```
*************************************************************************
***   Do file which creates the following strength measures           *
***                                                                   *
***         1. the HP-Index                                           *
***         2. the Dividend-Payout Ratio                              *
***         3. the Whited-Wu Index                                    *
***         4. the Rating Indicator                                   *
***                                                                   *
*************************************************************************
*************************************************************************


use "All_Compustat.dta", clear     /*Data corresponding to all firms on Compustat*/

bysort gvkey fyear: gen set=_n

keep if set==1          /*Keep one Report per fiscal year per Company*/
drop set

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

* --- 1. Calculating the HP-Index *

destring gvkey, replace
egen com_id=group(gvkey)      /*Id for each Company*/



* --- 1.1 Age Variable *

gen age_indi=1 if prcc_c!=. /*Age indicator which equals 1 for each fiscal year
                                  a company has a listed closing price*/

replace age_indi=0 if prcc_c==. /*Age indicator which equal 0 for each fiscal
                                  year a company is missing a listed closing price */

bysort com_id: gen age=sum(age_indi) /*Calculated the age of each company years
                                       in which the age indicator equals 1*/

gen limit=1 if age>37   /*Winsorize age at 37 years*/
gen help_age=age
replace help_age=37 if limit==1  /*limit age at 37*/
drop age
rename help_age age     /*New winsorized age variable*/



* --- 1.2 Size Variable *

gen inflation=.   /*Inflation in 2004 dollars from the US inflation center*/
replace inflation=0.69 if fyear==1990
replace inflation=0.72 if fyear==1991
replace inflation=0.74 if fyear==1992
replace inflation=0.76 if fyear==1993
replace inflation=0.78 if fyear==1994
replace inflation=0.81 if fyear==1995
replace inflation=0.83 if fyear==1996
replace inflation=0.85 if fyear==1997
replace inflation=0.86 if fyear==1998
replace inflation=0.88 if fyear==1999
replace inflation=0.91 if fyear==2000
replace inflation=0.94 if fyear==2001
replace inflation=0.95 if fyear==2002
replace inflation=0.97 if fyear==2003
replace inflation=1.00 if fyear==2004
replace inflation=1.03 if fyear==2005
replace inflation=1.07 if fyear==2006
replace inflation=1.10 if fyear==2007
replace inflation=1.14 if fyear==2008
replace inflation=1.14 if fyear==2009
replace inflation=1.15 if fyear==2010
replace inflation=1.19 if fyear==2011
replace inflation=1.22 if fyear==2012
replace inflation=1.23 if fyear==2013
replace inflation=1.25 if fyear==2014
replace inflation=1.25 if fyear==2015
replace inflation=1.27 if fyear==2016
```

```
gen at_infl=at*inflation     /*2004 Inflation adjusted assets*/

gen at_hp=at_infl
replace at_hp=4500 if at_infl>=4500  /*winsorize size at 4.5 billion*/
gen size_hp=log(at_hp)
drop if size_hp==.


* --- 1.3 Calculating the HP-Index *

by com_id: gen hp_index=-0.737*size_hp+0.043*(size_hp*size_hp)-0.040*age

gen hp_indicator=.

quietly forvalues i=1993(1)2017{
egen p1 = pctile(hp_index)if fyear==`i', p(33.33) /*Bottom tercile*/
replace bottom = p1 if fyear==`i'
replace hp_indicator=0 if hp_index<=bottom  & fyear==`i' /* zero if financially
                                                          unconstrained*/
drop p1

egen p2 = pctile(hp_index)if fyear==`i', p(66.66) /*Top tercile*/
replace top = p2 if fyear==`i'
replace hp_indicator=1 if hp_index>=top & fyear==`i' /*one if financially

                  constrained*/
drop p2
}
sort gvkey fyear

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

* --- 2. Calculating the Dividend Payout Ratio *

gen opincome=ib/at                   /*Operating Income */
gen payoutratio=(dvp+dvc+prstkc-pstkrv)/opincome /*Payoutratio for each company
                                                   in each fiscal year */
gen divratio=.
gen id=_n
tsset id
replace payoutratio=1 if payoutratio>1 /*Winsorize payout ratio at 1 */
replace payoutratio=1 if ib<0 & dvc+dvp>0 /*Payoutratio equals one if negative
                                            income but positive dividends  */

quietly forvalues i=1(1)444244{ /*Mayimum number of observations in the dataset*/
replace divratio=(l.payoutratio+l2.payoutratio)/2 if id==`i'
/*Average payoutratio of the two preceeding years at each point in time*/
}

egen group_id=group(gvkey)

bysort group_id: replace divratio=. if _n==1 | _n==2 /*replace the dividend
                            payoutratio with . for each companies first fiscal year*/
drop id
gen bottom=.
gen top=.
gen div_indicator=.

quietly forvalues i=1993(1)2017{
egen p1 = pctile(divratio)if fyear==`i', p(33.33)
replace bottom = p1 if fyear==`i'
replace div_indicator=1 if divratio<=bottom  & fyear==`i' /*Bottom tercile

                  constrained firms*/
drop p1

egen p2 = pctile(divratio)if fyear==`i', p(66.66)
replace top = p2 if fyear==`i'
replace div_indicator=0 if divratio>=top & fyear==`i' /*Top tercile

            unconstrained firms */
drop p2
}
sort group_id fyear
```

```
*-----------------------------------------------------------------------------------------*

*--- 3. Calculating Whited Wu Index *

* --- Variable #1 *

gen wvar_one = (ib+dp)/at /*Ratio of Cash flow to assets*/

* --- Variable #2 *

gen wvar_two=1 if dvc+dvp>0    /*Indicator set to one if firm pay dividends*/
replace wvar_two=0 if dvc+dvp<=0 /*zero otherwise*/

* --- Variable #3 *

gen wvar_three=(dltt/at) /*Long term debt to total assets*/

* --- Variable #4 *

gen wvar_four = ln(at) /*size of the investor*/

* --- Variable #6 *

gen set=_n
tsset  set
gen wvar_six=.
sort group_id

quietly forvalues i=1(1)444244{
replace wvar_six=(sale/l.sale) if set==`i' /*investor's sales growth */
}


* --- Variable #5 *

bysort group_id: drop if _n==1 /*first observation and therefore
                                    no sales growth available*/

gen tsic=substr(sic,1,3) /*three digit SIC industry*/

destring tsic, generate(tsicnum)

bysort fyear tsicnum: egen wvar_five=mean(wvar_six) /*average industry sales
                        growth, estimated for each three digit SIC industry and year*/

sort group_ip

* --- Calculating the Index *

bysort group_id: gen ww_index = -0.091*wvar_one-0.062*wvar_two+0.021*wvar_three
                                    -0.044*wvar_four-0.035*wvar_six+0.102*wvar_five

* --- Sort by Terciles and order constrained *

xtile ww_tercile = ww_index, nquantiles(3) /*Sort into terciles*/

gen ww_indicator=1 if ww_tercile==3
replace ww_indicator=0 if ww_tercile==1


keep gvkey fyear hp_indicator div_indicator ww_indicator

merge m:1 gvkey fyear using "Filer_Targets_Data.dta" /*Merge with dataset that
                                    includes the final data of the Schedule 13(D) Filings*/
```