

# Analysis

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## Analysis

### Dispersion to Returns

We first want to look on how dispersion affects returns. We hypothesize that (future) return is higher if dispersion is lower. Therefore, we look at the mean return of the  $q$  quantil of dispersion and the mean return of its  $1-q$  quantil. We do this for all the sentiments in comparison with all stocks.

We depict this value. row: index, column: sentiment We also depict the ranks (higher rank = higher value). Be careful as the absolute values of returns are different across indices (therefore ranking is not really justified) Comparing in each row is justified and higher value is good (should expecially be greater than 0).

Let  $n$  be the number of periods considered ( $n=1$ : just this period,  $n=2$ : this and next period) and let  $m$  be the time lapse ( $m=0$ : returns starting right now,  $m=1$ : returns starting 1 one period behind).

```
q <- 0.1

compareDispRes <- function(n, m=0){
  res <- matrix(NA, nrow = ncol(ret), ncol = length(sDisp))
  rownames(res) <- colnames(ret)
  colnames(res) <- names(sDisp)

  for(d in 1:length(names(sDisp))){
    for(s in 1:ncol(ret)){
      dat <- data.frame(disp = sDisp[[d]][2:(nrow(sDisp[[d]])-n+1-m),s+1])
      for(k in 1:(nrow(ret)-n+1-m)){
        dat[k,"r"] <- prod(1+ret[(k+m):(k+m+n-1),s])-1
      }
      dat <- dat[order(dat$disp),] # ascending by default
      res[s, d] <- round( mean(dat[1:(q*nrow(dat)),"r"]) - mean(dat[((1-q)*nrow(dat)):nrow(dat),
    ]
  }
  return(res)
}
```

actual dispersion to actual return, no lag

dispersion in connection with return of same period

So I1 seems to be able to predict returns, while P6 does not.

```
res <- compareDispRes(1)
res
```

##	P1	P6	I1	I6	G1	G6
## DAX	0.018	0.001	0.034	-0.004	0.027	0.001
## TEC	0.000	-0.002	0.018	0.011	0.006	0.007
## ESX50	0.012	-0.004	0.029	0.000	0.023	-0.001

```
## SP5      0.001 -0.001  0.017  0.004 0.011 -0.001
## NASDAQ  0.002 -0.003  0.018  0.003 0.011  0.002
## NIKKEI  0.005  0.014  0.021  0.019 0.013  0.020
## BUND    0.000  0.001 -0.001  0.003 0.000  0.001
```

```
matrix(rank(res), ncol = ncol(res), dimnames = list(rownames(res), colnames(res)))
```

```
##          P1  P6  I1  I6  G1  G6
## DAX      34.0 15.0 42.0  1.5 40.0 15.0
## TEC      10.5  4.0 34.0 27.0 24.0 25.0
## ESX50    29.0  1.5 41.0 10.5 39.0  6.5
## SP5      15.0  6.5 32.0 22.0 27.0  6.5
## NASDAQ   18.5  3.0 34.0 20.5 27.0 18.5
## NIKKEI   23.0 31.0 38.0 36.0 30.0 37.0
## BUND     10.5 15.0  6.5 20.5 10.5 15.0
```

