

## Appendix

### 1. List of prohibited sector activities

Business activities related to the following are excluded:

1. Advertising and Media, with the following exceptions:
  - Media and advertising companies generating revenues in excess of 65% of total income from the GCC countries
  - News Channels
  - Newspapers
  - Sports Channels
2. Alcohol
3. Cloning
4. Financials, except:
  - Islamic Banks
  - Islamic Financial Institutions
  - Islamic Insurance Companies

Defined as a company having:

  - Shariah Committee to supervise all activities
  - All products are Islamic
  - All investments of the company are Islamic
  - Passes accounting based screens
5. Gambling
6. Pork
7. Pornography
8. Tobacco
9. Trading of gold and silver as cash on deferred basis

*Sources: S&P (2015)*

## **2. Screening methodology of Securities Commission Malaysia**

### **Business Activity Benchmarks**

The 5% benchmark would be applicable to the following business activities:

- conventional banking;
- conventional insurance;
- gambling;
- liquor and liquor-related activities;
- pork and pork-related activities;
- non-halal food and beverages;
- Shariah non-compliant entertainment;
- interest income from conventional accounts and instruments;
- tobacco and tobacco-related activities; and
- other activities deemed non-compliant according to Shariah.

The 20% benchmark would be applicable to the following activities:

- hotel and resort operations;
- share trading;
- stockbroking business;
- rental received from Shariah non-compliant activities; and
- other activities deemed non-compliant according to Shariah.

The contribution of Shariah non-compliant activities to the overall revenue and profit before tax of the company will be calculated and compared against the relevant business activity benchmarks.

### **Financial Ratio Benchmarks**

The financial ratios applied are as follows:

#### **i. Cash over Total Assets**

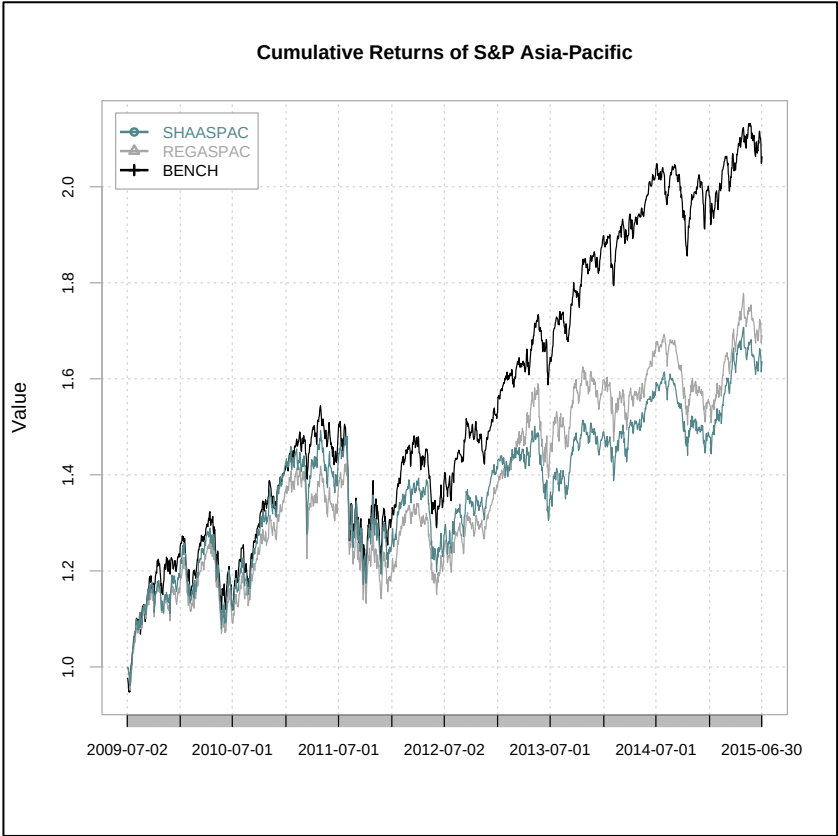
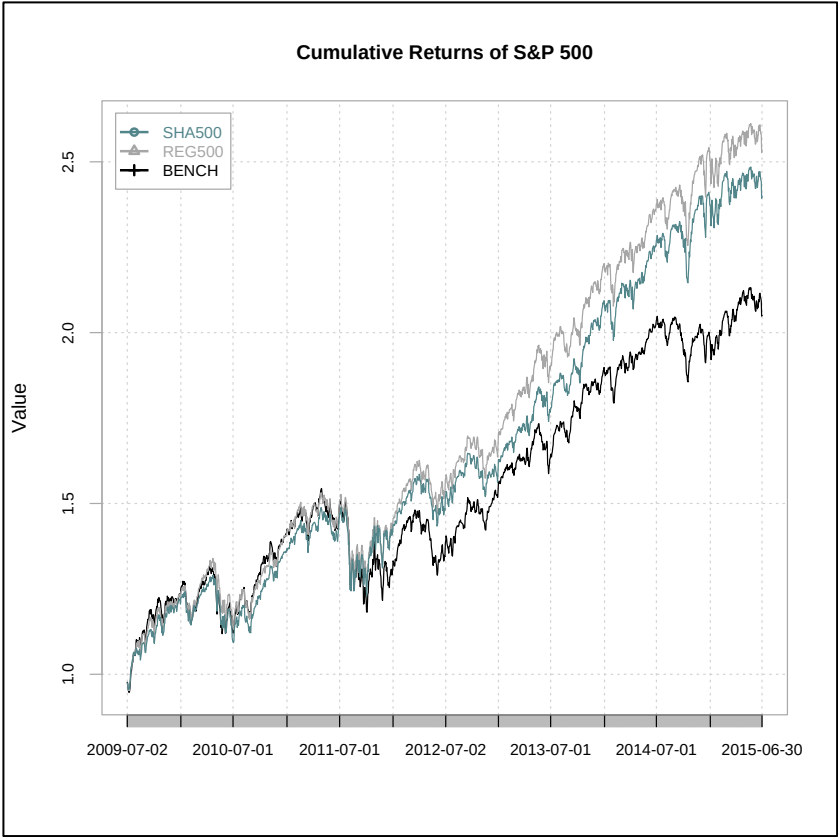
Cash will only include cash placed in conventional accounts and instruments, whereas cash placed in Islamic accounts and instruments will be excluded from the calculation.

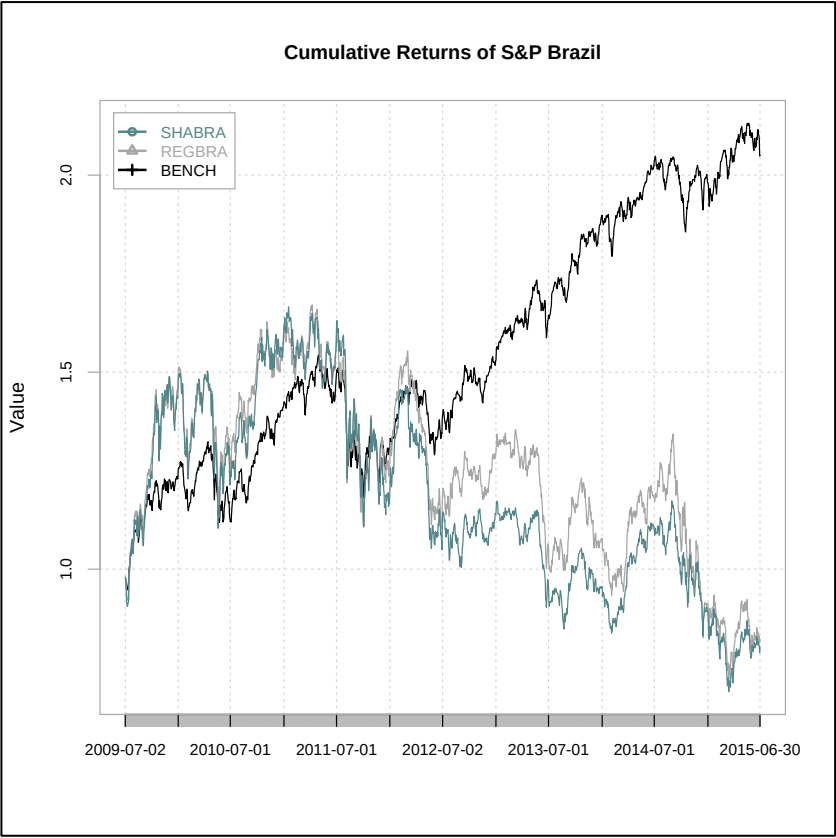
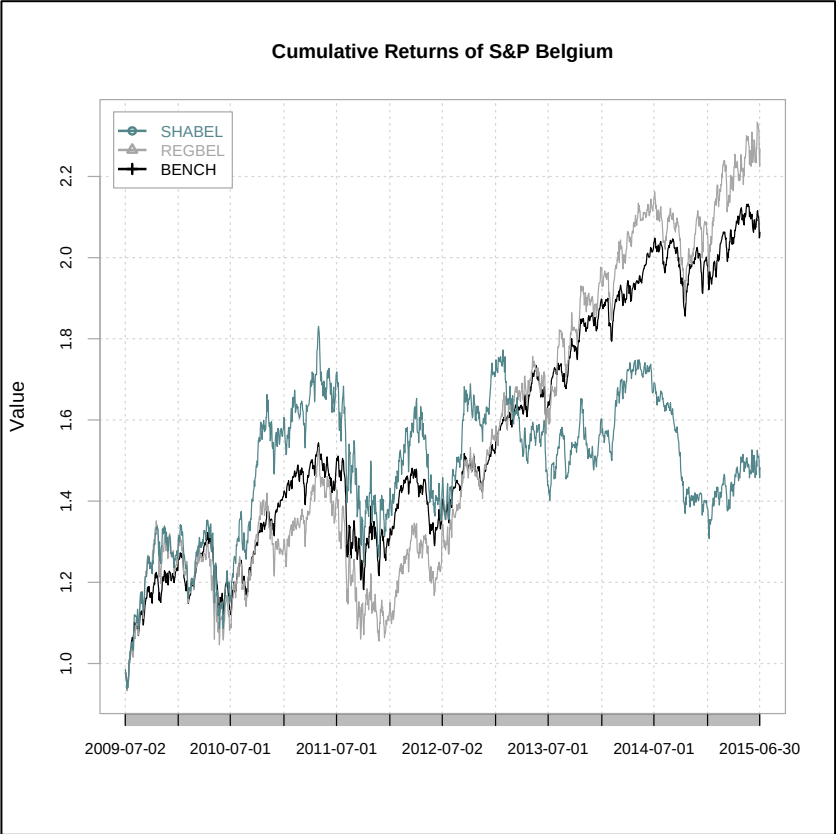
#### **ii. Debt over Total Assets**

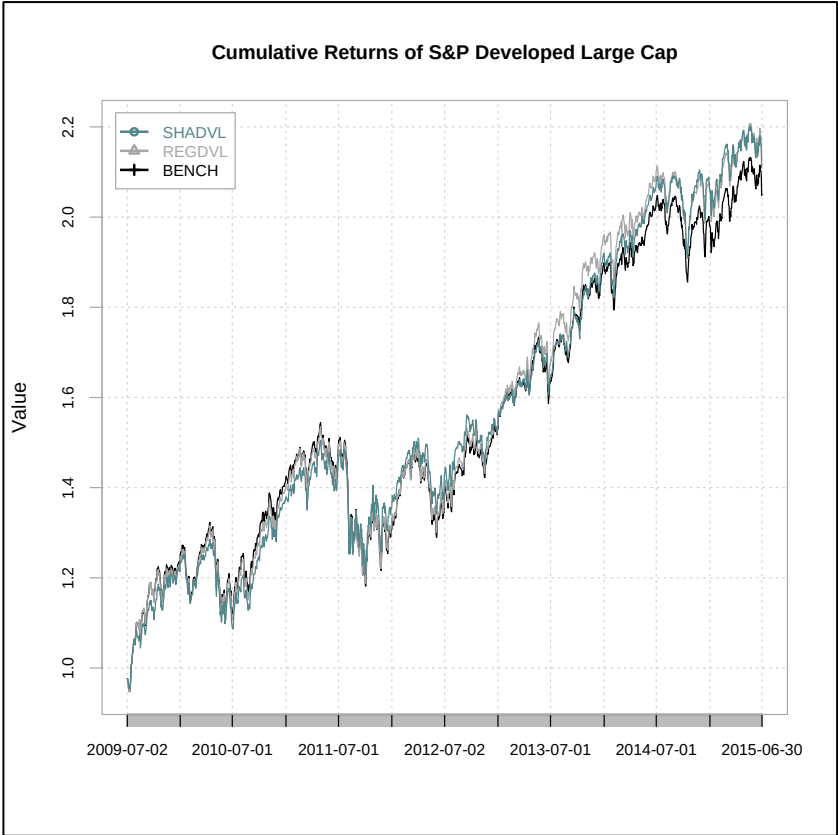
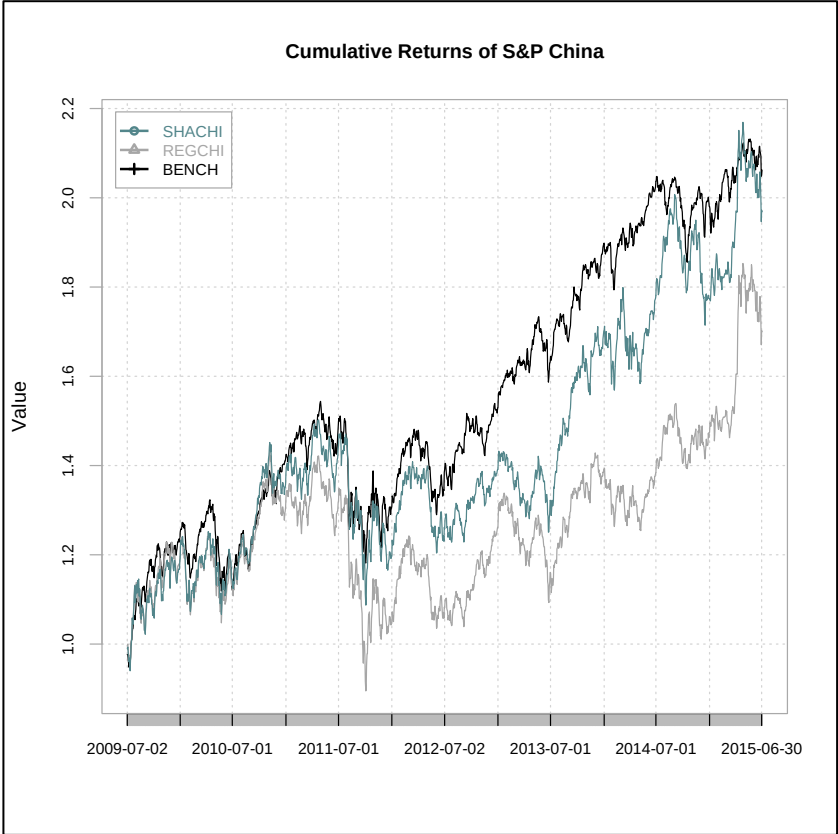
Debt will only include interest-bearing debt whereas Islamic debt/financing or *sukuk* will be excluded from the calculation. Both ratios, which are intended to measure *riba* and *riba*-based elements within a company's balance sheet, must be lower than 33%.

