

NB!: Jeg fikk ikke lastet opp .R filen, og har derfor brukt bilder slik det kan konverters som en .pdf fil.

```
39
40
41
42 ▸ ## Aksjeprisdata ## -----
43
44 ## Laste inn dataen - Eikon
45 aksjer <- read.csv("Eikonaksjer.csv", header = FALSE, sep = ";",
46                 dec = ",")
47
48
49
50 ## lager en enkel oversikt ##
51 summary(aksjer)
52 aksjer$V3 <- NULL
53
54
55 ## Laga relevante kolonnenavn i dataframe ##
56 colnames(aksjer) <- c("Date", "SecurityID",
57                    "SecurityName", "SecurityType", "CompanyID", "Last",
58                    "AdjLast", "SharesIssued")
59 summary(aksjer$SecurityType)
60
61 ## Tar relevante aksjer ##
62 aksjer20 <- aksjer[aksjer$SecurityType == "Primary Shares", ]
63 aksjer <- rbind(aksjer20, )
64 aksjer$SecurityType <- NULL
65
66 ## Tallverdier numeric ##
67 aksjer$SecurityID <- as.numeric(as.character(aksjer$SecurityID))
68 aksjer$Last <- as.numeric(as.character(aksjer$Last))
69 aksjer$AdjLast <- as.numeric(as.character(aksjer$AdjLast))
70 aksjer$SharesIssued <- as.numeric(as.character(aksjer$SharesIssued))
71 aksjer$CompanyID <- as.numeric(as.character(aksjer$CompanyID))
72
73 ## Fjerner NA's på aksjekursene##
74 aksjer <- aksjer[!is.na(aksjer$Last), ]
75
76 ## setter restriksjonene ##
77 aksjer <- aksjer[aksjer$Last > 1, ] ## fjerner observasjoner som handles under NOK 3 kurs
78 aksjer <- aksjer[aksjer$SharesIssued > 0, ] ## fjerner observasjoner med negativ aksjer utstedt (0 obs)
79
80 ## Riktig formatering på dato ##
```

```

79 ## Fjerner NA's på aksjekursene##
80 aksjer <- aksjer[!is.na(aksjer$Last), ]
81
82 ## setter restriksjonene n ##
83 aksjer <- aksjer[aksjer$Last > 1, ] ## fjerner observasjoner som handles under NOK 3 kurs
84 aksjer <- aksjer[aksjer$SharesIssued > 0, ] ## Fjerner observasjoner med negativ aksjer utstedt (0 obs)
85
86 ## Riktig formatering på dato ##
87 aksjer$Date <- as.Date(aksjer$Date, formate = "%m/%d/%Y")
88
89
90 year <- seq(as.Date("2000-01-01"), as.Date("2020-31-12"), by = "year")
91 year <- year - 1
92
93 aksjer$Date.aux <- cut(aksjer$Date, year, right = T)
94
95 aksjer$Date[1]
96 aksjer$Date.aux[1]
97
98 i <- as.numeric(aksjer$Date.aux)
99 aksjer$Date.aux <- year [i + 1]
100
101 aksjer$Date[1:5]
102 aksjer$Date.aux[1:5]
103
104 ## finner antall observasjoner per aksjer per år ##
105 num <- aggregate(aksjer$SecurityID, list(aksjer$Date.aux, aksjer$SecurityID), length)
106 head(num[num$x > 1, ])
107
108 ## fjerner dobbelverdier på samme år ##
109 aksjer <- aksjer[order(aksjer$SecurityID, aksjer$Date), ]
110 aksjer$row <- 1:nrow(aksjer)
111 rows <- aggregate(aksjer$row, list(aksjer$Date.aux, aksjer$SecurityID), max)
112 aksjer <- aksjer[rows$x, ]
113 aksjer$row <- NULL
114
115 ## Kun aksjer som handler i slutten av året blir med ##
116 aksjer$delta.t <- as.numeric(aksjer$Date.aux - aksjer$Date)
117 summary(aksjer$delta.t)
118 aksjer <- aksjer[aksjer$delta.t <= 5, ]
119 aksjer$delta.t <- NULL

```

```

121 ## dropper dato - og bytter med den nå relevante datoen ##
122 aksjer$Date <- aksjer$Date.aux
123 aksjer$Date.aux <- NULL
124
125
126 ## Beregne avkastning ##
127 aksjer$Date.aux2 <- cut(aksjer$Date, year, right = T)
128
129 aksjer$Date[1]
130 aksjer$Date.aux2[1]
131
132 i <- as.numeric(aksjer$Date.aux2)
133 aksjer$Date.aux2 <- year[i + 2]
134
135 aksjer$Date[1:5]
136 aksjer$Date.aux2[1:5]
137
138 aksjer <- aksjer[order(aksjer$SecurityID, aksjer$Date.aux2), ]
139 aksjer$R <- unlist(tapply(aksjer$AdjLast, aksjer$SecurityID,
140                       function(v) c(v[-1]/v[-length(v)] - 1, NA)))
141
142 aksjer10 <- aksjer[, c("SecurityID", "R", "Date.aux2") ]
143 names(aksjer10) <- c("SecurityID", "R", "Date")
144
145 aksjer <- left_join(aksjer, aksjer10, by = c("Date" = "Date", "SecurityID" = "SecurityID"))
146
147 aksjer$R.x <- NULL
148 aksjer$Date.aux2 <- NULL
149
150 names(aksjer) <- c("Date", "SecurityID", "SecurityName", "CompanyID", "Last", "AdjLast", "SharesIssued", "R")
151
152 ## fjerner observasjoner uten avkastningsobservasjoner ##
153 aksjer <- aksjer[!is.na(aksjer$R), ]
154
155 ## gjør avkastningen sammenhengende ##
156 aksjer <- aksjer[order(aksjer$SecurityID, aksjer$Date), ]
157 aksjer$delta.t <- unlist(tapply(aksjer$Date, list(aksjer$SecurityID),
158                             function(v) c(as.numeric(diff(v)), NA)))
159

```

```

160 summary(aksjer$delta.t)
161 summary(aksjer$R)
162
163 aksjer <- aksjer[!is.na(aksjer$delta.t), ]
164 aksjer <- aksjer[aksjer$delta.t <= 31, ]
165 aksjer$delta.t <- NULL
166 nrow(aksjer)
167
168
169 ## Winsorienterte avkastningen på 1 og 99 prosentilen ##
170 aksjer$R <- squish(aksjer$R, quantile(aksjer$R, c(.01, .99)))
171 summary(aksjer$R)
172
173 ## finner markedsverdien til hver aksje ##
174 aksjer$MarketCap <- aksjer$Last * aksjer$SharesIssued/1e+03 ## deler på 1000 for å ha tilsvarende befegnelse som regnskapsdataen
175
176 ## fjerner observasjoner med markedsverdi under NOK 1 000 000 #
177 aksjer <- aksjer[aksjer$MarketCap > "1000", ]
178
179 ## filtrerer og restriskjoner av datasettene #####
180 ## Merge dataen til en df ##
181 databehandling1 <- rbind(aksjer)
182 nrow(databehandling1)
183
184
185 ## oversikt ##
186 summary(databehandling1)
187
188 databehandling1$V9 <- NULL
189
190 head(databehandling1)
191
192 ## Riktig formatering på dato ##
193
194 databehandling1$Date <- as.Date(databehandling1$Date, formate = "%m/%d/%Y")
195
196 ## Fjerne NA samt legge til restriksjoner ##
197

```

```

196 ## Fjerne NA samt legge til restriksjoner ##
197
198 databehandling20 <- databehandling2[databehandling2$SecurityType == "Primary Shares", ]
199
200 databehandling3 <- rbind(databehandling20, databehandling21)
201 databehandling10 <- rbind(databehandling20, databehandling21)
202 databehandling15 <- rbind(databehandling20, databehandling21)
203
204 databehandling15$SecurityID <- as.numeric(as.character(databehandling10$SecurityID))
205 databehandling15$Last <- as.numeric(as.character(databehandling10$Last))
206 databehandling15$AdjLast <- as.numeric(as.character(databehandling10$AdjLast))
207 databehandling15$SharesIssued <- as.numeric(as.character(databehandling10$SharesIssued))
208 databehandling15$CompanyID <- as.numeric(as.character(databehandling10$CompanyID))
209
210 databehandling10$SecurityID <- as.numeric(as.character(databehandling10$SecurityID))
211 databehandling10$Last <- as.numeric(as.character(databehandling10$Last))
212 databehandling10$AdjLast <- as.numeric(as.character(databehandling10$AdjLast))
213 databehandling10$SharesIssued <- as.numeric(as.character(databehandling10$SharesIssued))
214 databehandling10$CompanyID <- as.numeric(as.character(databehandling10$CompanyID))
215
216 unique(databehandling10$SecurityID) #791 ## antall aksjer
217 databehandling16 <- databehandling10[databehandling10$SharesIssued == "0", ] # Antall observasjoner med 0 i markedsverdi
218
219 ## Illustrasjonstabell med nøkkeltall vist i databehandlingsseksjonen ##
220 oversiktstabell_nøkkeltall_prefilter <- databehandling10 %>%
221   select("AdjLast", "SharesIssued", "Last") %>%
222   describe(., na.rm = TRUE, skew = FALSE, quant = c(0.25, 0.75))
223
224 databehandling11 <- databehandling10
225 databehandling11 <- databehandling3[databehandling11$Last > 10, ] ## hvor mange aksjer vi mister med andre kriterier
226 databehandling3$SecurityType <- NULL
227
228
229 ## Må ha tallverdier numeric ##
230 databehandling3$SecurityID <- as.numeric(as.character(databehandling3$SecurityID))
231 databehandling3$Last <- as.numeric(as.character(databehandling3$Last))
232 databehandling3$AdjLast <- as.numeric(as.character(databehandling3$AdjLast))
233 databehandling3$SharesIssued <- as.numeric(as.character(databehandling3$SharesIssued))
234 databehandling3$CompanyID <- as.numeric(as.character(databehandling3$CompanyID))
235
236

```

```

237 ## Fjerner NA's på aksjeprisene ##
238 databehandling3 <- databehandling3[!is.na(databehandling3$Last), ]
239 databehandling3 <- databehandling3[!is.na(databehandling3$AdjLast), ] ## Fjerner alle observasjoner
240
241
242 ## Restriksjoner ##
243 databehandling3 <- databehandling3[databehandling3$Last > 1, ] ## hvor mange observasjoner som forsvinner av restriksjonen
244 databehandling3 <- databehandling3[databehandling3$SharesIssued > 0, ]
245
246
247
248 ## Rullerende observasjoner ##
249 year <- seq(as.Date("2000-01-01"), as.Date("2020-01-01"), by = "year")
250 year <- year - 1
251
252 databehandling3$Date.aux <- cut(databehandling3$Date, year, right = F)
253
254 databehandling3$Date[1]
255 databehandling3$Date.aux[1]
256
257 i <- as.numeric(databehandling3$Date.aux)
258 databehandling3$Date.aux <- year[i + 1]
259
260 databehandling3$Date[1:5]
261 databehandling3$Date.aux[1:5]
262
263 ## sjekke antall observasjoner per aksjer per år ##
264 num <- aggregate(databehandling3$SecurityID, list(databehandling3$Date.aux, databehandling3$SecurityID), length)
265
266 num1 <- (num[num$x > 1, ])
267 head(num[num$x > 1, ])
268
269
270 ## fjerne dobbelverdier på samme år ##
271
272 databehandling3 <- databehandling3[order(databehandling3$SecurityID, databehandling3$Date), ]
273 databehandling3$row <- 1:nrow(databehandling3)
274 rows <- aggregate(databehandling3$row, list(databehandling3$Date.aux, databehandling3$SecurityID), max)
275 databehandling3 <- databehandling3[rows$x, ]

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```

275 databehandling3 <- databehandling3[rows$ix, ]
276 databehandling3$row <- NULL
277
278 ## Kun aksjer som handler i slutten av måneden blir med ##
279 databehandling3$delta.t <- as.numeric(databehandling3$Date.aux - databehandling3$Date)
280 summary(databehandling3$delta.t)
281
282 databehandling3 <- databehandling3[databehandling3$delta.t <= 5, ]
283 databehandling3$delta.t <- NULL
284
285 ## dropper dato - og bytter med den nå relevante datoen ##
286
287 databehandling3$Date <- databehandling3$Date.aux
288 databehandling3$Date.aux <- NULL
289
290
291 ## Beregne avkastning ##
292 databehandling3$Date.aux2 <- cut(databehandling3$Date, year, right = T)
293
294 databehandling3$Date[1]
295 databehandling3$Date.aux2[1]
296
297 i <- as.numeric(databehandling3$Date.aux2)
298 databehandling3$Date.aux2 <- year[i + 2]
299
300 databehandling3$Date[1:5]
301 databehandling3$Date.aux2[1:5]
302
303 databehandling3 <- databehandling3[order(databehandling3$SecurityID, databehandling3$Date.aux2), ]
304 databehandling3$R <- unlist(tapply(databehandling3$AdjLast, databehandling3$SecurityID,
305                               function(v) c(v[-1]/v[-length(v)] - 1, NA)))
306
307 aksjer1000 <- databehandling3[, c("SecurityID","R", "Date.aux2") ]
308 names(aksjer1000) <- c("SecurityID", "R", "Date")
309
310 databehandling3 <- left_join(databehandling3, aksjer1000, by = c("Date" = "Date", "SecurityID" = "SecurityID"))
311

```

```

312 databehandling3$R.x <- NULL
313 databehandling3$Date.aux2 <- NULL
314
315 names(databehandling3) <- c("Date", "SecurityID", "SecurityName", "CompanyID", "Last", "AdjLast", "SharesIssued", "R")
316
317 ## Hvor mange observasjoner som forsvinner når jeg fjerner de uten avkastningsdata
318 databehandling3 <- databehandling3[!is.na(databehandling3$R), ]
319
320
321 ## Sørger for at avkastningen er kontinuerlig ##
322 databehandling3 <- databehandling3[order(databehandling3$SecurityID, databehandling3$Date), ]
323 databehandling3$delta.t <- unlist(tapply(databehandling3$Date, list(databehandling3$SecurityID),
324                                     function(v) c(as.numeric(diff(v)), NA)))
325
326
327 ## Hvor mange observasjoner som forsvinner når jeg fjerner de uten avkastningsdata
328 summary(databehandling3$delta.t)
329 summary(databehandling3$R)
330
331
332 ## Hvor mange observasjoner som forsvinner når jeg fjerner de uten avkastningsdata
333 databehandling3 <- databehandling3[!is.na(databehandling3$delta.t), ]
334 databehandling3 <- databehandling3[databehandling3$delta.t <= 31, ]
335 databehandling3$delta.t <- NULL
336 nrow(databehandling3)
337
338 databehandling12 <- databehandling3
339
340
341 ## bruker unadjusted pga det allerede ligger i shares issued##
342 ## Beregner markedsverdien til aksjene ##
343 databehandling3$MarketCap <- databehandling3$Last * databehandling3$SharesIssued/1e+03
344
345 ## se hvor mange observasjoner som forsvinner, setter minimum markedsverdikravet ##
346 databehandling3 <- databehandling3[databehandling3$MarketCap > "1000", ]
347
348
349
350 summary(databehandling3$R)
351 summary(databehandling3$MarketCap)
352

```



```

352
353 ## Lager oversiktstabell for nøkkeltall på avkastning og markedsverdi som vist i databehandlingsseksjonen ##
354 oversiktstabell_nøkkeltall_prefilter1 <- databehandling3 %>%
355   select("R","MarketCap") %>%
356   describe(., na.rm = TRUE, skew = FALSE, quant = c(0.25,0.75))
357
358
359
360 ## Winsorientere avkastningen på 1 og 99 prosentilen ##
361 databehandling3R <- squish(databehandling3R, quantile(databehandling3R, c(.01, .99)))
362 summary(databehandling3R)
363
364
365 ## Viser endring av at vi winsorienterer dataen ##
366 summary_statistics_postfilter_yearly <- databehandling3 %>%
367   select("AdjLast","SharesIssued", "R") %>%
368   describe(., na.rm = TRUE, skew = FALSE, quant = c(0.25,0.75))
369
370
371 ### Regnskapsdata filtrering ###
372
373 r2_2000 <- r_2000[, c("orgnr", "aar", "P_B")]
374 r2_2001 <- r_2001[, c("orgnr", "aar", "P_B")]
375 r2_2002 <- r_2002[, c("orgnr", "aar", "P_B")]
376 r2_2003 <- r_2003[, c("orgnr", "aar", "P_B")]
377 r2_2004 <- r_2004[, c("orgnr", "aar", "P_B")]
378 r2_2005 <- r_2005[, c("orgnr", "aar", "P_B")]
379 r2_2006 <- r_2006[, c("orgnr", "aar", "P_B")]
380 r2_2007 <- r_2007[, c("orgnr", "aar", "P_B")]
381 r2_2008 <- r_2008[, c("orgnr", "aar", "P_B")]
382 r2_2009 <- r_2009[, c("orgnr", "aar", "P_B")]
383 r2_2010 <- r_2010[, c("orgnr", "aar", "P_B")]
384 r2_2011 <- r_2011[, c("orgnr", "aar", "P_B")]
385 r2_2012 <- r_2012[, c("orgnr", "aar", "P_B")]
386 r2_2013 <- r_2013[, c("orgnr", "aar", "P_B")]
387 r2_2014 <- r_2014[, c("orgnr", "aar", "P_B")]
388 r2_2015 <- r_2015[, c("orgnr", "aar", "P_B")]
389 r2_2016 <- r_2016[, c("orgnr", "aar", "P_B")]
390 r2_2017 <- r_2017[, c("orgnr", "aar", "P_B")]
391 r2_2018 <- r_2018[, c("orgnr", "aar", "P_B")]
392 r2_2019 <- r_2019[, c("orgnr", "aar", "P_B")]
393 r2_2020 <- r_2020[, c("orgnr", "aar", "P_B")]

```

```

396 regnskapsdatautvalg <- rbind(r2_2000, r2_2001, r2_2002, r2_2003, r2_2004, r2_2005, r2_2006
397                               ,r2_2007, r2_2008, r2_2009, r2_2010, r2_2011, r2_2012, r2_2013, r2_2014, r2_2015
398                               ,r2_2016, r2_2017, r2_2018,r2_2019, r2_2020,)
399
400 ## fjerner de med negativ P/B ##
401 regnskapsdatautvalg <- regnskapsdatautvalg[c(regnskapsdatautvalg$P_B > 0), ]
402
403
404 # fjerner observasjoner med P/B over 15 ##
405 regnskapsdatautvalg <- regnskapsdatautvalg[c(regnskapsdatautvalg$P_B < 15), ]
406
407
408 # hvor mange aksjer i utvalget ettersom jeg gjennomfører stegvis filtrering av datasettet ##
409 lapply(databehandling15, class)
410
411 databehandling15$Date <- as.Date(databehandling15$Date, formate = "%m/%d/%Y")
412
413 databehandling15 <- databehandling15 %>%
414   dplyr::mutate(year = lubridate::year(Date),
415               year = lubridate::year(Date),
416               day = lubridate::day(Date))
417
418
419 ## antall aksjer i datasettet
420 aksjer_2000_1 <- databehandling15[databehandling15$year == "2000", ]
421 aksjer_2001_1 <- databehandling15[databehandling15$year == "2001", ]
422 aksjer_2002_1 <- databehandling15[databehandling15$year == "2002", ]
423 aksjer_2003_1 <- databehandling15[databehandling15$year == "2003", ]
424 aksjer_2004_1 <- databehandling15[databehandling15$year == "2004", ]
425 aksjer_2005_1 <- databehandling15[databehandling15$year == "2005", ]
426 aksjer_2006_1 <- databehandling15[databehandling15$year == "2006", ]
427 aksjer_2007_1 <- databehandling15[databehandling15$year == "2007", ]
428 aksjer_2008_1 <- databehandling15[databehandling15$year == "2008", ]
429 aksjer_2009_1 <- databehandling15[databehandling15$year == "2009", ]
430 aksjer_2010_1 <- databehandling15[databehandling15$year == "2010", ]
431 aksjer_2011_1 <- databehandling15[databehandling15$year == "2011", ]
432 aksjer_2012_1 <- databehandling15[databehandling15$year == "2012", ]
433 aksjer_2013_1 <- databehandling15[databehandling15$year == "2013", ]
434 aksjer_2014_1 <- databehandling15[databehandling15$year == "2014", ]
435 aksjer_2015_1 <- databehandling15[databehandling15$year == "2015", ]

```

```

436 aksjer_2016_1 <- databehandling15[databehandling15$year == "2016", ]
437 aksjer_2017_1 <- databehandling15[databehandling15$year == "2017", ]
438 aksjer_2018_1 <- databehandling15[databehandling15$year == "2018", ]
439 aksjer_2019_1 <- databehandling15[databehandling15$year == "2019", ]
440 aksjer_2020_1 <- databehandling15[databehandling15$year == "2020", ]
441
442
443 antallaks <- unique(aksjer_2000_1$SecurityID)
444 antallaks <- unique(aksjer_2001_1$SecurityID)
445 antallaks <- unique(aksjer_2002_1$SecurityID)
446 antallaks <- unique(aksjer_2003_1$SecurityID)
447 antallaks <- unique(aksjer_2004_1$SecurityID)
448 antallaks <- unique(aksjer_2005_1$SecurityID)
449 antallaks <- unique(aksjer_2006_1$SecurityID)
450 antallaks <- unique(aksjer_2007_1$SecurityID)
451 antallaks <- unique(aksjer_2008_1$SecurityID)
452 antallaks <- unique(aksjer_2009_1$SecurityID)
453 antallaks <- unique(aksjer_2010_1$SecurityID)
454 antallaks <- unique(aksjer_2011_1$SecurityID)
455 antallaks <- unique(aksjer_2012_1$SecurityID)
456 antallaks <- unique(aksjer_2013_1$SecurityID)
457 antallaks <- unique(aksjer_2014_1$SecurityID)
458 antallaks <- unique(aksjer_2015_1$SecurityID)
459 antallaks <- unique(aksjer_2016_1$SecurityID)
460 antallaks <- unique(aksjer_2017_1$SecurityID)
461 antallaks <- unique(aksjer_2018_1$SecurityID)
462 antallaks <- unique(aksjer_2019_1$SecurityID)
463 antallaks <- unique(aksjer_2020_1$SecurityID)
464
465
466
467 ### Kursdata-filtrering ##
468
469 databehandling10 <- databehandling10[!is.na(databehandling10$AdjLast), ]
470
471 databehandling10 <- databehandling10 %>%
472   dplyr::mutate(year = lubridate::year(Date),
473               year = lubridate::year(Date),
474               day = lubridate::day(Date))
475

```

```
475 |
476 aksjer_2000_2 <- databehandling10[databehandling10$year == "2000", ]
477 aksjer_2001_2 <- databehandling10[databehandling10$year == "2001", ]
478 aksjer_2002_2 <- databehandling10[databehandling10$year == "2002", ]
479 aksjer_2003_2 <- databehandling10[databehandling10$year == "2003", ]
480 aksjer_2004_2 <- databehandling10[databehandling10$year == "2004", ]
481 aksjer_2005_2 <- databehandling10[databehandling10$year == "2005", ]
482 aksjer_2006_2 <- databehandling10[databehandling10$year == "2006", ]
483 aksjer_2007_2 <- databehandling10[databehandling10$year == "2007", ]
484 aksjer_2008_2 <- databehandling10[databehandling10$year == "2008", ]
485 aksjer_2009_2 <- databehandling10[databehandling10$year == "2009", ]
486 aksjer_2010_2 <- databehandling10[databehandling10$year == "2010", ]
487 aksjer_2011_2 <- databehandling10[databehandling10$year == "2011", ]
488 aksjer_2012_2 <- databehandling10[databehandling10$year == "2012", ]
489 aksjer_2013_2 <- databehandling10[databehandling10$year == "2013", ]
490 aksjer_2014_2 <- databehandling10[databehandling10$year == "2014", ]
491 aksjer_2015_2 <- databehandling10[databehandling10$year == "2015", ]
492 aksjer_2016_2 <- databehandling10[databehandling10$year == "2016", ]
493 aksjer_2017_2 <- databehandling10[databehandling10$year == "2017", ]
494 aksjer_2018_2 <- databehandling10[databehandling10$year == "2018", ]
495 aksjer_2019_2 <- databehandling10[databehandling10$year == "2019", ]
496 aksjer_2020_2 <- databehandling10[databehandling10$year == "2020", ]
497
498 antallaks <- unique(aksjer_2000_2$SecurityID)
499 antallaks <- unique(aksjer_2001_2$SecurityID)
500 antallaks <- unique(aksjer_2002_2$SecurityID)
501 antallaks <- unique(aksjer_2003_2$SecurityID)
502 antallaks <- unique(aksjer_2004_2$SecurityID)
503 antallaks <- unique(aksjer_2005_2$SecurityID)
504 antallaks <- unique(aksjer_2006_2$SecurityID)
505 antallaks <- unique(aksjer_2007_2$SecurityID)
506 antallaks <- unique(aksjer_2008_2$SecurityID)
507 antallaks <- unique(aksjer_2009_2$SecurityID)
508 antallaks <- unique(aksjer_2010_2$SecurityID)
509 antallaks <- unique(aksjer_2011_2$SecurityID)
510 antallaks <- unique(aksjer_2012_2$SecurityID)
511 antallaks <- unique(aksjer_2013_2$SecurityID)
512 antallaks <- unique(aksjer_2014_2$SecurityID)
513 antallaks <- unique(aksjer_2015_2$SecurityID)
514 antallaks <- unique(aksjer_2016_2$SecurityID)
```

```
514 antallaks <- unique(aksjer_2016_2$SecurityID)
515 antallaks <- unique(aksjer_2017_2$SecurityID)
516 antallaks <- unique(aksjer_2018_2$SecurityID)
517 antallaks <- unique(aksjer_2019_2$SecurityID)
518 antallaks <- unique(aksjer_2020_2$SecurityID)
519
520
521 ## Kurs over 3kr - filtrering ##
522
523 databehandling10 <- databehandling10[databehandling10$Last > 3, ]
524
525 aksjer_2000_2 <- databehandling10[databehandling10$year == "2000", ]
526 aksjer_2001_2 <- databehandling10[databehandling10$year == "2001", ]
527 aksjer_2002_2 <- databehandling10[databehandling10$year == "2002", ]
528 aksjer_2003_2 <- databehandling10[databehandling10$year == "2003", ]
529 aksjer_2004_2 <- databehandling10[databehandling10$year == "2004", ]
530 aksjer_2005_2 <- databehandling10[databehandling10$year == "2005", ]
531 aksjer_2006_2 <- databehandling10[databehandling10$year == "2006", ]
532 aksjer_2007_2 <- databehandling10[databehandling10$year == "2007", ]
533 aksjer_2008_2 <- databehandling10[databehandling10$year == "2008", ]
534 aksjer_2009_2 <- databehandling10[databehandling10$year == "2009", ]
535 aksjer_2010_2 <- databehandling10[databehandling10$year == "2010", ]
536 aksjer_2011_2 <- databehandling10[databehandling10$year == "2011", ]
537 aksjer_2012_2 <- databehandling10[databehandling10$year == "2012", ]
538 aksjer_2013_2 <- databehandling10[databehandling10$year == "2013", ]
539 aksjer_2014_2 <- databehandling10[databehandling10$year == "2014", ]
540 aksjer_2015_2 <- databehandling10[databehandling10$year == "2015", ]
541 aksjer_2016_2 <- databehandling10[databehandling10$year == "2016", ]
542 aksjer_2017_2 <- databehandling10[databehandling10$year == "2017", ]
543 aksjer_2018_2 <- databehandling10[databehandling10$year == "2018", ]
544 aksjer_2019_2 <- databehandling10[databehandling10$year == "2019", ]
545 aksjer_2020_2 <- databehandling10[databehandling10$year == "2020", ]
546
```

```
548 antallaks <- unique(aksjer_2000_2$SecurityID)
549 antallaks <- unique(aksjer_2001_2$SecurityID)
550 antallaks <- unique(aksjer_2002_2$SecurityID)
551 antallaks <- unique(aksjer_2003_2$SecurityID)
552 antallaks <- unique(aksjer_2004_2$SecurityID)
553 antallaks <- unique(aksjer_2005_2$SecurityID)
554 antallaks <- unique(aksjer_2006_2$SecurityID)
555 antallaks <- unique(aksjer_2007_2$SecurityID)
556 antallaks <- unique(aksjer_2008_2$SecurityID)
557 antallaks <- unique(aksjer_2009_2$SecurityID)
558 antallaks <- unique(aksjer_2010_2$SecurityID)
559 antallaks <- unique(aksjer_2011_2$SecurityID)
560 antallaks <- unique(aksjer_2012_2$SecurityID)
561 antallaks <- unique(aksjer_2013_2$SecurityID)
562 antallaks <- unique(aksjer_2014_2$SecurityID)
563 antallaks <- unique(aksjer_2015_2$SecurityID)
564 antallaks <- unique(aksjer_2016_2$SecurityID)
565 antallaks <- unique(aksjer_2017_2$SecurityID)
566 antallaks <- unique(aksjer_2018_2$SecurityID)
567 antallaks <- unique(aksjer_2019_2$SecurityID)
568 antallaks <- unique(aksjer_2020_2$SecurityID)
569
570 databehandling12 <- databehandling12 %>%
571   dplyr::mutate(year = lubridate::year(Date),
572               year = lubridate::year(Date),
573               day = lubridate::day(Date))
574
575
576
577 ## Regnskapsdata - filtrering ##
578
579 aksjer_2000_3 <- utvalg41[utvalg41$aar == "2000", ]
580 aksjer_2001_3 <- utvalg41[utvalg41$aar == "2001", ]
581 aksjer_2002_3 <- utvalg41[utvalg41$aar == "2002", ]
582 aksjer_2003_3 <- utvalg41[utvalg41$aar == "2003", ]
583 aksjer_2004_3 <- utvalg41[utvalg41$aar == "2004", ]
584 aksjer_2005_3 <- utvalg41[utvalg41$aar == "2005", ]
585 aksjer_2006_3 <- utvalg41[utvalg41$aar == "2006", ]
586 aksjer_2007_3 <- utvalg41[utvalg41$aar == "2007", ]
587 aksjer_2008_3 <- utvalg41[utvalg41$aar == "2008", ]
588 aksjer_2009_3 <- utvalg41[utvalg41$aar == "2009", ]
```

```
588 aksjer_2009_3 <- utvalg41[utvalg41$aar == "2009", ]
589 aksjer_2010_3 <- utvalg41[utvalg41$aar == "2010", ]
590 aksjer_2011_3 <- utvalg41[utvalg41$aar == "2011", ]
591 aksjer_2012_3 <- utvalg41[utvalg41$aar == "2012", ]
592 aksjer_2013_3 <- utvalg41[utvalg41$aar == "2013", ]
593 aksjer_2014_3 <- utvalg41[utvalg41$aar == "2014", ]
594 aksjer_2015_3 <- utvalg41[utvalg41$aar == "2015", ]
595 aksjer_2016_3 <- utvalg41[utvalg41$aar == "2016", ]
596 aksjer_2017_3 <- utvalg41[utvalg41$aar == "2017", ]
597 aksjer_2018_3 <- utvalg41[utvalg41$aar == "2018", ]
598 aksjer_2019_3 <- utvalg41[utvalg41$aar == "2019", ]
599 aksjer_2020_3 <- utvalg41[utvalg41$aar == "2020", ]
600
601
602 antallaks <- unique(aksjer_2000_3$orgnr)
603 antallaks <- unique(aksjer_2001_3$orgnr)
604 antallaks <- unique(aksjer_2002_3$orgnr)
605 antallaks <- unique(aksjer_2003_3$orgnr)
606 antallaks <- unique(aksjer_2004_3$orgnr)
607 antallaks <- unique(aksjer_2005_3$orgnr)
608 antallaks <- unique(aksjer_2006_3$orgnr)
609 antallaks <- unique(aksjer_2007_3$orgnr)
610 antallaks <- unique(aksjer_2008_3$orgnr)
611 antallaks <- unique(aksjer_2009_3$orgnr)
612 antallaks <- unique(aksjer_2010_3$orgnr)
613 antallaks <- unique(aksjer_2011_3$orgnr)
614 antallaks <- unique(aksjer_2012_3$orgnr)
615 antallaks <- unique(aksjer_2013_3$orgnr)
616 antallaks <- unique(aksjer_2014_3$orgnr)
617 antallaks <- unique(aksjer_2015_3$orgnr)
618 antallaks <- unique(aksjer_2016_3$orgnr)
619 antallaks <- unique(aksjer_2017_3$orgnr)
620 antallaks <- unique(aksjer_2018_3$orgnr)
621 antallaks <- unique(aksjer_2019_3$orgnr)
622 antallaks <- unique(aksjer_2020_3$orgnr)
623
624
625
```

```

626 ## Henter Risikofritt aktivum - NIBOR-renten ##
627 df2 <- read.csv("NIBOR-2000-2012.csv", skip = 6, header = TRUE, sep = ";", dec = ",")
628 df2 <- df2[, c(1, 5)]
629 names(df2) <- c("Date", "rf")
630 df2 <- df2[!is.na(df2$rf), ]
631 Year <- seq(as.Date("1986-01-01"), as.Date("2013-12-01"), by = "1 year")
632 year <- year - 1
633 df2$Date <- year
634
635 head(year)
636
637 ## year
638 year <- rev(year)
639 head(year)
640
641 df2$Date <- year
642 df2 <- df2[order(df2$Date), ]
643 df2$rf <- df2$rf/100
644
645
646 ## Neste periode ##
647 df3 <- read.csv("NIBOR-2013-2020-SSB.csv", skip = 0, header = FALSE, sep = ";", dec = ",")
648 names(df3) <- c("Date", "rf")
649 head(df3)
650
651
652 Year <- seq(as.Date("2013-01-01"), as.Date("2020-31-01"), by = "1 year")
653 year <- year - 1
654 df3$Date <- year
655
656 df3$rf <- df3$rf/100
657
658 range(df2$Date)
659 range(df3$Date)
660
661
662 ## Setter sammen aksjedata og risikofritt aktivum og beregner meravkastning ##
663 aksjer <- merge(aksjer, rf, by = "Date")
664 aksjer$RZ <- aksjer$R - aksjer$rf
665
666

```



```

662 ## Setter sammen aksjedata og risikofritt aktivum og beregner meravkastning ##
663 aksjer <- merge(aksjer, rf, by = "Date")
664 aksjer$R2 <- aksjer$R - aksjer$rf
665
666
667
668 ## Betautregning ##
669
670 ## betaberegningen i henhold til originale studiet - lager aksjer til long format og fører over ##
671 write.csv(aksjer, file = "Betaut")
672 betautregning1 <- read_excel("betaut1.xlsx", sheet = "beta")
673
674 beta.long <- melt(betautregning1, id.vars = "Date")
675 names(beta.long) <- c("Date", "SecurityID", "beta")
676 summary(beta.long)
677
678 ## fjerner verdier uten Beta #
679 beta.long <- beta.long[!is.na(beta.long$beta), ]
680 summary(beta.long$beta)
681
682 ## tilpasser dataframen til R #
683
684 beta.long$SecurityID <- gsub('R.', '', beta.long$SecurityID)
685 lapply(beta.long, class)
686
687 beta.long$Date <- as.Date(beta.long$Date, formate = "%m/%d/%Y") ## korrekt klasse på df
688 beta.long$SecurityID <- as.numeric(beta.long$SecurityID)
689 summary(beta.long)
690
691
692 ## her lager jeg en dataframe for å kunne lage en representativ markedsverdi og beta i utregningen av de individuelle kvalitetsmålene ##
693 r2 <- aksjer[, c(1,2,3,4,9)]
694 abc <- format(r2, format="%Y")
695 r2 <- transform(r2, aar = abc)
696 head(r2)
697
698 r1 <- r2[, c(1,2,3,4,5,6)]
699 head(r1)
700

```

```

700
701 colnames(r1) <- c("Date", "SecurityID", "SecurityName", "CompanyID", "MarketCap", "aar")
702 head(r1)
703
704 orgnrcom <- read_excel("OrgCom.xlsx") ## er for å kombinere aksje unike id-en til aksje og regnskapsdataen
705 orgnrcom <- orgnrcom[!is.na(orgnrcom$OrgNumber),]
706
707 orgnrcom <- read_csv("orgnrCom.csv.csv", header = T)
708 colnames(orgnrcom) <- c("CompanyID", "orgnr") ## orgnr er unik selskapsid for regnskapsdata og CompanyID er for aksjeprisdataen
709 head(orgnrcom)
710
711 r1 <- left_join(r1, orgnrcom, by = c("CompanyID" = "CompanyID")) ## merger de sammen
712
713 head(r1)
714 sapply(r1, class)
715 r1$aar <- as.integer(r1$aar) ## lager til riktig klasse
716
717 ## Tilpasse betaverdiene til regnskapstallene##
718 r1 <- left_join(r1, beta.long, by = c("SecurityID" = "SecurityID", "Date" = "Date"))
719 summary(r1$beta)
720
721 ## finner Årlig beta-tall som skal brukes i enkelte av de individuelle kvalitetsmålene ##
722 betal <- aggregate(beta ~ aar + CompanyID, r1, mean)
723
724 r1$aar <- as.numeric(r1$aar)
725 betal$aar <- as.numeric(betal$aar)
726 betal <- left_join(betal, r1[ c("orgnr", "aar", "CompanyID")], by = c("aar" = "aar", "CompanyID" = "CompanyID"))
727 summary(betal$beta)
728 head(betal)
729 betal$CompanyID <- NULL
730
731
732 ## fjerner årlige duplikater og etterlater bare 1 årlig verdi som brukes i de individuelle kvalitetsmål##
733 betal <- betal[!duplicated(betal[c('aar', 'orgnr')]),]
734
735 ## beta rangeres synkende ##
736 betal$beta <- -betal$beta
737
738