### actual dispersion to actual return, lag of 1

dispersion in connection with return of same period

```
res <- compareDispRes(1, 1)
res
```

```
##          P1  P6  I1  I6  G1  G6
## DAX     -0.008 0.001 0.001 0.012 -0.010  0.002
## TEC     -0.021 -0.007 0.002 0.012 -0.014 -0.003
## ESX50   -0.003 -0.004 -0.002 0.004 -0.008 -0.002
## SP5     -0.007 -0.008 -0.001 -0.001 -0.003 -0.004
## NASDAQ  0.002 -0.007 0.006 0.012  0.004 -0.004
## NIKKEI  0.000  0.006 0.003 0.009 -0.003  0.012
## BUND    0.000 -0.001 0.002 -0.002  0.001 -0.002
```

```
matrix(rank(res), ncol = ncol(res), dimnames = list(rownames(res), colnames(res)))
```

```
##          P1  P6  I1  I6  G1  G6
## DAX      5.0 27.0 27.0 40.5  3.0 30.5
## TEC      1.0  8.0 30.5 40.5  2.0 14.5
## ESX50    14.5 11.0 18.5 34.5  5.0 18.5
## SP5       8.0  5.0 22.0 22.0 14.5 11.0
## NASDAQ   30.5  8.0 36.5 40.5 34.5 11.0
## NIKKEI   24.5 36.5 33.0 38.0 14.5 40.5
## BUND     24.5 22.0 30.5 18.5 27.0 18.5
```

### actual dispersion with future return (n=3), no lag

dispersion of one period with return over next  $n$  periods (this period up to  $n-1$  period).

```
res <- compareDispRes(3)
res
```

```
##          P1  P6  I1  I6  G1  G6
## DAX      0.007  0.000 0.028 0.008  0.006  0.004
## TEC     -0.031 -0.008 0.013 0.037 -0.018  0.003
## ESX50    0.001 -0.012 0.025 0.000 -0.001 -0.005
## SP5     -0.010 -0.016 0.014 0.004  0.001 -0.009
## NASDAQ  -0.002 -0.013 0.019 0.018  0.006  0.002
```

```
## NIKKEI -0.002  0.020 0.022 0.031  0.008  0.035
## BUND   -0.002  0.001 0.001 0.002 -0.002  0.001
```

```
matrix(rank(res), ncol = ncol(res), dimnames = list(rownames(res), colnames(res)))
```

```
##          P1  P6 I1  I6  G1  G6
## DAX      29.0 15.5 39 30.5 27.5 25.5
## TEC       1.0  8.0 32 42.0  2.0 24.0
## ESX50     19.0  5.0 38 15.5 14.0  9.0
## SP5        6.0  3.0 33 25.5 19.0  7.0
## NASDAQ    11.5  4.0 35 34.0 27.5 22.5
## NIKKEI    11.5 36.0 37 40.0 30.5 41.0
## BUND      11.5 19.0 19 22.5 11.5 19.0
```

### actual dispersion with future return (n=6), no lag

dispersion of one period with return over next  $n$  periods (this period up to  $n-1$  period).

```
res <- compareDispRes(6)
res
```

```
##          P1  P6  I1  I6  G1  G6
## DAX      0.001 0.000 0.010 -0.012 -0.004  0.001
## TEC     -0.034 -0.027 -0.008  0.066 -0.034  0.001
## ESX50   -0.010 -0.010  0.003  0.004 -0.015  0.006
## SP5     -0.010 -0.030  0.002  0.009 -0.007 -0.025
## NASDAQ  0.000 -0.030 -0.002  0.038  0.001 -0.014
## NIKKEI  0.000  0.026  0.021  0.059  0.004  0.051
## BUND   -0.006  0.001  0.001  0.006 -0.004  0.002
```

```
matrix(rank(res), ncol = ncol(res), dimnames = list(rownames(res), colnames(res)))
```

```
##          P1  P6  I1  I6  G1  G6
## DAX      24.5 20.0 36.0  9.0 16.5 24.5
## TEC       1.5  5.0 13.0 42.0  1.5 24.5
## ESX50     11.0 11.0 30.0 31.5  7.0 33.5
## SP5       11.0  3.5 28.5 35.0 14.0  6.0
## NASDAQ    20.0  3.5 18.0 39.0 24.5  8.0
## NIKKEI    20.0 38.0 37.0 41.0 31.5 40.0
## BUND      15.0 24.5 24.5 33.5 16.5 28.5
```

```
rm(q, res, n)
```

```
## Warning in rm(q, res, n): Objekt 'n' nicht gefunden
```