```
'MASTER_Thesis_script

'Run Program in quite mode to speed up the process.
mode quiet

'Create a new workfile with 5 day frequency; from to...
wfcreate(wf=MASTER_THESIS_WORKFILE, page=Data_Daily) d5 18/09/2000 17/05/2019

'Importing (daily) data from the Excel File :
'Import from Excel file saved in:(NB: NEED TO CHANGE LOCATION BEFORE RUNNING SCRIPT!)
%Data = "\\Oslodata2\NBDCE1\My Documents\Privat\A Master Papers\MASTER_THESIS_DATA.xlsx"

'_____________________________________________________________________________________________
'1. Importing all the (daily) series:
' DAILY:
import %Data range=EURNOK colhead=1 namepos=all na="#N/A" names=(,"EURNOK")
descriptions=("DATE","EURO/NORWEGIAN KRONE Last Price",) @freq D5 @id @date(series01) @destid @date
@smpl @all
import %Data range=NIBOR_1W colhead=1 namepos=all na="#N/A" names=("Series02","NIBOR1W_INDEX") @freq
D5 @id @date(series02) @destid @date @smpl @all

import %Data range=EURIBOR colhead=1 namepos=custom colheadnames=("Description") na="#N/A"
names=("DATE","EURIBOR_1W","EURIBOR_1M","EURIBOR_3M","EURIBOR_6M","EURIBOR_12M") @freq D5
@id @date(date) @destid @date @smpl @all

import %Data range=DB colhead=2 namepos=custom colheadnames=("Name","Description") na="#N/A"
names=("Date_1","DB_Carry_Index","DB_Momentum_Index","DB_Value_Index") format=(D,3W) @freq D5 @id
@date(DATE_1) @destid @date @smpl @all

import %Data range=OIL colhead=1 namepos=all na="#N/A" names=("Series07","OIL_BRENT") @freq D5 @id
@date(series07) @destid @date @smpl @all

import %Data range=JPMVIX colhead=2 namepos=custom colheadnames=("Name","Description") na="#N/A"
names=("Dates_jpm", "JMPVIXFX") descriptions=(,"JPMorgan JPMVXYGL Index") @freq D5 @id @date(dates_jpm)
@destid @date @smpl @all

import %Data range=VIX_Barc colhead=2 namepos=custom colheadnames=("Name","Description") na="#N/A"
names=("SeriesBARC","VIXFXEM_barc","VIXG10_Barc") descriptions=(,"Barclays EM FX Risk BXIIVEMG
Index","Barclays G10 FX Risk BXIIVG10 Index") @freq D5 @id @date(seriesbarc) @destid @date @smpl @all

import %Data range=VIX_N colhead=2 namepos=custom colheadnames=("Name","Description") na="#N/A"
names=(,"FXVOL_nomura") @id @date(series01) @destid @date @smpl @all

import %Data range=VIX_CBOE colhead=2 namepos=custom colheadnames=("Name","Description") na="#N/A"
@freq D5 @id @date(series01) @destid @date @smpl @all


'_____________________________________________________________
'2.Creating WEEKLY series
pagecreate(page=Data_Weekly) w 18/09/2000 17/05/2019
pageselect Data_Weekly

copy(link, c=l) Data_Daily\NIBOR1W_INDEX *
copy(link, c=l) Data_Daily\EURIBOR_1W *
copy(link, c=l) Data_Daily\EURNOK *
copy(link, c=l) Data_Daily\DB_Carry_index*
copy(link, c=l) Data_Daily\DB_Momentum_Index*
copy(link, c=l) Data_Daily\DB_Value_Index*
copy(link, c=l) Data_Daily\OIL_BRENT*
copy(link, c=l) Data_Daily\JMPVIXFX*
copy(link, c=l) Data_Daily\vix_index*
copy(link, c=l) Data_Daily\fxvol_nomura*
```

```
copy(link, c=l) Data_Daily\vixfxem_barc*
copy(link, c=l) Data_Daily\vixg10_barc*

'_____________________________________________________________
'3. Calcualting series
'For Weekly:
pageselect Data_weekly

'Transforming simple interest rates to log interest rates in %
series r_euribor_1w = log(1 + euribor_1w/100)*100
series r_nibor_1w = log(1 + nibor1w_index/100)*100

'Calculate DB_indexes yearly returns in %
series rcarry = dlog(db_carry_index)*52*100
series rmomentum = dlog(db_momentum_index)*52*100
series rvalue = dlog(db_value_index)*52*100

''Calculate log NOK yearly returns in %
series reurnok = dlog(eurnok)*52*100

''Calculate log Brent yearly returns in %
series roil = dlog(oil_brent)*52*100

'Rate differential between Norway and EUR area
series rdiff = (r_nibor_1w  - r_euribor_1w)

'VIX_changes
