```
*************************************************************************
***   Do file which                                                   *
***   1. Estimates the abnormal returns                               *
***   2. Calculates the cumulative abnormal returns                   *
***   3. Calculates the buy-and-hold returns                          *
***                                                                   *
*************************************************************************
*************************************************************************


* --- 1. Eventstudy - Market Model*

use "ES_prepared.dta", clear

gen returnmam=.
order returnmam, before (retx)
label variable returnmam "Predicted Return Market Model"


egen id=group(group_id)
order id, before(group_id)
summ id

* --- 1.1 Estimating the Normal Performance *

      forvalues i=1(1)756{
      l id permno if id ==`i' & dif==0
      reg retx vwretx if id==`i' & estimation_window==1 /*Market Model*/
      predict p if id==`i'
      replace returnmam = p if id==`i' & event_window==1
      drop p
      }

      sort id date

bysort group_id: gen eventdays=_n if event_window==1
replace eventdays=eventdays-120
order eventdays, before(dif)

gen aret_mm = retx-returnmam if event_window==1 /*Calculate the Abnormal Return*/
label variable aret_mm "Abnormal Return Market Model"

* --- 1.2 Calculate Cumulative abnormal Returns for each company & each Event Window*

* --- 1.2.1 Event window [-30,30] *

by group_id: egen car_one_mm = sum(aret_mm) if inrange(dif,-30,30)

* --- 1.2.2 Event window [-30,30] *

by group_id: egen car_two_mm = sum(aret_mm) if inrange(dif,-30,5)

* --- 1.2.3 Event window [-10,3] *

by group_id: egen car_three_mm = sum(aret_mm) if inrange(dif,-10,3)

* --- 1.2.4 Event window [-10,-6] *

by group_id: egen car_four_mm = sum(aret_mm) if inrange(dif,-10,-6)

* --- 1.2.5 Event Window [-5,3] *

by group_id: egen car_five_mm = sum(aret_mm) if inrange(dif,-5,3)

* --- 1.2.6 Event Window [-1,3] *

by group_id: egen car_sic_mm = sum(aret_mm) if inrange(dif,-1,3)
```

```
* --- 5.4 Calculate the time-series of CAAR's for Event Window [-30,30] *

by group_id: gen cumul_mm=0 if event_window==1
label variable cumul_mm "The aggregated Time Series of Abnormal Returns by Company MM"
replace cumul_mm=1+aret_mm if dif==-30

by group_id: gen h=1 if cumul_mm==0
order h, before (cumul_mm)
replace cumul_mm=aret_mm if cumul_mm==0
replace cumul_mm=aret_mm+cumul[_n-1] if h==1
replace cumul_mm=cumul_mm-1
drop h


*-------------------------------------------------------------------------------------*

*--- 2. Calculate the Abnormal buy-and-hold return *

      gen bhretx=retx+1
      replace vwretx=vwretx+1 /*VW market return*/

* --- 7.1 Calculate the abnormal Buy-and-Hold returns by company in [-30,+30] *
* --- 7.1.1 Actual return *

by group_id: gen double bhret_one = bhretx if dif==-30
by group_id: replace bhret_one=bhret_one[_n-1] * bhretx if inrange(dif,-29,30)

* --- 7.1-2 Market return*

by group_id: gen double index_bhret_one=vwretx if dif==-30
by group_id: replace index_bhret_one=index_bhret_one[_n-1] * vwretx if inrange(dif,-29,30)

* --- 7.1.3 Abnormal return*

gen bhar_one=bhret_one-index_bhret_one


* --- 7.2 Calculate the abnormal Buy-and-Hold returns by company in [-30,5] *
* --- 7.2.1 Actual return *

by group_id: gen double bhret_two = bhretx if dif==-30
by group_id: replace bhret_two=bhret_two[_n-1] * bhretx if inrange(dif,-29,5)

* --- 7.2.2 Market return*

by group_id: gen double index_bhret_two = vwretx if dif==-30
by group_id: replace index_bhret_two=index_bhret_two[_n-1] * vwretx if inrange(dif,-29,5)

* --- 7.2.3 Abnormal return*

gen bhar_two=bhret_two-index_bhret_two


* --- 7.3 Calculate the Abnormal Buy-and-Hold Returns by company in [-10,3]*
* --- 7.3.1 Actual return *

by group_id: gen double bhret_seven = bhretx if dif==-10
by group_id: replace bhret_seven=bhret_seven[_n-1] * bhretx if inrange(dif,-9,3)

* --- 7.3.2 Market return*

by group_id: gen double index_bhret_seven = vwretx if dif==-10
by group_id: replace index_bhret_seven=index_bhret_seven[_n-1] * vwretx if inrange(dif,-9,3)
* --- 7.3.3 Abnormal return*
gen bhar_seven=bhret_seven-index_bhret_seven


* --- 7.4 Calculate the Abnormal Buy-and-Hold Returns by company in [-10,-6]*
* --- 7.4.1 Actual return *

by group_id: gen double bhret_eight = bhretx if dif==-10
by group_id: replace bhret_eight=bhret_eight[_n-1] * bhretx if inrange(dif,-9,-6)

* --- 7.4.2 Market return*

by group_id: gen double index_bhret_eight = vwretx if dif==-10
by group_id: replace index_bhret_eight=index_bhret_eight[_n-1] * vwretx if inrange(dif,-9,-6)
```

```
* --- 7.4.3 Abnormal return*

gen bhar_eight=bhret_eight-index_bhret_eight


* --- 7.9 Calculate the Abnormal Buy-and-Hold Returns by company in [-5,3]*
* --- 7.4.1 Actual return *

by group_id: gen double bhret_nine = bhretx if dif==-5
by group_id: replace bhret_nine=bhret_nine[_n-1] * bhretx if inrange(dif,-4,3)

* --- 7.4.2 Market return*

by group_id: gen double index_bhret_nine = vwretx if dif==-5
by group_id: replace index_bhret_nine=index_bhret_nine[_n-1] * vwretx if inrange(dif,-4,3)

* --- 7.4.3 Abnormal return*

gen bhar_nine=bhret_nine-index_bhret_nine


* --- 7.10 Calculate the Abnormal Buy-and-Hold Returns by company in [-1,3]*
* --- 7.4.1 Actual return *

by group_id: gen double bhret_ten = bhretx if dif==-1
by group_id: replace bhret_ten=bhret_ten[_n-1] * bhretx if inrange(dif,0,3)

* --- 7.4.2 Market return*

by group_id: gen double index_bhret_ten = vwretx if dif==-1
by group_id: replace index_bhret_ten=index_bhret_ten[_n-1] * vwretx if inrange(dif,0,3)

* --- 7.4.3 Abnormal return*
gen bhar_ten=bhret_ten-index_bhret_ten
```