# Funds analysis

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# Contents

# Golbal Configuration

```
filePath <- "~/Desktop/morningstar.csv"
sysKeyword <- "(Summary|Percentile|Sum|Average|Count|Maximum|Minimum|Median|Deviation)"
msciKeyword <-"MSCI"
ftseKeyword <-"(FTSE|Russell)"
stoxxKeyword <-"STOXX"
spdjKeyword <-"(S&P|Dow|DJ)"
esgKeywords <- '(Sustain|ESG|esg|SRI|sri|Social|Governance|Catholic|Ethical)'
envKeywords <-'(Water|Carbon|Climate|Enviro|Green|Energy|Renew|Tech|Fossil|Alternative|Clean|Fuel|Pollu
blackrockKeyword <- '(iShare|BlackRock|BLK|Blackrock)'
sumF <- function(vec) {sum(as.numeric(gsub(",", "", as.character(vec))), na.rm=TRUE)}
toP <- function(c,d) {paste(as.character(c), "(",as.character(round(d*100,digits=1)),"%)",sep="")}
"^" <- function(x,y) ifelse(y==0,0,base:::"/"(x,y))
provider <- c("MSCI","FTSE Russell","STOXX","SPDJ")
esgIndexTotal <- c(82,5,35,67)
envIndexTotal <- c(7,34,5,11)
myPalette <- c("#722287","#0079C1","#009941","#002960")
fillTheme <- scale_fill_manual(values=myPalette)
colorTheme <- scale_color_manual(values=myPalette)
```

# Analysis of funds tracking each provider

| provider | fundsCount | fundsPercent | AUM |
|---|---:|---|---:|
| MSCI | 750 | 0.2884615 | 226613780269 |
| FTSE Russell | 814 | 0.3130769 | 325942388219 |
| STOXX | 135 | 0.0519231 | 12645888332 |
| SPDJ | 901 | 0.3465385 | 631386740470 |

## Count bar chart
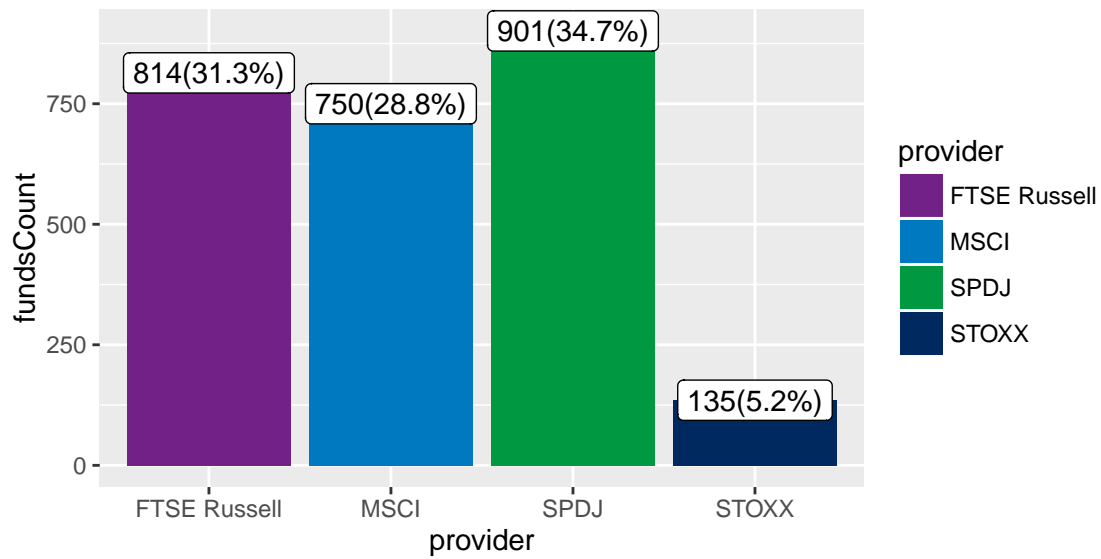


## AUM bar chart
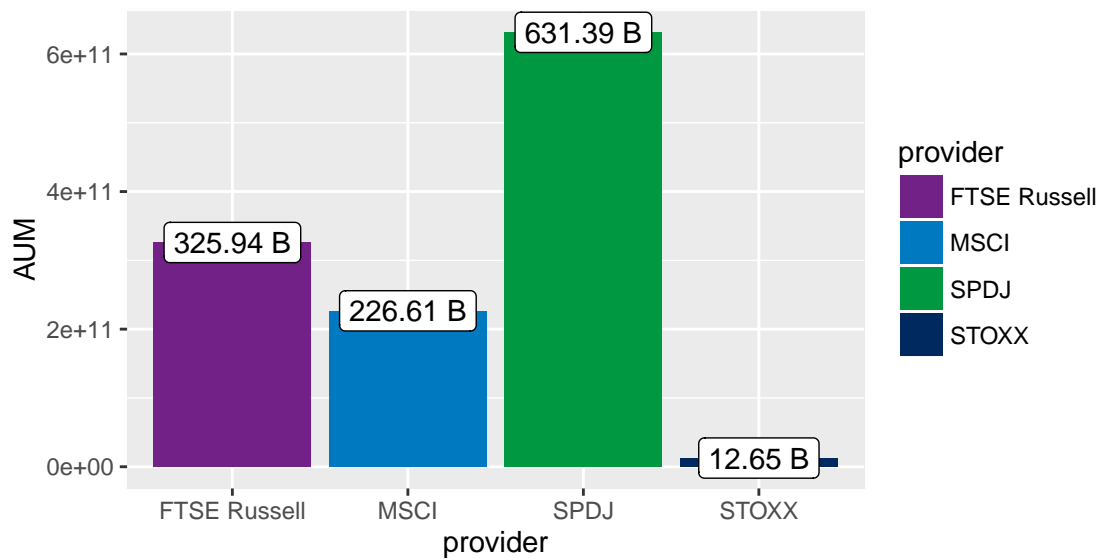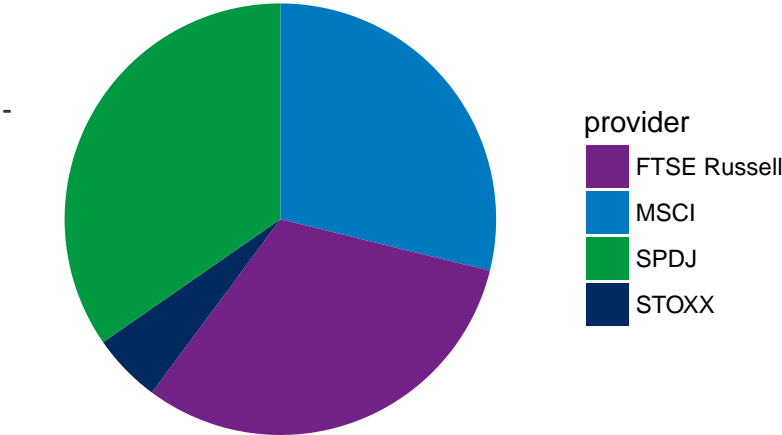
## Count pie chart



## AUM pie chart
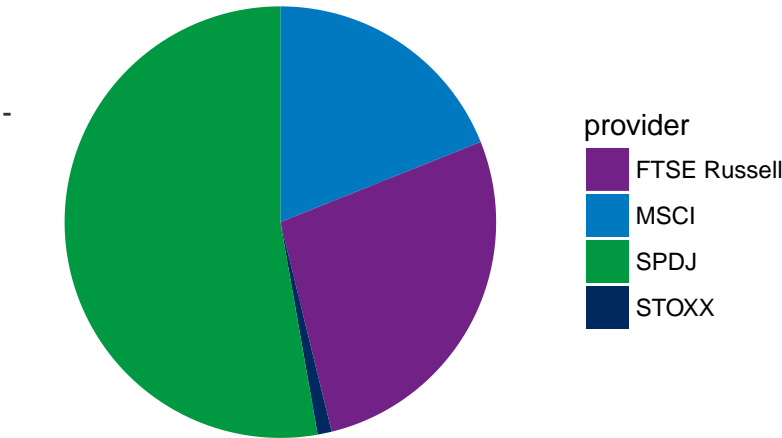
# Analysis of funds tracking ESG indexes of each provider

| provider | esgCount | esgPercent | esgAUM |
|---|---:|---:|---:|
| MSCI | 43 | 0.5890411 | 15334725344 |
| FTSE Russell | 5 | 0.0684932 | 328102278 |
| STOXX | 5 | 0.0684932 | 92539260 |
| SPDJ | 20 | 0.2739726 | 1691202927 |