series dJMPVIXFX = dlog(JMPVIXFX)*100
series dvix_index = dlog(vix_index)*100
series dvix_nom = dlog(fxvol_nomura)*100
series dvix_em_barc = dlog(vixfxem_barc)*100
series dvix_g10_barc = dlog(vixg10_barc)*100


'_____________________________________________________________________________________
'4. Summary statistics & Simple Regressions
' Sample without financial crisis period
smpl 18092000 30062008 30062009 @last

'Summary statistics Table 1
group group_Stats reurnok rdiff  roil rcarry rvalue rmomentum dJMPVIXFX  dvix_index  dvix_em_barc
freeze(Table1_summary_statistics) group_Stats.stats
freeze(Table1_corr) group_Stats.corr

'Simple-regressions over the entire period
equation UIP.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff
equation OIL.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff  roil
equation CARRY.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil rcarry
equation VALUE.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff  roil rvalue
equation MOM.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff  roil rmomentum
equation ALL.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil rcarry  rmomentum rvalue
equation jpmfxvix.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil dJMPVIXFX
equation ALL_m_jpmvix.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff  rcarry  rmomentum rvalue  roil dJMPVIXFX
equation last.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil rcarry  rmomentum rvalue  dvix_em_barc
equation vix.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil dvix_index
equation vix_em_barc.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil dvix_em_barc
```

```
'New page for whole sample with the period of the fin. ciris included
pagecreate(page=WFinCri) w 18/09/2000 17/05/2019
pageselect WFinCri

copy(link) Data_Weekly\EURNOK *
copy(link) Data_Weekly\reurnok *
copy(link) Data_Weekly\rdiff  *
copy(link) Data_Weekly\rcarry  *
copy(link) Data_Weekly\rvalue *
copy(link) Data_Weekly\rmomentum *
copy(link) Data_Weekly\roil *
copy(link) Data_Weekly\oil_brent *
copy(link) Data_Weekly\r_euribor_1w  *
copy(link) Data_Weekly\r_nibor_1w *
copy(link) Data_Weekly\dJMPVIXFX *
copy(link) Data_Weekly\dvix_index *
copy(link) Data_Weekly\dvix_em_barc *

smpl @all
'Summary statistics Table 1
group group_1 reurnok rdiff  roil rcarry rvalue rmomentum dJMPVIXFX
freeze(Table1_summary_statistics) group_1.stats
freeze(Table1_corr) group_1.corr

'Simple-regressions over the entire period
equation UIP.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff
equation OIL.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff  roil
equation CARRY.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil rcarry
equation VALUE.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff  roil rvalue
equation MOM.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff  roil rmomentum
equation ALL.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil rcarry  rmomentum rvalue
equation jpmfxvix.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil dJMPVIXFX
equation ALLdvix.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff  rcarry  rmomentum rvalue  roil dJMPVIXFX
equation Index.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff rcarry  rmomentum rvalue
equation ALL_ikkemom.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil rcarry rvalue
equation last.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil rcarry  rmomentum rvalue  dvix_em_barc
equation vix.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil dvix_index
equation vix_em_barc.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil dvix_em_barc


'ROBUSTHET
pagecreate(page=Robust_2) w 18/09/2000 17/05/2019
pageselect Robust_2

copy(link) Data_Weekly\EURNOK *
copy(link) Data_Weekly\reurnok *