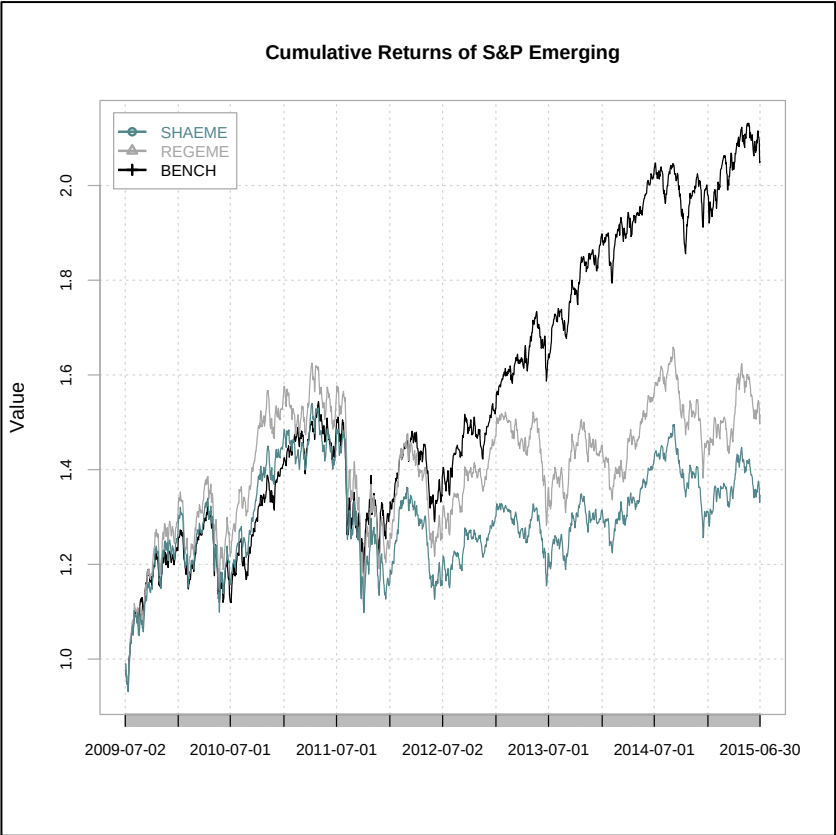
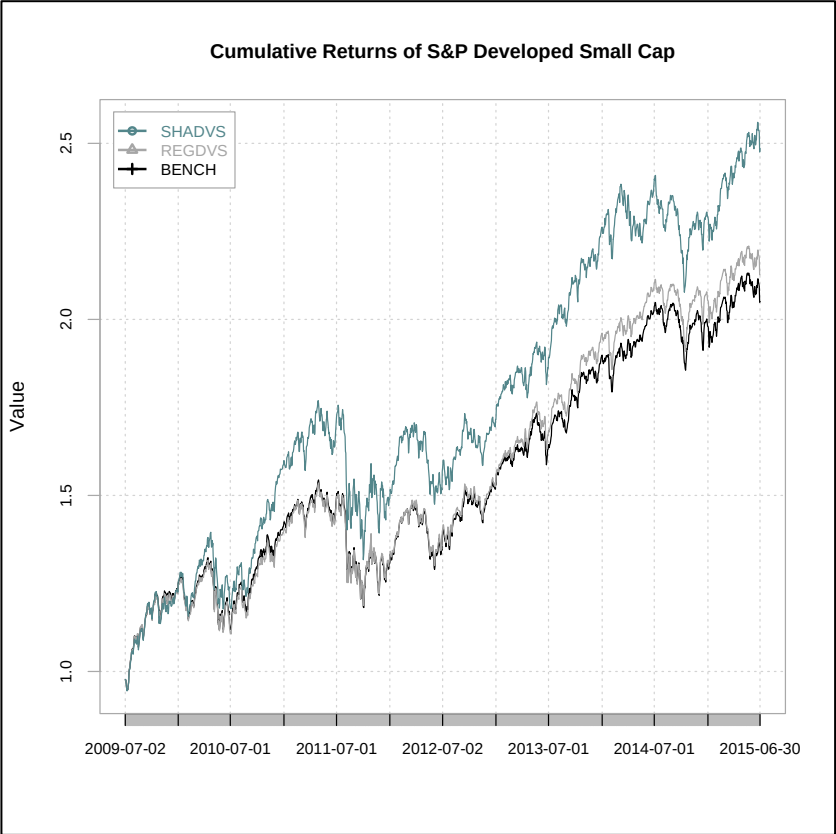
*Sources: Securities Commission Malaysia (2015)*

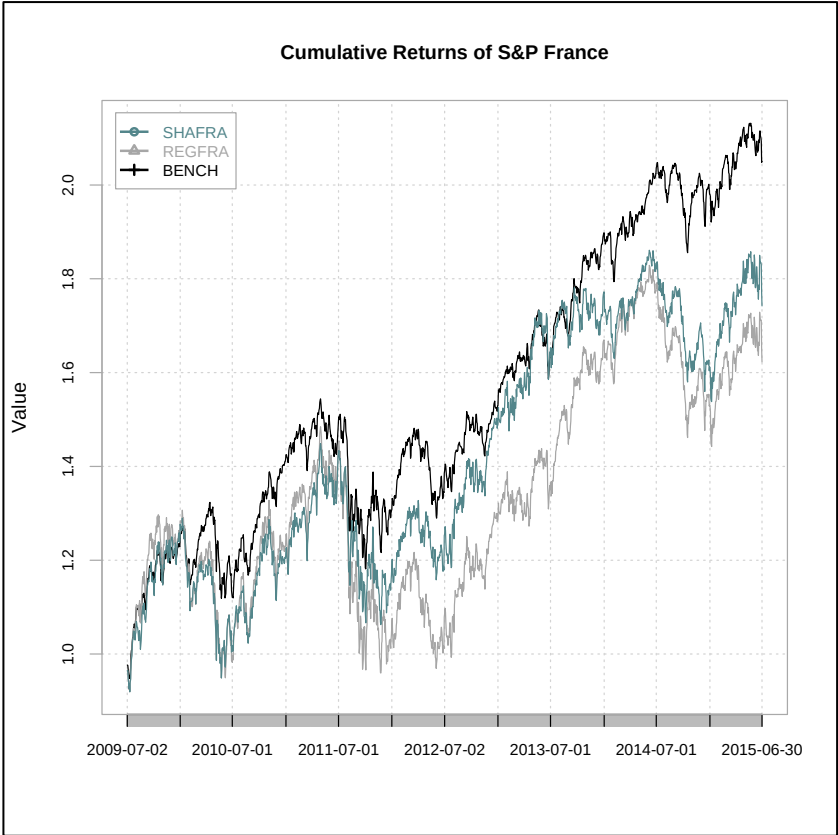
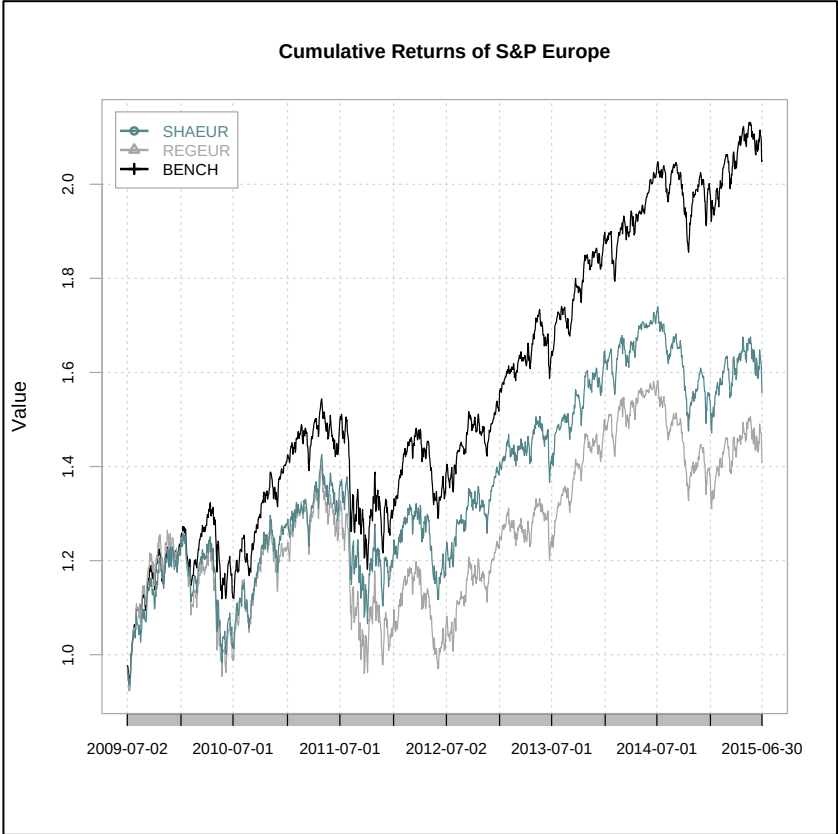
3. Cumulative Returns in graphs

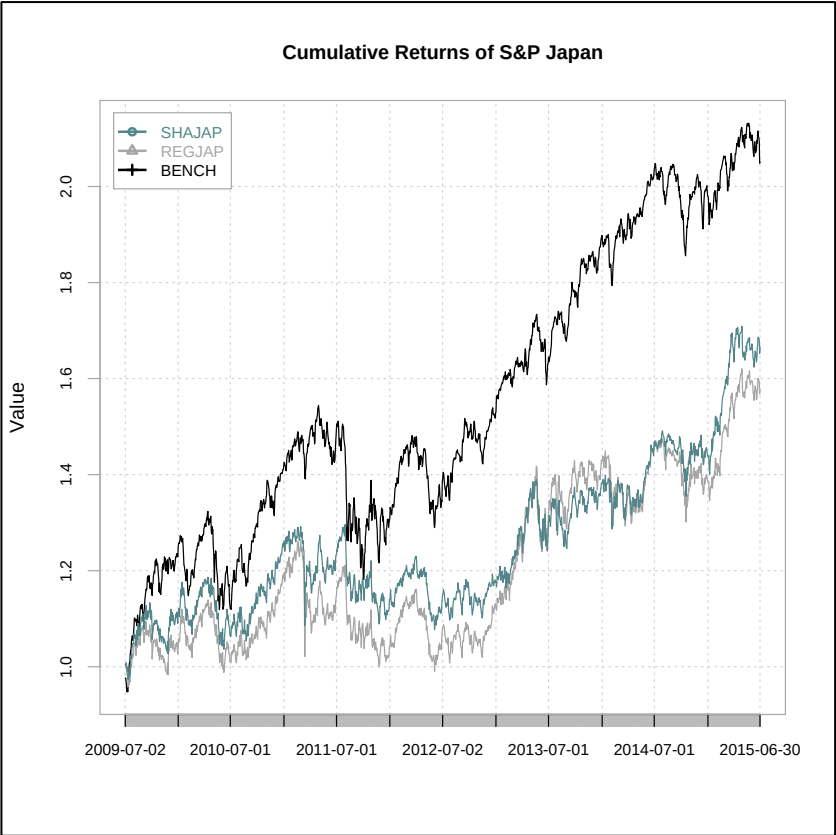
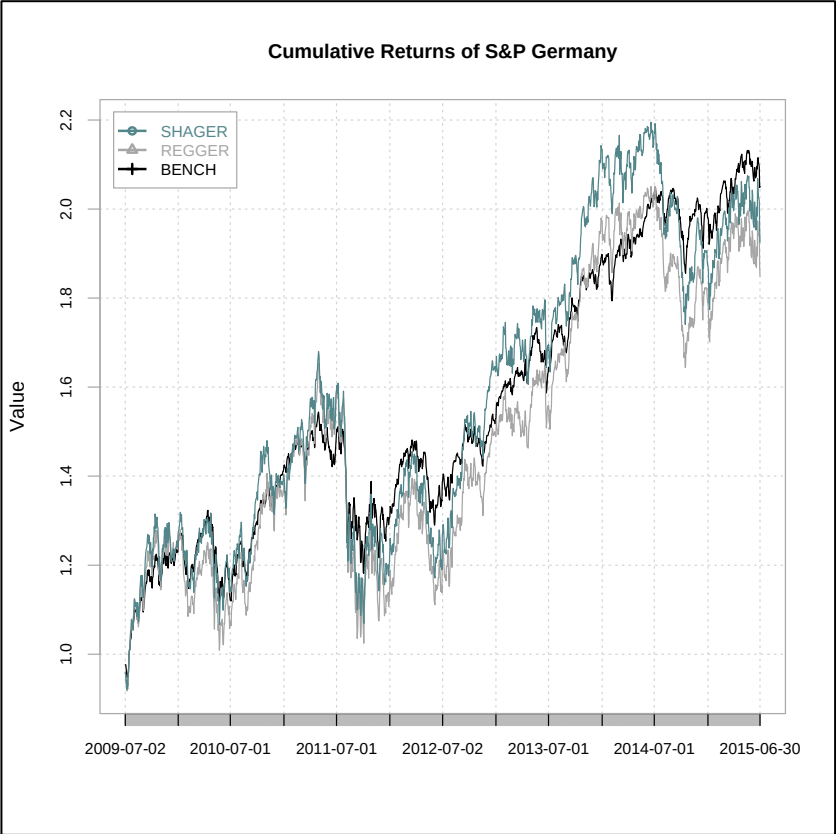


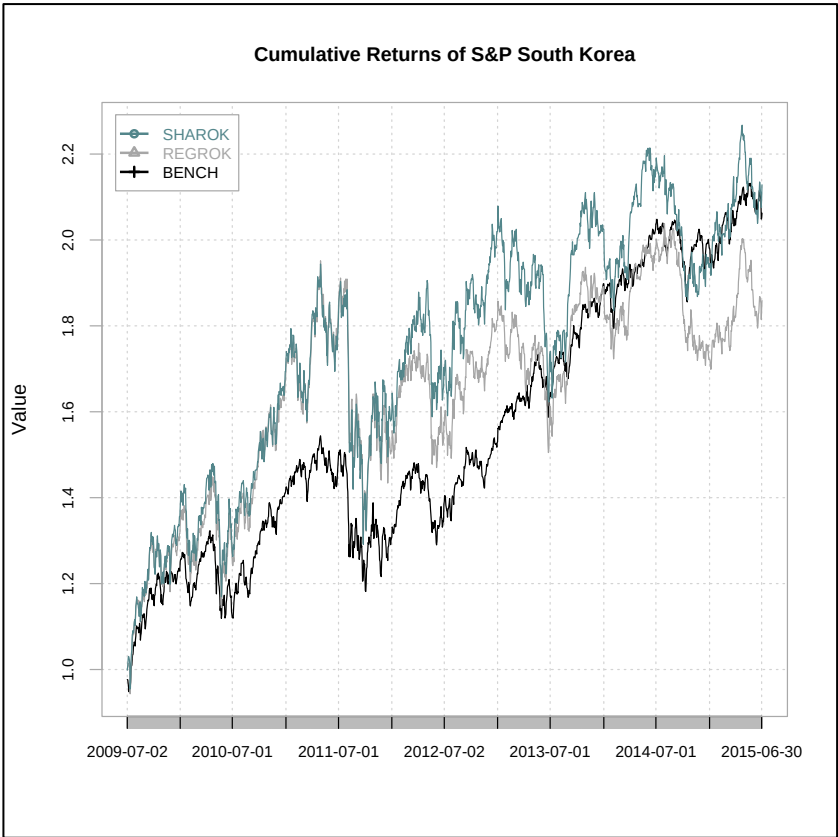
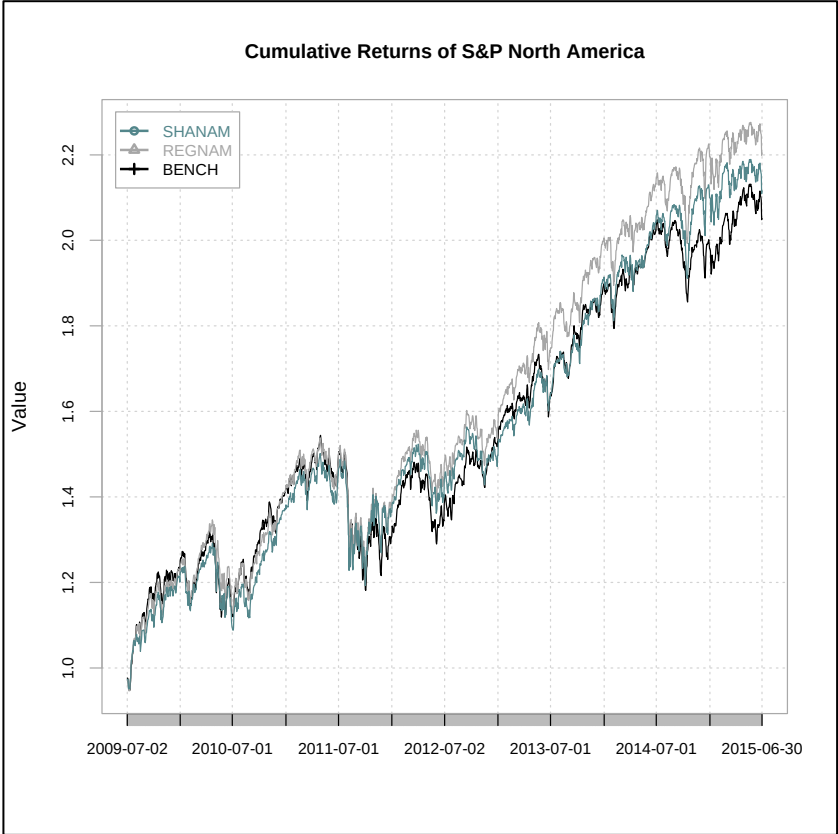