## Count bar chart
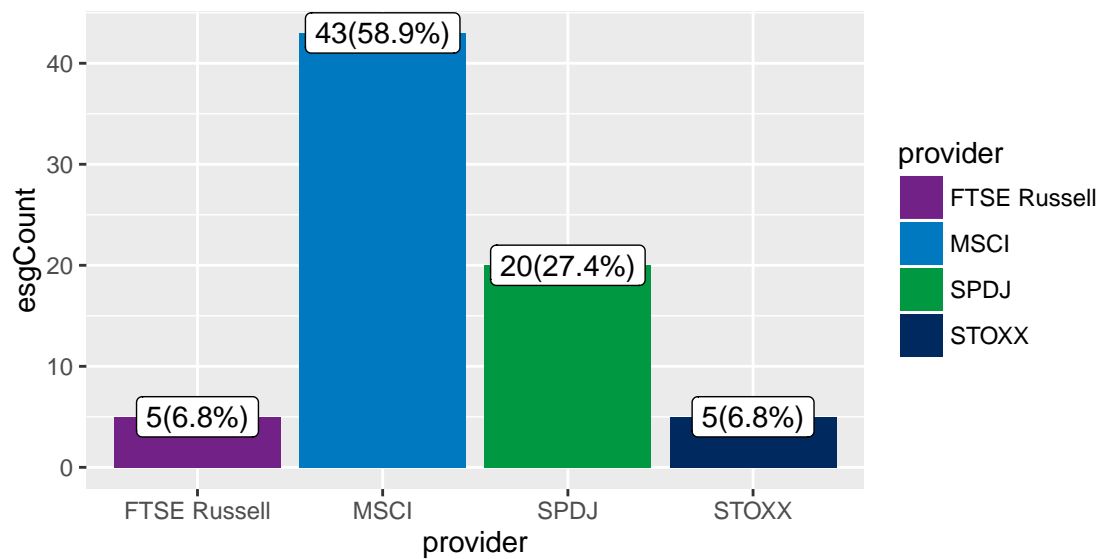


## AUM bar comparison

## Count pie chart



provider
- FTSE Russell
- MSCI
- SPDJ
- STOXX

## AUM pie chart



provider
- FTSE Russell
- MSCI
- SPDJ
- STOXX
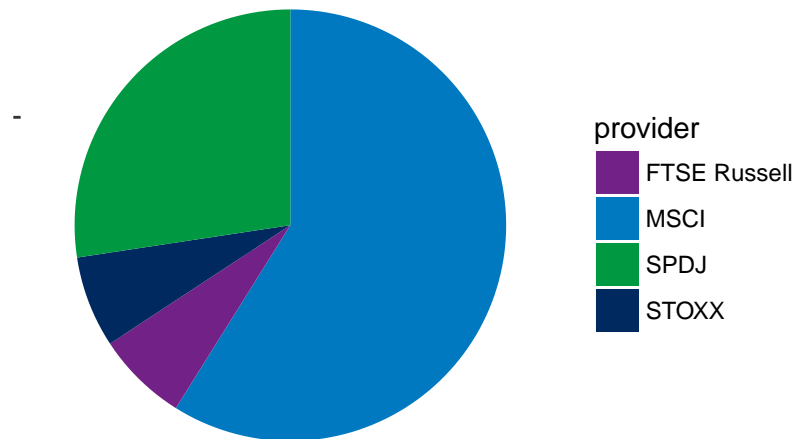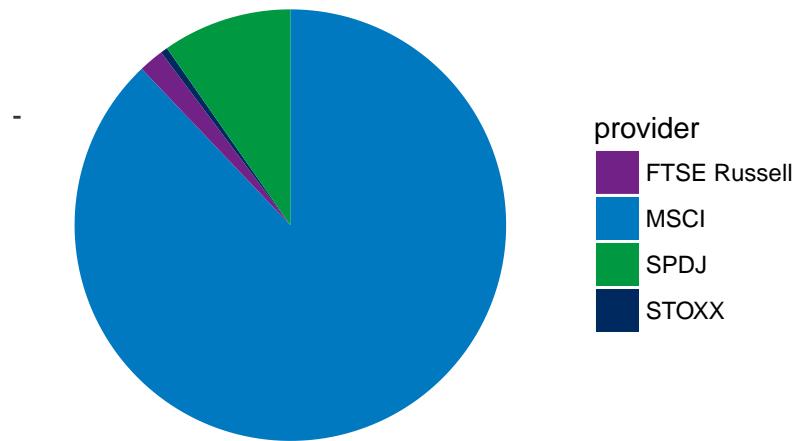
# Percentage of funds tracking ESG indexes for each provider

total tracking ESG count: 73

total funds count: 2600

percentage count of total: 0.0280769

percentage AUM of total: 0.0145803

## Count ratio for each provider
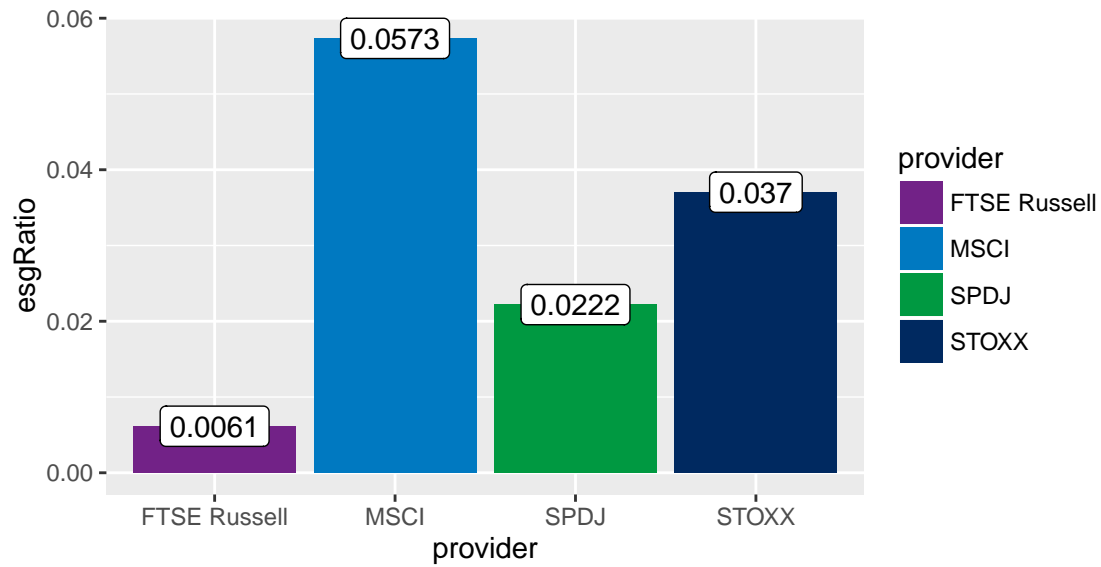


## AUM ratio for each provider
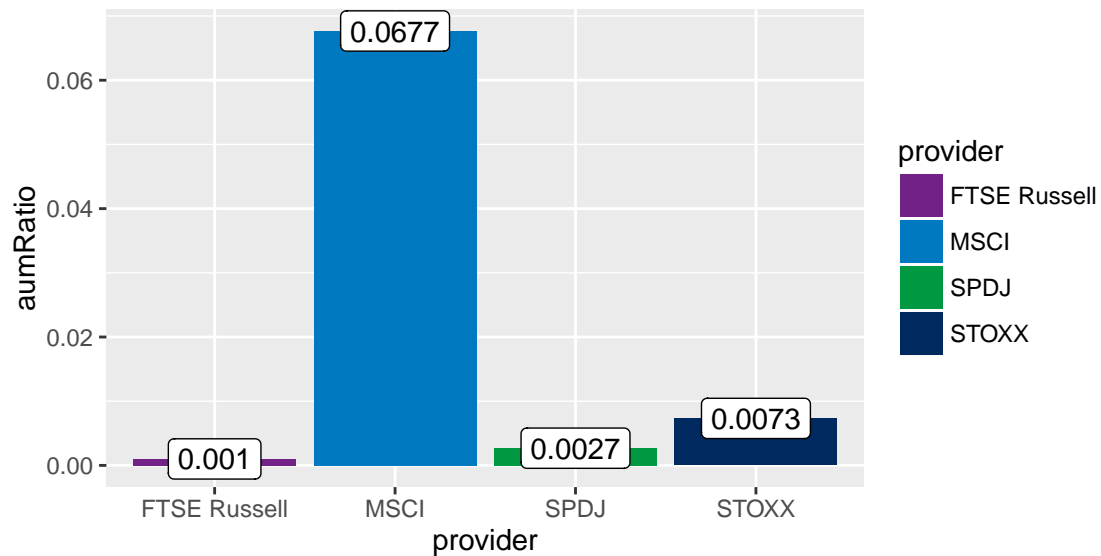
# Analysis of funds tracking Environment indexes of each provider

| provider | envCount | envPercent | envAUM |
|---|---|---|---|
| MSCI | 9 | 0.4285714 | 910962321 |
| FTSE Russell | 3 | 0.1428571 | 383672454 |
| STOXX | 0 | 0.0000000 | 0 |
| SPDJ | 9 | 0.4285714 | 591649224 |

