0.0194	2.5566	0.0106	0.0115
Issues_1 -1.0378	-1.0701	0.0165	-65.037	0.0000	-1.1024
Issues_2 -0.7582	-0.7994	0.0210	-38.041	0.0000	-0.8406
Issues_3 -0.3903	-0.4227	0.0165	-25.610	0.0000	-0.4551
1 -0.1499	-0.2268	0.0392	-5.7828	0.0000	-0.3037
2 0.2150	0.1382	0.0392	3.5276	0.0004	0.0614
3 -0.0502	-0.1269	0.0392	-3.2415	0.0012	-0.2037
4 0.2869	0.2091	0.0397	5.2674	0.0000	0.1313

=====

=====

```
[ ]: model = PanelOLS(panel3.fillna(0).Issues,
                      panel3.fillna(0).drop(columns=['Issues']))
res = model.fit()

print(res.summary)
```

PanelOLS Estimation Summary

=====

Dep. Variable:	Issues	R-squared:	0.6290
Estimator:	PanelOLS	R-squared (Between):	-4.7415
No. Observations:	4000	R-squared (Within):	0.6293
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.6290
Time:	12:13:57	Log-likelihood	-5442.6
Cov. Estimator:	Unadjusted		
		F-statistic:	280.85
Entities:	40	P-value	0.0000



Avg Obs:	100.000	Distribution:	F(24,3975)
Min Obs:	100.000		
Max Obs:	100.000	F-statistic (robust):	280.79
		P-value	0.0000
Time periods:	100	Distribution:	F(24,3975)
Avg Obs:	40.000		
Min Obs:	40.000		
Max Obs:	40.000		

#### Parameter Estimates

=====					
=====					
	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI	-----				
-----					
Liquidity_1p	-0.0157	0.0160	-0.9855	0.3245	-0.0470
0.0156					
Liquidity	0.0727	0.0225	3.2299	0.0012	0.0286
0.1169					
Liquidity_1	0.1142	0.0257	4.4458	0.0000	0.0639
0.1646					
Liquidity_2	0.1201	0.0259	4.6439	0.0000	0.0694
0.1708					
Liquidity_3	0.1239	0.0227	5.4447	0.0000	0.0793
0.1684					
Liquidity_4	0.0416	0.0160	2.6067	0.0092	0.0103
0.0729					
Market_returns_1p	-0.0010	0.0171	-0.0570	0.9546	-0.0345
0.0325					
Market_returns	0.0486	0.0170	2.8611	0.0042	0.0153
0.0820					
Market_returns_1	0.0724	0.0174	4.1603	0.0000	0.0383
0.1065					
Market_returns_2	-0.0642	0.0175	-3.6654	0.0003	-0.0986
-0.0299					
Market_returns_3	-0.0307	0.0176	-1.7476	0.0806	-0.0652
0.0037					
Market_returns_4	-0.0359	0.0176	-2.0371	0.0417	-0.0705
-0.0013					
Volatility_1p	0.0247	0.0162	1.5248	0.1274	-0.0071
0.0566					
Volatility	0.0108	0.0245	0.4430	0.6578	-0.0371
0.0588					
Volatility_1	-0.0153	0.0286	-0.5346	0.5929	-0.0714
0.0408					
Volatility_2	0.0089	0.0287	0.3101	0.7565	-0.0473
0.0651					

Volatility_3	0.0181	0.0245	0.7394	0.4597	-0.0299
0.0661					
Volatility_4	0.0422	0.0161	2.6207	0.0088	0.0106
0.0738					
Issues_1	-1.0609	0.0145	-73.404	0.0000	-1.0893
-1.0326					
Issues_2	-0.7876	0.0185	-42.571	0.0000	-0.8239
-0.7513					
Issues_3	-0.4223	0.0145	-29.033	0.0000	-0.4508
-0.3937					
1	-0.1541	0.0312	-4.9421	0.0000	-0.2153
-0.0930					
2	0.1231	0.0315	3.9051	0.0001	0.0613
0.1849					
3	-0.1101	0.0316	-3.4874	0.0005	-0.1720
-0.0482					
4	0.1767	0.0315	5.6085	0.0000	0.1150
0.2385					

=====

=====

### 3.3 Table 3 model 3

```
[ ]: panel3 = panel_data[['Issues', 'Liquidity_1p', 'Liquidity', 'Liquidity_1',
    ↳ 'Liquidity_2',
    ↳ 'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
    ↳
    ↳ 'Market_returns',          'Market_returns_1',          'Market_returns_2',
    ↳
    ↳ 'Market_returns_3',          'Market_returns_4',          'Issues_1',          'Issues_2',
    ↳1, 2, 3, 4]]

panel3 = pd.concat([panel3.drop(columns= ['Issues_1',          'Issues_2',
    ↳ 'Issues_3' ],1, 2, 3, 4)),
    Turnover_1p, Turnover, Turnover_1,
    Turnover_2, Turnover_3, Turnover_4,
    panel3[['Issues_1',          'Issues_2',
    ↳ 'Issues_3' ],1, 2, 3, 4]]], axis = 1)

panel3
```

```
[ ]:
Country    YearQuarter    Issues    Liquidity_1p    Liquidity    ...    2    3    4
ARG        19901         NaN         NaN         NaN    ...    0    0    0
AUS        19901         NaN         NaN         NaN    ...    0    0    0
AUT        19901         NaN         NaN         NaN    ...    0    0    0
```

BEL	19901	NaN	NaN	NaN	...	0	0	0
BRA	19901	NaN	NaN	NaN	...	0	0	0
...		...	...	...	...	...	...	...
SWE	20144	1.498864	NaN	0.195308	...	0	0	1
THA	20144	1.521491	NaN	0.514388	...	0	0	1
USANASDAQ	20144	1.481866	NaN	-0.651659	...	0	0	1
USANYSE	20144	0.079183	NaN	-0.432412	...	0	0	1
ZAF	20144	2.606112	NaN	-2.069796	...	0	0	1

[4000 rows x 26 columns]

```
[ ]: model = PanelOLS(panel3.dropna().Issues,
                    panel3.dropna().drop(columns=['Issues']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues    R-squared:          0.6441
Estimator:              PanelOLS  R-squared (Between): 0.3388
No. Observations:      3087      R-squared (Within):  0.6442
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.6441
Time:                  12:13:58    Log-likelihood       -4429.9
Cov. Estimator:        Unadjusted

                                F-statistic:      230.93
Entities:               40          P-value       0.0000
Avg Obs:                77.175     Distribution:    F(24,3062)
Min Obs:                0.0000
Max Obs:                92.000     F-statistic (robust): 230.02
                                P-value       0.0000
Time periods:           99         Distribution:    F(24,3062)
Avg Obs:                31.182
Min Obs:                0.0000
Max Obs:                38.000
```

#### Parameter Estimates

```
=====
=====
Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Liquidity_1p    -0.0261    0.0188   -1.3888    0.1650   -0.0630
0.0108
Liquidity       0.0792    0.0273    2.9026    0.0037    0.0257
0.1327
Liquidity_1     0.1281    0.0312    4.1087    0.0000    0.0669
```

0.1892					
Liquidity_2	0.1229	0.0309	3.9722	0.0001	0.0622
0.1836					
Liquidity_3	0.1158	0.0264	4.3877	0.0000	0.0641
0.1676					
Liquidity_4	0.0351	0.0178	1.9755	0.0483	0.0003
0.0700					
Market_returns_1p	0.0009	0.0210	0.0448	0.9643	-0.0403
0.0422					
Market_returns	0.0637	0.0209	3.0548	0.0023	0.0228
0.1046					
Market_returns_1	0.0864	0.0213	4.0499	0.0001	0.0446
0.1283					
Market_returns_2	-0.0864	0.0214	-4.0366	0.0001	-0.1284
-0.0444					
Market_returns_3	-0.0269	0.0214	-1.2575	0.2087	-0.0688
0.0150					
Market_returns_4	-0.0609	0.0212	-2.8710	0.0041	-0.1025
-0.0193					
Turnover_1p	-0.0759	0.0221	-3.4336	0.0006	-0.1193
-0.0326					
Turnover	-0.1573	0.0402	-3.9097	0.0001	-0.2362
-0.0784					
Turnover_1	-0.1628	0.0514	-3.1667	0.0016	-0.2637
-0.0620					
Turnover_2	-0.1124	0.0512	-2.1963	0.0281	-0.2127
-0.0121					
Turnover_3	-0.0632	0.0400	-1.5802	0.1142	-0.1415
0.0152					
Turnover_4	-0.0165	0.0220	-0.7503	0.4531	-0.0596
0.0266					
Issues_1	-1.0786	0.0165	-65.363	0.0000	-1.1110
-1.0463					
Issues_2	-0.8096	0.0211	-38.387	0.0000	-0.8509
-0.7682					
Issues_3	-0.4280	0.0165	-25.885	0.0000	-0.4604
-0.3956					
1	-0.2271	0.0407	-5.5844	0.0000	-0.3068
-0.1473					
2	0.1123	0.0406	2.7685	0.0057	0.0328
0.1919					
3	-0.1232	0.0405	-3.0440	0.0024	-0.2026
-0.0439					
4	0.2326	0.0410	5.6792	0.0000	0.1523
0.3129					

=====

=====

```
[ ]: model = PanelOLS(panel3.fillna(0).Issues,
                    panel3.fillna(0).drop(columns=['Issues']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:                Issues    R-squared:                0.6292
Estimator:                   PanelOLS   R-squared (Between):      -4.9933
No. Observations:             4000      R-squared (Within):       0.6294
Date:                        Wed, Jul 28 2021  R-squared (Overall):      0.6292
Time:                        12:13:58      Log-likelihood            -5441.9
Cov. Estimator:              Unadjusted

                                F-statistic:                281.01
Entities:                    40          P-value                 0.0000
Avg Obs:                    100.000      Distribution:            F(24,3975)
Min Obs:                    100.000
Max Obs:                    100.000      F-statistic (robust):    280.95
                                P-value                 0.0000
Time periods:                100      Distribution:            F(24,3975)
Avg Obs:                    40.000
Min Obs:                    40.000
Max Obs:                    40.000
```

#### Parameter Estimates

```
=====
=====
Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Liquidity_1p    -0.0244    0.0155   -1.5714    0.1162   -0.0549
0.0060
Liquidity      0.0693    0.0218    3.1782    0.0015    0.0266
0.1121
Liquidity_1    0.1158    0.0249    4.6584    0.0000    0.0671
0.1646
Liquidity_2    0.1163    0.0250    4.6573    0.0000    0.0674
0.1653
Liquidity_3    0.1150    0.0217    5.2867    0.0000    0.0723
0.1576
Liquidity_4    0.0287    0.0152    1.8807    0.0601   -0.0012
0.0585
Market_returns_1p -0.0042    0.0166   -0.2523    0.8008   -0.0367
```

0.0283					
Market_returns	0.0500	0.0166	3.0225	0.0025	0.0176
0.0825					
Market_returns_1	0.0739	0.0170	4.3521	0.0000	0.0406
0.1071					
Market_returns_2	-0.0685	0.0171	-4.0090	0.0001	-0.1020
-0.0350					
Market_returns_3	-0.0322	0.0171	-1.8775	0.0605	-0.0657
0.0014					
Market_returns_4	-0.0366	0.0172	-2.1328	0.0330	-0.0703
-0.0030					
Turnover_1p	-0.0564	0.0165	-3.4269	0.0006	-0.0887
-0.0241					
Turnover	-0.1131	0.0271	-4.1718	0.0000	-0.1663
-0.0600					
Turnover_1	-0.1067	0.0332	-3.2169	0.0013	-0.1717
-0.0417					
Turnover_2	-0.0632	0.0333	-1.8961	0.0580	-0.1285
0.0021					
Turnover_3	-0.0234	0.0275	-0.8510	0.3948	-0.0772
0.0305					
Turnover_4	0.0035	0.0167	0.2109	0.8330	-0.0292
0.0363					
Issues_1	-1.0676	0.0145	-73.755	0.0000	-1.0960
-1.0393					
Issues_2	-0.7965	0.0185	-43.009	0.0000	-0.8328
-0.7602					
Issues_3	-0.4275	0.0145	-29.384	0.0000	-0.4560
-0.3990					
1	-0.1494	0.0322	-4.6349	0.0000	-0.2126
-0.0862					
2	0.1049	0.0325	3.2250	0.0013	0.0411
0.1686					
3	-0.1077	0.0326	-3.3047	0.0010	-0.1716
-0.0438					
4	0.1947	0.0326	5.9637	0.0000	0.1307
0.2587					
=====					
=====					

### 3.4 Table 3 model 4

```
[ ]: panel3 = panel_data[['Issues', 'Liquidity_1p', 'Liquidity', 'Liquidity_1', 'Liquidity_2',
                        'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
```

```

    ↳
    ↳ 'Market_returns',          'Market_returns_1',          'Market_returns_2',
    ↳
    ↳ 'Market_returns_3',          'Market_returns_4',          'Issues_1',          'Issues_2',
    ↳ 1, 2, 3, 4]]

panel3 = pd.concat([panel3.drop(columns= ['Issues_1',          'Issues_2',
                                          'Issues_3' ,1, 2, 3, 4]),
                    Liquidity_risk_1p, Liquidity_risk, Liquidity_risk_1,
                    Liquidity_risk_2, Liquidity_risk_3, Liquidity_risk_4,
                    panel3[['Issues_1',          'Issues_2',
                              'Issues_3' ,1, 2, 3, 4]]], axis = 1)

panel3

```

```

[ ]:
Country    YearQuarter    Issues    Liquidity_1p    Liquidity    ...    2    3    4
ARG        19901          NaN          NaN          NaN    ...    0    0    0
AUS        19901          NaN          NaN          NaN    ...    0    0    0
AUT        19901          NaN          NaN          NaN    ...    0    0    0
BEL        19901          NaN          NaN          NaN    ...    0    0    0
BRA        19901          NaN          NaN          NaN    ...    0    0    0
...        ...          ...          ...          ...    ...    ...    ...
SWE        20144          1.498864        NaN          0.195308    ...    0    0    1
THA        20144          1.521491        NaN          0.514388    ...    0    0    1
USANASDAQ  20144          1.481866        NaN          -0.651659    ...    0    0    1
USANYSE    20144          0.079183        NaN          -0.432412    ...    0    0    1
ZAF        20144          2.606112        NaN          -2.069796    ...    0    0    1

```

[4000 rows x 26 columns]

```

[ ]: model = PanelOLS(panel3.dropna().Issues,
                      panel3.dropna().drop(columns=['Issues']))
res = model.fit()

print(res.summary)

```

```

PanelOLS Estimation Summary
=====
Dep. Variable:          Issues    R-squared:          0.6446
Estimator:              PanelOLS    R-squared (Between): 0.1357
No. Observations:      3079    R-squared (Within): 0.6447
Date:                  Wed, Jul 28 2021    R-squared (Overall): 0.6446
Time:                  12:13:58    Log-likelihood      -4419.4
Cov. Estimator:        Unadjusted
                        F-statistic:          230.83
Entities:              40    P-value            0.0000
Avg Obs:               76.975    Distribution:       F(24,3054)

```

Min Obs:	0.0000		
Max Obs:	92.000	F-statistic (robust):	230.74
		P-value	0.0000
Time periods:	99	Distribution:	F(24,3054)
Avg Obs:	31.101		
Min Obs:	0.0000		
Max Obs:	38.000		

# Parameter Estimates

=====					
=====					
	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI	-----				
-----					
Liquidity_1p	-0.0276	0.0189	-1.4610	0.1441	-0.0647
0.0094					
Liquidity	0.0847	0.0275	3.0794	0.0021	0.0308
0.1386					
Liquidity_1	0.1308	0.0316	4.1393	0.0000	0.0688
0.1927					
Liquidity_2	0.1220	0.0314	3.8799	0.0001	0.0603
0.1836					
Liquidity_3	0.1122	0.0269	4.1718	0.0000	0.0595
0.1650					
Liquidity_4	0.0285	0.0180	1.5791	0.1144	-0.0069
0.0638					
Market_returns_1p	0.0013	0.0210	0.0628	0.9499	-0.0399
0.0426					
Market_returns	0.0711	0.0208	3.4138	0.0006	0.0303
0.1119					
Market_returns_1	0.0955	0.0213	4.4906	0.0000	0.0538
0.1372					
Market_returns_2	-0.0888	0.0214	-4.1507	0.0000	-0.1307
-0.0468					
Market_returns_3	-0.0348	0.0214	-1.6242	0.1044	-0.0768
0.0072					
Market_returns_4	-0.0656	0.0212	-3.0950	0.0020	-0.1072
-0.0241					
Liquidity_risk_1p	0.0558	0.0195	2.8632	0.0042	0.0176
0.0940					
Liquidity_risk	0.0157	0.0253	0.6216	0.5342	-0.0339
0.0653					
Liquidity_risk_1	0.0057	0.0277	0.2042	0.8382	-0.0486
0.0599					
Liquidity_risk_2	-0.0031	0.0273	-0.1139	0.9093	-0.0566
0.0504					
Liquidity_risk_3	0.0137	0.0236	0.5823	0.5604	-0.0325



```

0.0599
Liquidity_risk_4      0.0240      0.0177      1.3569      0.1749      -0.0107
0.0587
Issues_1              -1.0743      0.0165     -65.236      0.0000     -1.1066
-1.0421
Issues_2              -0.8008      0.0210     -38.109      0.0000     -0.8420
-0.7596
Issues_3              -0.4232      0.0165     -25.667      0.0000     -0.4556
-0.3909
1                     -0.2338      0.0389      -6.0053      0.0000     -0.3101
-0.1575
2                      0.1406      0.0390      3.6039      0.0003      0.0641
0.2170
3                     -0.1158      0.0388      -2.9877      0.0028     -0.1918
-0.0398
4                      0.2049      0.0393      5.2180      0.0000      0.1279
0.2819
=====
=====

```

```

[ ]: model = PanelOLS(panel3.fillna(0).Issues,
                      panel3.fillna(0).drop(columns=['Issues']))
res = model.fit()

print(res.summary)

```

```

                                PanelOLS Estimation Summary
=====
Dep. Variable:                Issues      R-squared:                0.6281
Estimator:                    PanelOLS    R-squared (Between):      -4.6245
No. Observations:              4000       R-squared (Within):       0.6283
Date:                          Wed, Jul 28 2021   R-squared (Overall):      0.6281
Time:                          12:13:58          Log-likelihood            -5447.9
Cov. Estimator:                Unadjusted

                                F-statistic:                279.68
Entities:                      40              P-value                  0.0000
Avg Obs:                       100.000          Distribution:             F(24,3975)
Min Obs:                       100.000
Max Obs:                       100.000          F-statistic (robust):     279.66
                                P-value                  0.0000
Time periods:                  100              Distribution:             F(24,3975)
Avg Obs:                       40.000
Min Obs:                       40.000
Max Obs:                       40.000

```

# Parameter Estimates

=====					
=====					
	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI					
-----					
-----					
Liquidity_1p 0.0068	-0.0238	0.0156	-1.5252	0.1273	-0.0544
Liquidity 0.1164	0.0734	0.0220	3.3411	0.0008	0.0303
Liquidity_1 0.1703	0.1209	0.0252	4.7958	0.0000	0.0715
Liquidity_2 0.1685	0.1188	0.0254	4.6768	0.0000	0.0690
Liquidity_3 0.1572	0.1138	0.0221	5.1407	0.0000	0.0704
Liquidity_4 0.0549	0.0246	0.0154	1.5963	0.1105	-0.0056
Market_returns_1p 0.0287	-0.0039	0.0166	-0.2331	0.8157	-0.0364
Market_returns 0.0871	0.0547	0.0165	3.3075	0.0009	0.0223
Market_returns_1 0.1122	0.0790	0.0169	4.6612	0.0000	0.0458
Market_returns_2 -0.0377	-0.0712	0.0171	-4.1604	0.0000	-0.1048
Market_returns_3 -0.0033	-0.0371	0.0172	-2.1536	0.0313	-0.0708
Market_returns_4 -0.0055	-0.0392	0.0172	-2.2777	0.0228	-0.0729
Liquidity_risk_1p 0.0513	0.0235	0.0142	1.6636	0.0963	-0.0042
Liquidity_risk 0.0351	-0.0002	0.0180	-0.0086	0.9932	-0.0354
Liquidity_risk_1 0.0225	-0.0158	0.0195	-0.8081	0.4191	-0.0541
Liquidity_risk_2 0.0200	-0.0182	0.0195	-0.9335	0.3506	-0.0564
Liquidity_risk_3 0.0300	-0.0050	0.0179	-0.2802	0.7793	-0.0400
Liquidity_risk_4 0.0397	0.0120	0.0141	0.8503	0.3952	-0.0157
Issues_1 -1.0349	-1.0632	0.0145	-73.535	0.0000	-1.0916
Issues_2 -0.7543	-0.7906	0.0185	-42.737	0.0000	-0.8268
Issues_3	-0.4249	0.0145	-29.231	0.0000	-0.4534

-0.3964					
1	-0.1596	0.0311	-5.1268	0.0000	-0.2207
-0.0986					
2	0.1239	0.0315	3.9393	0.0001	0.0623
0.1856					
3	-0.0995	0.0314	-3.1655	0.0016	-0.1612
-0.0379					
4	0.1724	0.0314	5.4906	0.0000	0.1108
0.2340					

=====

=====

### 3.5 Table 3 model 5

```
[ ]: panel3 = panel_data[['Issues', 'Liquidity_1p', 'Liquidity', 'Liquidity_1',
    ↳ 'Liquidity_2',
    ↳ 'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
    ↳ 'Market_returns_1', 'Market_returns_2',
    ↳ 'Market_returns_3', 'Market_returns_4', 'Issues_1', 'Issues_2',
    ↳ 1, 2, 3, 4]]

panel3 = pd.concat([panel3.drop(columns= ['Issues_1', 'Issues_2',
    ↳ 'Issues_3' ,1, 2, 3, 4]),
    MB_ratio_1p, MB_ratio, MB_ratio_1,
    MB_ratio_2, MB_ratio_3, MB_ratio_4,
    panel3[['Issues_1', 'Issues_2',
    ↳ 'Issues_3' ,1, 2, 3, 4]]], axis = 1)

panel3
```

```
[ ]:
Country    YearQuarter    Issues    Liquidity_1p    Liquidity    ...    2    3    4
ARG        19901         NaN         NaN         NaN    ...    0    0    0
AUS        19901         NaN         NaN         NaN    ...    0    0    0
AUT        19901         NaN         NaN         NaN    ...    0    0    0
BEL        19901         NaN         NaN         NaN    ...    0    0    0
BRA        19901         NaN         NaN         NaN    ...    0    0    0
...        ...         ...         ...         ...    ...    ...    ...
SWE        20144        1.498864         NaN        0.195308    ...    0    0    1
THA        20144        1.521491         NaN        0.514388    ...    0    0    1
USANASDAQ  20144        1.481866         NaN       -0.651659    ...    0    0    1
USANYSE    20144        0.079183         NaN       -0.432412    ...    0    0    1
ZAF        20144        2.606112         NaN       -2.069796    ...    0    0    1
```

[4000 rows x 26 columns]

```
[ ]: model = PanelOLS(panel3.dropna().Issues,  
                    panel3.dropna().drop(columns=['Issues']))  
res = model.fit()  
  
print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues    R-squared:          0.6397
Estimator:              PanelOLS  R-squared (Between): 0.4357
No. Observations:      2901      R-squared (Within):  0.6397
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.6397
Time:                  12:13:59    Log-likelihood       -4188.1
Cov. Estimator:        Unadjusted

                               F-statistic:          212.78
Entities:              40         P-value          0.0000
Avg Obs:               72.525     Distribution:      F(24,2876)
Min Obs:               0.0000
Max Obs:               92.000     F-statistic (robust): 212.20
                               P-value          0.0000
Time periods:          99         Distribution:      F(24,2876)
Avg Obs:               29.303
Min Obs:               0.0000
Max Obs:               36.000
```

#### Parameter Estimates

```
=====
=====
      Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Liquidity_1p    -0.0176    0.0195   -0.9015    0.3674   -0.0559
0.0207
Liquidity       0.0691    0.0284    2.4339    0.0150    0.0134
0.1248
Liquidity_1     0.1156    0.0325    3.5599    0.0004    0.0519
0.1793
Liquidity_2     0.1192    0.0323    3.6873    0.0002    0.0558
0.1825
Liquidity_3     0.1084    0.0279    3.8802    0.0001    0.0536
0.1632
Liquidity_4     0.0279    0.0189    1.4738    0.1406   -0.0092
0.0650
Market_returns_1p 0.0066    0.0220    0.3000    0.7642   -0.0365
0.0496
```

Market_returns	0.0042	0.0284	0.1470	0.8832	-0.0516
0.0599					
Market_returns_1	0.0837	0.0288	2.9062	0.0037	0.0272
0.1401					
Market_returns_2	-0.0821	0.0285	-2.8773	0.0040	-0.1380
-0.0261					
Market_returns_3	-0.0299	0.0281	-1.0649	0.2870	-0.0850
0.0252					
Market_returns_4	-0.0437	0.0279	-1.5634	0.1181	-0.0984
0.0111					
MB_ratio_1p	0.0825	0.0257	3.2152	0.0013	0.0322
0.1329					
MB_ratio	0.0852	0.0322	2.6439	0.0082	0.0220
0.1484					
MB_ratio_1	0.0742	0.0342	2.1711	0.0300	0.0072
0.1411					
MB_ratio_2	0.0802	0.0324	2.4725	0.0135	0.0166
0.1437					
MB_ratio_3	0.0584	0.0258	2.2631	0.0237	0.0078
0.1091					
MB_ratio_4	0.0406	0.0190	2.1379	0.0326	0.0034
0.0778					
Issues_1	-1.0780	0.0169	-63.613	0.0000	-1.1113
-1.0448					
Issues_2	-0.8134	0.0216	-37.592	0.0000	-0.8558
-0.7710					
Issues_3	-0.4315	0.0170	-25.330	0.0000	-0.4649
-0.3981					
1	-0.2430	0.0411	-5.9102	0.0000	-0.3237
-0.1624					
2	0.1358	0.0410	3.3126	0.0009	0.0554
0.2162					
3	-0.1005	0.0408	-2.4638	0.0138	-0.1805
-0.0205					
4	0.2090	0.0415	5.0322	0.0000	0.1276
0.2905					

=====

=====

```
[ ]: model = PanelOLS(panel3.fillna(0).Issues,
                      panel3.fillna(0).drop(columns=['Issues']))
res = model.fit()

print(res.summary)
```

PanelOLS Estimation Summary

```

=====
Dep. Variable:          Issues    R-squared:          0.6283
Estimator:             PanelOLS  R-squared (Between): -4.7717
No. Observations:      4000      R-squared (Within):  0.6285
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.6283
Time:                  12:13:59    Log-likelihood       -5446.8
Cov. Estimator:        Unadjusted

                               F-statistic:          279.91
Entities:              40        P-value          0.0000
Avg Obs:               100.000   Distribution:      F(24,3975)
Min Obs:               100.000
Max Obs:               100.000   F-statistic (robust): 279.85
                               P-value          0.0000
Time periods:          100      Distribution:      F(24,3975)
Avg Obs:               40.000
Min Obs:               40.000
Max Obs:               40.000

```

#### Parameter Estimates

```

=====
=====

```

	Parameter	Std. Err.	T-stat	P-value	Lower CI	Upper CI
Liquidity_1p	-0.0213	0.0156	-1.3689	0.1711	-0.0518	
0.0092						
Liquidity	0.0725	0.0219	3.3148	0.0009	0.0296	
0.1153						
Liquidity_1	0.1204	0.0249	4.8248	0.0000	0.0714	
0.1693						
Liquidity_2	0.1217	0.0251	4.8524	0.0000	0.0725	
0.1709						
Liquidity_3	0.1190	0.0220	5.3981	0.0000	0.0758	
0.1622						
Liquidity_4	0.0289	0.0155	1.8655	0.0622	-0.0015	
0.0593						
Market_returns_1p	-0.0046	0.0166	-0.2790	0.7802	-0.0372	
0.0279						
Market_returns	0.0302	0.0200	1.5123	0.1305	-0.0090	
0.0694						
Market_returns_1	0.0795	0.0205	3.8724	0.0001	0.0393	
0.1198						
Market_returns_2	-0.0704	0.0207	-3.4075	0.0007	-0.1109	
-0.0299						
Market_returns_3	-0.0409	0.0205	-1.9927	0.0464	-0.0812	
-0.0007						
Market_returns_4	-0.0260	0.0206	-1.2614	0.2072	-0.0665	

