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*****
*** 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 *
*** *
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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

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* --- 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

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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 = pctlile(hp_index)if fyear==`i', p(30) /*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 = pctlile(hp_index)if fyear==`i', p(700) /*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

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

gen opincome=ib/at          /*Operating Income */
gen payoutratio=(dvp+dvc+prstk-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 = pctlile(divratio)if fyear==`i', p(30)
replace bottom = p1 if fyear==`i'
replace div_indicator=1 if divratio<=bottom & fyear==`i' /*Bottom tercile
constrained firms*/
drop p1

egen p2 = pctlile(divratio)if fyear==`i', p(70)
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

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*--- 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+divp>0 /*Indicator set to one if firm pay dividends*/
replace wvar_two=0 if dvc+divp<=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*/

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