```

```

739 ## Koble markedsveredien til aksjekursene ##
740
741 head(aksjer)
742 aksjer <- left_join(aksjer, orgnrcom, by = c("CompanyID" = "CompanyID"))
743
744 ## For å få markedsverdi i regnskapsdataen - samme som med betaverdiene over ##
745
746 AksjedataMarketCap <- r1
747 head(AksjedataMarketCap)
748 MarketCap1 <- aggregate(MarketCap ~ aar + CompanyID, AksjedataMarketCap, mean)
749 MarketCap1 <- left_join(MarketCap1, AksjedataMarketCap[c("orgnr", "aar", "CompanyID")], by = c("aar" = "aar", "CompanyID" = "CompanyID"))
750 head(MarketCap1)
751 MarketCap1$CompanyID <- NULL
752 head(MarketCap1)
753 MarketCap1 <- MarketCap1[!duplicated(MarketCap1[c('aar', 'orgnr')]),]
754
755
756
757
758 ## Regnskapsdata - legger inn data ##
759
760 ### Trasfomerer DTA filer til R-filer, selskapsregnskap ###
761
762 ren_akjser_2000 <- read_dta("rskap_sel_2000.dta")
763 ren_akjser_2001 <- read_dta("rskap_sel_2001.dta")
764 ren_akjser_2002 <- read_dta("rskap_sel_2002.dta")
765 ren_akjser_2003 <- read_dta("rskap_sel_2003.dta")
766 ren_akjser_2004 <- read_dta("rskap0_sel_2004.dta")
767 ren_akjser_2005 <- read_dta("rskap_sel_2005.dta")
768 ren_akjser_2006 <- read_dta("rskap_sel_2006.dta")
769 ren_akjser_2007 <- read_dta("rskap_sel_2007.dta")
770 ren_akjser_2008 <- read_dta("rskap_sel_2008.dta")
771 ren_akjser_2009 <- read_dta("rskap_sel_2009.dta")
772 ren_akjser_2010 <- read_dta("rskap_sel_2010.dta")
773 ren_akjser_2011 <- read_dta("rskap_sel_2011.dta")
774 ren_akjser_2012 <- read_dta("rskap_sel_2012.dta")
775 ren_akjser_2013 <- read_dta("rskap_sel_2013.dta")
776 ren_akjser_2014 <- read_dta("rskap_sel_2014.dta")
777 ren_akjser_2015 <- read_dta("rskap_sel_2015.dta")
778 ren_akjser_2016 <- read_dta("rskap_sel_2016.dta")
779 ren_akjser_2017 <- read_dta("rskap_sel_2017.dta")

```

```
779 ren_akjser_2017 <- read_dta("rskap_sel_2017.dta")
780 ren_akjser_2018 <- read_dta("rskap_sel_2018.dta")
781 ren_akjser_2019 <- read_dta("rskap_sel_2019.dta")
782 ren_akjser_2020 <- read_dta("rskap_sel_2020.dta")
783
784
785 ## Aksjerregnskapsdata ##
786
787 ard_2000 <- read_dta("rskap0520_kon_2000.dta")
788 ard_2001 <- read_dta("rskap0520_kon_2001.dta")
789 ard_2002 <- read_dta("rskap0520_kon_2002.dta")
790 ard_2003 <- read_dta("rskap0520_kon_2003.dta")
791 ard_2004 <- read_dta("rskap0520_kon_2004.dta")
792 ard_2005 <- read_dta("rskap0520_kon_2005.dta")
793 ard_2006 <- read_dta("rskap0520_kon_2006.dta")
794 ard_2007 <- read_dta("rskap0520_kon_2007.dta")
795 ard_2008 <- read_dta("rskap0520_kon_2008.dta")
796 ard_2009 <- read_dta("rskap0520_kon_2009.dta")
797 ard_2010 <- read_dta("rskap0520_kon_2010.dta")
798 ard_2011 <- read_dta("rskap0520_kon_2011.dta")
799 ard_2012 <- read_dta("rskap0520_kon_2012.dta")
800 ard_2013 <- read_dta("rskap0520_kon_2013.dta")
801 ard_2014 <- read_dta("rskap0520_kon_2014.dta")
802 ard_2015 <- read_dta("rskap0520_kon_2015.dta")
803 ard_2016 <- read_dta("rskap0520_kon_2016.dta")
804 ard_2017 <- read_dta("rskap0520_kon_2017.dta")
805 ard_2018 <- read_dta("rskap0520_kon_2018.dta")
806 ard_2019 <- read_dta("rskap0520_kon_2019.dta")
807 ard_2020 <- read_dta("rskap0520_kon_2020.dta")
808
809
810 ## Henter ut selskapene ##
811
812 borsdata_2000_1 <- (for_2000[for_2000$bors_aks == 1,c(1,28)])
813 borsdata_2001_1 <- (for_2001[for_2001$bors_aks == 1,c(1,28)])
814 borsdata_2002_1 <- (for_2002[for_2002$bors_aks == 1,c(1,28)])
815 borsdata_2003_1 <- (for_2003[for_2003$bors_aks == 1,c(1,28)])
816 borsdata_2004_1 <- (for_2004[for_2004$bors_aks == 1,c(1,28)])
817 borsdata_2005_1 <- (for_2005[for_2005$bors_aks == 1,c(1,28)])
818 borsdata_2006_1 <- (for_2006[for_2006$bors_aks == 1,c(1,28)])
```

```
818 borsdata_2006_1 <- (for_2006[for_2006$bors_aks == 1,c(1,28)])
819 borsdata_2007_1 <- (for_2007[for_2007$bors_aks == 1,c(1,28)])
820 borsdata_2008_1 <- (for_2008[for_2008$bors_aks == 1,c(1,28)])
821 borsdata_2009_1 <- (for_2009[for_2009$bors_aks == 1,c(1,28)])
822 borsdata_2010_1 <- (for_2010[for_2010$bors_aks == 1,c(1,28)])
823 borsdata_2011_1 <- (for_2011[for_2011$bors_aks == 1,c(1,28)])
824 borsdata_2012_1 <- (for_2012[for_2012$bors_aks == 1,c(1,28)])
825 borsdata_2013_1 <- (for_2013[for_2013$bors_aks == 1,c(1,28)])
826 borsdata_2014_1 <- (for_2014[for_2014$bors_aks == 1,c(1,28)])
827 borsdata_2015_1 <- (for_2015[for_2015$bors_aks == 1,c(1,28)])
828 borsdata_2016_1 <- (for_2016[for_2016$bors_aks == 1,c(1,28)])
829 borsdata_2017_1 <- (for_2017[for_2017$bors_aks == 1,c(1,28)])
830 borsdata_2018_1 <- (for_2018[for_2018$bors_aks == 1,c(1,28)])
831 borsdata_2019_1 <- (for_2019[for_2019$bors_aks == 1,c(1,28)])
832 borsdata_2020_1 <- (for_2020[for_2020$bors_aks == 1,c(1,28)])
833
834
835 ## fjerner NA's, feilverdier og tommeverdier ##
836
837 borsdata_2000 <- na.omit(borsdata_2000_1)
838 borsdata_2001 <- na.omit(borsdata_2001_1)
839 borsdata_2002 <- na.omit(borsdata_2002_1)
840 borsdata_2003 <- na.omit(borsdata_2003_1)
841 borsdata_2004 <- na.omit(borsdata_2004_1)
842 borsdata_2005 <- na.omit(borsdata_2005_1)
843 borsdata_2006 <- na.omit(borsdata_2006_1)
844 borsdata_2007 <- na.omit(borsdata_2007_1)
845 borsdata_2008 <- na.omit(borsdata_2008_1)
846 borsdata_2009 <- na.omit(borsdata_2009_1)
847 borsdata_2010 <- na.omit(borsdata_2010_1)
848 borsdata_2011 <- na.omit(borsdata_2011_1)
849 borsdata_2012 <- na.omit(borsdata_2012_1)
850 borsdata_2013 <- na.omit(borsdata_2013_1)
851 borsdata_2014 <- na.omit(borsdata_2014_1)
852 borsdata_2015 <- na.omit(borsdata_2015_1)
853 borsdata_2016 <- na.omit(borsdata_2016_1)
854 borsdata_2017 <- na.omit(borsdata_2017_1)
855 borsdata_2018 <- na.omit(borsdata_2018_1)
856 borsdata_2019 <- na.omit(borsdata_2019_1)
857 borsdata_2020 <- na.omit(borsdata_2020_1)
```

```
857 borsdata_2020 <- na.omit(borsdata_2020_1)
858
859
860 ### Slår sammen dataene ###
861
862 ren_2000 <- merge(ren_akjser_2000,borsdata_2000_1, by="orgnr")
863 ren_2001 <- merge(ren_akjser_2001,borsdata_2001_1, by="orgnr")
864 ren_2002 <- merge(ren_akjserl_2002,borsdata_2002_1, by="orgnr")
865 ren_2003 <- merge(ren_akjser_2003,borsdata_2003_1, by="orgnr")
866 ren_2004 <- merge(ren_akjserl_2004,borsdata_2004_1, by="orgnr")
867 ren_2005 <- merge(ren_akjser_2005,borsdata_2005_1, by="orgnr")
868 ren_2006 <- merge(ren_akjserl_2006,borsdata_2006_1, by="orgnr")
869 ren_2007 <- merge(ren_akjser_2007,borsdata_2007_1, by="orgnr")
870 ren_2008 <- merge(ren_akjserl_2008,borsdata_2008_1, by="orgnr")
871 ren_2009 <- merge(ren_akjser_2009,borsdata_2009_1, by="orgnr")
872 ren_2010 <- merge(ren_akjser_2010,borsdata_2010_1, by="orgnr")
873 ren_2011 <- merge(ren_akjser_2011,borsdata_2011_1, by="orgnr")
874 ren_2012 <- merge(ren_akjser_2012,borsdata_2012_1, by="orgnr")
875 ren_2013 <- merge(ren_akjser_2013,borsdata_2013_1, by="orgnr")
876 ren_2014 <- merge(ren_akjser_2014,borsdata_2014_1, by="orgnr")
877 ren_2015 <- merge(ren_akjser_2015,borsdata_2015_1, by="orgnr")
878 ren_2016 <- merge(ren_akjser_2016,borsdata_2016_1, by="orgnr")
879 ren_2017 <- merge(ren_akjser_2017,borsdata_2017_1, by="orgnr")
880 ren_2018 <- merge(ren_akjser_2018,borsdata_2018_1, by="orgnr")
881 ren_2019 <- merge(ren_akjser_2019,borsdata_2019_1, by="orgnr")
882 ren_2020 <- merge(ren_akjser_2020,borsdata_2020_1, by="orgnr")
883
884
885 kon_2000 <- merge(ard_2000,borsdata_2000_1, by="orgnr")
886 kon_2001 <- merge(ard_2001,borsdata_2001_1, by="orgnr")
887 kon_2002 <- merge(ard_2002,borsdata_2002_1, by="orgnr")
888 kon_2003 <- merge(ard_2003,borsdata_2003_1, by="orgnr")
889 kon_2004 <- merge(ard_2004,borsdata_2004_1, by="orgnr")
890 kon_2005 <- merge(ard_2005,borsdata_2005_1, by="orgnr")
891 kon_2006 <- merge(ard_2006,borsdata_2006_1, by="orgnr")
892 kon_2007 <- merge(ard_2007,borsdata_2007_1, by="orgnr")
893 kon_2008 <- merge(ard_2008,borsdata_2008_1, by="orgnr")
894 kon_2009 <- merge(ard_2009,borsdata_2009_1, by="orgnr")
895 kon_2010 <- merge(ard_2010,borsdata_2010_1, by="orgnr")
```

```
895 kon_2010 <- merge(ard_2010,borsdata_2010_1, by="orgnr")
896 kon_2011 <- merge(ard_2011,borsdata_2011_1, by="orgnr")
897 kon_2012 <- merge(ard_2012,borsdata_2012_1, by="orgnr")
898 kon_2013 <- merge(ard_2013,borsdata_2013_1, by="orgnr")
899 kon_2014 <- merge(ard_2014,borsdata_2014_1, by="orgnr")
900 kon_2015 <- merge(ard_2015,borsdata_2015_1, by="orgnr")
901 kon_2016 <- merge(ard_2016,borsdata_2016_1, by="orgnr")
902 kon_2017 <- merge(ard_2017,borsdata_2017_1, by="orgnr")
903 kon_2018 <- merge(ard_2018,borsdata_2018_1, by="orgnr")
904 kon_2019 <- merge(ard_2019,borsdata_2019_1, by="orgnr")
905 kon_2020 <- merge(ard_2020,borsdata_2020_1, by="orgnr")
906
907 # videre setter jeg de to sammenslåtte til en"
908
909 kon_ren_2000 <- merge(kon_2000,ren_2000, by="orgnr", all.x = T, all.y = T)
910 kon_ren_2001 <- merge(kon_2001,ren_2001, by="orgnr", all.x = T, all.y = T)
911 kon_ren_2002 <- merge(kon_2002,ren_2002, by="orgnr", all.x = T, all.y = T)
912 kon_ren_2003 <- merge(kon_2003,ren_2003, by="orgnr", all.x = T, all.y = T)
913 kon_ren_2004 <- merge(kon_2004,ren_2004, by="orgnr", all.x = T, all.y = T)
914 kon_ren_2005 <- merge(kon_2005,ren_2005, by="orgnr", all.x = T, all.y = T)
915 kon_ren_2006 <- merge(kon_2006,ren_2006, by="orgnr", all.x = T, all.y = T)
916 kon_ren_2007 <- merge(kon_2007,ren_2007, by="orgnr", all.x = T, all.y = T)
917 kon_ren_2008 <- merge(kon_2008,ren_2008, by="orgnr", all.x = T, all.y = T)
918 kon_ren_2009 <- merge(kon_2009,ren_2009, by="orgnr", all.x = T, all.y = T)
919 kon_ren_2010 <- merge(kon_2010,ren_2010, by="orgnr", all.x = T, all.y = T)
920 kon_ren_2011 <- merge(kon_2011,ren_2011, by="orgnr", all.x = T, all.y = T)
921 kon_ren_2012 <- merge(kon_2012,ren_2012, by="orgnr", all.x = T, all.y = T)
922 kon_ren_2013 <- merge(kon_2013,ren_2013, by="orgnr", all.x = T, all.y = T)
923 kon_ren_2014 <- merge(kon_2014,ren_2014, by="orgnr", all.x = T, all.y = T)
924 kon_ren_2015 <- merge(kon_2015,ren_2015, by="orgnr", all.x = T, all.y = T)
925 kon_ren_2016 <- merge(kon_2016,ren_2016, by="orgnr", all.x = T, all.y = T)
926 kon_ren_2017 <- merge(kon_2017,ren_2017, by="orgnr", all.x = T, all.y = T)
927 kon_ren_2018 <- merge(kon_2018,ren_2018, by="orgnr", all.x = T, all.y = T)
928 kon_ren_2019 <- merge(kon_2019,ren_2019, by="orgnr", all.x = T, all.y = T)
929 kon_ren_2020 <- merge(kon_2020,ren_2020, by="orgnr", all.x = T, all.y = T)
930
931
```

```
932 kon1_2000 <- kon_2000
933 kon1_2001 <- kon_2001
934 kon1_2002 <- kon_2002
935 kon1_2003 <- kon_2003
936 kon1_2004 <- kon_2004
937 kon1_2005 <- kon_2005
938 kon1_2006 <- kon_2006
939 kon1_2007 <- kon_2007
940 kon1_2008 <- kon_2008
941 kon1_2009 <- kon_2009
942 kon1_2010 <- kon_2010
943 kon1_2011 <- kon_2011
944 kon1_2012 <- kon_2012
945 kon1_2013 <- kon_2013
946 kon1_2014 <- kon_2014
947 kon1_2015 <- kon_2015
948 kon1_2016 <- kon_2016
949 kon1_2017 <- kon_2017
950 kon1_2018 <- kon_2018
951 kon1_2019 <- kon_2019
952 kon1_2020 <- kon_2020
953
954
955 ## ta ut de som ikke matcher ##
956
957 ren1_2000 <- anti_join(ren_2000, kon1_2000, by = "orgnr")
958 ren1_2001 <- anti_join(ren_2001, kon1_2001, by = "orgnr")
959 ren1_2002 <- anti_join(ren_2002, kon1_2002, by = "orgnr")
960 ren1_2003 <- anti_join(ren_2003, kon1_2003, by = "orgnr")
961 ren1_2004 <- anti_join(ren_2004, kon1_2004, by = "orgnr")
962 ren1_2005 <- anti_join(ren_2005, kon1_2005, by = "orgnr")
963 ren1_2006 <- anti_join(ren_2006, kon1_2006, by = "orgnr")
964 ren1_2007 <- anti_join(ren_2007, kon1_2007, by = "orgnr")
965 ren1_2008 <- anti_join(ren_2008, kon1_2008, by = "orgnr")
966 ren1_2009 <- anti_join(ren_2009, kon1_2009, by = "orgnr")
967 ren1_2010 <- anti_join(ren_2010, kon1_2010, by = "orgnr")
968 ren1_2011 <- anti_join(ren_2011, kon1_2011, by = "orgnr")
969 ren1_2012 <- anti_join(ren_2012, kon1_2012, by = "orgnr")
970 ren1_2013 <- anti_join(ren_2013, kon1_2013, by = "orgnr")
971 ren1_2014 <- anti_join(ren_2014, kon1_2014, by = "orgnr")
972 ren1_2015 <- anti_join(ren_2015, kon1_2015, by = "orgnr")
973 ren1_2016 <- anti_join(ren_2016, kon1_2016, by = "orgnr")
```



```
973 ren1_2016 <- anti_join(ren_2016, kon1_2016, by = "orgnr")
974 ren1_2017 <- anti_join(ren_2017, kon1_2017, by = "orgnr")
975 ren1_2018 <- anti_join(ren_2018, kon1_2018, by = "orgnr")
976 ren1_2019 <- anti_join(ren_2019, kon1_2019, by = "orgnr")
977 ren1_2020 <- anti_join(ren_2020, kon1_2020, by = "orgnr")
978
979 ## Loader data ##
980
981 load("regnskapsdata2000_1.Rda")
982 load("regnskapsdata2001_1.Rda")
983 load("regnskapsdata2002_1.Rda")
984 load("regnskapsdata2003_1.Rda")
985 load("regnskapsdata2004_1.Rda")
986 load("regnskapsdata2005_1.Rda")
987 load("regnskapsdata2006_1.Rda")
988 load("regnskapsdata2007_1.Rda")
989 load("regnskapsdata2008_1.Rda")
990 load("regnskapsdata2009_1.Rda")
991 load("regnskapsdata2010_1.Rda")
992 load("regnskapsdata2011_1.Rda")
993 load("regnskapsdata2012_1.Rda")
994 load("regnskapsdata2013_1.Rda")
995 load("regnskapsdata2014_1.Rda")
996 load("regnskapsdata2015_1.Rda")
997 load("regnskapsdata2016_1.Rda")
998 load("regnskapsdata2017_1.Rda")
999 load("regnskapsdata2018_1.Rda")
1000 load("regnskapsdata2019_1.Rda")
1001 load("regnskapsdata2020_1.Rda")
1002
1003
1004 load("aksjedata2000.Rda")
1005 load("aksjedata2001.Rda")
1006 load("aksjedata2002.Rda")
1007 load("aksjedata2003.Rda")
1008 load("aksjedata2004.Rda")
1009 load("aksjedata2005.Rda")
1010 load("aksjedata2006.Rda")
1011 load("aksjedata2007.Rda")
1012 load("aksjedata2008.Rda")
```

```
1012 load("aksjedata2008.Rda")
1013 load("aksjedata2009.Rda")
1014 load("aksjedata2010.Rda")
1015 load("aksjedata2011.Rda")
1016 load("aksjedata2012.Rda")
1017 load("aksjedata2013.Rda")
1018 load("aksjedata2014.Rda")
1019 load("aksjedata2015.Rda")
1020 load("aksjedata2016.Rda")
1021 load("aksjedata2017.Rda")
1022 load("aksjedata2018.Rda")
1023 load("aksjedata2019.Rda")
1024 load("aksjedata2020.Rda")
1025
1026
1027
1028 ## Lager dataframe av den relevante regnskapsdataen ##
1029
1030 r_2000 <- rbind(ren1_2000, kon1_2000)
1031 r_2001 <- rbind(ren1_2001, kon1_2001)
1032 r_2002 <- rbind(ren1_2002, kon1_2002)
1033 r_2003 <- rbind(ren1_2003, kon1_2003)
1034 r_2004 <- rbind(ren1_2004, kon1_2004)
1035 r_2005 <- rbind(ren1_2005, kon1_2005)
1036 r_2006 <- rbind(ren1_2006, kon1_2006)
1037 r_2007 <- rbind(ren1_2007, kon1_2007)
1038 r_2008 <- rbind(ren1_2008, kon1_2008)
1039 r_2009 <- rbind(ren1_2009, kon1_2009)
1040 r_2010 <- rbind(ren1_2010, kon1_2010)
1041 r_2011 <- rbind(ren1_2011, kon1_2011)
1042 r_2012 <- rbind(ren1_2012, kon1_2012)
1043 r_2013 <- rbind(ren1_2013, kon1_2013)
1044 r_2014 <- rbind(ren1_2014, kon1_2014)
1045 r_2015 <- rbind(ren1_2015, kon1_2015)
1046 r_2016 <- rbind(ren1_2016, kon1_2016)
1047 r_2017 <- rbind(ren1_2017, kon1_2017)
1048 r_2018 <- rbind(ren1_2018, kon1_2018)
1049 r_2019 <- rbind(ren1_2019, kon1_2019)
1050 r_2020 <- rbind(ren1_2020, kon1_2020)
1051
```

```
1052 ## legge ved marketcap og betaverdier i regnskapsdataen til senere utregninger ##
1053 r_2000 <- left_join(r_2000, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1054 r_2001 <- left_join(r_2001, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1055 r_2002 <- left_join(r_2002, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1056 r_2003 <- left_join(r_2003, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1057 r_2004 <- left_join(r_2004, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1058 r_2005 <- left_join(r_2005, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1059 r_2006 <- left_join(r_2006, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1060 r_2007 <- left_join(r_2007, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1061 r_2008 <- left_join(r_2008, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1062 r_2009 <- left_join(r_2009, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1063 r_2010 <- left_join(r_2010, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1064 r_2011 <- left_join(r_2011, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1065 r_2012 <- left_join(r_2012, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1066 r_2013 <- left_join(r_2013, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1067 r_2014 <- left_join(r_2014, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1068 r_2015 <- left_join(r_2015, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1069 r_2016 <- left_join(r_2016, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1070 r_2017 <- left_join(r_2017, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1071 r_2018 <- left_join(r_2018, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1072 r_2019 <- left_join(r_2019, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1073 r_2020 <- left_join(r_2020, MarketCap1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1074
1075
1076
1077 r_2000 <- left_join(r_2000, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1078 r_2001 <- left_join(r_2001, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1079 r_2002 <- left_join(r_2002, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1080 r_2003 <- left_join(r_2003, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1081 r_2004 <- left_join(r_2004, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1082 r_2005 <- left_join(r_2005, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1083 r_2006 <- left_join(r_2006, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1084 r_2007 <- left_join(r_2007, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1085 r_2008 <- left_join(r_2008, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1086 r_2009 <- left_join(r_2009, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1087 r_2010 <- left_join(r_2010, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1088 r_2011 <- left_join(r_2011, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1089 r_2012 <- left_join(r_2012, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1090 r_2013 <- left_join(r_2013, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1091 r_2014 <- left_join(r_2014, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1092 r_2015 <- left_join(r_2015, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1093 r_2016 <- left_join(r_2016, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
```

```
1093 r_2016 <- left_join(r_2016, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1094 r_2017 <- left_join(r_2017, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1095 r_2018 <- left_join(r_2018, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1096 r_2019 <- left_join(r_2019, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1097 r_2020 <- left_join(r_2020, beta1, by = c("aar" = "aar", "orgnr" = "orgnr"))
1098
1099
1100
1101 ## Legge ved KPI verdier (KPI - basis 2015) ##
1102 kpi <- read_excel("kpi.xlsx")
1103
1104 kpi <- kpi[-1, c(1,2) ]
1105 colnames(kpi) <- c("aar", "kpi")
1106 kpi$kpi <- gsub(',', '.', kpi$kpi)
1107 kpi$kpi <- as.numeric(kpi$kpi)
1108 class(kpi$kpi)
1109 head(kpi)
1110 r_2000 <- left_join(r_2000, kpi, by = c("aar" = "aar"))
1111 r_2001 <- left_join(r_2001, kpi, by = c("aar" = "aar"))
1112 r_2002 <- left_join(r_2002, kpi, by = c("aar" = "aar"))
1113 r_2003 <- left_join(r_2003, kpi, by = c("aar" = "aar"))
1114 r_2004 <- left_join(r_2004, kpi, by = c("aar" = "aar"))
1115 r_2005 <- left_join(r_2005, kpi, by = c("aar" = "aar"))
1116 r_2006 <- left_join(r_2006, kpi, by = c("aar" = "aar"))
1117 r_2007 <- left_join(r_2007, kpi, by = c("aar" = "aar"))
1118 r_2008 <- left_join(r_2008, kpi, by = c("aar" = "aar"))
1119 r_2009 <- left_join(r_2009, kpi, by = c("aar" = "aar"))
1120 r_2010 <- left_join(r_2010, kpi, by = c("aar" = "aar"))
1121 r_2011 <- left_join(r_2011, kpi, by = c("aar" = "aar"))
1122 r_2012 <- left_join(r_2012, kpi, by = c("aar" = "aar"))
1123 r_2013 <- left_join(r_2013, kpi, by = c("aar" = "aar"))
1124 r_2014 <- left_join(r_2014, kpi, by = c("aar" = "aar"))
1125 r_2015 <- left_join(r_2015, kpi, by = c("aar" = "aar"))
1126 r_2016 <- left_join(r_2016, kpi, by = c("aar" = "aar"))
1127 r_2017 <- left_join(r_2017, kpi, by = c("aar" = "aar"))
1128 r_2018 <- left_join(r_2018, kpi, by = c("aar" = "aar"))
1129 r_2019 <- left_join(r_2019, kpi, by = c("aar" = "aar"))
1130 r_2020 <- left_join(r_2020, kpi, by = c("aar" = "aar"))
1131
```

```
1133 ## her Lager jeg variabler brukt i beregningen av kvalitetsmalene
1134
1135 ## Dummyvariabel ONEG ##
1136
1137
1138 r_2000$ONEG <- ifelse(r_2000$gjeld > r_2000$sumeiend, 1,0)
1139 r_2001$ONEG <- ifelse(r_2001$gjeld > r_2001$sumeiend, 1,0)
1140 r_2002$ONEG <- ifelse(r_2002$gjeld > r_2002$sumeiend, 1,0)
1141 r_2003$ONEG <- ifelse(r_2003$gjeld > r_2003$sumeiend, 1,0)
1142 r_2004$ONEG <- ifelse(r_2004$gjeld > r_2004$sumeiend, 1,0)
1143 r_2005$ONEG <- ifelse(r_2005$gjeld > r_2005$sumeiend, 1,0)
1144 r_2006$ONEG <- ifelse(r_2006$gjeld > r_2006$sumeiend, 1,0)
1145 r_2007$ONEG <- ifelse(r_2007$gjeld > r_2007$sumeiend, 1,0)
1146 r_2008$ONEG <- ifelse(r_2008$gjeld > r_2008$sumeiend, 1,0)
1147 r_2009$ONEG <- ifelse(r_2009$gjeld > r_2009$sumeiend, 1,0)
1148 r_2010$ONEG <- ifelse(r_2010$gjeld > r_2010$sumeiend, 1,0)
1149 r_2011$ONEG <- ifelse(r_2011$gjeld > r_2011$sumeiend, 1,0)
1150 r_2012$ONEG <- ifelse(r_2012$gjeld > r_2012$sumeiend, 1,0)
1151 r_2013$ONEG <- ifelse(r_2013$gjeld > r_2013$sumeiend, 1,0)
1152 r_2014$ONEG <- ifelse(r_2014$gjeld > r_2014$sumeiend, 1,0)
1153 r_2015$ONEG <- ifelse(r_2015$gjeld > r_2015$sumeiend, 1,0)
1154 r_2016$ONEG <- ifelse(r_2016$gjeld > r_2016$sumeiend, 1,0)
1155 r_2017$ONEG <- ifelse(r_2017$gjeld > r_2017$sumeiend, 1,0)
1156 r_2018$ONEG <- ifelse(r_2018$gjeld > r_2018$sumeiend, 1,0)
1157 r_2019$ONEG <- ifelse(r_2019$gjeld > r_2019$sumeiend, 1,0)
1158 r_2020$ONEG <- ifelse(r_2020$gjeld > r_2020$sumeiend, 1,0)
1159
1160 ### Lage INTWO dummyvariabel til 0 score###
1161
1162 intwo_2000 <- r_2000
1163 intwo_2001 <- r_2001
1164 intwo_2002 <- r_2002
1165 intwo_2003 <- r_2003
1166 intwo_2004 <- r_2004
1167 intwo_2005 <- r_2005
1168 intwo_2006 <- r_2006
1169 intwo_2007 <- r_2007
1170 intwo_2008 <- r_2008
1171 intwo_2009 <- r_2009
1172 intwo_2010 <- r_2010
1173 intwo_2011 <- r_2011
1174 intwo_2012 <- r_2012
```

```
1174 intwo_2012 <- r_2012
1175 intwo_2013 <- r_2013
1176 intwo_2014 <- r_2014
1177 intwo_2015 <- r_2015
1178 intwo_2016 <- r_2016
1179 intwo_2017 <- r_2017
1180 intwo_2018 <- r_2018
1181 intwo_2019 <- r_2019
1182 intwo_2020 <- r_2020
1183
1184 intwo_2000 <- merge(intwo_2000, r_1999[ , c("orgnr", "aarsrs" )], by = "orgnr")
1185 intwo_2001 <- merge(intwo_2001, r_2000[ , c("orgnr", "aarsrs" )], by = "orgnr")
1186 intwo_2002 <- merge(intwo_2002, r_2001[ , c("orgnr", "aarsrs" )], by = "orgnr")
1187 intwo_2003 <- merge(intwo_2003, r_2002[ , c("orgnr", "aarsrs" )], by = "orgnr")
1188 intwo_2004 <- merge(intwo_2004, r_2003[ , c("orgnr", "aarsrs" )], by = "orgnr")
1189 intwo_2005 <- merge(intwo_2005, r_2004[ , c("orgnr", "aarsrs" )], by = "orgnr")
1190 intwo_2006 <- merge(intwo_2006, r_2005[ , c("orgnr", "aarsrs" )], by = "orgnr")
1191 intwo_2007 <- merge(intwo_2007, r_2006[ , c("orgnr", "aarsrs" )], by = "orgnr")
1192 intwo_2008 <- merge(intwo_2008, r_2007[ , c("orgnr", "aarsrs" )], by = "orgnr")
1193 intwo_2009 <- merge(intwo_2009, r_2008[ , c("orgnr", "aarsrs" )], by = "orgnr")
1194 intwo_2010 <- merge(intwo_2010, r_2009[ , c("orgnr", "aarsrs" )], by = "orgnr")
1195 intwo_2011 <- merge(intwo_2011, r_2010[ , c("orgnr", "aarsrs" )], by = "orgnr")
1196 intwo_2012 <- merge(intwo_2012, r_2011[ , c("orgnr", "aarsrs" )], by = "orgnr")
1197 intwo_2013 <- merge(intwo_2013, r_2012[ , c("orgnr", "aarsrs" )], by = "orgnr")
1198 intwo_2014 <- merge(intwo_2014, r_2013[ , c("orgnr", "aarsrs" )], by = "orgnr")
1199 intwo_2015 <- merge(intwo_2015, r_2014[ , c("orgnr", "aarsrs" )], by = "orgnr")
1200 intwo_2016 <- merge(intwo_2016, r_2015[ , c("orgnr", "aarsrs" )], by = "orgnr")
1201 intwo_2017 <- merge(intwo_2017, r_2016[ , c("orgnr", "aarsrs" )], by = "orgnr")
1202 intwo_2018 <- merge(intwo_2018, r_2017[ , c("orgnr", "aarsrs" )], by = "orgnr")
1203 intwo_2019 <- merge(intwo_2019, r_2019[ , c("orgnr", "aarsrs" )], by = "orgnr")
1204 intwo_2020 <- merge(intwo_2020, r_2020[ , c("orgnr", "aarsrs" )], by = "orgnr")
1205
1206 intwo_2000$INTWO1 <- ifelse(intwo_2000$aarsrs.x < 0, 1, 0)
1207 intwo_2001$INTWO1 <- ifelse(intwo_2001$aarsrs.x < 0, 1, 0)
1208 intwo_2002$INTWO1 <- ifelse(intwo_2002$aarsrs.x < 0, 1, 0)
1209 intwo_2003$INTWO1 <- ifelse(intwo_2003$aarsrs.x < 0, 1, 0)
1210 intwo_2004$INTWO1 <- ifelse(intwo_2004$aarsrs.x < 0, 1, 0)
1211 intwo_2005$INTWO1 <- ifelse(intwo_2005$aarsrs.x < 0, 1, 0)
1212 intwo_2006$INTWO1 <- ifelse(intwo_2006$aarsrs.x < 0, 1, 0)
1213 intwo_2007$INTWO1 <- ifelse(intwo_2007$aarsrs.x < 0, 1, 0)
```

```
1213 intwo_2007$INTWO1 <- ifelse(intwo_2007$aarsrs.x < 0, 1, 0)
1214 intwo_2008$INTWO1 <- ifelse(intwo_2008$aarsrs.x < 0, 1, 0)
1215 intwo_2009$INTWO1 <- ifelse(intwo_2009$aarsrs.x < 0, 1, 0)
1216 intwo_2010$INTWO1 <- ifelse(intwo_2010$aarsrs.x < 0, 1, 0)
1217 intwo_2011$INTWO1 <- ifelse(intwo_2011$aarsrs.x < 0, 1, 0)
1218 intwo_2012$INTWO1 <- ifelse(intwo_2012$aarsrs.x < 0, 1, 0)
1219 intwo_2013$INTWO1 <- ifelse(intwo_2013$aarsrs.x < 0, 1, 0)
1220 intwo_2014$INTWO1 <- ifelse(intwo_2014$aarsrs.x < 0, 1, 0)
1221 intwo_2015$INTWO1 <- ifelse(intwo_2015$aarsrs.x < 0, 1, 0)
1222 intwo_2016$INTWO1 <- ifelse(intwo_2016$aarsrs.x < 0, 1, 0)
1223 intwo_2017$INTWO1 <- ifelse(intwo_2017$aarsrs.x < 0, 1, 0)
1224 intwo_2018$INTWO1 <- ifelse(intwo_2018$aarsrs.x < 0, 1, 0)
1225 intwo_2019$INTWO1 <- ifelse(intwo_2019$aarsrs.x < 0, 1, 0)
1226 intwo_2020$INTWO1 <- ifelse(intwo_2020$aarsrs.x < 0, 1, 0)
1227
1228 intwo_2000$INTWO2 <- ifelse(intwo_2000$aarsrs.y < 0, 1, 0)
1229 intwo_2001$INTWO2 <- ifelse(intwo_2001$aarsrs.y < 0, 1, 0)
1230 intwo_2002$INTWO2 <- ifelse(intwo_2002$aarsrs.y < 0, 1, 0)
1231 intwo_2003$INTWO2 <- ifelse(intwo_2003$aarsrs.y < 0, 1, 0)
1232 intwo_2004$INTWO2 <- ifelse(intwo_2004$aarsrs.y < 0, 1, 0)
1233 intwo_2005$INTWO2 <- ifelse(intwo_2005$aarsrs.y < 0, 1, 0)
1234 intwo_2006$INTWO2 <- ifelse(intwo_2006$aarsrs.y < 0, 1, 0)
1235 intwo_2007$INTWO2 <- ifelse(intwo_2007$aarsrs.y < 0, 1, 0)
1236 intwo_2008$INTWO2 <- ifelse(intwo_2008$aarsrs.y < 0, 1, 0)
1237 intwo_2009$INTWO2 <- ifelse(intwo_2009$aarsrs.y < 0, 1, 0)
1238 intwo_2010$INTWO2 <- ifelse(intwo_2010$aarsrs.y < 0, 1, 0)
1239 intwo_2011$INTWO2 <- ifelse(intwo_2011$aarsrs.y < 0, 1, 0)
1240 intwo_2012$INTWO2 <- ifelse(intwo_2012$aarsrs.y < 0, 1, 0)
1241 intwo_2013$INTWO2 <- ifelse(intwo_2013$aarsrs.y < 0, 1, 0)
1242 intwo_2014$INTWO2 <- ifelse(intwo_2014$aarsrs.y < 0, 1, 0)
1243 intwo_2015$INTWO2 <- ifelse(intwo_2015$aarsrs.y < 0, 1, 0)
1244 intwo_2016$INTWO2 <- ifelse(intwo_2016$aarsrs.y < 0, 1, 0)
1245 intwo_2017$INTWO2 <- ifelse(intwo_2017$aarsrs.y < 0, 1, 0)
1246 intwo_2018$INTWO2 <- ifelse(intwo_2018$aarsrs.y < 0, 1, 0)
1247 intwo_2019$INTWO2 <- ifelse(intwo_2019$aarsrs.y < 0, 1, 0)
1248 intwo_2020$INTWO2 <- ifelse(intwo_2020$aarsrs.y < 0, 1, 0)
1249
1250 intwo_2000$INTWO <- ifelse((intwo_2000$INTWO1 + intwo_2000$INTWO2) > 0, 1, 0)
1251 intwo_2001$INTWO <- ifelse((intwo_2001$INTWO1 + intwo_2001$INTWO2) > 0, 1, 0)
1252 intwo_2002$INTWO <- ifelse((intwo_2002$INTWO1 + intwo_2002$INTWO2) > 0, 1, 0)
```

```
1252 intwo_2002$INTWO <- ifelse((intwo_2002$INTWO1 + intwo_2002$INTWO2) > 0, 1, 0)
1253 intwo_2003$INTWO <- ifelse((intwo_2003$INTWO1 + intwo_2003$INTWO2) > 0, 1, 0)
1254 intwo_2004$INTWO <- ifelse((intwo_2004$INTWO1 + intwo_2004$INTWO2) > 0, 1, 0)
1255 intwo_2005$INTWO <- ifelse((intwo_2005$INTWO1 + intwo_2005$INTWO2) > 0, 1, 0)
1256 intwo_2006$INTWO <- ifelse((intwo_2006$INTWO1 + intwo_2006$INTWO2) > 0, 1, 0)
1257 intwo_2007$INTWO <- ifelse((intwo_2007$INTWO1 + intwo_2007$INTWO2) > 0, 1, 0)
1258 intwo_2008$INTWO <- ifelse((intwo_2008$INTWO1 + intwo_2008$INTWO2) > 0, 1, 0)
1259 intwo_2009$INTWO <- ifelse((intwo_2009$INTWO1 + intwo_2009$INTWO2) > 0, 1, 0)
1260 intwo_2010$INTWO <- ifelse((intwo_2010$INTWO1 + intwo_2010$INTWO2) > 0, 1, 0)
1261 intwo_2011$INTWO <- ifelse((intwo_2011$INTWO1 + intwo_2011$INTWO2) > 0, 1, 0)
1262 intwo_2012$INTWO <- ifelse((intwo_2012$INTWO1 + intwo_2012$INTWO2) > 0, 1, 0)
1263 intwo_2013$INTWO <- ifelse((intwo_2013$INTWO1 + intwo_2013$INTWO2) > 0, 1, 0)
1264 intwo_2014$INTWO <- ifelse((intwo_2014$INTWO1 + intwo_2014$INTWO2) > 0, 1, 0)
1265 intwo_2015$INTWO <- ifelse((intwo_2015$INTWO1 + intwo_2015$INTWO2) > 0, 1, 0)
1266 intwo_2016$INTWO <- ifelse((intwo_2016$INTWO1 + intwo_2016$INTWO2) > 0, 1, 0)
1267 intwo_2017$INTWO <- ifelse((intwo_2017$INTWO1 + intwo_2017$INTWO2) > 0, 1, 0)
1268 intwo_2018$INTWO <- ifelse((intwo_2018$INTWO1 + intwo_2018$INTWO2) > 0, 1, 0)
1269 intwo_2019$INTWO <- ifelse((intwo_2019$INTWO1 + intwo_2019$INTWO2) > 0, 1, 0)
1270 intwo_2020$INTWO <- ifelse((intwo_2020$INTWO1 + intwo_2020$INTWO2) > 0, 1, 0)
1271
1272
1273 r_2000 <- merge(r_2000, intwo_2000[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1274 r_2001 <- merge(r_2001, intwo_2001[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1275 r_2002 <- merge(r_2002, intwo_2002[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1276 r_2003 <- merge(r_2003, intwo_2003[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1277 r_2004 <- merge(r_2004, intwo_2004[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1278 r_2005 <- merge(r_2005, intwo_2005[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1279 r_2006 <- merge(r_2006, intwo_2006[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1280 r_2007 <- merge(r_2007, intwo_2007[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1281 r_2008 <- merge(r_2008, intwo_2008[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1282 r_2009 <- merge(r_2009, intwo_2009[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1283 r_2010 <- merge(r_2010, intwo_2010[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1284 r_2011 <- merge(r_2011, intwo_2011[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1285 r_2012 <- merge(r_2012, intwo_2012[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1286 r_2013 <- merge(r_2013, intwo_2013[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1287 r_2014 <- merge(r_2014, intwo_2014[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1288 r_2015 <- merge(r_2015, intwo_2015[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1289 r_2016 <- merge(r_2016, intwo_2016[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1290 r_2017 <- merge(r_2017, intwo_2017[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1291 r_2018 <- merge(r_2018, intwo_2018[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
```



```
1292 r_2019 <- merge(r_2019, intwo_2019[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1293 r_2020 <- merge(r_2020, intwo_2020[, c("orgnr", "INTWO")], by = "orgnr", all.x=T)
1294
1295
1296 ### Chin variabeleer ##
1297
1298 chin_2000 <- r_2000
1299 chin_2001 <- r_2001
1300 chin_2002 <- r_2002
1301 chin_2003 <- r_2003
1302 chin_2004 <- r_2004
1303 chin_2005 <- r_2005
1304 chin_2006 <- r_2006
1305 chin_2007 <- r_2007
1306 chin_2008 <- r_2008
1307 chin_2009 <- r_2009
1308 chin_2010 <- r_2010
1309 chin_2011 <- r_2011
1310 chin_2012 <- r_2012
1311 chin_2013 <- r_2013
1312 chin_2014 <- r_2014
1313 chin_2015 <- r_2015
1314 chin_2016 <- r_2016
1315 chin_2017 <- r_2017
1316 chin_2018 <- r_2018
1317 chin_2019 <- r_2019
1318 chin_2020 <- r_2020
1319
1320
1321 ## endring AK og kvm ##
1322 ## Lager et-årige variabler ##
1323
1324 ru_2001 <- inner_join(r_2001, r_2000, by = "orgnr", all.x=T)
1325 ru_2002 <- inner_join(r_2002, r_2001, by = "orgnr", all.x=T)
1326 ru_2003 <- inner_join(r_2003, r_2002, by = "orgnr", all.x=T)
1327 ru_2004 <- inner_join(r_2004, r_2003, by = "orgnr", all.x=T)
1328 ru_2005 <- inner_join(r_2005, r_2004, by = "orgnr", all.x=T)
1329 ru_2006 <- inner_join(r_2006, r_2005, by = "orgnr", all.x=T)
1330 ru_2007 <- inner_join(r_2007, r_2006, by = "orgnr", all.x=T)
```

```
1331 ru_2008 <- inner_join(r_2008, r_2007, by = "orgnr", all.x=T)
1332 ru_2009 <- inner_join(r_2009, r_2008, by = "orgnr", all.x=T)
1333 ru_2010 <- inner_join(r_2010, r_2009, by = "orgnr", all.x=T)
1334 ru_2011 <- inner_join(r_2011, r_2010, by = "orgnr", all.x=T)
1335 ru_2012 <- inner_join(r_2012, r_2011, by = "orgnr", all.x=T)
1336 ru_2013 <- inner_join(r_2013, r_2012, by = "orgnr", all.x=T)
1337 ru_2014 <- inner_join(r_2014, r_2013, by = "orgnr", all.x=T)
1338 ru_2015 <- inner_join(r_2015, r_2014, by = "orgnr", all.x=T)
1339 ru_2016 <- inner_join(r_2016, r_2015, by = "orgnr", all.x=T)
1340 ru_2017 <- inner_join(r_2017, r_2016, by = "orgnr", all.x=T)
1341 ru_2018 <- inner_join(r_2018, r_2017, by = "orgnr", all.x=T)
1342 ru_2019 <- inner_join(r_2019, r_2018, by = "orgnr", all.x=T)
1343 ru_2020 <- inner_join(r_2020, r_2019, by = "orgnr", all.x=T)
1344
1345 ru_2000 <- transform(ru_2000, deltaAK = (ru_2000$oml.x - ru_2000$kgjeld.x - ru_2000$cash.x) - (ru_2000$oml.y - ru_2000$kgjeld.y - ru_2000$cash.y))
1346 ru_2001 <- transform(ru_2001, deltaAK = (ru_2001$oml.x - ru_2001$kgjeld.x - ru_2001$cash.x) - (ru_2001$oml.y - ru_2001$kgjeld.y - ru_2001$cash.y))
1347 ru_2002 <- transform(ru_2002, deltaAK = (ru_2002$oml.x - ru_2002$kgjeld.x - ru_2002$cash.x) - (ru_2002$oml.y - ru_2002$kgjeld.y - ru_2002$cash.y))
1348 ru_2003 <- transform(ru_2003, deltaAK = (ru_2003$oml.x - ru_2003$kgjeld.x - ru_2003$cash.x) - (ru_2003$oml.y - ru_2003$kgjeld.y - ru_2003$cash.y))
1349 ru_2004 <- transform(ru_2004, deltaAK = (ru_2004$oml.x - ru_2004$kgjeld.x - ru_2004$cash.x) - (ru_2004$oml.y - ru_2004$kgjeld.y - ru_2004$cash.y))
1350 ru_2005 <- transform(ru_2005, deltaAK = (ru_2005$oml.x - ru_2005$kgjeld.x - ru_2005$cash.x) - (ru_2005$oml.y - ru_2005$kgjeld.y - ru_2005$cash.y))
1351 ru_2006 <- transform(ru_2006, deltaAK = (ru_2006$oml.x - ru_2006$kgjeld.x - ru_2006$cash.x) - (ru_2006$oml.y - ru_2006$kgjeld.y - ru_2006$cash.y))
1352 ru_2007 <- transform(ru_2007, deltaAK = (ru_2007$oml.x - ru_2007$kgjeld.x - ru_2007$cash.x) - (ru_2007$oml.y - ru_2007$kgjeld.y - ru_2007$cash.y))
1353 ru_2008 <- transform(ru_2008, deltaAK = (ru_2008$oml.x - ru_2008$kgjeld.x - ru_2008$cash.x) - (ru_2008$oml.y - ru_2008$kgjeld.y - ru_2008$cash.y))
1354 ru_2009 <- transform(ru_2009, deltaAK = (ru_2009$oml.x - ru_2009$kgjeld.x - ru_2009$cash.x) - (ru_2009$oml.y - ru_2009$kgjeld.y - ru_2009$cash.y))
1355 ru_2010 <- transform(ru_2010, deltaAK = (ru_2010$oml.x - ru_2010$kgjeld.x - ru_2010$cash.x) - (ru_2010$oml.y - ru_2010$kgjeld.y - ru_2010$cash.y))
1356 ru_2011 <- transform(ru_2011, deltaAK = (ru_2011$oml.x - ru_2011$kgjeld.x - ru_2011$cash.x) - (ru_2011$oml.y - ru_2011$kgjeld.y - ru_2011$cash.y))
1357 ru_2012 <- transform(ru_2012, deltaAK = (ru_2012$oml.x - ru_2012$kgjeld.x - ru_2012$cash.x) - (ru_2012$oml.y - ru_2012$kgjeld.y - ru_2012$cash.y))
1358 ru_2013 <- transform(ru_2013, deltaAK = (ru_2013$oml.x - ru_2013$kgjeld.x - ru_2013$cash.x) - (ru_2013$oml.y - ru_2013$kgjeld.y - ru_2013$cash.y))
1359 ru_2014 <- transform(ru_2014, deltaAK = (ru_2014$oml.x - ru_2014$kgjeld.x - ru_2014$cash.x) - (ru_2014$oml.y - ru_2014$kgjeld.y - ru_2014$cash.y))
1360 ru_2015 <- transform(ru_2015, deltaAK = (ru_2015$oml.x - ru_2015$kgjeld.x - ru_2015$cash.x) - (ru_2015$oml.y - ru_2015$kgjeld.y - ru_2015$cash.y))
1361 ru_2016 <- transform(ru_2016, deltaAK = (ru_2016$oml.x - ru_2016$kgjeld.x - ru_2016$cash.x) - (ru_2016$oml.y - ru_2016$kgjeld.y - ru_2016$cash.y))
1362 ru_2017 <- transform(ru_2017, deltaAK = (ru_2017$oml.x - ru_2017$kgjeld.x - ru_2017$cash.x) - (ru_2017$oml.y - ru_2017$kgjeld.y - ru_2017$cash.y))
1363 ru_2018 <- transform(ru_2018, deltaAK = (ru_2018$oml.x - ru_2018$kgjeld.x - ru_2018$cash.x) - (ru_2018$oml.y - ru_2018$kgjeld.y - ru_2018$cash.y))
1364 ru_2019 <- transform(ru_2019, deltaAK = (ru_2019$oml.x - ru_2019$kgjeld.x - ru_2019$cash.x) - (ru_2019$oml.y - ru_2019$kgjeld.y - ru_2019$cash.y))
1365 ru_2020 <- transform(ru_2020, deltaAK = (ru_2020$oml.x - ru_2020$kgjeld.x - ru_2020$cash.x) - (ru_2020$oml.y - ru_2020$kgjeld.y - ru_2020$cash.y))
1366
1367 ru_2000 <- transform(ru_2000, CAPX = (ru_2000$anl.x - ru_2000$anl.y + ru_2000$avskr.x))
1368 ru_2001 <- transform(ru_2001, CAPX = (ru_2001$anl.x - ru_2001$anl.y + ru_2001$avskr.x))
1369 ru_2002 <- transform(ru_2002, CAPX = (ru_2002$anl.x - ru_2002$anl.y + ru_2002$avskr.x))
1370 ru_2003 <- transform(ru_2003, CAPX = (ru_2003$anl.x - ru_2003$anl.y + ru_2003$avskr.x))
1371 ru_2004 <- transform(ru_2004, CAPX = (ru_2004$anl.x - ru_2004$anl.y + ru_2004$avskr.x))
1372 ru_2005 <- transform(ru_2005, CAPX = (ru_2005$anl.x - ru_2005$anl.y + ru_2005$avskr.x))
```

```
1372 ru_2005 <- transform(ru_2005, CAPX = (ru_2005$anl.x - ru_2005$anl.y + ru_2005$avskr.x))
1373 ru_2006 <- transform(ru_2006, CAPX = (ru_2006$anl.x - ru_2006$anl.y + ru_2006$avskr.x))
1374 ru_2007 <- transform(ru_2007, CAPX = (ru_2007$anl.x - ru_2007$anl.y + ru_2007$avskr.x))
1375 ru_2008 <- transform(ru_2008, CAPX = (ru_2008$anl.x - ru_2008$anl.y + ru_2008$avskr.x))
1376 ru_2009 <- transform(ru_2009, CAPX = (ru_2009$anl.x - ru_2009$anl.y + ru_2009$avskr.x))
1377 ru_2010 <- transform(ru_2010, CAPX = (ru_2010$anl.x - ru_2010$anl.y + ru_2010$avskr.x))
1378 ru_2011 <- transform(ru_2011, CAPX = (ru_2011$anl.x - ru_2011$anl.y + ru_2011$avskr.x))
1379 ru_2012 <- transform(ru_2012, CAPX = (ru_2012$anl.x - ru_2012$anl.y + ru_2012$avskr.x))
1380 ru_2013 <- transform(ru_2013, CAPX = (ru_2013$anl.x - ru_2013$anl.y + ru_2013$avskr.x))
1381 ru_2014 <- transform(ru_2014, CAPX = (ru_2014$anl.x - ru_2014$anl.y + ru_2014$avskr.x))
1382 ru_2015 <- transform(ru_2015, CAPX = (ru_2015$anl.x - ru_2015$anl.y + ru_2015$avskr.x))
1383 ru_2016 <- transform(ru_2016, CAPX = (ru_2016$anl.x - ru_2016$anl.y + ru_2016$avskr.x))
1384 ru_2017 <- transform(ru_2017, CAPX = (ru_2017$anl.x - ru_2017$anl.y + ru_2017$avskr.x))
1385 ru_2018 <- transform(ru_2018, CAPX = (ru_2018$anl.x - ru_2018$anl.y + ru_2018$avskr.x))
1386 ru_2019 <- transform(ru_2019, CAPX = (ru_2019$anl.x - ru_2019$anl.y + ru_2019$avskr.x))
1387 ru_2020 <- transform(ru_2020, CAPX = (ru_2020$anl.x - ru_2020$anl.y + ru_2020$avskr.x))
1388
1389 r_2000 <- merge(r_2000, ru_2000[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1390 r_2001 <- merge(r_2001, ru_2001[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1391 r_2002 <- merge(r_2002, ru_2002[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1392 r_2003 <- merge(r_2003, ru_2003[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1393 r_2004 <- merge(r_2004, ru_2004[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1394 r_2005 <- merge(r_2005, ru_2005[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1395 r_2006 <- merge(r_2006, ru_2006[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1396 r_2007 <- merge(r_2007, ru_2007[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1397 r_2008 <- merge(r_2008, ru_2008[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1398 r_2009 <- merge(r_2009, ru_2009[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1399 r_2010 <- merge(r_2010, ru_2010[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1400 r_2011 <- merge(r_2011, ru_2011[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1401 r_2012 <- merge(r_2012, ru_2012[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1402 r_2013 <- merge(r_2013, ru_2013[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1403 r_2014 <- merge(r_2014, ru_2014[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1404 r_2015 <- merge(r_2015, ru_2015[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1405 r_2016 <- merge(r_2016, ru_2016[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1406 r_2017 <- merge(r_2017, ru_2017[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1407 r_2018 <- merge(r_2018, ru_2018[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1408 r_2019 <- merge(r_2019, ru_2019[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
1409 r_2020 <- merge(r_2020, ru_2020[, c("orgnr", "deltaAK", "CAPX")], by = "orgnr", all.x=T)
```

```

1412 ## Quality minus junk fakren ##
1413
1414 ## Beregning av de individuelle kvalitetsmålene på lønnsomhet #####
1415 ## GPOA ##
1416
1417 r_2000 <- transform(r_2000, GPOA = (r_2000$salgsinn - (r_2000$varefor + r_2000$behend)) / r_2000$sumeiend)
1418 r_2001 <- transform(r_2001, GPOA = (r_2001$salgsinn - (r_2001$varefor + r_2001$behend)) / r_2001$sumeiend)
1419 r_2002 <- transform(r_2002, GPOA = (r_2002$salgsinn - (r_2002$varefor + r_2002$behend)) / r_2002$sumeiend)
1420 r_2003 <- transform(r_2003, GPOA = (r_2003$salgsinn - (r_2003$varefor + r_2003$behend)) / r_2003$sumeiend)
1421 r_2004 <- transform(r_2004, GPOA = (r_2004$salgsinn - (r_2004$varefor + r_2004$behend)) / r_2004$sumeiend)
1422 r_2005 <- transform(r_2005, GPOA = (r_2005$salgsinn - (r_2005$varefor + r_2005$behend)) / r_2005$sumeiend)
1423 r_2006 <- transform(r_2006, GPOA = (r_2006$salgsinn - (r_2006$varefor + r_2006$behend)) / r_2006$sumeiend)
1424 r_2007 <- transform(r_2007, GPOA = (r_2007$salgsinn - (r_2007$varefor + r_2007$behend)) / r_2007$sumeiend)
1425 r_2008 <- transform(r_2008, GPOA = (r_2008$salgsinn - (r_2008$varefor + r_2008$behend)) / r_2008$sumeiend)
1426 r_2009 <- transform(r_2009, GPOA = (r_2009$salgsinn - (r_2009$varefor + r_2009$behend)) / r_2009$sumeiend)
1427 r_2010 <- transform(r_2010, GPOA = (r_2010$salgsinn - (r_2010$varefor + r_2010$behend)) / r_2010$sumeiend)
1428 r_2011 <- transform(r_2011, GPOA = (r_2011$salgsinn - (r_2011$varefor + r_2011$behend)) / r_2011$sumeiend)
1429 r_2012 <- transform(r_2012, GPOA = (r_2012$salgsinn - (r_2012$varefor + r_2012$behend)) / r_2012$sumeiend)
1430 r_2013 <- transform(r_2013, GPOA = (r_2013$salgsinn - (r_2013$varefor + r_2013$behend)) / r_2013$sumeiend)
1431 r_2014 <- transform(r_2014, GPOA = (r_2014$salgsinn - (r_2014$varefor + r_2014$behend)) / r_2014$sumeiend)
1432 r_2015 <- transform(r_2015, GPOA = (r_2015$salgsinn - (r_2015$varefor + r_2015$behend)) / r_2015$sumeiend)
1433 r_2016 <- transform(r_2016, GPOA = (r_2016$salgsinn - (r_2016$varefor + r_2016$behend)) / r_2016$sumeiend)
1434 r_2017 <- transform(r_2017, GPOA = (r_2017$salgsinn - (r_2017$varefor + r_2017$behend)) / r_2017$sumeiend)
1435 r_2018 <- transform(r_2018, GPOA = (r_2018$salgsinn - (r_2018$varefor + r_2018$behend)) / r_2018$sumeiend)
1436 r_2019 <- transform(r_2019, GPOA = (r_2019$salgsinn - (r_2019$varefor + r_2019$behend)) / r_2019$sumeiend)
1437 r_2020 <- transform(r_2020, GPOA = (r_2020$salgsinn - (r_2020$varefor + r_2020$behend)) / r_2020$sumeiend)
1438
1439
1440 ## gjør dette med enkelte individuelle kvalitetsmål ettersom noen inneholder verdier betegnet som inf+/inf- som ødelegger beregning senere.##
1441
1442 r_2000$GPOA[!is.finite(r_2000$GPOA)] <- NA
1443 r_2001$GPOA[!is.finite(r_2001$GPOA)] <- NA
1444 r_2002$GPOA[!is.finite(r_2002$GPOA)] <- NA
1445 r_2003$GPOA[!is.finite(r_2003$GPOA)] <- NA
1446 r_2004$GPOA[!is.finite(r_2004$GPOA)] <- NA
1447 r_2005$GPOA[!is.finite(r_2005$GPOA)] <- NA
1448 r_2006$GPOA[!is.finite(r_2006$GPOA)] <- NA
1449 r_2007$GPOA[!is.finite(r_2007$GPOA)] <- NA
1450 r_2008$GPOA[!is.finite(r_2008$GPOA)] <- NA
1451 r_2009$GPOA[!is.finite(r_2009$GPOA)] <- NA
1452 r_2010$GPOA[!is.finite(r_2010$GPOA)] <- NA
1453 r_2011$GPOA[!is.finite(r_2011$GPOA)] <- NA