## Count bar chart



## AUM bar chart

## Count pie chart



- 

provider
- FTSE Russell
- MSCI
- SPDJ
- STOXX

## AUM pie chart



- 

provider
- FTSE Russell
- MSCI
- SPDJ
- STOXX
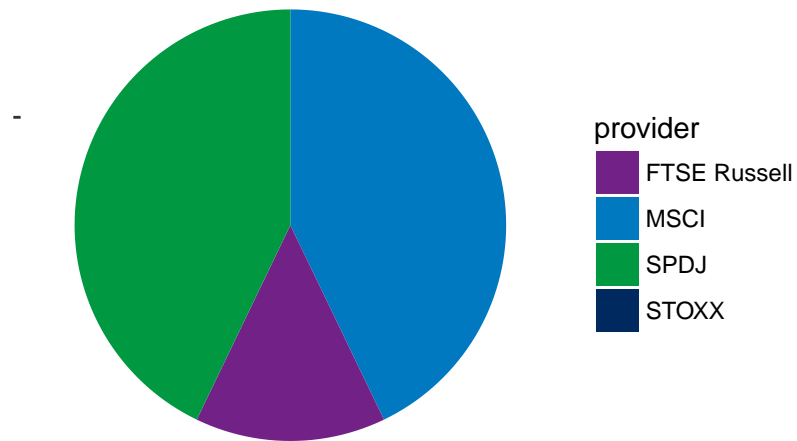
# Percentage of Environment funds tracking Environment indexes for each provider

total tracking Environment count: 21

total funds count: 2600

percentage count of total: 0.0080769

percentage AUM of total: 0.0015764

## Count ratio for each provider
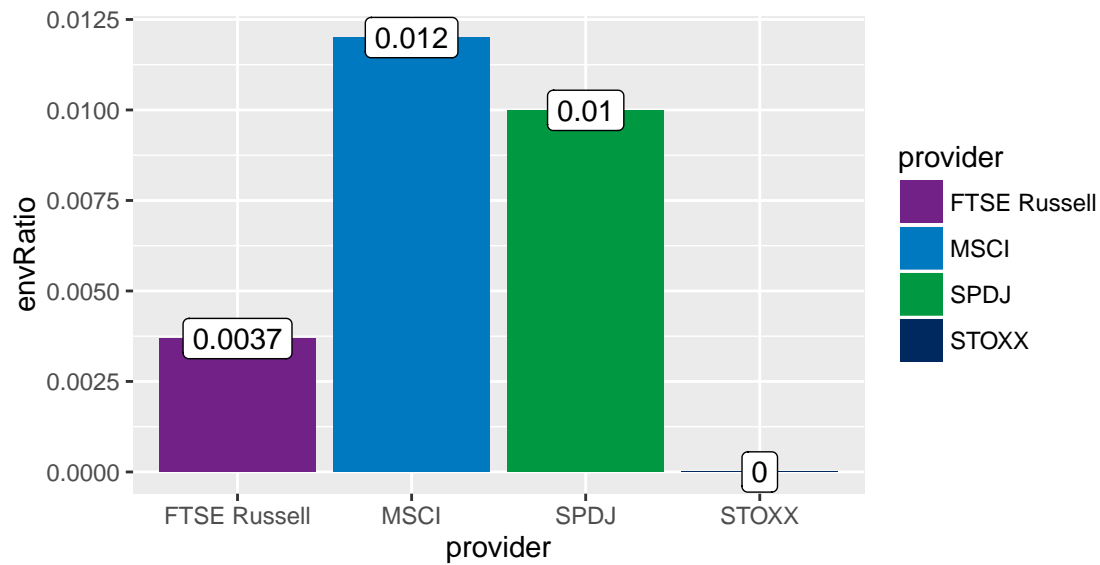


## AUM ratio for each provider
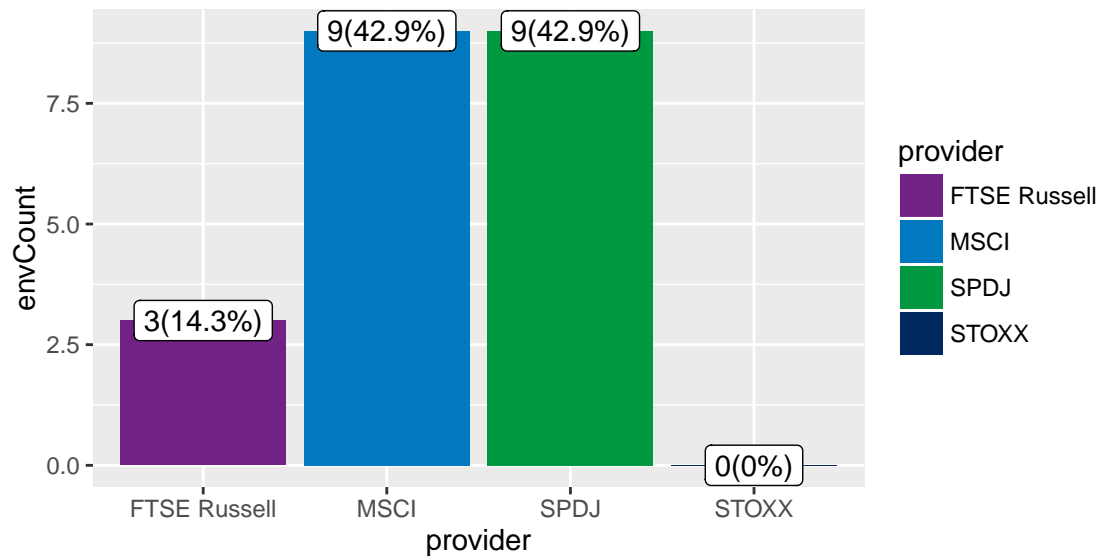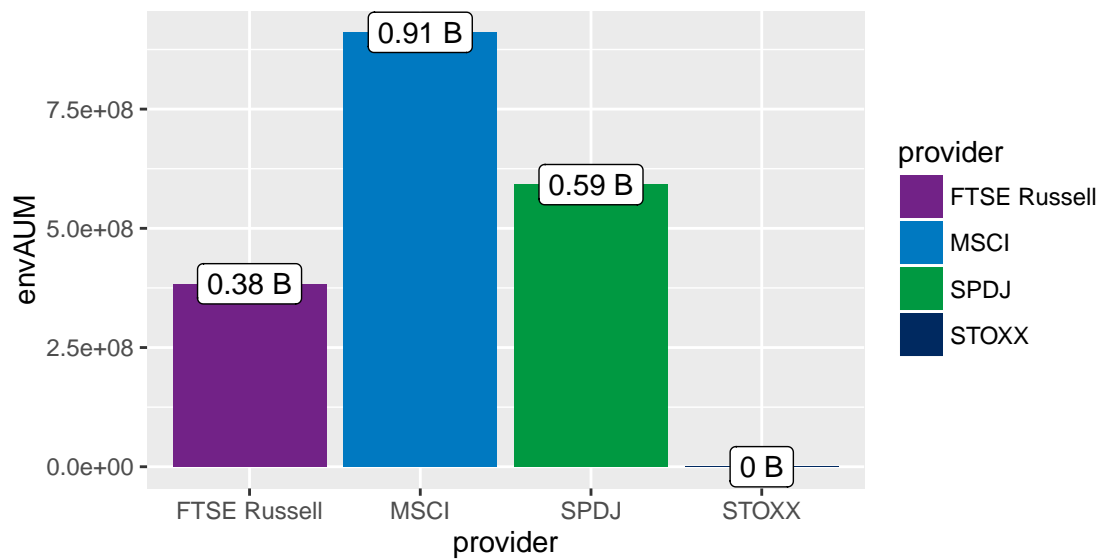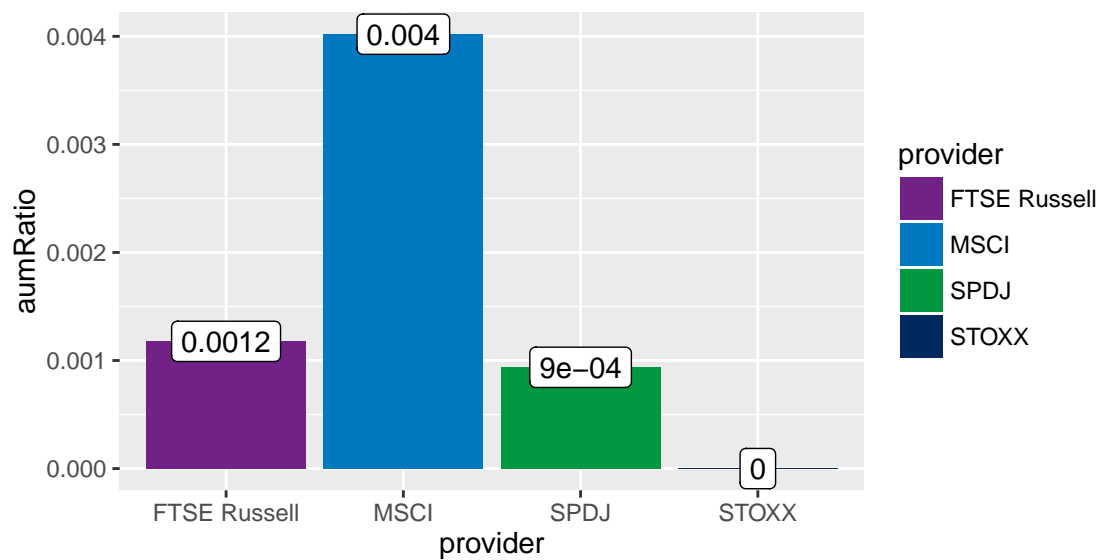
# ESG & Environment cross comparison