copy(link) Data_Weekly\rdiff  *
copy(link) Data_Weekly\rcarry  *
copy(link) Data_Weekly\rvalue *
copy(link) Data_Weekly\rmomentum *
copy(link) Data_Weekly\roil *
copy(link) Data_Weekly\oil_brent *
copy(link) Data_Weekly\r_euribor_1w  *
copy(link) Data_Weekly\r_nibor_1w *
copy(link) Data_Weekly\dJMPVIXFX *
copy(link) Data_Weekly\dvix_index *
copy(link) Data_Weekly\dvix_em_barc *
```

```
'Simple-regressions over the period:
smpl 18092000 30062008 30062009 @last

equation CARRY.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil rcarry dvix_em_barc
equation VALUE.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff  roil rvalue dvix_em_barc
equation MOM.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff  roil rmomentum dvix_em_barc
equation ALL_index_emvix.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil rcarry  rmomentum rvalue dvix_em_barc
equation ALL_index_vix.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil rcarry  rmomentum rvalue dvix_index
equation ALL_index_jpm.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil rcarry  rmomentum rvalue dJMPVIXFX
equation ALL_all.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil rcarry  rmomentum rvalue dvix_em_barc dvix_index
dJMPVIXFX
equation jpmfxvix.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil dJMPVIXFX
equation ALLdvix.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff  rcarry  rmomentum rvalue  roil dJMPVIXFX
equation Index.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff rcarry  rmomentum rvalue
equation ALL_ikkemom.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil rcarry rvalue
equation last.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil rcarry  rmomentum rvalue  dvix_em_barc
equation vix.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil dvix_index
equation vix_em_barc.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff roil dvix_em_barc


'_____________________________________________________________________
'ROLLING REGRESSIONS
 for %Window 52 260 520
'Lag en ny workfilepage for simple regressions
pagecreate(page=Eq_NOK_{%Window}) w 18/09/2000 17/05/2019
pageselect Eq_NOK_{%Window}

'Link serier over fra Weekly
copy(link, c=l) Data_Daily\EURNOK *
copy(link) Data_Weekly\reurnok *
copy(link) Data_Weekly\rdiff  *
copy(link) Data_Weekly\rcarry  *
copy(link) Data_Weekly\rvalue *
copy(link) Data_Weekly\rmomentum *
copy(link) Data_Weekly\roil *
copy(link) Data_Weekly\oil_brent *
copy(link) Data_Weekly\r_euribor_1w  *
copy(link) Data_Weekly\r_nibor_1w *
copy(link) Data_Weekly\dJMPVIXFX *
copy(link) Data_Weekly\dvix_index *
copy(link) Data_Weekly\dvix_em_barc *

'_____________________________________________________________________
'RUN ROLLING PRICE IMPACT REGRESSIONS

' set window size. "!x" means that this is a number used in programming, a socalled macro-variable
!window = @val(%Window)         'Window sample size

' get the length of the current workfile range
!length = @obsrange

' set step size
!step = 1               'We move ahead with 1 week at a time

'calculate number of rolls
!nrolls = @round((!length-!window)/!step)
'-------------------------------------------------------------------------------------------------------------------------------
' Clean samle whe re-running????
if @isobject("smpl_roll") then
    delete smpl_roll
endif
sample smpl_roll @first+!window @last
```

```
' declare equation for estimation
equation eq_roll_UIP
equation eq_roll_DB
equation eq_roll_Car
equation eq_roll_Mom
equation eq_roll_Val
equation eq_roll_OIL
equation eq_roll_ALL
equation eq_roll_rates
equation eq_roll_ikkem
equation eq_roll_dvix
equation eq_roll_alldvix
equation eq_roll_benchdvix
equation eq_roll_EMvix
equation eq_roll_vix

' Create series to hold coeffs and SE-stats from rolling regs.