0.0144					
MB_ratio_1p	0.0377	0.0178	2.1142	0.0346	0.0027
0.0726					
MB_ratio	0.0363	0.0221	1.6407	0.1009	-0.0071
0.0797					
MB_ratio_1	0.0323	0.0236	1.3681	0.1714	-0.0140
0.0787					
MB_ratio_2	0.0435	0.0229	1.8966	0.0580	-0.0015
0.0884					
MB_ratio_3	0.0270	0.0195	1.3870	0.1655	-0.0112
0.0652					
MB_ratio_4	0.0335	0.0149	2.2458	0.0248	0.0043
0.0627					
Issues_1	-1.0626	0.0145	-73.530	0.0000	-1.0910
-1.0343					
Issues_2	-0.7909	0.0185	-42.797	0.0000	-0.8271
-0.7547					
Issues_3	-0.4243	0.0145	-29.199	0.0000	-0.4528
-0.3958					
1	-0.1675	0.0316	-5.2934	0.0000	-0.2296
-0.1055					
2	0.1210	0.0318	3.8008	0.0001	0.0586
0.1834					
3	-0.0934	0.0318	-2.9353	0.0034	-0.1558
-0.0310					
4	0.1742	0.0319	5.4685	0.0000	0.1118
0.2367					
=====					
=====					

### 3.6 Table 3 model 6

```
[ ]: panel3 = panel_data[['Issues', 'Liquidity_1p', 'Liquidity', 'Liquidity_1',
    ↳ 'Liquidity_2',
    ↳ 'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
    ↳
    ↳ 'Market_returns',          'Market_returns_1',          'Market_returns_2',
    ↳
    ↳ 'Market_returns_3',          'Market_returns_4',          'Issues_1',          'Issues_2',
    ↳ 1, 2, 3, 4]]

panel3 = pd.concat([panel3.drop(columns= ['Issues_1',          'Issues_2',
    ↳ 'Issues_3' ,1, 2, 3, 4]),
    price_earning_1p, price_earning, price_earning_1,
    price_earning_2, price_earning_3, price_earning_4,
```

```
panel3[['Issues_1',      'Issues_2',
        'Issues_3' ,1, 2, 3, 4]], axis = 1)
```

```
panel3
```

```
[ ]:
Country      YearQuarter      Issues      Liquidity_1p      Liquidity      ...      2      3      4
ARG          19901            NaN            NaN            NaN      ...      0      0      0
AUS          19901            NaN            NaN            NaN      ...      0      0      0
AUT          19901            NaN            NaN            NaN      ...      0      0      0
BEL          19901            NaN            NaN            NaN      ...      0      0      0
BRA          19901            NaN            NaN            NaN      ...      0      0      0
...          ...            ...            ...            ...      ...      ...      ...
SWE          20144            1.498864        NaN            0.195308      ...      0      0      1
THA          20144            1.521491        NaN            0.514388      ...      0      0      1
USANASDAQ   20144            1.481866        NaN            -0.651659      ...      0      0      1
USANYSE     20144            0.079183        NaN            -0.432412      ...      0      0      1
ZAF          20144            2.606112        NaN            -2.069796      ...      0      0      1
```

```
[4000 rows x 26 columns]
```

```
[ ]: model = PanelOLS(panel3.dropna().Issues,
                      panel3.dropna().drop(columns=['Issues']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:            Issues      R-squared:            0.6393
Estimator:                PanelOLS    R-squared (Between):    0.4358
No. Observations:         2903        R-squared (Within):    0.6393
Date:                     Wed, Jul 28 2021    R-squared (Overall):    0.6393
Time:                     12:13:59            Log-likelihood          -4191.8
Cov. Estimator:           Unadjusted

                               F-statistic:            212.55
Entities:                  40        P-value              0.0000
Avg Obs:                   72.575    Distribution:          F(24,2878)
Min Obs:                   0.0000
Max Obs:                   92.000    F-statistic (robust):    211.98
                               P-value              0.0000
Time periods:              99        Distribution:          F(24,2878)
Avg Obs:                   29.323
Min Obs:                   0.0000
Max Obs:                   36.000
```

#### Parameter Estimates

```
=====
```



=====

	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI					
-----					
-----					
Liquidity_1p 0.0192	-0.0190	0.0195	-0.9764	0.3290	-0.0573
Liquidity 0.1229	0.0673	0.0284	2.3699	0.0179	0.0116
Liquidity_1 0.1738	0.1102	0.0324	3.3957	0.0007	0.0466
Liquidity_2 0.1748	0.1115	0.0323	3.4539	0.0006	0.0482
Liquidity_3 0.1565	0.1021	0.0278	3.6742	0.0002	0.0476
Liquidity_4 0.0610	0.0242	0.0188	1.2889	0.1975	-0.0126
Market_returns_1p 0.0490	0.0059	0.0220	0.2702	0.7870	-0.0372
Market_returns 0.0955	0.0489	0.0238	2.0554	0.0399	0.0022
Market_returns_1 0.1245	0.0772	0.0242	3.1947	0.0014	0.0298
Market_returns_2 -0.0465	-0.0939	0.0242	-3.8851	0.0001	-0.1413
Market_returns_3 0.0146	-0.0328	0.0242	-1.3552	0.1755	-0.0802
Market_returns_4 0.0129	-0.0344	0.0241	-1.4276	0.1535	-0.0817
price_earning_1p 0.0661	0.0252	0.0208	1.2120	0.2256	-0.0156
price_earning 0.1079	0.0544	0.0273	1.9941	0.0462	0.0009
price_earning_1 0.1347	0.0769	0.0294	2.6131	0.0090	0.0192
price_earning_2 0.1506	0.0947	0.0285	3.3170	0.0009	0.0387
price_earning_3 0.0961	0.0481	0.0245	1.9625	0.0498	4.116e-05
price_earning_4 0.0561	0.0206	0.0181	1.1401	0.2543	-0.0149
Issues_1 -1.0443	-1.0775	0.0170	-63.568	0.0000	-1.1107
Issues_2 -0.7700	-0.8125	0.0216	-37.543	0.0000	-0.8549
Issues_3 -0.3981	-0.4315	0.0170	-25.333	0.0000	-0.4649
1	-0.2326	0.0405	-5.7475	0.0000	-0.3119

```

-0.1532
2          0.1380    0.0404    3.4178    0.0006    0.0588
0.2172
3          -0.1050    0.0401    -2.6202    0.0088    -0.1836
-0.0264
4          0.1985    0.0407    4.8813    0.0000    0.1188
0.2783
=====
=====

```

```

[ ]: model = PanelOLS(panel3.fillna(0).Issues,
                    panel3.fillna(0).drop(columns=['Issues']))
res = model.fit()

print(res.summary)

```

#### PanelOLS Estimation Summary

```

=====
Dep. Variable:          Issues    R-squared:          0.6280
Estimator:              PanelOLS  R-squared (Between): -4.4811
No. Observations:      4000      R-squared (Within):  0.6282
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.6280
Time:                  12:13:59    Log-likelihood      -5448.2
Cov. Estimator:        Unadjusted

                               F-statistic:      279.61
Entities:              40          P-value          0.0000
Avg Obs:               100.000      Distribution:      F(24,3975)
Min Obs:               100.000
Max Obs:               100.000      F-statistic (robust): 279.55
                               P-value          0.0000
Time periods:          100          Distribution:      F(24,3975)
Avg Obs:               40.000
Min Obs:               40.000
Max Obs:               40.000

```

#### Parameter Estimates

```

=====
=====

```

	Parameter	Std. Err.	T-stat	P-value	Lower CI	Upper CI
Liquidity_1p	-0.0232	0.0155	-1.4945	0.1351	-0.0537	0.0072
Liquidity	0.0705	0.0219	3.2240	0.0013	0.0276	

0.1133					
Liquidity_1	0.1177	0.0249	4.7188	0.0000	0.0688
0.1666					
Liquidity_2	0.1186	0.0251	4.7271	0.0000	0.0694
0.1678					
Liquidity_3	0.1144	0.0220	5.2106	0.0000	0.0714
0.1575					
Liquidity_4	0.0261	0.0154	1.6899	0.0911	-0.0042
0.0563					
Market_returns_1p	-0.0052	0.0166	-0.3160	0.7520	-0.0378
0.0273					
Market_returns	0.0506	0.0179	2.8327	0.0046	0.0156
0.0856					
Market_returns_1	0.0798	0.0183	4.3545	0.0000	0.0439
0.1157					
Market_returns_2	-0.0787	0.0184	-4.2724	0.0000	-0.1148
-0.0426					
Market_returns_3	-0.0451	0.0185	-2.4365	0.0149	-0.0814
-0.0088					
Market_returns_4	-0.0227	0.0186	-1.2177	0.2234	-0.0592
0.0138					
price_earning_1p	0.0046	0.0157	0.2957	0.7675	-0.0261
0.0354					
price_earning	0.0054	0.0202	0.2672	0.7894	-0.0342
0.0450					
price_earning_1	0.0250	0.0220	1.1371	0.2556	-0.0181
0.0682					
price_earning_2	0.0499	0.0216	2.3097	0.0210	0.0075
0.0923					
price_earning_3	0.0218	0.0189	1.1563	0.2476	-0.0152
0.0589					
price_earning_4	0.0111	0.0144	0.7716	0.4404	-0.0172
0.0394					
Issues_1	-1.0632	0.0145	-73.538	0.0000	-1.0916
-1.0349					
Issues_2	-0.7914	0.0185	-42.797	0.0000	-0.8276
-0.7551					
Issues_3	-0.4253	0.0145	-29.258	0.0000	-0.4538
-0.3968					
1	-0.1593	0.0312	-5.1003	0.0000	-0.2205
-0.0980					
2	0.1246	0.0315	3.9550	0.0001	0.0628
0.1864					
3	-0.1000	0.0315	-3.1790	0.0015	-0.1617
-0.0383					
4	0.1708	0.0314	5.4319	0.0000	0.1091
0.2324					

=====

=====

### 3.7 Table 3 model 7

```
[ ]: panel3 = panel_data[['Issues', 'Liquidity_1p', 'Liquidity', 'Liquidity_1',
    ↳ 'Liquidity_2',
    ↳ 'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
    ↳
    ↳ 'Market_returns',          'Market_returns_1',          'Market_returns_2',
    ↳
    ↳ 'Market_returns_3',          'Market_returns_4',          'Issues_1',          'Issues_2',
    ↳1, 2, 3, 4]]

panel3 = pd.concat([panel3.drop(columns= ['Issues_1',          'Issues_2',
    ↳ 'Issues_3' ,1, 2, 3, 4]),
    Dividend_yield_1p, Dividend_yield, Dividend_yield_1,
    Dividend_yield_2, Dividend_yield_3, Dividend_yield_4,
    panel3[['Issues_1',          'Issues_2',
    ↳ 'Issues_3' ,1, 2, 3, 4]]], axis = 1)

panel3
```

```
[ ]:
Country      YearQuarter      Issues      Liquidity_1p      Liquidity      ...      2      3      4
ARG          19901          NaN          NaN          NaN      ...      0      0      0
AUS          19901          NaN          NaN          NaN      ...      0      0      0
AUT          19901          NaN          NaN          NaN      ...      0      0      0
BEL          19901          NaN          NaN          NaN      ...      0      0      0
BRA          19901          NaN          NaN          NaN      ...      0      0      0
...          ...          ...          ...          ...      ...      ...      ...
SWE          20144          1.498864          NaN          0.195308      ...      0      0      1
THA          20144          1.521491          NaN          0.514388      ...      0      0      1
USANASDAQ    20144          1.481866          NaN          -0.651659      ...      0      0      1
USANYSE      20144          0.079183          NaN          -0.432412      ...      0      0      1
ZAF          20144          2.606112          NaN          -2.069796      ...      0      0      1
```

[4000 rows x 26 columns]

```
[ ]: model = PanelOLS(panel3.dropna().Issues,
    panel3.dropna().drop(columns=['Issues']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

=====

Dep. Variable:	Issues	R-squared:	0.6394
Estimator:	PanelOLS	R-squared (Between):	0.4409
No. Observations:	2903	R-squared (Within):	0.6394
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.6394
Time:	12:14:00	Log-likelihood	-4191.5
Cov. Estimator:	Unadjusted		
		F-statistic:	212.63
Entities:	40	P-value	0.0000
Avg Obs:	72.575	Distribution:	F(24,2878)
Min Obs:	0.0000		
Max Obs:	92.000	F-statistic (robust):	212.06
		P-value	0.0000
Time periods:	99	Distribution:	F(24,2878)
Avg Obs:	29.323		
Min Obs:	0.0000		
Max Obs:	36.000		

#### Parameter Estimates

```

=====
=====

```

	Parameter	Std. Err.	T-stat	P-value	Lower CI	Upper CI
	-----					
	-----					
Liquidity_1p	-0.0228	0.0195	-1.1648	0.2442	-0.0611	
0.0155						
Liquidity	0.0537	0.0287	1.8727	0.0612	-0.0025	
0.1098						
Liquidity_1	0.0895	0.0329	2.7189	0.0066	0.0249	
0.1540						
Liquidity_2	0.0927	0.0328	2.8233	0.0048	0.0283	
0.1571						
Liquidity_3	0.0896	0.0286	3.1346	0.0017	0.0336	
0.1456						
Liquidity_4	0.0187	0.0195	0.9613	0.3365	-0.0195	
0.0570						
Market_returns_1p	0.0049	0.0220	0.2242	0.8227	-0.0382	
0.0480						
Market_returns	0.0224	0.0274	0.8168	0.4141	-0.0313	
0.0761						
Market_returns_1	0.0597	0.0276	2.1600	0.0309	0.0055	
0.1139						
Market_returns_2	-0.0751	0.0276	-2.7167	0.0066	-0.1293	
-0.0209						
Market_returns_3	-0.0075	0.0275	-0.2748	0.7835	-0.0614	
0.0463						
Market_returns_4	-0.0316	0.0277	-1.1424	0.2534	-0.0859	
0.0226						

Dividend_yield_1p	-0.0652	0.0270	-2.4175	0.0157	-0.1180
-0.0123					
Dividend_yield	-0.1116	0.0331	-3.3719	0.0008	-0.1765
-0.0467					
Dividend_yield_1	-0.0983	0.0344	-2.8605	0.0043	-0.1657
-0.0309					
Dividend_yield_2	-0.0728	0.0323	-2.2562	0.0241	-0.1361
-0.0095					
Dividend_yield_3	-0.0384	0.0254	-1.5083	0.1316	-0.0882
0.0115					
Dividend_yield_4	-0.0151	0.0193	-0.7822	0.4341	-0.0528
0.0227					
Issues_1	-1.0783	0.0169	-63.638	0.0000	-1.1116
-1.0451					
Issues_2	-0.8132	0.0216	-37.582	0.0000	-0.8556
-0.7708					
Issues_3	-0.4321	0.0170	-25.344	0.0000	-0.4655
-0.3987					
1	-0.2273	0.0408	-5.5672	0.0000	-0.3074
-0.1473					
2	0.1447	0.0407	3.5536	0.0004	0.0649
0.2246					
3	-0.1063	0.0403	-2.6383	0.0084	-0.1852
-0.0273					
4	0.1904	0.0408	4.6645	0.0000	0.1104
0.2704					

=====

=====

```
[ ]: model = PanelOLS(panel3.fillna(0).Issues,
                    panel3.fillna(0).drop(columns=['Issues']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:            Issues    R-squared:                0.6276
Estimator:                PanelOLS  R-squared (Between):      -4.7133
No. Observations:         4000     R-squared (Within):       0.6279
Date:                     Wed, Jul 28 2021  R-squared (Overall):      0.6276
Time:                     12:14:00    Log-likelihood            -5450.3
Cov. Estimator:           Unadjusted
                               F-statistic:                279.14
Entities:                 40        P-value                 0.0000
=====
```

Avg Obs:	100.000	Distribution:	F(24,3975)
Min Obs:	100.000		
Max Obs:	100.000	F-statistic (robust):	279.08
		P-value	0.0000
Time periods:	100	Distribution:	F(24,3975)
Avg Obs:	40.000		
Min Obs:	40.000		
Max Obs:	40.000		

#### Parameter Estimates

=====					
=====					
	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI	-----				
-----					
Liquidity_1p 0.0071	-0.0234	0.0156	-1.5031	0.1329	-0.0539
Liquidity 0.1115	0.0685	0.0219	3.1189	0.0018	0.0254
Liquidity_1 0.1625	0.1132	0.0251	4.5061	0.0000	0.0640
Liquidity_2 0.1637	0.1140	0.0253	4.4995	0.0000	0.0643
Liquidity_3 0.1544	0.1107	0.0223	4.9662	0.0000	0.0670
Liquidity_4 0.0551	0.0243	0.0157	1.5434	0.1228	-0.0066
Market_returns_1p 0.0265	-0.0061	0.0166	-0.3682	0.7127	-0.0387
Market_returns 0.0797	0.0415	0.0195	2.1271	0.0335	0.0032
Market_returns_1 0.1104	0.0711	0.0200	3.5553	0.0004	0.0319
Market_returns_2 -0.0291	-0.0686	0.0202	-3.4030	0.0007	-0.1081
Market_returns_3 0.0048	-0.0347	0.0202	-1.7217	0.0852	-0.0743
Market_returns_4 0.0133	-0.0265	0.0203	-1.3044	0.1922	-0.0663
Dividend_yield_1p 0.0153	-0.0193	0.0177	-1.0933	0.2743	-0.0540
Dividend_yield 0.0105	-0.0319	0.0216	-1.4758	0.1401	-0.0742
Dividend_yield_1 0.0145	-0.0301	0.0228	-1.3222	0.1862	-0.0747
Dividend_yield_2 0.0117	-0.0312	0.0219	-1.4243	0.1544	-0.0741

Dividend_yield_3	-0.0166	0.0184	-0.8996	0.3684	-0.0528
0.0196					
Dividend_yield_4	-0.0070	0.0145	-0.4801	0.6312	-0.0354
0.0215					
Issues_1	-1.0630	0.0145	-73.530	0.0000	-1.0914
-1.0347					
Issues_2	-0.7912	0.0185	-42.796	0.0000	-0.8275
-0.7550					
Issues_3	-0.4254	0.0145	-29.249	0.0000	-0.4539
-0.3969					
1	-0.1604	0.0314	-5.1089	0.0000	-0.2220
-0.0988					
2	0.1250	0.0316	3.9535	0.0001	0.0630
0.1870					
3	-0.1001	0.0315	-3.1773	0.0015	-0.1619
-0.0383					
4	0.1694	0.0315	5.3713	0.0000	0.1076
0.2312					

=====

=====

### 3.8 Table 3 model 8

```
[ ]: panel3 = panel_data[['Issues', 'Liquidity_1p', 'Liquidity', 'Liquidity_1',
    ↳ 'Liquidity_2',
    ↳ 'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
    ↳
    ↳ 'Market_returns',          'Market_returns_1',          'Market_returns_2',
    ↳
    ↳ 'Market_returns_3',          'Market_returns_4',          'Issues_1',          'Issues_2',
    ↳1, 2, 3, 4]]

panel3 = pd.concat([panel3.drop(columns= ['Issues_1',          'Issues_2',
    ↳ 'Issues_3' ,1, 2, 3, 4]),
    ↳ Volatility_1p, Volatility, Volatility_1,
    ↳ Volatility_2, Volatility_3, Volatility_4,
    ↳ Turnover_1p, Turnover, Turnover_1,
    ↳ Turnover_2, Turnover_3, Turnover_4,
    ↳ Liquidity_risk_1p, Liquidity_risk, Liquidity_risk_1,
    ↳ Liquidity_risk_2, Liquidity_risk_3, Liquidity_risk_4,
    ↳ MB_ratio_1p, MB_ratio, MB_ratio_1,
    ↳ MB_ratio_2, MB_ratio_3, MB_ratio_4,
    ↳ price_earning_1p, price_earning, price_earning_1,
    ↳ price_earning_2, price_earning_3, price_earning_4,
    ↳ Dividend_yield_1p, Dividend_yield, Dividend_yield_1,
```



```
Dividend_yield_2, Dividend_yield_3, Dividend_yield_4,
panel3[['Issues_1',      'Issues_2',
        'Issues_3' ,1, 2, 3, 4]]], axis = 1)
```

```
panel3
```

```
[ ]:      Issues  Liquidity_1p  Liquidity  ...  2  3  4
Country  YearQuarter      ...
ARG      19901      NaN      NaN      NaN  ...  0  0  0
AUS      19901      NaN      NaN      NaN  ...  0  0  0
AUT      19901      NaN      NaN      NaN  ...  0  0  0
BEL      19901      NaN      NaN      NaN  ...  0  0  0
BRA      19901      NaN      NaN      NaN  ...  0  0  0
...      ...      ...      ...      ...  ...  ...  ...
SWE      20144      1.498864      NaN      0.195308  ...  0  0  1
THA      20144      1.521491      NaN      0.514388  ...  0  0  1
USANASDAQ 20144      1.481866      NaN      -0.651659  ...  0  0  1
USANYSE   20144      0.079183      NaN      -0.432412  ...  0  0  1
ZAF      20144      2.606112      NaN      -2.069796  ...  0  0  1
```

```
[4000 rows x 56 columns]
```

```
[ ]: model = PanelOLS(panel3.dropna().Issues,
                      panel3.dropna().drop(columns=['Issues']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:      Issues      R-squared:      0.6486
Estimator:          PanelOLS    R-squared (Between): 0.2804
No. Observations:   2894        R-squared (Within):  0.6487
Date:               Wed, Jul 28 2021  R-squared (Overall): 0.6486
Time:               12:14:00          Log-likelihood      -4144.6
Cov. Estimator:     Unadjusted

F-statistic:      97.047
Entities:         40      P-value      0.0000
Avg Obs:          72.350  Distribution:  F(54,2839)
Min Obs:          0.0000
Max Obs:          92.000  F-statistic (robust): 96.978
                        P-value      0.0000
Time periods:     99      Distribution:  F(54,2839)
Avg Obs:          29.232
Min Obs:          0.0000
Max Obs:          36.000
```

#### Parameter Estimates

=====					
=====					
	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI	-----				
-----					
Liquidity_1p 0.0284	-0.0110	0.0201	-0.5478	0.5839	-0.0504
Liquidity 0.1298	0.0721	0.0294	2.4469	0.0145	0.0143
Liquidity_1 0.1672	0.1006	0.0340	2.9593	0.0031	0.0339
Liquidity_2 0.1639	0.0969	0.0342	2.8366	0.0046	0.0299
Liquidity_3 0.1496	0.0905	0.0301	3.0055	0.0027	0.0315
Liquidity_4 0.0640	0.0238	0.0205	1.1631	0.2449	-0.0163
Market_returns_1p 0.0699	0.0239	0.0234	1.0204	0.3076	-0.0221
Market_returns 0.0217	-0.0446	0.0338	-1.3194	0.1871	-0.1108
Market_returns_1 0.1006	0.0343	0.0338	1.0138	0.3107	-0.0320
Market_returns_2 0.0096	-0.0564	0.0337	-1.6760	0.0938	-0.1224
Market_returns_3 0.0566	-0.0086	0.0333	-0.2580	0.7964	-0.0738
Market_returns_4 0.0574	-0.0077	0.0332	-0.2320	0.8166	-0.0728
Volatility_1p 0.1030	0.0584	0.0228	2.5626	0.0104	0.0137
Volatility 0.1078	0.0390	0.0351	1.1102	0.2670	-0.0298
Volatility_1 0.0666	-0.0143	0.0412	-0.3468	0.7288	-0.0952
Volatility_2 0.0770	-0.0036	0.0411	-0.0866	0.9310	-0.0841
Volatility_3 0.0676	-0.0013	0.0351	-0.0365	0.9709	-0.0702
Volatility_4 0.0776	0.0329	0.0228	1.4472	0.1480	-0.0117
Turnover_1p -0.0440	-0.0952	0.0261	-3.6473	0.0003	-0.1464
Turnover -0.0859	-0.1785	0.0472	-3.7791	0.0002	-0.2712
Turnover_1 -0.0252	-0.1421	0.0596	-2.3833	0.0172	-0.2589

Turnover_2 0.0349	-0.0806	0.0589	-1.3684	0.1713	-0.1960
Turnover_3 0.0705	-0.0185	0.0454	-0.4070	0.6840	-0.1074
Turnover_4 0.0541	0.0067	0.0242	0.2755	0.7830	-0.0408
Liquidity_risk_1p 0.0970	0.0577	0.0200	2.8812	0.0040	0.0184
Liquidity_risk 0.0716	0.0200	0.0263	0.7616	0.4464	-0.0316
Liquidity_risk_1 0.0665	0.0088	0.0294	0.2993	0.7647	-0.0489
Liquidity_risk_2 0.0508	-0.0061	0.0290	-0.2115	0.8325	-0.0631
Liquidity_risk_3 0.0545	0.0058	0.0248	0.2355	0.8138	-0.0428
Liquidity_risk_4 0.0524	0.0160	0.0186	0.8635	0.3879	-0.0204
MB_ratio_1p 0.1263	0.0740	0.0267	2.7748	0.0056	0.0217
MB_ratio 0.1247	0.0581	0.0340	1.7103	0.0873	-0.0085
MB_ratio_1 0.1160	0.0439	0.0368	1.1949	0.2322	-0.0282
MB_ratio_2 0.1171	0.0471	0.0357	1.3186	0.1874	-0.0229
MB_ratio_3 0.1009	0.0414	0.0304	1.3625	0.1732	-0.0182
MB_ratio_4 0.0905	0.0456	0.0229	1.9927	0.0464	0.0007
price_earning_1p 0.0507	0.0083	0.0216	0.3824	0.7022	-0.0341
price_earning 0.0886	0.0322	0.0288	1.1195	0.2630	-0.0242
price_earning_1 0.1124	0.0508	0.0314	1.6146	0.1065	-0.0109
price_earning_2 0.1290	0.0680	0.0311	2.1850	0.0290	0.0070
price_earning_3 0.0821	0.0279	0.0276	1.0089	0.3131	-0.0263
price_earning_4 0.0452	0.0047	0.0206	0.2300	0.8181	-0.0357
Dividend_yield_1p 0.0018	-0.0524	0.0276	-1.8966	0.0580	-0.1066
Dividend_yield -0.0243	-0.0917	0.0344	-2.6689	0.0077	-0.1591
Dividend_yield_1 -0.0039	-0.0751	0.0363	-2.0691	0.0386	-0.1463

Dividend_yield_2	-0.0493	0.0348	-1.4169	0.1566	-0.1175
0.0189					
Dividend_yield_3	-0.0248	0.0292	-0.8506	0.3951	-0.0821
0.0324					
Dividend_yield_4	0.0081	0.0225	0.3610	0.7181	-0.0360
0.0522					
Issues_1	-1.0888	0.0171	-63.784	0.0000	-1.1223
-1.0554					
Issues_2	-0.8197	0.0218	-37.518	0.0000	-0.8626
-0.7769					
Issues_3	-0.4325	0.0172	-25.161	0.0000	-0.4662
-0.3988					
1	-0.2022	0.0445	-4.5464	0.0000	-0.2895
-0.1150					
2	0.0845	0.0442	1.9119	0.0560	-0.0022
0.1711					
3	-0.1252	0.0437	-2.8659	0.0042	-0.2108
-0.0395					
4	0.2481	0.0444	5.5914	0.0000	0.1611
0.3351					

=====

=====