## ESG index count VS Environment index count
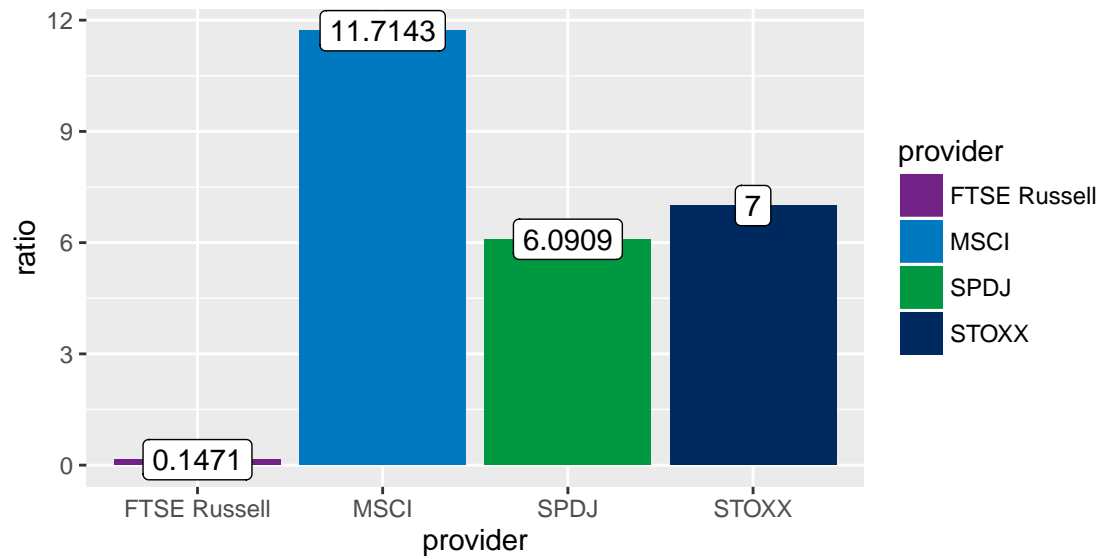


## Count of ESG index in use VS Count of Environment index in use
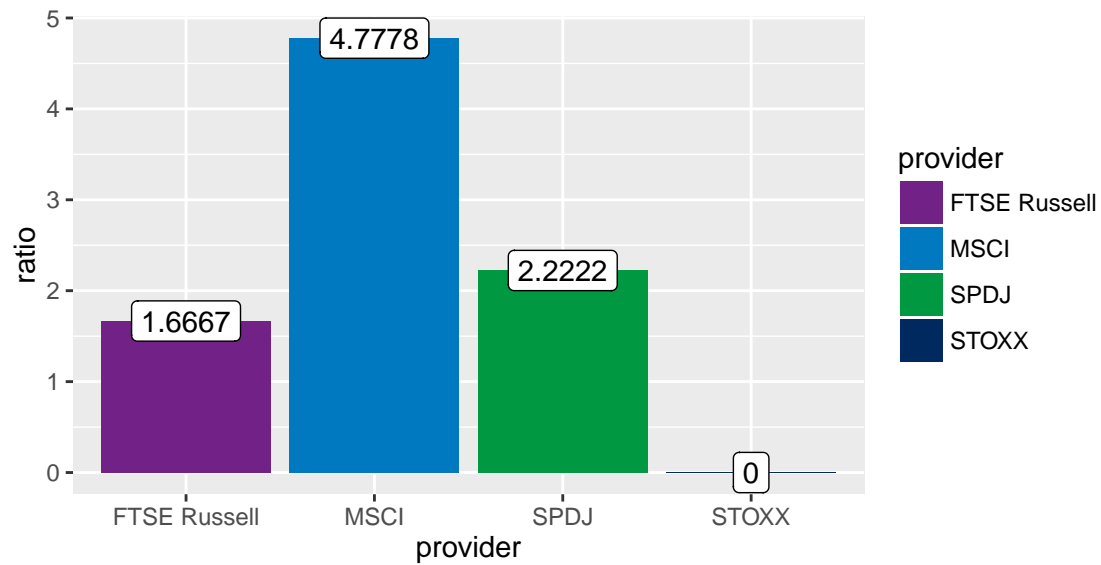
**Percentage of ESG index in use VS Percentage of Environment index in use**
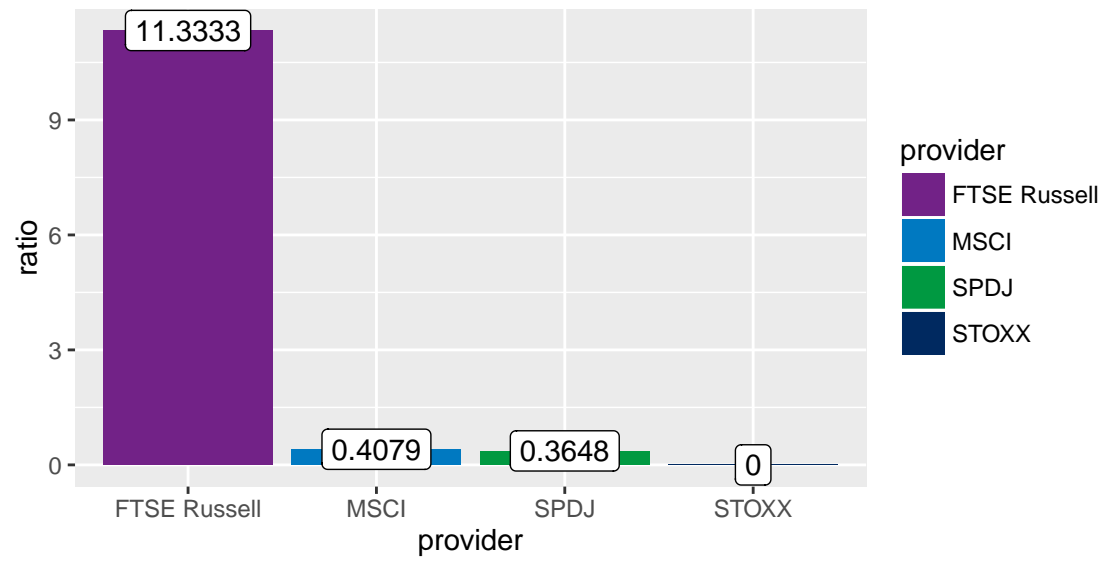
# Function 1: get timeseries given any universe and keyword

```r
getYearCountForUniverse <- function(universe, keyword="", yearLimit=1930) {
  dateU <- universe %>%
    filter(grepl(keyword, Name)) %>%
    filter(grepl("/",as.character(Inception.Date))) %>%
    mutate(date=as.character(Inception.Date))
  yearVec <- dateU$date
  for (i in 1:length(yearVec)) {
    d <- yearVec[i]
    st <- substring(d, nchar(d)-1, nchar(d))
    if (as.numeric(st) < 17) {
      yearVec[i] <- as.numeric(paste("20", st, sep=""))
    } else {
      yearVec[i] <- as.numeric(paste("19", st, sep=""))
    }
  }
  yearVec <- as.numeric(yearVec)
  yearDF <- data.frame(year=yearVec) %>%
    group_by(year) %>%
    filter(year >= yearLimit) %>%
    summarize(count=n())
  return(yearDF)
}

plotTimeSeriesForUniverse <- function(universe, keyword="",  yearLimit=1930) {

  getYearCountForUniverse(universe, keyword, yearLimit) %>%
    ggplot(aes(x=year, y=count)) +
    geom_line() +
    scale_x_continuous(breaks=seq(yearLimit, 2016, 5)) +
    colorTheme
}

plotTimeSeriesForAllScope <- function(universe, esgU, envU, keyword="",  yearLimit=1930) {
  yearDF <- getYearCountForUniverse(universe, keyword, yearLimit)
  esgDF <- getYearCountForUniverse(esgU, keyword, yearLimit)
  envDF <- getYearCountForUniverse(envU, keyword, yearLimit)
  colnames(esgDF) <- c('year', 'esg')
  colnames(envDF) <- c('year', 'env')
  fullYears <- yearDF %>%
    full_join(esgDF, by="year") %>%
    full_join(envDF, by="year")
  fullYears[is.na(fullYears)] <- 0
  fullYearsNarrow <- gather(fullYears, year)
  colnames(fullYearsNarrow) <- c("year", "type", "count")