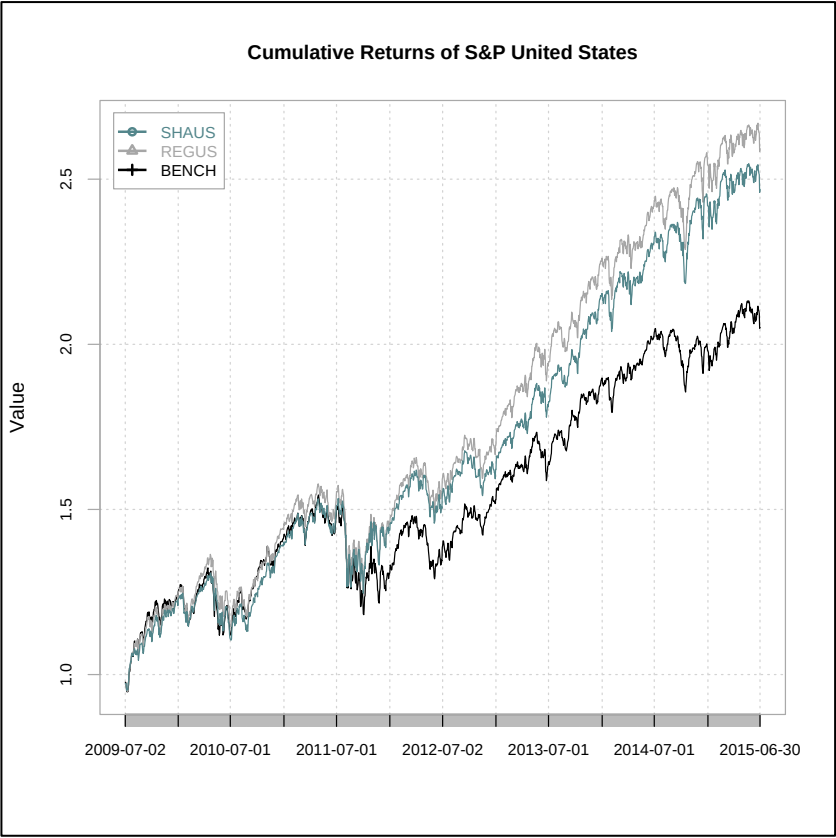
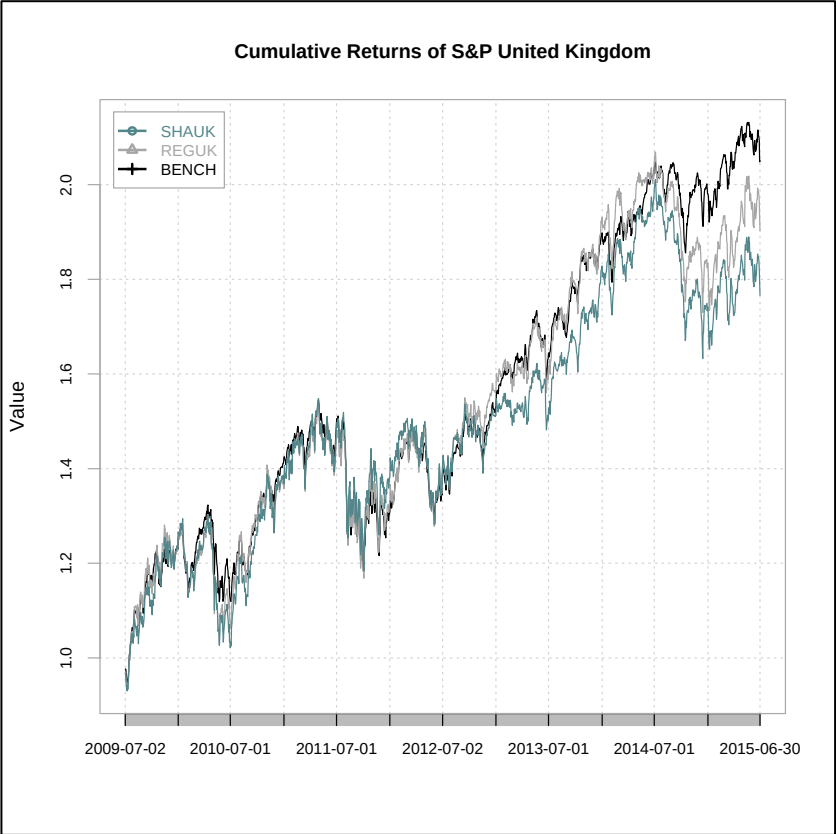












#### 4. Average daily returns, annualized returns, and global returns (Excel)

|                                                             | SHA500  | REG500  | BENCH   | SHAASPAC | REGASPAC | BENCH   | SHABEL  | REGBEL  | BENCH   | SHABRA   | REGBRA   | BENCH   |
|-------------------------------------------------------------|---------|---------|---------|----------|----------|---------|---------|---------|---------|----------|----------|---------|
| <b>Average Daily Return: Arithmetic mean (%)</b>            | 0,0630% | 0,0671% | 0,0521% | 0,0367%  | 0,0386%  | 0,0504% | 0,0350% | 0,0619% | 0,0504% | 0,0000%  | 0,0020%  | 0,0500% |
| Global Return (excl. compound.): Arithmetic mean (%)        | 95,07%  | 101,24% | 78,68%  | 57,23%   | 60,18%   | 78,61%  | 54,63%  | 96,61%  | 78,61%  | 0,01%    | 3,05%    | 78,04%  |
| Final Value (excluding compounding)                         | 195,07  | 201,24  | 178,68  | 157,23   | 160,18   | 178,61  | 154,63  | 196,61  | 178,61  | 100,01   | 103,05   | 178,04  |
|                                                             |         |         |         |          |          |         |         |         |         |          |          |         |
| <b>Average Daily Return: Geometric mean (%)</b>             | 0,0584% | 0,0621% | 0,0480% | 0,0315%  | 0,0336%  | 0,0464% | 0,0252% | 0,0525% | 0,0464% | -0,0141% | -0,0125% | 0,0460% |
| Average Daily Log Return (%)                                | 0,0584% | 0,0621% | 0,0480% | 0,0315%  | 0,0336%  | 0,0464% | 0,0252% | 0,0525% | 0,0464% | -0,0141% | -0,0125% | 0,0460% |
| Annual Return: Arithmetic average (%)                       | 15,88%  | 16,91%  | 13,14%  | 9,24%    | 9,71%    | 12,69%  | 8,82%   | 15,60%  | 12,69%  | 0,00%    | 0,49%    | 12,60%  |
| Annual Return: Geometric average (%)                        | 14,72%  | 15,65%  | 12,09%  | 7,94%    | 8,48%    | 11,69%  | 6,36%   | 13,22%  | 11,69%  | -3,56%   | -3,14%   | 11,60%  |
| Effective (or Annualised) Return: Log Return (%)            | 15,85%  | 16,94%  | 12,85%  | 8,26%    | 8,84%    | 12,40%  | 6,57%   | 14,13%  | 12,40%  | -3,50%   | -3,09%   | 12,29%  |
| <b>Effective (or Annualised) Return: Geometric mean (%)</b> | 15,85%  | 16,94%  | 12,85%  | 8,26%    | 8,84%    | 12,40%  | 6,57%   | 14,13%  | 12,40%  | -3,50%   | -3,09%   | 12,29%  |

|                                                             | SHACHI  | REGCHI  | BENCH   | SHAEME  | REGEME  | BENCH   | SHAEUR  | REGEUR  | BENCH   | SHAFRA  | REGFRA  | BENCH   |
|-------------------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>Average Daily Return: Arithmetic mean (%)</b>            | 0,0503% | 0,0419% | 0,0504% | 0,0234% | 0,0314% | 0,0500% | 0,0364% | 0,0315% | 0,0511% | 0,0456% | 0,0432% | 0,0500% |
| Global Return (excl. compound.): Arithmetic mean (%)        | 78,54%  | 65,34%  | 78,61%  | 36,51%  | 49,02%  | 78,04%  | 56,02%  | 48,57%  | 78,64%  | 71,19%  | 67,45%  | 78,04%  |
| Final Value (excluding compounding)                         | 178,54  | 165,34  | 178,61  | 136,51  | 149,02  | 178,04  | 156,02  | 148,57  | 178,64  | 171,19  | 167,45  | 178,04  |
|                                                             |         |         |         |         |         |         |         |         |         |         |         |         |
| <b>Average Daily Return: Geometric mean (%)</b>             | 0,0434% | 0,0340% | 0,0464% | 0,0190% | 0,0267% | 0,0460% | 0,0294% | 0,0228% | 0,0470% | 0,0356% | 0,0310% | 0,0460% |
| Average Daily Log Return (%)                                | 0,0434% | 0,0340% | 0,0464% | 0,0190% | 0,0267% | 0,0460% | 0,0294% | 0,0228% | 0,0470% | 0,0356% | 0,0310% | 0,0460% |
| Annual Return: Arithmetic average (%)                       | 12,68%  | 10,55%  | 12,69%  | 5,89%   | 7,91%   | 12,60%  | 9,17%   | 7,95%   | 12,87%  | 11,49%  | 10,89%  | 12,60%  |
| Annual Return: Geometric average (%)                        | 10,94%  | 8,56%   | 11,69%  | 4,80%   | 6,72%   | 11,60%  | 7,41%   | 5,75%   | 11,85%  | 8,96%   | 7,82%   | 11,60%  |
| Effective (or Annualised) Return: Log Return (%)            | 11,56%  | 8,94%   | 12,40%  | 4,91%   | 6,95%   | 12,29%  | 7,69%   | 5,92%   | 12,58%  | 9,38%   | 8,13%   | 12,29%  |
| <b>Effective (or Annualised) Return: Geometric mean (%)</b> | 11,56%  | 8,94%   | 12,40%  | 4,91%   | 6,95%   | 12,29%  | 7,69%   | 5,92%   | 12,58%  | 9,38%   | 8,13%   | 12,29%  |

|                                                      | SHAGER  | REGGER  | BENCH   | SHAJAP  | REGJAP  | BENCH   | SHADVL  | REGDVL  | BENCH   | SHADVS  | REGDVS  | BENCH   |
|------------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Average Daily Return: Arithmetic mean (%)            | 0,0530% | 0,0511% | 0,0500% | 0,0389% | 0,0359% | 0,0500% | 0,0516% | 0,0525% | 0,0500% | 0,0637% | 0,0525% | 0,0500% |
| Global Return (excl. compound.): Arithmetic mean (%) | 82,70%  | 79,73%  | 78,04%  | 60,73%  | 56,09%  | 78,04%  | 80,49%  | 81,90%  | 78,04%  | 99,37%  | 81,90%  | 78,04%  |
| Final Value (excluding compounding)                  | 182,70  | 179,73  | 178,04  | 160,73  | 156,09  | 178,04  | 180,49  | 181,90  | 178,04  | 199,37  | 181,90  | 178,04  |
|                                                      |         |         |         |         |         |         |         |         |         |         |         |         |
| Average Daily Return: Geometric mean (%)             | 0,0420% | 0,0394% | 0,0460% | 0,0327% | 0,0292% | 0,0460% | 0,0478% | 0,0483% | 0,0460% | 0,0583% | 0,0483% | 0,0460% |
| Average Daily Log Return (%)                         | 0,0420% | 0,0394% | 0,0460% | 0,0327% | 0,0292% | 0,0460% | 0,0478% | 0,0483% | 0,0460% | 0,0583% | 0,0483% | 0,0460% |
| Annual Return: Arithmetic average (%)                | 13,35%  | 12,87%  | 12,60%  | 9,80%   | 9,05%   | 12,60%  | 12,99%  | 13,22%  | 12,60%  | 16,04%  | 13,22%  | 12,60%  |
| Annual Return: Geometric average (%)                 | 10,58%  | 9,93%   | 11,60%  | 8,24%   | 7,36%   | 11,60%  | 12,04%  | 12,18%  | 11,60%  | 14,70%  | 12,18%  | 11,60%  |
| Effective (or Annualised) Return: Log Return (%)     | 11,16%  | 10,43%  | 12,29%  | 8,59%   | 7,63%   | 12,29%  | 12,80%  | 12,95%  | 12,29%  | 15,83%  | 12,95%  | 12,29%  |
| Effective (or Annualised) Return: Geometric mean (%) | 11,16%  | 10,43%  | 12,29%  | 8,59%   | 7,63%   | 12,29%  | 12,80%  | 12,95%  | 12,29%  | 15,83%  | 12,95%  | 12,29%  |

|                                                      | SHANAM  | REGNAM  | BENCH   | SHAROK  | REGROK  | BENCH   | SHAUK   | REGUK   | BENCH   | SHAUS   | REGUS   | BENCH   |
|------------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Average Daily Return: Arithmetic mean (%)            | 0,0528% | 0,0557% | 0,0500% | 0,0602% | 0,0499% | 0,0504% | 0,0439% | 0,0483% | 0,0500% | 0,0627% | 0,0662% | 0,0500% |
| Global Return (excl. compound.): Arithmetic mean (%) | 82,48%  | 86,97%  | 78,04%  | 93,96%  | 77,89%  | 78,61%  | 68,49%  | 75,34%  | 78,04%  | 97,90%  | 103,35% | 78,04%  |
| Final Value (excluding compounding)                  | 182,48  | 186,97  | 178,04  | 193,96  | 177,89  | 178,61  | 168,49  | 175,34  | 178,04  | 197,90  | 203,35  | 178,04  |
|                                                      |         |         |         |         |         |         |         |         |         |         |         |         |
| Average Daily Return: Geometric mean (%)             | 0,0480% | 0,0507% | 0,0460% | 0,0484% | 0,0397% | 0,0464% | 0,0364% | 0,0412% | 0,0460% | 0,0579% | 0,0610% | 0,0460% |
| Average Daily Log Return (%)                         | 0,0480% | 0,0506% | 0,0460% | 0,0484% | 0,0397% | 0,0464% | 0,0364% | 0,0412% | 0,0460% | 0,0579% | 0,0610% | 0,0460% |
| Annual Return: Arithmetic average (%)                | 13,32%  | 14,04%  | 12,60%  | 15,17%  | 12,57%  | 12,69%  | 11,06%  | 12,16%  | 12,60%  | 15,80%  | 16,68%  | 12,60%  |
| Annual Return: Geometric average (%)                 | 12,10%  | 12,77%  | 11,60%  | 12,20%  | 10,01%  | 11,69%  | 9,18%   | 10,38%  | 11,60%  | 14,60%  | 15,38%  | 11,60%  |
| Effective (or Annualised) Return: Log Return (%)     | 12,86%  | 13,61%  | 12,29%  | 12,97%  | 10,53%  | 12,40%  | 9,61%   | 10,94%  | 12,29%  | 15,71%  | 16,62%  | 12,29%  |
| Effective (or Annualised) Return: Geometric mean (%) | 12,86%  | 13,61%  | 12,29%  | 12,97%  | 10,53%  | 12,40%  | 9,61%   | 10,94%  | 12,29%  | 15,71%  | 16,62%  | 12,29%  |

## 5. Average daily returns, annualized returns, and global returns (R)

```
> # Descriptive statistics including daily arithmetic and geometric mean returns
> table.Stats(mydata500[,1:2],digits=6)
              SHA500    REG500
Observations 1508.000000 1508.000000
NAs          0.000000   0.000000
Minimum      -0.058450  -0.066490
Quartile 1    -0.003713  -0.003860
Median        0.000785   0.000830
Arithmetic Mean 0.000627  0.000667
Geometric Mean 0.000581  0.000617
Quartile 3     0.005732  0.005652
Maximum       0.044040  0.047430
SE Mean       0.000247  0.000257
LCL Mean (0.95) 0.000142  0.000163
UCL Mean (0.95) 0.001111  0.001170
Variance      0.000092  0.000099
Stdev         0.009592  0.009967
Skewness      -0.317751 -0.353533
Kurtosis      3.373791  3.973154
>
> #Annualised Return: Geometric average (%)
> Return.annualized(mydata500[,1:2])
              SHA500    REG500
Annualized Return 0.1575154 0.1681401
>
> #Global Return (incl. compound.): Geometric mean (%)
> tail(cumprod(1+mydata500[,1:2])-1,1)
              SHA500    REG500
2015-06-30 1.399674 1.534535
>
> # Global Return (excl. compound.): Arithmetic mean
> tail(cumsum(mydata500[,1:2]),1)
              SHA500    REG500
2015-06-30 0.94503 1.0053
```

```
> # Descriptive statistics including daily arithmetic and geometric mean returns
> table.Stats(mydataaspac[,1:2],digits=6)
              SHAASPAC    REGASPAC
Observations 1561.000000 1561.000000
NAs          0.000000   0.000000
Minimum      -0.052180  -0.060170
Quartile 1    -0.005340  -0.004930
Median        0.000720   0.000430
Arithmetic Mean 0.000367  0.000385
Geometric Mean 0.000315  0.000336
Quartile 3     0.006480  0.006510
Maximum       0.041540  0.042000
SE Mean       0.000257  0.000251
LCL Mean (0.95) -0.000137 -0.000107
UCL Mean (0.95) 0.000870  0.000877
Variance      0.000103  0.000098
Stdev         0.010136  0.009909
Skewness      -0.331136 -0.395173
Kurtosis      1.597054  2.011182
>
> #Annualised Return: Geometric average (%)
> Return.annualized(mydataaspac[,1:2])
              SHAASPAC    REGASPAC
Annualized Return 0.08267014 0.08840548
>
> #Global Return (incl. compound.): Geometric mean (%)
> tail(cumprod(1+mydataaspac[,1:2])-1,1)
              SHAASPAC    REGASPAC
2015-07-01 0.635628 0.6900442
>
> # Global Return (excl. compound.): Arithmetic mean
> tail(cumsum(mydataaspac[,1:2]),1)
              SHAASPAC    REGASPAC
2015-07-01 0.5724 0.60162
```

```

> # Descriptive statistics including daily arithmetic and geometric mean returns
> table.Stats(mydataabel[,1:2],digits=6)
      SHABEL      REGBEL
Observations  1561.000000 1561.000000
NAs           0.000000   0.000000
Minimum      -0.057408  -0.061120
Quartile 1    -0.007112  -0.006734
Median        0.000050   0.000464
Arithmetic Mean 0.000350   0.000619
Geometric Mean 0.000252   0.000525
Quartile 3     0.008009   0.008324
Maximum       0.080536   0.108243
SE Mean       0.000354   0.000348
LCL Mean (0.95) -0.000344 -0.000063
UCL Mean (0.95) 0.001044   0.001301
Variance       0.000195   0.000189
Stdev          0.013974   0.013740
Skewness       -0.011604   0.111696
Kurtosis       1.976712   3.889502
>
> #Annualised Return: Geometric average (%)
> Return.annualized(mydataabel[,1:2])
      SHABEL      REGBEL
Annualized Return 0.0656501 0.1413221
>
> #Global Return (incl. compound.): Geometric mean (%)
> tail(cumprod(1+mydataabel[,1:2])-1,1)
      SHABEL      REGBEL
2015-07-01 0.4827137 1.267838
>
> # Global Return (excl. compound.): Arithmetic mean
> tail(cumsum(mydataabel[,1:2]),1)
      SHABEL      REGBEL
2015-07-01 0.5462697 0.9661457