```

```
1454 r_2012$GPOA[!is.finite(r_2012$GPOA)] <- NA
1455 r_2013$GPOA[!is.finite(r_2013$GPOA)] <- NA
1456 r_2014$GPOA[!is.finite(r_2014$GPOA)] <- NA
1457 r_2015$GPOA[!is.finite(r_2015$GPOA)] <- NA
1458 r_2016$GPOA[!is.finite(r_2016$GPOA)] <- NA
1459 r_2017$GPOA[!is.finite(r_2017$GPOA)] <- NA
1460 r_2018$GPOA[!is.finite(r_2018$GPOA)] <- NA
1461 r_2019$GPOA[!is.finite(r_2019$GPOA)] <- NA
1462 r_2020$GPOA[!is.finite(r_2020$GPOA)] <- NA
1463
1464 ## ROE ## #
1465
1466
1467 r_2000 <- transform(r_2000, ROE = r_2000$aarsrs / (r_2000$ek))
1468 r_2001 <- transform(r_2001, ROE = r_2001$aarsrs / (r_2001$ek))
1469 r_2002 <- transform(r_2002, ROE = r_2002$aarsrs / (r_2002$ek))
1470 r_2003 <- transform(r_2003, ROE = r_2003$aarsrs / (r_2003$ek))
1471 r_2004 <- transform(r_2004, ROE = r_2004$aarsrs / (r_2004$ek))
1472 r_2005 <- transform(r_2005, ROE = r_2005$aarsrs / (r_2005$ek))
1473 r_2006 <- transform(r_2006, ROE = r_2006$aarsrs / (r_2006$ek))
1474 r_2007 <- transform(r_2007, ROE = r_2007$aarsrs / (r_2007$ek))
1475 r_2008 <- transform(r_2008, ROE = r_2008$aarsrs / (r_2008$ek))
1476 r_2009 <- transform(r_2009, ROE = r_2009$aarsrs / (r_2009$ek))
1477 r_2010 <- transform(r_2010, ROE = r_2010$aarsrs / (r_2010$ek))
1478 r_2011 <- transform(r_2011, ROE = r_2011$aarsrs / (r_2011$ek))
1479 r_2012 <- transform(r_2012, ROE = r_2012$aarsrs / (r_2012$ek))
1480 r_2013 <- transform(r_2013, ROE = r_2013$aarsrs / (r_2013$ek))
1481 r_2014 <- transform(r_2014, ROE = r_2014$aarsrs / (r_2014$ek))
1482 r_2015 <- transform(r_2015, ROE = r_2015$aarsrs / (r_2015$ek))
1483 r_2016 <- transform(r_2016, ROE = r_2016$aarsrs / (r_2016$ek))
1484 r_2017 <- transform(r_2017, ROE = r_2017$aarsrs / (r_2017$ek))
1485 r_2018 <- transform(r_2018, ROE = r_2018$aarsrs / (r_2018$ek))
1486 r_2019 <- transform(r_2019, ROE = r_2019$aarsrs / (r_2019$ek))
1487 r_2020 <- transform(r_2020, ROE = r_2020$aarsrs / (r_2020$ek))
1488
1489 r_2000$ROE[!is.finite(r_2000$ROE)] <- NA
1490 r_2001$ROE[!is.finite(r_2001$ROE)] <- NA
1491 r_2002$ROE[!is.finite(r_2002$ROE)] <- NA
1492 r_2003$ROE[!is.finite(r_2003$ROE)] <- NA
```

```
1493 r_2004$ROE[!is.finite(r_2004$ROE)] <- NA
1494 r_2005$ROE[!is.finite(r_2005$ROE)] <- NA
1495 r_2006$ROE[!is.finite(r_2006$ROE)] <- NA
1496 r_2007$ROE[!is.finite(r_2007$ROE)] <- NA
1497 r_2008$ROE[!is.finite(r_2008$ROE)] <- NA
1498 r_2009$ROE[!is.finite(r_2009$ROE)] <- NA
1499 r_2010$ROE[!is.finite(r_2010$ROE)] <- NA
1500 r_2011$ROE[!is.finite(r_2011$ROE)] <- NA
1501 r_2012$ROE[!is.finite(r_2012$ROE)] <- NA
1502 r_2013$ROE[!is.finite(r_2013$ROE)] <- NA
1503 r_2014$ROE[!is.finite(r_2014$ROE)] <- NA
1504 r_2015$ROE[!is.finite(r_2015$ROE)] <- NA
1505 r_2016$ROE[!is.finite(r_2016$ROE)] <- NA
1506 r_2017$ROE[!is.finite(r_2017$ROE)] <- NA
1507 r_2018$ROE[!is.finite(r_2018$ROE)] <- NA
1508 r_2019$ROE[!is.finite(r_2019$ROE)] <- NA
1509 r_2020$ROE[!is.finite(r_2020$ROE)] <- NA
1510
1511
1512 ## ROA ##
1513
1514 r_2000 <- transform(r_2000, ROA = r_2000$aarsrs / r_2000$sumeiend)
1515 r_2001 <- transform(r_2001, ROA = r_2001$aarsrs / r_2001$sumeiend)
1516 r_2002 <- transform(r_2002, ROA = r_2002$aarsrs / r_2002$sumeiend)
1517 r_2003 <- transform(r_2003, ROA = r_2003$aarsrs / r_2003$sumeiend)
1518 r_2004 <- transform(r_2004, ROA = r_2004$aarsrs / r_2004$sumeiend)
1519 r_2005 <- transform(r_2005, ROA = r_2005$aarsrs / r_2005$sumeiend)
1520 r_2006 <- transform(r_2006, ROA = r_2006$aarsrs / r_2006$sumeiend)
1521 r_2007 <- transform(r_2007, ROA = r_2007$aarsrs / r_2007$sumeiend)
1522 r_2008 <- transform(r_2008, ROA = r_2008$aarsrs / r_2008$sumeiend)
1523 r_2009 <- transform(r_2009, ROA = r_2009$aarsrs / r_2009$sumeiend)
1524 r_2010 <- transform(r_2010, ROA = r_2010$aarsrs / r_2010$sumeiend)
1525 r_2011 <- transform(r_2011, ROA = r_2011$aarsrs / r_2011$sumeiend)
1526 r_2012 <- transform(r_2012, ROA = r_2012$aarsrs / r_2012$sumeiend)
1527 r_2013 <- transform(r_2013, ROA = r_2013$aarsrs / r_2013$sumeiend)
1528 r_2014 <- transform(r_2014, ROA = r_2014$aarsrs / r_2014$sumeiend)
1529 r_2015 <- transform(r_2015, ROA = r_2015$aarsrs / r_2015$sumeiend)
1530 r_2016 <- transform(r_2016, ROA = r_2016$aarsrs / r_2016$sumeiend)
1531 r_2017 <- transform(r_2017, ROA = r_2017$aarsrs / r_2017$sumeiend)
1532 r_2018 <- transform(r_2018, ROA = r_2018$aarsrs / r_2018$sumeiend)
1533 r_2019 <- transform(r_2019, ROA = r_2019$aarsrs / r_2019$sumeiend)
1534 r_2020 <- transform(r_2020, ROA = r_2020$aarsrs / r_2020$sumeiend)
```

```

1536 r_2000$ROA[!is.finite(r_2000$ROA)] <- NA
1537 r_2001$ROA[!is.finite(r_2001$ROA)] <- NA
1538 r_2002$ROA[!is.finite(r_2002$ROA)] <- NA
1539 r_2003$ROA[!is.finite(r_2003$ROA)] <- NA
1540 r_2004$ROA[!is.finite(r_2004$ROA)] <- NA
1541 r_2005$ROA[!is.finite(r_2005$ROA)] <- NA
1542 r_2006$ROA[!is.finite(r_2006$ROA)] <- NA
1543 r_2007$ROA[!is.finite(r_2007$ROA)] <- NA
1544 r_2008$ROA[!is.finite(r_2008$ROA)] <- NA
1545 r_2009$ROA[!is.finite(r_2009$ROA)] <- NA
1546 r_2010$ROA[!is.finite(r_2010$ROA)] <- NA
1547 r_2011$ROA[!is.finite(r_2011$ROA)] <- NA
1548 r_2012$ROA[!is.finite(r_2012$ROA)] <- NA
1549 r_2013$ROA[!is.finite(r_2013$ROA)] <- NA
1550 r_2014$ROA[!is.finite(r_2014$ROA)] <- NA
1551 r_2015$ROA[!is.finite(r_2015$ROA)] <- NA
1552 r_2016$ROA[!is.finite(r_2016$ROA)] <- NA
1553 r_2017$ROA[!is.finite(r_2017$ROA)] <- NA
1554 r_2018$ROA[!is.finite(r_2018$ROA)] <- NA
1555 r_2019$ROA[!is.finite(r_2019$ROA)] <- NA
1556 r_2020$ROA[!is.finite(r_2020$ROA)] <- NA
1557
1558
1559
1560 ## CFOA ##
1561
1562
1563 r_2000 <- transform(r_2000, CFOA = (r_2000$aarsrs + r_2000$avskr - r_2000$deltaAK - r_2000$CAPX) / r_2000$sumeiend)
1564 r_2001 <- transform(r_2001, CFOA = (r_2001$aarsrs + r_2001$avskr - r_2001$deltaAK - r_2001$CAPX) / r_2001$sumeiend)
1565 r_2002 <- transform(r_2002, CFOA = (r_2002$aarsrs + r_2002$avskr - r_2002$deltaAK - r_2002$CAPX) / r_2002$sumeiend)
1566 r_2003 <- transform(r_2003, CFOA = (r_2003$aarsrs + r_2003$avskr - r_2003$deltaAK - r_2003$CAPX) / r_2003$sumeiend)
1567 r_2004 <- transform(r_2004, CFOA = (r_2004$aarsrs + r_2004$avskr - r_2004$deltaAK - r_2004$CAPX) / r_2004$sumeiend)
1568 r_2005 <- transform(r_2005, CFOA = (r_2005$aarsrs + r_2005$avskr - r_2005$deltaAK - r_2005$CAPX) / r_2005$sumeiend)
1569 r_2006 <- transform(r_2006, CFOA = (r_2006$aarsrs + r_2006$avskr - r_2006$deltaAK - r_2006$CAPX) / r_2006$sumeiend)
1570 r_2007 <- transform(r_2007, CFOA = (r_2007$aarsrs + r_2007$avskr - r_2007$deltaAK - r_2007$CAPX) / r_2007$sumeiend)
1571 r_2008 <- transform(r_2008, CFOA = (r_2008$aarsrs + r_2008$avskr - r_2008$deltaAK - r_2008$CAPX) / r_2008$sumeiend)
1572 r_2009 <- transform(r_2009, CFOA = (r_2009$aarsrs + r_2009$avskr - r_2009$deltaAK - r_2009$CAPX) / r_2009$sumeiend)
1573 r_2010 <- transform(r_2010, CFOA = (r_2010$aarsrs + r_2010$avskr - r_2010$deltaAK - r_2010$CAPX) / r_2010$sumeiend)
1574 r_2011 <- transform(r_2011, CFOA = (r_2011$aarsrs + r_2011$avskr - r_2011$deltaAK - r_2011$CAPX) / r_2011$sumeiend)
1575 r_2012 <- transform(r_2012, CFOA = (r_2012$aarsrs + r_2012$avskr - r_2012$deltaAK - r_2012$CAPX) / r_2012$sumeiend)
1576 r_2013 <- transform(r_2013, CFOA = (r_2013$aarsrs + r_2013$avskr - r_2013$deltaAK - r_2013$CAPX) / r_2013$sumeiend)
1577 r_2014 <- transform(r_2014, CFOA = (r_2014$aarsrs + r_2014$avskr - r_2014$deltaAK - r_2014$CAPX) / r_2014$sumeiend)

```

```

1577 r_2014 <- transform(r_2014, CFOA = (r_2014$aarsrs + r_2014$avskr - r_2014$deltaAK - r_2014$CAPX) / r_2014$sumeiend)
1578 r_2015 <- transform(r_2015, CFOA = (r_2015$aarsrs + r_2015$avskr - r_2015$deltaAK - r_2015$CAPX) / r_2015$sumeiend)
1579 r_2016 <- transform(r_2016, CFOA = (r_2016$aarsrs + r_2016$avskr - r_2016$deltaAK - r_2016$CAPX) / r_2016$sumeiend)
1580 r_2017 <- transform(r_2017, CFOA = (r_2017$aarsrs + r_2017$avskr - r_2017$deltaAK - r_2017$CAPX) / r_2017$sumeiend)
1581 r_2019 <- transform(r_2019, CFOA = (r_2019$aarsrs + r_2019$avskr - r_2019$deltaAK - r_2019$CAPX) / r_2019$sumeiend)
1582 r_2020 <- transform(r_2020, CFOA = (r_2020$aarsrs + r_2020$avskr - r_2020$deltaAK - r_2020$CAPX) / r_2020$sumeiend)
1583
1584 r_2000$CFOA[!is.finite(r_2000$CFOA)] <- NA
1585 r_2001$CFOA[!is.finite(r_2001$CFOA)] <- NA
1586 r_2002$CFOA[!is.finite(r_2002$CFOA)] <- NA
1587 r_2003$CFOA[!is.finite(r_2003$CFOA)] <- NA
1588 r_2004$CFOA[!is.finite(r_2004$CFOA)] <- NA
1589 r_2005$CFOA[!is.finite(r_2005$CFOA)] <- NA
1590 r_2006$CFOA[!is.finite(r_2006$CFOA)] <- NA
1591 r_2007$CFOA[!is.finite(r_2007$CFOA)] <- NA
1592 r_2008$CFOA[!is.finite(r_2008$CFOA)] <- NA
1593 r_2009$CFOA[!is.finite(r_2009$CFOA)] <- NA
1594 r_2010$CFOA[!is.finite(r_2010$CFOA)] <- NA
1595 r_2011$CFOA[!is.finite(r_2011$CFOA)] <- NA
1596 r_2012$CFOA[!is.finite(r_2012$CFOA)] <- NA
1597 r_2013$CFOA[!is.finite(r_2013$CFOA)] <- NA
1598 r_2014$CFOA[!is.finite(r_2014$CFOA)] <- NA
1599 r_2015$CFOA[!is.finite(r_2015$CFOA)] <- NA
1600 r_2016$CFOA[!is.finite(r_2016$CFOA)] <- NA
1601 r_2017$CFOA[!is.finite(r_2017$CFOA)] <- NA
1602 r_2018$CFOA[!is.finite(r_2018$CFOA)] <- NA
1603 r_2019$CFOA[!is.finite(r_2019$CFOA)] <- NA
1604 r_2020$CFOA[!is.finite(r_2020$CFOA)] <- NA
1605
1606
1607 ## GMAR ##
1608 r_2000 <- transform(r_2000, GMAR = (r_2000$salgsinn - (r_2000$varefor + r_2000$behend)) / r_2000$totinn)
1609 r_2001 <- transform(r_2001, GMAR = (r_2001$salgsinn - (r_2001$varefor + r_2001$behend)) / r_2001$totinn)
1610 r_2002 <- transform(r_2002, GMAR = (r_2002$salgsinn - (r_2002$varefor + r_2002$behend)) / r_2002$totinn)
1611 r_2003 <- transform(r_2003, GMAR = (r_2003$salgsinn - (r_2003$varefor + r_2003$behend)) / r_2003$totinn)
1612 r_2004 <- transform(r_2004, GMAR = (r_2004$salgsinn - (r_2004$varefor + r_2004$behend)) / r_2004$totinn)
1613 r_2005 <- transform(r_2005, GMAR = (r_2005$salgsinn - (r_2005$varefor + r_2005$behend)) / r_2005$totinn)
1614 r_2006 <- transform(r_2006, GMAR = (r_2006$salgsinn - (r_2006$varefor + r_2006$behend)) / r_2006$totinn)
1615 r_2007 <- transform(r_2007, GMAR = (r_2007$salgsinn - (r_2007$varefor + r_2007$behend)) / r_2007$totinn)