```
[ ]: model = PanelOLS(panel3.fillna(0).Issues,
                    panel3.fillna(0).drop(columns=['Issues']))
res = model.fit()

print(res.summary)
```

PanelOLS Estimation Summary

=====

Dep. Variable:	Issues	R-squared:	0.6343
Estimator:	PanelOLS	R-squared (Between):	-5.0211
No. Observations:	4000	R-squared (Within):	0.6345
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.6343
Time:	12:14:00	Log-likelihood	-5414.2
Cov. Estimator:	Unadjusted		
		F-statistic:	126.70
Entities:	40	P-value	0.0000
Avg Obs:	100.000	Distribution:	F(54,3945)
Min Obs:	100.000		
Max Obs:	100.000	F-statistic (robust):	126.69
		P-value	0.0000
Time periods:	100	Distribution:	F(54,3945)
Avg Obs:	40.000		

Min Obs: 40.000  
Max Obs: 40.000

# Parameter Estimates

=====					
=====	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI	-----				
-----					
Liquidity_1p 0.0198	-0.0117	0.0161	-0.7274	0.4670	-0.0432
Liquidity 0.1230	0.0785	0.0227	3.4616	0.0005	0.0341
Liquidity_1 0.1663	0.1151	0.0261	4.4084	0.0000	0.0639
Liquidity_2 0.1654	0.1135	0.0265	4.2915	0.0000	0.0617
Liquidity_3 0.1588	0.1126	0.0236	4.7792	0.0000	0.0664
Liquidity_4 0.0647	0.0321	0.0166	1.9333	0.0533	-0.0005
Market_returns_1p 0.0391	0.0053	0.0172	0.3088	0.7575	-0.0285
Market_returns 0.0558	0.0118	0.0224	0.5270	0.5982	-0.0321
Market_returns_1 0.1071	0.0620	0.0230	2.6989	0.0070	0.0170
Market_returns_2 -0.0158	-0.0613	0.0232	-2.6422	0.0083	-0.1068
Market_returns_3 0.0076	-0.0378	0.0231	-1.6332	0.1025	-0.0832
Market_returns_4 0.0302	-0.0154	0.0233	-0.6626	0.5076	-0.0610
Volatility_1p 0.0747	0.0413	0.0170	2.4306	0.0151	0.0080
Volatility 0.0657	0.0152	0.0257	0.5920	0.5539	-0.0352
Volatility_1 0.0180	-0.0409	0.0300	-1.3620	0.1733	-0.0998
Volatility_2 0.0423	-0.0167	0.0301	-0.5547	0.5791	-0.0757
Volatility_3 0.0471	-0.0046	0.0264	-0.1731	0.8626	-0.0562
Volatility_4 0.0667	0.0321	0.0177	1.8168	0.0693	-0.0025
Turnover_1p -0.0373	-0.0724	0.0179	-4.0487	0.0001	-0.1075

Turnover -0.0836	-0.1404	0.0290	-4.8473	0.0000	-0.1971
Turnover_1 -0.0366	-0.1048	0.0348	-3.0104	0.0026	-0.1731
Turnover_2 0.0140	-0.0544	0.0349	-1.5601	0.1188	-0.1228
Turnover_3 0.0542	-0.0023	0.0288	-0.0789	0.9371	-0.0588
Turnover_4 0.0497	0.0154	0.0175	0.8819	0.3779	-0.0189
Liquidity_risk_1p 0.0553	0.0274	0.0142	1.9319	0.0534	-0.0004
Liquidity_risk 0.0400	0.0046	0.0180	0.2562	0.7978	-0.0308
Liquidity_risk_1 0.0294	-0.0091	0.0196	-0.4653	0.6417	-0.0476
Liquidity_risk_2 0.0268	-0.0116	0.0196	-0.5904	0.5550	-0.0499
Liquidity_risk_3 0.0315	-0.0035	0.0179	-0.1964	0.8443	-0.0385
Liquidity_risk_4 0.0405	0.0128	0.0141	0.9045	0.3658	-0.0149
MB_ratio_1p 0.0713	0.0343	0.0189	1.8184	0.0691	-0.0027
MB_ratio 0.0701	0.0235	0.0238	0.9858	0.3243	-0.0232
MB_ratio_1 0.0749	0.0241	0.0259	0.9312	0.3518	-0.0267
MB_ratio_2 0.0795	0.0292	0.0257	1.1372	0.2555	-0.0211
MB_ratio_3 0.0704	0.0254	0.0230	1.1043	0.2695	-0.0197
MB_ratio_4 0.0793	0.0442	0.0179	2.4655	0.0137	0.0091
price_earning_1p 0.0293	-0.0029	0.0164	-0.1767	0.8597	-0.0351
price_earning 0.0371	-0.0048	0.0214	-0.2243	0.8225	-0.0467
price_earning_1 0.0572	0.0110	0.0236	0.4679	0.6399	-0.0352
price_earning_2 0.0817	0.0355	0.0236	1.5082	0.1316	-0.0107
price_earning_3 0.0537	0.0119	0.0213	0.5585	0.5765	-0.0299
price_earning_4 0.0293	-0.0029	0.0164	-0.1768	0.8597	-0.0351
Dividend_yield_1p 0.0248	-0.0108	0.0181	-0.5943	0.5524	-0.0463

Dividend_yield	-0.0172	0.0223	-0.7708	0.4409	-0.0610
0.0266					
Dividend_yield_1	-0.0135	0.0239	-0.5665	0.5711	-0.0603
0.0333					
Dividend_yield_2	-0.0180	0.0234	-0.7675	0.4428	-0.0640
0.0280					
Dividend_yield_3	-0.0118	0.0208	-0.5656	0.5717	-0.0526
0.0291					
Dividend_yield_4	0.0106	0.0166	0.6366	0.5244	-0.0220
0.0432					
Issues_1	-1.0675	0.0145	-73.567	0.0000	-1.0959
-1.0390					
Issues_2	-0.7935	0.0186	-42.656	0.0000	-0.8299
-0.7570					
Issues_3	-0.4239	0.0146	-29.000	0.0000	-0.4526
-0.3953					
1	-0.1409	0.0333	-4.2334	0.0000	-0.2062
-0.0757					
2	0.0839	0.0335	2.5060	0.0122	0.0183
0.1495					
3	-0.1176	0.0334	-3.5208	0.0004	-0.1830
-0.0521					
4	0.2126	0.0336	6.3323	0.0000	0.1468
0.2784					

=====

=====

## 4 Table 4

Defining variables and data

```
[ ]: # Defining GDP_growth, and its lags
GDP_growth = pd.read_excel(path, sheet_name='GDP growth', skiprows=5)
GDP_growth = GDP_growth.set_index(['YearQuarter'])
#GDP_growth = GDP_growth.diff()
GDP_growth_1p = GDP_growth.shift(-1)
GDP_growth_1 = GDP_growth.shift(1)
GDP_growth_2 = GDP_growth.shift(2)
GDP_growth_3 = GDP_growth.shift(3)
GDP_growth_4 = GDP_growth.shift(4)

v = [GDP_growth_1p, GDP_growth, GDP_growth_1,
      GDP_growth_2, GDP_growth_3, GDP_growth_4]
names = ['GDP_growth_1p', 'GDP_growth', 'GDP_growth_1',
         'GDP_growth_2', 'GDP_growth_3', 'GDP_growth_4']
```

```

i = 0
for data in v:
    v[i] = pd.DataFrame(data.stack(dropna = False ), columns= [names[i]])
    v[i].index = v[i].index.set_names(['YearQuarter', 'Country'])
    v[i] = v[i].reset_index().set_index(['Country', 'YearQuarter'])
    i += 1
[GDP_growth_1p, GDP_growth, GDP_growth_1,
 GDP_growth_2, GDP_growth_3, GDP_growth_4] = v

# Defining Sales_growth, and its lags
Sales_growth = pd.read_excel(path, sheet_name='Sales growth', skiprows=5)
Sales_growth = Sales_growth.set_index(['YearQuarter'])
#Sales_growth = Sales_growth.diff()
Sales_growth_1p = Sales_growth.shift(-1)
Sales_growth_1 = Sales_growth.shift(1)
Sales_growth_2 = Sales_growth.shift(2)
Sales_growth_3 = Sales_growth.shift(3)
Sales_growth_4 = Sales_growth.shift(4)

v = [Sales_growth_1p, Sales_growth, Sales_growth_1,
     Sales_growth_2, Sales_growth_3, Sales_growth_4]
names = ['Sales_growth_1p', 'Sales_growth', 'Sales_growth_1',
         'Sales_growth_2', 'Sales_growth_3', 'Sales_growth_4']
i = 0
for data in v:
    v[i] = pd.DataFrame(data.stack(dropna = False ), columns= [names[i]])
    v[i].index = v[i].index.set_names(['YearQuarter', 'Country'])
    v[i] = v[i].reset_index().set_index(['Country', 'YearQuarter'])
    i += 1
[Sales_growth_1p, Sales_growth, Sales_growth_1,
 Sales_growth_2, Sales_growth_3, Sales_growth_4] = v

# Defining LEI_growth, and its lags
LEI_growth = pd.read_excel(path, sheet_name='LEI growth', skiprows=5)
LEI_growth = LEI_growth.set_index(['YearQuarter'])
#LEI_growth = LEI_growth.diff()
LEI_growth_1p = LEI_growth.shift(-1)
LEI_growth_1 = LEI_growth.shift(1)
LEI_growth_2 = LEI_growth.shift(2)
LEI_growth_3 = LEI_growth.shift(3)
LEI_growth_4 = LEI_growth.shift(4)

v = [LEI_growth_1p, LEI_growth, LEI_growth_1,
     LEI_growth_2, LEI_growth_3, LEI_growth_4]

```



```

names = ['LEI_growth_1p', 'LEI_growth', 'LEI_growth_1',
         'LEI_growth_2', 'LEI_growth_3', 'LEI_growth_4']
i = 0
for data in v:
    v[i] = pd.DataFrame(data.stack(dropna = False ), columns= [names[i]])
    v[i].index = v[i].index.set_names(['YearQuarter', 'Country'])
    v[i] = v[i].reset_index().set_index(['Country', 'YearQuarter'])
    i += 1
[LEI_growth_1p, LEI_growth, LEI_growth_1,
 LEI_growth_2, LEI_growth_3, LEI_growth_4] = v

# Defining Idiosyncratic_volatility, and its lags
Idiosyncratic_volatility = pd.read_excel(path, sheet_name='Idiosyncratic_
→volatility', skiprows=5)
Idiosyncratic_volatility = Idiosyncratic_volatility.set_index(['YearQuarter'])
Idiosyncratic_volatility = Idiosyncratic_volatility.diff()
Idiosyncratic_volatility_1p = Idiosyncratic_volatility.shift(-1)
Idiosyncratic_volatility_1 = Idiosyncratic_volatility.shift(1)
Idiosyncratic_volatility_2 = Idiosyncratic_volatility.shift(2)
Idiosyncratic_volatility_3 = Idiosyncratic_volatility.shift(3)
Idiosyncratic_volatility_4 = Idiosyncratic_volatility.shift(4)

v = [Idiosyncratic_volatility_1p, Idiosyncratic_volatility,
→Idiosyncratic_volatility_1,
      Idiosyncratic_volatility_2, Idiosyncratic_volatility_3,
→Idiosyncratic_volatility_4]
names = ['Idiosyncratic_volatility_1p', 'Idiosyncratic_volatility',
→'Idiosyncratic_volatility_1',
         'Idiosyncratic_volatility_2', 'Idiosyncratic_volatility_3',
→'Idiosyncratic_volatility_4']
i = 0
for data in v:
    v[i] = pd.DataFrame(data.stack(dropna = False ), columns= [names[i]])
    v[i].index = v[i].index.set_names(['YearQuarter', 'Country'])
    v[i] = v[i].reset_index().set_index(['Country', 'YearQuarter'])
    i += 1
[Idiosyncratic_volatility_1p, Idiosyncratic_volatility,
→Idiosyncratic_volatility_1,
      Idiosyncratic_volatility_2, Idiosyncratic_volatility_3,
→Idiosyncratic_volatility_4] = v

```

```

# Defining Stock_price_synchronicity, and its lags
Stock_price_synchronicity = pd.read_excel(path, sheet_name='Stock price_
→synchronicity', skiprows=5)
Stock_price_synchronicity = Stock_price_synchronicity.set_index(['YearQuarter'])
Stock_price_synchronicity = Stock_price_synchronicity.diff()
Stock_price_synchronicity_1p = Stock_price_synchronicity.shift(-1)
Stock_price_synchronicity_1 = Stock_price_synchronicity.shift(1)
Stock_price_synchronicity_2 = Stock_price_synchronicity.shift(2)
Stock_price_synchronicity_3 = Stock_price_synchronicity.shift(3)
Stock_price_synchronicity_4 = Stock_price_synchronicity.shift(4)

v = [Stock_price_synchronicity_1p, Stock_price_synchronicity,
→Stock_price_synchronicity_1,
      Stock_price_synchronicity_2, Stock_price_synchronicity_3,
→Stock_price_synchronicity_4]
names = ['Stock_price_synchronicity_1p', 'Stock_price_synchronicity',
→'Stock_price_synchronicity_1',
          'Stock_price_synchronicity_2', 'Stock_price_synchronicity_3',
→'Stock_price_synchronicity_4']
i = 0
for data in v:
    v[i] = pd.DataFrame(data.stack(dropna = False ), columns= [names[i]])
    v[i].index = v[i].index.set_names(['YearQuarter', 'Country'])
    v[i] = v[i].reset_index().set_index(['Country', 'YearQuarter'])
    i += 1
[Stock_price_synchronicity_1p, Stock_price_synchronicity,
→Stock_price_synchronicity_1,
      Stock_price_synchronicity_2, Stock_price_synchronicity_3,
→Stock_price_synchronicity_4] = v

```

#### 4.1 Table 4 model 1

```

[: panel3 = panel_data[['Issues', 'Liquidity_1p', 'Liquidity', 'Liquidity_1',
→'Liquidity_2',
                        'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
                        ],
→'Market_returns',          'Market_returns_1',          'Market_returns_2',
                        ],
→          'Market_returns_3',          'Market_returns_4',          'Issues_1',          'Issues_2',
→1, 2, 3, 4]]

panel3

[:
      Issues Liquidity_1p Liquidity ... 2 3 4
Country YearQuarter
ARG      19901          NaN          NaN ... 0 0 0

```

AUS	19901	NaN	NaN	NaN	...	0	0	0
AUT	19901	NaN	NaN	NaN	...	0	0	0
BEL	19901	NaN	NaN	NaN	...	0	0	0
BRA	19901	NaN	NaN	NaN	...	0	0	0
...	...	...	...	...	...	...	...	...
SWE	20144	1.498864	NaN	0.195308	...	0	0	1
THA	20144	1.521491	NaN	0.514388	...	0	0	1
USANASDAQ	20144	1.481866	NaN	-0.651659	...	0	0	1
USANYSE	20144	0.079183	NaN	-0.432412	...	0	0	1
ZAF	20144	2.606112	NaN	-2.069796	...	0	0	1

[4000 rows x 20 columns]

```
[ ]: model = PanelOLS(panel3.dropna().Issues,
                    panel3.dropna().drop(columns = ['Issues']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues    R-squared:          0.6421
Estimator:              PanelOLS  R-squared (Between): 0.3458
No. Observations:      3087      R-squared (Within):  0.6421
Date:                   Wed, Jul 28 2021  R-squared (Overall): 0.6421
Time:                   12:14:04    Log-likelihood       -4438.8
Cov. Estimator:        Unadjusted

                               F-statistic:          305.74
Entities:               40          P-value          0.0000
Avg Obs:                77.175     Distribution:      F(18,3068)
Min Obs:                0.0000
Max Obs:                92.000     F-statistic (robust): 304.54
                               P-value          0.0000
Time periods:           99         Distribution:      F(18,3068)
Avg Obs:                31.182
Min Obs:                0.0000
Max Obs:                38.000
```

#### Parameter Estimates

```
=====
=====
Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Liquidity_1p    -0.0237    0.0188   -1.2595    0.2080   -0.0606
0.0132
Liquidity       0.0817    0.0273    2.9953    0.0028    0.0282
```

0.1352					
Liquidity_1	0.1301	0.0312	4.1715	0.0000	0.0689
0.1912					
Liquidity_2	0.1253	0.0310	4.0471	0.0001	0.0646
0.1861					
Liquidity_3	0.1165	0.0264	4.4075	0.0000	0.0647
0.1683					
Liquidity_4	0.0335	0.0178	1.8872	0.0592	-0.0013
0.0684					
Market_returns_1p	0.0019	0.0210	0.0902	0.9282	-0.0393
0.0431					
Market_returns	0.0696	0.0208	3.3492	0.0008	0.0289
0.1104					
Market_returns_1	0.0936	0.0212	4.4118	0.0000	0.0520
0.1352					
Market_returns_2	-0.0881	0.0213	-4.1345	0.0000	-0.1299
-0.0463					
Market_returns_3	-0.0323	0.0213	-1.5158	0.1297	-0.0741
0.0095					
Market_returns_4	-0.0616	0.0211	-2.9135	0.0036	-0.1031
-0.0201					
Issues_1	-1.0721	0.0164	-65.196	0.0000	-1.1044
-1.0399					
Issues_2	-0.8022	0.0210	-38.206	0.0000	-0.8433
-0.7610					
Issues_3	-0.4245	0.0165	-25.770	0.0000	-0.4568
-0.3922					
1	-0.2372	0.0389	-6.0955	0.0000	-0.3136
-0.1609					
2	0.1422	0.0389	3.6521	0.0003	0.0658
0.2185					
3	-0.1159	0.0387	-2.9920	0.0028	-0.1919
-0.0400					
4	0.2046	0.0393	5.2025	0.0000	0.1275
0.2817					

```
=====
=====
```

```
[ ]: model = PanelOLS(panel3.fillna(0).Issues,
                    panel3.fillna(0).drop(columns = ['Issues']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
```

Dep. Variable:	Issues	R-squared:	0.6273
Estimator:	PanelOLS	R-squared (Between):	-4.6129
No. Observations:	4000	R-squared (Within):	0.6276
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.6273
Time:	12:14:05	Log-likelihood	-5451.8
Cov. Estimator:	Unadjusted		
		F-statistic:	372.31
Entities:	40	P-value	0.0000
Avg Obs:	100.000	Distribution:	F(18,3981)
Min Obs:	100.000		
Max Obs:	100.000	F-statistic (robust):	372.22
		P-value	0.0000
Time periods:	100	Distribution:	F(18,3981)
Avg Obs:	40.000		
Min Obs:	40.000		
Max Obs:	40.000		

#### Parameter Estimates

```
=====
=====
```

	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI					
-----					
-----					
Liquidity_1p	-0.0234	0.0155	-1.5058	0.1322	-0.0539
0.0071					
Liquidity	0.0700	0.0218	3.2079	0.0013	0.0272
0.1128					
Liquidity_1	0.1164	0.0249	4.6777	0.0000	0.0676
0.1652					
Liquidity_2	0.1181	0.0250	4.7216	0.0000	0.0690
0.1671					
Liquidity_3	0.1157	0.0218	5.3170	0.0000	0.0731
0.1584					
Liquidity_4	0.0281	0.0152	1.8446	0.0652	-0.0018
0.0579					
Market_returns_1p	-0.0047	0.0166	-0.2845	0.7760	-0.0372
0.0278					
Market_returns	0.0538	0.0165	3.2620	0.0011	0.0215
0.0862					
Market_returns_1	0.0792	0.0169	4.6871	0.0000	0.0461
0.1123					
Market_returns_2	-0.0707	0.0170	-4.1556	0.0000	-0.1040
-0.0373					
Market_returns_3	-0.0358	0.0171	-2.0949	0.0362	-0.0693
-0.0023					
Market_returns_4	-0.0370	0.0171	-2.1589	0.0309	-0.0706
-0.0034					

Issues_1	-1.0627	0.0144	-73.552	0.0000	-1.0911
-1.0344					
Issues_2	-0.7907	0.0185	-42.799	0.0000	-0.8269
-0.7545					
Issues_3	-0.4249	0.0145	-29.264	0.0000	-0.4533
-0.3964					
1	-0.1601	0.0311	-5.1445	0.0000	-0.2211
-0.0991					
2	0.1248	0.0315	3.9672	0.0001	0.0631
0.1865					
3	-0.0996	0.0314	-3.1659	0.0016	-0.1612
-0.0379					
4	0.1719	0.0314	5.4758	0.0000	0.1104
0.2335					

=====

=====

## 4.2 Table 4 model 2

```
[ ]: panel3 = panel_data[['Issues', 'Liquidity_1p', 'Liquidity', 'Liquidity_1', 'Liquidity_2',
                        'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
                        'Market_returns', 'Market_returns_1', 'Market_returns_2',
                        'Market_returns_3', 'Market_returns_4', 'Issues_1', 'Issues_2',
                        'Issues_3', 'Issues_4', '1', '2', '3', '4']]

panel3 = pd.concat([panel3.drop(columns= ['Issues_1', 'Issues_2',
                                         'Issues_3', 'Issues_4', '1', '2', '3', '4']),
                    GDP_growth_1p, GDP_growth, GDP_growth_1,
                    GDP_growth_2, GDP_growth_3, GDP_growth_4,
                    panel3[['Issues_1', 'Issues_2', 'Issues_3', 'Issues_4', '1', '2', '3', '4']]], axis = 1)

panel3
```

```
[ ]:
Country    YearQuarter    Issues    Liquidity_1p    Liquidity    ...    2    3    4
ARG        19901         NaN         NaN         NaN    ...    0    0    0
AUS        19901         NaN         NaN         NaN    ...    0    0    0
AUT        19901         NaN         NaN         NaN    ...    0    0    0
BEL        19901         NaN         NaN         NaN    ...    0    0    0
BRA        19901         NaN         NaN         NaN    ...    0    0    0
...        ...         ...         ...         ...    ...    ...    ...
SWE        20144        1.498864         NaN        0.195308    ...    0    0    1
```

THA	20144	1.521491	NaN	0.514388	...	0	0	1
USANASDAQ	20144	1.481866	NaN	-0.651659	...	0	0	1
USANYSE	20144	0.079183	NaN	-0.432412	...	0	0	1
ZAF	20144	2.606112	NaN	-2.069796	...	0	0	1

[4000 rows x 26 columns]

```
[ ]: model = PanelOLS(panel3.dropna().Issues,
                    panel3.dropna().drop(columns = ['Issues']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:            Issues    R-squared:                0.6644
Estimator:                PanelOLS  R-squared (Between):      0.1374
No. Observations:         2514      R-squared (Within):       0.6645
Date:                     Wed, Jul 28 2021  R-squared (Overall):      0.6644
Time:                     12:14:05    Log-likelihood            -3557.7
Cov. Estimator:           Unadjusted

                                F-statistic:                205.32
Entities:                  40      P-value                  0.0000
Avg Obs:                   62.850  Distribution:            F(24,2489)
Min Obs:                   0.0000
Max Obs:                   92.000  F-statistic (robust):     204.18
                                P-value                  0.0000
Time periods:              99      Distribution:            F(24,2489)
Avg Obs:                   25.394
Min Obs:                   0.0000
Max Obs:                   32.000
```

#### Parameter Estimates

```
=====
=====
Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Liquidity_1p    -0.0253    0.0211   -1.2039    0.2288   -0.0666
0.0159
Liquidity       0.0825    0.0308    2.6782    0.0075    0.0221
0.1429
Liquidity_1     0.1033    0.0351    2.9403    0.0033    0.0344
0.1721
Liquidity_2     0.1081    0.0348    3.1092    0.0019    0.0399
0.1763
Liquidity_3     0.0962    0.0296    3.2468    0.0012    0.0381
```

0.1543					
Liquidity_4	0.0254	0.0198	1.2845	0.1991	-0.0134
0.0642					
Market_returns_1p	-0.0077	0.0233	-0.3287	0.7424	-0.0534
0.0381					
Market_returns	0.0820	0.0237	3.4580	0.0006	0.0355
0.1286					
Market_returns_1	0.1102	0.0245	4.5007	0.0000	0.0622
0.1581					
Market_returns_2	-0.0795	0.0248	-3.2043	0.0014	-0.1281
-0.0308					
Market_returns_3	-0.0274	0.0248	-1.1044	0.2695	-0.0760
0.0212					
Market_returns_4	-0.0580	0.0246	-2.3557	0.0186	-0.1063
-0.0097					
GDP_growth_1p	-0.0935	0.0480	-1.9460	0.0518	-0.1876
0.0007					
GDP_growth	0.0756	0.0628	1.2025	0.2293	-0.0477
0.1988					
GDP_growth_1	0.0025	0.0582	0.0425	0.9661	-0.1117
0.1166					
GDP_growth_2	-0.0053	0.0579	-0.0922	0.9266	-0.1188
0.1081					
GDP_growth_3	-0.0585	0.0613	-0.9549	0.3397	-0.1788
0.0617					
GDP_growth_4	0.0796	0.0440	1.8090	0.0706	-0.0067
0.1658					
Issues_1	-1.0949	0.0182	-60.149	0.0000	-1.1306
-1.0592					
Issues_2	-0.8212	0.0235	-34.945	0.0000	-0.8672
-0.7751					
Issues_3	-0.4324	0.0183	-23.674	0.0000	-0.4683
-0.3966					
1	-0.2411	0.0425	-5.6717	0.0000	-0.3245
-0.1578					
2	0.1670	0.0427	3.9106	0.0001	0.0833
0.2508					
3	-0.1403	0.0425	-3.2983	0.0010	-0.2237
-0.0569					
4	0.1985	0.0431	4.6013	0.0000	0.1139
0.2831					
=====					
=====					



```
[ ]: model = PanelOLS(panel3.fillna(0).Issues,
                    panel3.fillna(0).drop(columns = ['Issues']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues    R-squared:          0.6283
Estimator:              PanelOLS  R-squared (Between): -4.5495
No. Observations:      4000      R-squared (Within):  0.6285
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.6283
Time:                  12:14:05    Log-likelihood       -5446.7
Cov. Estimator:        Unadjusted

                               F-statistic:          279.93
Entities:              40         P-value          0.0000
Avg Obs:              100.000     Distribution:      F(24,3975)
Min Obs:              100.000
Max Obs:              100.000     F-statistic (robust): 279.87
                               P-value          0.0000
Time periods:         100        Distribution:      F(24,3975)
Avg Obs:              40.000
Min Obs:              40.000
Max Obs:              40.000
```

#### Parameter Estimates

```
=====
=====
Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Liquidity_1p      -0.0247    0.0156   -1.5832    0.1134   -0.0552
0.0059
Liquidity         0.0671    0.0219    3.0614    0.0022    0.0241
0.1101
Liquidity_1       0.1140    0.0250    4.5530    0.0000    0.0649
0.1632
Liquidity_2       0.1155    0.0252    4.5838    0.0000    0.0661
0.1649
Liquidity_3       0.1136    0.0219    5.1770    0.0000    0.0706
0.1566
Liquidity_4       0.0265    0.0154    1.7258    0.0845   -0.0036
0.0566
Market_returns_1p -0.0013    0.0167   -0.0755    0.9398   -0.0340
0.0315
Market_returns     0.0614    0.0168    3.6481    0.0003    0.0284
```

0.0944					
Market_returns_1	0.0863	0.0173	4.9742	0.0000	0.0523
0.1203					
Market_returns_2	-0.0618	0.0175	-3.5256	0.0004	-0.0962
-0.0274					
Market_returns_3	-0.0261	0.0176	-1.4786	0.1393	-0.0607
0.0085					
Market_returns_4	-0.0309	0.0177	-1.7524	0.0798	-0.0656
0.0037					
GDP_growth_1p	-0.0917	0.0378	-2.4258	0.0153	-0.1658
-0.0176					
GDP_growth	0.0789	0.0499	1.5805	0.1141	-0.0190
0.1767					
GDP_growth_1	-0.0187	0.0470	-0.3990	0.6899	-0.1109
0.0734					
GDP_growth_2	0.0064	0.0470	0.1363	0.8916	-0.0857
0.0986					
GDP_growth_3	-0.0614	0.0498	-1.2329	0.2177	-0.1590
0.0362					
GDP_growth_4	0.0771	0.0366	2.1083	0.0351	0.0054
0.1488					
Issues_1	-1.0636	0.0144	-73.619	0.0000	-1.0919
-1.0353					
Issues_2	-0.7923	0.0185	-42.882	0.0000	-0.8285
-0.7560					
Issues_3	-0.4259	0.0145	-29.335	0.0000	-0.4544
-0.3974					
1	-0.1612	0.0311	-5.1800	0.0000	-0.2222
-0.1002					
2	0.1242	0.0314	3.9504	0.0001	0.0626
0.1859					
3	-0.0996	0.0314	-3.1694	0.0015	-0.1613
-0.0380					
4	0.1714	0.0314	5.4584	0.0000	0.1098
0.2329					
=====					
=====					

### 4.3 Table 4 model 3