```

```

> # Descriptive statistics including daily arithmetic and geometric mean returns
> table.Stats(mydatabra[,1:2],digits=6)
      SHABRA      REGBRA
Observations  1561.000000 1561.000000
NAs           0.000000   0.000000
Minimum      -0.096790  -0.088350
Quartile 1    -0.008980  -0.009100
Median        0.000180   0.000000
Arithmetic Mean 0.000000   0.000020
Geometric Mean -0.000141  -0.000125
Quartile 3     0.009380   0.009480
Maximum       0.074150   0.081750
SE Mean       0.000425   0.000430
LCL Mean (0.95) -0.000834 -0.000823
UCL Mean (0.95) 0.000834   0.000862
Variance       0.000282   0.000288
Stdev          0.016803   0.016972
Skewness       -0.115418  -0.029348
Kurtosis       2.076356   1.958698
>
> #Annualised Return: Geometric average (%)
> Return.annualized(mydatabra[,1:2])
      SHABRA      REGBRA
Annualized Return -0.03496557 -0.0309055
>
> #Global Return (incl. compound.): Geometric mean (%)
> tail(cumprod(1+mydatabra[,1:2])-1,1)
      SHABRA      REGBRA
2015-06-30 -0.1978579 -0.1767234
>
> # Global Return (excl. compound.): Arithmetic mean
> tail(cumsum(mydatabra[,1:2]),1)
      SHABRA      REGBRA
2015-06-30 0.00021 0.03044

```

```

> # Descriptive statistics including daily arithmetic and geometric mean returns
> table.Stats(mydataachi[,1:2],digits=6)
      SHACHI  REGCHI
Observations 1561.000000 1561.000000
NAs          0.000000  0.000000
Minimum      -0.060870  -0.063440
Quartile 1    -0.006060  -0.006170
Median        0.000690  0.000180
Arithmetic Mean 0.000503  0.000419
Geometric Mean 0.000434  0.000340
Quartile 3    0.007160  0.007570
Maximum       0.056170  0.060370
SE Mean       0.000297  0.000318
LCL Mean (0.95) -0.000080 -0.000204
UCL Mean (0.95) 0.001086  0.001042
Variance      0.000138  0.000157
Stdev         0.011747  0.012549
Skewness      -0.150208  -0.049687
Kurtosis      1.685015  2.280597
>
> #Annualised Return: Geometric average (%)
> Return.annualized(mydataachi[,1:2])
      SHACHI  REGCHI
Annualized Return 0.1155666 0.08942296
>
> #Global Return (incl. compound.): Geometric mean (%)
> tail(cumprod(1+mydataachi[,1:2])-1,1)
      SHACHI  REGCHI
2015-07-01 0.9688301 0.6998547
>
> # Global Return (excl. compound.): Arithmetic mean
> tail(cumsum(mydataachi[,1:2]),1)
      SHACHI  REGCHI
2015-07-01 0.78532 0.65351

```

```

> # Descriptive statistics including daily arithmetic and geometric mean returns
> table.Stats(mydataaeme[,1:2],digits=6)
      SHAEME  REGEME
Observations 1561.000000 1561.000000
NAs          0.000000  0.000000
Minimum      -0.063060  -0.063060
Quartile 1    -0.004460  -0.004790
Median        0.000520  0.000520
Arithmetic Mean 0.000234  0.000314
Geometric Mean 0.000190  0.000267
Quartile 3    0.005640  0.005890
Maximum       0.040900  0.043990
SE Mean       0.000236  0.000246
LCL Mean (0.95) -0.000229 -0.000168
UCL Mean (0.95) 0.000697  0.000796
Variance      0.000087  0.000094
Stdev         0.009324  0.009714
Skewness      -0.397323  -0.342322
Kurtosis      3.080026  2.936723
>
> #Annualised Return: Geometric average (%)
> Return.annualized(mydataaeme[,1:2])
      SHAEME  REGEME
Annualized Return 0.04913399 0.06955125
>
> #Global Return (incl. compound.): Geometric mean (%)
> tail(cumprod(1+mydataaeme[,1:2])-1,1)
      SHAEME  REGEME
2015-06-30 0.3459725 0.5166581
>
> # Global Return (excl. compound.): Arithmetic mean
> tail(cumsum(mydataaeme[,1:2]),1)
      SHAEME  REGEME
2015-06-30 0.36512 0.49032

```

```

> # Descriptive statistics including daily arithmetic and geometric mean returns
> table.Stats(mydataeur[,1:2],digits=6)
      SHAEUR      REGEUR
Observations 1539.000000 1539.000000
NAs          0.000000   0.000000
Minimum      -0.056560  -0.064060
Quartile 1   -0.005755  -0.006235
Median       0.000550   0.000330
Arithmetic Mean 0.000357  0.000310
Geometric Mean 0.000287  0.000222
Quartile 3   0.006835   0.007600
Maximum      0.063760   0.079470
SE Mean      0.000301   0.000337
LCL Mean (0.95) -0.000233 -0.000350
UCL Mean (0.95) 0.000948  0.000970
Variance     0.000139   0.000174
Stdev        0.011811   0.013201
Skewness     -0.107306  -0.067941
Kurtosis     2.174423   2.714296
>
> #Annualised Return: Geometric average (%)
> Return.annualized(mydataeur[,1:2])
      SHAEUR      REGEUR
Annualized Return 0.07512587 0.05764673
>
> #Global Return (incl. compound.): Geometric mean (%)
> tail(cumprod(1+mydataeur[,1:2])-1,1)
      SHAEUR      REGEUR
2015-06-30 0.556419 0.408159
>
> # Global Return (excl. compound.): Arithmetic mean
> tail(cumsum(mydataeur[,1:2]),1)
      SHAEUR      REGEUR
2015-06-30 0.54981 0.47644

```

```

> # Descriptive statistics including daily arithmetic and geometric mean returns
> table.Stats(mydatafra[,1:2],digits=6)
      SHAFRA      REGFRA
Observations 1561.000000 1561.000000
NAs          0.000000   0.000000
Minimum      -0.059850  -0.070750
Quartile 1   -0.007190  -0.007510
Median       0.000710   0.000430
Arithmetic Mean 0.000456  0.000432
Geometric Mean 0.000356  0.000310
Quartile 3   0.008140   0.009100
Maximum      0.087330   0.107180
SE Mean      0.000359   0.000395
LCL Mean (0.95) -0.000248 -0.000343
UCL Mean (0.95) 0.001160  0.001207
Variance     0.000201   0.000244
Stdev        0.014171   0.015618
Skewness     0.059901   0.072357
Kurtosis     2.375497   3.459620
>
> #Annualised Return: Geometric average (%)
> Return.annualized(mydatafra[,1:2])
      SHAFRA      REGFRA
Annualized Return 0.09376526 0.08130814
>
> #Global Return (incl. compound.): Geometric mean (%)
> tail(cumprod(1+mydatafra[,1:2])-1,1)
      SHAFRA      REGFRA
2015-06-30 0.7422615 0.6229238
>
> # Global Return (excl. compound.): Arithmetic mean
> tail(cumsum(mydatafra[,1:2]),1)
      SHAFRA      REGFRA
2015-06-30 0.71184 0.67447

```

```

> # Descriptive statistics including daily arithmetic and geometric mean returns
> table.Stats(mydatager[,1:2],digits=6)
              SHAGER      REGGER
Observations  1561.000000  1561.000000
NAs           0.000000    0.000000
Minimum       -0.065180   -0.066460
Quartile 1    -0.007060   -0.007430
Median        0.000560    0.000360
Arithmetic Mean 0.000530    0.000511
Geometric Mean 0.000420    0.000394
Quartile 3     0.008870    0.008790
Maximum       0.067580    0.074720
SE Mean       0.000375    0.000387
LCL Mean (0.95) -0.000206   -0.000248
UCL Mean (0.95) 0.001266    0.001270
Variance       0.000220    0.000234
Stdev          0.014826    0.015288
Skewness       -0.108610   -0.077917
Kurtosis       1.717696    2.369173
>
> #Annualised Return: Geometric average (%)
> Return.annualized(mydatager[,1:2])
              SHAGER      REGGER
Annualized Return 0.1115707 0.1043587
>
> #Global Return (incl. compound.): Geometric mean (%)
> tail(cumprod(1+mydatager[,1:2])-1,1)
              SHAGER      REGGER
2015-06-30 0.9255495 0.8494541
>
> # Global Return (excl. compound.): Arithmetic mean
> tail(cumsum(mydatager[,1:2]),1)
              SHAGER      REGGER
2015-06-30 0.82698 0.79748

```

```

> # Descriptive statistics including daily arithmetic and geometric mean returns
> table.Stats(mydatajap[,1:2],digits=6)
              SHAJAP      REGJAP
Observations  1561.000000  1561.000000
NAs           0.000000    0.000000
Minimum       -0.070630   -0.085180
Quartile 1    -0.005930   -0.006430
Median        0.000390    0.000240
Arithmetic Mean 0.000389    0.000359
Geometric Mean 0.000327    0.000292
Quartile 3     0.007160    0.007560
Maximum       0.070870    0.075100
SE Mean       0.000282    0.000294
LCL Mean (0.95) -0.000164   -0.000217
UCL Mean (0.95) 0.000942    0.000935
Variance       0.000124    0.000135
Stdev          0.011131    0.011602
Skewness       -0.202581   -0.325762
Kurtosis       3.162430    4.389981
>
> #Annualised Return: Geometric average (%)
> Return.annualized(mydatajap[,1:2])
              SHAJAP      REGJAP
Annualized Return 0.08589628 0.07633699
>
> #Global Return (incl. compound.): Geometric mean (%)
> tail(cumprod(1+mydatajap[,1:2])-1,1)
              SHAJAP      REGJAP
2015-06-30 0.6660534 0.5772544
>
> # Global Return (excl. compound.): Arithmetic mean
> tail(cumsum(mydatajap[,1:2]),1)
              SHAJAP      REGJAP
2015-06-30 0.60732 0.56102

```

```

> # Descriptive statistics including daily arithmetic and geometric mean returns
> table.Stats(mydatadvl[,1:2],digits=6)
      SHADV L  REGDVL
Observations 1561.000000 1561.000000
NAs          0.000000 0.000000
Minimum      -0.048870 -0.053240
Quartile 1   -0.003520 -0.003610
Median       0.000630 0.000830
Arithmetic Mean 0.000516 0.000525
Geometric Mean 0.000478 0.000483
Quartile 3   0.004810 0.004980
Maximum      0.041630 0.049630
SE Mean      0.000220 0.000230
LCL Mean (0.95) 0.000085 0.000074
UCL Mean (0.95) 0.000946 0.000975
Variance     0.000075 0.000082
Stdev        0.008677 0.009074
Skewness     -0.308726 -0.314314
Kurtosis     3.404448 3.755088
>
> #Annualised Return: Geometric average (%)
> Return.annualized(mydatadvl[,1:2])
      SHADV L  REGDVL
Annualized Return 0.127959 0.1295194
>
> #Global Return (incl. compound.): Geometric mean (%)
> tail(cumprod(1+mydatadvl[,1:2])-1,1)
      SHADV L  REGDVL
2015-06-30 1.108278 1.12641
>
> # Global Return (excl. compound.): Arithmetic mean
> tail(cumsum(mydatadvl[,1:2]),1)
      SHADV L  REGDVL
2015-06-30 0.80487 0.81894

```

```

> # Descriptive statistics including daily arithmetic and geometric mean returns
> table.Stats(mydatadvsv[,1:2],digits=6)
      SHADV S  REGDVS
Observations 1561.000000 1561.000000
NAs          0.000000 0.000000
Minimum      -0.067010 -0.053240
Quartile 1   -0.004280 -0.003610
Median       0.001200 0.000830
Arithmetic Mean 0.000637 0.000525
Geometric Mean 0.000583 0.000483
Quartile 3   0.005820 0.004980
Maximum      0.050070 0.049630
SE Mean      0.000261 0.000230
LCL Mean (0.95) 0.000125 0.000074
UCL Mean (0.95) 0.001148 0.000975
Variance     0.000106 0.000082
Stdev        0.010307 0.009074
Skewness     -0.404309 -0.314314
Kurtosis     3.807133 3.755088
>
> #Annualised Return: Geometric average (%)
> Return.annualized(mydatadvsv[,1:2])
      SHADV S  REGDVS
Annualized Return 0.158322 0.1295194
>
> #Global Return (incl. compound.): Geometric mean (%)
> tail(cumprod(1+mydatadvsv[,1:2])-1,1)
      SHADV S  REGDVS
2015-06-30 1.485347 1.12641
>
> # Global Return (excl. compound.): Arithmetic mean
> tail(cumsum(mydatadvsv[,1:2]),1)
      SHADV S  REGDVS
2015-06-30 0.99375 0.81894

```

```

> # Descriptive statistics including daily arithmetic and geometric mean returns
> table.Stats(mydatanam[,1:2],digits=6)
      SHANAM      REGNAM
Observations  1561.000000 1561.000000
NAs           0.000000   0.000000
Minimum       -0.061350  -0.068340
Quartile 1    -0.003780  -0.003880
Median        0.000580   0.000650
Arithmetic Mean 0.000528   0.000557
Geometric Mean 0.000480   0.000507
Quartile 3     0.005500   0.005450
Maximum       0.043670   0.049130
SE Mean       0.000248   0.000254
LCL Mean (0.95) 0.000042   0.000058
UCL Mean (0.95) 0.001015   0.001056
Variance      0.000096   0.000101
Stdev         0.009799   0.010046
Skewness      -0.336727  -0.369502
Kurtosis      3.599843   4.167397
>
> #Annualised Return: Geometric average (%)
> Return.annualized(mydatanam[,1:2])
      SHANAM      REGNAM
Annualized Return 0.1286111 0.1361381
>
> #Global Return (incl. compound.): Geometric mean (%)
> tail(cumprod(1+mydatanam[,1:2])-1,1)
      SHANAM      REGNAM
2015-06-30 1.11584 1.204779
>
> # Global Return (excl. compound.): Arithmetic mean
> tail(cumsum(mydatanam[,1:2]),1)
      SHANAM      REGNAM
2015-06-30 0.82468 0.86973

```

```

> # Descriptive statistics including daily arithmetic and geometric mean returns
> table.Stats(mydatarok[,1:2],digits=6)
      SHAROK      REGROK
Observations  1561.000000 1561.000000
NAs           0.000000   0.000000
Minimum       -0.078710  -0.073590
Quartile 1    -0.007340  -0.006570
Median        0.000530   0.000020
Arithmetic Mean 0.000602   0.000499
Geometric Mean 0.000484   0.000397
Quartile 3     0.009440   0.008170
Maximum       0.067160   0.069800
SE Mean       0.000388   0.000361
LCL Mean (0.95) -0.000160  -0.000208
UCL Mean (0.95) 0.001364   0.001206
Variance      0.000236   0.000203
Stdev         0.015349   0.014249
Skewness      -0.236770  -0.325432
Kurtosis      2.199770   2.897378
>
> #Annualised Return: Geometric average (%)
> Return.annualized(mydatarok[,1:2])
      SHAROK      REGROK
Annualized Return 0.1296845 0.1052496
>
> #Global Return (incl. compound.): Geometric mean (%)
> tail(cumprod(1+mydatarok[,1:2])-1,1)
      SHAROK      REGROK
2015-07-01 1.128336 0.8587156
>
> # Global Return (excl. compound.): Arithmetic mean
> tail(cumsum(mydatarok[,1:2]),1)
      SHAROK      REGROK
2015-07-01 0.93973 0.77887