'"%x" means that this is a text-string used in programming, a socalled macro-variable
for %mod UIP DB Car mom val oil all ikkem dvix alldvix benchdvix EMvix vix
    for %vartext rdiff
        series c_{%vartext}_{%mod} = na
        series se_{%vartext}_{%mod} = na
        series r2_{%mod} = na
    next
next

for %mod DB Car all  ikkem
    for %vartext rcarry
        series c_{%vartext}_{%mod} = na
        series se_{%vartext}_{%mod} = na
    next
next

for %mod DB mom all
    for %vartext rmomentum
        series c_{%vartext}_{%mod} = na
        series se_{%vartext}_{%mod} = na
    next
next

for %mod DB val all ikkem
    for %vartext rvalue
        series c_{%vartext}_{%mod} = na
        series se_{%vartext}_{%mod} = na
    next
next

for %mod Car mom val oil all ikkem benchdvix EMvix vix
    for %vartext roil
        series c_{%vartext}_{%mod} = na
        series se_{%vartext}_{%mod} = na
    next
next

for %mod EMvix
    for %vartext dvix_em_barc
        series c_{%vartext}_{%mod} = na
        series se_{%vartext}_{%mod} = na
    next
next

for %mod  vix
```

```
    for %vartext dvix_index
        series c_{%vartext}_{%mod} = na
        series se_{%vartext}_{%mod} = na
    next
next

for %mod  dvix  alldvix benchdvix
    for %vartext dJMPVIXFX
        series c_{%vartext}_{%mod} = na
        series se_{%vartext}_{%mod} = na
    next
next


' ROLL begin
'-----------------------------------------------------------------
'Variable keeping track of how many rolls we've done
' Initialized to 0
!j=0

' Move sample !step obs at a time
for !i = 1 to !length-!window+1-!step step !step
    !j=!j+1

    ' Set sample to estimation period
    smpl @first+!i-1 @first+!i+!window-2

    ' ESTIMATE equation - where the equation is y=c(1) + c(2)*x1 + c(3)*x2
    eq_roll_UIP.ls(cov=HAC) dlog(eurnok)*52*100 C rdiff
    eq_roll_DB.ls(cov=HAC) dlog(eurnok)*52*100 C rdiff rcarry rvalue rmomentum
    eq_roll_Car.ls(cov=HAC) dlog(eurnok)*52*100 C rdiff rcarry  roil
    eq_roll_Mom.ls(cov=HAC) dlog(eurnok)*52*100 C rdiff rmomentum  roil
    eq_roll_Val.ls(cov=HAC) dlog(eurnok)*52*100 C rdiff rvalue  roil
    eq_roll_OIL.ls(cov=HAC) dlog(eurnok)*52*100 C rdiff  roil
    eq_roll_alL.ls(cov=HAC) dlog(eurnok)*52*100 C rdiff rcarry  rvalue rmomentum  roil
    eq_roll_ikkem.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff rcarry  rvalue roil
    eq_roll_dvix.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff dJMPVIXFX
    eq_roll_alldvix.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff dJMPVIXFX rcarry  rvalue rmomentum  roil
    eq_roll_benchdvix.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff dJMPVIXFX roil
    eq_roll_EMvix.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff dvix_em_barc roil
    eq_roll_vix.ls(cov=HAC) dlog(eurnok)*52*100 c rdiff dvix_index roil

    ' Save rolling coeffs and stats
    smpl @first+!i+!window-2 @first+!i+!window-2

    ' Counter to select variables, initialized to 2 (after constant)
    !k = 2

    for %mod UIP DB Car mom val oil all ikkem dvix alldvix benchdvix EMvix vix
        r2_{%mod} = eq_roll_{%mod}.@rbar2
        for %vartext rdiff
            c_{%vartext}_{%mod} = eq_roll_{%mod}.@coefs(!k)
            se_{%vartext}_{%mod} = eq_roll_{%mod}.@stderrs(!k)
            ' Updating of variable-counter (go to next variable)
            !k = !k
        next
    next

    !k = !k +1


    for %mod DB Car all ikkem
```

```
    for %vartext rcarry
        c_{%vartext}_{%mod} = eq_roll_{%mod}.@coefs(!k)
        se_{%vartext}_{%mod} = eq_roll_{%mod}.@stderrs(!k)
        ' Updating of variable-counter (go to next variable)
        !k = !k
    next
next

for %mod mom
    for %vartext rmomentum
        c_{%vartext}_{%mod} = eq_roll_{%mod}.@coefs(!k)
        se_{%vartext}_{%mod} = eq_roll_{%mod}.@stderrs(!k)