```
[ ]: panel3 = panel_data[['Issues', 'Liquidity_1p', 'Liquidity', 'Liquidity_1',
    ↳ 'Liquidity_2',
    ↳ 'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
    ↳
    ↳ 'Market_returns', 'Market_returns_1', 'Market_returns_2',
```

```

→      'Market_returns_3',      'Market_returns_4',      'Issues_1',      'Issues_2',
→1, 2, 3, 4]]

panel3 = pd.concat([panel3.drop(columns= ['Issues_1',      'Issues_2',
      'Issues_3' ,1, 2, 3, 4]),
      Sales_growth_1p, Sales_growth, Sales_growth_1,
      Sales_growth_2, Sales_growth_3, Sales_growth_4,
      panel3[['Issues_1',      'Issues_2',
      'Issues_3' ,1, 2, 3, 4]]], axis = 1)

panel3

```

```

[ ]:
Country      YearQuarter      Issues      Liquidity_1p      Liquidity      ...      2      3      4
ARG          19901          NaN          NaN          NaN      ...      0      0      0
AUS          19901          NaN          NaN          NaN      ...      0      0      0
AUT          19901          NaN          NaN          NaN      ...      0      0      0
BEL          19901          NaN          NaN          NaN      ...      0      0      0
BRA          19901          NaN          NaN          NaN      ...      0      0      0
...          ...          ...          ...          ...      ...      ...      ...
SWE          20144          1.498864          NaN          0.195308      ...      0      0      1
THA          20144          1.521491          NaN          0.514388      ...      0      0      1
USANASDAQ    20144          1.481866          NaN          -0.651659      ...      0      0      1
USANYSE      20144          0.079183          NaN          -0.432412      ...      0      0      1
ZAF          20144          2.606112          NaN          -2.069796      ...      0      0      1

```

[4000 rows x 26 columns]

```

[ ]: model = PanelOLS(panel3.dropna().Issues,
      panel3.dropna().drop(columns = ['Issues']))
res = model.fit()

print(res.summary)

```

#### PanelOLS Estimation Summary

```

=====
Dep. Variable:      Issues      R-squared:      0.6720
Estimator:      PanelOLS      R-squared (Between):      0.2110
No. Observations:      2310      R-squared (Within):      0.6721
Date:      Wed, Jul 28 2021      R-squared (Overall):      0.6720
Time:      12:14:05      Log-likelihood      -3277.4
Cov. Estimator:      Unadjusted

F-statistic:      195.07
Entities:      40      P-value      0.0000
Avg Obs:      57.750      Distribution:      F(24,2285)
Min Obs:      0.0000
Max Obs:      91.000      F-statistic (robust):      194.30

```

Time periods:	99	P-value	0.0000
Avg Obs:	23.333	Distribution:	F(24,2285)
Min Obs:	0.0000		
Max Obs:	30.000		

# Parameter Estimates

	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI					
Liquidity_1p	-0.0211	0.0222	-0.9506	0.3419	-0.0647
0.0224					
Liquidity	0.0889	0.0323	2.7536	0.0059	0.0256
0.1523					
Liquidity_1	0.1116	0.0369	3.0285	0.0025	0.0393
0.1839					
Liquidity_2	0.1079	0.0365	2.9538	0.0032	0.0363
0.1795					
Liquidity_3	0.0907	0.0309	2.9386	0.0033	0.0302
0.1512					
Liquidity_4	0.0165	0.0204	0.8119	0.4169	-0.0234
0.0565					
Market_returns_1p	-0.0064	0.0242	-0.2643	0.7916	-0.0539
0.0411					
Market_returns	0.0801	0.0242	3.3150	0.0009	0.0327
0.1275					
Market_returns_1	0.1047	0.0248	4.2276	0.0000	0.0561
0.1532					
Market_returns_2	-0.0947	0.0250	-3.7888	0.0002	-0.1437
-0.0457					
Market_returns_3	-0.0388	0.0251	-1.5477	0.1218	-0.0880
0.0104					
Market_returns_4	-0.0673	0.0250	-2.6896	0.0072	-0.1164
-0.0182					
Sales_growth_1p	-0.0513	0.0426	-1.2050	0.2283	-0.1349
0.0322					
Sales_growth	0.0499	0.0504	0.9899	0.3223	-0.0489
0.1487					
Sales_growth_1	-0.0189	0.0466	-0.4045	0.6859	-0.1103
0.0726					
Sales_growth_2	-0.0534	0.0459	-1.1628	0.2450	-0.1435
0.0367					
Sales_growth_3	0.0556	0.0481	1.1581	0.2470	-0.0386
0.1499					
Sales_growth_4	0.0101	0.0385	0.2614	0.7938	-0.0654

```

0.0855
Issues_1          -1.0956      0.0190     -57.714      0.0000     -1.1328
-1.0584
Issues_2          -0.8243      0.0244     -33.730      0.0000     -0.8723
-0.7764
Issues_3          -0.4362      0.0190     -22.938      0.0000     -0.4735
-0.3989
1                -0.2515      0.0448     -5.6089      0.0000     -0.3394
-0.1636
2                 0.1912      0.0450      4.2455      0.0000      0.1029
0.2796
3                -0.1551      0.0449     -3.4539      0.0006     -0.2431
-0.0670
4                 0.2173      0.0456      4.7617      0.0000      0.1278
0.3068
=====
=====

```

```

[ ]: model = PanelOLS(panel3.fillna(0).Issues,
                      panel3.fillna(0).drop(columns = ['Issues']))
res = model.fit()

print(res.summary)

```

#### PanelOLS Estimation Summary

```

=====
Dep. Variable:          Issues      R-squared:          0.6280
Estimator:              PanelOLS    R-squared (Between): -4.5873
No. Observations:      4000        R-squared (Within):  0.6282
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.6280
Time:                  12:14:06      Log-likelihood      -5448.5
Cov. Estimator:        Unadjusted

                               F-statistic:          279.55
Entities:              40          P-value          0.0000
Avg Obs:              100.000      Distribution:      F(24,3975)
Min Obs:              100.000
Max Obs:              100.000      F-statistic (robust): 279.55
                               P-value          0.0000
Time periods:         100          Distribution:      F(24,3975)
Avg Obs:              40.000
Min Obs:              40.000
Max Obs:              40.000

```

#### Parameter Estimates

```
=====
```

=====

	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI					
-----					
-----					
Liquidity_1p 0.0067	-0.0238	0.0156	-1.5298	0.1261	-0.0544
Liquidity 0.1105	0.0676	0.0219	3.0868	0.0020	0.0247
Liquidity_1 0.1629	0.1139	0.0250	4.5558	0.0000	0.0649
Liquidity_2 0.1648	0.1156	0.0251	4.5982	0.0000	0.0663
Liquidity_3 0.1567	0.1138	0.0219	5.2052	0.0000	0.0709
Liquidity_4 0.0578	0.0278	0.0153	1.8206	0.0687	-0.0021
Market_returns_1p 0.0279	-0.0046	0.0166	-0.2795	0.7799	-0.0372
Market_returns 0.0877	0.0552	0.0166	3.3293	0.0009	0.0227
Market_returns_1 0.1143	0.0810	0.0170	4.7666	0.0000	0.0477
Market_returns_2 -0.0339	-0.0676	0.0172	-3.9391	0.0001	-0.1012
Market_returns_3 0.0006	-0.0332	0.0172	-1.9260	0.0542	-0.0669
Market_returns_4 -0.0006	-0.0345	0.0173	-1.9971	0.0459	-0.0684
Sales_growth_1p 0.0305	-0.0292	0.0304	-0.9583	0.3380	-0.0888
Sales_growth 0.1131	0.0407	0.0369	1.1010	0.2710	-0.0317
Sales_growth_1 0.0233	-0.0452	0.0350	-1.2943	0.1956	-0.1138
Sales_growth_2 0.0435	-0.0251	0.0350	-0.7172	0.4733	-0.0937
Sales_growth_3 0.1216	0.0484	0.0373	1.2962	0.1950	-0.0248
Sales_growth_4 0.0568	-0.0032	0.0306	-0.1045	0.9168	-0.0632
Issues_1 -1.0343	-1.0626	0.0145	-73.521	0.0000	-1.0910
Issues_2 -0.7545	-0.7907	0.0185	-42.793	0.0000	-0.8270
Issues_3 -0.3971	-0.4256	0.0145	-29.306	0.0000	-0.4540
1	-0.1595	0.0311	-5.1256	0.0000	-0.2205

```

-0.0985
2          0.1246      0.0315      3.9598      0.0001      0.0629
0.1862
3          -0.0991     0.0314     -3.1513     0.0016     -0.1608
-0.0374
4          0.1708      0.0314      5.4390      0.0000      0.1092
0.2324
=====
=====

```

#### 4.4 Table 4 model 4

```

[ ]: panel3 = panel_data[['Issues', 'Liquidity_1p', 'Liquidity', 'Liquidity_1',
    ↳ 'Liquidity_2',
    ↳ 'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
    ↳
    ↳ 'Market_returns',      'Market_returns_1',      'Market_returns_2',
    ↳
    ↳ 'Market_returns_3',      'Market_returns_4',      'Issues_1',      'Issues_2',
    ↳1, 2, 3, 4]]

panel3 = pd.concat([panel3.drop(columns= ['Issues_1',      'Issues_2',
    ↳ 'Issues_3' ,1, 2, 3, 4]),
    ↳ LEI_growth_1p, LEI_growth, LEI_growth_1,
    ↳ LEI_growth_2, LEI_growth_3, LEI_growth_4,
    ↳ panel3[['Issues_1',      'Issues_2',
    ↳ 'Issues_3' ,1, 2, 3, 4]]], axis = 1)

panel3

```

```

[ ]:
Country    YearQuarter    Issues    Liquidity_1p    Liquidity    ...    2    3    4
ARG        19901          NaN          NaN          NaN    ...    0    0    0
AUS        19901          NaN          NaN          NaN    ...    0    0    0
AUT        19901          NaN          NaN          NaN    ...    0    0    0
BEL        19901          NaN          NaN          NaN    ...    0    0    0
BRA        19901          NaN          NaN          NaN    ...    0    0    0
...        ...          ...          ...          ...    ...    ...    ...
SWE        20144        1.498864          NaN        0.195308    ...    0    0    1
THA        20144        1.521491          NaN        0.514388    ...    0    0    1
USANASDAQ  20144        1.481866          NaN       -0.651659    ...    0    0    1
USANYSE    20144        0.079183          NaN       -0.432412    ...    0    0    1
ZAF        20144        2.606112          NaN       -2.069796    ...    0    0    1

```

[4000 rows x 26 columns]

```
[ ]: model = PanelOLS(panel3.dropna().Issues,
                    panel3.dropna().drop(columns = ['Issues']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues    R-squared:          0.6629
Estimator:             PanelOLS  R-squared (Between): 0.4064
No. Observations:      2478      R-squared (Within):  0.6630
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.6629
Time:                  12:14:06   Log-likelihood       -3520.3
Cov. Estimator:        Unadjusted

                               F-statistic:          201.01
Entities:               40       P-value          0.0000
Avg Obs:                61.950   Distribution:      F(24,2453)
Min Obs:                0.0000
Max Obs:                91.000   F-statistic (robust): 199.99
                               P-value          0.0000
Time periods:           99       Distribution:      F(24,2453)
Avg Obs:                25.030
Min Obs:                0.0000
Max Obs:                31.000
```

#### Parameter Estimates

```
=====
=====
-----
Upper CI
-----
-----
-----
Liquidity_1p          -0.0213    0.0216    -0.9856    0.3244    -0.0637
0.0211
Liquidity              0.0929    0.0318     2.9181    0.0036     0.0305
0.1553
Liquidity_1           0.1199    0.0365     3.2870    0.0010     0.0484
0.1914
Liquidity_2           0.1256    0.0361     3.4797    0.0005     0.0548
0.1964
Liquidity_3           0.1061    0.0307     3.4525    0.0006     0.0458
0.1663
Liquidity_4           0.0288    0.0204     1.4148    0.1573    -0.0111
0.0688
Market_returns_1p     -0.0078    0.0260    -0.2997    0.7644    -0.0587
0.0432
Market_returns         0.0936    0.0258     3.6203    0.0003     0.0429
```



0.1443					
Market_returns_1	0.1134	0.0261	4.3463	0.0000	0.0622
0.1645					
Market_returns_2	-0.0757	0.0262	-2.8897	0.0039	-0.1271
-0.0243					
Market_returns_3	-0.0099	0.0261	-0.3779	0.7056	-0.0611
0.0414					
Market_returns_4	-0.0626	0.0256	-2.4465	0.0145	-0.1127
-0.0124					
LEI_growth_1p	-0.0004	0.1162	-0.0031	0.9975	-0.2283
0.2276					
LEI_growth	-0.2959	0.2738	-1.0809	0.2798	-0.8328
0.2409					
LEI_growth_1	0.5643	0.3640	1.5503	0.1212	-0.1495
1.2781					
LEI_growth_2	-0.5822	0.3598	-1.6183	0.1057	-1.2877
0.1233					
LEI_growth_3	0.3046	0.2625	1.1601	0.2461	-0.2102
0.8194					
LEI_growth_4	-0.0860	0.1060	-0.8117	0.4170	-0.2938
0.1218					
Issues_1	-1.0887	0.0183	-59.448	0.0000	-1.1247
-1.0528					
Issues_2	-0.8126	0.0236	-34.503	0.0000	-0.8588
-0.7664					
Issues_3	-0.4315	0.0183	-23.526	0.0000	-0.4674
-0.3955					
1	-0.2378	0.0431	-5.5141	0.0000	-0.3224
-0.1532					
2	0.1768	0.0433	4.0843	0.0000	0.0919
0.2617					
3	-0.1464	0.0431	-3.3979	0.0007	-0.2308
-0.0619					
4	0.1954	0.0438	4.4633	0.0000	0.1096
0.2813					

```
=====
=====
```

```
[ ]: model = PanelOLS(panel3.fillna(0).Issues,
                    panel3.fillna(0).drop(columns = ['Issues']))
res = model.fit()

print(res.summary)
```

PanelOLS Estimation Summary

```
=====
```

Dep. Variable:	Issues	R-squared:	0.6280
Estimator:	PanelOLS	R-squared (Between):	-4.5826
No. Observations:	4000	R-squared (Within):	0.6283
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.6280
Time:	12:14:06	Log-likelihood	-5448.0
Cov. Estimator:	Unadjusted		
		F-statistic:	279.65
Entities:	40	P-value	0.0000
Avg Obs:	100.000	Distribution:	F(24,3975)
Min Obs:	100.000		
Max Obs:	100.000	F-statistic (robust):	279.59
		P-value	0.0000
Time periods:	100	Distribution:	F(24,3975)
Avg Obs:	40.000		
Min Obs:	40.000		
Max Obs:	40.000		

#### Parameter Estimates

	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI					
Liquidity_1p	-0.0258	0.0156	-1.6512	0.0988	-0.0564
0.0048					
Liquidity	0.0661	0.0220	3.0065	0.0027	0.0230
0.1092					
Liquidity_1	0.1123	0.0251	4.4682	0.0000	0.0630
0.1615					
Liquidity_2	0.1148	0.0253	4.5422	0.0000	0.0653
0.1644					
Liquidity_3	0.1129	0.0221	5.1199	0.0000	0.0697
0.1562					
Liquidity_4	0.0257	0.0155	1.6647	0.0961	-0.0046
0.0560					
Market_returns_1p	-0.0035	0.0171	-0.2060	0.8368	-0.0371
0.0300					
Market_returns	0.0603	0.0174	3.4697	0.0005	0.0262
0.0944					
Market_returns_1	0.0897	0.0178	5.0471	0.0000	0.0549
0.1246					
Market_returns_2	-0.0591	0.0179	-3.3074	0.0009	-0.0941
-0.0241					
Market_returns_3	-0.0256	0.0179	-1.4319	0.1523	-0.0607
0.0095					
Market_returns_4	-0.0298	0.0179	-1.6684	0.0953	-0.0649
0.0052					

LEI_growth_1p 0.0878	-0.0373	0.0638	-0.5846	0.5588	-0.1624
LEI_growth 0.2144	-0.0291	0.1242	-0.2340	0.8150	-0.2725
LEI_growth_1 0.3196	0.0384	0.1434	0.2680	0.7887	-0.2428
LEI_growth_2 0.2215	-0.0611	0.1441	-0.4241	0.6715	-0.3437
LEI_growth_3 0.2725	0.0280	0.1247	0.2248	0.8221	-0.2165
LEI_growth_4 0.0955	-0.0270	0.0625	-0.4318	0.6659	-0.1494
Issues_1 -1.0352	-1.0636	0.0145	-73.585	0.0000	-1.0919
Issues_2 -0.7558	-0.7920	0.0185	-42.844	0.0000	-0.8282
Issues_3 -0.3973	-0.4258	0.0145	-29.287	0.0000	-0.4543
1 -0.0997	-0.1609	0.0312	-5.1523	0.0000	-0.2221
2 0.1861	0.1241	0.0316	3.9292	0.0001	0.0622
3 -0.0375	-0.0995	0.0316	-3.1478	0.0017	-0.1614
4 0.2337	0.1720	0.0315	5.4597	0.0000	0.1102

=====

=====

#### 4.5 Table 4 model 5

```
[ ]: panel3 = panel_data[['Issues', 'Liquidity_1p', 'Liquidity', 'Liquidity_1',
    ↳ 'Liquidity_2',
    ↳ 'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
    ↳
    ↳ 'Market_returns',          'Market_returns_1',          'Market_returns_2',
    ↳
    ↳ 'Market_returns_3',          'Market_returns_4',          'Issues_1',          'Issues_2',
    ↳ 1, 2, 3, 4]]

panel3 = pd.concat([panel3.drop(columns= ['Issues_1',          'Issues_2',
    ↳ 'Issues_3' ,1, 2, 3, 4]),
    ↳ Idiosyncratic_volatility_1p, Idiosyncratic_volatility,
    ↳ Idiosyncratic_volatility_1,
```

```

        Idiosyncratic_volatility_2, Idiosyncratic_volatility_3,
        Idiosyncratic_volatility_4,
        panel3[['Issues_1', 'Issues_2',
                  'Issues_3'], 1, 2, 3, 4]], axis = 1)

panel3

```

```

[ ]:
Country    YearQuarter    Issues    Liquidity_1p    Liquidity    ...    2    3    4
ARG        19901          NaN        NaN            NaN    ...    0    0    0
AUS        19901          NaN        NaN            NaN    ...    0    0    0
AUT        19901          NaN        NaN            NaN    ...    0    0    0
BEL        19901          NaN        NaN            NaN    ...    0    0    0
BRA        19901          NaN        NaN            NaN    ...    0    0    0
...        ...          ...        ...            ...    ...    ...    ...
SWE        20144        1.498864    NaN            0.195308    ...    0    0    1
THA        20144        1.521491    NaN            0.514388    ...    0    0    1
USANASDAQ  20144        1.481866    NaN           -0.651659    ...    0    0    1
USANYSE    20144        0.079183    NaN           -0.432412    ...    0    0    1
ZAF        20144        2.606112    NaN           -2.069796    ...    0    0    1

```

[4000 rows x 26 columns]

```

[ ]: model = PanelOLS(panel3.dropna().Issues,
                    panel3.dropna().drop(columns = ['Issues']))
res = model.fit()

print(res.summary)

```

```

                    PanelOLS Estimation Summary
=====
Dep. Variable:            Issues    R-squared:            0.6437
Estimator:                PanelOLS    R-squared (Between):    0.1528
No. Observations:         3070    R-squared (Within):     0.6438
Date:                     Wed, Jul 28 2021    R-squared (Overall):    0.6437
Time:                     12:14:06    Log-likelihood          -4405.0
Cov. Estimator:           Unadjusted

                                F-statistic:            229.26
Entities:                  40    P-value              0.0000
Avg Obs:                   76.750    Distribution:         F(24,3045)
Min Obs:                   0.0000
Max Obs:                   92.000    F-statistic (robust):    228.45
                                P-value              0.0000
Time periods:              99    Distribution:         F(24,3045)
Avg Obs:                   31.010
Min Obs:                   0.0000
Max Obs:                   38.000

```

Parameter Estimates					
=====					
=====					
CI	Upper CI	Parameter	Std. Err.	T-stat	P-value
-----					
-----					
Liquidity_1p		-0.0189	0.0192	-0.9841	0.3251
-0.0565	0.0188				
Liquidity		0.0810	0.0279	2.9045	0.0037
0.0263	0.1358				
Liquidity_1		0.1354	0.0320	4.2357	0.0000
0.0727	0.1981				
Liquidity_2		0.1374	0.0318	4.3199	0.0000
0.0750	0.1997				
Liquidity_3		0.1251	0.0273	4.5821	0.0000
0.0716	0.1786				
Liquidity_4		0.0436	0.0184	2.3717	0.0178
0.0076	0.0796				
Market_returns_1p		-0.0013	0.0214	-0.0592	0.9528
-0.0432	0.0407				
Market_returns		0.0682	0.0212	3.2223	0.0013
0.0267	0.1097				
Market_returns_1		0.0995	0.0216	4.6161	0.0000
0.0572	0.1418				
Market_returns_2		-0.0842	0.0217	-3.8889	0.0001
-0.1267	-0.0418				
Market_returns_3		-0.0332	0.0217	-1.5350	0.1249
-0.0757	0.0092				
Market_returns_4		-0.0709	0.0216	-3.2879	0.0010
-0.1132	-0.0286				
Idiosyncratic_volatility_1p		0.0194	0.0188	1.0325	0.3019
-0.0174	0.0562				
Idiosyncratic_volatility		0.0162	0.0260	0.6203	0.5351
-0.0349	0.0672				
Idiosyncratic_volatility_1		0.0193	0.0298	0.6460	0.5183
-0.0392	0.0778				
Idiosyncratic_volatility_2		0.0702	0.0296	2.3666	0.0180
0.0120	0.1283				
Idiosyncratic_volatility_3		0.0374	0.0256	1.4621	0.1438
-0.0127	0.0875				
Idiosyncratic_volatility_4		0.0431	0.0184	2.3460	0.0190
0.0071	0.0792				
Issues_1		-1.0697	0.0165	-64.718	0.0000
-1.1021	-1.0372				
Issues_2		-0.7979	0.0211	-37.738	0.0000
-0.8393	-0.7564				
Issues_3		-0.4217	0.0166	-25.453	0.0000

-0.4542	-0.3892				
1		-0.2249	0.0401	-5.6077	0.0000
-0.3035	-0.1463				
2		0.1298	0.0400	3.2475	0.0012
0.0514	0.2082				
3		-0.1293	0.0400	-3.2305	0.0012
-0.2078	-0.0508				
4		0.2218	0.0403	5.5072	0.0000
0.1428	0.3008				

=====

=====

```
[ ]: model = PanelOLS(panel3.fillna(0).Issues,
                    panel3.fillna(0).drop(columns = ['Issues']))
res = model.fit()

print(res.summary)
```

PanelOLS Estimation Summary

=====

Dep. Variable:	Issues	R-squared:	0.6288
Estimator:	PanelOLS	R-squared (Between):	-4.6281
No. Observations:	4000	R-squared (Within):	0.6290
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.6288
Time:	12:14:07	Log-likelihood	-5443.9
Cov. Estimator:	Unadjusted		
		F-statistic:	280.57
Entities:	40	P-value	0.0000
Avg Obs:	100.000	Distribution:	F(24,3975)
Min Obs:	100.000		
Max Obs:	100.000	F-statistic (robust):	280.50
		P-value	0.0000
Time periods:	100	Distribution:	F(24,3975)
Avg Obs:	40.000		
Min Obs:	40.000		
Max Obs:	40.000		

Parameter Estimates

=====

=====

CI	Upper CI	Parameter	Std. Err.	T-stat	P-value	Lower
-----						
-----						
		Liquidity_1p	-0.0192	0.0158	-1.2138	0.2249

-0.0502	0.0118				
Liquidity		0.0682	0.0223	3.0592	0.0022
0.0245	0.1118				
Liquidity_1		0.1151	0.0255	4.5178	0.0000
0.0651	0.1650				
Liquidity_2		0.1218	0.0256	4.7557	0.0000
0.0716	0.1720				
Liquidity_3		0.1194	0.0223	5.3462	0.0000
0.0756	0.1632				
Liquidity_4		0.0356	0.0156	2.2842	0.0224
0.0050	0.0662				
Market_returns_1p		-0.0064	0.0167	-0.3851	0.7002
-0.0392	0.0263				
Market_returns		0.0521	0.0166	3.1313	0.0018
0.0195	0.0846				
Market_returns_1		0.0798	0.0170	4.6936	0.0000
0.0465	0.1131				
Market_returns_2		-0.0690	0.0171	-4.0317	0.0001
-0.1026	-0.0355				
Market_returns_3		-0.0316	0.0172	-1.8394	0.0659
-0.0654	0.0021				
Market_returns_4		-0.0418	0.0173	-2.4179	0.0157
-0.0756	-0.0079				
Idiosyncratic_volatility_1p		0.0165	0.0149	1.1103	0.2669
-0.0126	0.0456				
Idiosyncratic_volatility		0.0037	0.0201	0.1857	0.8527
-0.0356	0.0431				
Idiosyncratic_volatility_1		-0.0099	0.0228	-0.4348	0.6637
-0.0546	0.0348				
Idiosyncratic_volatility_2		0.0335	0.0228	1.4695	0.1418
-0.0112	0.0782				
Idiosyncratic_volatility_3		0.0218	0.0201	1.0828	0.2790
-0.0176	0.0612				
Idiosyncratic_volatility_4		0.0343	0.0150	2.2820	0.0225
0.0048	0.0637				
Issues_1		-1.0606	0.0145	-73.382	0.0000
-1.0889	-1.0322				
Issues_2		-0.7892	0.0185	-42.697	0.0000
-0.8254	-0.7530				
Issues_3		-0.4248	0.0145	-29.251	0.0000
-0.4533	-0.3964				
1		-0.1492	0.0317	-4.7090	0.0000
-0.2114	-0.0871				
2		0.1212	0.0319	3.7957	0.0001
0.0586	0.1839				
3		-0.1155	0.0321	-3.5985	0.0003
-0.1785	-0.0526				
4		0.1794	0.0319	5.6253	0.0000

0.1169      0.2419

=====

#### 4.6 Table 4 model 6

```
[ ]: panel3 = panel_data[['Issues', 'Liquidity_1p', 'Liquidity', 'Liquidity_1',  
    ↳ 'Liquidity_2',  
        'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',  
    ↳  
    ↳ 'Market_returns',          'Market_returns_1',          'Market_returns_2',  
    ↳  
    ↳ 'Market_returns_3',          'Market_returns_4',          'Issues_1',          'Issues_2',  
    ↳1, 2, 3, 4]]
```

```
panel3 = pd.concat([panel3.drop(columns= ['Issues_1',          'Issues_2',  
        'Issues_3' ],1, 2, 3, 4)),  
    Stock_price_synchronicity_1p, Stock_price_synchronicity,  
    ↳Stock_price_synchronicity_1,  
        Stock_price_synchronicity_2, Stock_price_synchronicity_3,  
    ↳Stock_price_synchronicity_4,  
        panel3[['Issues_1',          'Issues_2',  
            'Issues_3' ],1, 2, 3, 4]]], axis = 1)
```

panel3