```

```

> # Descriptive statistics including daily arithmetic and geometric mean returns
> table.Stats(mydatauk[,1:2],digits=6)
      SHAUK      REGUK
Observations 1561.000000 1561.000000
NAs          0.000000   0.000000
Minimum      -0.062870  -0.061260
Quartile 1   -0.005900  -0.005590
Median       0.000560   0.000590
Arithmetic Mean 0.000439  0.000483
Geometric Mean 0.000364  0.000412
Quartile 3   0.006840   0.007070
Maximum      0.062060   0.072990
SE Mean      0.000309   0.000301
LCL Mean (0.95) -0.000167 -0.000107
UCL Mean (0.95) 0.001044  0.001073
Variance     0.000149   0.000141
Stdev        0.012195   0.011883
Skewness     -0.134924  -0.111620
Kurtosis     2.117704   2.629299
>
> #Annualised Return: Geometric average (%)
> Return.annualized(mydatauk[,1:2])
      SHAUK      REGUK
Annualized Return 0.09617674 0.1093712
>
> #Global Return (incl. compound.): Geometric mean (%)
> tail(cumprod(1+mydatauk[,1:2])-1,1)
      SHAUK      REGUK
2015-06-30 0.7661925 0.9020695
>
> # Global Return (excl. compound.): Arithmetic mean
> tail(cumsum(mydatauk[,1:2]),1)
      SHAUK      REGUK
2015-06-30 0.68504 0.7533

```

```

> # Descriptive statistics including daily arithmetic and geometric mean returns
> table.Stats(mydataus[,1:2],digits=6)
      SHAUS      REGUS
Observations 1561.000000 1561.000000
NAs          0.000000   0.000000
Minimum      -0.062000  -0.070270
Quartile 1   -0.003720  -0.003800
Median       0.000530   0.000670
Arithmetic Mean 0.000627  0.000662
Geometric Mean 0.000579  0.000610
Quartile 3   0.005600   0.005610
Maximum      0.045230   0.050780
SE Mean      0.000248   0.000257
LCL Mean (0.95) 0.000141  0.000158
UCL Mean (0.95) 0.001113  0.001167
Variance     0.000096   0.000103
Stdev        0.009789   0.010161
Skewness     -0.335263  -0.365892
Kurtosis     3.716095   4.353031
>
> #Annualised Return: Geometric average (%)
> Return.annualized(mydataus[,1:2])
      SHAUS      REGUS
Annualized Return 0.157101 0.166227
>
> #Global Return (incl. compound.): Geometric mean (%)
> tail(cumprod(1+mydataus[,1:2])-1,1)
      SHAUS      REGUS
2015-06-30 1.469163 1.592294
>
> # Global Return (excl. compound.): Arithmetic mean
> tail(cumsum(mydataus[,1:2]),1)
      SHAUS      REGUS
2015-06-30 0.97902 1.03354

```

## 6. T-test on comparison of means

500

### Comparing Means of the two indices [ t-test assuming equal variances (homoscedastic) ]

#### Descriptive Statistics

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02644880808753179 | 1508        | 0,00065 | 0,00009  |
| -0.02911718604712955 | 1508        | 0,00069 | 0,0001   |

#### Summary

|                    |         |                              |        |
|--------------------|---------|------------------------------|--------|
| Degrees Of Freedom | 3014    | Hypothesized Mean Difference | 0,E+0  |
| Test Statistics    | 0,12027 | Pooled Variance              | 0,0001 |

#### Two-tailed distribution

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,90428 | t Critical Value (5%) | 1,96075 |
|---------|---------|-----------------------|---------|

### Comparing Means of Islamic and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]

#### Descriptive Statistics

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02644880808753179 | 1508,00     | 0,00065 | 0,00009  |
| -0.02340805395754805 | 1508,00     | 0,00054 | 0,00008  |

#### Summary

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3006,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,32558 | Pooled Variance              | 0,00009 |

#### Two-tailed distribution

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,74476 | t Critical Value (5%) | 1,96075 |
|---------|---------|-----------------------|---------|

### Comparing Means of Regular and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]

#### Descriptive Statistics

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02911718604712955 | 1508,00     | 0,00069 | 0,0001   |
| -0.02340805395754805 | 1508,00     | 0,00054 | 0,00008  |

#### Summary

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 2991,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,44217 | Pooled Variance              | 0,00009 |

#### Two-tailed distribution

|         |        |                       |         |
|---------|--------|-----------------------|---------|
| p-level | 0,6584 | t Critical Value (5%) | 1,96076 |
|---------|--------|-----------------------|---------|

**Asia-Pacific****Comparing Means of the two indices [ t-test assuming equal variances (homoscedastic) ]***Descriptive Statistics*

| VAR                    | Sample size | Mean    | Variance |
|------------------------|-------------|---------|----------|
| -0.0004562737642585724 | 1560        | 0,00037 | 0,0001   |
| -0.002237831789643896  | 1560        | 0,00039 | 0,0001   |

*Summary*

|                    |         |                              |        |
|--------------------|---------|------------------------------|--------|
| Degrees Of Freedom | 3118    | Hypothesized Mean Difference | 0,E+0  |
| Test Statistics    | 0,05585 | Pooled Variance              | 0,0001 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,95547 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

**Comparing Means of Islamic and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                    | Sample size | Mean    | Variance |
|------------------------|-------------|---------|----------|
| -0.0004562737642585724 | 1560,00     | 0,00037 | 0,0001   |
| -0.02340805395754805   | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3066,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,44449 | Pooled Variance              | 0,00009 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,65672 | t Critical Value (5%) | 1,96074 |
|---------|---------|-----------------------|---------|

**Comparing Means of Regular and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                   | Sample size | Mean    | Variance |
|-----------------------|-------------|---------|----------|
| -0.002237831789643896 | 1560,00     | 0,00039 | 0,0001   |
| -0.02340805395754805  | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3082,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,3907  | Pooled Variance              | 0,00009 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,69605 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

**Belgium****Comparing Means of the two indices [ t-test assuming equal variances (homoscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.01459503905714672 | 1560        | 0,00036 | 0,0002   |
| -0.02344901894068272 | 1560        | 0,00063 | 0,00019  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3118    | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,55407 | Pooled Variance              | 0,00019 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,57957 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

**Comparing Means of Islamic and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.01459503905714672 | 1560,00     | 0,00036 | 0,0002   |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 2645,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,38008 | Pooled Variance              | 0,00014 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,70391 | t Critical Value (5%) | 1,96086 |
|---------|---------|-----------------------|---------|

**Comparing Means of Regular and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02344901894068272 | 1560,00     | 0,00063 | 0,00019  |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 2672,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,27861 | Pooled Variance              | 0,00013 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,78056 | t Critical Value (5%) | 1,96085 |
|---------|---------|-----------------------|---------|

**Brazil****Comparing Means of the two indices [ t-test assuming equal variances (homoscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02202472417182322 | 1560        | 0,00001 | 0,00028  |
| -0.01830821380010331 | 1560        | 0,00003 | 0,00029  |

*Summary*

|                    |        |                              |         |
|--------------------|--------|------------------------------|---------|
| Degrees Of Freedom | 3118   | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,0283 | Pooled Variance              | 0,00029 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,97742 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

**Comparing Means of Islamic and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02202472417182322 | 1560,00     | 0,00001 | 0,00028  |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 2369,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 1,04122 | Pooled Variance              | 0,00018 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,29788 | t Critical Value (5%) | 1,96097 |
|---------|---------|-----------------------|---------|

**Comparing Means of Regular and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.01830821380010331 | 1560,00     | 0,00003 | 0,00029  |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 2355,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,9977  | Pooled Variance              | 0,00018 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,31853 | t Critical Value (5%) | 1,96097 |
|---------|---------|-----------------------|---------|

**China****Comparing Means of the two indices [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                   | Sample size | Mean    | Variance |
|-----------------------|-------------|---------|----------|
| -0.01051350350156109  | 1560,00     | 0,00051 | 0,00014  |
| -0.003170165006104071 | 1560,00     | 0,00042 | 0,00016  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3104,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,20524 | Pooled Variance              | 0,00015 |

*Two-tailed distribution*

|         |        |                       |         |
|---------|--------|-----------------------|---------|
| p-level | 0,8374 | t Critical Value (5%) | 1,96073 |
|---------|--------|-----------------------|---------|

**Comparing Means of Islamic and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.01051350350156109 | 1560,00     | 0,00051 | 0,00014  |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 2904,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,02339 | Pooled Variance              | 0,00011 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,98134 | t Critical Value (5%) | 1,96078 |
|---------|---------|-----------------------|---------|

**Comparing Means of Regular and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                   | Sample size | Mean    | Variance |
|-----------------------|-------------|---------|----------|
| -0.003170165006104071 | 1560,00     | 0,00042 | 0,00016  |
| -0.02340805395754805  | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 2809,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,25175 | Pooled Variance              | 0,00012 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,80125 | t Critical Value (5%) | 1,96081 |
|---------|---------|-----------------------|---------|

## Europe

**Comparing Means of the two indices [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.03175678367932422 | 1539,00     | 0,00038 | 0,00014  |
| -0.03689058593753533 | 1539,00     | 0,00034 | 0,00017  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3039,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,10012 | Pooled Variance              | 0,00016 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,92025 | t Critical Value (5%) | 1,96074 |
|---------|---------|-----------------------|---------|

**Comparing Means of Islamic and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.03175678367932422 | 1539,00     | 0,00038 | 0,00014  |
| -0.02340805395754805 | 1539,00     | 0,00053 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 2873,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,37477 | Pooled Variance              | 0,00011 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,70786 | t Critical Value (5%) | 1,96079 |
|---------|---------|-----------------------|---------|

**Comparing Means of Regular and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.03689058593753533 | 1539,00     | 0,00034 | 0,00017  |
| -0.02340805395754805 | 1539,00     | 0,00053 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 2713,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,45939 | Pooled Variance              | 0,00013 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,64599 | t Critical Value (5%) | 1,96084 |
|---------|---------|-----------------------|---------|

**Emerging****Comparing Means of the two indices [ t-test assuming equal variances (homoscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.01083032490974724 | 1560        | 0,00024 | 0,00009  |
| -0.00888621131109254 | 1560        | 0,00032 | 0,00009  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3118    | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,23157 | Pooled Variance              | 0,00009 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,81689 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

**Comparing Means of Islamic and Benchmark[ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.01083032490974724 | 1560,00     | 0,00024 | 0,00009  |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3111,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,84093 | Pooled Variance              | 0,00008 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,40045 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

**Comparing Means of Regular and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.00888621131109254 | 1560,00     | 0,00032 | 0,00009  |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3094,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,58594 | Pooled Variance              | 0,00009 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,55796 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

## France

**Comparing Means of the two indices [ t-test assuming unequal variances (heteroscedastic) ]**

## Descriptive Statistics

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.03595106075216966 | 1560,00     | 0,00048 | 0,0002   |
| -0.03620738599705806 | 1560,00     | 0,00046 | 0,00024  |

## Summary

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3089,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,04465 | Pooled Variance              | 0,00022 |

## Two-tailed distribution

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,96439 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

**Comparing Means of Islamic and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]**

## Descriptive Statistics

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.03595106075216966 | 1560,00     | 0,00048 | 0,0002   |
| -0.03620738599705806 | 1560,00     | 0,00046 | 0,00024  |

## Summary

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3089,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,04465 | Pooled Variance              | 0,00022 |

## Two-tailed distribution

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,96439 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

**Comparing Means of Regular and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]**

## Descriptive Statistics

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.03620738599705806 | 1560,00     | 0,00046 | 0,00024  |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

## Summary

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 2476,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,13138 | Pooled Variance              | 0,00016 |

## Two-tailed distribution

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,89549 | t Critical Value (5%) | 1,96092 |
|---------|---------|-----------------------|---------|

**Germany****Comparing Means of the two indices [ t-test assuming equal variances (homoscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.04026418959488576 | 1560        | 0,00056 | 0,00022  |
| -0.04286339867597431 | 1560        | 0,00054 | 0,00023  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3118    | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,03231 | Pooled Variance              | 0,00023 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,97423 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

**Comparing Means of Islamic and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.04026418959488576 | 1560,00     | 0,00056 | 0,00022  |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 2556,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,09305 | Pooled Variance              | 0,00015 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,92587 | t Critical Value (5%) | 1,96089 |
|---------|---------|-----------------------|---------|

**Comparing Means of Regular and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.04286339867597431 | 1560,00     | 0,00054 | 0,00023  |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 2509,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,05209 | Pooled Variance              | 0,00016 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,95846 | t Critical Value (5%) | 1,96091 |
|---------|---------|-----------------------|---------|

**Japan****Comparing Means of the two indices [ t-test assuming equal variances (homoscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| 0.003992453823542259 | 1560        | 0,00039 | 0,00012  |
| 0.003020318506315196 | 1560        | 0,00036 | 0,00013  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3118    | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,07151 | Pooled Variance              | 0,00013 |

*Two-tailed distribution*

|         |       |                       |         |
|---------|-------|-----------------------|---------|
| p-level | 0,943 | t Critical Value (5%) | 1,96073 |
|---------|-------|-----------------------|---------|

**Comparing Means of Islamic and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| 0.003992453823542259 | 1560,00     | 0,00039 | 0,00012  |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |        |
|--------------------|---------|------------------------------|--------|
| Degrees Of Freedom | 2973,00 | Hypothesized Mean Difference | 0,E+0  |
| Test Statistics    | 0,35631 | Pooled Variance              | 0,0001 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,72163 | t Critical Value (5%) | 1,96076 |
|---------|---------|-----------------------|---------|

**Comparing Means of Regular and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| 0.003020318506315196 | 1560,00     | 0,00036 | 0,00013  |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 2920,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,42591 | Pooled Variance              | 0,00011 |

*Two-tailed distribution*

|         |        |                       |         |
|---------|--------|-----------------------|---------|
| p-level | 0,6702 | t Critical Value (5%) | 1,96078 |
|---------|--------|-----------------------|---------|

**Developed Large Cap****Comparing Means of the two indices [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02357516101591945 | 1560,00     | 0,00053 | 0,00007  |
| -0.02513245033112575 | 1560,00     | 0,00054 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3112,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,03152 | Pooled Variance              | 0,00008 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,97486 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

**Comparing Means of Islamic and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02357516101591945 | 1560,00     | 0,00053 | 0,00007  |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3116,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,0503  | Pooled Variance              | 0,00008 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,95988 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

**Comparing Means of Regular and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02513245033112575 | 1560,00     | 0,00054 | 0,00008  |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3117,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,08031 | Pooled Variance              | 0,00008 |

*Two-tailed distribution*

|         |       |                       |         |
|---------|-------|-----------------------|---------|
| p-level | 0,936 | t Critical Value (5%) | 1,96073 |
|---------|-------|-----------------------|---------|

**Developed Small Cap****Comparing Means of the two indices [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02272378320282507 | 1560,00     | 0,00065 | 0,00011  |
| -0.02513245033112575 | 1560,00     | 0,00054 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3068,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,31837 | Pooled Variance              | 0,00009 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,75023 | t Critical Value (5%) | 1,96074 |
|---------|---------|-----------------------|---------|

**Comparing Means of Islamic and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02272378320282507 | 1560,00     | 0,00065 | 0,00011  |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3054,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,39575 | Pooled Variance              | 0,00009 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,69232 | t Critical Value (5%) | 1,96074 |
|---------|---------|-----------------------|---------|

**Comparing Means of Regular and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02513245033112575 | 1560,00     | 0,00054 | 0,00008  |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3117,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,08031 | Pooled Variance              | 0,00008 |

*Two-tailed distribution*

|         |       |                       |         |
|---------|-------|-----------------------|---------|
| p-level | 0,936 | t Critical Value (5%) | 1,96073 |
|---------|-------|-----------------------|---------|

**North America****Comparing Means of the two indices [ t-test assuming equal variances (homoscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02685330667047578 | 1560        | 0,00055 | 0,0001   |
| -0.02921195652173923 | 1560        | 0,00058 | 0,0001   |

*Summary*

|                    |         |                              |        |
|--------------------|---------|------------------------------|--------|
| Degrees Of Freedom | 3118    | Hypothesized Mean Difference | 0,E+0  |
| Test Statistics    | 0,08545 | Pooled Variance              | 0,0001 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,93191 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