```



```

1616 r_2008 <- transform(r_2008, GMAR = (r_2008$salgsinn - (r_2008$varefor + r_2008$behend)) / r_2008$totinn)
1617 r_2009 <- transform(r_2009, GMAR = (r_2009$salgsinn - (r_2009$varefor + r_2009$behend)) / r_2009$totinn)
1618 r_2010 <- transform(r_2010, GMAR = (r_2010$salgsinn - (r_2010$varefor + r_2010$behend)) / r_2010$totinn)
1619 r_2011 <- transform(r_2011, GMAR = (r_2011$salgsinn - (r_2011$varefor + r_2011$behend)) / r_2011$totinn)
1620 r_2012 <- transform(r_2012, GMAR = (r_2012$salgsinn - (r_2012$varefor + r_2012$behend)) / r_2012$totinn)
1621 r_2013 <- transform(r_2013, GMAR = (r_2013$salgsinn - (r_2013$varefor + r_2013$behend)) / r_2013$totinn)
1622 r_2014 <- transform(r_2014, GMAR = (r_2014$salgsinn - (r_2014$varefor + r_2014$behend)) / r_2014$totinn)
1623 r_2015 <- transform(r_2015, GMAR = (r_2015$salgsinn - (r_2015$varefor + r_2015$behend)) / r_2015$totinn)
1624 r_2016 <- transform(r_2016, GMAR = (r_2016$salgsinn - (r_2016$varefor + r_2016$behend)) / r_2016$totinn)
1625 r_2017 <- transform(r_2017, GMAR = (r_2017$salgsinn - (r_2017$varefor + r_2017$behend)) / r_2017$totinn)
1626 r_2018 <- transform(r_2018, GMAR = (r_2018$salgsinn - (r_2018$varefor + r_2018$behend)) / r_2018$totinn)
1627 r_2019 <- transform(r_2019, GMAR = (r_2019$salgsinn - (r_2019$varefor + r_2019$behend)) / r_2019$totinn)
1628 r_2020 <- transform(r_2020, GMAR = (r_2020$salgsinn - (r_2020$varefor + r_2020$behend)) / r_2020$totinn)
1629
1630 r_2000$GMAR[!is.finite(r_2000$GMAR)] <- NA
1631 r_2001$GMAR[!is.finite(r_2001$GMAR)] <- NA
1632 r_2002$GMAR[!is.finite(r_2002$GMAR)] <- NA
1633 r_2003$GMAR[!is.finite(r_2003$GMAR)] <- NA
1634 r_2004$GMAR[!is.finite(r_2004$GMAR)] <- NA
1635 r_2005$GMAR[!is.finite(r_2005$GMAR)] <- NA
1636 r_2006$GMAR[!is.finite(r_2006$GMAR)] <- NA
1637 r_2007$GMAR[!is.finite(r_2007$GMAR)] <- NA
1638 r_2008$GMAR[!is.finite(r_2008$GMAR)] <- NA
1639 r_2009$GMAR[!is.finite(r_2009$GMAR)] <- NA
1640 r_2010$GMAR[!is.finite(r_2010$GMAR)] <- NA
1641 r_2011$GMAR[!is.finite(r_2011$GMAR)] <- NA
1642 r_2012$GMAR[!is.finite(r_2012$GMAR)] <- NA
1643 r_2013$GMAR[!is.finite(r_2013$GMAR)] <- NA
1644 r_2014$GMAR[!is.finite(r_2014$GMAR)] <- NA
1645 r_2015$GMAR[!is.finite(r_2015$GMAR)] <- NA
1646 r_2016$GMAR[!is.finite(r_2016$GMAR)] <- NA
1647 r_2017$GMAR[!is.finite(r_2017$GMAR)] <- NA
1648 r_2018$GMAR[!is.finite(r_2018$GMAR)] <- NA
1649 r_2019$GMAR[!is.finite(r_2019$GMAR)] <- NA
1650 r_2020$GMAR[!is.finite(r_2020$GMAR)] <- NA
1651
1652 ## ACC ##
1653 r_2000 <- transform(r_2000, ACC = (r_2000$avskr - r_2000$deltaAK) / r_2000$sumeiend)
1654 r_2001 <- transform(r_2001, ACC = (r_2001$avskr - r_2001$deltaAK) / r_2001$sumeiend)

```

```
1652 ## ACC ##
1653 r_2000 <- transform(r_2000, ACC = (r_2000$avskr - r_2000$deltaAK) / r_2000$sumeiend)
1654 r_2001 <- transform(r_2001, ACC = (r_2001$avskr - r_2001$deltaAK) / r_2001$sumeiend)
1655 r_2002 <- transform(r_2002, ACC = (r_2002$avskr - r_2002$deltaAK) / r_2002$sumeiend)
1656 r_2003 <- transform(r_2003, ACC = (r_2003$avskr - r_2003$deltaAK) / r_2003$sumeiend)
1657 r_2004 <- transform(r_2004, ACC = (r_2004$avskr - r_2004$deltaAK) / r_2004$sumeiend)
1658 r_2005 <- transform(r_2005, ACC = (r_2005$avskr - r_2005$deltaAK) / r_2005$sumeiend)
1659 r_2006 <- transform(r_2006, ACC = (r_2006$avskr - r_2006$deltaAK) / r_2006$sumeiend)
1660 r_2007 <- transform(r_2007, ACC = (r_2007$avskr - r_2007$deltaAK) / r_2007$sumeiend)
1661 r_2008 <- transform(r_2008, ACC = (r_2008$avskr - r_2008$deltaAK) / r_2008$sumeiend)
1662 r_2009 <- transform(r_2009, ACC = (r_2009$avskr - r_2009$deltaAK) / r_2009$sumeiend)
1663 r_2010 <- transform(r_2010, ACC = (r_2010$avskr - r_2010$deltaAK) / r_2010$sumeiend)
1664 r_2011 <- transform(r_2011, ACC = (r_2011$avskr - r_2011$deltaAK) / r_2011$sumeiend)
1665 r_2012 <- transform(r_2012, ACC = (r_2012$avskr - r_2012$deltaAK) / r_2012$sumeiend)
1666 r_2013 <- transform(r_2013, ACC = (r_2013$avskr - r_2013$deltaAK) / r_2013$sumeiend)
1667 r_2014 <- transform(r_2014, ACC = (r_2014$avskr - r_2014$deltaAK) / r_2014$sumeiend)
1668 r_2015 <- transform(r_2015, ACC = (r_2015$avskr - r_2015$deltaAK) / r_2015$sumeiend)
1669 r_2016 <- transform(r_2016, ACC = (r_2016$avskr - r_2016$deltaAK) / r_2016$sumeiend)
1670 r_2017 <- transform(r_2017, ACC = (r_2017$avskr - r_2017$deltaAK) / r_2017$sumeiend)
1671 r_2018 <- transform(r_2018, ACC = (r_2018$avskr - r_2018$deltaAK) / r_2018$sumeiend)
1672 r_2019 <- transform(r_2019, ACC = (r_2019$avskr - r_2019$deltaAK) / r_2019$sumeiend)
1673 r_2020 <- transform(r_2020, ACC = (r_2020$avskr - r_2020$deltaAK) / r_2020$sumeiend)
1674
1675
1676 r_2000$ACC[!is.finite(r_2000$ACC)] <- NA
1677 r_2001$ACC[!is.finite(r_2001$ACC)] <- NA
1678 r_2002$ACC[!is.finite(r_2002$ACC)] <- NA
1679 r_2003$ACC[!is.finite(r_2003$ACC)] <- NA
1680 r_2004$ACC[!is.finite(r_2004$ACC)] <- NA
1681 r_2005$ACC[!is.finite(r_2005$ACC)] <- NA
1682 r_2006$ACC[!is.finite(r_2006$ACC)] <- NA
1683 r_2007$ACC[!is.finite(r_2007$ACC)] <- NA
1684 r_2008$ACC[!is.finite(r_2008$ACC)] <- NA
1685 r_2009$ACC[!is.finite(r_2009$ACC)] <- NA
1686 r_2010$ACC[!is.finite(r_2010$ACC)] <- NA
1687 r_2011$ACC[!is.finite(r_2011$ACC)] <- NA
1688 r_2012$ACC[!is.finite(r_2012$ACC)] <- NA
1689 r_2013$ACC[!is.finite(r_2013$ACC)] <- NA
1690 r_2014$ACC[!is.finite(r_2014$ACC)] <- NA
```

```
1690 r_2014$ACC[!is.finite(r_2014$ACC)] <- NA
1691 r_2015$ACC[!is.finite(r_2015$ACC)] <- NA
1692 r_2016$ACC[!is.finite(r_2016$ACC)] <- NA
1693 r_2017$ACC[!is.finite(r_2017$ACC)] <- NA
1694 r_2018$ACC[!is.finite(r_2018$ACC)] <- NA
1695 r_2019$ACC[!is.finite(r_2019$ACC)] <- NA
1696 r_2020$ACC[!is.finite(r_2020$ACC)] <- NA
1697
1698
1699
1700 #### Vekst - 5 mål ####
1701
1702 ## lagrer dataframe som inneholder regnskapsdata for respektiv år og for 5 år siden ##
1703
1704 rd_2000 <- inner_join(r_1995,r_2000, by = "orgnr")
1705 rd_2001 <- inner_join(r_1996,r_2001, by = "orgnr")
1706 rd_2002 <- inner_join(r_1997,r_2002, by = "orgnr")
1707 rd_2003 <- inner_join(r_1998,r_2003, by = "orgnr")
1708 rd_2004 <- inner_join(r_1999,r_2004, by = "orgnr")
1709 rd_2005 <- inner_join(r_2000,r_2005, by = "orgnr")
1710 rd_2006 <- inner_join(r_2001,r_2006, by = "orgnr")
1711 rd_2007 <- inner_join(r_2002,r_2007, by = "orgnr")
1712 rd_2008 <- inner_join(r_2003,r_2008, by = "orgnr")
1713 rd_2009 <- inner_join(r_2004,r_2009, by = "orgnr")
1714 rd_2010 <- inner_join(r_2005,r_2010, by = "orgnr")
1715 rd_2011 <- inner_join(r_2006,r_2011, by = "orgnr")
1716 rd_2012 <- inner_join(r_2007,r_2012, by = "orgnr")
1717 rd_2013 <- inner_join(r_2008,r_2013, by = "orgnr")
1718 rd_2014 <- inner_join(r_2009,r_2014, by = "orgnr")
1719 rd_2015 <- inner_join(r_2010,r_2015, by = "orgnr")
1720 rd_2016 <- inner_join(r_2011,r_2016, by = "orgnr")
1721 rd_2017 <- inner_join(r_2012,r_2017, by = "orgnr")
1722 rd_2018 <- inner_join(r_2013,r_2018, by = "orgnr")
1723 rd_2019 <- inner_join(r_2014,r_2019, by = "orgnr")
1724 rd_2020 <- inner_join(r_2015,r_2020, by = "orgnr")
1725
1726
```

```

1726
1727 ## d-GPOA ##
1728
1729 rd_2000 <- transform(rd_2000, dGPOA = (((rd_2000$salgsinn.y-(rd_2000$ varefor.y + rd_2000$behend.y))-(rd_2000$salgsinn.x-(rd_2000$ varefor.x + rd_2000$behend.x))) / rd_2000$sumelend.x))
1730 rd_2001 <- transform(rd_2001, dGPOA = (((rd_2001$salgsinn.y-(rd_2001$ varefor.y + rd_2001$behend.y))-(rd_2001$salgsinn.x-(rd_2001$ varefor.x + rd_2001$behend.x))) / rd_2001$sumelend.x))
1731 rd_2002 <- transform(rd_2002, dGPOA = (((rd_2002$salgsinn.y-(rd_2002$ varefor.y + rd_2002$behend.y))-(rd_2002$salgsinn.x-(rd_2002$ varefor.x + rd_2002$behend.x))) / rd_2002$sumelend.x))
1732 rd_2003 <- transform(rd_2003, dGPOA = (((rd_2003$salgsinn.y-(rd_2003$ varefor.y + rd_2003$behend.y))-(rd_2003$salgsinn.x-(rd_2003$ varefor.x + rd_2003$behend.x))) / rd_2003$sumelend.x))
1733 rd_2004 <- transform(rd_2004, dGPOA = (((rd_2004$salgsinn.y-(rd_2004$ varefor.y + rd_2004$behend.y))-(rd_2004$salgsinn.x-(rd_2004$ varefor.x + rd_2004$behend.x))) / rd_2004$sumelend.x))
1734 rd_2005 <- transform(rd_2005, dGPOA = (((rd_2005$salgsinn.y-(rd_2005$ varefor.y + rd_2005$behend.y))-(rd_2005$salgsinn.x-(rd_2005$ varefor.x + rd_2005$behend.x))) / rd_2005$sumelend.x))
1735 rd_2006 <- transform(rd_2006, dGPOA = (((rd_2006$salgsinn.y-(rd_2006$ varefor.y + rd_2006$behend.y))-(rd_2006$salgsinn.x-(rd_2006$ varefor.x + rd_2006$behend.x))) / rd_2006$sumelend.x))
1736 rd_2007 <- transform(rd_2007, dGPOA = (((rd_2007$salgsinn.y-(rd_2007$ varefor.y + rd_2007$behend.y))-(rd_2007$salgsinn.x-(rd_2007$ varefor.x + rd_2007$behend.x))) / rd_2007$sumelend.x))
1737 rd_2008 <- transform(rd_2008, dGPOA = (((rd_2008$salgsinn.y-(rd_2008$ varefor.y + rd_2008$behend.y))-(rd_2008$salgsinn.x-(rd_2008$ varefor.x + rd_2008$behend.x))) / rd_2008$sumelend.x))
1738 rd_2009 <- transform(rd_2009, dGPOA = (((rd_2009$salgsinn.y-(rd_2009$ varefor.y + rd_2009$behend.y))-(rd_2009$salgsinn.x-(rd_2009$ varefor.x + rd_2009$behend.x))) / rd_2009$sumelend.x))
1739 rd_2010 <- transform(rd_2010, dGPOA = (((rd_2010$salgsinn.y-(rd_2010$ varefor.y + rd_2010$behend.y))-(rd_2010$salgsinn.x-(rd_2010$ varefor.x + rd_2010$behend.x))) / rd_2010$sumelend.x))
1740 rd_2011 <- transform(rd_2011, dGPOA = (((rd_2011$salgsinn.y-(rd_2011$ varefor.y + rd_2011$behend.y))-(rd_2011$salgsinn.x-(rd_2011$ varefor.x + rd_2011$behend.x))) / rd_2011$sumelend.x))
1741 rd_2012 <- transform(rd_2012, dGPOA = (((rd_2012$salgsinn.y-(rd_2012$ varefor.y + rd_2012$behend.y))-(rd_2012$salgsinn.x-(rd_2012$ varefor.x + rd_2012$behend.x))) / rd_2012$sumelend.x))
1742 rd_2013 <- transform(rd_2013, dGPOA = (((rd_2013$salgsinn.y-(rd_2013$ varefor.y + rd_2013$behend.y))-(rd_2013$salgsinn.x-(rd_2013$ varefor.x + rd_2013$behend.x))) / rd_2013$sumelend.x))
1743 rd_2014 <- transform(rd_2014, dGPOA = (((rd_2014$salgsinn.y-(rd_2014$ varefor.y + rd_2014$behend.y))-(rd_2014$salgsinn.x-(rd_2014$ varefor.x + rd_2014$behend.x))) / rd_2014$sumelend.x))
1744 rd_2015 <- transform(rd_2015, dGPOA = (((rd_2015$salgsinn.y-(rd_2015$ varefor.y + rd_2015$behend.y))-(rd_2015$salgsinn.x-(rd_2015$ varefor.x + rd_2015$behend.x))) / rd_2015$sumelend.x))
1745 rd_2016 <- transform(rd_2016, dGPOA = (((rd_2016$salgsinn.y-(rd_2016$ varefor.y + rd_2016$behend.y))-(rd_2016$salgsinn.x-(rd_2016$ varefor.x + rd_2016$behend.x))) / rd_2016$sumelend.x))
1746 rd_2017 <- transform(rd_2017, dGPOA = (((rd_2017$salgsinn.y-(rd_2017$ varefor.y + rd_2017$behend.y))-(rd_2017$salgsinn.x-(rd_2017$ varefor.x + rd_2017$behend.x))) / rd_2017$sumelend.x))
1747 rd_2018 <- transform(rd_2018, dGPOA = (((rd_2018$salgsinn.y-(rd_2018$ varefor.y + rd_2018$behend.y))-(rd_2018$salgsinn.x-(rd_2018$ varefor.x + rd_2018$behend.x))) / rd_2018$sumelend.x))
1748 rd_2019 <- transform(rd_2019, dGPOA = (((rd_2019$salgsinn.y-(rd_2019$ varefor.y + rd_2019$behend.y))-(rd_2019$salgsinn.x-(rd_2019$ varefor.x + rd_2019$behend.x))) / rd_2019$sumelend.x))
1749 rd_2020 <- transform(rd_2020, dGPOA = (((rd_2020$salgsinn.y-(rd_2020$ varefor.y + rd_2020$behend.y))-(rd_2020$salgsinn.x-(rd_2020$ varefor.x + rd_2020$behend.x))) / rd_2020$sumelend.x))
1750
1751 rd_2000$dGPOA[is.finite(rd_2000$dGPOA)] <- NA
1752 rd_2001$dGPOA[is.finite(rd_2001$dGPOA)] <- NA
1753 rd_2002$dGPOA[is.finite(rd_2002$dGPOA)] <- NA
1754 rd_2003$dGPOA[is.finite(rd_2003$dGPOA)] <- NA
1755 rd_2004$dGPOA[is.finite(rd_2004$dGPOA)] <- NA
1756 rd_2005$dGPOA[is.finite(rd_2005$dGPOA)] <- NA
1757 rd_2006$dGPOA[is.finite(rd_2006$dGPOA)] <- NA
1758 rd_2007$dGPOA[is.finite(rd_2007$dGPOA)] <- NA
1759 rd_2008$dGPOA[is.finite(rd_2008$dGPOA)] <- NA
1760 rd_2009$dGPOA[is.finite(rd_2009$dGPOA)] <- NA
1761 rd_2010$dGPOA[is.finite(rd_2010$dGPOA)] <- NA
1762 rd_2011$dGPOA[is.finite(rd_2011$dGPOA)] <- NA
1763 rd_2012$dGPOA[is.finite(rd_2012$dGPOA)] <- NA
1764 rd_2013$dGPOA[is.finite(rd_2013$dGPOA)] <- NA
1765 rd_2014$dGPOA[is.finite(rd_2014$dGPOA)] <- NA
1766 rd_2015$dGPOA[is.finite(rd_2015$dGPOA)] <- NA
1767 rd_2016$dGPOA[is.finite(rd_2016$dGPOA)] <- NA

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```
1768 rd_2017$dGPOA[!is.finite(rd_2017$dGPOA)] <- NA
1769 rd_2018$dGPOA[!is.finite(rd_2018$dGPOA)] <- NA
1770 rd_2019$dGPOA[!is.finite(rd_2019$dGPOA)] <- NA
1771 rd_2020$dGPOA[!is.finite(rd_2020$dGPOA)] <- NA
1772
1773
1774 ## d-ROE ##
1775
1776 rd_2000 <- transform(rd_2000, dROE = (rd_2000$aarsrs.y - rd_2000$aarsrs.x) / (rd_2000$ek.x))
1777 rd_2001 <- transform(rd_2001, dROE = (rd_2001$aarsrs.y - rd_2001$aarsrs.x) / (rd_2001$ek.x))
1778 rd_2002 <- transform(rd_2002, dROE = (rd_2002$aarsrs.y - rd_2002$aarsrs.x) / (rd_2002$ek.x))
1779 rd_2003 <- transform(rd_2003, dROE = (rd_2003$aarsrs.y - rd_2003$aarsrs.x) / (rd_2003$ek.x))
1780 rd_2004 <- transform(rd_2004, dROE = (rd_2004$aarsrs.y - rd_2004$aarsrs.x) / (rd_2004$ek.x))
1781 rd_2005 <- transform(rd_2005, dROE = (rd_2005$aarsrs.y - rd_2005$aarsrs.x) / (rd_2005$ek.x))
1782 rd_2006 <- transform(rd_2006, dROE = (rd_2006$aarsrs.y - rd_2006$aarsrs.x) / (rd_2006$ek.x))
1783 rd_2007 <- transform(rd_2007, dROE = (rd_2007$aarsrs.y - rd_2007$aarsrs.x) / (rd_2007$ek.x))
1784 rd_2008 <- transform(rd_2008, dROE = (rd_2008$aarsrs.y - rd_2008$aarsrs.x) / (rd_2008$ek.x))
1785 rd_2009 <- transform(rd_2009, dROE = (rd_2009$aarsrs.y - rd_2009$aarsrs.x) / (rd_2009$ek.x))
1786 rd_2010 <- transform(rd_2010, dROE = (rd_2010$aarsrs.y - rd_2010$aarsrs.x) / (rd_2010$ek.x))
1787 rd_2011 <- transform(rd_2011, dROE = (rd_2011$aarsrs.y - rd_2011$aarsrs.x) / (rd_2011$ek.x))
1788 rd_2012 <- transform(rd_2012, dROE = (rd_2012$aarsrs.y - rd_2012$aarsrs.x) / (rd_2012$ek.x))
1789 rd_2013 <- transform(rd_2013, dROE = (rd_2013$aarsrs.y - rd_2013$aarsrs.x) / (rd_2013$ek.x))
1790 rd_2014 <- transform(rd_2014, dROE = (rd_2014$aarsrs.y - rd_2014$aarsrs.x) / (rd_2014$ek.x))
1791 rd_2015 <- transform(rd_2015, dROE = (rd_2015$aarsrs.y - rd_2015$aarsrs.x) / (rd_2015$ek.x))
1792 rd_2016 <- transform(rd_2016, dROE = (rd_2016$aarsrs.y - rd_2016$aarsrs.x) / (rd_2016$ek.x))
1793 rd_2017 <- transform(rd_2017, dROE = (rd_2017$aarsrs.y - rd_2017$aarsrs.x) / (rd_2017$ek.x))
1794 rd_2018 <- transform(rd_2018, dROE = (rd_2018$aarsrs.y - rd_2018$aarsrs.x) / (rd_2018$ek.x))
1795 rd_2019 <- transform(rd_2019, dROE = (rd_2019$aarsrs.y - rd_2019$aarsrs.x) / (rd_2019$ek.x))
1796 rd_2020 <- transform(rd_2020, dROE = (rd_2020$aarsrs.y - rd_2020$aarsrs.x) / (rd_2020$ek.x))
1797
1798 rd_2000$dROE[!is.finite(rd_2000$dROE)] <- NA
1799 rd_2001$dROE[!is.finite(rd_2001$dROE)] <- NA
1800 rd_2002$dROE[!is.finite(rd_2002$dROE)] <- NA
1801 rd_2003$dROE[!is.finite(rd_2003$dROE)] <- NA
1802 rd_2004$dROE[!is.finite(rd_2004$dROE)] <- NA
1803 rd_2005$dROE[!is.finite(rd_2005$dROE)] <- NA
1804 rd_2006$dROE[!is.finite(rd_2006$dROE)] <- NA
1805 rd_2007$dROE[!is.finite(rd_2007$dROE)] <- NA
1806 rd_2008$dROE[!is.finite(rd_2008$dROE)] <- NA
```

```
1806 rd_2008$dROE[!is.finite(rd_2008$dROE)] <- NA
1807 rd_2009$dROE[!is.finite(rd_2009$dROE)] <- NA
1808 rd_2010$dROE[!is.finite(rd_2010$dROE)] <- NA
1809 rd_2011$dROE[!is.finite(rd_2011$dROE)] <- NA
1810 rd_2012$dROE[!is.finite(rd_2012$dROE)] <- NA
1811 rd_2013$dROE[!is.finite(rd_2013$dROE)] <- NA
1812 rd_2014$dROE[!is.finite(rd_2014$dROE)] <- NA
1813 rd_2015$dROE[!is.finite(rd_2015$dROE)] <- NA
1814 rd_2016$dROE[!is.finite(rd_2016$dROE)] <- NA
1815 rd_2017$dROE[!is.finite(rd_2017$dROE)] <- NA
1816 rd_2018$dROE[!is.finite(rd_2018$dROE)] <- NA
1817 rd_2019$dROE[!is.finite(rd_2019$dROE)] <- NA
1818 rd_2020$dROE[!is.finite(rd_2020$dROE)] <- NA
1819
1820
1821 ## d-ROA ##
1822
1823 rd_2000 <- transform(rd_2000, dROA = (rd_2000$aarsrs.y - rd_2000$aarsrs.x) / rd_2000$sumeiend.x)
1824 rd_2001 <- transform(rd_2001, dROA = (rd_2001$aarsrs.y - rd_2001$aarsrs.x) / rd_2001$sumeiend.x)
1825 rd_2002 <- transform(rd_2002, dROA = (rd_2002$aarsrs.y - rd_2002$aarsrs.x) / rd_2002$sumeiend.x)
1826 rd_2003 <- transform(rd_2003, dROA = (rd_2003$aarsrs.y - rd_2003$aarsrs.x) / rd_2003$sumeiend.x)
1827 rd_2004 <- transform(rd_2004, dROA = (rd_2004$aarsrs.y - rd_2004$aarsrs.x) / rd_2004$sumeiend.x)
1828 rd_2005 <- transform(rd_2005, dROA = (rd_2005$aarsrs.y - rd_2005$aarsrs.x) / rd_2005$sumeiend.x)
1829 rd_2006 <- transform(rd_2006, dROA = (rd_2006$aarsrs.y - rd_2006$aarsrs.x) / rd_2006$sumeiend.x)
1830 rd_2007 <- transform(rd_2007, dROA = (rd_2007$aarsrs.y - rd_2007$aarsrs.x) / rd_2007$sumeiend.x)
1831 rd_2008 <- transform(rd_2008, dROA = (rd_2008$aarsrs.y - rd_2008$aarsrs.x) / rd_2008$sumeiend.x)
1832 rd_2009 <- transform(rd_2009, dROA = (rd_2009$aarsrs.y - rd_2009$aarsrs.x) / rd_2009$sumeiend.x)
1833 rd_2010 <- transform(rd_2010, dROA = (rd_2010$aarsrs.y - rd_2010$aarsrs.x) / rd_2010$sumeiend.x)
1834 rd_2011 <- transform(rd_2011, dROA = (rd_2011$aarsrs.y - rd_2011$aarsrs.x) / rd_2011$sumeiend.x)
1835 rd_2012 <- transform(rd_2012, dROA = (rd_2012$aarsrs.y - rd_2012$aarsrs.x) / rd_2012$sumeiend.x)
1836 rd_2013 <- transform(rd_2013, dROA = (rd_2013$aarsrs.y - rd_2013$aarsrs.x) / rd_2013$sumeiend.x)
1837 rd_2014 <- transform(rd_2014, dROA = (rd_2014$aarsrs.y - rd_2014$aarsrs.x) / rd_2014$sumeiend.x)
1838 rd_2015 <- transform(rd_2015, dROA = (rd_2015$aarsrs.y - rd_2015$aarsrs.x) / rd_2015$sumeiend.x)
1839 rd_2016 <- transform(rd_2016, dROA = (rd_2016$aarsrs.y - rd_2016$aarsrs.x) / rd_2016$sumeiend.x)
1840 rd_2017 <- transform(rd_2017, dROA = (rd_2017$aarsrs.y - rd_2017$aarsrs.x) / rd_2017$sumeiend.x)
1841 rd_2018 <- transform(rd_2018, dROA = (rd_2018$aarsrs.y - rd_2018$aarsrs.x) / rd_2018$sumeiend.x)
1842 rd_2019 <- transform(rd_2019, dROA = (rd_2019$aarsrs.y - rd_2019$aarsrs.x) / rd_2019$sumeiend.x)
1843 rd_2020 <- transform(rd_2020, dROA = (rd_2020$aarsrs.y - rd_2020$aarsrs.x) / rd_2020$sumeiend.x)
1844
1845 rd_2000$dROA[!is.finite(rd_2000$dROA)] <- NA
```

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1846 rd_2001$drDA[is.finite(rd_2001$drDA)] <- NA
1847 rd_2002$drDA[is.finite(rd_2002$drDA)] <- NA
1848 rd_2003$drDA[is.finite(rd_2003$drDA)] <- NA
1849 rd_2004$drDA[is.finite(rd_2004$drDA)] <- NA
1850 rd_2005$drDA[is.finite(rd_2005$drDA)] <- NA
1851 rd_2006$drDA[is.finite(rd_2006$drDA)] <- NA
1852 rd_2007$drDA[is.finite(rd_2007$drDA)] <- NA
1853 rd_2008$drDA[is.finite(rd_2008$drDA)] <- NA
1854 rd_2009$drDA[is.finite(rd_2009$drDA)] <- NA
1855 rd_2010$drDA[is.finite(rd_2010$drDA)] <- NA
1856 rd_2011$drDA[is.finite(rd_2011$drDA)] <- NA
1857 rd_2012$drDA[is.finite(rd_2012$drDA)] <- NA
1858 rd_2013$drDA[is.finite(rd_2013$drDA)] <- NA
1859 rd_2014$drDA[is.finite(rd_2014$drDA)] <- NA
1860 rd_2015$drDA[is.finite(rd_2015$drDA)] <- NA
1861 rd_2016$drDA[is.finite(rd_2016$drDA)] <- NA
1862 rd_2017$drDA[is.finite(rd_2017$drDA)] <- NA
1863 rd_2018$drDA[is.finite(rd_2018$drDA)] <- NA
1864 rd_2019$drDA[is.finite(rd_2019$drDA)] <- NA
1865 rd_2020$drDA[is.finite(rd_2020$drDA)] <- NA
1866
1867
1868 ## a-CFA ##
1869
1870 rd_2000 <- transform(rd_2000, aCFA = ((rd_2000$aarsns.y + rd_2000$avskr.y - rd_2000$deltaAK.y - rd_2000$CAPX.y) / (rd_2000$aarsns.x + rd_2000$avskr.x - rd_2000$deltaAK.x - rd_2000$CAPX.x)) - rd_2000$sumIend.x)
1871 rd_2001 <- transform(rd_2001, aCFA = ((rd_2001$aarsns.y + rd_2001$avskr.y - rd_2001$deltaAK.y - rd_2001$CAPX.y) / (rd_2001$aarsns.x + rd_2001$avskr.x - rd_2001$deltaAK.x - rd_2001$CAPX.x)) - rd_2001$sumIend.x)
1872 rd_2002 <- transform(rd_2002, aCFA = ((rd_2002$aarsns.y + rd_2002$avskr.y - rd_2002$deltaAK.y - rd_2002$CAPX.y) / (rd_2002$aarsns.x + rd_2002$avskr.x - rd_2002$deltaAK.x - rd_2002$CAPX.x)) - rd_2002$sumIend.x)
1873 rd_2003 <- transform(rd_2003, aCFA = ((rd_2003$aarsns.y + rd_2003$avskr.y - rd_2003$deltaAK.y - rd_2003$CAPX.y) / (rd_2003$aarsns.x + rd_2003$avskr.x - rd_2003$deltaAK.x - rd_2003$CAPX.x)) - rd_2003$sumIend.x)
1874 rd_2004 <- transform(rd_2004, aCFA = ((rd_2004$aarsns.y + rd_2004$avskr.y - rd_2004$deltaAK.y - rd_2004$CAPX.y) / (rd_2004$aarsns.x + rd_2004$avskr.x - rd_2004$deltaAK.x - rd_2004$CAPX.x)) - rd_2004$sumIend.x)
1875 rd_2005 <- transform(rd_2005, aCFA = ((rd_2005$aarsns.y + rd_2005$avskr.y - rd_2005$deltaAK.y - rd_2005$CAPX.y) / (rd_2005$aarsns.x + rd_2005$avskr.x - rd_2005$deltaAK.x - rd_2005$CAPX.x)) - rd_2005$sumIend.x)
1876 rd_2006 <- transform(rd_2006, aCFA = ((rd_2006$aarsns.y + rd_2006$avskr.y - rd_2006$deltaAK.y - rd_2006$CAPX.y) / (rd_2006$aarsns.x + rd_2006$avskr.x - rd_2006$deltaAK.x - rd_2006$CAPX.x)) - rd_2006$sumIend.x)
1877 rd_2007 <- transform(rd_2007, aCFA = ((rd_2007$aarsns.y + rd_2007$avskr.y - rd_2007$deltaAK.y - rd_2007$CAPX.y) / (rd_2007$aarsns.x + rd_2007$avskr.x - rd_2007$deltaAK.x - rd_2007$CAPX.x)) - rd_2007$sumIend.x)
1878 rd_2008 <- transform(rd_2008, aCFA = ((rd_2008$aarsns.y + rd_2008$avskr.y - rd_2008$deltaAK.y - rd_2008$CAPX.y) / (rd_2008$aarsns.x + rd_2008$avskr.x - rd_2008$deltaAK.x - rd_2008$CAPX.x)) - rd_2008$sumIend.x)
1879 rd_2009 <- transform(rd_2009, aCFA = ((rd_2009$aarsns.y + rd_2009$avskr.y - rd_2009$deltaAK.y - rd_2009$CAPX.y) / (rd_2009$aarsns.x + rd_2009$avskr.x - rd_2009$deltaAK.x - rd_2009$CAPX.x)) - rd_2009$sumIend.x)
1880 rd_2010 <- transform(rd_2010, aCFA = ((rd_2010$aarsns.y + rd_2010$avskr.y - rd_2010$deltaAK.y - rd_2010$CAPX.y) / (rd_2010$aarsns.x + rd_2010$avskr.x - rd_2010$deltaAK.x - rd_2010$CAPX.x)) - rd_2010$sumIend.x)
1881 rd_2011 <- transform(rd_2011, aCFA = ((rd_2011$aarsns.y + rd_2011$avskr.y - rd_2011$deltaAK.y - rd_2011$CAPX.y) / (rd_2011$aarsns.x + rd_2011$avskr.x - rd_2011$deltaAK.x - rd_2011$CAPX.x)) - rd_2011$sumIend.x)
1882 rd_2012 <- transform(rd_2012, aCFA = ((rd_2012$aarsns.y + rd_2012$avskr.y - rd_2012$deltaAK.y - rd_2012$CAPX.y) / (rd_2012$aarsns.x + rd_2012$avskr.x - rd_2012$deltaAK.x - rd_2012$CAPX.x)) - rd_2012$sumIend.x)
1883 rd_2013 <- transform(rd_2013, aCFA = ((rd_2013$aarsns.y + rd_2013$avskr.y - rd_2013$deltaAK.y - rd_2013$CAPX.y) / (rd_2013$aarsns.x + rd_2013$avskr.x - rd_2013$deltaAK.x - rd_2013$CAPX.x)) - rd_2013$sumIend.x)
1884 rd_2014 <- transform(rd_2014, aCFA = ((rd_2014$aarsns.y + rd_2014$avskr.y - rd_2014$deltaAK.y - rd_2014$CAPX.y) / (rd_2014$aarsns.x + rd_2014$avskr.x - rd_2014$deltaAK.x - rd_2014$CAPX.x)) - rd_2014$sumIend.x)
1885 rd_2015 <- transform(rd_2015, aCFA = ((rd_2015$aarsns.y + rd_2015$avskr.y - rd_2015$deltaAK.y - rd_2015$CAPX.y) / (rd_2015$aarsns.x + rd_2015$avskr.x - rd_2015$deltaAK.x - rd_2015$CAPX.x)) - rd_2015$sumIend.x)
1886 rd_2016 <- transform(rd_2016, aCFA = ((rd_2016$aarsns.y + rd_2016$avskr.y - rd_2016$deltaAK.y - rd_2016$CAPX.y) / (rd_2016$aarsns.x + rd_2016$avskr.x - rd_2016$deltaAK.x - rd_2016$CAPX.x)) - rd_2016$sumIend.x)
1887 rd_2017 <- transform(rd_2017, aCFA = ((rd_2017$aarsns.y + rd_2017$avskr.y - rd_2017$deltaAK.y - rd_2017$CAPX.y) / (rd_2017$aarsns.x + rd_2017$avskr.x - rd_2017$deltaAK.x - rd_2017$CAPX.x)) - rd_2017$sumIend.x)

```