```
[ ]:      Issues  Liquidity_1p  Liquidity  ...  2  3  4  
Country  YearQuarter  
ARG      19901             NaN          NaN  ...  0  0  0  
AUS      19901             NaN          NaN  ...  0  0  0  
AUT      19901             NaN          NaN  ...  0  0  0  
BEL      19901             NaN          NaN  ...  0  0  0  
BRA      19901             NaN          NaN  ...  0  0  0  
...      ...             ...          ...  ...  ..  ..  ..  
SWE      20144      1.498864          NaN    0.195308  ...  0  0  1  
THA      20144      1.521491          NaN    0.514388  ...  0  0  1  
USANASDAQ 20144      1.481866          NaN   -0.651659  ...  0  0  1  
USANYSE   20144      0.079183          NaN   -0.432412  ...  0  0  1  
ZAF      20144      2.606112          NaN   -2.069796  ...  0  0  1
```

[4000 rows x 26 columns]

```
[ ]: model = PanelOLS(panel3.dropna().Issues,  
    panel3.dropna().drop(columns = ['Issues']))  
res = model.fit()
```



```
print(res.summary)
```

### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues      R-squared:          0.6429
Estimator:             PanelOLS    R-squared (Between): 0.1279
No. Observations:      3070        R-squared (Within):  0.6430
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.6429
Time:                  12:14:07      Log-likelihood       -4408.5
Cov. Estimator:        Unadjusted

                               F-statistic:          228.44
Entities:              40          P-value          0.0000
Avg Obs:               76.750      Distribution:      F(24,3045)
Min Obs:               0.0000
Max Obs:               92.000      F-statistic (robust): 227.63
                               P-value          0.0000
Time periods:          99          Distribution:      F(24,3045)
Avg Obs:               31.010
Min Obs:               0.0000
Max Obs:               38.000
```

### Parameter Estimates

```
=====
=====
Lower CI    Upper CI      Parameter  Std. Err.    T-stat    P-value
-----
-----
Liquidity_1p      -0.0189    0.0190    -0.9969    0.3189
-0.0562    0.0183
Liquidity         0.0833    0.0275     3.0254    0.0025
0.0293    0.1373
Liquidity_1       0.1288    0.0314     4.0987    0.0000
0.0672    0.1905
Liquidity_2       0.1246    0.0313     3.9793    0.0001
0.0632    0.1860
Liquidity_3       0.1190    0.0270     4.4055    0.0000
0.0660    0.1719
Liquidity_4       0.0379    0.0183     2.0714    0.0384
0.0020    0.0738
Market_returns_1p  0.0169    0.0222     0.7628    0.4457
-0.0265    0.0603
Market_returns     0.0561    0.0219     2.5612    0.0105
0.0132    0.0991
Market_returns_1   0.0894    0.0224     3.9845    0.0001
0.0454    0.1334
Market_returns_2  -0.0899    0.0225    -3.9950    0.0001
```

-0.1340	-0.0458				
Market_returns_3		-0.0305	0.0225	-1.3601	0.1739
-0.0746	0.0135				
Market_returns_4		-0.0503	0.0222	-2.2598	0.0239
-0.0939	-0.0066				
Stock_price_synchronicity_1p		0.0397	0.0204	1.9444	0.0519
-0.0003	0.0797				
Stock_price_synchronicity		0.0263	0.0316	0.8319	0.4055
-0.0356	0.0882				
Stock_price_synchronicity_1		0.0031	0.0366	0.0849	0.9323
-0.0687	0.0749				
Stock_price_synchronicity_2		-0.0099	0.0363	-0.2739	0.7842
-0.0811	0.0612				
Stock_price_synchronicity_3		-0.0075	0.0307	-0.2445	0.8069
-0.0677	0.0527				
Stock_price_synchronicity_4		0.0153	0.0192	0.8004	0.4235
-0.0222	0.0529				
Issues_1		-1.0723	0.0165	-64.805	0.0000
-1.1048	-1.0399				
Issues_2		-0.7984	0.0212	-37.704	0.0000
-0.8399	-0.7569				
Issues_3		-0.4200	0.0166	-25.294	0.0000
-0.4526	-0.3875				
1		-0.2379	0.0392	-6.0739	0.0000
-0.3147	-0.1611				
2		0.1375	0.0391	3.5154	0.0004
0.0608	0.2142				
3		-0.1168	0.0389	-3.0046	0.0027
-0.1930	-0.0406				
4		0.2134	0.0395	5.4017	0.0000
0.1359	0.2908				

=====

=====

```
[ ]: model = PanelOLS(panel3.fillna(0).Issues,
                      panel3.fillna(0).drop(columns = ['Issues']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

Dep. Variable:	Issues	R-squared:	0.6284
Estimator:	PanelOLS	R-squared (Between):	-4.6079
No. Observations:	4000	R-squared (Within):	0.6287

Date:	Wed, Jul 28 2021	R-squared (Overall):	0.6284
Time:	12:14:07	Log-likelihood	-5446.0
Cov. Estimator:	Unadjusted		
		F-statistic:	280.09
Entities:	40	P-value	0.0000
Avg Obs:	100.000	Distribution:	F(24,3975)
Min Obs:	100.000		
Max Obs:	100.000	F-statistic (robust):	280.03
		P-value	0.0000
Time periods:	100	Distribution:	F(24,3975)
Avg Obs:	40.000		
Min Obs:	40.000		
Max Obs:	40.000		

#### Parameter Estimates

		Parameter	Std. Err.	T-stat	P-value
Lower CI	Upper CI				
-----					
-----					
Liquidity_1p		-0.0197	0.0157	-1.2539	0.2100
-0.0504	0.0111				
Liquidity		0.0722	0.0220	3.2825	0.0010
0.0291	0.1153				
Liquidity_1		0.1147	0.0251	4.5760	0.0000
0.0655	0.1638				
Liquidity_2		0.1168	0.0252	4.6325	0.0000
0.0674	0.1662				
Liquidity_3		0.1167	0.0221	5.2787	0.0000
0.0734	0.1601				
Liquidity_4		0.0338	0.0156	2.1640	0.0305
0.0032	0.0644				
Market_returns_1p		0.0038	0.0172	0.2225	0.8240
-0.0299	0.0375				
Market_returns		0.0476	0.0172	2.7710	0.0056
0.0139	0.0812				
Market_returns_1		0.0717	0.0176	4.0752	0.0000
0.0372	0.1062				
Market_returns_2		-0.0682	0.0177	-3.8486	0.0001
-0.1029	-0.0334				
Market_returns_3		-0.0329	0.0178	-1.8505	0.0643
-0.0677	0.0020				
Market_returns_4		-0.0276	0.0178	-1.5500	0.1212
-0.0625	0.0073				
Stock_price_synchronicity_1p		0.0258	0.0157	1.6443	0.1002
-0.0050	0.0567				
Stock_price_synchronicity		0.0132	0.0234	0.5655	0.5718

-0.0326	0.0590				
Stock_price_synchronicity_1		-0.0172	0.0268	-0.6412	0.5214
-0.0698	0.0354				
Stock_price_synchronicity_2		-0.0217	0.0269	-0.8068	0.4198
-0.0744	0.0310				
Stock_price_synchronicity_3		-0.0189	0.0235	-0.8034	0.4218
-0.0649	0.0272				
Stock_price_synchronicity_4		0.0138	0.0155	0.8891	0.3740
-0.0166	0.0441				
Issues_1		-1.0628	0.0145	-73.502	0.0000
-1.0911	-1.0344				
Issues_2		-0.7903	0.0185	-42.735	0.0000
-0.8265	-0.7540				
Issues_3		-0.4240	0.0145	-29.164	0.0000
-0.4525	-0.3955				
1		-0.1639	0.0312	-5.2532	0.0000
-0.2250	-0.1027				
2		0.1229	0.0315	3.9046	0.0001
0.0612	0.1846				
3		-0.0989	0.0315	-3.1451	0.0017
-0.1606	-0.0373				
4		0.1757	0.0315	5.5862	0.0000
0.1140	0.2374				

=====

=====

#### 4.7 Table 4 model 7

```
[ ]: panel3 = panel_data[['Issues', 'Liquidity_1p', 'Liquidity', 'Liquidity_1',
    ↳ 'Liquidity_2',
    ↳ 'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
    ↳
    ↳ 'Market_returns',          'Market_returns_1',          'Market_returns_2',
    ↳
    ↳ 'Market_returns_3',          'Market_returns_4',          'Issues_1',          'Issues_2',
    ↳1, 2, 3, 4]]

panel3 = pd.concat([panel3.drop(columns= ['Issues_1',          'Issues_2',
    ↳ 'Issues_3' ,1, 2, 3, 4]),
    ↳
    ↳ GDP_growth_1p, GDP_growth, GDP_growth_1,
    ↳ GDP_growth_2, GDP_growth_3, GDP_growth_4,
    ↳ Sales_growth_1p, Sales_growth, Sales_growth_1,
    ↳ Sales_growth_2, Sales_growth_3, Sales_growth_4,
    ↳
    ↳ LEI_growth_1p, LEI_growth, LEI_growth_1,
```

```

        LEI_growth_2, LEI_growth_3, LEI_growth_4,

        Idiosyncratic_volatility_1p, Idiosyncratic_volatility,
        ↪Idiosyncratic_volatility_1,
        Idiosyncratic_volatility_2, Idiosyncratic_volatility_3,
        ↪Idiosyncratic_volatility_4,

        Stock_price_synchronicity_1p, Stock_price_synchronicity,
        ↪Stock_price_synchronicity_1,
        Stock_price_synchronicity_2, Stock_price_synchronicity_3,
        ↪Stock_price_synchronicity_4,

        panel3[['Issues_1',      'Issues_2',
                 'Issues_3' ,1, 2, 3, 4]], axis = 1)

panel3

```

```

[:
Country    YearQuarter    Issues    Liquidity_1p    Liquidity    ...    2    3    4
...
ARG        19901          NaN          NaN          NaN    ...    0    0    0
AUS        19901          NaN          NaN          NaN    ...    0    0    0
AUT        19901          NaN          NaN          NaN    ...    0    0    0
BEL        19901          NaN          NaN          NaN    ...    0    0    0
BRA        19901          NaN          NaN          NaN    ...    0    0    0
...
SWE        20144          1.498864        NaN          0.195308    ...    0    0    1
THA        20144          1.521491        NaN          0.514388    ...    0    0    1
USANASDAQ  20144          1.481866        NaN          -0.651659    ...    0    0    1
USANYSE    20144          0.079183        NaN          -0.432412    ...    0    0    1
ZAF        20144          2.606112        NaN          -2.069796    ...    0    0    1

```

[4000 rows x 50 columns]

```

[: model = PanelOLS(panel3.dropna().Issues,
                    panel3.dropna().drop(columns = ['Issues']))
res = model.fit()

print(res.summary)

```

```

PanelOLS Estimation Summary
=====
Dep. Variable:          Issues    R-squared:          0.6766
Estimator:              PanelOLS  R-squared (Between): 0.2285
No. Observations:      2249      R-squared (Within):  0.6766
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.6766
Time:                  12:14:08    Log-likelihood       -3186.7
Cov. Estimator:        Unadjusted

```

Entities:	40	F-statistic:	95.874
Avg Obs:	56.225	P-value	0.0000
Min Obs:	0.0000	Distribution:	F(48,2200)
Max Obs:	91.000	F-statistic (robust):	95.469
		P-value	0.0000
Time periods:	99	Distribution:	F(48,2200)
Avg Obs:	22.717		
Min Obs:	0.0000		
Max Obs:	29.000		

### Parameter Estimates

		Parameter	Std. Err.	T-stat	P-value
Lower CI	Upper CI				
Liquidity_1p		-0.0132	0.0239	-0.5511	0.5816
-0.0600	0.0337				
Liquidity		0.0889	0.0353	2.5207	0.0118
0.0197	0.1580				
Liquidity_1		0.1246	0.0407	3.0579	0.0023
0.0447	0.2045				
Liquidity_2		0.1358	0.0406	3.3491	0.0008
0.0563	0.2153				
Liquidity_3		0.1258	0.0346	3.6367	0.0003
0.0580	0.1936				
Liquidity_4		0.0477	0.0228	2.0920	0.0366
0.0030	0.0924				
Market_returns_1p		0.0120	0.0293	0.4108	0.6812
-0.0454	0.0695				
Market_returns		0.1037	0.0294	3.5242	0.0004
0.0460	0.1614				
Market_returns_1		0.1069	0.0296	3.6123	0.0003
0.0489	0.1650				
Market_returns_2		-0.0701	0.0298	-2.3562	0.0185
-0.1285	-0.0118				
Market_returns_3		-0.0226	0.0298	-0.7573	0.4489
-0.0810	0.0359				
Market_returns_4		-0.0618	0.0295	-2.0940	0.0364
-0.1197	-0.0039				
GDP_growth_1p		-0.0912	0.0589	-1.5481	0.1218
-0.2068	0.0243				
GDP_growth		0.1058	0.0728	1.4542	0.1460
-0.0369	0.2485				
GDP_growth_1		0.0059	0.0672	0.0885	0.9295
-0.1258	0.1377				

GDP_growth_2	-0.0454	0.0666	-0.6811	0.4959
-0.1761      0.0853				
GDP_growth_3	-0.0891	0.0709	-1.2572	0.2088
-0.2281      0.0499				
GDP_growth_4	0.1303	0.0565	2.3072	0.0211
0.0195      0.2410				
Sales_growth_1p	-0.0199	0.0455	-0.4372	0.6620
-0.1091      0.0693				
Sales_growth	0.0336	0.0523	0.6419	0.5210
-0.0690      0.1362				
Sales_growth_1	-0.0340	0.0486	-0.7003	0.4838
-0.1293      0.0613				
Sales_growth_2	-0.0504	0.0481	-1.0476	0.2949
-0.1447      0.0439				
Sales_growth_3	0.0651	0.0503	1.2947	0.1956
-0.0335      0.1637				
Sales_growth_4	-0.0180	0.0418	-0.4298	0.6674
-0.0999      0.0640				
LEI_growth_1p	0.0720	0.1292	0.5575	0.5772
-0.1813      0.3253				
LEI_growth	-0.4661	0.3007	-1.5503	0.1212
-1.0557      0.1235				
LEI_growth_1	0.8271	0.4006	2.0646	0.0391
0.0415      1.6127				
LEI_growth_2	-0.7505	0.3980	-1.8857	0.0595
-1.5309      0.0300				
LEI_growth_3	0.3615	0.2911	1.2417	0.2145
-0.2094      0.9323				
LEI_growth_4	-0.0863	0.1193	-0.7233	0.4696
-0.3202      0.1476				
Idiosyncratic_volatility_1p	0.0045	0.0231	0.1960	0.8446
-0.0408      0.0498				
Idiosyncratic_volatility	-0.0068	0.0324	-0.2111	0.8329
-0.0704      0.0567				
Idiosyncratic_volatility_1	0.0205	0.0377	0.5451	0.5858
-0.0534      0.0944				
Idiosyncratic_volatility_2	0.0926	0.0374	2.4784	0.0133
0.0193      0.1658				
Idiosyncratic_volatility_3	0.0448	0.0317	1.4120	0.1581
-0.0174      0.1070				
Idiosyncratic_volatility_4	0.0504	0.0226	2.2356	0.0255
0.0062      0.0947				
Stock_price_synchronicity_1p	0.0391	0.0241	1.6207	0.1052
-0.0082      0.0864				
Stock_price_synchronicity	0.0337	0.0370	0.9102	0.3628
-0.0389      0.1063				
Stock_price_synchronicity_1	0.0007	0.0428	0.0160	0.9872
-0.0833      0.0847				

Stock_price_synchronicity_2	-0.0074	0.0425	-0.1748	0.8612
-0.0909	0.0760			
Stock_price_synchronicity_3	0.0165	0.0363	0.4549	0.6493
-0.0546	0.0876			
Stock_price_synchronicity_4	0.0340	0.0227	1.5008	0.1336
-0.0104	0.0785			
Issues_1	-1.0916	0.0193	-56.468	0.0000
-1.1295	-1.0536			
Issues_2	-0.8197	0.0249	-32.930	0.0000
-0.8686	-0.7709			
Issues_3	-0.4337	0.0194	-22.397	0.0000
-0.4717	-0.3958			
1	-0.2563	0.0477	-5.3716	0.0000
-0.3499	-0.1627			
2	0.1706	0.0478	3.5689	0.0004
0.0768	0.2643			
3	-0.1521	0.0479	-3.1728	0.0015
-0.2461	-0.0581			
4	0.2345	0.0483	4.8559	0.0000
0.1398	0.3292			

=====

=====

```
[ ]: model = PanelOLS(panel3.fillna(0).Issues,
                    panel3.fillna(0).drop(columns = ['Issues']))
res = model.fit()

print(res.summary)
```

PanelOLS Estimation Summary

=====

Dep. Variable:	Issues	R-squared:	0.6315
Estimator:	PanelOLS	R-squared (Between):	-4.5581
No. Observations:	4000	R-squared (Within):	0.6318
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.6315
Time:	12:14:08	Log-likelihood	-5429.2
Cov. Estimator:	Unadjusted		
		F-statistic:	141.07
Entities:	40	P-value	0.0000
Avg Obs:	100.000	Distribution:	F(48,3951)
Min Obs:	100.000		
Max Obs:	100.000	F-statistic (robust):	141.07
		P-value	0.0000
Time periods:	100	Distribution:	F(48,3951)
Avg Obs:	40.000		



Min Obs: 40.000  
Max Obs: 40.000

# Parameter Estimates

		Parameter	Std. Err.	T-stat	P-value
Lower CI	Upper CI				
-----					
Liquidity_1p		-0.0173	0.0160	-1.0807	0.2799
-0.0486	0.0141				
Liquidity		0.0664	0.0226	2.9397	0.0033
0.0221	0.1106				
Liquidity_1		0.1102	0.0259	4.2599	0.0000
0.0595	0.1609				
Liquidity_2		0.1159	0.0260	4.4502	0.0000
0.0648	0.1669				
Liquidity_3		0.1169	0.0228	5.1175	0.0000
0.0721	0.1617				
Liquidity_4		0.0385	0.0161	2.3991	0.0165
0.0070	0.0700				
Market_returns_1p		0.0042	0.0178	0.2388	0.8113
-0.0306	0.0391				
Market_returns		0.0558	0.0181	3.0758	0.0021
0.0202	0.0914				
Market_returns_1		0.0827	0.0185	4.4594	0.0000
0.0463	0.1190				
Market_returns_2		-0.0551	0.0186	-2.9592	0.0031
-0.0917	-0.0186				
Market_returns_3		-0.0163	0.0187	-0.8707	0.3839
-0.0530	0.0204				
Market_returns_4		-0.0234	0.0187	-1.2514	0.2109
-0.0601	0.0133				
GDP_growth_1p		-0.0727	0.0419	-1.7334	0.0831
-0.1549	0.0095				
GDP_growth		0.0740	0.0518	1.4299	0.1528
-0.0275	0.1755				
GDP_growth_1		-0.0049	0.0489	-0.0997	0.9206
-0.1007	0.0909				
GDP_growth_2		0.0045	0.0489	0.0921	0.9266
-0.0914	0.1004				
GDP_growth_3		-0.0657	0.0517	-1.2701	0.2041
-0.1671	0.0357				
GDP_growth_4		0.0745	0.0413	1.8041	0.0713
-0.0065	0.1555				
Sales_growth_1p		-0.0141	0.0319	-0.4409	0.6593
-0.0767	0.0485				

Sales_growth	0.0387	0.0377	1.0264	0.3048
-0.0352      0.1127				
Sales_growth_1	-0.0496	0.0357	-1.3884	0.1651
-0.1197      0.0204				
Sales_growth_2	-0.0256	0.0358	-0.7167	0.4736
-0.0958      0.0445				
Sales_growth_3	0.0515	0.0382	1.3498	0.1772
-0.0233      0.1264				
Sales_growth_4	-0.0210	0.0321	-0.6526	0.5140
-0.0839      0.0420				
LEI_growth_1p	0.0031	0.0675	0.0456	0.9636
-0.1293      0.1355				
LEI_growth	-0.0810	0.1283	-0.6313	0.5279
-0.3324      0.1705				
LEI_growth_1	0.0731	0.1475	0.4954	0.6204
-0.2162      0.3623				
LEI_growth_2	-0.0157	0.1488	-0.1055	0.9160
-0.3074      0.2760				
LEI_growth_3	-0.0360	0.1296	-0.2780	0.7810
-0.2902      0.2181				
LEI_growth_4	-0.0046	0.0663	-0.0692	0.9448
-0.1346      0.1254				
Idiosyncratic_volatility_1p	0.0151	0.0153	0.9814	0.3264
-0.0150      0.0451				
Idiosyncratic_volatility	0.0038	0.0210	0.1794	0.8577
-0.0374      0.0450				
Idiosyncratic_volatility_1	-0.0080	0.0240	-0.3314	0.7404
-0.0551      0.0391				
Idiosyncratic_volatility_2	0.0347	0.0241	1.4422	0.1493
-0.0125      0.0820				
Idiosyncratic_volatility_3	0.0223	0.0211	1.0589	0.2897
-0.0190      0.0636				
Idiosyncratic_volatility_4	0.0330	0.0155	2.1282	0.0334
0.0026      0.0633				
Stock_price_synchronicity_1p	0.0262	0.0159	1.6511	0.0988
-0.0049      0.0573				
Stock_price_synchronicity	0.0134	0.0236	0.5679	0.5701
-0.0328      0.0596				
Stock_price_synchronicity_1	-0.0190	0.0272	-0.6970	0.4858
-0.0723      0.0344				
Stock_price_synchronicity_2	-0.0278	0.0273	-1.0188	0.3083
-0.0814      0.0257				
Stock_price_synchronicity_3	-0.0200	0.0239	-0.8367	0.4028
-0.0669      0.0269				
Stock_price_synchronicity_4	0.0128	0.0157	0.8148	0.4152
-0.0180      0.0437				
Issues_1	-1.0618	0.0145	-73.337	0.0000
-1.0902      -1.0334				

Issues_2		-0.7906	0.0185	-42.689	0.0000
-0.8269	-0.7542				
Issues_3		-0.4255	0.0146	-29.214	0.0000
-0.4541	-0.3970				
1		-0.1568	0.0319	-4.9095	0.0000
-0.2194	-0.0942				
2		0.1166	0.0321	3.6305	0.0003
0.0536	0.1796				
3		-0.1116	0.0323	-3.4592	0.0005
-0.1749	-0.0484				
4		0.1832	0.0321	5.7128	0.0000
0.1203	0.2460				

=====

=====

## 5 Table 5

### 5.1 Upper tab, model 1, Full sample

```
[ ]: panel3 = panel_data[['Issues', 'Liquidity_1p', 'Liquidity', 'Liquidity_1',
    ↳ 'Liquidity_2',
    ↳ 'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
    ↳
    ↳ 'Market_returns',          'Market_returns_1',          'Market_returns_2',
    ↳
    ↳ 'Market_returns_3',          'Market_returns_4',          'Issues_1',          'Issues_2',
    ↳1, 2, 3, 4]]

panel3
```

```
[ ]:
Country    YearQuarter    Issues    Liquidity_1p    Liquidity    ...    2    3    4
ARG        19901            NaN        NaN            NaN    ...    0    0    0
AUS        19901            NaN        NaN            NaN    ...    0    0    0
AUT        19901            NaN        NaN            NaN    ...    0    0    0
BEL        19901            NaN        NaN            NaN    ...    0    0    0
BRA        19901            NaN        NaN            NaN    ...    0    0    0
...        ...            ...        ...            ...    ...    ...    ...
SWE        20144        1.498864        NaN        0.195308    ...    0    0    1
THA        20144        1.521491        NaN        0.514388    ...    0    0    1
USANASDAQ  20144        1.481866        NaN        -0.651659    ...    0    0    1
USANYSE    20144        0.079183        NaN        -0.432412    ...    0    0    1
ZAF        20144        2.606112        NaN        -2.069796    ...    0    0    1

[4000 rows x 20 columns]
```

```
[ ]: model = PanelOLS(panel3.dropna().Issues,
                    panel3.dropna().drop(columns = ['Issues']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues    R-squared:          0.6421
Estimator:              PanelOLS  R-squared (Between): 0.3458
No. Observations:      3087      R-squared (Within):  0.6421
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.6421
Time:                  12:14:08    Log-likelihood       -4438.8
Cov. Estimator:        Unadjusted

                               F-statistic:          305.74
Entities:               40        P-value          0.0000
Avg Obs:                77.175    Distribution:      F(18,3068)
Min Obs:                0.0000
Max Obs:                92.000    F-statistic (robust): 304.54
                               P-value          0.0000
Time periods:           99        Distribution:      F(18,3068)
Avg Obs:                31.182
Min Obs:                0.0000
Max Obs:                38.000
```

#### Parameter Estimates

```
=====
=====
-----
Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Liquidity_1p      -0.0237    0.0188   -1.2595    0.2080   -0.0606
0.0132
Liquidity         0.0817    0.0273    2.9953    0.0028    0.0282
0.1352
Liquidity_1       0.1301    0.0312    4.1715    0.0000    0.0689
0.1912
Liquidity_2       0.1253    0.0310    4.0471    0.0001    0.0646
0.1861
Liquidity_3       0.1165    0.0264    4.4075    0.0000    0.0647
0.1683
Liquidity_4       0.0335    0.0178    1.8872    0.0592   -0.0013
0.0684
Market_returns_1p 0.0019    0.0210    0.0902    0.9282   -0.0393
0.0431
Market_returns    0.0696    0.0208    3.3492    0.0008    0.0289
```

0.1104					
Market_returns_1	0.0936	0.0212	4.4118	0.0000	0.0520
0.1352					
Market_returns_2	-0.0881	0.0213	-4.1345	0.0000	-0.1299
-0.0463					
Market_returns_3	-0.0323	0.0213	-1.5158	0.1297	-0.0741
0.0095					
Market_returns_4	-0.0616	0.0211	-2.9135	0.0036	-0.1031
-0.0201					
Issues_1	-1.0721	0.0164	-65.196	0.0000	-1.1044
-1.0399					
Issues_2	-0.8022	0.0210	-38.206	0.0000	-0.8433
-0.7610					
Issues_3	-0.4245	0.0165	-25.770	0.0000	-0.4568
-0.3922					
1	-0.2372	0.0389	-6.0955	0.0000	-0.3136
-0.1609					
2	0.1422	0.0389	3.6521	0.0003	0.0658
0.2185					
3	-0.1159	0.0387	-2.9920	0.0028	-0.1919
-0.0400					
4	0.2046	0.0393	5.2025	0.0000	0.1275
0.2817					

=====

=====