**Comparing Means of Islamic and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02685330667047578 | 1560,00     | 0,00055 | 0,0001   |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3090,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,09162 | Pooled Variance              | 0,00009 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,92701 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

**Comparing Means of Regular and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02921195652173923 | 1560,00     | 0,00058 | 0,0001   |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3075,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,17968 | Pooled Variance              | 0,00009 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,85742 | t Critical Value (5%) | 1,96074 |
|---------|---------|-----------------------|---------|

## South Korea

### Comparing Means of the two indices [ t-test assuming unequal variances (heteroscedastic) ]

#### Descriptive Statistics

| VAR                   | Sample size | Mean   | Variance |
|-----------------------|-------------|--------|----------|
| -0.001070063694267556 | 1560,00     | 0,0006 | 0,00024  |
| -0.001283298782981439 | 1560,00     | 0,0005 | 0,0002   |

#### Summary

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3101,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,19397 | Pooled Variance              | 0,00022 |

#### Two-tailed distribution

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,84621 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

### Comparing Means of Islamic and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]

#### Descriptive Statistics

| VAR                   | Sample size | Mean    | Variance |
|-----------------------|-------------|---------|----------|
| -0.001070063694267556 | 1560,00     | 0,0006  | 0,00024  |
| -0.02340805395754805  | 1560,00     | 0,00052 | 0,00008  |

#### Summary

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 2500,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,18713 | Pooled Variance              | 0,00016 |

#### Two-tailed distribution

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,85157 | t Critical Value (5%) | 1,96091 |
|---------|---------|-----------------------|---------|

### Comparing Means of Regular and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]

#### Descriptive Statistics

| VAR                   | Sample size | Mean    | Variance |
|-----------------------|-------------|---------|----------|
| -0.001283298782981439 | 1560,00     | 0,0005  | 0,0002   |
| -0.02340805395754805  | 1560,00     | 0,00052 | 0,00008  |

#### Summary

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 2614,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,04423 | Pooled Variance              | 0,00014 |

#### Two-tailed distribution

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,96473 | t Critical Value (5%) | 1,96087 |
|---------|---------|-----------------------|---------|

**United Kingdom****Comparing Means of the two indices [ t-test assuming equal variances (homoscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.0324792493684589  | 1560        | 0,00046 | 0,00015  |
| -0.03005263802178967 | 1560        | 0,0005  | 0,00014  |

*Summary*

|                    |        |                              |         |
|--------------------|--------|------------------------------|---------|
| Degrees Of Freedom | 3118   | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,0985 | Pooled Variance              | 0,00014 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,92154 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

**Comparing Means of Islamic and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.0324792493684589  | 1560,00     | 0,00046 | 0,00015  |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 2855,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,14526 | Pooled Variance              | 0,00011 |

*Two-tailed distribution*

|         |         |                       |        |
|---------|---------|-----------------------|--------|
| p-level | 0,88452 | t Critical Value (5%) | 1,9608 |
|---------|---------|-----------------------|--------|

**Comparing Means of Regular and Benchmark[ t-test assuming unequal variances (heteroscedastic) ]***Descriptive Statistics*

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.03005263802178967 | 1560,00     | 0,0005  | 0,00014  |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

*Summary*

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 2891,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,03477 | Pooled Variance              | 0,00011 |

*Two-tailed distribution*

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,97226 | t Critical Value (5%) | 1,96078 |
|---------|---------|-----------------------|---------|

## United States

### Comparing Means of the two indices [ t-test assuming equal variances (homoscedastic) ]

#### Descriptive Statistics

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02709000873871253 | 1560        | 0,00064 | 0,0001   |
| -0.02983378781976366 | 1560        | 0,00068 | 0,0001   |

#### Summary

|                    |         |                              |        |
|--------------------|---------|------------------------------|--------|
| Degrees Of Freedom | 3118    | Hypothesized Mean Difference | 0,E+0  |
| Test Statistics    | 0,10286 | Pooled Variance              | 0,0001 |

#### Two-tailed distribution

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,91808 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

### Comparing Means of Islamic and Benchmark [ t-test assuming unequal variances (heteroscedastic) ]

#### Descriptive Statistics

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02709000873871253 | 1560,00     | 0,00064 | 0,0001   |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

#### Summary

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3091,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,38772 | Pooled Variance              | 0,00009 |

#### Two-tailed distribution

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,69825 | t Critical Value (5%) | 1,96073 |
|---------|---------|-----------------------|---------|

### Comparing Means of Regular and Benchmark[ t-test assuming unequal variances (heteroscedastic) ]

#### Descriptive Statistics

| VAR                  | Sample size | Mean    | Variance |
|----------------------|-------------|---------|----------|
| -0.02983378781976366 | 1560,00     | 0,00068 | 0,0001   |
| -0.02340805395754805 | 1560,00     | 0,00052 | 0,00008  |

#### Summary

|                    |         |                              |         |
|--------------------|---------|------------------------------|---------|
| Degrees Of Freedom | 3066,00 | Hypothesized Mean Difference | 0,E+0   |
| Test Statistics    | 0,48719 | Pooled Variance              | 0,00009 |

#### Two-tailed distribution

|         |         |                       |         |
|---------|---------|-----------------------|---------|
| p-level | 0,62616 | t Critical Value (5%) | 1,96074 |
|---------|---------|-----------------------|---------|

## 7. StDev and Variability (Excel)

|                               | SHA500 | REG500 | BENCH  | SHAASPAC | REGASPAC | BENCH  | SHABEL | REGBEL | BENCH  | SHABRA  | REGBRA  | BENCH  |
|-------------------------------|--------|--------|--------|----------|----------|--------|--------|--------|--------|---------|---------|--------|
| Standard Deviation            | 0,010  | 0,010  | 0,009  | 0,010    | 0,010    | 0,009  | 0,014  | 0,014  | 0,009  | 0,017   | 0,017   | 0,009  |
| Volatility (%)                | 15,22% | 15,82% | 14,47% | 16,09%   | 15,73%   | 14,15% | 22,18% | 21,81% | 14,15% | 26,67%  | 26,94%  | 14,15% |
| M-squared                     | 15,06% | 15,50% | 12,85% | 7,27%    | 7,96%    | 12,40% | 4,20%  | 9,18%  | 12,40% | -1,83%  | -1,60%  | 12,29% |
| Excess M-squared (simple)     | 2,21%  | 2,65%  | 0,00%  | -5,12%   | -4,44%   | 0,00%  | -8,19% | -3,21% | 0,00%  | -14,13% | -13,89% | 0,00%  |
| Excess M-squared (compounded) | 1,96%  | 2,35%  | 0,00%  | -4,56%   | -3,95%   | 0,00%  | -7,29% | -2,86% | 0,00%  | -12,58% | -12,37% | 0,00%  |

|                               | SHACHI | REGCHI | BENCH  | SHAEME | REGEME | BENCH  | SHAEUR | REGEUR | BENCH  | SHAFRA | REGFRA | BENCH  |
|-------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Standard Deviation            | 0,012  | 0,013  | 0,009  | 0,009  | 0,010  | 0,009  | 0,012  | 0,013  | 0,009  | 0,014  | 0,016  | 0,009  |
| Volatility (%)                | 18,65% | 19,92% | 14,15% | 14,80% | 15,42% | 14,15% | 18,75% | 20,95% | 14,27% | 22,50% | 24,79% | 14,15% |
| M-squared                     | 8,78%  | 6,36%  | 12,40% | 4,70%  | 6,38%  | 12,29% | 5,87%  | 4,05%  | 12,58% | 5,91%  | 4,66%  | 12,29% |
| Excess M-squared (simple)     | -3,62% | -6,03% | 0,00%  | -7,60% | -5,91% | 0,00%  | -6,71% | -8,53% | 0,00%  | -6,38% | -7,64% | 0,00%  |
| Excess M-squared (compounded) | -3,22% | -5,37% | 0,00%  | -6,76% | -5,26% | 0,00%  | -5,96% | -7,58% | 0,00%  | -5,68% | -6,80% | 0,00%  |

|                               | SHAGER | REGGER | BENCH  | SHAJAP | REGJAP | BENCH  | SHADVL | REGDVL | BENCH  | SHADVS | REGDVS | BENCH  |
|-------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Standard Deviation            | 0,015  | 0,015  | 0,009  | 0,011  | 0,012  | 0,009  | 0,009  | 0,009  | 0,009  | 0,010  | 0,009  | 0,009  |
| Volatility (%)                | 23,54% | 24,27% | 14,15% | 17,67% | 18,42% | 14,15% | 13,78% | 14,40% | 14,15% | 16,36% | 14,40% | 14,15% |
| M-squared                     | 6,72%  | 6,10%  | 12,29% | 6,89%  | 5,87%  | 12,29% | 13,14% | 12,72% | 12,29% | 13,69% | 12,72% | 12,29% |
| Excess M-squared (simple)     | -5,57% | -6,19% | 0,00%  | -5,41% | -6,42% | 0,00%  | 0,85%  | 0,43%  | 0,00%  | 1,40%  | 0,43%  | 0,00%  |
| Excess M-squared (compounded) | -4,96% | -5,52% | 0,00%  | -4,82% | -5,72% | 0,00%  | 0,75%  | 0,38%  | 0,00%  | 1,25%  | 0,38%  | 0,00%  |

|                               | SHANAM | REGNAM | BENCH  | SHAROK | REGROK | BENCH  | SHAUK  | REGUK  | BENCH  | SHAUS  | REGUS  | BENCH  |
|-------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Standard Deviation            | 0,010  | 0,010  | 0,009  | 0,015  | 0,014  | 0,009  | 0,012  | 0,012  | 0,009  | 0,010  | 0,010  | 0,009  |
| Volatility (%)                | 15,56% | 15,95% | 14,15% | 24,37% | 22,62% | 14,15% | 19,36% | 18,86% | 14,15% | 15,54% | 16,13% | 14,15% |
| M-squared                     | 11,70% | 12,08% | 12,29% | 7,55%  | 6,60%  | 12,40% | 7,04%  | 8,21%  | 12,29% | 14,31% | 14,58% | 12,29% |
| Excess M-squared (simple)     | -0,59% | -0,21% | 0,00%  | -4,85% | -5,79% | 0,00%  | -5,26% | -4,08% | 0,00%  | 2,01%  | 2,29%  | 0,00%  |
| Excess M-squared (compounded) | -0,53% | -0,19% | 0,00%  | -4,31% | -5,16% | 0,00%  | -4,68% | -3,63% | 0,00%  | 1,79%  | 2,04%  | 0,00%  |

## 8. StDev and Variability (R)

```
> # Standard deviation and Volatility
> table.Variability(mydata500[,1:3])
              SHA500 REG500 BENCH
Mean Absolute deviation 0.0068 0.0070 0.0065
Monthly Std Dev         0.0096 0.0100 0.0091
Annualized Std Dev      0.1523 0.1582 0.1447
>
> # Msquared Measure
> MSquared(mydata500[,1:2], mydata500[,3],Rf = 0.04/252)
              SHA500 REG500
MSquared (Risk free = 0.000158730158730159) 0.1497021 0.1537936
```

```
> # Standard deviation and Volatility
> table.Variability(mydataaspac[,1:3])
              SHAASPAC REGASPAC BENCH
Mean Absolute deviation 0.0076 0.0075 0.0063
Monthly Std Dev         0.0101 0.0099 0.0089
Annualized Std Dev      0.1609 0.1573 0.1415
>
> # Msquared Measure
> MSquared(mydataaspac[,1:2], mydataaspac[,3],Rf = 0.04/252)
              SHAASPAC REGASPAC
MSquared (Risk free = 0.000158730158730159) 0.07273108 0.07954863
```

```
> # Standard deviation and Volatility
> table.Variability(mydatabel[,1:3])
              SHABEL REGBEL BENCH
Mean Absolute deviation 0.0102 0.0100 0.0063
Monthly Std Dev         0.0140 0.0137 0.0089
Annualized Std Dev      0.2218 0.2181 0.1415
>
> # Msquared Measure
> MSquared(mydatabel[,1:2], mydatabel[,3],Rf = 0.04/252)
              SHABEL REGBEL
MSquared (Risk free = 0.000158730158730159) 0.04193729 0.09174364
```

```
> # Standard deviation and Volatility
> table.Variability(mydatabra[,1:3])
              SHABRA REGBRA BENCH
Mean Absolute deviation 0.0124 0.0125 0.0063
Monthly Std Dev         0.0168 0.0170 0.0089
Annualized Std Dev      0.2667 0.2694 0.1415
>
> # Msquared Measure
> MSquared(mydatabra[,1:2], mydatabra[,3],Rf = 0.04/252)
              SHABRA REGBRA
MSquared (Risk free = 0.000158730158730159) -0.0184687 -0.0161519
```

```
> # Standard deviation and Volatility
> table.Variability(mydatachi[,1:3])
              SHACHI REGCHI BENCH
Mean Absolute deviation 0.0087 0.0091 0.0063
Monthly Std Dev         0.0117 0.0125 0.0089
Annualized Std Dev      0.1865 0.1992 0.1415
>
> # Msquared Measure
> MSquared(mydatachi[,1:2], mydatachi[,3],Rf = 0.04/252)
              SHACHI REGCHI
MSquared (Risk free = 0.000158730158730159) 0.08771799 0.06355389
```

```
> # Standard deviation and Volatility
> table.Variability(mydataeme[,1:3])
              SHAEME REGEME BENCH
Mean Absolute deviation 0.0068 0.0071 0.0063
Monthly Std Dev         0.0093 0.0097 0.0089
Annualized Std Dev      0.1480 0.1542 0.1415
>
> # Msquared Measure
> MSquared(mydataeme[,1:2], mydataeme[,3],Rf = 0.04/252)
              SHAEME REGEME
MSquared (Risk free = 0.000158730158730159) 0.04696772 0.06381984
```

```
> # Standard deviation and Volatility
```

```
> table.Variability(mydataeur[,1:3])
```

|                         | SHAEUR | REGEUR | BENCH  |
|-------------------------|--------|--------|--------|
| Mean Absolute deviation | 0.0086 | 0.0095 | 0.0064 |
| Monthly Std Dev         | 0.0118 | 0.0132 | 0.0090 |
| Annualized Std Dev      | 0.1875 | 0.2096 | 0.1428 |

```
>
```

```
> # Msquared Measure
```

```
> MSquared(mydataeur[,1:2], mydataeur[,3],Rf = 0.04/252)
```

|                                             | SHAEUR     | REGEUR     |
|---------------------------------------------|------------|------------|
| MSquared (Risk free = 0.000158730158730159) | 0.05724237 | 0.03932174 |

```
> # Standard deviation and Volatility
```

```
> table.Variability(mydatager[,1:3])
```

|                         | SHAGER | REGGER | BENCH  |
|-------------------------|--------|--------|--------|
| Mean Absolute deviation | 0.0109 | 0.0110 | 0.0063 |
| Monthly Std Dev         | 0.0148 | 0.0153 | 0.0089 |
| Annualized Std Dev      | 0.2354 | 0.2427 | 0.1415 |

```
>
```

```
> # Msquared Measure
```

```
> MSquared(mydatager[,1:2], mydatager[,3],Rf = 0.04/252)
```

|                                             | SHAGER     | REGGER     |
|---------------------------------------------|------------|------------|
| MSquared (Risk free = 0.000158730158730159) | 0.06712269 | 0.06089494 |

```
> # Standard deviation and Volatility
```

```
> table.Variability(mydatafra[,1:3])
```

|                         | SHAFRA | REGFRA | BENCH  |
|-------------------------|--------|--------|--------|
| Mean Absolute deviation | 0.0104 | 0.0112 | 0.0063 |
| Monthly Std Dev         | 0.0142 | 0.0156 | 0.0089 |
| Annualized Std Dev      | 0.2250 | 0.2479 | 0.1415 |

```
>
```

```
> # Msquared Measure
```

```
> MSquared(mydatafra[,1:2], mydatafra[,3],Rf = 0.04/252)
```

|                                             | SHAFRA     | REGFRA    |
|---------------------------------------------|------------|-----------|
| MSquared (Risk free = 0.000158730158730159) | 0.05902163 | 0.0464614 |

```
> # Standard deviation and Volatility
```

```
> table.Variability(mydatajap[,1:3])
```

|                         | SHAJAP | REGJAP | BENCH  |
|-------------------------|--------|--------|--------|
| Mean Absolute deviation | 0.0084 | 0.0087 | 0.0063 |
| Monthly Std Dev         | 0.0111 | 0.0116 | 0.0089 |
| Annualized Std Dev      | 0.1767 | 0.1842 | 0.1415 |

```
>
```

```
> # Msquared Measure
```

```
> MSquared(mydatajap[,1:2], mydatajap[,3],Rf = 0.04/252)
```