  fullYearsNarrow %>%
    filter(year >= yearLimit) %>%
    ggplot(aes(x=year, y=count, group=type, col=type)) +
    geom_line() +
    colorTheme
}
```

```r
plotTimeSeriesForEsgEnv <- function(esgU, envU, keyword="",  yearLimit=1930) {
  esgDF <- getYearCountForUniverse(esgU, keyword, yearLimit)
  envDF <- getYearCountForUniverse(envU, keyword, yearLimit)
  colnames(esgDF) <- c('year', 'esg')
  colnames(envDF) <- c('year', 'env')
  fullYears <- esgDF %>%
    full_join(envDF, by="year")
  fullYears[is.na(fullYears)] <- 0
  fullYearsNarrow <- gather(fullYears, year)
  colnames(fullYearsNarrow) <- c("year", "type", "count")
  fullYearsNarrow %>%
    filter(year >= yearLimit) %>%
    ggplot(aes(x=year, y=count, group=type, col=type)) +
    geom_line() +
    colorTheme
}

plotTimeSeriesForProviders <- function(MSCI, FTSE, SPDJ, STOXX, keyword="",  yearLimit=1930) {
  msciDF <- getYearCountForUniverse(MSCI, keyword, yearLimit)
  ftseDF <- getYearCountForUniverse(FTSE, keyword, yearLimit)
  spdjDF <- getYearCountForUniverse(SPDJ, keyword, yearLimit)
  stoxxDF <- getYearCountForUniverse(STOXX, keyword, yearLimit)
  colnames(msciDF) <- c('year', 'MSCI')
  colnames(ftseDF) <- c('year', 'FTSE')
  colnames(spdjDF) <- c('year', 'SPDJ')
  colnames(stoxxDF) <- c('year', 'STOXX')
  fullYears <- msciDF %>%
    full_join(ftseDF, by="year") %>%
    full_join(spdjDF, by="year") %>%
    full_join(stoxxDF, by="year")
  fullYears[is.na(fullYears)] <- 0
  fullYearsNarrow <- gather(fullYears, year)
  colnames(fullYearsNarrow) <- c("year", "type", "count")
  fullYearsNarrow %>%
    filter(year >= yearLimit) %>%
    ggplot(aes(x=year, y=count, group=type, col=type)) +
    geom_line() +
    colorTheme
}
```
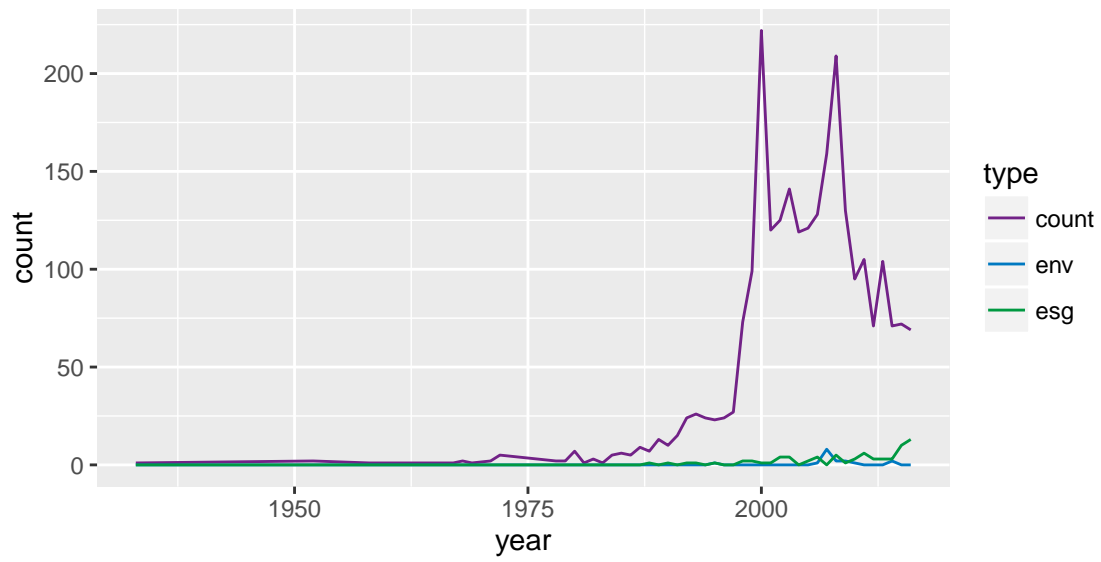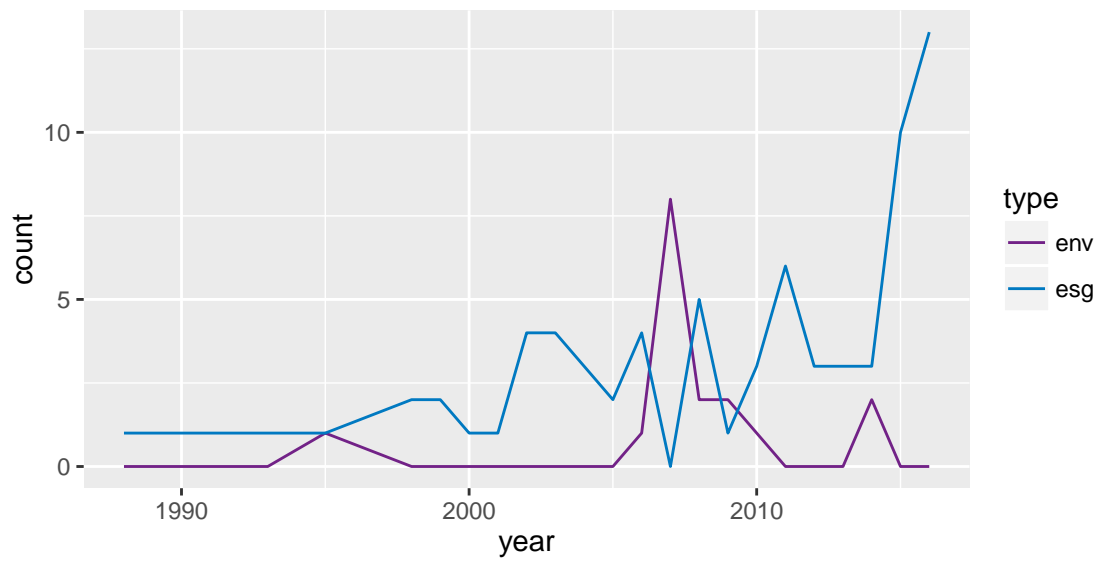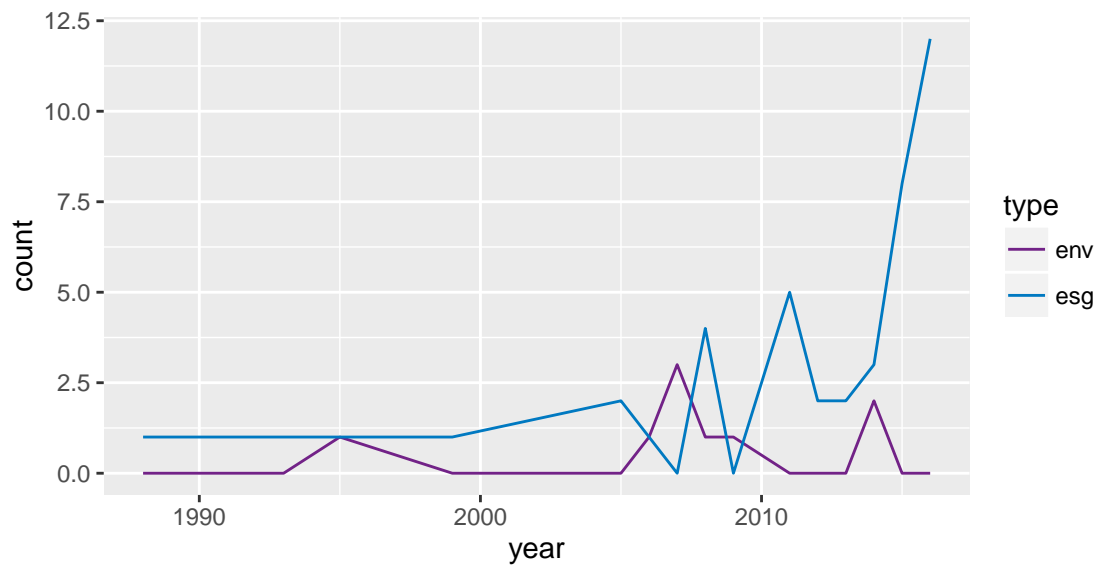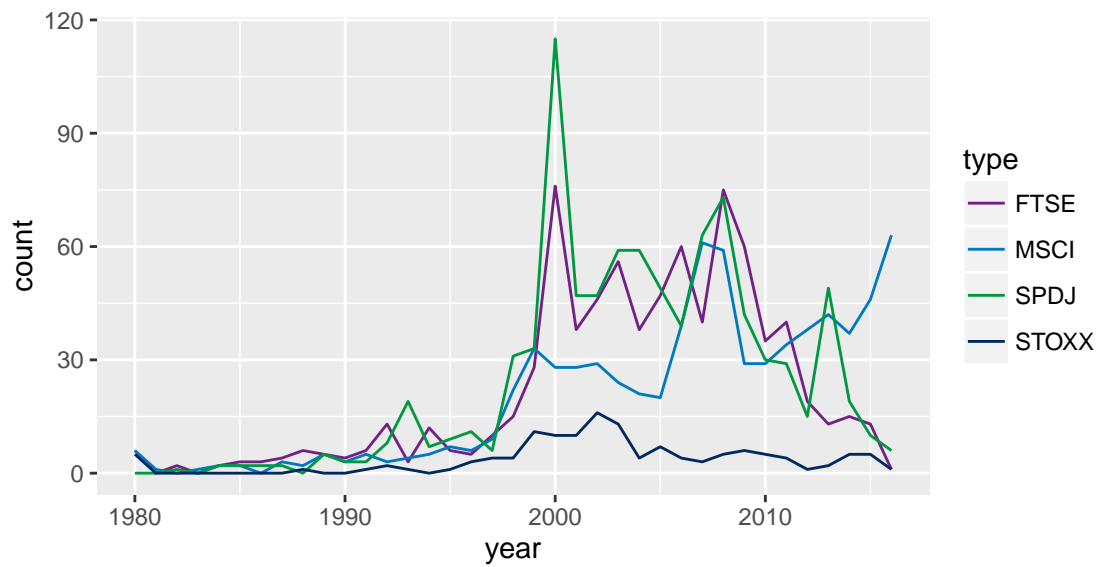
**example: universe time series**