```

1887 rd_2017 <- transform(rd_2017, dCFOA = ((rd_2017$saarsrs.y + rd_2017$avskr.y - rd_2017$deltaAK.y - rd_2017$CAPX.y) - (rd_2017$saarsrs.x + rd_2017$avskr.x - rd_2017$deltaAK.x - rd_2017$CAPX.x)) / rd_2017$sumetend.x)
1888 rd_2018 <- transform(rd_2018, dCFOA = ((rd_2018$saarsrs.y + rd_2018$avskr.y - rd_2018$deltaAK.y - rd_2018$CAPX.y) - (rd_2018$saarsrs.x + rd_2018$avskr.x - rd_2018$deltaAK.x - rd_2018$CAPX.x)) / rd_2018$sumetend.x)
1889 rd_2019 <- transform(rd_2019, dCFOA = ((rd_2019$saarsrs.y + rd_2019$avskr.y - rd_2019$deltaAK.y - rd_2019$CAPX.y) - (rd_2019$saarsrs.x + rd_2019$avskr.x - rd_2019$deltaAK.x - rd_2019$CAPX.x)) / rd_2019$sumetend.x)
1890 rd_2020 <- transform(rd_2020, dCFOA = ((rd_2020$saarsrs.y + rd_2020$avskr.y - rd_2020$deltaAK.y - rd_2020$CAPX.y) - (rd_2020$saarsrs.x + rd_2020$avskr.x - rd_2020$deltaAK.x - rd_2020$CAPX.x)) / rd_2020$sumetend.x)
1891
1892 rd_2000$dCFOA[is.finite(rd_2000$dCFOA)] <- NA
1893 rd_2001$dCFOA[is.finite(rd_2001$dCFOA)] <- NA
1894 rd_2002$dCFOA[is.finite(rd_2002$dCFOA)] <- NA
1895 rd_2003$dCFOA[is.finite(rd_2003$dCFOA)] <- NA
1896 rd_2004$dCFOA[is.finite(rd_2004$dCFOA)] <- NA
1897 rd_2005$dCFOA[is.finite(rd_2005$dCFOA)] <- NA
1898 rd_2006$dCFOA[is.finite(rd_2006$dCFOA)] <- NA
1899 rd_2007$dCFOA[is.finite(rd_2007$dCFOA)] <- NA
1900 rd_2008$dCFOA[is.finite(rd_2008$dCFOA)] <- NA
1901 rd_2009$dCFOA[is.finite(rd_2009$dCFOA)] <- NA
1902 rd_2010$dCFOA[is.finite(rd_2010$dCFOA)] <- NA
1903 rd_2011$dCFOA[is.finite(rd_2011$dCFOA)] <- NA
1904 rd_2012$dCFOA[is.finite(rd_2012$dCFOA)] <- NA
1905 rd_2013$dCFOA[is.finite(rd_2013$dCFOA)] <- NA
1906 rd_2014$dCFOA[is.finite(rd_2014$dCFOA)] <- NA
1907 rd_2015$dCFOA[is.finite(rd_2015$dCFOA)] <- NA
1908 rd_2016$dCFOA[is.finite(rd_2016$dCFOA)] <- NA
1909 rd_2017$dCFOA[is.finite(rd_2017$dCFOA)] <- NA
1910 rd_2018$dCFOA[is.finite(rd_2018$dCFOA)] <- NA
1911 rd_2019$dCFOA[is.finite(rd_2019$dCFOA)] <- NA
1912 rd_2020$dCFOA[is.finite(rd_2020$dCFOA)] <- NA
1913
1914 ## d-GMAR ##
1915
1916 rd_2000 <- transform(rd_2000, dGMAR = (((rd_2000$salgsinn.y (rd_2000$varefor.y - rd_2000$behend.y)) - (rd_2000$salgsinn.x - (rd_2000$varefor.x + rd_2000$behend.x))) / rd_2000$totinn.x))
1917 rd_2001 <- transform(rd_2001, dGMAR = (((rd_2001$salgsinn.y (rd_2001$varefor.y - rd_2001$behend.y)) - (rd_2001$salgsinn.x - (rd_2001$varefor.x + rd_2001$behend.x))) / rd_2001$totinn.x))
1918 rd_2002 <- transform(rd_2002, dGMAR = (((rd_2002$salgsinn.y (rd_2002$varefor.y - rd_2002$behend.y)) - (rd_2002$salgsinn.x - (rd_2002$varefor.x + rd_2002$behend.x))) / rd_2002$totinn.x))
1919 rd_2003 <- transform(rd_2003, dGMAR = (((rd_2003$salgsinn.y (rd_2003$varefor.y - rd_2003$behend.y)) - (rd_2003$salgsinn.x - (rd_2003$varefor.x + rd_2003$behend.x))) / rd_2003$totinn.x))
1920 rd_2004 <- transform(rd_2004, dGMAR = (((rd_2004$salgsinn.y (rd_2004$varefor.y - rd_2004$behend.y)) - (rd_2004$salgsinn.x - (rd_2004$varefor.x + rd_2004$behend.x))) / rd_2004$totinn.x))
1921 rd_2005 <- transform(rd_2005, dGMAR = (((rd_2005$salgsinn.y (rd_2005$varefor.y - rd_2005$behend.y)) - (rd_2005$salgsinn.x - (rd_2005$varefor.x + rd_2005$behend.x))) / rd_2005$totinn.x))
1922 rd_2006 <- transform(rd_2006, dGMAR = (((rd_2006$salgsinn.y (rd_2006$varefor.y - rd_2006$behend.y)) - (rd_2006$salgsinn.x - (rd_2006$varefor.x + rd_2006$behend.x))) / rd_2006$totinn.x))
1923 rd_2007 <- transform(rd_2007, dGMAR = (((rd_2007$salgsinn.y (rd_2007$varefor.y - rd_2007$behend.y)) - (rd_2007$salgsinn.x - (rd_2007$varefor.x + rd_2007$behend.x))) / rd_2007$totinn.x))
1924 rd_2008 <- transform(rd_2008, dGMAR = (((rd_2008$salgsinn.y (rd_2008$varefor.y - rd_2008$behend.y)) - (rd_2008$salgsinn.x - (rd_2008$varefor.x + rd_2008$behend.x))) / rd_2008$totinn.x))
1925 rd_2009 <- transform(rd_2009, dGMAR = (((rd_2009$salgsinn.y (rd_2009$varefor.y - rd_2009$behend.y)) - (rd_2009$salgsinn.x - (rd_2009$varefor.x + rd_2009$behend.x))) / rd_2009$totinn.x))
1926 rd_2010 <- transform(rd_2010, dGMAR = (((rd_2010$salgsinn.y (rd_2010$varefor.y - rd_2010$behend.y)) - (rd_2010$salgsinn.x - (rd_2010$varefor.x + rd_2010$behend.x))) / rd_2010$totinn.x))

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1926 rd_2010 <- transform(rd_2010, dGMAR = (((rd_2010$salgsinn.y - (rd_2010$varefor.y - rd_2010$behend.y)) - (rd_2010$salgsinn.x - (rd_2010$varefor.x - rd_2010$behend.x))) / rd_2010$totinn.x))
1927 rd_2011 <- transform(rd_2011, dGMAR = (((rd_2011$salgsinn.y - (rd_2011$varefor.y - rd_2011$behend.y)) - (rd_2011$salgsinn.x - (rd_2011$varefor.x - rd_2011$behend.x))) / rd_2011$totinn.x))
1928 rd_2012 <- transform(rd_2012, dGMAR = (((rd_2012$salgsinn.y - (rd_2012$varefor.y - rd_2012$behend.y)) - (rd_2012$salgsinn.x - (rd_2012$varefor.x - rd_2012$behend.x))) / rd_2012$totinn.x))
1929 rd_2013 <- transform(rd_2013, dGMAR = (((rd_2013$salgsinn.y - (rd_2013$varefor.y - rd_2013$behend.y)) - (rd_2013$salgsinn.x - (rd_2013$varefor.x - rd_2013$behend.x))) / rd_2013$totinn.x))
1930 rd_2014 <- transform(rd_2014, dGMAR = (((rd_2014$salgsinn.y - (rd_2014$varefor.y - rd_2014$behend.y)) - (rd_2014$salgsinn.x - (rd_2014$varefor.x - rd_2014$behend.x))) / rd_2014$totinn.x))
1931 rd_2015 <- transform(rd_2015, dGMAR = (((rd_2015$salgsinn.y - (rd_2015$varefor.y - rd_2015$behend.y)) - (rd_2015$salgsinn.x - (rd_2015$varefor.x - rd_2015$behend.x))) / rd_2015$totinn.x))
1932 rd_2016 <- transform(rd_2016, dGMAR = (((rd_2016$salgsinn.y - (rd_2016$varefor.y - rd_2016$behend.y)) - (rd_2016$salgsinn.x - (rd_2016$varefor.x - rd_2016$behend.x))) / rd_2016$totinn.x))
1933 rd_2017 <- transform(rd_2017, dGMAR = (((rd_2017$salgsinn.y - (rd_2017$varefor.y - rd_2017$behend.y)) - (rd_2017$salgsinn.x - (rd_2017$varefor.x - rd_2017$behend.x))) / rd_2017$totinn.x))
1934 rd_2018 <- transform(rd_2018, dGMAR = (((rd_2018$salgsinn.y - (rd_2018$varefor.y - rd_2018$behend.y)) - (rd_2018$salgsinn.x - (rd_2018$varefor.x - rd_2018$behend.x))) / rd_2018$totinn.x))
1935 rd_2019 <- transform(rd_2019, dGMAR = (((rd_2019$salgsinn.y - (rd_2019$varefor.y - rd_2019$behend.y)) - (rd_2019$salgsinn.x - (rd_2019$varefor.x - rd_2019$behend.x))) / rd_2019$totinn.x))
1936 rd_2020 <- transform(rd_2020, dGMAR = (((rd_2020$salgsinn.y - (rd_2020$varefor.y - rd_2020$behend.y)) - (rd_2020$salgsinn.x - (rd_2020$varefor.x - rd_2020$behend.x))) / rd_2020$totinn.x))
1937
1938 rd_2000$dGMAR[is.finite(rd_2000$dGMAR)] <- NA
1939 rd_2001$dGMAR[is.finite(rd_2001$dGMAR)] <- NA
1940 rd_2002$dGMAR[is.finite(rd_2002$dGMAR)] <- NA
1941 rd_2003$dGMAR[is.finite(rd_2003$dGMAR)] <- NA
1942 rd_2004$dGMAR[is.finite(rd_2004$dGMAR)] <- NA
1943 rd_2005$dGMAR[is.finite(rd_2005$dGMAR)] <- NA
1944 rd_2006$dGMAR[is.finite(rd_2006$dGMAR)] <- NA
1945 rd_2007$dGMAR[is.finite(rd_2007$dGMAR)] <- NA
1946 rd_2008$dGMAR[is.finite(rd_2008$dGMAR)] <- NA
1947 rd_2009$dGMAR[is.finite(rd_2009$dGMAR)] <- NA
1948 rd_2010$dGMAR[is.finite(rd_2010$dGMAR)] <- NA
1949 rd_2011$dGMAR[is.finite(rd_2011$dGMAR)] <- NA
1950 rd_2012$dGMAR[is.finite(rd_2012$dGMAR)] <- NA
1951 rd_2013$dGMAR[is.finite(rd_2013$dGMAR)] <- NA
1952 rd_2014$dGMAR[is.finite(rd_2014$dGMAR)] <- NA
1953 rd_2015$dGMAR[is.finite(rd_2015$dGMAR)] <- NA
1954 rd_2016$dGMAR[is.finite(rd_2016$dGMAR)] <- NA
1955 rd_2017$dGMAR[is.finite(rd_2017$dGMAR)] <- NA
1956 rd_2018$dGMAR[is.finite(rd_2018$dGMAR)] <- NA
1957 rd_2019$dGMAR[is.finite(rd_2019$dGMAR)] <- NA
1958 rd_2020$dGMAR[is.finite(rd_2020$dGMAR)] <- NA
1959

```

```
1961 ✖ #### Sikkerhet - 5 mål. ####
1962
1963 ## BAB ##
1964
1965 ## dette er allerede beregnet - og lagt inn i dataframene ##
1966
1967 ## LEV ##
1968
1969 r_2000 <- transform(r_2000, LEV = - (r_2000$kgjeld + r_2000$lgjeld) / r_2000$sumeiend )
1970 r_2001 <- transform(r_2001, LEV = - (r_2001$kgjeld + r_2001$lgjeld) / r_2001$sumeiend )
1971 r_2002 <- transform(r_2002, LEV = - (r_2002$kgjeld + r_2002$lgjeld) / r_2002$sumeiend )
1972 r_2003 <- transform(r_2003, LEV = - (r_2003$kgjeld + r_2003$lgjeld) / r_2003$sumeiend )
1973 r_2004 <- transform(r_2004, LEV = - (r_2004$kgjeld + r_2004$lgjeld) / r_2004$sumeiend )
1974 r_2005 <- transform(r_2005, LEV = - (r_2005$kgjeld + r_2005$lgjeld) / r_2005$sumeiend )
1975 r_2006 <- transform(r_2006, LEV = - (r_2006$kgjeld + r_2006$lgjeld) / r_2006$sumeiend )
1976 r_2007 <- transform(r_2007, LEV = - (r_2007$kgjeld + r_2007$lgjeld) / r_2007$sumeiend )
1977 r_2008 <- transform(r_2008, LEV = - (r_2008$kgjeld + r_2008$lgjeld) / r_2008$sumeiend )
1978 r_2009 <- transform(r_2009, LEV = - (r_2009$kgjeld + r_2009$lgjeld) / r_2009$sumeiend )
1979 r_2010 <- transform(r_2010, LEV = - (r_2010$kgjeld + r_2010$lgjeld) / r_2010$sumeiend )
1980 r_2011 <- transform(r_2011, LEV = - (r_2011$kgjeld + r_2011$lgjeld) / r_2011$sumeiend )
1981 r_2012 <- transform(r_2012, LEV = - (r_2012$kgjeld + r_2012$lgjeld) / r_2012$sumeiend )
1982 r_2013 <- transform(r_2013, LEV = - (r_2013$kgjeld + r_2013$lgjeld) / r_2013$sumeiend )
1983 r_2014 <- transform(r_2014, LEV = - (r_2014$kgjeld + r_2014$lgjeld) / r_2014$sumeiend )
1984 r_2015 <- transform(r_2015, LEV = - (r_2015$kgjeld + r_2015$lgjeld) / r_2015$sumeiend )
1985 r_2016 <- transform(r_2016, LEV = - (r_2016$kgjeld + r_2016$lgjeld) / r_2016$sumeiend )
1986 r_2017 <- transform(r_2017, LEV = - (r_2017$kgjeld + r_2017$lgjeld) / r_2017$sumeiend )
1987 r_2018 <- transform(r_2018, LEV = - (r_2018$kgjeld + r_2018$lgjeld) / r_2018$sumeiend )
1988 r_2019 <- transform(r_2019, LEV = - (r_2019$kgjeld + r_2019$lgjeld) / r_2019$sumeiend )
1989 r_2020 <- transform(r_2020, LEV = - (r_2018$kgjeld + r_2020$lgjeld) / r_2020$sumeiend )
1990
```

```

2002 #P JLNORS D score, BIKNER JLNKO variasjons, GENKO, CHNKF
1999
1999 r_2000 transform(r_2000, 0_score = (1.32-0.407)*log(r_2000)suneIend + 0.27*(r_2000)MarketCap + r_2000(tek)) + 0.076 * (r_2000)kgjeld + 0.285*(r_2000)INTWO - 0.521*(r_2000)CHNK
1999 r_2001 transform(r_2001, 0_score = (1.32-0.407)*log(r_2001)suneIend + 0.27*(r_2001)MarketCap + r_2001(tek)) + 0.076 * (r_2001)kgjeld + 0.285*(r_2001)INTWO - 0.521*(r_2001)CHNK
2007 r_2002 transform(r_2002, 0_score = (1.32-0.407)*log(r_2002)suneIend + 0.27*(r_2002)MarketCap + r_2002(tek)) + 0.076 * (r_2002)kgjeld + 0.285*(r_2002)INTWO - 0.521*(r_2002)CHNK
1998 r_2003 transform(r_2003, 0_score = (1.32-0.407)*log(r_2003)suneIend + 0.27*(r_2003)MarketCap + r_2003(tek)) + 0.076 * (r_2003)kgjeld + 0.285*(r_2003)INTWO - 0.521*(r_2003)CHNK
1999 r_2004 transform(r_2004, 0_score = (1.32-0.407)*log(r_2004)suneIend + 0.27*(r_2004)MarketCap + r_2004(tek)) + 0.076 * (r_2004)kgjeld + 0.285*(r_2004)INTWO - 0.521*(r_2004)CHNK
2009 r_2005 transform(r_2005, 0_score = (1.32-0.407)*log(r_2005)suneIend + 0.27*(r_2005)MarketCap + r_2005(tek)) + 0.076 * (r_2005)kgjeld + 0.285*(r_2005)INTWO - 0.521*(r_2005)CHNK
2001 r_2006 transform(r_2006, 0_score = (1.32-0.407)*log(r_2006)suneIend + 0.27*(r_2006)MarketCap + r_2006(tek)) + 0.076 * (r_2006)kgjeld + 0.285*(r_2006)INTWO - 0.521*(r_2006)CHNK
2007 r_2007 transform(r_2007, 0_score = (1.32-0.407)*log(r_2007)suneIend + 0.27*(r_2007)MarketCap + r_2007(tek)) + 0.076 * (r_2007)kgjeld + 0.285*(r_2007)INTWO - 0.521*(r_2007)CHNK
2008 r_2008 transform(r_2008, 0_score = (1.32-0.407)*log(r_2008)suneIend + 0.27*(r_2008)MarketCap + r_2008(tek)) + 0.076 * (r_2008)kgjeld + 0.285*(r_2008)INTWO - 0.521*(r_2008)CHNK
2001 r_2009 transform(r_2009, 0_score = (1.32-0.407)*log(r_2009)suneIend + 0.27*(r_2009)MarketCap + r_2009(tek)) + 0.076 * (r_2009)kgjeld + 0.285*(r_2009)INTWO - 0.521*(r_2009)CHNK
2005 r_2010 transform(r_2010, 0_score = (1.32-0.407)*log(r_2010)suneIend + 0.27*(r_2010)MarketCap + r_2010(tek)) + 0.076 * (r_2010)kgjeld + 0.285*(r_2010)INTWO - 0.521*(r_2010)CHNK
2009 r_2011 transform(r_2011, 0_score = (1.32-0.407)*log(r_2011)suneIend + 0.27*(r_2011)MarketCap + r_2011(tek)) + 0.076 * (r_2011)kgjeld + 0.285*(r_2011)INTWO - 0.521*(r_2011)CHNK
2007 r_2012 transform(r_2012, 0_score = (1.32-0.407)*log(r_2012)suneIend + 0.27*(r_2012)MarketCap + r_2012(tek)) + 0.076 * (r_2012)kgjeld + 0.285*(r_2012)INTWO - 0.521*(r_2012)CHNK
2009 r_2013 transform(r_2013, 0_score = (1.32-0.407)*log(r_2013)suneIend + 0.27*(r_2013)MarketCap + r_2013(tek)) + 0.076 * (r_2013)kgjeld + 0.285*(r_2013)INTWO - 0.521*(r_2013)CHNK
2009 r_2014 transform(r_2014, 0_score = (1.32-0.407)*log(r_2014)suneIend + 0.27*(r_2014)MarketCap + r_2014(tek)) + 0.076 * (r_2014)kgjeld + 0.285*(r_2014)INTWO - 0.521*(r_2014)CHNK
2005 r_2015 transform(r_2015, 0_score = (1.32-0.407)*log(r_2015)suneIend + 0.27*(r_2015)MarketCap + r_2015(tek)) + 0.076 * (r_2015)kgjeld + 0.285*(r_2015)INTWO - 0.521*(r_2015)CHNK
2001 r_2016 transform(r_2016, 0_score = (1.32-0.407)*log(r_2016)suneIend + 0.27*(r_2016)MarketCap + r_2016(tek)) + 0.076 * (r_2016)kgjeld + 0.285*(r_2016)INTWO - 0.521*(r_2016)CHNK
2007 r_2017 transform(r_2017, 0_score = (1.32-0.407)*log(r_2017)suneIend + 0.27*(r_2017)MarketCap + r_2017(tek)) + 0.076 * (r_2017)kgjeld + 0.285*(r_2017)INTWO - 0.521*(r_2017)CHNK
2003 r_2018 transform(r_2018, 0_score = (1.32-0.407)*log(r_2018)suneIend + 0.27*(r_2018)MarketCap + r_2018(tek)) + 0.076 * (r_2018)kgjeld + 0.285*(r_2018)INTWO - 0.521*(r_2018)CHNK
2004 r_2019 transform(r_2019, 0_score = (1.32-0.407)*log(r_2019)suneIend + 0.27*(r_2019)MarketCap + r_2019(tek)) + 0.076 * (r_2019)kgjeld + 0.285*(r_2019)INTWO - 0.521*(r_2019)CHNK
2005 r_2020 transform(r_2020, 0_score = (1.32-0.407)*log(r_2020)suneIend + 0.27*(r_2020)MarketCap + r_2020(tek)) + 0.076 * (r_2020)kgjeld + 0.285*(r_2020)INTWO - 0.521*(r_2020)CHNK
2004

```

Disse kodene henger sammen

```
2018 r_2000$0_score[!is.finite(r_2000$0_score)] <- NA
2019 r_2001$0_score[!is.finite(r_2001$0_score)] <- NA
2020 r_2002$0_score[!is.finite(r_2002$0_score)] <- NA
2021 r_2003$0_score[!is.finite(r_2003$0_score)] <- NA
2022 r_2004$0_score[!is.finite(r_2004$0_score)] <- NA
2023 r_2005$0_score[!is.finite(r_2005$0_score)] <- NA
2024 r_2006$0_score[!is.finite(r_2006$0_score)] <- NA
2025 r_2007$0_score[!is.finite(r_2007$0_score)] <- NA
2026 r_2008$0_score[!is.finite(r_2008$0_score)] <- NA
2027 r_2009$0_score[!is.finite(r_2009$0_score)] <- NA
2028 r_2010$0_score[!is.finite(r_2010$0_score)] <- NA
2029 r_2011$0_score[!is.finite(r_2011$0_score)] <- NA
2030 r_2012$0_score[!is.finite(r_2012$0_score)] <- NA
2031 r_2013$0_score[!is.finite(r_2013$0_score)] <- NA
2032 r_2014$0_score[!is.finite(r_2014$0_score)] <- NA
2033 r_2015$0_score[!is.finite(r_2015$0_score)] <- NA
2034 r_2016$0_score[!is.finite(r_2016$0_score)] <- NA
2035 r_2017$0_score[!is.finite(r_2017$0_score)] <- NA
2036 r_2018$0_score[!is.finite(r_2018$0_score)] <- NA
2037 r_2019$0_score[!is.finite(r_2019$0_score)] <- NA
2038 r_2020$0_score[!is.finite(r_2020$0_score)] <- NA
2039
```

```

2841 ## Altman Z-score ##
2842
2843 r_2000 <- transform(r_2000, AltmanZ = (1.2 * (r_2000$oml - r_2000$kgjeld - r_2000$cash) + 1.4 * (r_2000$aarsrs - r_2000$utb) + 3.3 * r_2000$driftsrs + 0.6 * r_2000$MarketCap - r_2000$totinn) / r_2000$sumeiend)
2844 r_2001 <- transform(r_2001, AltmanZ = (1.2 * (r_2001$oml - r_2001$kgjeld - r_2001$cash) + 1.4 * (r_2001$aarsrs - r_2001$utb) + 3.3 * r_2001$driftsrs + 0.6 * r_2001$MarketCap - r_2001$totinn) / r_2001$sumeiend)
2845 r_2002 <- transform(r_2002, AltmanZ = (1.2 * (r_2002$oml - r_2002$kgjeld - r_2002$cash) + 1.4 * (r_2002$aarsrs - r_2002$utb) + 3.3 * r_2002$driftsrs + 0.6 * r_2002$MarketCap - r_2002$totinn) / r_2002$sumeiend)
2846 r_2003 <- transform(r_2003, AltmanZ = (1.2 * (r_2003$oml - r_2003$kgjeld - r_2003$cash) + 1.4 * (r_2003$aarsrs - r_2003$utb) + 3.3 * r_2003$driftsrs + 0.6 * r_2003$MarketCap - r_2003$totinn) / r_2003$sumeiend)
2847 r_2004 <- transform(r_2004, AltmanZ = (1.2 * (r_2004$oml - r_2004$kgjeld - r_2004$cash) + 1.4 * (r_2004$aarsrs - r_2004$utb) + 3.3 * r_2004$driftsrs + 0.6 * r_2004$MarketCap - r_2004$totinn) / r_2004$sumeiend)
2848 r_2005 <- transform(r_2005, AltmanZ = (1.2 * (r_2005$oml - r_2005$kgjeld - r_2005$cash) + 1.4 * (r_2005$aarsrs - r_2005$utb) + 3.3 * r_2005$driftsrs + 0.6 * r_2005$MarketCap - r_2005$totinn) / r_2005$sumeiend)
2849 r_2006 <- transform(r_2006, AltmanZ = (1.2 * (r_2006$oml - r_2006$kgjeld - r_2006$cash) + 1.4 * (r_2006$aarsrs - r_2006$utb) + 3.3 * r_2006$driftsrs + 0.6 * r_2006$MarketCap - r_2006$totinn) / r_2006$sumeiend)
2850 r_2007 <- transform(r_2007, AltmanZ = (1.2 * (r_2007$oml - r_2007$kgjeld - r_2007$cash) + 1.4 * (r_2007$aarsrs - r_2007$utb) + 3.3 * r_2007$driftsrs + 0.6 * r_2007$MarketCap - r_2007$totinn) / r_2007$sumeiend)
2851 r_2008 <- transform(r_2008, AltmanZ = (1.2 * (r_2008$oml - r_2008$kgjeld - r_2008$cash) + 1.4 * (r_2008$aarsrs - r_2008$utb) + 3.3 * r_2008$driftsrs + 0.6 * r_2008$MarketCap - r_2008$totinn) / r_2008$sumeiend)
2852 r_2009 <- transform(r_2009, AltmanZ = (1.2 * (r_2009$oml - r_2009$kgjeld - r_2009$cash) + 1.4 * (r_2009$aarsrs - r_2009$utb) + 3.3 * r_2009$driftsrs + 0.6 * r_2009$MarketCap - r_2009$totinn) / r_2009$sumeiend)
2853 r_2010 <- transform(r_2010, AltmanZ = (1.2 * (r_2010$oml - r_2010$kgjeld - r_2010$cash) + 1.4 * (r_2010$aarsrs - r_2010$utb) + 3.3 * r_2010$driftsrs + 0.6 * r_2010$MarketCap - r_2010$totinn) / r_2010$sumeiend)
2854 r_2011 <- transform(r_2011, AltmanZ = (1.2 * (r_2011$oml - r_2011$kgjeld - r_2011$cash) + 1.4 * (r_2011$aarsrs - r_2011$utb) + 3.3 * r_2011$driftsrs + 0.6 * r_2011$MarketCap - r_2011$totinn) / r_2011$sumeiend)
2855 r_2012 <- transform(r_2012, AltmanZ = (1.2 * (r_2012$oml - r_2012$kgjeld - r_2012$cash) + 1.4 * (r_2012$aarsrs - r_2012$utb) + 3.3 * r_2012$driftsrs + 0.6 * r_2012$MarketCap - r_2012$totinn) / r_2012$sumeiend)
2856 r_2013 <- transform(r_2013, AltmanZ = (1.2 * (r_2013$oml - r_2013$kgjeld - r_2013$cash) + 1.4 * (r_2013$aarsrs - r_2013$utb) + 3.3 * r_2013$driftsrs + 0.6 * r_2013$MarketCap - r_2013$totinn) / r_2013$sumeiend)
2857 r_2014 <- transform(r_2014, AltmanZ = (1.2 * (r_2014$oml - r_2014$kgjeld - r_2014$cash) + 1.4 * (r_2014$aarsrs - r_2014$utb) + 3.3 * r_2014$driftsrs + 0.6 * r_2014$MarketCap - r_2014$totinn) / r_2014$sumeiend)
2858 r_2015 <- transform(r_2015, AltmanZ = (1.2 * (r_2015$oml - r_2015$kgjeld - r_2015$cash) + 1.4 * (r_2015$aarsrs - r_2015$utb) + 3.3 * r_2015$driftsrs + 0.6 * r_2015$MarketCap - r_2015$totinn) / r_2015$sumeiend)
2859 r_2016 <- transform(r_2016, AltmanZ = (1.2 * (r_2016$oml - r_2016$kgjeld - r_2016$cash) + 1.4 * (r_2016$aarsrs - r_2016$utb) + 3.3 * r_2016$driftsrs + 0.6 * r_2016$MarketCap - r_2016$totinn) / r_2016$sumeiend)
2860 r_2017 <- transform(r_2017, AltmanZ = (1.2 * (r_2017$oml - r_2017$kgjeld - r_2017$cash) + 1.4 * (r_2017$aarsrs - r_2017$utb) + 3.3 * r_2017$driftsrs + 0.6 * r_2017$MarketCap - r_2017$totinn) / r_2017$sumeiend)
2861 r_2018 <- transform(r_2018, AltmanZ = (1.2 * (r_2018$oml - r_2018$kgjeld - r_2018$cash) + 1.4 * (r_2018$aarsrs - r_2018$utb) + 3.3 * r_2018$driftsrs + 0.6 * r_2018$MarketCap - r_2018$totinn) / r_2018$sumeiend)
2862 r_2019 <- transform(r_2019, AltmanZ = (1.2 * (r_2019$oml - r_2019$kgjeld - r_2019$cash) + 1.4 * (r_2019$aarsrs - r_2019$utb) + 3.3 * r_2019$driftsrs + 0.6 * r_2019$MarketCap - r_2019$totinn) / r_2019$sumeiend)
2863 r_2020 <- transform(r_2020, AltmanZ = (1.2 * (r_2020$oml - r_2020$kgjeld - r_2020$cash) + 1.4 * (r_2020$aarsrs - r_2020$utb) + 3.3 * r_2020$driftsrs + 0.6 * r_2020$MarketCap - r_2020$totinn) / r_2020$sumeiend)
2864
2865
2866 r_2000$AltmanZ[ is.finite(r_2000$AltmanZ) ] <- NA
2867 r_2001$AltmanZ[ is.finite(r_2001$AltmanZ) ] <- NA
2868 r_2002$AltmanZ[ is.finite(r_2002$AltmanZ) ] <- NA
2869 r_2003$AltmanZ[ is.finite(r_2003$AltmanZ) ] <- NA
2870 r_2004$AltmanZ[ is.finite(r_2004$AltmanZ) ] <- NA
2871 r_2005$AltmanZ[ is.finite(r_2005$AltmanZ) ] <- NA
2872 r_2006$AltmanZ[ is.finite(r_2006$AltmanZ) ] <- NA
2873 r_2007$AltmanZ[ is.finite(r_2007$AltmanZ) ] <- NA
2874 r_2008$AltmanZ[ is.finite(r_2008$AltmanZ) ] <- NA
2875 r_2009$AltmanZ[ is.finite(r_2009$AltmanZ) ] <- NA
2876 r_2010$AltmanZ[ is.finite(r_2010$AltmanZ) ] <- NA
2877 r_2011$AltmanZ[ is.finite(r_2011$AltmanZ) ] <- NA
2878 r_2012$AltmanZ[ is.finite(r_2012$AltmanZ) ] <- NA

```

```
2089 ## EVOL ##
2090
2091 re_2000 <- r_2000[, c("orgnr", "navn", "ROE")]
2092 re_2001 <- r_2001[, c("orgnr", "navn", "ROE")]
2093 re_2002 <- r_2002[, c("orgnr", "navn", "ROE")]
2094 re_2003 <- r_2003[, c("orgnr", "navn", "ROE")]
2095 re_2004 <- r_2004[, c("orgnr", "navn", "ROE")]
2096 re_2005 <- r_2005[, c("orgnr", "navn", "ROE")]
2097 re_2006 <- r_2006[, c("orgnr", "navn", "ROE")]
2098 re_2007 <- r_2007[, c("orgnr", "navn", "ROE")]
2099 re_2008 <- r_2008[, c("orgnr", "navn", "ROE")]
2100 re_2009 <- r_2009[, c("orgnr", "navn", "ROE")]
2101 re_2010 <- r_2010[, c("orgnr", "navn", "ROE")]
2102 re_2011 <- r_2011[, c("orgnr", "navn", "ROE")]
2103 re_2012 <- r_2012[, c("orgnr", "navn", "ROE")]
2104 re_2013 <- r_2013[, c("orgnr", "navn", "ROE")]
2105 re_2014 <- r_2014[, c("orgnr", "navn", "ROE")]
2106 re_2015 <- r_2015[, c("orgnr", "navn", "ROE")]
2107 re_2016 <- r_2016[, c("orgnr", "navn", "ROE")]
2108 re_2017 <- r_2017[, c("orgnr", "navn", "ROE")]
2109 re_2019 <- r_2019[, c("orgnr", "navn", "ROE")]
2110 re_2020 <- r_2020[, c("orgnr", "navn", "ROE")]
2111
2112 |
2113
2114
2115
2116 ## standard div. for hver linje, som nå er et selskap med 5 år med ROE ##
2117
2118 re4_2000$EVOL = rowSds(as.matrix(re4_2000[,c(3,4,5,6,7)]))
2119 re4_2001$EVOL = rowSds(as.matrix(re4_2001[,c(3,4,5,6,7)]))
2120 re4_2002$EVOL = rowSds(as.matrix(re4_2002[,c(3,4,5,6,7)]))
2121 re4_2003$EVOL = rowSds(as.matrix(re4_2003[,c(3,4,5,6,7)]))
2122 re4_2004$EVOL = rowSds(as.matrix(re4_2004[,c(3,4,5,6,7)]))
2123 re4_2005$EVOL = rowSds(as.matrix(re4_2005[,c(3,4,5,6,7)]))
2124 re4_2006$EVOL = rowSds(as.matrix(re4_2006[,c(3,4,5,6,7)]))
2125 re4_2007$EVOL = rowSds(as.matrix(re4_2007[,c(3,4,5,6,7)]))
2126 re4_2008$EVOL = rowSds(as.matrix(re4_2008[,c(3,4,5,6,7)]))
2127 re4_2009$EVOL = rowSds(as.matrix(re4_2009[,c(3,4,5,6,7)]))
```

```
2116 ## standard div. for hver linje, som nå er et selskap med 5 år med ROE ##
```

```
2117
```

```
2118 re4_2000$EVOL = rowSds(as.matrix(re4_2000[,c(3,4,5,6,7)]))
```

```
2119 re4_2001$EVOL = rowSds(as.matrix(re4_2001[,c(3,4,5,6,7)]))
```

```
2120 re4_2002$EVOL = rowSds(as.matrix(re4_2002[,c(3,4,5,6,7)]))
```

```
2121 re4_2003$EVOL = rowSds(as.matrix(re4_2003[,c(3,4,5,6,7)]))
```

```
2122 re4_2004$EVOL = rowSds(as.matrix(re4_2004[,c(3,4,5,6,7)]))
```

```
2123 re4_2005$EVOL = rowSds(as.matrix(re4_2005[,c(3,4,5,6,7)]))
```

```
2124 re4_2006$EVOL = rowSds(as.matrix(re4_2006[,c(3,4,5,6,7)]))
```

```
2125 re4_2007$EVOL = rowSds(as.matrix(re4_2007[,c(3,4,5,6,7)]))
```

```
2126 re4_2008$EVOL = rowSds(as.matrix(re4_2008[,c(3,4,5,6,7)]))
```

```
2127 re4_2009$EVOL = rowSds(as.matrix(re4_2009[,c(3,4,5,6,7)]))
```

```
2128 re4_2010$EVOL = rowSds(as.matrix(re4_2010[,c(3,4,5,6,7)]))
```

```
2129 re4_2011$EVOL = rowSds(as.matrix(re4_2011[,c(3,4,5,6,7)]))
```

```
2130 re4_2012$EVOL = rowSds(as.matrix(re4_2012[,c(3,4,5,6,7)]))
```

```
2131 re4_2013$EVOL = rowSds(as.matrix(re4_2013[,c(3,4,5,6,7)]))
```

```
2132 re4_2014$EVOL = rowSds(as.matrix(re4_2014[,c(3,4,5,6,7)]))
```

```
2133 re4_2015$EVOL = rowSds(as.matrix(re4_2015[,c(3,4,5,6,7)]))
```

```
2134 re4_2016$EVOL = rowSds(as.matrix(re4_2016[,c(3,4,5,6,7)]))
```

```
2135 re4_2017$EVOL = rowSds(as.matrix(re4_2017[,c(3,4,5,6,7)]))
```

```
2136 re4_2018$EVOL = rowSds(as.matrix(re4_2018[,c(3,4,5,6,7)]))
```

```
2137 re4_2019$EVOL = rowSds(as.matrix(re4_2019[,c(3,4,5,6,7)]))
```

```
2138 re4_2020$EVOL = rowSds(as.matrix(re4_2020[,c(3,4,5,6,7)]))
```

```
2139
```

```
2140 ## I likhet med beta skal EVOL rangeressynkende ##
```

```
2141
```

```
2142 re4_2000$EVOL <- -re4_2000$EVOL
```

```
2143 re4_2001$EVOL <- -re4_2001$EVOL
```

```
2144 re4_2002$EVOL <- -re4_2002$EVOL
```

```
2145 re4_2003$EVOL <- -re4_2003$EVOL
```

```
2146 re4_2004$EVOL <- -re4_2004$EVOL
```

```
2147 re4_2005$EVOL <- -re4_2005$EVOL
```

```
2148 re4_2006$EVOL <- -re4_2006$EVOL
```

```
2149 re4_2007$EVOL <- -re4_2007$EVOL
```

```
2150 re4_2008$EVOL <- -re4_2008$EVOL
```

```
2151 re4_2009$EVOL <- -re4_2009$EVOL
```

```
2152 re4_2010$EVOL <- -re4_2010$EVOL
```

```
2153 re4_2011$EVOL <- -re4_2011$EVOL
```

```
2154 re4_2012$EVOL <- -re4_2012$EVOL
```

```
2155 re4_2013$EVOL <- -re4_2013$EVOL
```

```
2156 re4_2014$EVOL <- -re4_2014$EVOL
2157 re4_2015$EVOL <- -re4_2015$EVOL
2158 re4_2016$EVOL <- -re4_2016$EVOL
2159 re4_2017$EVOL <- -re4_2017$EVOL
2160 re4_2018$EVOL <- -re4_2018$EVOL
2161 re4_2019$EVOL <- -re4_2019$EVOL
2162 re4_2020$EVOL <- -re4_2020$EVOL
2163
2164 r_2000 <- merge(r_2000, re4_2000[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2165 r_2001 <- merge(r_2001, re4_2001[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2166 r_2002 <- merge(r_2002, re4_2002[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2167 r_2003 <- merge(r_2003, re4_2003[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2168 r_2004 <- merge(r_2004, re4_2004[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2169 r_2005 <- merge(r_2005, re4_2005[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2170 r_2006 <- merge(r_2006, re4_2006[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2171 r_2007 <- merge(r_2007, re4_2007[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2172 r_2008 <- merge(r_2008, re4_2008[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2173 r_2009 <- merge(r_2009, re4_2009[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2174 r_2010 <- merge(r_2010, re4_2010[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2175 r_2011 <- merge(r_2011, re4_2011[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2176 r_2012 <- merge(r_2012, re4_2012[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2177 r_2013 <- merge(r_2013, re4_2013[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2178 r_2014 <- merge(r_2014, re4_2014[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2179 r_2015 <- merge(r_2015, re4_2015[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2180 r_2016 <- merge(r_2016, re4_2016[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2181 r_2017 <- merge(r_2017, re4_2017[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2182 r_2018 <- merge(r_2018, re4_2018[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2183 r_2019 <- merge(r_2019, re4_2019[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2184 r_2020 <- merge(r_2020, re4_2020[, c("orgnr", "EVOL")], by = "orgnr", all.x=T)
2185
2186
2187 r_2000$EVOL[!is.finite(r_2000$EVOL)] <- NA
2188 r_2001$EVOL[!is.finite(r_2001$EVOL)] <- NA
2189 r_2002$EVOL[!is.finite(r_2002$EVOL)] <- NA
2190 r_2003$EVOL[!is.finite(r_2003$EVOL)] <- NA
2191 r_2004$EVOL[!is.finite(r_2004$EVOL)] <- NA
2192 r_2005$EVOL[!is.finite(r_2005$EVOL)] <- NA
2193 r_2006$EVOL[!is.finite(r_2006$EVOL)] <- NA
2194 r_2007$EVOL[!is.finite(r_2007$EVOL)] <- NA
```