```
[ ]: model = PanelOLS(panel3.fillna(0).Issues,
                      panel3.fillna(0).drop(columns = ['Issues']))
res = model.fit()

print(res.summary)
```

PanelOLS Estimation Summary

=====

Dep. Variable:	Issues	R-squared:	0.6273
Estimator:	PanelOLS	R-squared (Between):	-4.6129
No. Observations:	4000	R-squared (Within):	0.6276
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.6273
Time:	12:14:08	Log-likelihood	-5451.8
Cov. Estimator:	Unadjusted		
		F-statistic:	372.31
Entities:	40	P-value	0.0000
Avg Obs:	100.000	Distribution:	F(18,3981)
Min Obs:	100.000		
Max Obs:	100.000	F-statistic (robust):	372.22

Time periods:	100	P-value	0.0000
Avg Obs:	40.000	Distribution:	F(18,3981)
Min Obs:	40.000		
Max Obs:	40.000		

# Parameter Estimates

=====					
=====					
	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI					
-----					
Liquidity_1p	-0.0234	0.0155	-1.5058	0.1322	-0.0539
0.0071					
Liquidity	0.0700	0.0218	3.2079	0.0013	0.0272
0.1128					
Liquidity_1	0.1164	0.0249	4.6777	0.0000	0.0676
0.1652					
Liquidity_2	0.1181	0.0250	4.7216	0.0000	0.0690
0.1671					
Liquidity_3	0.1157	0.0218	5.3170	0.0000	0.0731
0.1584					
Liquidity_4	0.0281	0.0152	1.8446	0.0652	-0.0018
0.0579					
Market_returns_1p	-0.0047	0.0166	-0.2845	0.7760	-0.0372
0.0278					
Market_returns	0.0538	0.0165	3.2620	0.0011	0.0215
0.0862					
Market_returns_1	0.0792	0.0169	4.6871	0.0000	0.0461
0.1123					
Market_returns_2	-0.0707	0.0170	-4.1556	0.0000	-0.1040
-0.0373					
Market_returns_3	-0.0358	0.0171	-2.0949	0.0362	-0.0693
-0.0023					
Market_returns_4	-0.0370	0.0171	-2.1589	0.0309	-0.0706
-0.0034					
Issues_1	-1.0627	0.0144	-73.552	0.0000	-1.0911
-1.0344					
Issues_2	-0.7907	0.0185	-42.799	0.0000	-0.8269
-0.7545					
Issues_3	-0.4249	0.0145	-29.264	0.0000	-0.4533
-0.3964					
1	-0.1601	0.0311	-5.1445	0.0000	-0.2211
-0.0991					
2	0.1248	0.0315	3.9672	0.0001	0.0631
0.1865					
3	-0.0996	0.0314	-3.1659	0.0016	-0.1612

```

-0.0379
4          0.1719      0.0314      5.4758      0.0000      0.1104
0.2335
=====
=====

```

## 5.2 Upper tab, model 2, $ROA > 0$

```

[ ]: # Defining ROAp, and its lags
ROAp = pd.read_excel(path, sheet_name='Issues ROA>0', skiprows=5)
ROAp = ROAp.set_index(['YearQuarter'])
ROAp = pd.DataFrame(ROAp.stack(dropna = False ), columns=['Issues ROA>0'])
ROAp.index = ROAp.index.set_names(['YearQuarter', 'Country'])
#ROAp = pd.DataFrame(index = ROAp.index, columns= list_of_variables)
ROAp = ROAp.reset_index().set_index(['Country', 'YearQuarter'])
ROAp

```

```

[ ]:          Issues ROA>0
Country  YearQuarter
ARG      19901      NaN
AUS      19901      NaN
AUT      19901      NaN
BEL      19901      NaN
BRA      19901      NaN
...
SWE      20144      0.524806
THA      20144      2.305493
USANASDAQ 20144      0.192464
USANYSE   20144     -1.235691
ZAF      20144      0.637719

```

[4000 rows x 1 columns]

```

[ ]: panel3 = panel_data[['Liquidity_1p', 'Liquidity', 'Liquidity_1', 'Liquidity_2',
                          'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
                          ↳
                          ↳ 'Market_returns',          'Market_returns_1',          'Market_returns_2',
                          ↳
                          ↳ 'Market_returns_3',          'Market_returns_4',          'Issues_1',          'Issues_2',
                          ↳1, 2, 3, 4]]

panel3 = pd.concat([ROAp, panel3], axis = 1)

panel3

```

```
[ ]:
Country    YearQuarter    Issues ROA>0    Liquidity_1p    Liquidity    ...    2    3    4
ARG        19901          NaN            NaN            NaN    ...    0    0    0
AUS        19901          NaN            NaN            NaN    ...    0    0    0
AUT        19901          NaN            NaN            NaN    ...    0    0    0
BEL        19901          NaN            NaN            NaN    ...    0    0    0
BRA        19901          NaN            NaN            NaN    ...    0    0    0
...
SWE        20144          0.524806       NaN            0.195308    ...    0    0    1
THA        20144          2.305493       NaN            0.514388    ...    0    0    1
USANASDAQ  20144          0.192464       NaN            -0.651659    ...    0    0    1
USANYSE    20144          -1.235691      NaN            -0.432412    ...    0    0    1
ZAF        20144          0.637719       NaN            -2.069796    ...    0    0    1
```

[4000 rows x 20 columns]

```
[ ]: model = PanelOLS(panel3.dropna()['Issues ROA>0'],
                    panel3.dropna().drop(columns = ['Issues ROA>0']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues ROA>0    R-squared:          0.1267
Estimator:              PanelOLS        R-squared (Between): -0.1855
No. Observations:      3096             R-squared (Within):  0.1267
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.1267
Time:                  12:14:09          Log-likelihood      -4292.5
Cov. Estimator:        Unadjusted

F-statistic:          24.790
Entities:             40    P-value          0.0000
Avg Obs:              77.400    Distribution:      F(18,3077)
Min Obs:              0.0000
Max Obs:              92.000    F-statistic (robust): 24.396
P-value              0.0000
Time periods:         99    Distribution:      F(18,3077)
Avg Obs:              31.273
Min Obs:              0.0000
Max Obs:              38.000
```

#### Parameter Estimates

```
=====
=====
Parameter    Std. Err.    T-stat    P-value    Lower CI    Upper CI
-----
```



Liquidity_1p 0.0003	-0.0346	0.0178	-1.9434	0.0521	-0.0694
Liquidity 0.0822	0.0314	0.0259	1.2145	0.2247	-0.0193
Liquidity_1 0.1266	0.0686	0.0296	2.3174	0.0205	0.0106
Liquidity_2 0.1155	0.0578	0.0294	1.9686	0.0491	0.0002
Liquidity_3 0.1043	0.0552	0.0251	2.2010	0.0278	0.0060
Liquidity_4 0.0306	-0.0023	0.0168	-0.1394	0.8891	-0.0353
Market_returns_1p 0.0245	-0.0147	0.0200	-0.7357	0.4620	-0.0538
Market_returns 0.1236	0.0849	0.0197	4.3072	0.0000	0.0463
Market_returns_1 0.1386	0.0992	0.0201	4.9255	0.0000	0.0597
Market_returns_2 -0.0176	-0.0573	0.0202	-2.8328	0.0046	-0.0970
Market_returns_3 0.0368	-0.0029	0.0202	-0.1423	0.8869	-0.0425
Market_returns_4 0.0431	0.0037	0.0201	0.1841	0.8539	-0.0357
Issues_1 -0.1604	-0.1909	0.0156	-12.250	0.0000	-0.2215
Issues_2 -0.1826	-0.2216	0.0199	-11.133	0.0000	-0.2606
Issues_3 -0.1122	-0.1428	0.0156	-9.1511	0.0000	-0.1734
1 -0.0632	-0.1354	0.0368	-3.6748	0.0002	-0.2077
2 0.1653	0.0929	0.0369	2.5138	0.0120	0.0204
3 -0.1121	-0.1842	0.0368	-5.0105	0.0000	-0.2562
4 0.2873	0.2142	0.0373	5.7499	0.0000	0.1412

=====

=====

```
[ ]: model = PanelOLS(panel3.fillna(0)['Issues ROA>0'],
                    panel3.fillna(0).drop(columns = ['Issues ROA>0']))
res = model.fit()
```

```
print(res.summary)
```

### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues ROA>0    R-squared:                0.1116
Estimator:              PanelOLS        R-squared (Between):      -8.659e+28
No. Observations:      4000             R-squared (Within):       0.1116
Date:                  Wed, Jul 28 2021  R-squared (Overall):     0.1116
Time:                  12:14:09          Log-likelihood            -5190.9
Cov. Estimator:        Unadjusted

                               F-statistic:          27.774
Entities:              40                P-value                0.0000
Avg Obs:               100.000           Distribution:           F(18,3981)
Min Obs:               100.000
Max Obs:               100.000           F-statistic (robust):    27.517
                               P-value                0.0000
Time periods:          100              Distribution:           F(18,3981)
Avg Obs:               40.000
Min Obs:               40.000
Max Obs:               40.000
```

### Parameter Estimates

```
=====
=====
Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Liquidity_1p      -0.0309    0.0146   -2.1222    0.0339   -0.0594
-0.0024
Liquidity         0.0331    0.0204    1.6177    0.1058   -0.0070
0.0732
Liquidity_1       0.0685    0.0233    2.9395    0.0033    0.0228
0.1143
Liquidity_2       0.0590    0.0234    2.5168    0.0119    0.0130
0.1049
Liquidity_3       0.0583    0.0204    2.8615    0.0042    0.0184
0.0983
Liquidity_4       0.0030    0.0143    0.2132    0.8312   -0.0249
0.0310
Market_returns_1p -0.0161    0.0155   -1.0385    0.2991   -0.0466
0.0143
Market_returns     0.0673    0.0155    4.3547    0.0000    0.0370
0.0976
Market_returns_1   0.0787    0.0158    4.9693    0.0000    0.0476
0.1097
Market_returns_2  -0.0416    0.0159   -2.6088    0.0091   -0.0728
```

-0.0103					
Market_returns_3	-0.0112	0.0160	-0.6993	0.4844	-0.0426
0.0202					
Market_returns_4	0.0082	0.0161	0.5135	0.6076	-0.0232
0.0397					
Issues_1	-0.1899	0.0135	-14.031	0.0000	-0.2165
-0.1634					
Issues_2	-0.2106	0.0173	-12.167	0.0000	-0.2445
-0.1767					
Issues_3	-0.1352	0.0136	-9.9417	0.0000	-0.1619
-0.1086					
1	-0.0945	0.0292	-3.2434	0.0012	-0.1517
-0.0374					
2	0.0829	0.0295	2.8140	0.0049	0.0252
0.1407					
3	-0.1468	0.0295	-4.9846	0.0000	-0.2046
-0.0891					
4	0.1621	0.0294	5.5110	0.0000	0.1044
0.2198					

=====

=====

### 5.3 Upper tab, model 3, $ROA < 0$

```
[ ]: # Defining ROAn, and its lags
ROAn = pd.read_excel(path, sheet_name='Issues ROA<0', skiprows=5)
ROAn = ROAn.set_index(['YearQuarter'])
ROAn = pd.DataFrame(ROAn.stack(dropna = False ), columns=['Issues ROA<0'])
ROAn.index = ROAn.index.set_names(['YearQuarter', 'Country'])
#ROAn = pd.DataFrame(index = ROAn.index, columns= list_of_variables)
ROAn = ROAn.reset_index().set_index(['Country', 'YearQuarter'])
ROAn
```

```
[ ]:
Country  YearQuarter  Issues ROA<0
ARG      19901      NaN
AUS      19901      NaN
AUT      19901      NaN
BEL      19901      NaN
BRA      19901      NaN
...
SWE      20144     -0.390022
THA      20144     -1.344931
USANASDAQ 20144      0.825653
USANYSE   20144      1.885841
ZAF      20144     -1.586646
```

[4000 rows x 1 columns]

```
[ ]: panel3 = panel_data[['Liquidity_1p', 'Liquidity', 'Liquidity_1', 'Liquidity_2',
                        'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
                        ↵
                        ↪ 'Market_returns',          'Market_returns_1',          'Market_returns_2',
                        ↵
                        ↪          'Market_returns_3',          'Market_returns_4',          'Issues_1',          'Issues_2',
                        ↪ 1, 2, 3, 4]]

panel3 = pd.concat([ROAn, panel3], axis = 1)

panel3
```

```
[ ]:
      Country  YearQuarter  Issues ROA<0  Liquidity_1p  Liquidity  ...  2  3  4
ARG      19901          NaN          NaN          NaN  ...  0  0  0
AUS      19901          NaN          NaN          NaN  ...  0  0  0
AUT      19901          NaN          NaN          NaN  ...  0  0  0
BEL      19901          NaN          NaN          NaN  ...  0  0  0
BRA      19901          NaN          NaN          NaN  ...  0  0  0
...
SWE      20144      -0.390022          NaN      0.195308  ...  0  0  1
THA      20144      -1.344931          NaN      0.514388  ...  0  0  1
USANASDAQ 20144       0.825653          NaN     -0.651659  ...  0  0  1
USANYSE   20144       1.885841          NaN     -0.432412  ...  0  0  1
ZAF      20144      -1.586646          NaN     -2.069796  ...  0  0  1
```

[4000 rows x 20 columns]

```
[ ]: model = PanelOLS(panel3.dropna()['Issues ROA<0'],
                    panel3.dropna().drop(columns = ['Issues ROA<0']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues ROA<0    R-squared:          0.0544
Estimator:              PanelOLS        R-squared (Between): -0.1952
No. Observations:        3096          R-squared (Within):   0.0544
Date:                    Wed, Jul 28 2021  R-squared (Overall): 0.0544
Time:                    12:14:10         Log-likelihood      -4464.9
Cov. Estimator:          Unadjusted

F-statistic:          9.8352
Entities:              40          P-value              0.0000
Avg Obs:               77.400      Distribution:       F(18,3077)
Min Obs:               0.0000
```

Max Obs:	92.000	F-statistic (robust):	9.6049
		P-value	0.0000
Time periods:	99	Distribution:	F(18,3077)
Avg Obs:	31.273		
Min Obs:	0.0000		
Max Obs:	38.000		

# Parameter Estimates

=====					
=====					
	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI	-----				
-----					
Liquidity_1p	-0.0465	0.0188	-2.4756	0.0134	-0.0834
-0.0097					
Liquidity	0.0208	0.0274	0.7611	0.4467	-0.0328
0.0745					
Liquidity_1	0.0642	0.0313	2.0534	0.0401	0.0029
0.1256					
Liquidity_2	0.0659	0.0311	2.1224	0.0339	0.0050
0.1268					
Liquidity_3	0.0887	0.0265	3.3477	0.0008	0.0367
0.1406					
Liquidity_4	0.0583	0.0178	3.2795	0.0011	0.0235
0.0932					
Market_returns_1p	0.0623	0.0211	2.9512	0.0032	0.0209
0.1037					
Market_returns	0.0249	0.0209	1.1945	0.2324	-0.0160
0.0658					
Market_returns_1	0.0228	0.0213	1.0713	0.2841	-0.0189
0.0645					
Market_returns_2	-0.0636	0.0214	-2.9735	0.0030	-0.1055
-0.0217					
Market_returns_3	-0.0037	0.0214	-0.1729	0.8628	-0.0456
0.0382					
Market_returns_4	-0.0418	0.0212	-1.9676	0.0492	-0.0834
-0.0001					
Issues_1	-0.1499	0.0165	-9.0953	0.0000	-0.1822
-0.1176					
Issues_2	-0.1432	0.0210	-6.8064	0.0000	-0.1845
-0.1020					
Issues_3	-0.1077	0.0165	-6.5283	0.0000	-0.1401
-0.0754					
1	0.0469	0.0390	1.2043	0.2286	-0.0295
0.1233					
2	-0.0163	0.0391	-0.4184	0.6757	-0.0929
0.0603					

```

3          -0.0332      0.0389      -0.8554      0.3924      -0.1094
0.0430
4          0.0053      0.0394      0.1343      0.8932      -0.0719
0.0825
=====
=====

```

```

[ ]: model = PanelOLS(panel3.fillna(0)['Issues ROA<0'],
                      panel3.fillna(0).drop(columns = ['Issues ROA<0']))
res = model.fit()

print(res.summary)

```

#### PanelOLS Estimation Summary

```

=====
Dep. Variable:      Issues ROA<0      R-squared:      0.0465
Estimator:          PanelOLS          R-squared (Between):      -5.155e+28
No. Observations:   4000              R-squared (Within):      0.0466
Date:               Wed, Jul 28 2021  R-squared (Overall):      0.0465
Time:               12:14:10           Log-likelihood      -5332.1
Cov. Estimator:     Unadjusted

                               F-statistic:      10.796
Entities:            40              P-value      0.0000
Avg Obs:             100.000          Distribution:      F(18,3981)
Min Obs:             100.000
Max Obs:             100.000          F-statistic (robust):      10.528
                               P-value      0.0000
Time periods:        100              Distribution:      F(18,3981)
Avg Obs:             40.000
Min Obs:             40.000
Max Obs:             40.000

```

#### Parameter Estimates

```

=====
=====

```

	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI					
-----					
-----					
Liquidity_1p	-0.0447	0.0151	-2.9640	0.0031	-0.0743
-0.0151					
Liquidity	0.0172	0.0212	0.8098	0.4181	-0.0244
0.0587					
Liquidity_1	0.0499	0.0242	2.0672	0.0388	0.0026
0.0973					

Liquidity_2 0.0952	0.0476	0.0243	1.9613	0.0499	1.777e-05
Liquidity_3 0.1122	0.0708	0.0211	3.3501	0.0008	0.0294
Liquidity_4 0.0770	0.0480	0.0148	3.2488	0.0012	0.0190
Market_returns_1p 0.0785	0.0470	0.0161	2.9198	0.0035	0.0154
Market_returns 0.0524	0.0210	0.0160	1.3104	0.1902	-0.0104
Market_returns_1 0.0518	0.0197	0.0164	1.2010	0.2298	-0.0125
Market_returns_2 -0.0158	-0.0482	0.0165	-2.9193	0.0035	-0.0806
Market_returns_3 0.0281	-0.0044	0.0166	-0.2646	0.7914	-0.0369
Market_returns_4 -0.0042	-0.0369	0.0166	-2.2152	0.0268	-0.0695
Issues_1 -0.1088	-0.1363	0.0140	-9.7201	0.0000	-0.1638
Issues_2 -0.0947	-0.1299	0.0179	-7.2432	0.0000	-0.1650
Issues_3 -0.0687	-0.0963	0.0141	-6.8361	0.0000	-0.1240
1 0.0867	0.0275	0.0302	0.9116	0.3620	-0.0317
2 0.0559	-0.0040	0.0305	-0.1308	0.8960	-0.0638
3 0.0390	-0.0209	0.0305	-0.6837	0.4942	-0.0807
4 0.0597	-6.259e-05	0.0305	-0.0021	0.9984	-0.0598

=====

=====

## 5.4 Lower tab, model 1, Full sample

```
[ ]: panel3 = panel_data[['Issues', 'Liquidity_1p', 'Liquidity', 'Liquidity_1',
    ↳ 'Liquidity_2',
    ↳ 'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
    ↳
    ↳ 'Market_returns',          'Market_returns_1',          'Market_returns_2',
    ↳
    ↳ 'Market_returns_3',          'Market_returns_4',          'Issues_1',          'Issues_2',
    ↳ 1, 2, 3, 4]]
```

```
panel3
```

```
[ ]:      Issues  Liquidity_1p  Liquidity  ...  2  3  4
Country  YearQuarter
ARG      19901          NaN          NaN      ...  0  0  0
AUS      19901          NaN          NaN      ...  0  0  0
AUT      19901          NaN          NaN      ...  0  0  0
BEL      19901          NaN          NaN      ...  0  0  0
BRA      19901          NaN          NaN      ...  0  0  0
...      ...          ...          ...      ...  ...  ...
SWE      20144      1.498864          NaN      0.195308  ...  0  0  1
THA      20144      1.521491          NaN      0.514388  ...  0  0  1
USANASDAQ 20144      1.481866          NaN     -0.651659  ...  0  0  1
USANYSE   20144      0.079183          NaN     -0.432412  ...  0  0  1
ZAF      20144      2.606112          NaN     -2.069796  ...  0  0  1
```

```
[4000 rows x 20 columns]
```

```
[ ]: model = PanelOLS(panel3.dropna().Issues,
                    panel3.dropna().drop(columns = ['Issues']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues  R-squared:          0.6421
Estimator:              PanelOLS  R-squared (Between):  0.3458
No. Observations:        3087  R-squared (Within):   0.6421
Date:                   Wed, Jul 28 2021  R-squared (Overall):  0.6421
Time:                   12:14:11  Log-likelihood        -4438.8
Cov. Estimator:          Unadjusted

                               F-statistic:          305.74
Entities:                 40  P-value            0.0000
Avg Obs:                   77.175  Distribution:        F(18,3068)
Min Obs:                   0.0000
Max Obs:                   92.000  F-statistic (robust):  304.54
                               P-value            0.0000
Time periods:              99  Distribution:        F(18,3068)
Avg Obs:                   31.182
Min Obs:                   0.0000
Max Obs:                   38.000
```

#### Parameter Estimates

```
=====
=====
```

Parameter	Std. Err.	T-stat	P-value	Lower CI
-----------	-----------	--------	---------	----------



## Upper CI

-----					
-----					
Liquidity_1p	-0.0237	0.0188	-1.2595	0.2080	-0.0606
0.0132					
Liquidity	0.0817	0.0273	2.9953	0.0028	0.0282
0.1352					
Liquidity_1	0.1301	0.0312	4.1715	0.0000	0.0689
0.1912					
Liquidity_2	0.1253	0.0310	4.0471	0.0001	0.0646
0.1861					
Liquidity_3	0.1165	0.0264	4.4075	0.0000	0.0647
0.1683					
Liquidity_4	0.0335	0.0178	1.8872	0.0592	-0.0013
0.0684					
Market_returns_1p	0.0019	0.0210	0.0902	0.9282	-0.0393
0.0431					
Market_returns	0.0696	0.0208	3.3492	0.0008	0.0289
0.1104					
Market_returns_1	0.0936	0.0212	4.4118	0.0000	0.0520
0.1352					
Market_returns_2	-0.0881	0.0213	-4.1345	0.0000	-0.1299
-0.0463					
Market_returns_3	-0.0323	0.0213	-1.5158	0.1297	-0.0741
0.0095					
Market_returns_4	-0.0616	0.0211	-2.9135	0.0036	-0.1031
-0.0201					
Issues_1	-1.0721	0.0164	-65.196	0.0000	-1.1044
-1.0399					
Issues_2	-0.8022	0.0210	-38.206	0.0000	-0.8433
-0.7610					
Issues_3	-0.4245	0.0165	-25.770	0.0000	-0.4568
-0.3922					
1	-0.2372	0.0389	-6.0955	0.0000	-0.3136
-0.1609					
2	0.1422	0.0389	3.6521	0.0003	0.0658
0.2185					
3	-0.1159	0.0387	-2.9920	0.0028	-0.1919
-0.0400					
4	0.2046	0.0393	5.2025	0.0000	0.1275
0.2817					
=====					
=====					

```
[ ]: model = PanelOLS(panel3.fillna(0).Issues,
                    panel3.fillna(0).drop(columns = ['Issues']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues    R-squared:          0.6273
Estimator:             PanelOLS  R-squared (Between): -4.6129
No. Observations:      4000      R-squared (Within):  0.6276
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.6273
Time:                  12:14:11  Log-likelihood       -5451.8
Cov. Estimator:        Unadjusted

                               F-statistic:          372.31
Entities:              40      P-value          0.0000
Avg Obs:              100.000  Distribution:      F(18,3981)
Min Obs:              100.000
Max Obs:              100.000  F-statistic (robust): 372.22
                               P-value          0.0000
Time periods:         100      Distribution:      F(18,3981)
Avg Obs:              40.000
Min Obs:              40.000
Max Obs:              40.000
```

#### Parameter Estimates

```
=====
=====
Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Liquidity_1p      -0.0234    0.0155   -1.5058    0.1322   -0.0539
0.0071
Liquidity         0.0700    0.0218    3.2079    0.0013    0.0272
0.1128
Liquidity_1       0.1164    0.0249    4.6777    0.0000    0.0676
0.1652
Liquidity_2       0.1181    0.0250    4.7216    0.0000    0.0690
0.1671
Liquidity_3       0.1157    0.0218    5.3170    0.0000    0.0731
0.1584
Liquidity_4       0.0281    0.0152    1.8446    0.0652   -0.0018
0.0579
Market_returns_1p -0.0047    0.0166   -0.2845    0.7760   -0.0372
0.0278
Market_returns     0.0538    0.0165    3.2620    0.0011    0.0215
```

0.0862					
Market_returns_1	0.0792	0.0169	4.6871	0.0000	0.0461
0.1123					
Market_returns_2	-0.0707	0.0170	-4.1556	0.0000	-0.1040
-0.0373					
Market_returns_3	-0.0358	0.0171	-2.0949	0.0362	-0.0693
-0.0023					
Market_returns_4	-0.0370	0.0171	-2.1589	0.0309	-0.0706
-0.0034					
Issues_1	-1.0627	0.0144	-73.552	0.0000	-1.0911
-1.0344					
Issues_2	-0.7907	0.0185	-42.799	0.0000	-0.8269
-0.7545					
Issues_3	-0.4249	0.0145	-29.264	0.0000	-0.4533
-0.3964					
1	-0.1601	0.0311	-5.1445	0.0000	-0.2211
-0.0991					
2	0.1248	0.0315	3.9672	0.0001	0.0631
0.1865					
3	-0.0996	0.0314	-3.1659	0.0016	-0.1612
-0.0379					
4	0.1719	0.0314	5.4758	0.0000	0.1104
0.2335					
=====					
=====					

## 5.5 Lower tab, model 2, SEOs

```
[ ]: # Defining SEOs, and its lags
SEOs = pd.read_excel(path, sheet_name='SEOs', skiprows=5)
SEOs = SEOs.set_index(['YearQuarter'])
SEOs = pd.DataFrame(SEOs.stack(dropna = False ), columns=['SEOs'])
SEOs.index = SEOs.index.set_names(['YearQuarter', 'Country'])
#SEOs = pd.DataFrame(index = SEOs.index, columns= list_of_variables)
SEOs = SEOs.reset_index().set_index(['Country', 'YearQuarter'])
SEOs
```

```
[ ]:
Country  YearQuarter  SEOs
ARG      19901      NaN
AUS      19901      NaN
AUT      19901      NaN
BEL      19901      NaN
BRA      19901      NaN
...
SWE      20144      0.210321
```

THA	20144	0.461566
USANASDAQ	20144	0.516548
USANYSE	20144	-0.885527
ZAF	20144	-0.618466

[4000 rows x 1 columns]

```
[ ]: panel3 = panel_data[['Liquidity_1p', 'Liquidity', 'Liquidity_1', 'Liquidity_2',
                        'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
                        'Market_returns', 'Market_returns_1', 'Market_returns_2',
                        'Market_returns_3', 'Market_returns_4', 'Issues_1', 'Issues_2',
                        1, 2, 3, 4]]

panel3 = pd.concat([SEOs, panel3], axis = 1)

panel3
```

```
[ ]:
Country  YearQuarter  SEOs  Liquidity_1p  Liquidity  ...  2  3  4
ARG      19901      NaN      NaN      NaN  ...  0  0  0
AUS      19901      NaN      NaN      NaN  ...  0  0  0
AUT      19901      NaN      NaN      NaN  ...  0  0  0
BEL      19901      NaN      NaN      NaN  ...  0  0  0
BRA      19901      NaN      NaN      NaN  ...  0  0  0
...      ...      ...      ...      ...  ...  ...  ...
SWE      20144      0.210321  NaN      0.195308  ...  0  0  1
THA      20144      0.461566  NaN      0.514388  ...  0  0  1
USANASDAQ 20144      0.516548  NaN     -0.651659  ...  0  0  1
USANYSE   20144     -0.885527  NaN     -0.432412  ...  0  0  1
ZAF      20144     -0.618466  NaN     -2.069796  ...  0  0  1
```

[4000 rows x 20 columns]

```
[ ]: model = PanelOLS(panel3.dropna()['SEOs'],
                    panel3.dropna().drop(columns = ['SEOs']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:          SEOs  R-squared:          0.1258
Estimator:              PanelOLS  R-squared (Between): -0.1335
No. Observations:      3031  R-squared (Within):  0.1258
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.1258
Time:                  12:14:12  Log-likelihood      -4135.8
Cov. Estimator:        Unadjusted
```

		F-statistic:	24.076
Entities:	40	P-value	0.0000
Avg Obs:	75.775	Distribution:	F(18,3012)
Min Obs:	0.0000		
Max Obs:	92.000	F-statistic (robust):	23.949
		P-value	0.0000
Time periods:	99	Distribution:	F(18,3012)
Avg Obs:	30.616		
Min Obs:	0.0000		
Max Obs:	38.000		