**example: ESG vs ENV time series**

**example: MSCI ESG vs ENV time series**



**example: all provider time series**

# Function 2: check any keyword's distribution of index provider

```r
institutionChoice <- function(keyword, universe) {
  companyUniverse <- universe %>% filter(grepl(keyword, Name))
  MSCI <- companyUniverse %>% filter(grepl(msciKeyword,Primary.Prospectus.Benchmark))
  FTSE <- companyUniverse %>% filter(grepl(ftseKeyword,Primary.Prospectus.Benchmark))
  STOXX <- companyUniverse %>% filter(grepl(stoxxKeyword,Primary.Prospectus.Benchmark))
  SPDJ <- companyUniverse %>% filter(grepl(spdjKeyword,Primary.Prospectus.Benchmark))
  fundsCount <- c(length(MSCI$Name),length(FTSE$Name),length(STOXX$Name),length(SPDJ$Name))
  fundsPercent <- fundsCount/sum(fundsCount)
  countTable <- data.frame(provider=provider, fundsCount=fundsCount, fundsPercent=fundsPercent)
  return(countTable)
}

plotInstitutionChoice <- function(keyword, universe) {
  companyUniverse <- universe %>% filter(grepl(keyword, Name))
  MSCI <- companyUniverse %>% filter(grepl(msciKeyword,Primary.Prospectus.Benchmark))
  FTSE <- companyUniverse %>% filter(grepl(ftseKeyword,Primary.Prospectus.Benchmark))
  STOXX <- companyUniverse %>% filter(grepl(stoxxKeyword,Primary.Prospectus.Benchmark))
  SPDJ <- companyUniverse %>% filter(grepl(spdjKeyword,Primary.Prospectus.Benchmark))
  fundsCount <- c(length(MSCI$Name),length(FTSE$Name),length(STOXX$Name),length(SPDJ$Name))
  fundsPercent <- fundsCount/sum(fundsCount)
  data.frame(provider=provider, fundsCount=fundsCount, fundsPercent=fundsPercent) %>%
    ggplot(aes(x=provider, y=fundsCount, fill=provider)) +
    geom_bar(stat="identity") +
    geom_label(fill='white',aes(label=toP(fundsCount, fundsPercent))) +
    fillTheme
}

getInstitutionChoice <- function(keyword, universe) {
  companyUniverse <- universe %>% filter(grepl(keyword, Name))
  MSCI <- companyUniverse %>% filter(grepl(msciKeyword,Primary.Prospectus.Benchmark))
  FTSE <- companyUniverse %>% filter(grepl(ftseKeyword,Primary.Prospectus.Benchmark))
  STOXX <- companyUniverse %>% filter(grepl(stoxxKeyword,Primary.Prospectus.Benchmark))
  SPDJ <- companyUniverse %>% filter(grepl(spdjKeyword,Primary.Prospectus.Benchmark))
  return(list(MSCI=MSCI, FTSE=FTSE, STOXX=STOXX, SPDJ=SPDJ))
}
```

## exsample: BlackRock

| provider | fundsCount | fundsPercent |
| --- | ---: | ---: |
| MSCI | 20 | 0.4166667 |
| FTSE Russell | 18 | 0.3750000 |
| STOXX | 0 | 0.0000000 |
| SPDJ | 10 | 0.2083333 |

- MSCI:

## Name

iShares Euro Corp Bd Sstnbty Scrnd 0-3yr BlackRock Charifaith Com Inv Acc
BlackRock Armed Forces Common Invmt Inc
iShares MSCI ACWI Low Carbon Target
iShares Sustainable MSCI Global Impact
iShares MSCI EAFE ESG Select
iShares MSCI EM ESG Select
iShares MSCI Emerging Markets Islamic
iShares Sustainable MSCI Japan SRI EUR H iShares MSCI KLD 400 Social
iShares MSCI USA ESG Select
iShares MSCI USA Islamic
GW iShares MSCI World Islamic Acc
iShares MSCI World Islamic
FPI BlackRock New Energy
ZIL Blackrock Glbl New Energy USD
OMI IM USD BlackRock GF New Energy
ZIL Blackrock GF New Energy
FPIL BlackRock GF New Energy
DSP BlackRock Nat Res & New Engy Reg Gr