|                                             | SHAJAP     | REGJAP     |
|---------------------------------------------|------------|------------|
| MSquared (Risk free = 0.000158730158730159) | 0.06880038 | 0.05867042 |

```
> # Standard deviation and Volatility
> table.Variability(mydatadvl[,1:3])
              SHADVL REGDVL  BENCH
Mean Absolute deviation 0.0061 0.0064 0.0063
Monthly Std Dev         0.0087 0.0091 0.0089
Annualized Std Dev      0.1378 0.1440 0.1415
>
> # Msquared Measure
> MSquared(mydatadvl[,1:2], mydatadvl[,3],Rf = 0.04/252)
              SHADVL  REGDVL
MSquared (Risk free = 0.000158730158730159) 0.1314032 0.1272055
```

```
> # Standard deviation and Volatility
> table.Variability(mydatanam[,1:3])
              SHANAM REGNAM  BENCH
Mean Absolute deviation 0.0068 0.0070 0.0063
Monthly Std Dev         0.0098 0.0100 0.0089
Annualized Std Dev      0.1556 0.1595 0.1415
>
> # Msquared Measure
> MSquared(mydatanam[,1:2], mydatanam[,3],Rf = 0.04/252)
              SHANAM  REGNAM
MSquared (Risk free = 0.000158730158730159) 0.1169707 0.1207748
```

```
> # Standard deviation and Volatility
> table.Variability(mydatauk[,1:3])
              SHAUK  REGUK  BENCH
Mean Absolute deviation 0.0089 0.0086 0.0063
Monthly Std Dev         0.0122 0.0119 0.0089
Annualized Std Dev      0.1936 0.1886 0.1415
>
> # Msquared Measure
> MSquared(mydatauk[,1:2], mydatauk[,3],Rf = 0.04/252)
              SHAUK  REGUK
MSquared (Risk free = 0.000158730158730159) 0.07032423 0.08205921
```

```
> # Standard deviation and Volatility
> table.Variability(mydatadvs[,1:3])
              SHADVS REGDVS  BENCH
Mean Absolute deviation 0.0073 0.0064 0.0063
Monthly Std Dev         0.0103 0.0091 0.0089
Annualized Std Dev      0.1636 0.1440 0.1415
>
> # Msquared Measure
> MSquared(mydatadvs[,1:2], mydatadvs[,3],Rf = 0.04/252)
              SHADVS  REGDVS
MSquared (Risk free = 0.000158730158730159) 0.1369013 0.1272055
```

```
> # Standard deviation and Volatility
> table.Variability(mydatarok[,1:3])
              SHAROK REGROK  BENCH
Mean Absolute deviation 0.0112 0.0102 0.0063
Monthly Std Dev         0.0153 0.0142 0.0089
Annualized Std Dev      0.2437 0.2262 0.1415
>
> # Msquared Measure
> MSquared(mydatarok[,1:2], mydatarok[,3],Rf = 0.04/252)
              SHAROK  REGROK
MSquared (Risk free = 0.000158730158730159) 0.07538516 0.06590777
```

```
> # Standard deviation and Volatility
> table.Variability(mydataus[,1:3])
              SHAUS  REGUS  BENCH
Mean Absolute deviation 0.0068 0.0070 0.0063
Monthly Std Dev         0.0098 0.0102 0.0089
Annualized Std Dev      0.1554 0.1613 0.1415
>
> # Msquared Measure
> MSquared(mydataus[,1:2], mydataus[,3],Rf = 0.04/252)
              SHAUS  REGUS
MSquared (Risk free = 0.000158730158730159) 0.1430324 0.1458029
```

## 9. F-test of equality of variances

500

### F-Test Two-Sample for Variances of the two indices

#### Descriptive Statistics

| VAR                 | -0.02644880808753179 | -0.02911718604712955 |
|---------------------|----------------------|----------------------|
| Sample size         | 1508,00              | 1508,00              |
| Mean                | 0,00065              | 0,00069              |
| Variance            | 0,00009              | 0,0001               |
| Standard Deviation  | 0,00957              | 0,00994              |
| Mean Standard Error | 0,00025              | 0,00026              |

#### Summary

|                         |          |                              |         |
|-------------------------|----------|------------------------------|---------|
| <i>F</i>                | 1,0791   | <i>F Critical value (5%)</i> | 1,08847 |
| <i>p-level 1-tailed</i> | 0,06981  | <i>p-level 2-tailed</i>      | 0,13961 |
| <i>H0 (5%)?</i>         | accepted |                              |         |

### Asia-Pacific

### F-Test Two-Sample for Variances of the two indices

#### Descriptive Statistics

| VAR                 | -0.002237831789643896 | -0.0004562737642585724 |
|---------------------|-----------------------|------------------------|
| Sample size         | 1560,00               | 1560,00                |
| Mean                | 0,00039               | 0,00037                |
| Variance            | 0,0001                | 0,0001                 |
| Standard Deviation  | 0,00991               | 0,01014                |
| Mean Standard Error | 0,00025               | 0,00026                |

#### Summary

|                         |          |                              |         |
|-------------------------|----------|------------------------------|---------|
| <i>F</i>                | 1,04624  | <i>F Critical value (5%)</i> | 1,08691 |
| <i>p-level 1-tailed</i> | 0,18615  | <i>p-level 2-tailed</i>      | 0,37231 |
| <i>H0 (5%)?</i>         | accepted |                              |         |

### Belgium

### F-Test Two-Sample for Variances of the two indices

#### Descriptive Statistics

| VAR                 | -0.02344901894068272 | -0.01459503905714672 |
|---------------------|----------------------|----------------------|
| Sample size         | 1560,00              | 1560,00              |
| Mean                | 0,00063              | 0,00036              |
| Variance            | 0,00019              | 0,0002               |
| Standard Deviation  | 0,01373              | 0,01397              |
| Mean Standard Error | 0,00035              | 0,00035              |

*Summary*

|                         |          |                              |         |
|-------------------------|----------|------------------------------|---------|
| <i>F</i>                | 1,03562  | <i>F Critical value (5%)</i> | 1,08691 |
| <i>p-level 1-tailed</i> | 0,2448   | <i>p-level 2-tailed</i>      | 0,48961 |
| <i>H0 (5%)?</i>         | accepted |                              |         |

**Brazil****F-Test Two-Sample for Variances***Descriptive Statistics*

| VAR                        | -0.02202472417182322 | -0.01830821380010331 |
|----------------------------|----------------------|----------------------|
| <i>Sample size</i>         | 1560,00              | 1560,00              |
| <i>Mean</i>                | 0,00001              | 0,00003              |
| <i>Variance</i>            | 0,00028              | 0,00029              |
| <i>Standard Deviation</i>  | 0,0168               | 0,01697              |
| <i>Mean Standard Error</i> | 0,00043              | 0,00043              |

*Summary*

|                         |          |                              |         |
|-------------------------|----------|------------------------------|---------|
| <i>F</i>                | 1,02053  | <i>F Critical value (5%)</i> | 1,08691 |
| <i>p-level 1-tailed</i> | 0,34416  | <i>p-level 2-tailed</i>      | 0,68833 |
| <i>H0 (5%)?</i>         | accepted |                              |         |

**China****F-Test Two-Sample for Variances***Descriptive Statistics*

| VAR                        | -0.01051350350156109 | -0.003170165006104071 |
|----------------------------|----------------------|-----------------------|
| <i>Sample size</i>         | 1560,00              | 1560,00               |
| <i>Mean</i>                | 0,00051              | 0,00042               |
| <i>Variance</i>            | 0,00014              | 0,00016               |
| <i>Standard Deviation</i>  | 0,01175              | 0,01255               |
| <i>Mean Standard Error</i> | 0,0003               | 0,00032               |

*Summary*

|                         |          |                              |         |
|-------------------------|----------|------------------------------|---------|
| <i>F</i>                | 1,14182  | <i>F Critical value (5%)</i> | 1,08691 |
| <i>p-level 1-tailed</i> | 0,00444  | <i>p-level 2-tailed</i>      | 0,00887 |
| <i>H0 (5%)?</i>         | rejected |                              |         |

**Emerging****F-Test Two-Sample for Variances***Descriptive Statistics*

| VAR                | -0.01083032490974724 | -0.00888621131109254 |
|--------------------|----------------------|----------------------|
| <i>Sample size</i> | 1560,00              | 1560,00              |
| <i>Mean</i>        | 0,00024              | 0,00032              |
| <i>Variance</i>    | 0,00009              | 0,00009              |

|                     |         |         |
|---------------------|---------|---------|
| Standard Deviation  | 0,00932 | 0,00971 |
| Mean Standard Error | 0,00024 | 0,00025 |

#### Summary

|                         |          |                              |         |
|-------------------------|----------|------------------------------|---------|
| <i>F</i>                | 1,08575  | <i>F Critical value (5%)</i> | 1,08691 |
| <i>p-level 1-tailed</i> | 0,05222  | <i>p-level 2-tailed</i>      | 0,10445 |
| <i>H0 (5%)?</i>         | accepted |                              |         |

### Europe

#### F-Test Two-Sample for Variances

##### Descriptive Statistics

| VAR                 | -0.03175678367932422 | -0.03689058593753533 |
|---------------------|----------------------|----------------------|
| Sample size         | 1539,00              | 1539,00              |
| Mean                | 0,00038              | 0,00034              |
| Variance            | 0,00014              | 0,00017              |
| Standard Deviation  | 0,01179              | 0,01317              |
| Mean Standard Error | 0,0003               | 0,00034              |

#### Summary

|                         |          |                              |             |
|-------------------------|----------|------------------------------|-------------|
| <i>F</i>                | 1,24867  | <i>F Critical value (5%)</i> | 1,0875<br>3 |
| <i>p-level 1-tailed</i> | 0,00001  | <i>p-level 2-tailed</i>      | 0,0000<br>1 |
| <i>H0 (5%)?</i>         | rejected |                              |             |

### France

#### F-Test Two-Sample for Variances

##### Descriptive Statistics

| VAR                 | -0.03595106075216966 | -0.03620738599705806 |
|---------------------|----------------------|----------------------|
| Sample size         | 1560,00              | 1560,00              |
| Mean                | 0,00048              | 0,00046              |
| Variance            | 0,0002               | 0,00024              |
| Standard Deviation  | 0,01415              | 0,0156               |
| Mean Standard Error | 0,00036              | 0,00039              |

#### Summary

|                         |          |                              |         |
|-------------------------|----------|------------------------------|---------|
| <i>F</i>                | 1,21543  | <i>F Critical value (5%)</i> | 1,08691 |
| <i>p-level 1-tailed</i> | 0,00006  | <i>p-level 2-tailed</i>      | 0,00012 |
| <i>H0 (5%)?</i>         | rejected |                              |         |

### Germany

#### F-Test Two-Sample for Variances

##### Descriptive Statistics

| VAR                 | -0.04026418959488576 | -0.04286339867597431          |
|---------------------|----------------------|-------------------------------|
| Sample size         | 1560,00              | 1560,00                       |
| Mean                | 0,00056              | 0,00054                       |
| Variance            | 0,00022              | 0,00023                       |
| Standard Deviation  | 0,0148               | 0,01525                       |
| Mean Standard Error | 0,00037              | 0,00039                       |
| <i>Summary</i>      |                      |                               |
| F                   | 1,06295              | F Critical value (5%) 1,08691 |
| p-level 1-tailed    | 0,11411              | p-level 2-tailed 0,22823      |
| H0 (5%)?            | accepted             |                               |

### Japan

#### F-Test Two-Sample for Variances

##### Descriptive Statistics

| VAR                 | 0.003992453823542259 | 0.003020318506315196 |
|---------------------|----------------------|----------------------|
| Sample size         | 1560,00              | 1560,00              |
| Mean                | 0,00039              | 0,00036              |
| Variance            | 0,00012              | 0,00013              |
| Standard Deviation  | 0,01113              | 0,01161              |
| Mean Standard Error | 0,00028              | 0,00029              |

##### Summary

|                  |          |                               |
|------------------|----------|-------------------------------|
| F                | 1,08649  | F Critical value (5%) 1,08691 |
| p-level 1-tailed | 0,0508   | p-level 2-tailed 0,1016       |
| H0 (5%)?         | accepted |                               |

### Developed Large Cap

#### F-Test Two-Sample for Variances

##### Descriptive Statistics

| VAR                 | -0.02357516101591945 | -0.02513245033112575 |
|---------------------|----------------------|----------------------|
| Sample size         | 1560,00              | 1560,00              |
| Mean                | 0,00053              | 0,00054              |
| Variance            | 0,00007              | 0,00008              |
| Standard Deviation  | 0,00866              | 0,00905              |
| Mean Standard Error | 0,00022              | 0,00023              |

##### Summary

|                  |          |                               |
|------------------|----------|-------------------------------|
| F                | 1,0932   | F Critical value (5%) 1,08691 |
| p-level 1-tailed | 0,03932  | p-level 2-tailed 0,07864      |
| H0 (5%)?         | rejected |                               |

### Developed Small Cap

**F-Test Two-Sample for Variances***Descriptive Statistics*

| VAR                 | -0.02513245033112575 | -0.02272378320282507 |
|---------------------|----------------------|----------------------|
| Sample size         | 1560,00              | 1560,00              |
| Mean                | 0,00054              | 0,00065              |
| Variance            | 0,00008              | 0,00011              |
| Standard Deviation  | 0,00905              | 0,01029              |
| Mean Standard Error | 0,00023              | 0,00026              |

*Summary*

|                  |             |                       |             |
|------------------|-------------|-----------------------|-------------|
| F                | 1,29278     | F Critical value (5%) | 1,08691     |
| p-level 1-tailed | 2,07531E-07 | p-level 2-tailed      | 4,15062E-07 |
| H0 (5%)?         | rejected    |                       |             |

**North America****F-Test Two-Sample for Variances***Descriptive Statistics*

| VAR                 | -0.02685330667047578 | -0.02921195652173923 |
|---------------------|----------------------|----------------------|
| Sample size         | 1560,00              | 1560,00              |
| Mean                | 0,00055              | 0,00058              |
| Variance            | 0,0001               | 0,0001               |
| Standard Deviation  | 0,00978              | 0,01002              |
| Mean Standard Error | 0,00025              | 0,00025              |

*Summary*

|                  |          |                       |         |
|------------------|----------|-----------------------|---------|
| F                | 1,05039  | F Critical value (5%) | 1,08691 |
| p-level 1-tailed | 0,16592  | p-level 2-tailed      | 0,33184 |
| H0 (5%)?         | accepted |                       |         |

**South Korea****F-Test Two-Sample for Variances***Descriptive Statistics*

| VAR                 | -0.001283298782981439 | -0.001070063694267556 |
|---------------------|-----------------------|-----------------------|
| Sample size         | 1560,00               | 1560,00               |
| Mean                | 0,0005                | 0,0006                |
| Variance            | 0,0002                | 0,00024               |
| Standard Deviation  | 0,01425               | 0,01535               |
| Mean Standard Error | 0,00036               | 0,00039               |

*Summary*

|                  |         |                       |         |
|------------------|---------|-----------------------|---------|
| F                | 1,16042 | F Critical value (5%) | 1,08691 |
| p-level 1-tailed | 0,00167 | p-level 2-tailed      | 0,00333 |

*H0 (5%)? rejected*

## United Kingdom

### F-Test Two-Sample for Variances

#### Descriptive Statistics

| VAR                 | -0.03005263802178967 | -0.0324792493684589 |
|---------------------|----------------------|---------------------|
| Sample size         | 1560,00              | 1560,00             |
| Mean                | 0,0005               | 0,00046             |
| Variance            | 0,00014              | 0,00015             |
| Standard Deviation  | 0,01186              | 0,01217             |
| Mean Standard Error | 0,0003               | 0,00031             |

#### Summary

|                         |                 |                              |         |
|-------------------------|-----------------|------------------------------|---------|
| <i>F</i>                | 1,05272         | <i>F Critical value (5%)</i> | 1,08691 |
| <i>p-level 1-tailed</i> | 0,15529         | <i>p-level 2-tailed</i>      | 0,31058 |
| <i>H0 (5%)?</i>         | <i>accepted</i> |                              |         |

## United States

### F-Test Two-Sample for Variances

#### Descriptive Statistics

| VAR                 | -0.02709000873871253 | -0.02983378781976366 |
|---------------------|----------------------|----------------------|
| Sample size         | 1560,00              | 1560,00              |
| Mean                | 0,00064              | 0,00068              |
| Variance            | 0,0001               | 0,0001               |
| Standard Deviation  | 0,00977              | 0,01013              |
| Mean Standard Error | 0,00025              | 0,00026              |

#### Summary

|                         |                 |                              |         |
|-------------------------|-----------------|------------------------------|---------|
| <i>F</i>                | 1,07682         | <i>F Critical value (5%)</i> | 1,08691 |
| <i>p-level 1-tailed</i> | 0,07203         | <i>p-level 2-tailed</i>      | 0,14406 |
| <i>H0 (5%)?</i>         | <i>accepted</i> |                              |         |