#### Parameter Estimates

```

=====
=====
=====

```

	Parameter	Std. Err.	T-stat	P-value	Lower CI	Upper CI
Liquidity_1p	-0.0396	0.0178	-2.2313	0.0257	-0.0744	-0.0048
Liquidity	0.0513	0.0257	1.9944	0.0462	0.0009	0.1018
Liquidity_1	0.0972	0.0294	3.3018	0.0010	0.0395	0.1549
Liquidity_2	0.0854	0.0294	2.9105	0.0036	0.0279	0.1430
Liquidity_3	0.0970	0.0251	3.8712	0.0001	0.0479	0.1461
Liquidity_4	0.0360	0.0169	2.1262	0.0336	0.0028	0.0692
Market_returns_1p	-0.0016	0.0197	-0.0796	0.9366	-0.0402	0.0371
Market_returns	0.0798	0.0196	4.0793	0.0000	0.0414	0.1182
Market_returns_1	0.0619	0.0200	3.0984	0.0020	0.0227	0.1011
Market_returns_2	-0.0353	0.0201	-1.7561	0.0792	-0.0747	0.0041
Market_returns_3	-0.0172	0.0201	-0.8547	0.3928	-0.0566	0.0222
Market_returns_4	-0.0397	0.0200	-1.9885	0.0468	-0.0788	-0.0006
Issues_1	-0.2117	0.0153	-13.821	0.0000	-0.2418	-0.1817
Issues_2	-0.2544	0.0196	-13.006	0.0000	-0.2927	-0.2160
Issues_3	-0.1722	0.0154	-11.216	0.0000	-0.2023	-0.1421

1	-0.1119	0.0365	-3.0674	0.0022	-0.1835
-0.0404					
2	0.0629	0.0366	1.7175	0.0860	-0.0089
0.1347					
3	-0.0633	0.0364	-1.7400	0.0820	-0.1346
0.0080					
4	0.1263	0.0369	3.4263	0.0006	0.0540
0.1986					

=====

=====

```
[ ]: model = PanelOLS(panel3.fillna(0)['SEOs'],
                    panel3.fillna(0).drop(columns = ['SEOs']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:          SEOs    R-squared:                0.1179
Estimator:              PanelOLS  R-squared (Between):      -1.444e+29
No. Observations:       4000    R-squared (Within):       0.1180
Date:                   Wed, Jul 28 2021  R-squared (Overall):      0.1179
Time:                   12:14:12  Log-likelihood            -5034.6
Cov. Estimator:         Unadjusted

                               F-statistic:          29.570
Entities:                40      P-value           0.0000
Avg Obs:                  100.000  Distribution:         F(18,3981)
Min Obs:                  100.000
Max Obs:                  100.000  F-statistic (robust):    29.548
                               P-value           0.0000
Time periods:             100    Distribution:         F(18,3981)
Avg Obs:                  40.000
Min Obs:                  40.000
Max Obs:                  40.000
```

#### Parameter Estimates

```
=====
=====
Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Liquidity_1p    -0.0370    0.0140    -2.6418    0.0083    -0.0644
-0.0095
```

Liquidity	0.0418	0.0197	2.1245	0.0337	0.0032
0.0803					
Liquidity_1	0.0851	0.0224	3.7941	0.0002	0.0411
0.1290					
Liquidity_2	0.0752	0.0225	3.3382	0.0009	0.0310
0.1194					
Liquidity_3	0.0874	0.0196	4.4590	0.0000	0.0490
0.1259					
Liquidity_4	0.0320	0.0137	2.3339	0.0196	0.0051
0.0589					
Market_returns_1p	-0.0009	0.0149	-0.0626	0.9501	-0.0302
0.0283					
Market_returns	0.0601	0.0149	4.0401	0.0001	0.0309
0.0892					
Market_returns_1	0.0524	0.0152	3.4450	0.0006	0.0226
0.0823					
Market_returns_2	-0.0337	0.0153	-2.1986	0.0280	-0.0637
-0.0036					
Market_returns_3	-0.0199	0.0154	-1.2915	0.1966	-0.0501
0.0103					
Market_returns_4	-0.0247	0.0154	-1.6001	0.1097	-0.0550
0.0056					
Issues_1	-0.2073	0.0130	-15.924	0.0000	-0.2328
-0.1818					
Issues_2	-0.2417	0.0166	-14.518	0.0000	-0.2743
-0.2090					
Issues_3	-0.1637	0.0131	-12.515	0.0000	-0.1894
-0.1381					
1	-0.0983	0.0280	-3.5081	0.0005	-0.1533
-0.0434					
2	0.0652	0.0283	2.2998	0.0215	0.0096
0.1207					
3	-0.0631	0.0283	-2.2262	0.0261	-0.1186
-0.0075					
4	0.1009	0.0283	3.5665	0.0004	0.0454
0.1564					

=====

=====

## 5.6 Lower tab, model 4, IPOs

```
[ ]: # Defining IPOs, and its lags
      IPOs = pd.read_excel(path, sheet_name='IPOs', skiprows=5)
      IPOs = IPOs.set_index(['YearQuarter'])
      IPOs = pd.DataFrame(IPOs.stack(dropna = False ), columns=['IPOs'])
```

```

IPOs.index = IPOs.index.set_names(['YearQuarter', 'Country'])
#IPOs = pd.DataFrame(index = IPOs.index, columns= list_of_variables)
IPOs = IPOs.reset_index().set_index(['Country', 'YearQuarter'])
IPOs

```

```

[:]:
Country    YearQuarter    IPOs
ARG        19901         NaN
AUS        19901         NaN
AUT        19901         NaN
BEL        19901         NaN
BRA        19901         NaN
...
SWE        20144         NaN
THA        20144         NaN
USANASDAQ  20144         0.183248
USANYSE    20144         0.544958
ZAF        20144         NaN

```

[4000 rows x 1 columns]

```

[:]: panel3 = panel_data[['Liquidity_1p', 'Liquidity', 'Liquidity_1', 'Liquidity_2',
                        'Liquidity_3', 'Liquidity_4', 'Market_returns_1p',
                        ↳
                        ↳ 'Market_returns',          'Market_returns_1',          'Market_returns_2',
                        ↳
                        ↳ 'Market_returns_3',          'Market_returns_4',          'Issues_1',          'Issues_2',
                        ↳1, 2, 3, 4]]

panel3 = pd.concat([IPOs, panel3], axis = 1)

panel3

```

```

[:]:
Country    YearQuarter    IPOs    Liquidity_1p    Liquidity    ...    2    3    4
ARG        19901         NaN         NaN         NaN    ...    0    0    0
AUS        19901         NaN         NaN         NaN    ...    0    0    0
AUT        19901         NaN         NaN         NaN    ...    0    0    0
BEL        19901         NaN         NaN         NaN    ...    0    0    0
BRA        19901         NaN         NaN         NaN    ...    0    0    0
...
SWE        20144         NaN         NaN    0.195308    ...    0    0    1
THA        20144         NaN         NaN    0.514388    ...    0    0    1
USANASDAQ  20144         0.183248    NaN    -0.651659    ...    0    0    1
USANYSE    20144         0.544958    NaN    -0.432412    ...    0    0    1
ZAF        20144         NaN         NaN    -2.069796    ...    0    0    1

```

[4000 rows x 20 columns]



```
[ ]: model = PanelOLS(panel3.dropna()['IPOs'],
                    panel3.dropna().drop(columns = ['IPOs']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:          IPOs    R-squared:                0.1635
Estimator:              PanelOLS  R-squared (Between):    0.1222
No. Observations:      2835    R-squared (Within):    0.1636
Date:                  Wed, Jul 28 2021  R-squared (Overall):   0.1635
Time:                  12:14:13  Log-likelihood          -3733.3
Cov. Estimator:        Unadjusted

                               F-statistic:          30.580
Entities:              40      P-value            0.0000
Avg Obs:               70.875  Distribution:        F(18,2816)
Min Obs:               0.0000
Max Obs:               92.000  F-statistic (robust): 30.358
                               P-value            0.0000
Time periods:          99      Distribution:        F(18,2816)
Avg Obs:               28.636
Min Obs:               0.0000
Max Obs:               37.000
```

#### Parameter Estimates

```
=====
=====
Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Liquidity_1p      -0.0206    0.0174   -1.1827    0.2370   -0.0547
0.0135
Liquidity         -0.0004    0.0252   -0.0153    0.9878   -0.0498
0.0490
Liquidity_1       0.0238    0.0289    0.8209    0.4118   -0.0330
0.0805
Liquidity_2       0.0423    0.0288    1.4701    0.1417   -0.0141
0.0987
Liquidity_3       0.0365    0.0245    1.4898    0.1364   -0.0115
0.0845
Liquidity_4       0.0080    0.0164    0.4887    0.6251   -0.0242
0.0403
Market_returns_1p  0.0039    0.0193    0.1994    0.8419   -0.0341
0.0418
Market_returns    0.0401    0.0191    2.0999    0.0358    0.0027
```

0.0775					
Market_returns_1	0.1384	0.0195	7.0883	0.0000	0.1001
0.1767					
Market_returns_2	-0.0381	0.0196	-1.9382	0.0527	-0.0766
0.0004					
Market_returns_3	0.0353	0.0197	1.7931	0.0731	-0.0033
0.0739					
Market_returns_4	-0.0208	0.0196	-1.0588	0.2898	-0.0593
0.0177					
Issues_1	-0.2106	0.0153	-13.743	0.0000	-0.2406
-0.1805					
Issues_2	-0.1623	0.0197	-8.2507	0.0000	-0.2009
-0.1237					
Issues_3	-0.1094	0.0154	-7.0893	0.0000	-0.1397
-0.0792					
1	-0.2892	0.0360	-8.0357	0.0000	-0.3598
-0.2187					
2	0.1919	0.0360	5.3225	0.0000	0.1212
0.2626					
3	-0.1507	0.0360	-4.1918	0.0000	-0.2212
-0.0802					
4	0.2260	0.0363	6.2308	0.0000	0.1548
0.2971					

=====

=====

```
[ ]: model = PanelOLS(panel3.fillna(0)['IPOs'],
                      panel3.fillna(0).drop(columns = ['IPOs']))
res = model.fit()

print(res.summary)
```

PanelOLS Estimation Summary

=====

Dep. Variable:	IPOs	R-squared:	0.1261
Estimator:	PanelOLS	R-squared (Between):	-8.266e+28
No. Observations:	4000	R-squared (Within):	0.1261
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.1261
Time:	12:14:13	Log-likelihood	-4853.4
Cov. Estimator:	Unadjusted		
		F-statistic:	31.911
Entities:	40	P-value	0.0000
Avg Obs:	100.000	Distribution:	F(18,3981)
Min Obs:	100.000		
Max Obs:	100.000	F-statistic (robust):	31.843

Time periods:	100	P-value	0.0000
Avg Obs:	40.000	Distribution:	F(18,3981)
Min Obs:	40.000		
Max Obs:	40.000		

# Parameter Estimates

	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI					
Liquidity_1p	-0.0192	0.0134	-1.4331	0.1519	-0.0454
0.0071					
Liquidity	-0.0042	0.0188	-0.2238	0.8229	-0.0411
0.0326					
Liquidity_1	0.0199	0.0214	0.9273	0.3538	-0.0221
0.0619					
Liquidity_2	0.0364	0.0215	1.6908	0.0909	-0.0058
0.0786					
Liquidity_3	0.0419	0.0187	2.2369	0.0253	0.0052
0.0787					
Liquidity_4	0.0050	0.0131	0.3837	0.7012	-0.0207
0.0307					
Market_returns_1p	-0.0046	0.0143	-0.3188	0.7499	-0.0325
0.0234					
Market_returns	0.0388	0.0142	2.7286	0.0064	0.0109
0.0666					
Market_returns_1	0.0978	0.0145	6.7216	0.0000	0.0693
0.1263					
Market_returns_2	-0.0222	0.0146	-1.5184	0.1290	-0.0510
0.0065					
Market_returns_3	0.0118	0.0147	0.8025	0.4223	-0.0170
0.0407					
Market_returns_4	6.869e-05	0.0148	0.0047	0.9963	-0.0289
0.0290					
Issues_1	-0.1928	0.0124	-15.498	0.0000	-0.2172
-0.1684					
Issues_2	-0.1550	0.0159	-9.7462	0.0000	-0.1862
-0.1239					
Issues_3	-0.1116	0.0125	-8.9282	0.0000	-0.1361
-0.0871					
1	-0.1748	0.0268	-6.5254	0.0000	-0.2274
-0.1223					
2	0.1261	0.0271	4.6571	0.0000	0.0730
0.1792					
3	-0.1023	0.0271	-3.7775	0.0002	-0.1554

```

-0.0492
4          0.1527    0.0270    5.6489    0.0000    0.0997
0.2057
=====
=====

```

## 6 Extension

```

[: Issues.columns
[: Index(['ARG', 'AUS', 'AUT', 'BEL', 'BRA', 'CAN', 'CHE', 'CHL', 'CHN', 'COL',
        'DEU', 'DNK', 'EGY', 'ESP', 'FIN', 'FRA', 'GBR', 'GRC', 'HKG', 'IDN',
        'IND', 'ISR', 'ITA', 'JPN', 'KOR', 'MEX', 'MYS', 'NLD', 'NOR', 'NZL',
        'PHL', 'POL', 'PRT', 'RUS', 'SGP', 'SWE', 'THA', 'USANASDAQ', 'USANYSE',
        'ZAF'],
        dtype='object')

```

### 6.0.1 table 2 model 1 for different countries

```

[: Asian_countries = ['CHN', 'HKG', 'IDN', 'IND',
                    'ISR', 'JPN', 'KOR', 'KOR', 'MYS', 'RUS', 'SGP', 'THA', 'PHL']

European_countries = ['AUT', 'BEL', 'CHE', 'DNK', 'ESP', 'FIN', 'FRA', 'GBR',
                    'GRC', 'ITA', 'DEU', 'NLD', 'NOR', 'POL', 'PRT', 'SWE']

north_american_countries = ['CAN', 'USANASDAQ', 'USANYSE']
south_american_countries = ['ARG', 'BRA', 'COL', 'MEX', 'CHL', ]
Australia_Newzland = ['AUS', 'NZL',]
African_countries = ['EGY', 'ZAF']

list_name = ['Asian_countries', 'European_countries', 'north_american_countries',
            'south_american_countries', 'Australia_Newzland',
            'African_countries']

[: jj = 0
for region in [Asian_countries, European_countries, north_american_countries,
               south_american_countries, Australia_Newzland, African_countries]:

    print('=====')
    print('result for ', list_name[jj])
    jj += 1
    print('=====')

```

```

path = '/content/drive/MyDrive/PhD/ECF/Hanselaar_Stulz_vanDijk_data/
→Hanselaar_Stulz_vanDijk_data.xlsx'
Issues = pd.read_excel(path, sheet_name='Issues', skiprows=5)
Issues = Issues.set_index(['YearQuarter'])
Issues = Issues[region]

Issues = Issues.diff()
Issues_1 = Issues.shift()
Issues_2 = Issues.shift(2)
Issues_3 = Issues.shift(3)
#Issues['Quarter'] = Issues.YearQuarter % 10

Liquidity = pd.read_excel(path, sheet_name='Liquidity', skiprows=5)
Liquidity = Liquidity.set_index(['YearQuarter'])
Liquidity = Liquidity[region]

Liquidity = Liquidity.diff()
Liquidity_2p = Liquidity.shift(-2)
Liquidity_1p = Liquidity.shift(-1)
Liquidity_1 = Liquidity.shift(1)
Liquidity_2 = Liquidity.shift(2)
Liquidity_3 = Liquidity.shift(3)
Liquidity_4 = Liquidity.shift(4)
Liquidity_5 = Liquidity.shift(5)
Liquidity_6 = Liquidity.shift(6)

Market_returns = pd.read_excel(path, sheet_name='Market returns', skiprows=5)
Market_returns = Market_returns.set_index(['YearQuarter'])
Market_returns = Market_returns[region]

Market_returns_1p = Market_returns.shift(-1)
Market_returns_1 = Market_returns.shift(1)
Market_returns_2 = Market_returns.shift(2)
Market_returns_3 = Market_returns.shift(3)
Market_returns_4 = Market_returns.shift(4)

names_of_variables = [Issues,
                      Liquidity_2p, Liquidity_1p, Liquidity,
                      Liquidity_1, Liquidity_2, Liquidity_3, Liquidity_4,
                      Liquidity_5, Liquidity_6,
                      Market_returns_1p, Market_returns, Market_returns_1,
                      Market_returns_2, Market_returns_3, Market_returns_4,

```

```

Issues_1, Issues_2, Issues_3]

list_of_variables = ['Issues',
                    'Liquidity_2p', 'Liquidity_1p', 'Liquidity',
                    'Liquidity_1', 'Liquidity_2', 'Liquidity_3',
→ 'Liquidity_4',
                    'Liquidity_5', 'Liquidity_6',
                    'Market_returns_1p', 'Market_returns',
→ 'Market_returns_1',
                    'Market_returns_2', 'Market_returns_3',
→ 'Market_returns_4',
                    'Issues_1', 'Issues_2', 'Issues_3']

i = 0
for data in names_of_variables:
    data = pd.DataFrame(data.stack(dropna = False ),
→ columns=[list_of_variables[i]])
    data.index = data.index.set_names(['YearQuarter', 'Country'])
    if i == 0: new_name_of_variables = pd.DataFrame(index = data.index, columns=
→ list_of_variables)
    new_name_of_variables[list_of_variables[i]] = data
    i += 1

panel_data = pd.concat([new_name_of_variables,
                        pd.get_dummies(pd.DataFrame(new_name_of_variables.
→ index.get_level_values(0) % 10,
                                                    index = new_name_of_variables.
→ index)['YearQuarter'])], axis = 1)

panel_data = panel_data.reset_index().set_index(['Country', 'YearQuarter'])

model = PanelOLS(panel_data.dropna().Issues,
                  panel_data.dropna().drop(columns=['Issues', 'Liquidity_2p',
→ 'Liquidity_6', 'Issues_2', 'Issues_3']))
res = model.fit()

print(res.summary)

```

```

=====
result for Asian_countries
=====
                        PanelOLS Estimation Summary
=====
Dep. Variable:                Issues    R-squared:                0.3722

```

Estimator:	PanelOLS	R-squared (Between):	-1.5804
No. Observations:	984	R-squared (Within):	0.3724
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.3722
Time:	12:14:15	Log-likelihood	-1628.8
Cov. Estimator:	Unadjusted		
		F-statistic:	35.835
Entities:	12	P-value	0.0000
Avg Obs:	82.000	Distribution:	F(16,967)
Min Obs:	0.0000		
Max Obs:	178.00	F-statistic (robust):	35.814
		P-value	0.0000
Time periods:	98	Distribution:	F(16,967)
Avg Obs:	10.041		
Min Obs:	0.0000		
Max Obs:	12.000		

#### Parameter Estimates

	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI					
-----					
-----					
Liquidity_1p	-0.0549	0.0450	-1.2217	0.2221	-0.1432
0.0333					
Liquidity	0.0527	0.0665	0.7923	0.4284	-0.0778
0.1832					
Liquidity_1	0.1667	0.0758	2.1975	0.0282	0.0178
0.3155					
Liquidity_2	0.0554	0.0763	0.7261	0.4679	-0.0944
0.2052					
Liquidity_3	0.0177	0.0652	0.2715	0.7860	-0.1102
0.1456					
Liquidity_4	-0.0330	0.0422	-0.7820	0.4344	-0.1159
0.0499					
Market_returns_1p	-0.0182	0.0473	-0.3848	0.7005	-0.1109
0.0745					
Market_returns	0.0721	0.0469	1.5366	0.1247	-0.0200
0.1641					
Market_returns_1	0.0386	0.0477	0.8096	0.4183	-0.0550
0.1323					
Market_returns_2	-0.1179	0.0477	-2.4727	0.0136	-0.2114
-0.0243					
Market_returns_3	0.0210	0.0482	0.4349	0.6637	-0.0737
0.1156					
Market_returns_4	0.0003	0.0480	0.0065	0.9948	-0.0940
0.0946					
Issues_1	-0.5696	0.0264	-21.572	0.0000	-0.6215

```

-0.5178
1          -0.3994      0.0844      -4.7341      0.0000      -0.5649
-0.2338
2          -0.0294      0.0843      -0.3493      0.7269      -0.1948
0.1359
3          0.2197       0.0853       2.5757       0.0102       0.0523
0.3871
4          0.2102       0.0851       2.4703       0.0137       0.0432
0.3772
=====
=====

```

```

=====
result for European_countries
=====

```

#### PanelOLS Estimation Summary

```

=====
Dep. Variable:          Issues      R-squared:          0.5527
Estimator:              PanelOLS    R-squared (Between): 0.4309
No. Observations:      1265         R-squared (Within):  0.5527
Date:                  Wed, Jul 28 2021  R-squared (Overall): 0.5527
Time:                  12:14:18         Log-likelihood       -2013.4
Cov. Estimator:        Unadjusted

                               F-statistic:          96.361
Entities:              16          P-value          0.0000
Avg Obs:               79.062      Distribution:      F(16,1248)
Min Obs:               49.000
Max Obs:               89.000      F-statistic (robust): 95.271
                               P-value          0.0000
Time periods:          98          Distribution:      F(16,1248)
Avg Obs:               12.908
Min Obs:               0.0000
Max Obs:               16.000

```

#### Parameter Estimates

```

=====
=====
Upper CI
-----
-----
Liquidity_1p          0.0114      0.0347      0.3291      0.7422      -0.0567
0.0796
Liquidity             0.0986      0.0502      1.9652      0.0496      0.0002
0.1971
Liquidity_1           0.1092      0.0570      1.9175      0.0554      -0.0025
0.2209

```



Liquidity_2 0.1737	0.0631	0.0564	1.1190	0.2633	-0.0475
Liquidity_3 0.1629	0.0694	0.0477	1.4551	0.1459	-0.0242
Liquidity_4 0.0706	0.0075	0.0322	0.2332	0.8157	-0.0556
Market_returns_1p 0.0054	-0.0721	0.0395	-1.8243	0.0683	-0.1496
Market_returns 0.1465	0.0698	0.0391	1.7834	0.0748	-0.0070
Market_returns_1 0.1794	0.1002	0.0403	2.4851	0.0131	0.0211
Market_returns_2 -0.0328	-0.1117	0.0402	-2.7787	0.0055	-0.1905
Market_returns_3 0.0356	-0.0427	0.0399	-1.0693	0.2851	-0.1209
Market_returns_4 0.1001	0.0216	0.0400	0.5389	0.5901	-0.0569
Issues_1 -0.6368	-0.6780	0.0210	-32.327	0.0000	-0.7191
1 0.0207	-0.1182	0.0708	-1.6691	0.0954	-0.2572
2 0.4425	0.3033	0.0709	4.2770	0.0000	0.1642
3 -0.1981	-0.3405	0.0726	-4.6930	0.0000	-0.4828
4 0.2836	0.1419	0.0723	1.9637	0.0498	0.0001

=====

=====

=====

result for north\_american\_countries

=====

#### PanelOLS Estimation Summary

=====

Dep. Variable:	Issues	R-squared:	0.7557
Estimator:	PanelOLS	R-squared (Between):	0.9859
No. Observations:	267	R-squared (Within):	0.7557
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.7557
Time:	12:14:20	Log-likelihood	-329.89
Cov. Estimator:	Unadjusted		
		F-statistic:	48.328
Entities:	3	P-value	0.0000
Avg Obs:	89.000	Distribution:	F(16,250)
Min Obs:	89.000		
Max Obs:	89.000	F-statistic (robust):	43.196

Time periods:	98	P-value	0.0000
Avg Obs:	2.7245	Distribution:	F(16,250)
Min Obs:	0.0000		
Max Obs:	3.0000		

# Parameter Estimates

	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI					
Liquidity_1p	-0.1023	0.0651	-1.5726	0.1171	-0.2305
0.0258					
Liquidity	0.3808	0.0893	4.2661	0.0000	0.2050
0.5566					
Liquidity_1	0.3299	0.1038	3.1785	0.0017	0.1255
0.5344					
Liquidity_2	-0.0786	0.1010	-0.7781	0.4372	-0.2774
0.1203					
Liquidity_3	-0.0886	0.0836	-1.0589	0.2907	-0.2533
0.0762					
Liquidity_4	0.0453	0.0552	0.8215	0.4121	-0.0633
0.1539					
Market_returns_1p	0.0662	0.0597	1.1080	0.2689	-0.0515
0.1838					
Market_returns	0.0967	0.0590	1.6384	0.1026	-0.0196
0.2130					
Market_returns_1	0.0069	0.0628	0.1107	0.9119	-0.1167
0.1306					
Market_returns_2	-0.1640	0.0626	-2.6201	0.0093	-0.2872
-0.0407					
Market_returns_3	-0.0139	0.0628	-0.2220	0.8245	-0.1376
0.1097					
Market_returns_4	-0.1004	0.0629	-1.5965	0.1116	-0.2243
0.0235					
Issues_1	-0.6558	0.0479	-13.677	0.0000	-0.7502
-0.5613					
1	-0.6283	0.1261	-4.9817	0.0000	-0.8768
-0.3799					
2	0.1622	0.1308	1.2397	0.2163	-0.0955
0.4199					
3	-0.0881	0.1269	-0.6939	0.4884	-0.3380
0.1619					
4	0.5345	0.1259	4.2453	0.0000	0.2866
0.7825					

=====

=====

result for south\_american\_countries

=====

# PanelOLS Estimation Summary

=====

Dep. Variable:	Issues	R-squared:	0.4306
Estimator:	PanelOLS	R-squared (Between):	-0.6298
No. Observations:	282	R-squared (Within):	0.4308
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.4306
Time:	12:14:22	Log-likelihood	-481.65
Cov. Estimator:	Unadjusted		
		F-statistic:	12.524
Entities:	5	P-value	0.0000
Avg Obs:	56.400	Distribution:	F(16,265)
Min Obs:	0.0000		
Max Obs:	88.000	F-statistic (robust):	11.937
		P-value	0.0000
Time periods:	98	Distribution:	F(16,265)
Avg Obs:	2.8776		
Min Obs:	0.0000		
Max Obs:	4.0000		

# Parameter Estimates

=====

=====

	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI					
-----					
-----					
Liquidity_1p	-0.0084	0.0747	-0.1123	0.9107	-0.1555
0.1387					
Liquidity	0.0457	0.1122	0.4076	0.6839	-0.1752
0.2666					
Liquidity_1	-0.0322	0.1303	-0.2470	0.8051	-0.2888
0.2244					
Liquidity_2	-0.0805	0.1313	-0.6126	0.5406	-0.3391
0.1781					
Liquidity_3	-0.1139	0.1134	-1.0043	0.3162	-0.3371
0.1094					
Liquidity_4	-0.0616	0.0756	-0.8145	0.4161	-0.2104
0.0873					
Market_returns_1p	-0.1798	0.1008	-1.7828	0.0758	-0.3783
0.0188					
Market_returns	0.0345	0.0986	0.3496	0.7270	-0.1597
0.2286					

Market_returns_1	0.2289	0.0975	2.3478	0.0196	0.0369
0.4208					
Market_returns_2	-0.2669	0.0963	-2.7724	0.0060	-0.4564
-0.0773					
Market_returns_3	-0.0598	0.0955	-0.6262	0.5317	-0.2478
0.1282					
Market_returns_4	0.0559	0.0903	0.6191	0.5364	-0.1219
0.2337					
Issues_1	-0.5876	0.0501	-11.740	0.0000	-0.6862
-0.4891					
1	-0.5119	0.1702	-3.0068	0.0029	-0.8471
-0.1767					
2	0.4023	0.1726	2.3302	0.0205	0.0624
0.7423					
3	0.0621	0.1724	0.3602	0.7190	-0.2774
0.4017					
4	-0.0147	0.1694	-0.0869	0.9308	-0.3482
0.3188					