- SPDJ:

## Name

BlackRock/HSBC Amanah D Pen
BlackRock/HSBC Amanah P Pen
iShares DJ Eurp Sustainability Screened
iShares DJ Glbl Sustainability Screened
GW iShares Dow Jones Glbl Sustainability iShares DJ Eurzne SustainbltyScrned (DE) DSP BlackRock Nat Res & New Engy Reg Gr
iShares Global Clean Energy
iShares Global Water Adv
BlackRock Concentrated Industrial

- FTSE:

## Name

BlackRock Charifaith Com Inv Acc
BlackRock/Kames Ethical C Pen
BlackRock/Kames Ethical D Pen
BlackRock/Kames Ethical F Pen
BlackRock/Kames Ethical A Pen
BlackRock/Kames Ethical K Pen
BlackRock/Kames Ethical J Pen
BlackRock/Kames Ethical E Pen
BlackRock/Kames Ethical N Pen
BlackRock/Kames Ethical P Pen
Blackrock/Aedon Ethical K Pen
BlackRock/Kames Ethical T Pen
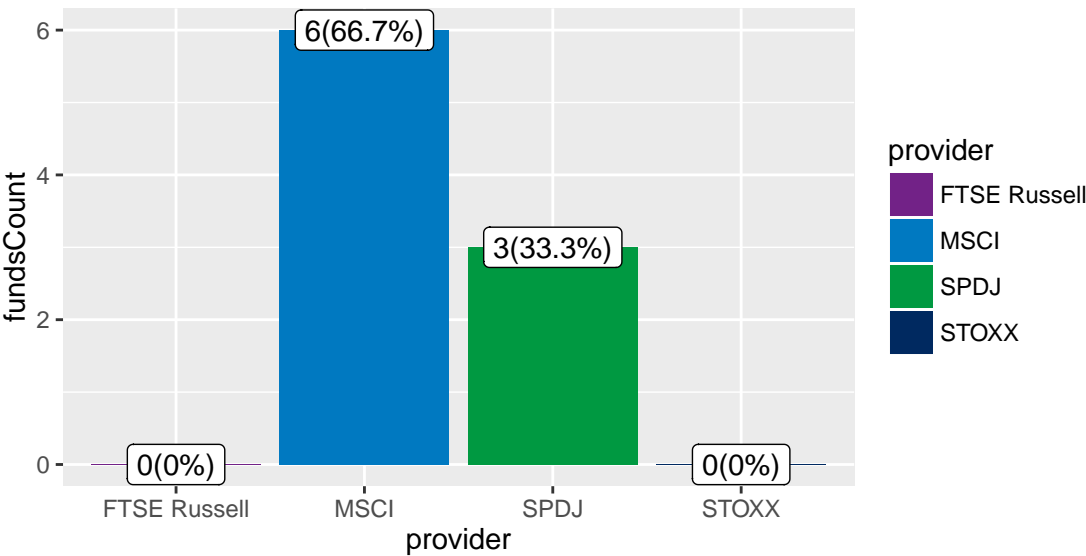BlackRock/Kames Ethical H Pen

BlackRock/Kames Ethical O Pen
BlackRock/Kames Ethical S Pen
BlackRock/Kames Ethical B Pen
BlackRock Armed Forces Common Invmt Inc BlackRock Impact US Equity Investor A
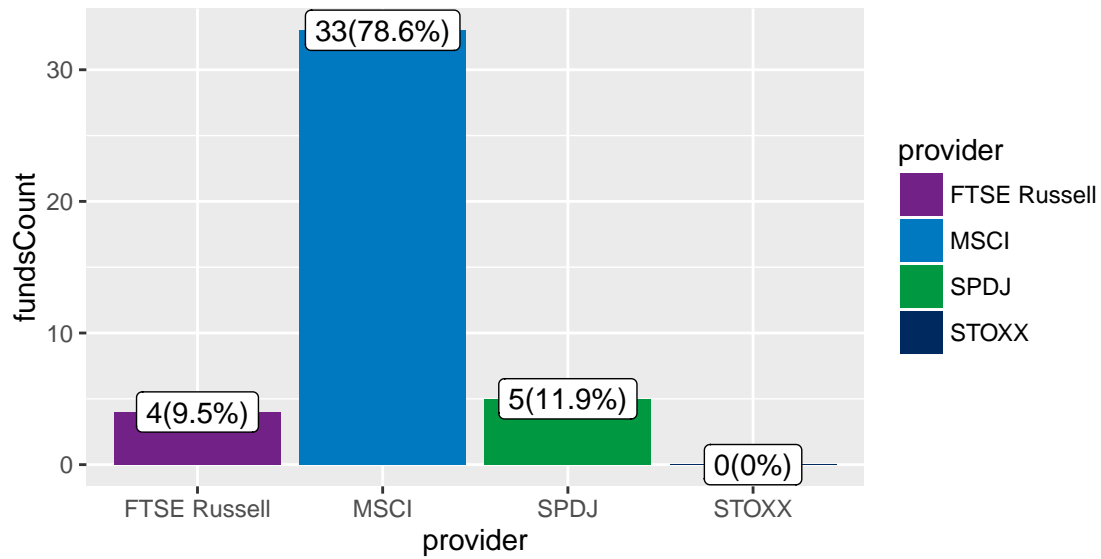
- Plot:
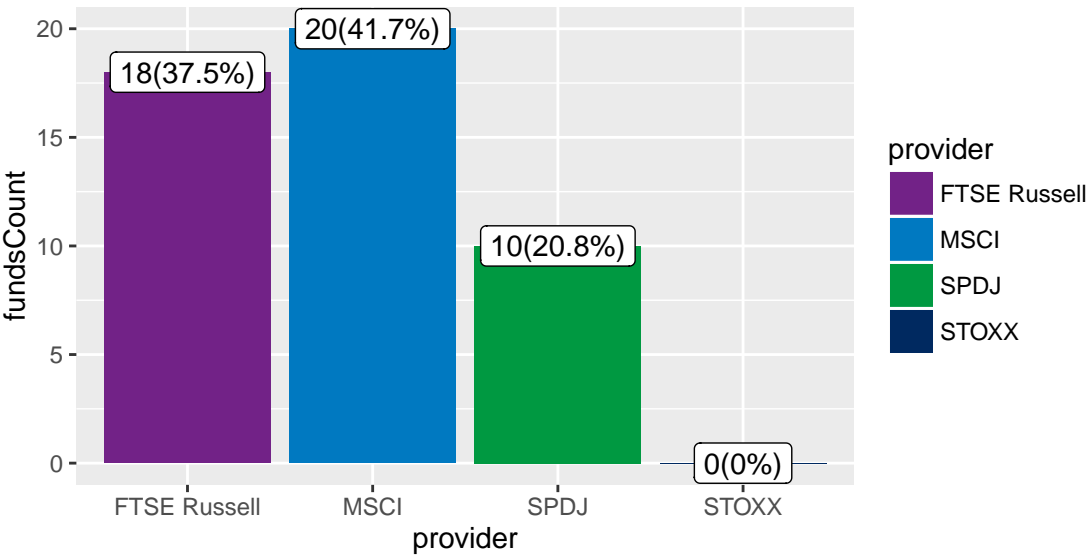


## exsample: BlackRock ESG

| provider | fundsCount | fundsPercent |
|---|---|---|
| MSCI | 6 | 0.6666667 |
| FTSE Russell | 0 | 0.0000000 |
| STOXX | 0 | 0.0000000 |
| SPDJ | 3 | 0.3333333 |

# exsample: ETF

| provider | fundsCount | fundsPercent |
| --- | --- | --- |
| MSCI | 33 | 0.7857143 |
| FTSE Russell | 4 | 0.0952381 |
| STOXX | 0 | 0.0000000 |
| SPDJ | 5 | 0.1190476 |