```

2194 r_2007$EVOL[!is.finite(r_2007$EVOL)] <- NA
2195 r_2008$EVOL[!is.finite(r_2008$EVOL)] <- NA
2196 r_2009$EVOL[!is.finite(r_2009$EVOL)] <- NA
2197 r_2010$EVOL[!is.finite(r_2010$EVOL)] <- NA
2198 r_2011$EVOL[!is.finite(r_2011$EVOL)] <- NA
2199 r_2012$EVOL[!is.finite(r_2012$EVOL)] <- NA
2200 r_2013$EVOL[!is.finite(r_2013$EVOL)] <- NA
2201 r_2014$EVOL[!is.finite(r_2014$EVOL)] <- NA
2202 r_2015$EVOL[!is.finite(r_2015$EVOL)] <- NA
2203 r_2016$EVOL[!is.finite(r_2016$EVOL)] <- NA
2204 r_2017$EVOL[!is.finite(r_2017$EVOL)] <- NA
2205 r_2018$EVOL[!is.finite(r_2018$EVOL)] <- NA
2206 r_2019$EVOL[!is.finite(r_2019$EVOL)] <- NA
2207 r_2020$EVOL[!is.finite(r_2020$EVOL)] <- NA
2208
2209
2210 ▾ ## samler kvalitetsmålene ####
2211 ## inkluderer individuelle kvalitetsmål for vekst og sikkerhet i samlet dataframe ##
2212
2213 ## VEKST VARIABLER ##
2214 r_2000 <- merge(r_2000, rd_2000[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2215 r_2001 <- merge(r_2001, rd_2001[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2216 r_2002 <- merge(r_2002, rd_2002[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2217 r_2003 <- merge(r_2003, rd_2003[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2218 r_2004 <- merge(r_2004, rd_2004[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2219 r_2005 <- merge(r_2005, rd_2005[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2220 r_2006 <- merge(r_2006, rd_2006[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2221 r_2007 <- merge(r_2007, rd_2007[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2222 r_2008 <- merge(r_2008, rd_2008[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2223 r_2009 <- merge(r_2009, rd_2009[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2224 r_2010 <- merge(r_2010, rd_2010[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2225 r_2011 <- merge(r_2011, rd_2011[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2226 r_2012 <- merge(r_2012, rd_2012[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2227 r_2013 <- merge(r_2013, rd_2013[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2228 r_2014 <- merge(r_2014, rd_2014[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2229 r_2015 <- merge(r_2015, rd_2015[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2230 r_2016 <- merge(r_2016, rd_2016[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2231 r_2017 <- merge(r_2017, rd_2017[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2232 r_2018 <- merge(r_2018, rd_2018[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2233 r_2019 <- merge(r_2019, rd_2019[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)

```

```

2232 r_2018 <- merge(r_2018, rd_2018[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2233 r_2019 <- merge(r_2019, rd_2019[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2234 r_2020 <- merge(r_2020, rd_2020[, c("orgnr", "dGPOA", "dROE", "dROA", "dCFOA", "dGMAR")], by = "orgnr", all.x=T)
2235
2236
2237 ## Fjerner selskap som mangler regnskapsdata i utvalget ##
2238 aksjer <- left_join(aksjer, AksjedataMarketCap[, c("Date", "aar", "CompanyID")], by = c("Date" = "Date", "CompanyID" = "CompanyID"))
2239 colnames(aksjer) <- c("Date", "SecurityID", "SecurityName", "CompanyID", "Last", "AdjLast", "SharesIssued", "R", "MarketCap1", "rf", "R2", "orgnr", "aar")
2240
2241 aksjer_2000 <- aksjer[aksjer$aar == "2000", ]
2242 aksjer_2001 <- aksjer[aksjer$aar == "2001", ]
2243 aksjer_2002 <- aksjer[aksjer$aar == "2002", ]
2244 aksjer_2003 <- aksjer[aksjer$aar == "2003", ]
2245 aksjer_2004 <- aksjer[aksjer$aar == "2004", ]
2246 aksjer_2005 <- aksjer[aksjer$aar == "2005", ]
2247 aksjer_2006 <- aksjer[aksjer$aar == "2006", ]
2248 aksjer_2007 <- aksjer[aksjer$aar == "2007", ]
2249 aksjer_2008 <- aksjer[aksjer$aar == "2008", ]
2250 aksjer_2009 <- aksjer[aksjer$aar == "2009", ]
2251 aksjer_2010 <- aksjer[aksjer$aar == "2010", ]
2252 aksjer_2011 <- aksjer[aksjer$aar == "2011", ]
2253 aksjer_2012 <- aksjer[aksjer$aar == "2012", ]
2254 aksjer_2013 <- aksjer[aksjer$aar == "2013", ]
2255 aksjer_2014 <- aksjer[aksjer$aar == "2014", ]
2256 aksjer_2015 <- aksjer[aksjer$aar == "2015", ]
2257 aksjer_2016 <- aksjer[aksjer$aar == "2016", ]
2258 aksjer_2017 <- aksjer[aksjer$aar == "2017", ]
2259 aksjer_2018 <- aksjer[aksjer$aar == "2018", ]
2260 aksjer_2019 <- aksjer[aksjer$aar == "2019", ]
2261 aksjer_2020 <- aksjer[aksjer$aar == "2020", ]
2262
2263
2264 r_2000 <- left_join(r_2000, aksjer_2000[, c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2265 r_2001 <- left_join(r_2001, aksjer_2001[, c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2266 r_2002 <- left_join(r_2002, aksjer_2002[, c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2267 r_2003 <- left_join(r_2003, aksjer_2003[, c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2268 r_2004 <- left_join(r_2004, aksjer_2004[, c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2269 r_2005 <- left_join(r_2005, aksjer_2005[, c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2270 r_2006 <- left_join(r_2006, aksjer_2006[, c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2271 r_2007 <- left_join(r_2007, aksjer_2007[, c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2272 r_2008 <- left_join(r_2008, aksjer_2008[, c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))

```

```
2273 r_2009 <- left_join(r_2009, aksjer_2009[c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2274 r_2010 <- left_join(r_2010, aksjer_2010[c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2275 r_2011 <- left_join(r_2011, aksjer_2011[c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2276 r_2012 <- left_join(r_2012, aksjer_2012[c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2277 r_2013 <- left_join(r_2013, aksjer_2013[c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2278 r_2014 <- left_join(r_2014, aksjer_2014[c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2279 r_2015 <- left_join(r_2015, aksjer_2015[c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2280 r_2016 <- left_join(r_2016, aksjer_2016[c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2281 r_2017 <- left_join(r_2017, aksjer_2017[c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2282 r_2018 <- left_join(r_2018, aksjer_2018[c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2283 r_2019 <- left_join(r_2019, aksjer_2019[c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2284 r_2020 <- left_join(r_2020, aksjer_2020[c("orgnr", "aar", "R2", "MarketCap1")], by = c("orgnr" = "orgnr", "aar" = "aar"))
2285
2286 r_2000 <- r_2000[!is.na(r_2000$R2), ]
2287 r_2001 <- r_2001[!is.na(r_2001$R2), ]
2288 r_2002 <- r_2002[!is.na(r_2002$R2), ]
2289 r_2003 <- r_2003[!is.na(r_2003$R2), ]
2290 r_2004 <- r_2004[!is.na(r_2004$R2), ]
2291 r_2005 <- r_2005[!is.na(r_2005$R2), ]
2292 r_2006 <- r_2006[!is.na(r_2006$R2), ]
2293 r_2007 <- r_2007[!is.na(r_2007$R2), ]
2294 r_2008 <- r_2008[!is.na(r_2008$R2), ]
2295 r_2009 <- r_2009[!is.na(r_2009$R2), ]
2296 r_2010 <- r_2010[!is.na(r_2010$R2), ]
2297 r_2011 <- r_2011[!is.na(r_2011$R2), ]
2298 r_2012 <- r_2012[!is.na(r_2012$R2), ]
2299 r_2013 <- r_2013[!is.na(r_2013$R2), ]
2300 r_2014 <- r_2014[!is.na(r_2014$R2), ]
2301 r_2015 <- r_2015[!is.na(r_2015$R2), ]
2302 r_2016 <- r_2016[!is.na(r_2016$R2), ]
2303 r_2017 <- r_2017[!is.na(r_2017$R2), ]
2304 r_2018 <- r_2018[!is.na(r_2018$R2), ]
2305 r_2019 <- r_2019[!is.na(r_2019$R2), ]
2306 r_2020 <- r_2020[!is.na(r_2020$R2), ]
2307
2308 r_2000 <- r_2000[!duplicated(r_2000[c('aar', 'orgnr')]),]
2309 r_2001 <- r_2001[!duplicated(r_2001[c('aar', 'orgnr')]),]
2310 r_2002 <- r_2002[!duplicated(r_2002[c('aar', 'orgnr')]),]
2311 r_2003 <- r_2003[!duplicated(r_2003[c('aar', 'orgnr')]),]
2312 r_2004 <- r_2004[!duplicated(r_2004[c('aar', 'orgnr')]),]
2313 r_2005 <- r_2005[!duplicated(r_2005[c('aar', 'orgnr')]),]
2314 r_2006 <- r_2006[!duplicated(r_2006[c('aar', 'orgnr')]),]
```

```
2315 r_2007 <- r_2007[!duplicated(r_2007[c('aar', 'orgnr')]),]
2316 r_2008 <- r_2008[!duplicated(r_2008[c('aar', 'orgnr')]),]
2317 r_2009 <- r_2009[!duplicated(r_2009[c('aar', 'orgnr')]),]
2318 r_2010 <- r_2010[!duplicated(r_2010[c('aar', 'orgnr')]),]
2319 r_2011 <- r_2011[!duplicated(r_2011[c('aar', 'orgnr')]),]
2320 r_2012 <- r_2012[!duplicated(r_2012[c('aar', 'orgnr')]),]
2321 r_2013 <- r_2013[!duplicated(r_2013[c('aar', 'orgnr')]),]
2322 r_2014 <- r_2014[!duplicated(r_2014[c('aar', 'orgnr')]),]
2323 r_2015 <- r_2015[!duplicated(r_2015[c('aar', 'orgnr')]),]
2324 r_2016 <- r_2016[!duplicated(r_2016[c('aar', 'orgnr')]),]
2325 r_2017 <- r_2017[!duplicated(r_2017[c('aar', 'orgnr')]),]
2326 r_2018 <- r_2018[!duplicated(r_2018[c('aar', 'orgnr')]),]
2327 r_2019 <- r_2019[!duplicated(r_2019[c('aar', 'orgnr')]),]
2328 r_2020 <- r_2020[!duplicated(r_2020[c('aar', 'orgnr')]),]
2329
2330
2331
2332 ▾ ### Z-verdier #####
2333 ### regner ut z-verdiene først for de individuelle kvalitetsmålene med å skalere verdiene i henhold til originale studiet ##
2334
2335 ▾ ## Lønnsomhet Z-verdier ####
2336
2337 ## Z-GPOA ##
2338
2339 r_2000 <- transform(r_2000, zGPOA = scale(r_2000$GPOA))
2340 r_2001 <- transform(r_2001, zGPOA = scale(r_2001$GPOA))
2341 r_2002 <- transform(r_2002, zGPOA = scale(r_2002$GPOA))
2342 r_2003 <- transform(r_2003, zGPOA = scale(r_2003$GPOA))
2343 r_2004 <- transform(r_2004, zGPOA = scale(r_2004$GPOA))
2344 r_2005 <- transform(r_2005, zGPOA = scale(r_2005$GPOA))
2345 r_2006 <- transform(r_2006, zGPOA = scale(r_2006$GPOA))
2346 r_2007 <- transform(r_2007, zGPOA = scale(r_2007$GPOA))
2347 r_2008 <- transform(r_2008, zGPOA = scale(r_2008$GPOA))
2348 r_2009 <- transform(r_2009, zGPOA = scale(r_2009$GPOA))
2349 r_2010 <- transform(r_2010, zGPOA = scale(r_2010$GPOA))
2350 r_2011 <- transform(r_2011, zGPOA = scale(r_2011$GPOA))
2351 r_2012 <- transform(r_2012, zGPOA = scale(r_2012$GPOA))
2352 r_2013 <- transform(r_2013, zGPOA = scale(r_2013$GPOA))
2353 r_2014 <- transform(r_2014, zGPOA = scale(r_2014$GPOA))
```

```
2353 r_2014 <- transform(r_2014, zGPOA = scale(r_2014$GPOA))
2354 r_2015 <- transform(r_2015, zGPOA = scale(r_2015$GPOA))
2355 r_2016 <- transform(r_2016, zGPOA = scale(r_2016$GPOA))
2356 r_2017 <- transform(r_2017, zGPOA = scale(r_2017$GPOA))
2357 r_2018 <- transform(r_2018, zGPOA = scale(r_2018$GPOA))
2358 r_2019 <- transform(r_2019, zGPOA = scale(r_2019$GPOA))
2359 r_2020 <- transform(r_2020, zGPOA = scale(r_2020$GPOA))
2360
2361
2362 ## Z-Score ROE ##
2363
2364 r_2000 <- transform(r_2000, zROE = scale(r_2000$ROE))
2365 r_2001 <- transform(r_2001, zROE = scale(r_2001$ROE))
2366 r_2002 <- transform(r_2002, zROE = scale(r_2002$ROE))
2367 r_2003 <- transform(r_2003, zROE = scale(r_2003$ROE))
2368 r_2004 <- transform(r_2004, zROE = scale(r_2004$ROE))
2369 r_2005 <- transform(r_2005, zROE = scale(r_2005$ROE))
2370 r_2006 <- transform(r_2006, zROE = scale(r_2006$ROE))
2371 r_2007 <- transform(r_2007, zROE = scale(r_2007$ROE))
2372 r_2008 <- transform(r_2008, zROE = scale(r_2008$ROE))
2373 r_2009 <- transform(r_2009, zROE = scale(r_2009$ROE))
2374 r_2010 <- transform(r_2010, zROE = scale(r_2010$ROE))
2375 r_2011 <- transform(r_2011, zROE = scale(r_2011$ROE))
2376 r_2012 <- transform(r_2012, zROE = scale(r_2012$ROE))
2377 r_2013 <- transform(r_2013, zROE = scale(r_2013$ROE))
2378 r_2014 <- transform(r_2014, zROE = scale(r_2014$ROE))
2379 r_2015 <- transform(r_2015, zROE = scale(r_2015$ROE))
2380 r_2016 <- transform(r_2016, zROE = scale(r_2016$ROE))
2381 r_2017 <- transform(r_2017, zROE = scale(r_2017$ROE))
2382 r_2018 <- transform(r_2018, zROE = scale(r_2018$ROE))
2383 r_2019 <- transform(r_2019, zROE = scale(r_2019$ROE))
2384 r_2020 <- transform(r_2020, zROE = scale(r_2020$ROE))
2385
2386
2387 ## z-Score ROA ##
2388
2389 r_2000 <- transform(r_2000, zROA = scale(r_2000$ROA))
2390 r_2001 <- transform(r_2001, zROA = scale(r_2001$ROA))
2391 r_2002 <- transform(r_2002, zROA = scale(r_2002$ROA))
2392 r_2003 <- transform(r_2003, zROA = scale(r_2003$ROA))
```

```
2393 r_2004 <- transform(r_2004, zROA = scale(r_2004$ROA))
2394 r_2005 <- transform(r_2005, zROA = scale(r_2005$ROA))
2395 r_2006 <- transform(r_2006, zROA = scale(r_2006$ROA))
2396 r_2007 <- transform(r_2007, zROA = scale(r_2007$ROA))
2397 r_2008 <- transform(r_2008, zROA = scale(r_2008$ROA))
2398 r_2009 <- transform(r_2009, zROA = scale(r_2009$ROA))
2399 r_2010 <- transform(r_2010, zROA = scale(r_2010$ROA))
2400 r_2011 <- transform(r_2011, zROA = scale(r_2011$ROA))
2401 r_2012 <- transform(r_2012, zROA = scale(r_2012$ROA))
2402 r_2013 <- transform(r_2013, zROA = scale(r_2013$ROA))
2403 r_2014 <- transform(r_2014, zROA = scale(r_2014$ROA))
2404 r_2015 <- transform(r_2015, zROA = scale(r_2015$ROA))
2405 r_2016 <- transform(r_2016, zROA = scale(r_2016$ROA))
2406 r_2017 <- transform(r_2017, zROA = scale(r_2017$ROA))
2407 r_2018 <- transform(r_2018, zROA = scale(r_2018$ROA))
2408 r_2019 <- transform(r_2019, zROA = scale(r_2019$ROA))
2409 r_2020 <- transform(r_2020, zROA = scale(r_2020$ROA))
2410
2411 ## z-Score CFOA ##
2412
2413 r_2000 <- transform(r_2000, zCFOA = scale(r_2000$CFOA))
2414 r_2001 <- transform(r_2001, zCFOA = scale(r_2001$CFOA))
2415 r_2002 <- transform(r_2002, zCFOA = scale(r_2002$CFOA))
2416 r_2003 <- transform(r_2003, zCFOA = scale(r_2003$CFOA))
2417 r_2004 <- transform(r_2004, zCFOA = scale(r_2004$CFOA))
2418 r_2005 <- transform(r_2005, zCFOA = scale(r_2005$CFOA))
2419 r_2006 <- transform(r_2006, zCFOA = scale(r_2006$CFOA))
2420 r_2007 <- transform(r_2007, zCFOA = scale(r_2007$CFOA))
2421 r_2008 <- transform(r_2008, zCFOA = scale(r_2008$CFOA))
2422 r_2009 <- transform(r_2009, zCFOA = scale(r_2009$CFOA))
2423 r_2010 <- transform(r_2010, zCFOA = scale(r_2010$CFOA))
2424 r_2011 <- transform(r_2011, zCFOA = scale(r_2011$CFOA))
2425 r_2012 <- transform(r_2012, zCFOA = scale(r_2012$CFOA))
2426 r_2013 <- transform(r_2013, zCFOA = scale(r_2013$CFOA))
2427 r_2014 <- transform(r_2014, zCFOA = scale(r_2014$CFOA))
2428 r_2015 <- transform(r_2015, zCFOA = scale(r_2015$CFOA))
2429 r_2016 <- transform(r_2016, zCFOA = scale(r_2016$CFOA))
2430 r_2017 <- transform(r_2017, zCFOA = scale(r_2017$CFOA))
2431 r_2018 <- transform(r_2018, zCFOA = scale(r_2018$CFOA))
```

```
2432 r_2019 <- transform(r_2019, zCFOA = scale(r_2019$CFOA))
2433 r_2020 <- transform(r_2020, zCFOA = scale(r_2020$CFOA))
2434
2435
2436
2437 ## z-Score GMAR ##
2438
2439 r_2000 <- transform(r_2000, zGMAR = scale(r_2000$GMAR))
2440 r_2001 <- transform(r_2001, zGMAR = scale(r_2001$GMAR))
2441 r_2002 <- transform(r_2002, zGMAR = scale(r_2002$GMAR))
2442 r_2003 <- transform(r_2003, zGMAR = scale(r_2003$GMAR))
2443 r_2004 <- transform(r_2004, zGMAR = scale(r_2004$GMAR))
2444 r_2005 <- transform(r_2005, zGMAR = scale(r_2005$GMAR))
2445 r_2006 <- transform(r_2006, zGMAR = scale(r_2006$GMAR))
2446 r_2007 <- transform(r_2007, zGMAR = scale(r_2007$GMAR))
2447 r_2008 <- transform(r_2008, zGMAR = scale(r_2008$GMAR))
2448 r_2009 <- transform(r_2009, zGMAR = scale(r_2009$GMAR))
2449 r_2010 <- transform(r_2010, zGMAR = scale(r_2010$GMAR))
2450 r_2011 <- transform(r_2011, zGMAR = scale(r_2011$GMAR))
2451 r_2012 <- transform(r_2012, zGMAR = scale(r_2012$GMAR))
2452 r_2013 <- transform(r_2013, zGMAR = scale(r_2013$GMAR))
2453 r_2014 <- transform(r_2014, zGMAR = scale(r_2014$GMAR))
2454 r_2015 <- transform(r_2015, zGMAR = scale(r_2015$GMAR))
2455 r_2016 <- transform(r_2016, zGMAR = scale(r_2016$GMAR))
2456 r_2017 <- transform(r_2017, zGMAR = scale(r_2017$GMAR))
2457 r_2018 <- transform(r_2018, zGMAR = scale(r_2018$GMAR))
2458 r_2019 <- transform(r_2019, zGMAR = scale(r_2019$GMAR))
2459 r_2020 <- transform(r_2020, zGMAR = scale(r_2020$GMAR))
2460
2461
2462
2463 ## ACC ##
2464 r_2000 <- transform(r_2000, zACC = scale(r_2000$ACC))
2465 r_2001 <- transform(r_2001, zACC = scale(r_2001$ACC))
2466 r_2002 <- transform(r_2002, zACC = scale(r_2002$ACC))
2467 r_2003 <- transform(r_2003, zACC = scale(r_2003$ACC))
2468 r_2004 <- transform(r_2004, zACC = scale(r_2004$ACC))
2469 r_2005 <- transform(r_2005, zACC = scale(r_2005$ACC))
2470 r_2006 <- transform(r_2006, zACC = scale(r_2006$ACC))
2471 r_2007 <- transform(r_2007, zACC = scale(r_2007$ACC))
2472 r_2008 <- transform(r_2008, zACC = scale(r_2008$ACC))
2473 r_2009 <- transform(r_2009, zACC = scale(r_2009$ACC))
```

```
2473 r_2009 <- transform(r_2009, zACC = scale(r_2009$ACC))
2474 r_2010 <- transform(r_2010, zACC = scale(r_2010$ACC))
2475 r_2011 <- transform(r_2011, zACC = scale(r_2011$ACC))
2476 r_2012 <- transform(r_2012, zACC = scale(r_2012$ACC))
2477 r_2013 <- transform(r_2013, zACC = scale(r_2013$ACC))
2478 r_2014 <- transform(r_2014, zACC = scale(r_2014$ACC))
2479 r_2015 <- transform(r_2015, zACC = scale(r_2015$ACC))
2480 r_2016 <- transform(r_2016, zACC = scale(r_2016$ACC))
2481 r_2017 <- transform(r_2017, zACC = scale(r_2017$ACC))
2482 r_2018 <- transform(r_2018, zACC = scale(r_2018$ACC))
2483 r_2019 <- transform(r_2019, zACC = scale(r_2019$ACC))
2484 r_2020 <- transform(r_2020, zACC = scale(r_2020$ACC))
2485
2486
2487
2488 ## z-Score for vekstmålene ####
2489
2490 ## z-Score dGPOA ##
2491
2492 r_2000 <- transform(r_2000, zdGPOA = scale(r_2000$dGPOA))
2493 r_2001 <- transform(r_2001, zdGPOA = scale(r_2001$dGPOA))
2494 r_2002 <- transform(r_2002, zdGPOA = scale(r_2002$dGPOA))
2495 r_2003 <- transform(r_2003, zdGPOA = scale(r_2003$dGPOA))
2496 r_2004 <- transform(r_2004, zdGPOA = scale(r_2004$dGPOA))
2497 r_2005 <- transform(r_2005, zdGPOA = scale(r_2005$dGPOA))
2498 r_2006 <- transform(r_2006, zdGPOA = scale(r_2006$dGPOA))
2499 r_2007 <- transform(r_2007, zdGPOA = scale(r_2007$dGPOA))
2500 r_2008 <- transform(r_2008, zdGPOA = scale(r_2008$dGPOA))
2501 r_2009 <- transform(r_2009, zdGPOA = scale(r_2009$dGPOA))
2502 r_2010 <- transform(r_2010, zdGPOA = scale(r_2010$dGPOA))
2503 r_2011 <- transform(r_2011, zdGPOA = scale(r_2011$dGPOA))
2504 r_2012 <- transform(r_2012, zdGPOA = scale(r_2012$dGPOA))
2505 r_2013 <- transform(r_2013, zdGPOA = scale(r_2013$dGPOA))
2506 r_2014 <- transform(r_2014, zdGPOA = scale(r_2014$dGPOA))
2507 r_2015 <- transform(r_2015, zdGPOA = scale(r_2015$dGPOA))
2508 r_2016 <- transform(r_2016, zdGPOA = scale(r_2016$dGPOA))
2509 r_2017 <- transform(r_2017, zdGPOA = scale(r_2017$dGPOA))
2510 r_2018 <- transform(r_2018, zdGPOA = scale(r_2018$dGPOA))
2511 r_2019 <- transform(r_2019, zdGPOA = scale(r_2019$dGPOA))
2512 r_2020 <- transform(r_2020, zdGPOA = scale(r_2020$dGPOA))
```



```
2512 r_2020 <- transform(r_2020, zdGPOA = scale(r_2020$dgPOA))
2513
2514
2515 ## Z-score dROE ##
2516
2517 r_2000 <- transform(r_2000, zdROE = scale(r_2000$dROE))
2518 r_2001 <- transform(r_2001, zdROE = scale(r_2001$dROE))
2519 r_2002 <- transform(r_2002, zdROE = scale(r_2002$dROE))
2520 r_2003 <- transform(r_2003, zdROE = scale(r_2003$dROE))
2521 r_2004 <- transform(r_2004, zdROE = scale(r_2004$dROE))
2522 r_2005 <- transform(r_2005, zdROE = scale(r_2005$dROE))
2523 r_2006 <- transform(r_2006, zdROE = scale(r_2006$dROE))
2524 r_2007 <- transform(r_2007, zdROE = scale(r_2007$dROE))
2525 r_2008 <- transform(r_2008, zdROE = scale(r_2008$dROE))
2526 r_2009 <- transform(r_2009, zdROE = scale(r_2009$dROE))
2527 r_2010 <- transform(r_2010, zdROE = scale(r_2010$dROE))
2528 r_2011 <- transform(r_2011, zdROE = scale(r_2011$dROE))
2529 r_2012 <- transform(r_2012, zdROE = scale(r_2012$dROE))
2530 r_2013 <- transform(r_2013, zdROE = scale(r_2013$dROE))
2531 r_2014 <- transform(r_2014, zdROE = scale(r_2014$dROE))
2532 r_2015 <- transform(r_2015, zdROE = scale(r_2015$dROE))
2533 r_2016 <- transform(r_2016, zdROE = scale(r_2016$dROE))
2534 r_2017 <- transform(r_2017, zdROE = scale(r_2017$dROE))
2535 r_2018 <- transform(r_2018, zdROE = scale(r_2018$dROE))
2536 r_2019 <- transform(r_2019, zdROE = scale(r_2019$dROE))
2537 r_2020 <- transform(r_2020, zdROE = scale(r_2020$dROE))
2538
2539
2540 ## Z-score dROA ##
2541
2542 r_2000 <- transform(r_2000, zdROA = scale(r_2000$dROA))
2543 r_2001 <- transform(r_2001, zdROA = scale(r_2001$dROA))
2544 r_2002 <- transform(r_2002, zdROA = scale(r_2002$dROA))
2545 r_2003 <- transform(r_2003, zdROA = scale(r_2003$dROA))
2546 r_2004 <- transform(r_2004, zdROA = scale(r_2004$dROA))
2547 r_2005 <- transform(r_2005, zdROA = scale(r_2005$dROA))
2548 r_2006 <- transform(r_2006, zdROA = scale(r_2006$dROA))
2549 r_2007 <- transform(r_2007, zdROA = scale(r_2007$dROA))
2550 r_2008 <- transform(r_2008, zdROA = scale(r_2008$dROA))
2551 r_2009 <- transform(r_2009, zdROA = scale(r_2009$dROA))
```

```
2551 r_2009 <- transform(r_2009, zdROA = scale(r_2009$zdROA))
2552 r_2010 <- transform(r_2010, zdROA = scale(r_2010$zdROA))
2553 r_2011 <- transform(r_2011, zdROA = scale(r_2011$zdROA))
2554 r_2012 <- transform(r_2012, zdROA = scale(r_2012$zdROA))
2555 r_2013 <- transform(r_2013, zdROA = scale(r_2013$zdROA))
2556 r_2014 <- transform(r_2014, zdROA = scale(r_2014$zdROA))
2557 r_2015 <- transform(r_2015, zdROA = scale(r_2015$zdROA))
2558 r_2016 <- transform(r_2016, zdROA = scale(r_2016$zdROA))
2559 r_2017 <- transform(r_2017, zdROA = scale(r_2017$zdROA))
2560 r_2018 <- transform(r_2018, zdROA = scale(r_2018$zdROA))
2561 r_2019 <- transform(r_2019, zdROA = scale(r_2019$zdROA))
2562 r_2020 <- transform(r_2020, zdROA = scale(r_2020$zdROA))
2563
2564
2565 ## z-score zdCFOA ##
2566
2567 r_2000 <- transform(r_2000, zdCFOA = scale(r_2000$zdCFOA))
2568 r_2001 <- transform(r_2001, zdCFOA = scale(r_2001$zdCFOA))
2569 r_2002 <- transform(r_2002, zdCFOA = scale(r_2002$zdCFOA))
2570 r_2003 <- transform(r_2003, zdCFOA = scale(r_2003$zdCFOA))
2571 r_2004 <- transform(r_2004, zdCFOA = scale(r_2004$zdCFOA))
2572 r_2005 <- transform(r_2005, zdCFOA = scale(r_2005$zdCFOA))
2573 r_2006 <- transform(r_2006, zdCFOA = scale(r_2006$zdCFOA))
2574 r_2007 <- transform(r_2007, zdCFOA = scale(r_2007$zdCFOA))
2575 r_2008 <- transform(r_2008, zdCFOA = scale(r_2008$zdCFOA))
2576 r_2009 <- transform(r_2009, zdCFOA = scale(r_2009$zdCFOA))
2577 r_2010 <- transform(r_2010, zdCFOA = scale(r_2010$zdCFOA))
2578 r_2011 <- transform(r_2011, zdCFOA = scale(r_2011$zdCFOA))
2579 r_2012 <- transform(r_2012, zdCFOA = scale(r_2012$zdCFOA))
2580 r_2013 <- transform(r_2013, zdCFOA = scale(r_2013$zdCFOA))
2581 r_2014 <- transform(r_2014, zdCFOA = scale(r_2014$zdCFOA))
2582 r_2015 <- transform(r_2015, zdCFOA = scale(r_2015$zdCFOA))
2583 r_2016 <- transform(r_2016, zdCFOA = scale(r_2016$zdCFOA))
2584 r_2017 <- transform(r_2017, zdCFOA = scale(r_2017$zdCFOA))
2585 r_2018 <- transform(r_2018, zdCFOA = scale(r_2018$zdCFOA))
2586 r_2019 <- transform(r_2019, zdCFOA = scale(r_2019$zdCFOA))
2587 r_2020 <- transform(r_2020, zdCFOA = scale(r_2020$zdCFOA))
```

```
2587 r_2020 <- transform(r_2020, zdCFOA = scale(r_2020$dcFOA))
2588
2589
2590 ## z-Score dGMAR ##
2591 r_2000 <- transform(r_2000, zdGMAR = scale(r_2000$dGMAR))
2592 r_2001 <- transform(r_2001, zdGMAR = scale(r_2001$dGMAR))
2593 r_2002 <- transform(r_2002, zdGMAR = scale(r_2002$dGMAR))
2594 r_2003 <- transform(r_2003, zdGMAR = scale(r_2003$dGMAR))
2595 r_2004 <- transform(r_2004, zdGMAR = scale(r_2004$dGMAR))
2596 r_2005 <- transform(r_2005, zdGMAR = scale(r_2005$dGMAR))
2597 r_2006 <- transform(r_2006, zdGMAR = scale(r_2006$dGMAR))
2598 r_2007 <- transform(r_2007, zdGMAR = scale(r_2007$dGMAR))
2599 r_2008 <- transform(r_2008, zdGMAR = scale(r_2008$dGMAR))
2600 r_2009 <- transform(r_2009, zdGMAR = scale(r_2009$dGMAR))
2601 r_2010 <- transform(r_2010, zdGMAR = scale(r_2010$dGMAR))
2602 r_2011 <- transform(r_2011, zdGMAR = scale(r_2011$dGMAR))
2603 r_2012 <- transform(r_2012, zdGMAR = scale(r_2012$dGMAR))
2604 r_2013 <- transform(r_2013, zdGMAR = scale(r_2013$dGMAR))
2605 r_2014 <- transform(r_2014, zdGMAR = scale(r_2014$dGMAR))
2606 r_2015 <- transform(r_2015, zdGMAR = scale(r_2015$dGMAR))
2607 r_2016 <- transform(r_2016, zdGMAR = scale(r_2016$dGMAR))
2608 r_2017 <- transform(r_2017, zdGMAR = scale(r_2017$dGMAR))
2609 r_2018 <- transform(r_2018, zdGMAR = scale(r_2018$dGMAR))
2610 r_2019 <- transform(r_2019, zdGMAR = scale(r_2019$dGMAR))
2611 r_2020 <- transform(r_2020, zdGMAR = scale(r_2020$dGMAR))
2612
2613
2614 ## Z-verdier for Sikkerhet ####
2615
2616 ## Beta (BAB) ##
2617
2618 r_2000 <- transform(r_2000, zbeta = scale(r_2000$beta))
2619 r_2001 <- transform(r_2001, zbeta = scale(r_2001$beta))
2620 r_2002 <- transform(r_2002, zbeta = scale(r_2002$beta))
2621 r_2003 <- transform(r_2003, zbeta = scale(r_2003$beta))
2622 r_2004 <- transform(r_2004, zbeta = scale(r_2004$beta))
2623 r_2005 <- transform(r_2005, zbeta = scale(r_2005$beta))
2624 r_2006 <- transform(r_2006, zbeta = scale(r_2006$beta))
2625 r_2007 <- transform(r_2007, zbeta = scale(r_2007$beta))
```

```
2625 r_2007 <- transform(r_2007, zbeta = scale(r_2007$beta))
2626 r_2008 <- transform(r_2008, zbeta = scale(r_2008$beta))
2627 r_2009 <- transform(r_2009, zbeta = scale(r_2009$beta))
2628 r_2010 <- transform(r_2010, zbeta = scale(r_2010$beta))
2629 r_2011 <- transform(r_2011, zbeta = scale(r_2011$beta))
2630 r_2012 <- transform(r_2012, zbeta = scale(r_2012$beta))
2631 r_2013 <- transform(r_2013, zbeta = scale(r_2013$beta))
2632 r_2014 <- transform(r_2014, zbeta = scale(r_2014$beta))
2633 r_2015 <- transform(r_2015, zbeta = scale(r_2015$beta))
2634 r_2016 <- transform(r_2016, zbeta = scale(r_2016$beta))
2635 r_2017 <- transform(r_2017, zbeta = scale(r_2017$beta))
2636 r_2018 <- transform(r_2018, zbeta = scale(r_2018$beta))
2637 r_2019 <- transform(r_2019, zbeta = scale(r_2019$beta))
2638 r_2020 <- transform(r_2020, zbeta = scale(r_2020$beta))
2639
2640 ## LEV ##
2641
2642 r_2000 <- transform(r_2000, zLEV = scale(r_2000$LEV))
2643 r_2001 <- transform(r_2001, zLEV = scale(r_2001$LEV))
2644 r_2002 <- transform(r_2002, zLEV = scale(r_2002$LEV))
2645 r_2003 <- transform(r_2003, zLEV = scale(r_2003$LEV))
2646 r_2004 <- transform(r_2004, zLEV = scale(r_2004$LEV))
2647 r_2005 <- transform(r_2005, zLEV = scale(r_2005$LEV))
2648 r_2006 <- transform(r_2006, zLEV = scale(r_2006$LEV))
2649 r_2007 <- transform(r_2007, zLEV = scale(r_2007$LEV))
2650 r_2008 <- transform(r_2008, zLEV = scale(r_2008$LEV))
2651 r_2009 <- transform(r_2009, zLEV = scale(r_2009$LEV))
2652 r_2010 <- transform(r_2010, zLEV = scale(r_2010$LEV))
2653 r_2011 <- transform(r_2011, zLEV = scale(r_2011$LEV))
2654 r_2012 <- transform(r_2012, zLEV = scale(r_2012$LEV))
2655 r_2013 <- transform(r_2013, zLEV = scale(r_2013$LEV))
2656 r_2014 <- transform(r_2014, zLEV = scale(r_2014$LEV))
2657 r_2015 <- transform(r_2015, zLEV = scale(r_2015$LEV))
2658 r_2016 <- transform(r_2016, zLEV = scale(r_2016$LEV))
2659 r_2017 <- transform(r_2017, zLEV = scale(r_2017$LEV))
2660 r_2018 <- transform(r_2018, zLEV = scale(r_2018$LEV))
2661 r_2019 <- transform(r_2019, zLEV = scale(r_2019$LEV))
2662 r_2020 <- transform(r_2020, zLEV = scale(r_2020$LEV))
2663
2664
```