        ' Updating of variable-counter (go to next variable)
        !k = !k
    next
next

for %mod oil
    for %vartext roil
        c_{%vartext}_{%mod} = eq_roll_{%mod}.@coefs(!k)
        se_{%vartext}_{%mod} = eq_roll_{%mod}.@stderrs(!k)
        ' Updating of variable-counter (go to next variable)
        !k = !k
    next
next

for %mod val
    for %vartext rvalue
        c_{%vartext}_{%mod} = eq_roll_{%mod}.@coefs(!k)
        se_{%vartext}_{%mod} = eq_roll_{%mod}.@stderrs(!k)
        ' Updating of variable-counter (go to next variable)
        !k = !k
    next
next

for %mod dvix alldvix benchdvix
    for %vartext dJMPVIXFX
        c_{%vartext}_{%mod} = eq_roll_{%mod}.@coefs(!k)
        se_{%vartext}_{%mod} = eq_roll_{%mod}.@stderrs(!k)
        ' Updating of variable-counter (go to next variable)
        !k = !k
    next
next

for %mod vix
    for %vartext dvix_index
        c_{%vartext}_{%mod} = eq_roll_{%mod}.@coefs(!k)
        se_{%vartext}_{%mod} = eq_roll_{%mod}.@stderrs(!k)
        ' Updating of variable-counter (go to next variable)
        !k = !k
    next
next

for %mod emvix
    for %vartext dvix_em_barc
        c_{%vartext}_{%mod} = eq_roll_{%mod}.@coefs(!k)
        se_{%vartext}_{%mod} = eq_roll_{%mod}.@stderrs(!k)
        ' Updating of variable-counter (go to next variable)
        !k = !k
    next
next
```

```
    !k = !k + 1

    for %mod DB all ikkem
        for %vartext rvalue
            c_{%vartext}_{%mod} = eq_roll_{%mod}.@coefs(!k)
            se_{%vartext}_{%mod} = eq_roll_{%mod}.@stderrs(!k)
            ' Updating of variable-counter (go to next variable)
            !k = !k
        next
    next

    for %mod car mom val benchdvix EMvix vix
        for %vartext roil
            c_{%vartext}_{%mod} = eq_roll_{%mod}.@coefs(!k)
            se_{%vartext}_{%mod} = eq_roll_{%mod}.@stderrs(!k)
            ' Updating of variable-counter (go to next variable)
            !k = !k
        next
    next

    !k = !k + 1

    for %mod DB all
        for %vartext rmomentum
            c_{%vartext}_{%mod} = eq_roll_{%mod}.@coefs(!k)
            se_{%vartext}_{%mod} = eq_roll_{%mod}.@stderrs(!k)
            ' Updating of variable-counter (go to next variable)
            !k = !k
        next
    next

    for %mod ikkem
        for %vartext roil
            c_{%vartext}_{%mod} = eq_roll_{%mod}.@coefs(!k)
            se_{%vartext}_{%mod} = eq_roll_{%mod}.@stderrs(!k)
            ' Updating of variable-counter (go to next variable)
            !k = !k
        next
    next

    !k = !k + 1

    for %mod all
        for %vartext roil
            c_{%vartext}_{%mod} = eq_roll_{%mod}.@coefs(!k)
            se_{%vartext}_{%mod} = eq_roll_{%mod}.@stderrs(!k)
            ' Updating of variable-counter (go to next variable)
            !k = !k
        next
    next
next

'
' Graphs for simple regressions

'R2 of simple rgressions
smpl @all
graph graph_r2.spike(m) r2_UIP  r2_Car r2_mom r2_val  r2_oil r2_DB r2_all r2_ikkem r2_dvix  r2_alldvix
r2_benchdvix  r2_vix r2_emvix
'show graph_r2

graph graph_rdiff.spike(m) c_rdiff_UIP c_rdiff_oil c_rdiff_Car c_rdiff_mom c_rdiff_val c_rdiff_DB  c_rdiff_all
```

c_rdiff_ikkem
'show graph_rdiff

graph graph_rcarry.spike(m) c_rcarry_Car c_rcarry_DB c_rcarry_all c_rcarry_ikkem
'show graph_rcarry

graph graph_rmomentum.spike(m) c_rmomentum_mom c_rmomentum_DB c_rmomentum_all
'show graph_rmomentum

graph graph_rvalue.spike(m) c_rvalue_val c_rvalue_DB c_rvalue_all c_rvalue_ikkem
'show graph_rvalue

graph graph_roil.spike(m) c_roil_oil c_roil_all c_roil_ikkem c_roil_car c_roil_mom c_roil_val c_roil_benchdvix
'show graph_roil

graph graph_dvix.spike(m) c_dJMPVIXFX_dvix c_dvix_index_vix c_dvix_em_barc_emvix
'show graph_roil

graph graph_r2_2.line r2_uip r2_oil r2_benchdvix r2_all r2_vix
'show graph_r2

next
smpl @all