# Function 3: check any company's index choice provider popularity

```r
plotUniverseByBrandName <- function(universe, floor=5) {
  universe %>%
    group_by(Branding.Name) %>%
    summarize(count=n()) %>%
    filter(count >= floor) %>%
    ggplot(aes(x=Branding.Name, y=count, fill=Branding.Name)) +
    geom_bar(stat="identity") +
    geom_label(fill='white',aes(label=count)) +
    theme(axis.text.x = element_text(angle = 45, hjust = 1))
}
```
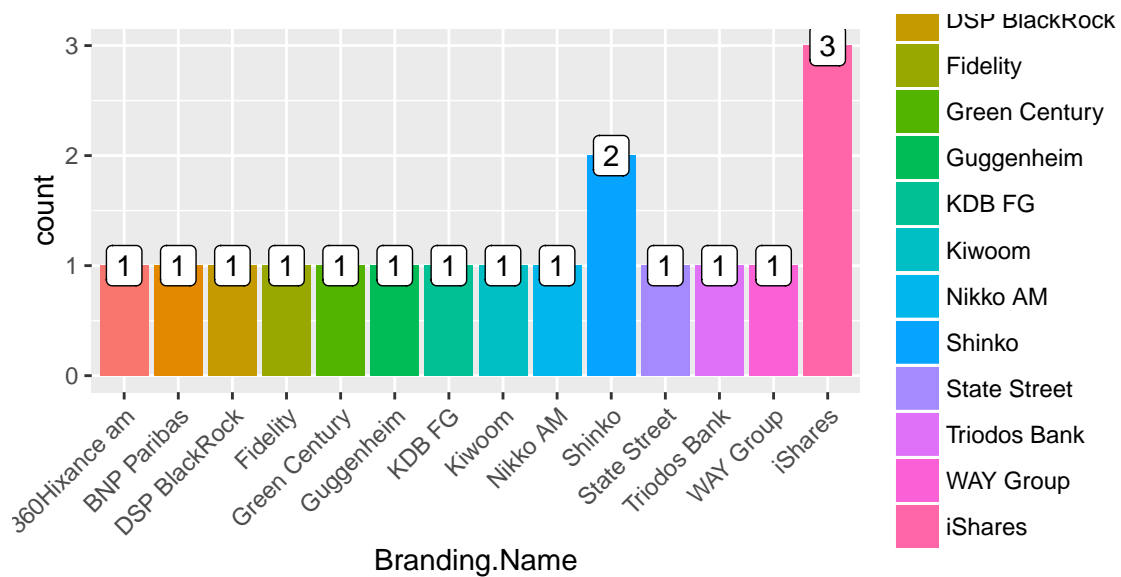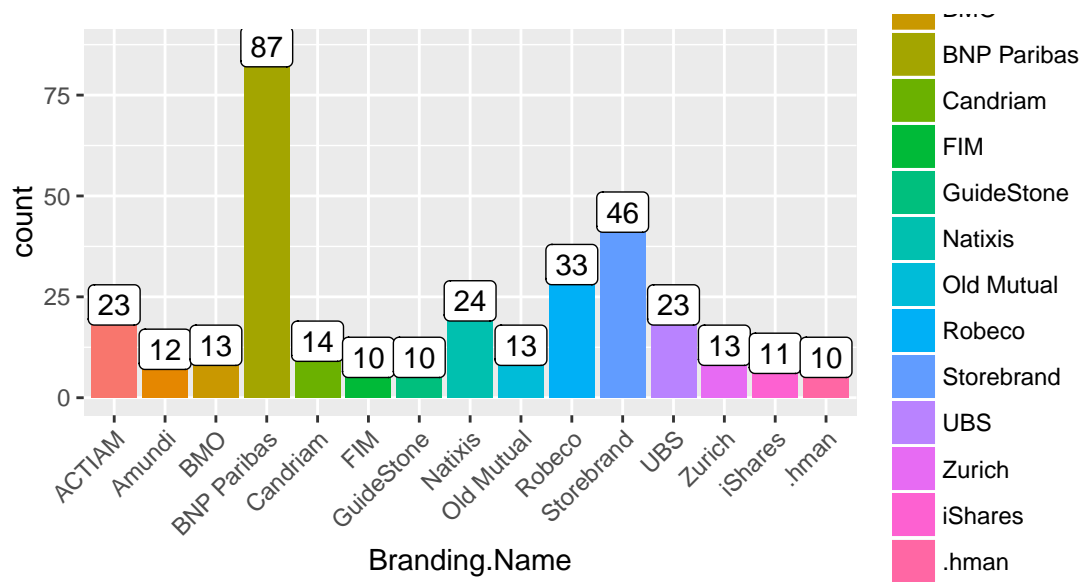
## exsample: universe plot
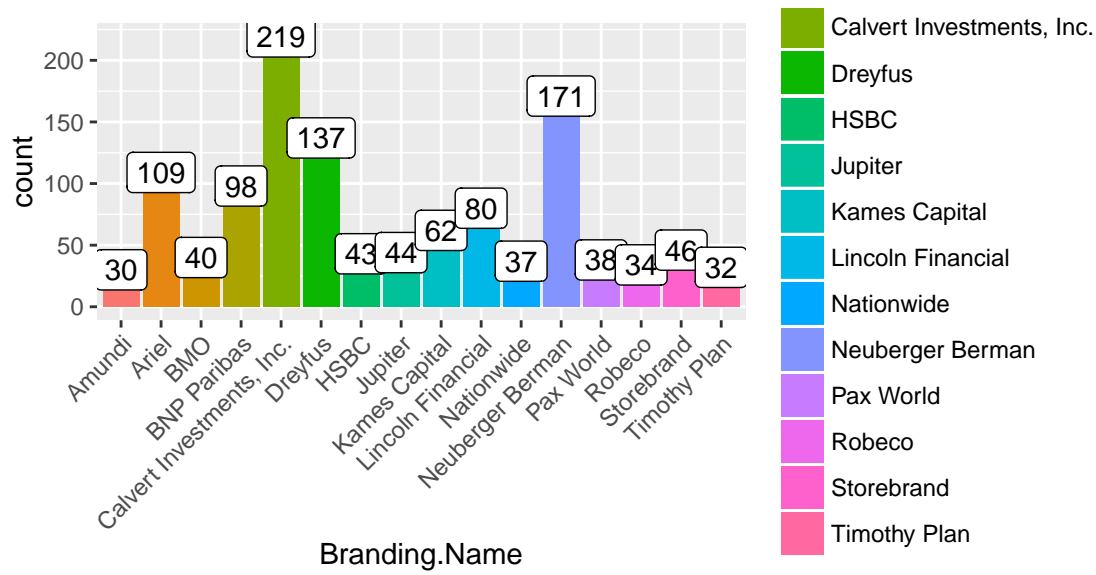
**exsample: universe ESG plot**
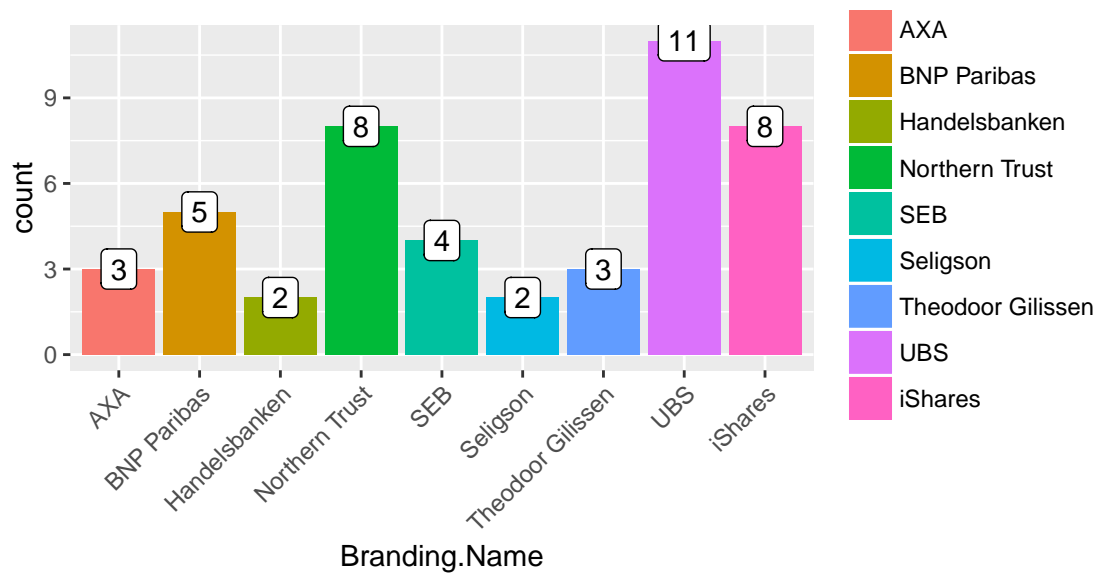


**exsample: universe ENV plot**

## exsample: MSCI plot



## exsample: MSCI ESG plot