```
2665  ## Ohlsons score ##
2666
2667  r_2000 <- transform(r_2000, z0_score = scale(r_2000$0_score))
2668  r_2001 <- transform(r_2001, z0_score = scale(r_2001$0_score))
2669  r_2002 <- transform(r_2002, z0_score = scale(r_2002$0_score))
2670  r_2003 <- transform(r_2003, z0_score = scale(r_2003$0_score))
2671  r_2004 <- transform(r_2004, z0_score = scale(r_2004$0_score))
2672  r_2005 <- transform(r_2005, z0_score = scale(r_2005$0_score))
2673  r_2006 <- transform(r_2006, z0_score = scale(r_2006$0_score))
2674  r_2007 <- transform(r_2007, z0_score = scale(r_2007$0_score))
2675  r_2008 <- transform(r_2008, z0_score = scale(r_2008$0_score))
2676  r_2009 <- transform(r_2009, z0_score = scale(r_2009$0_score))
2677  r_2010 <- transform(r_2010, z0_score = scale(r_2010$0_score))
2678  r_2011 <- transform(r_2011, z0_score = scale(r_2011$0_score))
2679  r_2012 <- transform(r_2012, z0_score = scale(r_2012$0_score))
2680  r_2013 <- transform(r_2013, z0_score = scale(r_2013$0_score))
2681  r_2014 <- transform(r_2014, z0_score = scale(r_2014$0_score))
2682  r_2015 <- transform(r_2015, z0_score = scale(r_2015$0_score))
2683  r_2016 <- transform(r_2016, z0_score = scale(r_2016$0_score))
2684  r_2017 <- transform(r_2017, z0_score = scale(r_2017$0_score))
2685  r_2018 <- transform(r_2018, z0_score = scale(r_2018$0_score))
2686  r_2019 <- transform(r_2019, z0_score = scale(r_2019$0_score))
2687  r_2020 <- transform(r_2020, z0_score = scale(r_2020$0_score))
2688
2689
2690  ## Altman Z-score ##
2691
2692  r_2000 <- transform(r_2000, zAltmanZ = scale(r_2000$AltmanZ))
2693  r_2001 <- transform(r_2001, zAltmanZ = scale(r_2001$AltmanZ))
2694  r_2002 <- transform(r_2002, zAltmanZ = scale(r_2002$AltmanZ))
2695  r_2003 <- transform(r_2003, zAltmanZ = scale(r_2003$AltmanZ))
2696  r_2004 <- transform(r_2004, zAltmanZ = scale(r_2004$AltmanZ))
2697  r_2005 <- transform(r_2005, zAltmanZ = scale(r_2005$AltmanZ))
2698  r_2006 <- transform(r_2006, zAltmanZ = scale(r_2006$AltmanZ))
2699  r_2007 <- transform(r_2007, zAltmanZ = scale(r_2007$AltmanZ))
2700  r_2008 <- transform(r_2008, zAltmanZ = scale(r_2008$AltmanZ))
2701  r_2009 <- transform(r_2009, zAltmanZ = scale(r_2009$AltmanZ))
2702  r_2010 <- transform(r_2010, zAltmanZ = scale(r_2010$AltmanZ))
2703  r_2011 <- transform(r_2011, zAltmanZ = scale(r_2011$AltmanZ))
2704  r_2012 <- transform(r_2012, zAltmanZ = scale(r_2012$AltmanZ))
2705  r_2013 <- transform(r_2013, zAltmanZ = scale(r_2013$AltmanZ))
2706  r_2014 <- transform(r_2014, zAltmanZ = scale(r_2014$AltmanZ))
```

```
2707 r_2015 <- transform(r_2015, zAltmanZ = scale(r_2015$AltmanZ))
2708 r_2016 <- transform(r_2016, zAltmanZ = scale(r_2016$AltmanZ))
2709 r_2017 <- transform(r_2017, zAltmanZ = scale(r_2017$AltmanZ))
2710 r_2018 <- transform(r_2018, zAltmanZ = scale(r_2018$AltmanZ))
2711 r_2019 <- transform(r_2019, zAltmanZ = scale(r_2019$AltmanZ))
2712 r_2020 <- transform(r_2020, zAltmanZ = scale(r_2020$AltmanZ))
2713
2714
2715 ## EVOL ##
2716
2717 r_2000 <- transform(r_2000, zEVOL = scale(r_2000$EVOL))
2718 r_2001 <- transform(r_2001, zEVOL = scale(r_2001$EVOL))
2719 r_2002 <- transform(r_2002, zEVOL = scale(r_2002$EVOL))
2720 r_2003 <- transform(r_2003, zEVOL = scale(r_2003$EVOL))
2721 r_2004 <- transform(r_2004, zEVOL = scale(r_2004$EVOL))
2722 r_2005 <- transform(r_2005, zEVOL = scale(r_2005$EVOL))
2723 r_2006 <- transform(r_2006, zEVOL = scale(r_2006$EVOL))
2724 r_2007 <- transform(r_2007, zEVOL = scale(r_2007$EVOL))
2725 r_2008 <- transform(r_2008, zEVOL = scale(r_2008$EVOL))
2726 r_2009 <- transform(r_2009, zEVOL = scale(r_2009$EVOL))
2727 r_2010 <- transform(r_2010, zEVOL = scale(r_2010$EVOL))
2728 r_2011 <- transform(r_2011, zEVOL = scale(r_2011$EVOL))
2729 r_2012 <- transform(r_2012, zEVOL = scale(r_2012$EVOL))
2730 r_2013 <- transform(r_2013, zEVOL = scale(r_2013$EVOL))
2731 r_2014 <- transform(r_2014, zEVOL = scale(r_2014$EVOL))
2732 r_2015 <- transform(r_2015, zEVOL = scale(r_2015$EVOL))
2733 r_2016 <- transform(r_2016, zEVOL = scale(r_2016$EVOL))
2734 r_2017 <- transform(r_2017, zEVOL = scale(r_2017$EVOL))
2735 r_2018 <- transform(r_2018, zEVOL = scale(r_2018$EVOL))
2736 r_2019 <- transform(r_2019, zEVOL = scale(r_2019$EVOL))
2737 r_2020 <- transform(r_2020, zEVOL = scale(r_2020$EVOL))
2738
2739
2740 ### Ferdigstilling av utvalg ###
2741
2742 ## beregne P/B
2743
2744 ## Beregne pris over bok (P/B) ##
2745
```

```
2744 ## Beregne pris over bok (P/B) ##
2745
2746 r_2000 <- transform(r_2000, P_B = r_2000$MarketCap1/(r_2000$ek))
2747 r_2001 <- transform(r_2001, P_B = r_2001$MarketCap1/(r_2001$ek))
2748 r_2002 <- transform(r_2002, P_B = r_2002$MarketCap1/(r_2002$ek))
2749 r_2003 <- transform(r_2003, P_B = r_2003$MarketCap1/(r_2003$ek))
2750 r_2004 <- transform(r_2004, P_B = r_2004$MarketCap1/(r_2004$ek))
2751 r_2005 <- transform(r_2005, P_B = r_2005$MarketCap1/(r_2005$ek))
2752 r_2006 <- transform(r_2006, P_B = r_2006$MarketCap1/(r_2006$ek))
2753 r_2007 <- transform(r_2007, P_B = r_2007$MarketCap1/(r_2007$ek))
2754 r_2008 <- transform(r_2008, P_B = r_2008$MarketCap1/(r_2008$ek))
2755 r_2009 <- transform(r_2009, P_B = r_2009$MarketCap1/(r_2009$ek))
2756 r_2010 <- transform(r_2010, P_B = r_2010$MarketCap1/(r_2010$ek))
2757 r_2011 <- transform(r_2011, P_B = r_2011$MarketCap1/(r_2011$ek))
2758 r_2012 <- transform(r_2012, P_B = r_2012$MarketCap1/(r_2012$ek))
2759 r_2013 <- transform(r_2013, P_B = r_2013$MarketCap1/(r_2013$ek))
2760 r_2014 <- transform(r_2014, P_B = r_2014$MarketCap1/(r_2014$ek))
2761 r_2015 <- transform(r_2015, P_B = r_2015$MarketCap1/(r_2015$ek))
2762 r_2016 <- transform(r_2016, P_B = r_2016$MarketCap1/(r_2016$ek))
2763 r_2017 <- transform(r_2017, P_B = r_2017$MarketCap1/(r_2017$ek))
2764 r_2018 <- transform(r_2018, P_B = r_2018$MarketCap1/(r_2018$ek))
2765 r_2019 <- transform(r_2019, P_B = r_2019$MarketCap1/(r_2019$ek))
2766 r_2020 <- transform(r_2020, P_B = r_2020$MarketCap1/(r_2020$ek))
2767
2768
2769 ## Beregning av P/B ##
2770
2771 ## Fjerner observasjoner med negativ P/B ##
2772
2773 r_2000 <- r_2000[c(r_2000$P_B > 0), ]
2774 r_2001 <- r_2001[c(r_2001$P_B > 0), ]
2775 r_2002 <- r_2002[c(r_2002$P_B > 0), ]
2776 r_2003 <- r_2003[c(r_2003$P_B > 0), ]
2777 r_2004 <- r_2004[c(r_2004$P_B > 0), ]
2778 r_2005 <- r_2005[c(r_2005$P_B > 0), ]
2779 r_2006 <- r_2006[c(r_2006$P_B > 0), ]
2780 r_2007 <- r_2007[c(r_2007$P_B > 0), ]
2781 r_2008 <- r_2008[c(r_2008$P_B > 0), ]
2782 r_2009 <- r_2009[c(r_2009$P_B > 0), ]
2783 r_2010 <- r_2010[c(r_2010$P_B > 0), ]
2784 r_2011 <- r_2011[c(r_2011$P_B > 0), ]
```

```
2785 r_2012 <- r_2012[c(r_2012$P_B > 0), ]
2786 r_2013 <- r_2013[c(r_2013$P_B > 0), ]
2787 r_2014 <- r_2014[c(r_2014$P_B > 0), ]
2788 r_2015 <- r_2015[c(r_2015$P_B > 0), ]
2789 r_2016 <- r_2016[c(r_2016$P_B > 0), ]
2790 r_2017 <- r_2017[c(r_2017$P_B > 0), ]
2791 r_2018 <- r_2018[c(r_2018$P_B > 0), ]
2792 r_2019 <- r_2019[c(r_2019$P_B > 0), ]
2793 r_2020 <- r_2020[c(r_2020$P_B > 0), ]
2794
2795
2796 ## Fjerner observasjoner som har P/B-verdier over 15 ##
2797
2798 r_2000 <- r_2000[c(r_2000$P_B < 15), ]
2799 r_2001 <- r_2001[c(r_2001$P_B < 15), ]
2800 r_2002 <- r_2002[c(r_2002$P_B < 15), ]
2801 r_2003 <- r_2003[c(r_2003$P_B < 15), ]
2802 r_2004 <- r_2004[c(r_2004$P_B < 15), ]
2803 r_2005 <- r_2005[c(r_2005$P_B < 15), ]
2804 r_2006 <- r_2006[c(r_2006$P_B < 15), ]
2805 r_2007 <- r_2007[c(r_2007$P_B < 15), ]
2806 r_2008 <- r_2008[c(r_2008$P_B < 15), ]
2807 r_2009 <- r_2009[c(r_2009$P_B < 15), ]
2808 r_2010 <- r_2010[c(r_2010$P_B < 15), ]
2809 r_2011 <- r_2011[c(r_2011$P_B < 15), ]
2810 r_2012 <- r_2012[c(r_2012$P_B < 15), ]
2811 r_2013 <- r_2013[c(r_2013$P_B < 15), ]
2812 r_2014 <- r_2014[c(r_2014$P_B < 15), ]
2813 r_2015 <- r_2015[c(r_2015$P_B < 15), ]
2814 r_2016 <- r_2016[c(r_2016$P_B < 15), ]
2815 r_2017 <- r_2017[c(r_2017$P_B < 15), ]
2816 r_2018 <- r_2018[c(r_2018$P_B < 15), ]
2817 r_2019 <- r_2019[c(r_2019$P_B < 15), ]
2818 r_2020 <- r_2020[c(r_2020$P_B < 15), ]
2819
2820
2821 ## Skalere P/B, sette Z-verdi på P/B ##
2822
2823 r_2000 <- transform(r_2000, zP_B = scale(r_2000$P_B))
2824 r_2001 <- transform(r_2001, zP_B = scale(r_2001$P_B))
2825 r_2002 <- transform(r_2002, zP_B = scale(r_2002$P_B))
2826 r_2003 <- transform(r_2003, zP_B = scale(r_2003$P_B))
```



```
2826 r_2003 <- transform(r_2003, zP_B = scale(r_2003$P_B))
2827 r_2004 <- transform(r_2004, zP_B = scale(r_2004$P_B))
2828 r_2005 <- transform(r_2005, zP_B = scale(r_2005$P_B))
2829 r_2006 <- transform(r_2006, zP_B = scale(r_2006$P_B))
2830 r_2007 <- transform(r_2007, zP_B = scale(r_2007$P_B))
2831 r_2008 <- transform(r_2008, zP_B = scale(r_2008$P_B))
2832 r_2009 <- transform(r_2009, zP_B = scale(r_2009$P_B))
2833 r_2010 <- transform(r_2010, zP_B = scale(r_2010$P_B))
2834 r_2011 <- transform(r_2011, zP_B = scale(r_2011$P_B))
2835 r_2012 <- transform(r_2012, zP_B = scale(r_2012$P_B))
2836 r_2013 <- transform(r_2013, zP_B = scale(r_2013$P_B))
2837 r_2014 <- transform(r_2014, zP_B = scale(r_2014$P_B))
2838 r_2015 <- transform(r_2015, zP_B = scale(r_2015$P_B))
2839 r_2016 <- transform(r_2016, zP_B = scale(r_2016$P_B))
2840 r_2017 <- transform(r_2017, zP_B = scale(r_2017$P_B))
2841 r_2018 <- transform(r_2018, zP_B = scale(r_2018$P_B))
2842 r_2019 <- transform(r_2019, zP_B = scale(r_2019$P_B))
2843 r_2020 <- transform(r_2020, zP_B = scale(r_2020$P_B))
2844
2845
2846 ## Regner ut størrelse for forskningnings spørsmål 1 ##
2847
2848 r_2000 <- transform(r_2000, størrelse = scale(r_2000$MarketCap))
2849 r_2001 <- transform(r_2001, størrelse = scale(r_2001$MarketCap))
2850 r_2002 <- transform(r_2002, størrelse = scale(r_2002$MarketCap))
2851 r_2003 <- transform(r_2003, størrelse = scale(r_2003$MarketCap))
2852 r_2004 <- transform(r_2004, størrelse = scale(r_2004$MarketCap))
2853 r_2005 <- transform(r_2005, størrelse = scale(r_2005$MarketCap))
2854 r_2006 <- transform(r_2006, størrelse = scale(r_2006$MarketCap))
2855 r_2007 <- transform(r_2007, størrelse = scale(r_2007$MarketCap))
2856 r_2008 <- transform(r_2008, størrelse = scale(r_2008$MarketCap))
2857 r_2009 <- transform(r_2009, størrelse = scale(r_2009$MarketCap))
2858 r_2010 <- transform(r_2010, størrelse = scale(r_2010$MarketCap))
2859 r_2011 <- transform(r_2011, størrelse = scale(r_2011$MarketCap))
2860 r_2012 <- transform(r_2012, størrelse = scale(r_2012$MarketCap))
2861 r_2013 <- transform(r_2013, størrelse = scale(r_2013$MarketCap))
2862 r_2014 <- transform(r_2014, størrelse = scale(r_2014$MarketCap))
2863 r_2015 <- transform(r_2015, størrelse = scale(r_2015$MarketCap))
2864 r_2016 <- transform(r_2016, størrelse = scale(r_2016$MarketCap))
2865 r_2017 <- transform(r_2017, størrelse = scale(r_2017$MarketCap))
```

```

2865 r_2017 <- transform(r_2017, størrelse = scale(r_2017$MarketCap))
2866 r_2018 <- transform(r_2018, størrelse = scale(r_2018$MarketCap))
2867 r_2019 <- transform(r_2019, størrelse = scale(r_2019$MarketCap))
2868 r_2020 <- transform(r_2020, størrelse = scale(r_2020$MarketCap))
2869
2870 ## Lager egen datafråme av fullstendig periode med relevante variabler for analysen ##
2871
2872 r1_2000 <- r_2000[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2873 r1_2001 <- r_2001[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2874 r1_2002 <- r_2002[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2875 r1_2003 <- r_2003[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2876 r1_2004 <- r_2004[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2877 r1_2005 <- r_2005[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2878 r1_2006 <- r_2006[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2879 r1_2007 <- r_2007[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2880 r1_2008 <- r_2008[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2881 r1_2009 <- r_2009[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2882 r1_2010 <- r_2010[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2883 r1_2011 <- r_2011[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2884 r1_2012 <- r_2012[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2885 r1_2013 <- r_2013[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2886 r1_2014 <- r_2014[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2887 r1_2015 <- r_2015[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2888 r1_2016 <- r_2016[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2889 r1_2017 <- r_2017[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2890 r1_2018 <- r_2018[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2891 r1_2019 <- r_2019[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2892 r1_2020 <- r_2020[, c("orgnr", "aar", "zP_B", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zACC", "zGPOA", "zROE", "zROA", "zCFDA", "zGMAR", "zbeta", "z0_score", "zAltmanZ", "zEVOL", "zLEV", "R2")]
2893
2894 ## jeg lager en datafråme for hele perioden med relevante variabler ##
2895 r_2000_2020 <- rbind(r1_2000, r1_2001, r1_2002, r1_2003, r1_2004, r1_2005, r1_2006,
2896 ,r1_2007, r1_2008, r1_2009, r1_2010, r1_2011, r1_2012, r1_2013, r1_2014, r1_2015,
2897 ,r1_2016, r1_2017, r1_2018, r1_2019, r1_2020,)
2898
2899

```

```

2900 ## Lage excel-fil for å ta gjennomsnitt av kvalitetsfaktorene, selv med manglende observasjoner i enkelte av målene, ##
2901 ## og lager en ny variabel i dataframen, "lønnsomhet", "vekst", og "sikkerhet" basert på summen an de individuelle kvalitetsmålene ##
2902
2903 ## skalerer variablene til "zlønnsomhet", "zvekst" og "zsikkerhet" i r for så å lage enda en excel sheet for å samle de tre skalerte ##
2904 ## kvalitetsmålene til en endelig samlet kvalitetsmål, "kvalitet". Skalerer så kvalitet i henhold til metoden, som gjøres under. ##
2905 ## Dataframen "utvalg41" inneholder tilslutt variablene "zlønnsomhet", "zvekst", "zsikkerhet" og "zkvalitet som det gjøres regresjon på ##
2906
2907 write_xlsx(r_2000_2020, path = "zscore.xlsx")
2908 utvalg2 <- read_excel("zscore.xlsx")
2909
2910 utvalg2 <- transform(utvalg2, zlonnsomhet = scale(utvalg2$lonnsomhet))
2911 utvalg2 <- transform(utvalg2, zvekst = scale(utvalg2$vekst))
2912 utvalg2 <- transform(utvalg2, zsikkerhet = scale(utvalg2$sikkerhet))
2913
2914 ## Laste inn bearbeidet excel-fil ##
2915 write_xlsx(utvalg2, path = "samletkvalitet_zcore.xlsx")
2916 utvalg41 <- read_excel("samletkvalitet_zcore_1.xlsx")
2917
2918 ## identifiserer om variablene har korrekte "classes" ##
2919 lapply(utvalg41, class)
2920
2921 ## Gjør dato til korrekt format ##
2922 utvalg41$Date <- as.Date(utvalg41$Date, formate = "%m/%d/%Y")
2923
2924 ## Skalerer kvalitetvariabelen i henhold til metoden ##
2925 utvalg41 <- transform(utvalg41, zkvalitet = scale(utvalg41$kvalitet))
2926
2927 ## Regner ut avkastning t-12 ##
2928 utvalg41$Ret12dato <- utvalg41$Date %m-% year(12)
2929
2930 ## legger ved siste års avkastning i korrekt dato i henhold til dataframen ##
2931 utvalg41 <- left_join(utvalg41, aksjer[,c("Date", "orgnr", "R2")], by = c("Ret12dato" = "Date", "orgnr" = "orgnr"))
2932
2933 colnames(utvalg41)[which(names(utvalg41) == "R2.y")] <- "Retlag12" ## siste års avkastning
2934 colnames(utvalg41)[which(names(utvalg41) == "R2.x")] <- "R2" ## avkastning for respektiv dato
2935
2936 ## Skalerer siste års avkastning ##
2937 utvalg41 <- transform(utvalg41, zRetlag12 = scale(utvalg41$Retlag12))
2938

```

```

2938
2939
2940 * ## Forskningsspørsmål 1. ###
2941 ## Regresjonen pris på kvalitet ##
2942
2943 pkreg1 <- pmg(utvalg41$P_B ~ utvalg41$zkvalitet, data = utvalg41, index = c("Date", "orgnr"))
2944 pkreg2 <- pmg(utvalg41$P_B ~ utvalg41$zkvalitet + utvalg41$størrelse + utvalg41$Retlag12, data = utvalg41, index = c("Date", "orgnr"))
2945 pkreg3 <- pmg(utvalg41$P_B ~ utvalg41$zlønnsomhet, data = utvalg41, index = c("Date", "orgnr"))
2946 pkreg4 <- pmg(utvalg41$P_B ~ utvalg41$zvekst, data = utvalg41, index = c("Date", "orgnr"))
2947 pkreg5 <- pmg(utvalg41$P_B ~ utvalg41$zsikkerhet, data = utvalg41, index = c("Date", "orgnr"))
2948 pkreg6 <- pmg(utvalg41$P_B ~ utvalg41$zlønnsomhet + utvalg41$zvekst + utvalg41$zsikkerhet + utvalg41$størrelse + utvalg41$Retlag12, data = utvalg41, index = c("Date", "or
2949
2950 ## Resultat av regresjonene ##
2951 summary(pkreg1)
2952 coeftest(pkreg1)
2953 summary(pkreg1)
2954 coeftest(pkreg1)
2955 summary(pkreg1)
2956 coeftest(pkreg1)
2957 summary(pkreg1)
2958 coeftest(pkreg1)
2959 summary(pkreg1)
2960 coeftest(pkreg1)
2961 summary(pkreg1)
2962 coeftest(pkreg1)
2963
2964
2965 * ## Forskningsspørsmål 2. ###
2966
2967
2968 ## første steg fordeler i 2 portefeljer basert på marketcap hver måned = breakpoint på 80% av markedsverdien i henhold til originale studiet ##
2969
2970 * ## (M)-faktoren ###
2971
2972 total_port_1 <- total_port
2973
2974 tot_mark_cap <- aggregate(total_port_1$MarketCap1, list(total_port_1$Date), sum)

```

```

2974 tot_mark_cap <- aggregate(total_port_1$MarketCap1, list(total_port_1$Date), sum)
2975 names(tot_mark_cap) <- c("Date", "TotMarketCap")
2976
2977 total_port_1 <- left_join(total_port_1, tot_mark_cap, by = c("Date" = "Date"))
2978
2979
2980 ## fordele i 2 porteføljer på størrelse ##
2981
2982 head(total_port_1)
2983 total_port_1 <- total_port_1 %>% group_by(Date) %>%
2984   mutate(q = quantile(MarketCap1,0.8),
2985     pgtq8 = ifelse(MarketCap1 >= q,1,0))
2986
2987 summary(total_port_1$pgtq8)
2988
2989
2990 ##
2991
2992 port_big <- total_port_1[total_port_1$pgtq8 == "1", ]
2993 port_small <- total_port_1[total_port_1$pgtq8 == "0", ]
2994
2995
2996 ## lager fordelingen 30% - 40% - 30% for store aksjer ##
2997
2998 port_big <- port_big %>% group_by(Date) %>%
2999   mutate(QJ = quantile(zkvalitet,0.3),
3000     BigJunk = ifelse(zkvalitet <= QJ,1,0))
3001
3002
3003 port_big <- port_big %>% group_by(Date) %>%
3004   mutate(QQ = quantile(zkvalitet,0.7),
3005     bigQuality = ifelse(zkvalitet >= QQ,1,0))
3006
3007
3008 port_big_junk <- port_big[port_big$BigJunk == "1", ]
3009
3010 port_big_quality <- port_big[port_big$bigQuality == "1", ]
3011
3012
3013 ## lager fordelingen 30% - 40% - 30% for små aksjer ##

```

```

3013 ## Lager fordelingen 30% - 40% - 30% for små aksjer ##
3014
3015
3016 port_small <- port_small %>% group_by(Date) %>%
3017   mutate(QJ = quantile(zkvalitet,0.3),
3018     SmallJunk = ifelse(zkvalitet <= QJ,1,0))
3019
3020
3021 port_small <- port_small %>% group_by(Date) %>%
3022   mutate(QQ = quantile(zkvalitet,0.7),
3023     SmallQuality = ifelse(zkvalitet >= QQ,1,0))
3024
3025
3026 port_small_junk <- port_small[port_small$SmallJunk == "1", ]
3027
3028 port_small_quality <- port_small[port_small$SmallQuality == "1", ]
3029
3030
3031 ## VW de ulike porteføljene for å beregne avkastningstallene ##
3032
3033 ## Beregner total markedscap for hver portefølje ##
3034 res1_1 <- aggregate(port_big_quality$MarketCap1, list(port_big_quality$Date), sum)
3035 names(res1_1) <- c("Date", "TotalMarketCap1_1")
3036
3037 res2_1 <- aggregate(port_big_junk$MarketCap1, list(port_big_junk$Date), sum)
3038 names(res2_1) <- c("Date", "TotalMarketCap2_1")
3039
3040 res3_1 <- aggregate(port_small_quality$MarketCap1, list(port_small_quality$Date), sum)
3041 names(res3_1) <- c("Date", "TotalMarketCap3_1")
3042
3043 res4_1 <- aggregate(port_small_junk$MarketCap1, list(port_small_junk$Date), sum)
3044 names(res4_1) <- c("Date", "TotalMarketCap4_1")
3045
3046
3047 ## merger de sammen ##
3048 port_big_quality <- merge(port_big_quality, res1_1, by = "Date")
3049 port_big_junk <- merge(port_big_junk, res2_1, by = "Date")
3050 port_small_quality <- merge(port_small_quality, res3_1, by = "Date")
3051 port_small_junk <- merge(port_small_junk, res4_1, by = "Date")

```

```

3052
3053
3054 ## vektning av porteføljene ##
3055 port_big_quality$vekker <- port_big_quality$MarketCap1 / port_big_quality$TotalMarketCap1_1
3056 port_big_junk$vekker <- port_big_junk$MarketCap1 / port_big_junk$TotalMarketCap2_1
3057 port_small_quality$vekker <- port_small_quality$MarketCap1 / port_small_quality$TotalMarketCap3_1
3058 port_small_junk$vekker <- port_small_junk$MarketCap1 / port_small_junk$TotalMarketCap4_1
3059
3060
3061 ## legge ved korrekt avkastning ##
3062 port_big_quality <- left_join(port_big_quality, aksjer[, c("Date", "R2", "orgnr")], by = c("Date" = "Date", "orgnr" = "orgnr"))
3063 port_big_junk <- left_join(port_big_junk, aksjer[, c("Date", "R2", "orgnr")], by = c("Date" = "Date", "orgnr" = "orgnr"))
3064 port_small_quality <- left_join(port_small_quality, aksjer[, c("Date", "R2", "orgnr")], by = c("Date" = "Date", "orgnr" = "orgnr"))
3065 port_small_junk <- left_join(port_small_junk, aksjer[, c("Date", "R2", "orgnr")], by = c("Date" = "Date", "orgnr" = "orgnr"))
3066
3067 ## beregner meravkastning på porteføljene ##
3068 port_big_quality>Returns1 <- port_big_quality$R2.y * port_big_quality$vekker
3069 port_big_junk>Returns2 <- port_big_junk$R2.y * port_big_junk$vekker
3070 port_small_quality>Returns3 <- port_small_quality$R2.y * port_small_quality$vekker
3071 port_small_junk>Returns4 <- port_small_junk$R2.y * port_small_junk$vekker
3072
3073
3074 ## aggregere porteføljeavkastningen så vi får samlet månedlige avkastningstall ##
3075 port_big_quality_1 <- aggregate(port_big_quality>Returns1, list(port_big_quality$Date), sum)
3076 names(port_big_quality_1) <- c("Date", "ReturnsBQ")
3077
3078 port_big_junk_1 <- aggregate(port_big_junk>Returns2, list(port_big_junk$Date), sum)
3079 names(port_big_junk_1) <- c("Date", "ReturnsBJ")
3080
3081 port_small_quality_1 <- aggregate(port_small_quality>Returns3, list(port_small_quality$Date), sum)
3082 names(port_small_quality_1) <- c("Date", "ReturnsSQ")
3083
3084 port_small_junk_1 <- aggregate(port_small_junk>Returns4, list(port_small_junk$Date), sum)
3085 names(port_small_junk_1) <- c("Date", "ReturnsSJ")
3086
3087
3088 ## Lage QMJ faktoren ##
3089 port_quality <- merge(port_big_quality_1, port_small_quality_1, by = "Date")
3090 port_junk <- merge(port_big_junk_1, port_small_junk_1, by = "Date")

```

```

3090 port_junk <- merge(port_big_junk_1, port_small_junk_1, by = "Date")
3091
3092 port_QMJ <- merge(port_quality, port_junk, by = "Date")
3093
3094
3095 ## QMJ faktoren ##
3096 port_QMJ <- transform(port_QMJ, QMJ = 0.5*(port_QMJ>ReturnsSQ - port_QMJ>ReturnsSJ)+0.5*(port_QMJ>ReturnsBQ - port_QMJ>ReturnsBJ))
3097
3098 ## QMJ faktoren ##
3099 port_longQuality <- transform(port_QMJ, LongQuality = 0.5*(port_QMJ>ReturnsSQ)+0.5*(port_QMJ>ReturnsBQ))
3100 port_ShortJunk <- transform(port_QMJ, ShortJunk = 0.5*(port_QMJ>ReturnsSJ)+0.5*(port_QMJ>ReturnsBJ))
3101
3102 ## legge ved faktorer ##
3103
3104 port_QMJ <- left_join(port_QMJ, Faktorer[,c("SMB", "HML", "PRIYR", "UMD", "Date")], by = c("Date" = "Date"))
3105 port_QMJ <- left_join(port_QMJ, Faktorer2[,c("MKT", "Date")], by = c("Date" = "Date"))
3106
3107 port_longQuality <- left_join(port_longQuality, Faktorer[,c("SMB", "HML", "PRIYR", "UMD", "Date")], by = c("Date" = "Date"))
3108 port_longQuality <- left_join(port_longQuality, Faktorer2[,c("MKT", "Date")], by = c("Date" = "Date"))
3109
3110 port_ShortJunk <- left_join(port_ShortJunk, Faktorer[,c("SMB", "HML", "PRIYR", "UMD", "Date")], by = c("Date" = "Date"))
3111 port_ShortJunk <- left_join(port_ShortJunk, Faktorer2[,c("MKT", "Date")], by = c("Date" = "Date"))
3112
3113
3114 ## Regresjon ... ##
3115 ## På market ##
3116
3117 fan30 <- lm(port_QMJ~QMJ - port_QMJ~MKT, data = port_QMJ)
3118 summary(fan30)
3119
3120 fan40 <- lm(port_QMJ~QMJ - port_QMJ~MKT + port_QMJ~SMB + port_QMJ~HML, data = port_QMJ)
3121 summary(fan40)
3122
3123 fan50 <- lm(port_QMJ~QMJ - port_QMJ~MKT + port_QMJ~SMB + port_QMJ~HML + port_QMJ~UMD, data = port_QMJ)
3124 summary(fan50)
3125
3126 fan60 <- lm(port_longQuality~LongQuality - port_longQuality~MKT.x + port_longQuality~SMB.x + port_longQuality~HML.x + port_longQuality~UMD.x, data = port_longQuality)
3127 summary(fan60)
3128
3129 fan70 <- lm(port_ShortJunk~ShortJunk - port_ShortJunk~MKT.x + port_ShortJunk~SMB.x + port_ShortJunk~HML.x + port_ShortJunk~UMD.x, data = port_ShortJunk)
3130 summary(fan70)

```



```

3133 ## På Excess returns ##
3134 res30_1 <- mean(port_QMJ$QMJ)
3135
3136 ## T-verdier
3137 res_30_2 <- res30_1/(StdDev(port_QMJ$QMJ)/sqrt(length(port_QMJ$QMJ)))
3138
3139 ## Sharpe verdier ##
3140 res_30_3 <- res30_1/(StdDev(port_QMJ$QMJ))
3141
3142
3143 ## Regne ut Lonnsomhet-Faktoren, Lik fremgangsmåte som i beregningen av QMJ-faktoren ####
3144
3145 port_big_lonnsomhet <- total_port_1[total_port_1$pgtq8 == "1", ]
3146 port_small_lonnsomhet <- total_port_1[total_port_1$pgtq8 == "0", ]
3147
3148 ## Lager quantiles 30% - 40% - 30% for store aksjer ##
3149
3150 port_big_lonnsomhet <- port_big_lonnsomhet %>% group_by(Date) %>%
3151   mutate(QJ = quantile(zlonnsomhet,0.3),
3152          BigJunk = ifelse(zlonnsomhet <= QJ,1,0))
3153 port_big_lonnsomhet <- port_big_lonnsomhet %>% group_by(Date) %>%
3154   mutate(QQ = quantile(zlonnsomhet,0.7),
3155          bigQuality = ifelse(zlonnsomhet >= QQ,1,0))
3156
3157 port_big_junk_lonnsomhet <- port_big_lonnsomhet[port_big_lonnsomhet$BigJunk == "1", ]
3158 port_big_quality_lonnsomhet <- port_big_lonnsomhet[port_big_lonnsomhet$bigQuality == "1", ]
3159
3160 ## Lager quantiles 30% - 40% - 30% for små aksjer ##
3161
3162 port_small_lonnsomhet <- port_small_lonnsomhet %>% group_by(Date) %>%
3163   mutate(QJ = quantile(zlonnsomhet,0.3),
3164          SmallJunk = ifelse(zlonnsomhet <= QJ,1,0))
3165 port_small_lonnsomhet <- port_small_lonnsomhet %>% group_by(Date) %>%
3166   mutate(QQ = quantile(zlonnsomhet,0.7),
3167          SmallQuality = ifelse(zlonnsomhet >= QQ,1,0))
3168

```