=====

=====

=====

result for Australia\_Newzland

=====

#### PanelOLS Estimation Summary

=====

Dep. Variable:	Issues	R-squared:	0.6530
Estimator:	PanelOLS	R-squared (Between):	0.9924
No. Observations:	175	R-squared (Within):	0.6530
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.6530
Time:	12:14:24	Log-likelihood	-247.04
Cov. Estimator:	Unadjusted		
		F-statistic:	18.581
Entities:	2	P-value	0.0000
Avg Obs:	87.500	Distribution:	F(16,158)
Min Obs:	87.000		
Max Obs:	88.000	F-statistic (robust):	18.239
		P-value	0.0000
Time periods:	98	Distribution:	F(16,158)
Avg Obs:	1.7857		
Min Obs:	0.0000		
Max Obs:	2.0000		

#### Parameter Estimates

=====

=====

Parameter	Std. Err.	T-stat	P-value	Lower CI
-----------	-----------	--------	---------	----------

Upper CI

-----					
-----					
Liquidity_1p 0.1492	-0.0214	0.0864	-0.2482	0.8043	-0.1920
Liquidity 0.3237	0.0678	0.1296	0.5229	0.6018	-0.1882
Liquidity_1 0.3018	0.0035	0.1510	0.0231	0.9816	-0.2948
Liquidity_2 0.2010	-0.0960	0.1503	-0.6383	0.5242	-0.3929
Liquidity_3 0.2137	-0.0305	0.1237	-0.2467	0.8055	-0.2747
Liquidity_4 0.1954	0.0366	0.0804	0.4559	0.6491	-0.1221
Market_returns_1p 0.3256	0.1536	0.0871	1.7628	0.0799	-0.0185
Market_returns 0.2835	0.1130	0.0863	1.3090	0.1925	-0.0575
Market_returns_1 0.2321	0.0519	0.0912	0.5696	0.5698	-0.1282
Market_returns_2 -0.2617	-0.4491	0.0949	-4.7327	0.0000	-0.6365
Market_returns_3 0.2390	0.0425	0.0995	0.4272	0.6698	-0.1540
Market_returns_4 0.2967	0.1040	0.0976	1.0660	0.2881	-0.0887
Issues_1 -0.5162	-0.6384	0.0619	-10.318	0.0000	-0.7606
1 -0.5644	-0.8974	0.1686	-5.3219	0.0000	-1.2305
2 0.9526	0.5994	0.1788	3.3520	0.0010	0.2462
3 0.6432	0.2700	0.1890	1.4287	0.1551	-0.1032
4 0.3541	0.0115	0.1735	0.0663	0.9472	-0.3311
=====					
=====					

result for African\_countries

=====			
PanelOLS Estimation Summary			
=====			
Dep. Variable:	Issues	R-squared:	0.4743
Estimator:	PanelOLS	R-squared (Between):	0.9220

No. Observations:	144	R-squared (Within):	0.4743
Date:	Wed, Jul 28 2021	R-squared (Overall):	0.4743
Time:	12:14:26	Log-likelihood	-240.45
Cov. Estimator:	Unadjusted		
		F-statistic:	7.1610
Entities:	2	P-value	0.0000
Avg Obs:	72.000	Distribution:	F(16,127)
Min Obs:	60.000		
Max Obs:	84.000	F-statistic (robust):	7.0279
		P-value	0.0000
Time periods:	98	Distribution:	F(16,127)
Avg Obs:	1.4694		
Min Obs:	0.0000		
Max Obs:	2.0000		

#### Parameter Estimates

	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI					
Liquidity_1p	-0.1705	0.1154	-1.4769	0.1422	-0.3989
0.0579					
Liquidity	-0.0841	0.1588	-0.5295	0.5974	-0.3983
0.2302					
Liquidity_1	-0.1412	0.1689	-0.8364	0.4045	-0.4754
0.1929					
Liquidity_2	-0.0514	0.1654	-0.3111	0.7562	-0.3787
0.2758					
Liquidity_3	0.1788	0.1484	1.2046	0.2306	-0.1149
0.4724					
Liquidity_4	0.1379	0.1062	1.2983	0.1965	-0.0723
0.3480					
Market_returns_1p	0.0874	0.1261	0.6927	0.4898	-0.1622
0.3370					
Market_returns	-0.2158	0.1247	-1.7306	0.0860	-0.4625
0.0309					
Market_returns_1	0.1523	0.1327	1.1469	0.2536	-0.1104
0.4149					
Market_returns_2	0.0581	0.1321	0.4399	0.6607	-0.2033
0.3195					
Market_returns_3	-0.1143	0.1282	-0.8914	0.3744	-0.3679
0.1394					
Market_returns_4	-0.0817	0.1276	-0.6401	0.5233	-0.3342
0.1708					
Issues_1	-0.6237	0.0712	-8.7540	0.0000	-0.7646
-0.4827					

1	-0.2168	0.2421	-0.8956	0.3722	-0.6958
0.2622					
2	0.0901	0.2422	0.3721	0.7105	-0.3891
0.5693					
3	-0.0781	0.2454	-0.3182	0.7508	-0.5637
0.4075					
4	0.3044	0.2437	1.2490	0.2140	-0.1778
0.7865					

=====

=====

## 6.1 Adding variables

```
[ ]: path = '/content/drive/MyDrive/PhD/ECF/Hanselaar_Stulz_vanDijk_data/
      ↳Hanselaar_Stulz_vanDijk_data.xlsx'
Issues = pd.read_excel(path, sheet_name='Issues', skiprows=5)
Issues = Issues.set_index(['YearQuarter'])
Issues = Issues.diff()
Issues_1 = Issues.shift()
Issues_2 = Issues.shift(2)
Issues_3 = Issues.shift(3)

Liquidity = pd.read_excel(path, sheet_name='Liquidity', skiprows=5)
Liquidity = Liquidity.set_index(['YearQuarter'])
Liquidity = Liquidity.diff()
Liquidity_2p = Liquidity.shift(-2)
Liquidity_1p = Liquidity.shift(-1)
Liquidity_1 = Liquidity.shift(1)
Liquidity_2 = Liquidity.shift(2)
Liquidity_3 = Liquidity.shift(3)
Liquidity_4 = Liquidity.shift(4)
Liquidity_5 = Liquidity.shift(5)
Liquidity_6 = Liquidity.shift(6)

Market_returns = pd.read_excel(path, sheet_name='Market returns', skiprows=5)
Market_returns = Market_returns.set_index(['YearQuarter'])

Market_returns_1p = Market_returns.shift(-1)
Market_returns_1 = Market_returns.shift(1)
Market_returns_2 = Market_returns.shift(2)
Market_returns_3 = Market_returns.shift(3)
Market_returns_4 = Market_returns.shift(4)
```

```

names_of_variables = [Issues,
                      Liquidity_2p, Liquidity_1p, Liquidity, Liquidity ** 2,
                      Liquidity_1, Liquidity_2, Liquidity_3, Liquidity_4,
                      Liquidity_5, Liquidity_6,
                      Market_returns_1p, Market_returns, Market_returns ** 2,
→Market_returns_1,
                      Market_returns_2, Market_returns_3, Market_returns_4,
                      Issues_1, Issues_2, Issues_3]

list_of_variables = ['Issues',
                    'Liquidity_2p', 'Liquidity_1p', 'Liquidity', 'Liquidity2',
                    'Liquidity_1', 'Liquidity_2', 'Liquidity_3', 'Liquidity_4',
                    'Liquidity_5', 'Liquidity_6',
                    'Market_returns_1p', 'Market_returns', 'Market_returns2',
→'Market_returns_1',
                    'Market_returns_2', 'Market_returns_3', 'Market_returns_4',
                    'Issues_1', 'Issues_2', 'Issues_3']

i = 0
for data in names_of_variables:
    data = pd.DataFrame(data.stack(dropna = False ),
→columns=[list_of_variables[i]])
    data.index = data.index.set_names(['YearQuarter', 'Country'])
    if i == 0: new_name_of_variables = pd.DataFrame(index = data.index, columns=
→list_of_variables)
    new_name_of_variables[list_of_variables[i]] = data
    i += 1

panel_data = pd.concat([new_name_of_variables,
                        pd.get_dummies(pd.DataFrame(new_name_of_variables.index.
→get_level_values(0) % 10,
                                                    index = new_name_of_variables.
→index)['YearQuarter'])], axis = 1)

panel_data

```

```

[ ]:
YearQuarter Country      Issues  Liquidity_2p  Liquidity_1p  ...  2  3  4
19901      ARG          NaN          NaN          NaN  ...  0  0  0
          AUS          NaN          NaN          NaN  ...  0  0  0
          AUT          NaN          NaN          NaN  ...  0  0  0
          BEL          NaN          NaN          NaN  ...  0  0  0
          BRA          NaN          NaN          NaN  ...  0  0  0
...          ...          ...          ...  ...  ...  ...  ...

```



20144	SWE	1.498864	NaN	NaN	...	0	0	1
	THA	1.521491	NaN	NaN	...	0	0	1
	USANASDAQ	1.481866	NaN	NaN	...	0	0	1
	USANYSE	0.079183	NaN	NaN	...	0	0	1
	ZAF	2.606112	NaN	NaN	...	0	0	1

[4000 rows x 25 columns]

```
[ ]: panel_data = panel_data.reset_index().set_index(['Country', 'YearQuarter'])

model = PanelOLS(panel_data.dropna().Issues,
                  panel_data.dropna().drop(columns=['Issues', 'Liquidity_2p',
                                                    'Liquidity_5', 'Liquidity_6',
                                                    'Issues_2', 'Issues_3']))
res = model.fit()

print(res.summary)
```

#### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues    R-squared:                0.4751
Estimator:              PanelOLS  R-squared (Between):      -0.3917
No. Observations:       3028      R-squared (Within):       0.4752
Date:                   Wed, Jul 28 2021  R-squared (Overall):      0.4751
Time:                   12:14:28    Log-likelihood            -4942.2
Cov. Estimator:         Unadjusted

                               F-statistic:            151.33
Entities:                40        P-value              0.0000
Avg Obs:                  75.700    Distribution:          F(18,3009)
Min Obs:                   0.0000
Max Obs:                   89.000    F-statistic (robust):    151.17
                               P-value              0.0000
Time periods:              98      Distribution:          F(18,3009)
Avg Obs:                   30.898
Min Obs:                   0.0000
Max Obs:                   38.000
```

#### Parameter Estimates

```
=====
=====
Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Liquidity_1p    -0.0145    0.0234   -0.6189    0.5360   -0.0605
0.0315
Liquidity       0.1104    0.0348    3.1673    0.0016    0.0420
```

0.1787					
Liquidity2	-0.0056	0.0036	-1.5608	0.1187	-0.0126
0.0014					
Liquidity_1	0.1121	0.0387	2.9001	0.0038	0.0363
0.1879					
Liquidity_2	0.0344	0.0381	0.9029	0.3667	-0.0403
0.1091					
Liquidity_3	0.0409	0.0324	1.2608	0.2075	-0.0227
0.1044					
Liquidity_4	0.0076	0.0218	0.3495	0.7267	-0.0351
0.0503					
Market_returns_1p	-0.0375	0.0257	-1.4600	0.1444	-0.0878
0.0129					
Market_returns	0.0657	0.0256	2.5711	0.0102	0.0156
0.1159					
Market_returns2	0.0064	0.0138	0.4672	0.6404	-0.0206
0.0334					
Market_returns_1	0.0898	0.0261	3.4418	0.0006	0.0386
0.1409					
Market_returns_2	-0.1569	0.0260	-6.0349	0.0000	-0.2079
-0.1059					
Market_returns_3	-0.0281	0.0261	-1.0789	0.2807	-0.0792
0.0230					
Market_returns_4	0.0174	0.0259	0.6713	0.5021	-0.0334
0.0682					
Issues_1	-0.6321	0.0142	-44.571	0.0000	-0.6599
-0.6042					
1	-0.3177	0.0485	-6.5500	0.0000	-0.4128
-0.2226					
2	0.2251	0.0493	4.5687	0.0000	0.1285
0.3218					
3	-0.0769	0.0506	-1.5177	0.1292	-0.1761
0.0224					
4	0.1919	0.0499	3.8472	0.0001	0.0941
0.2897					
=====					
=====					

```
[ ]: panel_data = panel_data.reset_index().set_index(['Country', 'YearQuarter'])

model = PanelOLS(panel_data.dropna().Issues,
                  panel_data.dropna().drop(columns=['Issues', 'Liquidity_2p',
                                                    'Liquidity_5', 'Liquidity_6']))
res = model.fit()
```

```
print(res.summary)
```

### PanelOLS Estimation Summary

```
=====
Dep. Variable:          Issues    R-squared:                0.6428
Estimator:              PanelOLS  R-squared (Between):      -0.2510
No. Observations:      3028      R-squared (Within):       0.6429
Date:                  Wed, Jul 28 2021  R-squared (Overall):      0.6428
Time:                  12:14:28    Log-likelihood            -4359.8
Cov. Estimator:        Unadjusted

                               F-statistic:          270.51
Entities:              40         P-value              0.0000
Avg Obs:               75.700     Distribution:         F(20,3007)
Min Obs:               0.0000
Max Obs:               89.000     F-statistic (robust):   270.29
                               P-value              0.0000
Time periods:          98         Distribution:         F(20,3007)
Avg Obs:               30.898
Min Obs:               0.0000
Max Obs:               38.000
```

### Parameter Estimates

```
=====
=====
Parameter  Std. Err.    T-stat    P-value    Lower CI
Upper CI
-----
-----
Liquidity_1p      -0.0211    0.0193   -1.0922    0.2748   -0.0591
0.0168
Liquidity         0.0877    0.0288    3.0469    0.0023    0.0312
0.1441
Liquidity2       -0.0030    0.0029   -1.0124    0.3114   -0.0088
0.0028
Liquidity_1       0.1306    0.0319    4.0935    0.0000    0.0680
0.1932
Liquidity_2       0.1171    0.0315    3.7126    0.0002    0.0552
0.1789
Liquidity_3       0.1098    0.0269    4.0826    0.0000    0.0571
0.1626
Liquidity_4       0.0307    0.0180    1.7021    0.0888   -0.0047
0.0660
Market_returns_1p  0.0011    0.0212    0.0533    0.9575   -0.0405
0.0427
Market_returns    0.0686    0.0211    3.2499    0.0012    0.0272
0.1101
```

Market_returns2	0.0070	0.0114	0.6186	0.5362	-0.0152
0.0293					
Market_returns_1	0.0965	0.0215	4.4825	0.0000	0.0543
0.1387					
Market_returns_2	-0.0866	0.0215	-4.0207	0.0001	-0.1288
-0.0444					
Market_returns_3	-0.0383	0.0216	-1.7751	0.0760	-0.0805
0.0040					
Market_returns_4	-0.0655	0.0215	-3.0475	0.0023	-0.1076
-0.0234					
Issues_1	-1.0738	0.0166	-64.543	0.0000	-1.1064
-1.0411					
Issues_2	-0.7999	0.0213	-37.529	0.0000	-0.8417
-0.7581					
Issues_3	-0.4215	0.0166	-25.324	0.0000	-0.4541
-0.3889					
1	-0.2372	0.0405	-5.8584	0.0000	-0.3166
-0.1578					
2	0.1427	0.0410	3.4846	0.0005	0.0624
0.2230					
3	-0.1157	0.0420	-2.7532	0.0059	-0.1981
-0.0333					
4	0.2044	0.0417	4.9033	0.0000	0.1227
0.2861					

=====

=====

## 6.2 Cross sectional or time series regressions

```
[ ]: path = '/content/drive/MyDrive/PhD/ECF/Hanselaar_Stulz_vanDijk_data/
      ↳Hanselaar_Stulz_vanDijk_data.xlsx'
Issues = pd.read_excel(path, sheet_name='Issues', skiprows=5)
Issues = Issues.set_index(['YearQuarter'])
Issues = Issues.diff()
Issues_1 = Issues.shift()
Issues_2 = Issues.shift(2)
Issues_3 = Issues.shift(3)
#Issues['Quarter'] = Issues.YearQuarter % 10

Liquidity = pd.read_excel(path, sheet_name='Liquidity', skiprows=5)
Liquidity = Liquidity.set_index(['YearQuarter'])
Liquidity = Liquidity.diff()
Liquidity_2p = Liquidity.shift(-2)
Liquidity_1p = Liquidity.shift(-1)
Liquidity_1 = Liquidity.shift(1)
```

```

Liquidity_2 = Liquidity.shift(2)
Liquidity_3 = Liquidity.shift(3)
Liquidity_4 = Liquidity.shift(4)
Liquidity_5 = Liquidity.shift(5)
Liquidity_6 = Liquidity.shift(6)

#Liquidity['Quarter'] = Liquidity.YearQuarter % 10

Market_returns = pd.read_excel(path, sheet_name='Market returns', skiprows=5)
Market_returns = Market_returns.set_index(['YearQuarter'])

Market_returns_1p = Market_returns.shift(-1)
Market_returns_1 = Market_returns.shift(1)
Market_returns_2 = Market_returns.shift(2)
Market_returns_3 = Market_returns.shift(3)
Market_returns_4 = Market_returns.shift(4)

names_of_variables = [Issues,
                      Liquidity_2p, Liquidity_1p, Liquidity,
                      Liquidity_1, Liquidity_2, Liquidity_3, Liquidity_4,
                      Liquidity_5, Liquidity_6,
                      Market_returns_1p, Market_returns, Market_returns_1,
                      Market_returns_2, Market_returns_3, Market_returns_4,
                      Issues_1, Issues_2, Issues_3]

list_of_variables = ['Issues',
                    'Liquidity_2p', 'Liquidity_1p', 'Liquidity',
                    'Liquidity_1', 'Liquidity_2', 'Liquidity_3', 'Liquidity_4',
                    'Liquidity_5', 'Liquidity_6',
                    'Market_returns_1p', 'Market_returns', 'Market_returns_1',
                    'Market_returns_2', 'Market_returns_3', 'Market_returns_4',
                    'Issues_1', 'Issues_2', 'Issues_3']

i = 0
for data in names_of_variables:
    data = pd.DataFrame(data.stack(dropna = False ),
    ↪columns=[list_of_variables[i]])
    data.index = data.index.set_names(['YearQuarter', 'Country'])
    if i == 0: new_name_of_variables = pd.DataFrame(index = data.index, columns=
    ↪list_of_variables)
    new_name_of_variables[list_of_variables[i]] = data
    i += 1

panel_data = pd.concat([new_name_of_variables,
                        pd.get_dummies(pd.DataFrame(new_name_of_variables.index.
    ↪get_level_values(0) % 10,

```

```
index = new_name_of_variables.  
→index)['YearQuarter']]], axis = 1)
```

```
[]: columns = ['HKG', 'IDN', 'IND',  
              'ISR', 'JPN', 'KOR', 'KOR', 'MYS', 'RUS', 'SGP', 'THA', 'PHL',  
              'AUT', 'BEL', 'CHE', 'DNK', 'ESP', 'FIN', 'FRA', 'GBR',  
              'GRC', 'ITA', 'DEU', 'NLD', 'NOR', 'POL', 'PRT', 'SWE',  
              'CAN', 'USANASDAQ', 'USANYSE', 'BRA', 'COL', 'MEX',  
              'CHL', 'AUS', 'NZL', 'EGY', 'ZAF']  
  
pvals = pd.DataFrame(index = panel_data.drop(columns=['Issues', 'Liquidity_2p',  
              'Liquidity_5', 'Liquidity_6']).columns, columns =  
→columns)  
  
coef = pd.DataFrame(index = panel_data.drop(columns=['Issues', 'Liquidity_2p',  
              'Liquidity_5', 'Liquidity_6']).columns, columns =  
→columns)  
for country in columns:  
  
    my_data = panel_data[panel_data.index.get_level_values('Country') == country]  
  
    model = sm.OLS(my_data.dropna().Issues,  
                  my_data.dropna().drop(columns=['Issues', 'Liquidity_2p',  
              'Liquidity_5',  
→'Liquidity_6'])))  
    res = model.fit()  
    pvals[country] = np.round(res.pvalues, decimals=3)  
    coef[country] = np.round(res.params, decimals=2)  
  
pvals.to_excel('pvals.xlsx')  
coef.to_excel('coef.xlsx')
```

### Controlling for regional effect

```
[]: path = '/content/drive/MyDrive/PhD/ECF/Hanselaar_Stulz_vanDijk_data/  
→Hanselaar_Stulz_vanDijk_data.xlsx'  
Issues = pd.read_excel(path, sheet_name='Issues', skiprows=5)  
Issues = Issues.set_index(['YearQuarter'])  
Issues = Issues.diff()  
Issues_1 = Issues.shift()  
Issues_2 = Issues.shift(2)  
Issues_3 = Issues.shift(3)  
  
Liquidity = pd.read_excel(path, sheet_name='Liquidity', skiprows=5)  
Liquidity = Liquidity.set_index(['YearQuarter'])  
Liquidity = Liquidity.diff()  
Liquidity_2p = Liquidity.shift(-2)
```

```

Liquidity_1p = Liquidity.shift(-1)
Liquidity_1 = Liquidity.shift(1)
Liquidity_2 = Liquidity.shift(2)
Liquidity_3 = Liquidity.shift(3)
Liquidity_4 = Liquidity.shift(4)
Liquidity_5 = Liquidity.shift(5)
Liquidity_6 = Liquidity.shift(6)

Market_returns = pd.read_excel(path, sheet_name='Market returns', skiprows=5)
Market_returns = Market_returns.set_index(['YearQuarter'])

Market_returns_1p = Market_returns.shift(-1)
Market_returns_1 = Market_returns.shift(1)
Market_returns_2 = Market_returns.shift(2)
Market_returns_3 = Market_returns.shift(3)
Market_returns_4 = Market_returns.shift(4)

names_of_variables = [Issues,
                      Liquidity_2p, Liquidity_1p, Liquidity,
                      Liquidity_1, Liquidity_2, Liquidity_3, Liquidity_4,
                      Liquidity_5, Liquidity_6,
                      Market_returns_1p, Market_returns, Market_returns_1,
                      Market_returns_2, Market_returns_3, Market_returns_4,
                      Issues_1, Issues_2, Issues_3]

list_of_variables = ['Issues',
                    'Liquidity_2p', 'Liquidity_1p', 'Liquidity',
                    'Liquidity_1', 'Liquidity_2', 'Liquidity_3', 'Liquidity_4',
                    'Liquidity_5', 'Liquidity_6',
                    'Market_returns_1p', 'Market_returns', 'Market_returns_1',
                    'Market_returns_2', 'Market_returns_3', 'Market_returns_4',
                    'Issues_1', 'Issues_2', 'Issues_3']

i = 0
for data in names_of_variables:
    data = pd.DataFrame(data.stack(dropna = False ),
                        →columns=[list_of_variables[i]])
    data.index = data.index.set_names(['YearQuarter', 'Country'])
    if i == 0: new_name_of_variables = pd.DataFrame(index = data.index, columns=
    →list_of_variables)
    new_name_of_variables[list_of_variables[i]] = data
    i += 1

panel_data = pd.concat([new_name_of_variables,

```

```

pd.get_dummies(pd.DataFrame(new_name_of_variables.index.
→get_level_values(0) % 10,
                                index = new_name_of_variables.
→index)['YearQuarter']),
pd.get_dummies(pd.DataFrame(new_name_of_variables.index.
→get_level_values(1),
                                index = new_name_of_variables.index))], axis = 1)

panel_data = panel_data.reset_index().set_index(['Country', 'YearQuarter'])

panel_data

```

```

[ ]:
Country    YearQuarter    Issues    Liquidity_2p    ...    Country_USANYSE    Country_ZAF
ARG        19901         NaN         NaN    ...         0         0
AUS        19901         NaN         NaN    ...         0         0
AUT        19901         NaN         NaN    ...         0         0
BEL        19901         NaN         NaN    ...         0         0
BRA        19901         NaN         NaN    ...         0         0
...        ...         ...         ...    ...         ...         ...
SWE        20144        1.498864         NaN    ...         0         0
THA        20144        1.521491         NaN    ...         0         0
USANASDAQ  20144        1.481866         NaN    ...         0         0
USANYSE    20144        0.079183         NaN    ...         1         0
ZAF        20144        2.606112         NaN    ...         0         1

```

[4000 rows x 63 columns]

```

[ ]: panel_data = panel_data.dropna()
panel_data = panel_data.loc[:, (panel_data != 0).any(axis=0)]

model = PanelOLS(panel_data.Issues,
                  panel_data.drop(columns=['Issues', 'Liquidity_2p',
                  'Liquidity_5', 'Liquidity_6', 'Issues_2', 'Issues_3']),
                  check_rank = False)
res = model.fit()

print(res.summary)

```

#### PanelOLS Estimation Summary

```

=====
Dep. Variable:            Issues    R-squared:            0.4748
Estimator:                PanelOLS    R-squared (Between):    1.0000
No. Observations:        3028    R-squared (Within):    0.4748
Date:                    Wed, Jul 28 2021    R-squared (Overall):    0.4748
Time:                    12:24:49    Log-likelihood          -4943.1

```



Cov. Estimator:	Unadjusted	F-statistic:	48.871
Entities:	40	P-value	0.0000
Avg Obs:	75.700	Distribution:	F(55,2973)
Min Obs:	0.0000		
Max Obs:	89.000	F-statistic (robust):	71.583
		P-value	0.0000
Time periods:	98	Distribution:	F(55,2973)
Avg Obs:	30.898		
Min Obs:	0.0000		
Max Obs:	38.000		

# Parameter Estimates

	Parameter	Std. Err.	T-stat	P-value	Lower CI
Upper CI					
Liquidity_1p	-0.0197	0.0233	-0.8437	0.3989	-0.0653
0.0260					
Liquidity	0.0955	0.0337	2.8320	0.0047	0.0294
0.1617					
Liquidity_1	0.1025	0.0384	2.6702	0.0076	0.0272
0.1778					
Liquidity_2	0.0306	0.0383	0.7998	0.4239	-0.0444
0.1056					
Liquidity_3	0.0388	0.0326	1.1892	0.2345	-0.0252
0.1027					
Liquidity_4	0.0077	0.0219	0.3504	0.7261	-0.0353
0.0507					
Market_returns_1p	-0.0362	0.0258	-1.4001	0.1616	-0.0869
0.0145					
Market_returns	0.0681	0.0256	2.6635	0.0078	0.0180
0.1182					
Market_returns_1	0.0884	0.0262	3.3747	0.0007	0.0370
0.1398					
Market_returns_2	-0.1580	0.0262	-6.0410	0.0000	-0.2093
-0.1067					
Market_returns_3	-0.0273	0.0262	-1.0410	0.2980	-0.0787
0.0241					
Market_returns_4	0.0169	0.0261	0.6468	0.5178	-0.0342
0.0679					
Issues_1	-0.6323	0.0143	-44.336	0.0000	-0.6603
-0.6044					
1	-0.3262				
2	0.2181				
3	-0.0831				

4	0.1863
Country_AUS	-0.0004
Country_AUT	-0.0092
Country_BEL	-0.0075
Country_BRA	0.0262
Country_CAN	-0.0088
Country_CHE	-0.0313
Country_CHL	-0.0231
Country_COL	-0.0352
Country_DEU	-0.0039
Country_DNK	-0.0072
Country_EGY	0.0273
Country_ESP	-0.0044
Country_FIN	-0.0012
Country_FRA	0.0143
Country_GBR	0.0104
Country_GRC	-0.0191
Country_HKG	-0.0023
Country_IDN	0.0272
Country_IND	0.0255
Country_ISR	-0.0574
Country_ITA	0.0075
Country_JPN	-0.0146
Country_KOR	0.0027
Country_MEX	0.0024
Country_MYS	0.0122
Country_NLD	0.0024
Country_NOR	0.0061
Country_NZL	-0.0095
Country_PHL	0.0090
Country_POL	0.0144
Country_PRT	-0.0168
Country_RUS	0.0521
Country_SGP	-0.0243
Country_SWE	0.0161
Country_THA	-0.0047
Country_USANASDAQ	-0.0099
Country_USANYSE	-0.0091
Country_ZAF	0.0394

```
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```

```
/usr/local/lib/python3.7/dist-packages/linearmodels/panel/results.py:85:
RuntimeWarning: invalid value encountered in sqrt
    return Series(np.sqrt(np.diag(self.cov)), self._var_names, name="std_error")
```