```

3168
3169 port_small_junk_lonnsomhet <- port_small_lonnsomhet[port_small_lonnsomhet$SmallJunk == "1", ]
3170 port_small_quality_lonnsomhet <- port_small_lonnsomhet[port_small_lonnsomhet$SmallQuality == "1", ]
3171
3172 ## VW de ulike porteføljene for å beregne avkastningen ##
3173
3174 ## Beregner total markedskap for hver portefølje ##
3175 res1_1_lonnsomhet <- aggregate(port_big_quality_lonnsomhet$MarketCap1, list(port_big_quality_lonnsomhet$Date), sum)
3176 names(res1_1_lonnsomhet) <- c("Date", "TotalMarketCap1_1")
3177
3178 res2_1_lonnsomhet <- aggregate(port_big_junk_lonnsomhet$MarketCap1, list(port_big_junk_lonnsomhet$Date), sum)
3179 names(res2_1_lonnsomhet) <- c("Date", "TotalMarketCap2_1")
3180
3181 res3_1_lonnsomhet <- aggregate(port_small_quality_lonnsomhet$MarketCap1, list(port_small_quality_lonnsomhet$Date), sum)
3182 names(res3_1_lonnsomhet) <- c("Date", "TotalMarketCap3_1")
3183
3184 res4_1_lonnsomhet <- aggregate(port_small_junk_lonnsomhet$MarketCap1, list(port_small_junk_lonnsomhet$Date), sum)
3185 names(res4_1_lonnsomhet) <- c("Date", "TotalMarketCap4_1")
3186
3187 port_big_quality_lonnsomhet <- merge(port_big_quality_lonnsomhet, res1_1_lonnsomhet, by = "Date")
3188 port_big_junk_lonnsomhet <- merge(port_big_junk_lonnsomhet, res2_1_lonnsomhet, by = "Date")
3189 port_small_quality_lonnsomhet <- merge(port_small_quality_lonnsomhet, res3_1_lonnsomhet, by = "Date")
3190 port_small_junk_lonnsomhet <- merge(port_small_junk_lonnsomhet, res4_1_lonnsomhet, by = "Date")
3191
3192
3193 ## vektning av porteføljene ##
3194
3195 port_big_quality_lonnsomhet$vekt <- port_big_quality_lonnsomhet$MarketCap1 / port_big_quality_lonnsomhet$TotalMarketCap1_1
3196 port_big_junk_lonnsomhet$vekt <- port_big_junk_lonnsomhet$MarketCap1 / port_big_junk_lonnsomhet$TotalMarketCap2_1
3197 port_small_quality_lonnsomhet$vekt <- port_small_quality_lonnsomhet$MarketCap1 / port_small_quality_lonnsomhet$TotalMarketCap3_1
3198 port_small_junk_lonnsomhet$vekt <- port_small_junk_lonnsomhet$MarketCap1 / port_small_junk_lonnsomhet$TotalMarketCap4_1
3199
3200 ## legge ved korrekt avkastning ##
3201
3202 port_big_quality_lonnsomhet <- left_join(port_big_quality_lonnsomhet, aksjer[, c("Date", "R2", "orgnr")], by = c("Date" = "Date", "orgnr" = "orgnr"))
3203 port_big_junk_lonnsomhet <- left_join(port_big_junk_lonnsomhet, aksjer[, c("Date", "R2", "orgnr")], by = c("Date" = "Date", "orgnr" = "orgnr"))
3204 port_small_quality_lonnsomhet <- left_join(port_small_quality_lonnsomhet, aksjer[, c("Date", "R2", "orgnr")], by = c("Date" = "Date", "orgnr" = "orgnr"))
3205 port_small_junk_lonnsomhet <- left_join(port_small_junk_lonnsomhet, aksjer[, c("Date", "R2", "orgnr")], by = c("Date" = "Date", "orgnr" = "orgnr"))
3206
3207 ## beregner neravkastning på porteføljene ##

```

```

3299 ## Beregner total markedscap for hver portefølje ##
3300 res1_1_vekst <- aggregate(port_big_quality_vekst$MarketCap1, list(port_big_quality_vekst$Date), sum)
3301 names(res1_1_vekst) <- c("Date", "TotalMarketCap1_1")
3302
3303 res2_1_vekst <- aggregate(port_big_junk_vekst$MarketCap1, list(port_big_junk_vekst$Date), sum)
3304 names(res2_1_vekst) <- c("Date", "TotalMarketCap2_1")
3305
3306 res3_1_vekst <- aggregate(port_small_quality_vekst$MarketCap1, list(port_small_quality_vekst$Date), sum)
3307 names(res3_1_vekst) <- c("Date", "TotalMarketCap3_1")
3308
3309 res4_1_vekst <- aggregate(port_small_junk_vekst$MarketCap1, list(port_small_junk_vekst$Date), sum)
3310 names(res4_1_vekst) <- c("Date", "TotalMarketCap4_1")
3311
3312 port_big_quality_vekst <- merge(port_big_quality_vekst, res1_1_vekst, by = "Date")
3313 port_big_junk_vekst <- merge(port_big_junk_vekst, res2_1_vekst, by = "Date")
3314 port_small_quality_vekst <- merge(port_small_quality_vekst, res3_1_vekst, by = "Date")
3315 port_small_junk_vekst <- merge(port_small_junk_vekst, res4_1_vekst, by = "Date")
3316
3317 ## vektning i porteføljene ##
3318
3319 port_big_quality_vekst$vekker <- port_big_quality_vekst$MarketCap1 / port_big_quality_vekst$TotalMarketCap1_1
3320 port_big_junk_vekst$vekker <- port_big_junk_vekst$MarketCap1 / port_big_junk_vekst$TotalMarketCap2_1
3321 port_small_quality_vekst$vekker <- port_small_quality_vekst$MarketCap1 / port_small_quality_vekst$TotalMarketCap3_1
3322 port_small_junk_vekst$vekker <- port_small_junk_vekst$MarketCap1 / port_small_junk_vekst$TotalMarketCap4_1
3323
3324
3325 ## legge ved korrekt avkastning ##
3326
3327 port_big_quality_vekst <- left_join(port_big_quality_vekst, aksjer[, c("Date", "R2", "orgnr")], by = c("Date" = "Date", "orgnr" = "orgnr"))
3328 port_big_junk_vekst <- left_join(port_big_junk_vekst, aksjer[, c("Date", "R2", "orgnr")], by = c("Date" = "Date", "orgnr" = "orgnr"))
3329 port_small_quality_vekst <- left_join(port_small_quality_vekst, aksjer[, c("Date", "R2", "orgnr")], by = c("Date" = "Date", "orgnr" = "orgnr"))
3330 port_small_junk_vekst <- left_join(port_small_junk_vekst, aksjer[, c("Date", "R2", "orgnr")], by = c("Date" = "Date", "orgnr" = "orgnr"))
3331
3332 ## beregner meravkastning på porteføljene ##
3333 port_big_quality_vekst>Returns1 <- port_big_quality_vekst$R2.y * port_big_quality_vekst$vekker
3334 port_big_junk_vekst>Returns2 <- port_big_junk_vekst$R2.y * port_big_junk_vekst$vekker
3335 port_small_quality_vekst>Returns3 <- port_small_quality_vekst$R2.y * port_small_quality_vekst$vekker
3336 port_small_junk_vekst>Returns4 <- port_small_junk_vekst$R2.y * port_small_junk_vekst$vekker
3337

```

```

3339 ## aggregere porteføljeavkastningen så vi får samlet månedlige avkastningstall ##
3340
3341 port_big_quality_vekst1 <- aggregate(port_big_quality_lonnsomhet$Returns1, list(port_big_quality_lonnsomhet$Date), sum)
3342 names(port_big_quality_vekst1) <- c("Date", "ReturnsBQ")
3343
3344 port_big_junk_vekst1 <- aggregate(port_big_junk_vekst$Returns2, list(port_big_junk_vekst$Date), sum)
3345 names(port_big_junk_vekst1) <- c("Date", "ReturnsBJ")
3346
3347 port_small_quality_vekst1 <- aggregate(port_small_quality_vekst$Returns3, list(port_small_quality_vekst$Date), sum)
3348 names(port_small_quality_vekst1) <- c("Date", "ReturnsSQ")
3349
3350 port_small_junk_vekst1 <- aggregate(port_small_junk_vekst$Returns4, list(port_small_junk_vekst$Date), sum)
3351 names(port_small_junk_vekst1) <- c("Date", "ReturnsSJ")
3352
3353
3354 ## Lage Vekst-Faktoren ##
3355
3356 port_quality_vekst <- merge(port_big_quality_vekst1, port_small_quality_vekst1, by = "Date")
3357 port_junk_vekst <- merge(port_big_junk_vekst1, port_small_junk_vekst1, by = "Date")
3358
3359 port_vekst <- merge(port_quality_vekst, port_junk_vekst, by = "Date")
3360
3361 ## Vekst-Faktoren ##
3362 port_vekst <- transform(port_vekst, vekst = 0.5*(port_vekst$ReturnsSQ - port_vekst$ReturnsSJ)+0.5*(port_vekst$ReturnsBQ - port_vekst$ReturnsBJ))
3363
3364 ## Legge ved faktorer ##
3365
3366 port_vekst <- left_join(port_vekst, Faktorer1[,c("SMB", "HML", "PRI1YR", "UMD", "Date")], by = c("Date" = "Date"))
3367 port_vekst <- left_join(port_vekst, Faktorer2[,c("MKT", "Date")], by = c("Date" = "Date"))
3368
3369
3370 ## Regresjon på... ##
3371 ## På market ##
3372

```

```

3370 ## Regresjon på... ##
3371 ## På market ##
3372
3373 fam30_vekst <- lm(port_vekst$vekst ~ port_vekst$MKT, data = port_vekst)
3374 summary(fam30_vekst)
3375
3376 fam40_vekst <- lm(port_vekst$vekst ~ port_vekst$MKT + port_vekst$SMB + port_vekst$HML, data = port_vekst)
3377 summary(fam40_vekst)
3378
3379 fam50_vekst <- lm(port_vekst$vekst ~ port_vekst$MKT + port_vekst$SMB + port_vekst$HML + port_vekst$UMD, data = port_vekst)
3380 summary(fam50_vekst)
3381
3382
3383 ## På Excess returns ##
3384 res30_1vekst <- mean(port_vekst$vekst)
3385
3386 ## T-verdier
3387 res_30_2vekst <- res30_1vekst/(StdDev(port_vekst$vekst)/sqrt(length(port_vekst$vekst)))
3388
3389 ## Sharpe verdier ##
3390 res_30_3vekst <- res30_1vekst/(StdDev(port_vekst$vekst))
3391
3392
3393
3394 ## Regne ut Sikkerhet-Faktoren ####
3395
3396 port_big_sikkerhet <- total_port_1[total_port_1$pgtq8 == "1", ]
3397 port_small_sikkerhet <- total_port_1[total_port_1$pgtq8 == "0", ]
3398
3399 ## Lager quantiles 30% - 40% - 30% for store aksjer ##
3400
3401 port_big_sikkerhet <- port_big_sikkerhet %>% group_by(Date) %>%
3402   mutate(QJ = quantile(zsikkerhet,0.3),
3403          BigJunk = ifelse(zsikkerhet <= QJ,1,0))
3404 port_big_sikkerhet <- port_big_sikkerhet %>% group_by(Date) %>%
3405   mutate(QQ = quantile(zsikkerhet,0.7),
3406          bigQuality = ifelse(zsikkerhet >= QQ,1,0))
3407

```

```

3407
3408 port_big_junk_sikkerhet <- port_big_sikkerhet[port_big_sikkerhet$BigJunk == "1", ]
3409 port_big_quality_sikkerhet <- port_big_sikkerhet[port_big_sikkerhet$bigQuality == "1", ]
3410
3411
3412 ## lager quantiles 30% - 40% - 30% for små aksjer ##
3413
3414
3415 port_small_sikkerhet <- port_small_sikkerhet %>% group_by(Date) %>%
3416   mutate(QJ = quantile(zsikkerhet,0.3),
3417     SmallJunk = ifelse(zsikkerhet <= QJ,1,0))
3418 port_small_sikkerhet <- port_small_sikkerhet %>% group_by(Date) %>%
3419   mutate(QQ = quantile(zsikkerhet,0.7),
3420     SmallQuality = ifelse(zsikkerhet >= QQ,1,0))
3421
3422 port_small_junk_sikkerhet <- port_small_sikkerhet[port_small_sikkerhet$SmallJunk == "1", ]
3423 port_small_quality_sikkerhet <- port_small_sikkerhet[port_small_sikkerhet$SmallQuality == "1", ]
3424
3425
3426 ## VW de ulike porteføljene for å lage avkastningstallene ##
3427
3428 ## Beregner total markedscap for hver portefølje ##
3429 res1_1_sikkerhet <- aggregate(port_big_quality_sikkerhet$MarketCap1, list(port_big_quality_sikkerhet$Date), sum)
3430 names(res1_1_sikkerhet) <- c("Date", "TotalMarketCap1_1")
3431
3432 res2_1_sikkerhet <- aggregate(port_big_junk_sikkerhet$MarketCap1, list(port_big_junk_sikkerhet$Date), sum)
3433 names(res2_1_sikkerhet) <- c("Date", "TotalMarketCap2_1")
3434
3435 res3_1_sikkerhet <- aggregate(port_small_quality_sikkerhet$MarketCap1, list(port_small_quality_sikkerhet$Date), sum)
3436 names(res3_1_sikkerhet) <- c("Date", "TotalMarketCap3_1")
3437
3438 res4_1_sikkerhet <- aggregate(port_small_junk_sikkerhet$MarketCap1, list(port_small_junk_sikkerhet$Date), sum)
3439 names(res4_1_sikkerhet) <- c("Date", "TotalMarketCap4_1")
3440
3441
3442 port_big_quality_sikkerhet <- merge(port_big_quality_sikkerhet, res1_1_sikkerhet, by = "Date")
3443 port_big_junk_sikkerhet <- merge(port_big_junk_sikkerhet, res2_1_sikkerhet, by = "Date")
3444 port_small_quality_sikkerhet <- merge(port_small_quality_sikkerhet, res3_1_sikkerhet, by = "Date")
3445 port_small_junk_sikkerhet <- merge(port_small_junk_sikkerhet, res4_1_sikkerhet, by = "Date")
3446
3447

```

```

3448 ## vektning i porteføljene ##
3449 port_big_quality_sikkerhet$vekker <- port_big_quality_sikkerhet$MarketCap1 / port_big_quality_sikkerhet$TotalMarketCap1_1
3450 port_big_junk_sikkerhet$vekker <- port_big_junk_sikkerhet$MarketCap1 / port_big_junk_sikkerhet$TotalMarketCap2_1
3451 port_small_quality_sikkerhet$vekker <- port_small_quality_sikkerhet$MarketCap1 / port_small_quality_sikkerhet$TotalMarketCap3_1
3452 port_small_junk_sikkerhet$vekker <- port_small_junk_sikkerhet$MarketCap1 / port_small_junk_sikkerhet$TotalMarketCap4_1
3453
3454
3455 ## legge ved korrekt avkastning ##
3456 port_big_quality_sikkerhet <- left_join(port_big_quality_sikkerhet, aksjer[, c("Date", "R2", "orgnr")], by = c("Date" = "Date", "orgnr" = "orgnr"))
3457 port_big_junk_sikkerhet <- left_join(port_big_junk_sikkerhet, aksjer[, c("Date", "R2", "orgnr")], by = c("Date" = "Date", "orgnr" = "orgnr"))
3458 port_small_quality_sikkerhet <- left_join(port_small_quality_sikkerhet, aksjer[, c("Date", "R2", "orgnr")], by = c("Date" = "Date", "orgnr" = "orgnr"))
3459 port_small_junk_sikkerhet <- left_join(port_small_junk_sikkerhet, aksjer[, c("Date", "R2", "orgnr")], by = c("Date" = "Date", "orgnr" = "orgnr"))
3460
3461 ## beregner meravkastning på porteføljene ##
3462 port_big_quality_sikkerhet>Returns1 <- port_big_quality_sikkerhet$R2.y * port_big_quality_sikkerhet$vekker
3463 port_big_junk_sikkerhet>Returns2 <- port_big_junk_sikkerhet$R2.y * port_big_junk_sikkerhet$vekker
3464 port_small_quality_sikkerhet>Returns3 <- port_small_quality_sikkerhet$R2.y * port_small_quality_sikkerhet$vekker
3465 port_small_junk_sikkerhet>Returns4 <- port_small_junk_sikkerhet$R2.y * port_small_junk_sikkerhet$vekker
3466
3467
3468 ## aggregere porteføljeavkastningen så vi får samlet månedlige avkastningstall ##
3469 port_big_quality_sikkerhet1 <- aggregate(port_big_quality_sikkerhet>Returns1, list(port_big_quality_sikkerhet$Date), sum)
3470 names(port_big_quality_sikkerhet1) <- c("Date", "ReturnsBQ")
3471
3472 port_big_junk_sikkerhet1 <- aggregate(port_big_junk_sikkerhet>Returns2, list(port_big_junk_sikkerhet$Date), sum)
3473 names(port_big_junk_sikkerhet1) <- c("Date", "ReturnsBJ")
3474
3475 port_small_quality_sikkerhet1 <- aggregate(port_small_quality_sikkerhet>Returns3, list(port_small_quality_sikkerhet$Date), sum)
3476 names(port_small_quality_sikkerhet1) <- c("Date", "ReturnsSQ")
3477
3478 port_small_junk_sikkerhet1 <- aggregate(port_small_junk_sikkerhet>Returns4, list(port_small_junk_sikkerhet$Date), sum)
3479 names(port_small_junk_sikkerhet1) <- c("Date", "ReturnsSJ")
3480
3481
3482 ## Lage Sikkerhet-Faktoren ##
3483
3484 port_quality_sikkerhet <- merge(port_big_quality_sikkerhet1, port_small_quality_sikkerhet1, by = "Date")
3485 port_junk_sikkerhet <- merge(port_big_junk_sikkerhet1, port_small_junk_sikkerhet1, by = "Date")
3486

```

```

3486
3487 port_sikkerhet <- merge(port_quality_sikkerhet, port_junk_sikkerhet, by = "Date")
3488
3489 ## Sikkerhet-Faktoren ##
3490 port_sikkerhet <- transform(port_sikkerhet, sikkerhet = 0.5*(port_sikkerhet>ReturnsSQ-port_sikkerhet>ReturnsSJ)+0.5*(port_sikkerhet>ReturnsBQ-port_sikkerhet>ReturnsBJ))
3491
3492 ## legge ved faktorer ##
3493 port_sikkerhet <- left_join(port_sikkerhet, Faktore1[,c("SMB", "HML", "PR1YE", "UMD", "Date")], by = c("Date" = "Date"))
3494 port_sikkerhet <- left_join(port_sikkerhet, Faktore2[,c("MKT", "Date")], by = c("Date" = "Date"))
3495
3496
3497 ## Regresjon på... ##
3498 ## På marked ##
3499
3500 f30_sikkerhet <- lm(port_sikkerhet$sikkerhet ~ port_sikkerhet$MKT, data = port_sikkerhet)
3501 summary(f30_sikkerhet)
3502
3503 f40_sikkerhet <- lm(port_sikkerhet$sikkerhet ~ port_sikkerhet$MKT + port_sikkerhet$SMB + port_sikkerhet$HML, data = port_sikkerhet)
3504 summary(f40_sikkerhet)
3505
3506 f50_sikkerhet <- lm(port_sikkerhet$sikkerhet ~ port_sikkerhet$MKT + port_sikkerhet$SMB + port_sikkerhet$HML + port_sikkerhet$UMD, data = port_sikkerhet)
3507 summary(f50_sikkerhet)
3508
3509 ## På Excess returns ##
3510 res30_1sikkerhet <- mean(port_sikkerhet$sikkerhet)
3511
3512 ## T-verdier
3513 res_30_2sikkerhet <- res30_1sikkerhet/(StdDev(port_sikkerhet$sikkerhet)/sqrt(length(port_sikkerhet$sikkerhet)))
3514
3515 ## Sharpe verdier ##
3516 res_30_3sikkerhet <- res30_1sikkerhet/(StdDev(port_sikkerhet$sikkerhet))
3517
3518

```



```
3520 ▾ ## Faktoreksponering ###
3521
3522 ## QMJ ##
3523 famQMJ_MKT <- lm(port_QMJ$QMJ ~ port_QMJ$MKT, data = port_QMJ)
3524 summary(famQMJ_MKT)
3525
3526 famQMJ_SMB <- lm(port_QMJ$QMJ ~ port_QMJ$SMB, data = port_QMJ)
3527 summary(famQMJ_SMB)
3528
3529 famQMJ_HML <- lm(port_QMJ$QMJ ~ port_QMJ$HML, data = port_QMJ)
3530 summary(famQMJ_HML)
3531
3532 famQMJ_UMD <- lm(port_QMJ$QMJ ~ port_QMJ$UMD, data = port_QMJ)
3533 summary(famQMJ_UMD)
3534
3535 ## lønnsomhet ##
3536 famlonnsomhet_MKT <- lm(port_lonnsomhet$lonnsomhet ~ port_lonnsomhet$MKT, data = port_lonnsomhet)
3537 summary(famlonnsomhet_MKT)
3538
3539 famlonnsomhet_SMB <- lm(port_lonnsomhet$lonnsomhet ~ port_lonnsomhet$SMB, data = port_lonnsomhet)
3540 summary(famlonnsomhet_SMB)
3541
3542 famlonnsomhet_HML <- lm(port_lonnsomhet$lonnsomhet ~ port_lonnsomhet$HML, data = port_lonnsomhet)
3543 summary(famlonnsomhet_HML)
3544
3545 famlonnsomhet_UMD <- lm(port_lonnsomhet$lonnsomhet ~ port_lonnsomhet$UMD, data = port_lonnsomhet)
3546 summary(famlonnsomhet_UMD)
3547
3548 ## vekst ##
3549 famvekst_MKT <- lm(port_vekst$vekst ~ port_vekst$MKT, data = port_vekst)
3550 summary(famvekst_MKT)
3551
3552 famvekst_SMB <- lm(port_vekst$vekst ~ port_vekst$SMB, data = port_vekst)
3553 summary(famvekst_SMB)
3554
3555 famvekst_HML <- lm(port_vekst$vekst ~ port_vekst$HML, data = port_vekst)
3556 summary(famvekst_HML)
3557
3558 famvekst_UMD <- lm(port_vekst$vekst ~ port_vekst$UMD, data = port_vekst)
3559 summary(famvekst_UMD)
3560
```

```

3561 ## sikkerhet ##
3562 famsikkerhet_MKT <- lm(port_sikkerhet$sikkerhet ~ port_sikkerhet$MKT, data = port_sikkerhet)
3563 summary(famsikkerhet_MKT)
3564
3565 famsikkerhet_SMB <- lm(port_sikkerhet$sikkerhet ~ port_sikkerhet$SMB, data = port_sikkerhet)
3566 summary(famsikkerhet_SMB)
3567
3568 famsikkerhet_HML <- lm(port_sikkerhet$sikkerhet ~ port_sikkerhet$HML, data = port_sikkerhet)
3569 summary(famsikkerhet_HML)
3570
3571 famsikkerhet_UMD <- lm(port_sikkerhet$sikkerhet ~ port_sikkerhet$UMD, data = port_sikkerhet)
3572 summary(famsikkerhet_UMD)
3573
3574 ## korellasjonsmatrisen av Kvalitetsfaktorene ####
3575
3576 port_alle_faktorer <- port_QMJ
3577 port_alle_faktorer <- left_join(port_alle_faktorer, port_lonnsomhet[,c("lonnsomhet", "Date")], by = c("Date" = "Date"))
3578 port_alle_faktorer <- left_join(port_alle_faktorer, port_vekst[,c("vekst", "Date")], by = c("Date" = "Date"))
3579 port_alle_faktorer <- left_join(port_alle_faktorer, port_sikkerhet[,c("sikkerhet", "Date")], by = c("Date" = "Date"))
3580 port_alle_faktorer <- port_alle_faktorer[, c(6,13,14,15)]
3581
3582 korrelasjon <- cor(port_alle_faktorer)
3583 korrelasjon
3584
3585
3586
3587 ## Robusthetstester ####
3588
3589
3590
3591 ## Robusthetstest på forskningsspørsmål 2 - QMJ-faktoren ##
3592
3593 ## QMJ - 2000-2010 ##
3594 port_QMJ_robust_2000_2010 <- port_QMJ[port_QMJ$Date < "2010-01-31", ]
3595 ## QMJ - 2011-2020 ##
3596 port_QMJ_robust_2011_2020 <- port_QMJ[port_QMJ$Date > "2010-01-31", ]

```

```

3593 # QM - 2009-2010 ##
3594 port_QM_robust_2009_2010 <- port_QM[port_QM$Date < "2010-01-31", ]
3595 # QM - 2011-2020 ##
3596 port_QM_robust_2011_2020 <- port_QM[port_QM$Date > "2011-01-01", ]
3597
3598 # Lønnsøstet - 2009-2010 ##
3599 port_lønnsøstet_robust_2009_2010 <- port_lønnsøstet[port_lønnsøstet$Date < "2010-01-31", ]
3600 # Lønnsøstet - 2011-2020 ##
3601 port_lønnsøstet_robust_2011_2020 <- port_lønnsøstet[port_lønnsøstet$Date > "2011-01-01", ]
3602
3603 # vekst - 2009-2010 ##
3604 port_vekst_robust_2009_2010 <- port_vekst[port_vekst$Date < "2010-01-31", ]
3605 # vekst - 2011-2020 ##
3606 port_vekst_robust_2011_2020 <- port_vekst[port_vekst$Date > "2011-01-01", ]
3607
3608 # sikkerhet - 2009-2010 ##
3609 port_sikkerhet_robust_2009_2010 <- port_sikkerhet[port_sikkerhet$Date < "2010-01-31", ]
3610 # sikkerhet - 2011-2020 ##
3611 port_sikkerhet_robust_2011_2020 <- port_sikkerhet[port_sikkerhet$Date > "2011-01-01", ]
3612
3613
3614
3615
3616 # regresjon 2009-2010 ##
3617
3618 # QM_1 ##
3619
3620 fm3000 <- lm(port_QM_robust_2009_2010$QM ~ port_QM_robust_2009_2010$MKT, data = port_QM_robust_2009_2010)
3621 summary(fm3000)
3622 fm4000 <- lm(port_QM_robust_2009_2010$QM ~ port_QM_robust_2009_2010$MKT + port_QM_robust_2009_2010$SMB + port_QM_robust_2009_2010$HML, data = port_QM_robust_2009_2010)
3623 summary(fm4000)
3624 fm5000 <- lm(port_QM_robust_2009_2010$QM ~ port_QM_robust_2009_2010$MKT + port_QM_robust_2009_2010$SMB + port_QM_robust_2009_2010$HML + port_QM_robust_2009_2010$UMD, data = port_QM_robust_2009_2010)
3625 summary(fm5000)
3626
3627 # R2 Excess returns ##
3628 res3000_1 <- mean(port_QM_robust_2009_2010$QM)
3629
3630 # F-voeding
3631 res_3000_2 <- res3000_1 / sd(psv(port_QM_robust_2009_2010$QM)) / sqrt(length(port_QM_robust_2009_2010$QM))

```

```

3636 ## Lonnsoehet_1 ##
3637
3638 fan3000_lonnsaehet <- In(port_lonnsaehet_robust_2000_2010)lonnsaehet ~ port_lonnsaehet_robust_2000_2010/MKT, data = port_lonnsaehet_robust_2000_2010)
3639 summary(fan3000_lonnsaehet)
3640 fan4000_lonnsaehet <- In(port_lonnsaehet_robust_2000_2010)lonnsaehet ~ port_lonnsaehet_robust_2000_2010/MKT + port_lonnsaehet_robust_2000_2010/SWB + port_lonnsaehet_robust_2000_2010/HL, data = port_lonnsaehet_robust_2000_2010)
3641 summary(fan4000_lonnsaehet)
3642 fan5000_lonnsaehet <- In(port_lonnsaehet_robust_2000_2010)lonnsaehet ~ port_lonnsaehet_robust_2000_2010/MKT + port_lonnsaehet_robust_2000_2010/SWB + port_lonnsaehet_robust_2000_2010/HL + port_lonnsaehet_robust_2000_2010/UMD, data = port_lonnsaehet_robust_2000_2010)
3643 summary(fan5000_lonnsaehet)
3644
3645 ## R^2 Excess returns ##
3646 ras3000_1lonnsaehet <- mean(port_lonnsaehet_robust_2000_2010)lonnsaehet)
3647
3648 ## T-ratio ##
3649 ras_3000_1lonnsaehet <- res3000_1lonnsaehet/(StdDev(port_lonnsaehet_robust_2000_2010)lonnsaehet)/sqrt(length(port_lonnsaehet_robust_2000_2010)lonnsaehet))
3650
3651 ## Steep wedges ##
3652 ras_3000_3lonnsaehet <- res3000_3lonnsaehet/(StdDev(port_lonnsaehet_robust_2000_2010)lonnsaehet))
3653
3654
3655 ## Vekst_1 ##
3656
3657 fan3000_vekst <- In(port_vekst_robust_2000_2010)vekst ~ port_vekst_robust_2000_2010/MKT, data = port_vekst_robust_2000_2010)
3658 summary(fan3000_vekst)
3659 fan4000_vekst <- In(port_vekst_robust_2000_2010)vekst ~ port_vekst_robust_2000_2010/MKT + port_vekst_robust_2000_2010/SWB + port_vekst_robust_2000_2010/HL, data = port_vekst_robust_2000_2010)
3660 summary(fan4000_vekst)
3661 fan5000_vekst <- In(port_vekst_robust_2000_2010)vekst ~ port_vekst_robust_2000_2010/MKT + port_vekst_robust_2000_2010/SWB + port_vekst_robust_2000_2010/HL + port_vekst_robust_2000_2010/UMD, data = port_vekst_robust_2000_2010)
3662 summary(fan5000_vekst)
3663
3664 ## R^2 Excess returns ##
3665 ras3000_1vekst <- mean(port_vekst_robust_2000_2010)vekst)
3666
3667 ## T-ratio ##
3668 ras_3000_1vekst <- res3000_1vekst/(StdDev(port_vekst_robust_2000_2010)vekst)/sqrt(length(port_vekst_robust_2000_2010)vekst))
3669
3670 ## Steep wedges ##

```

```

1570 ## Sample weights ##
1571 res_3000_1vektor <- res3000_1vektor/(St.Dev(port_vektor_robust_2000_2010)/vektor)
1572
1573
1574 ## Sikkerhet_1 ##
1575
1576 for5000_sikkerhet <- lm(port_sikkerhet_robust_2000_2010~sikkerhet ~ port_sikkerhet_robust_2000_2010|MI, data = port_sikkerhet_robust_2000_2010)
1577 summary(for5000_sikkerhet)
1578 for4000_sikkerhet <- lm(port_sikkerhet_robust_2000_2010~sikkerhet ~ port_sikkerhet_robust_2000_2010|MI + port_sikkerhet_robust_2000_2010|SW ~ port_sikkerhet_robust_2000_2010|MI, data = port_sikkerhet_robust_2000_2010)
1579 summary(for4000_sikkerhet)
1580 for6000_sikkerhet <- lm(port_sikkerhet_robust_2000_2010~sikkerhet ~ port_sikkerhet_robust_2000_2010|MI + port_sikkerhet_robust_2000_2010|SW ~ port_sikkerhet_robust_2000_2010|MI + port_sikkerhet_robust_2000_2010|HW, data = port_sikkerhet_robust_2000_2010)
1581 summary(for6000_sikkerhet)
1582
1583 ## Fit Access returns ##
1584 res3000_1sikkerhet <- mean(port_sikkerhet_robust_2000_2010)sikkerhet)
1585
1586 ## Twardziec ##
1587 res_3000_2sikkerhet <- res3000_1sikkerhet/(St.Dev(port_sikkerhet_robust_2000_2010)/sikkerhet) | sort(Teigh(port_sikkerhet_robust_2000_2010)/sikkerhet))
1588
1589 ## Sample weights ##
1590 res_3000_3sikkerhet <- res3000_1sikkerhet/(St.Dev(port_sikkerhet_robust_2000_2010)/sikkerhet)
1591
1592
1593
1594
1595 ## Regression 2011-2020 ##
1596
1597 ## Q1_1 ##
1598
1599 for30000 <- lm(port_Q1_robust_2011_2020~Q1 ~ port_Q1_robust_2011_2020|MI, data = port_Q1_robust_2011_2020)
1600 summary(for30000)
1601 for40000 <- lm(port_Q1_robust_2011_2020~Q1 ~ port_Q1_robust_2011_2020|MI + port_Q1_robust_2011_2020|SW ~ port_Q1_robust_2011_2020|MI, data = port_Q1_robust_2011_2020)
1602 summary(for40000)
1603 for50000 <- lm(port_Q1_robust_2011_2020~Q1 ~ port_Q1_robust_2011_2020|MI + port_Q1_robust_2011_2020|SW ~ port_Q1_robust_2011_2020|MI + port_Q1_robust_2011_2020|HW, data = port_Q1_robust_2011_2020)
1604 summary(for50000)
1605

```

```

3605 ## Regression 2011-2020 ##
3606
3607 ## QM_1 ##
3608
3609 fns30000 <- lm(port_QM_robust_2011_2020|QM ~ port_QM_robust_2011_2020|MKT, data = port_QM_robust_2011_2020)
3610 summary(fns30000)
3611 fns40000 <- lm(port_QM_robust_2011_2020|QM ~ port_QM_robust_2011_2020|MKT + port_QM_robust_2011_2020|SMB + port_QM_robust_2011_2020|HML, data = port_QM_robust_2011_2020)
3612 summary(fns40000)
3613 fns50000 <- lm(port_QM_robust_2011_2020|QM ~ port_QM_robust_2011_2020|MKT + port_QM_robust_2011_2020|SMB + port_QM_robust_2011_2020|HML + port_QM_robust_2011_2020|UMD, data = port_QM_robust_2011_2020)
3614 summary(fns50000)
3615
3616 ## R1 Excess returns ##
3617 res30000_1 <- resid(port_QM_robust_2011_2020|QM)
3618
3619 ## T-Statistic ##
3620 res_30000_2 <- res30000_1/(stdev(port_QM_robust_2011_2020|QM)/sqrt(length(port_QM_robust_2011_2020|QM)))
3621
3622 ## Slope Statistic ##
3623 res_30000_3 <- res30000_1/(stdev(port_QM_robust_2011_2020|QM))
3624
3625
3626 ## Lammsonhet_2 ##
3627
3628 fns30000_lammsonhet <- lm(port_lammsonhet_robust_2011_2020|lammsonhet ~ port_lammsonhet_robust_2011_2020|MKT, data = port_lammsonhet_robust_2011_2020)
3629 summary(fns30000_lammsonhet)
3630 fns40000_lammsonhet <- lm(port_lammsonhet_robust_2011_2020|lammsonhet ~ port_lammsonhet_robust_2011_2020|MKT + port_lammsonhet_robust_2011_2020|SMB + port_lammsonhet_robust_2011_2020|HML, data = port_lammsonhet_robust_2011_2020)
3631 summary(fns40000_lammsonhet)
3632 fns50000_lammsonhet <- lm(port_lammsonhet_robust_2011_2020|lammsonhet ~ port_lammsonhet_robust_2011_2020|MKT + port_lammsonhet_robust_2011_2020|SMB + port_lammsonhet_robust_2011_2020|HML + port_lammsonhet_robust_2011_2020|UMD, data = port_lammsonhet_robust_2011_2020)
3633 summary(fns50000_lammsonhet)
3634
3635 ## R1 Excess Returns ##
3636 res30000_1lammsonhet <- resid(port_lammsonhet_robust_2011_2020|lammsonhet)
3637
3638 ## T-Statistic ##
3639 res_30000_2lammsonhet <- res30000_1lammsonhet/(stdev(port_lammsonhet_robust_2011_2020|lammsonhet)/sqrt(length(port_lammsonhet_robust_2011_2020|lammsonhet)))
3640
3641 ## Slope Statistic ##

```

```

1723 ## Source variables ##
1724 res_30000_liknesmethet <- res30000_liknesmethet / (stdDev(port_liknesmethet_robust_2011_2020|liknesmethet))
1725
1726
1727
1728 ## Vekt_2 ##
1729
1730 fons0000_vekt <- lapply(port_vekt_robust_2011_2020|vekt ~ port_vekt_robust_2011_2020|MKI, data = port_vekt_robust_2011_2020)
1731 summary(fons0000_vekt)
1732 fons40000_vekt <- lapply(port_vekt_robust_2011_2020|vekt ~ port_vekt_robust_2011_2020|MKI ~ port_vekt_robust_2011_2020|SMR ~ port_vekt_robust_2011_2020|HML, data = port_vekt_robust_2011_2020)
1733 summary(fons40000_vekt)
1734 fons50000_vekt <- lapply(port_vekt_robust_2011_2020|vekt ~ port_vekt_robust_2011_2020|MKI ~ port_vekt_robust_2011_2020|SMR ~ port_vekt_robust_2011_2020|HML ~ port_vekt_robust_2011_2020|UMD, data = port_vekt_robust_2011_2020)
1735 summary(fons50000_vekt)
1736
1737 ## P3 Excess returns ##
1738 res30000_1vekt <- mean(port_vekt_robust_2011_2020|vekt)
1739
1740 ## T-senerer
1741 res_30000_2vekt <- res30000_1vekt / (stdDev(port_vekt_robust_2011_2020|vekt) / sqrt(length(port_vekt_robust_2011_2020|vekt)))
1742
1743 ## Source variables ##
1744 res_30000_3vekt <- res30000_2vekt / (stdDev(port_vekt_robust_2011_2020|vekt))
1745
1746
1747
1748 ## Sikkerhet_2 ##
1749
1750 fons0000_sikkerhet <- lapply(port_sikkerhet_robust_2011_2020|sikkerhet ~ port_sikkerhet_robust_2011_2020|MKI, data = port_sikkerhet_robust_2011_2020)
1751 summary(fons0000_sikkerhet)
1752 fons40000_sikkerhet <- lapply(port_sikkerhet_robust_2011_2020|sikkerhet ~ port_sikkerhet_robust_2011_2020|MKI ~ port_sikkerhet_robust_2011_2020|SMR ~ port_sikkerhet_robust_2011_2020|HML, data = port_sikkerhet_robust_2011_2020)
1753 summary(fons40000_sikkerhet)
1754 fons50000_sikkerhet <- lapply(port_sikkerhet_robust_2011_2020|sikkerhet ~ port_sikkerhet_robust_2011_2020|MKI ~ port_sikkerhet_robust_2011_2020|SMR ~ port_sikkerhet_robust_2011_2020|HML ~ port_sikkerhet_robust_2011_2020|UMD, data = port_sikkerhet_robust_2011_2020)
1755 summary(fons50000_sikkerhet)
1756
1757 ## P3 Excess returns ##
1758 res30000_1sikkerhet <- mean(port_sikkerhet_robust_2011_2020|sikkerhet)
1759
1760 ## T-senerer
1761 res_30000_2sikkerhet <- res30000_1sikkerhet / (stdDev(port_sikkerhet_robust_2011_2020|sikkerhet) / sqrt(length(port_sikkerhet_robust_2011_2020|sikkerhet)))
1762

```