10. Distribution (Excel)

|                         | SHA500 | REG500 | BENCH  | SHAASPAC | REGASPAC | BENCH  | SHABEL | REGBEL | BENCH  | SHABRA | REGBRA | BENCH  |
|-------------------------|--------|--------|--------|----------|----------|--------|--------|--------|--------|--------|--------|--------|
| Skewness                | -0,319 | -0,355 | -0,341 | -0,331   | -0,396   | -0,332 | -0,012 | 0,112  | -0,332 | -0,116 | -0,029 | -0,332 |
| Kurtosis                | 3,391  | 3,992  | 3,544  | 1,606    | 2,022    | 3,779  | 1,987  | 3,906  | 3,779  | 2,087  | 1,969  | 3,786  |
| Skewness-Kurtosis ratio | -0,094 | -0,089 | -0,096 | -0,206   | -0,196   | -0,088 | -0,006 | 0,029  | -0,088 | -0,055 | -0,015 | -0,088 |

|                         | SHACHI | REGCHI | BENCH  | SHAEME | REGEME | BENCH  | SHAEUR | REGEUR | BENCH  | SHAFRA | REGFRA | BENCH  |
|-------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Skewness                | -0,150 | -0,050 | -0,333 | -0,398 | -0,343 | -0,332 | -0,109 | -0,069 | -0,340 | 0,060  | 0,072  | -0,332 |
| Kurtosis                | 1,694  | 2,292  | 3,784  | 3,094  | 2,950  | 3,786  | 2,185  | 2,727  | 3,671  | 2,387  | 3,475  | 3,786  |
| Skewness-Kurtosis ratio | -0,089 | -0,022 | -0,088 | -0,129 | -0,116 | -0,088 | -0,050 | -0,025 | -0,093 | 0,025  | 0,021  | -0,088 |

|                         | SHAGER | REGGER | BENCH  | SHAJAP | REGJAP | BENCH  | SHADVL | REGDVL | BENCH  | SHADVS | REGDVS | BENCH  |
|-------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Skewness                | -0,109 | -0,078 | -0,332 | -0,203 | -0,326 | -0,332 | -0,309 | -0,315 | -0,332 | -0,405 | -0,315 | -0,332 |
| Kurtosis                | 1,727  | 2,380  | 3,786  | 3,176  | 4,408  | 3,786  | 3,419  | 3,771  | 3,786  | 3,823  | 3,771  | 3,786  |
| Skewness-Kurtosis ratio | -0,063 | -0,033 | -0,088 | -0,064 | -0,074 | -0,088 | -0,090 | -0,083 | -0,088 | -0,106 | -0,083 | -0,088 |

|                         | SHANAM | REGNAM | BENCH  | SHAROK | REGROK | BENCH  | SHAUK  | REGUK  | BENCH  | SHAUS  | REGUS  | BENCH  |
|-------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Skewness                | -0,337 | -0,370 | -0,332 | -0,237 | -0,326 | -0,332 | -0,135 | -0,112 | -0,332 | -0,336 | -0,366 | -0,332 |
| Kurtosis                | 3,616  | 4,184  | 3,786  | 2,211  | 2,911  | 3,779  | 2,128  | 2,642  | 3,786  | 3,732  | 4,371  | 3,786  |
| Skewness-Kurtosis ratio | -0,093 | -0,088 | -0,088 | -0,107 | -0,112 | -0,088 | -0,063 | -0,042 | -0,088 | -0,090 | -0,084 | -0,088 |

### 11. Beta and CAPM-derived metrics (Excel)

|                                             | SHA500  | REG500  | BENCH   | SHAASPAC | REGASPAC | BENCH   | SHABEL   | REGBEL   | BENCH   | SHABRA   | REGBRA   | BENCH   |
|---------------------------------------------|---------|---------|---------|----------|----------|---------|----------|----------|---------|----------|----------|---------|
| Correlation                                 | 0,88    | 0,89    | 1,00    | 0,51     | 0,50     | 1,00    | 0,81     | 0,82     | 1,00    | 0,71     | 0,70     | 1,00    |
| Beta                                        | 0,929   | 0,969   | 1,000   | 0,585    | 0,558    | 1,000   | 1,267    | 1,266    | 1,000   | 1,337    | 1,328    | 1,000   |
|                                             |         |         |         |          |          |         |          |          |         |          |          |         |
| t* with H0: beta= 0                         | 72,86   | 74,24   |         | 23,69    | 22,94    |         | 54,22    | 56,92    |         | 39,68    | 38,40    |         |
| Two-tailed p-value                          | 0,00%   | 0,00%   |         | 0,00%    | 0,00%    |         | 0,00%    | 0,00%    |         | 0,00%    | 0,00%    |         |
| t* with H0: beta = 1                        | -5,6    | -2,38   |         | -16,81   | -18,14   |         | 11,43    | 11,98    |         | 9,99     | 9,48     |         |
| Two-tailed p-value                          | 0,00%   | 1,75%   |         | 0,00%    | 0,00%    |         | 0,00%    | 0,00%    |         | 0,00%    | 0,00%    |         |
|                                             |         |         |         |          |          |         |          |          |         |          |          |         |
| Daily Jensen's Alpha (arith/arith) (%)      | 0,0146% | 0,0166% | 0,0000% | 0,0071%  | 0,0104%  | 0,0000% | -0,0288% | -0,0018% | 0,0000% | -0,0668% | -0,0644% | 0,0000% |
| Daily CAPM Alpha (regres.) (%)              | 0,0146% | 0,0166% | 0,0000% | 0,0071%  | 0,0104%  | 0,0000% | -0,0288% | -0,0018% | 0,0000% | -0,0668% | -0,0644% | 0,0000% |
| t* with H0: alpha = 0                       | 1,25    | 1,39    |         | 0,32     | 0,48     |         | -1,38    | -0,09    |         | -2,22    | -2,09    |         |
| Two-tailed p-value                          | 21,07%  | 16,45%  |         | 74,62%   | 63,37%   |         | 16,80%   | 92,61%   |         | 2,65%    | 3,71%    |         |
| R-squared                                   | 0,7789  | 0,7853  |         | 0,2646   | 0,2523   |         | 0,6534   | 0,6752   |         | 0,5024   | 0,4861   |         |
| Annual Jensen's Alpha (arith/arith) (%)     | 3,67%   | 4,17%   | 0,00%   | 1,80%    | 2,61%    | 0,00%   | -7,25%   | -0,46%   | 0,00%   | -16,82%  | -16,22%  | 0,00%   |
| Modified Jensen's alpha                     | 0,040   | 0,044   | 0,000   | 0,031    | 0,047    | 0,000   | -0,055   | -0,004   | 0,000   | -0,116   | -0,113   | 0,000   |
| Annualized Jensen's Alpha (arith/arith) (%) | 3,74%   | 4,26%   | 0,00%   | 1,81%    | 2,64%    | 0,00%   | -7,00%   | -0,46%   | 0,00%   | -15,49%  | -14,98%  | 0,00%   |
| Alpha (geom/geom) (%)                       | 3,912%  | 4,488%  | 0,00%   | 0,997%   | 1,903%   | 0,00%   | -9,131%  | -1,556%  | 0,00%   | -19,915% | -19,400% | 0,00%   |
| Alpha (log/log) (%)                         | 3,912%  | 4,488%  | 0,00%   | 0,997%   | 1,903%   | 0,00%   | -9,131%  | -1,556%  | 0,00%   | -19,915% | -19,400% | 0,00%   |
| Alpha (log/arith) (%)                       | 3,912%  | 4,488%  | 0,00%   | 0,997%   | 1,903%   | 0,00%   | -9,131%  | -1,556%  | 0,00%   | -19,915% | -19,400% | 0,00%   |
|                                             |         |         |         |          |          |         |          |          |         |          |          |         |
| Treynor ratio                               | 0,17    | 0,17    | 0,13    | 0,14     | 0,16     | 0,12    | 0,05     | 0,11     | 0,12    | -0,03    | -0,02    | 0,12    |
| Active Treynor ratio                        | 0,04    | 0,04    | 0,00    | 0,03     | 0,05     | 0,00    | -0,06    | 0,00     | 0,00    | -0,12    | -0,11    | 0,00    |
| Modified Treynor ratio                      | 1,18    | 1,20    | 0,88    | 0,99     | 1,11     | 0,87    | 0,36     | 0,79     | 0,87    | -0,19    | -0,17    | 0,87    |

|                                             | SHACHI  | REGCHI  | BENCH   | SHAEME   | REGEME   | BENCH   | SHAEUR   | REGEUR   | BENCH   | SHAFRA   | REGFRA   | BENCH   |
|---------------------------------------------|---------|---------|---------|----------|----------|---------|----------|----------|---------|----------|----------|---------|
| Correlation                                 | 0,56    | 0,52    | 1,00    | 0,80     | 0,81     | 1,00    | 0,87     | 0,89     | 1,00    | 0,83     | 0,87     | 1,00    |
| Beta                                        | 0,733   | 0,735   | 1,000   | 0,832    | 0,884    | 1,000   | 1,145    | 1,304    | 1,000   | 1,318    | 1,520    | 1,000   |
|                                             |         |         |         |          |          |         |          |          |         |          |          |         |
| t* with H0: beta= 0                         | 26,40   | 24,18   |         | 51,83    | 54,75    |         | 69,73    | 75,86    |         | 58,41    | 68,86    |         |
| Two-tailed p-value                          | 0,00%   | 0,00%   |         | 0,00%    | 0,00%    |         | 0,00%    | 0,00%    |         | 0,00%    | 0,00%    |         |
| t* with H0: beta = 1                        | -9,64   | -8,70   |         | -10,44   | -7,17    |         | 8,82     | 17,69    |         | 14,08    | 23,57    |         |
| Two-tailed p-value                          | 0,00%   | 0,00%   |         | 0,00%    | 0,00%    |         | 0,00%    | 0,00%    |         | 0,00%    | 0,00%    |         |
|                                             |         |         |         |          |          |         |          |          |         |          |          |         |
| Daily Jensen's Alpha (arith/arith) (%)      | 0,0134% | 0,0048% | 0,0000% | -0,0183% | -0,0128% | 0,0000% | -0,0221% | -0,0350% | 0,0000% | -0,0202% | -0,0327% | 0,0000% |
| Daily CAPM Alpha (regres.) (%)              | 0,0134% | 0,0048% | 0,0000% | -0,0183% | -0,0128% | 0,0000% | -0,0221% | -0,0350% | 0,0000% | -0,0202% | -0,0327% | 0,0000% |
| t* with H0: alpha = 0                       | 0,54    | 0,18    |         | -1,27    | -0,89    |         | -1,49    | -2,26    |         | -1,00    | -1,66    |         |
| Two-tailed p-value                          | 58,92%  | 86,03%  |         | 20,28%   | 37,36%   |         | 13,59%   | 2,39%    |         | 31,54%   | 9,70%    |         |
| R-squared                                   | 0,3089  | 0,2728  |         | 0,6328   | 0,6579   |         | 0,7597   | 0,7891   |         | 0,6864   | 0,7525   |         |
| Annual Jensen's Alpha (arith/arith) (%)     | 3,37%   | 1,20%   | 0,00%   | -4,60%   | -3,23%   | 0,00%   | -5,56%   | -8,82%   | 0,00%   | -5,09%   | -8,24%   | 0,00%   |
| Modified Jensen's alpha                     | 0,047   | 0,016   | 0,000   | -0,054   | -0,036   | 0,000   | -0,047   | -0,065   | 0,000   | -0,038   | -0,052   | 0,000   |
| Annualized Jensen's Alpha (arith/arith) (%) | 3,43%   | 1,21%   | 0,00%   | -4,50%   | -3,18%   | 0,00%   | -5,41%   | -8,44%   | 0,00%   | -4,97%   | -7,91%   | 0,00%   |
| Alpha (geom/geom) (%)                       | 2,466%  | -0,188% | 0,00%   | -5,327%  | -3,922%  | 0,00%   | -6,700%  | -10,465% | 0,00%   | -6,806%  | -10,537% | 0,00%   |
| Alpha (log/log) (%)                         | 2,466%  | -0,188% | 0,00%   | -5,327%  | -3,922%  | 0,00%   | -6,700%  | -10,465% | 0,00%   | -6,806%  | -10,537% | 0,00%   |
| Alpha (log/arith) (%)                       | 2,466%  | -0,188% | 0,00%   | -5,327%  | -3,922%  | 0,00%   | -6,700%  | -10,465% | 0,00%   | -6,806%  | -10,537% | 0,00%   |
|                                             |         |         |         |          |          |         |          |          |         |          |          |         |
| Treynor ratio                               | 0,16    | 0,12    | 0,12    | 0,06     | 0,08     | 0,12    | 0,07     | 0,05     | 0,13    | 0,07     | 0,05     | 0,12    |
| Active Treynor ratio                        | 0,05    | 0,02    | 0,00    | -0,05    | -0,04    | 0,00    | -0,05    | -0,06    | 0,00    | -0,04    | -0,05    | 0,00    |
| Modified Treynor ratio                      | 1,11    | 0,85    | 0,87    | 0,41     | 0,55     | 0,87    | 0,47     | 0,32     | 0,88    | 0,50     | 0,38     | 0,87    |

|                                             | SHAGER   | REGGER   | BENCH   | SHAJAP  | REGJAP  | BENCH   | SHADVL  | REGDVL  | BENCH   | SHADVS  | REGDVS  | BENCH   |
|---------------------------------------------|----------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Correlation                                 | 0,84     | 0,86     | 1,00    | 0,27    | 0,27    | 1,00    | 0,98    | 1,00    | 1,00    | 0,96    | 1,00    | 1,00    |
| Beta                                        | 1,394    | 1,483    | 1,000   | 0,334   | 0,349   | 1,000   | 0,955   | 1,015   | 1,000   | 1,106   | 1,015   | 1,000   |
| t* with H0: beta=                           | 0        | 60,53    | 67,81   | 10,96   | 10,97   |         | 198,33  | 505,76  |         | 128,51  | 505,76  |         |
| Two-tailed p-value                          | 0,00%    | 0,00%    |         | 0,00%   | 0,00%   |         | 0,00%   | 0,00%   |         | 0,00%   | 0,00%   |         |
| t* with H0: beta =                          | 1        | 17,09    | 22,07   | -21,85  | -20,51  |         | -9,34   | 7,55    |         | 12,28   | 7,55    |         |
| Two-tailed p-value                          | 0,00%    | 0,00%    |         | 0,00%   | 0,00%   |         | 0,00%   | 0,00%   |         | 0,00%   | 0,00%   |         |
| Daily Jensen's Alpha (arith/arith) (%)      | -0,0166% | -0,0230% | 0,0000% | 0,0221% | 0,0184% | 0,0000% | 0,0038% | 0,0017% | 0,0000% | 0,0084% | 0,0017% | 0,0000% |
| Daily CAPM Alpha (regres.) (%)              | -0,0166% | -0,0230% | 0,0000% | 0,0221% | 0,0184% | 0,0000% | 0,0038% | 0,0017% | 0,0000% | 0,0084% | 0,0017% | 0,0000% |
| t* with H0: alpha =                         | 0        | -0,81    | -1,18   | 0,81    | 0,65    |         | 0,89    | 0,96    |         | 1,09    | 0,96    |         |
| Two-tailed p-value                          | 41,85%   | 23,93%   |         | 41,68%  | 51,65%  |         | 37,54%  | 33,88%  |         | 27,40%  | 33,88%  |         |
| R-squared                                   | 0,7015   | 0,7468   |         | 0,0715  | 0,0717  |         | 0,9619  | 0,9939  |         | 0,9137  | 0,9939  |         |
| Annual Jensen's Alpha (arith/arith) (%)     | -4,19%   | -5,79%   | 0,00%   | 5,57%   | 4,64%   | 0,00%   | 0,96%   | 0,43%   | 0,00%   | 2,12%   | 0,43%   | 0,00%   |
| Modified Jensen's alpha                     | -0,029   | -0,038   | 0,000   | 0,171   | 0,136   | 0,000   | 0,010   | 0,004   | 0,000   | 0,019   | 0,004   | 0,000   |
| Annualized Jensen's Alpha (arith/arith) (%) | -4,10%   | -5,62%   | 0,00%   | 5,72%   | 4,74%   | 0,00%   | 0,96%   | 0,43%   | 0,00%   | 2,14%   | 0,43%   | 0,00%   |
| Alpha (geom/geom) (%)                       | -5,956%  | -7,773%  | 0,00%   | 4,453%  | 3,319%  | 0,00%   | 1,054%  | 0,473%  | 0,00%   | 2,244%  | 0,473%  | 0,00%   |
| Alpha (log/log) (%)                         | -5,956%  | -7,773%  | 0,00%   | 4,453%  | 3,319%  | 0,00%   | 1,054%  | 0,473%  | 0,00%   | 2,244%  | 0,473%  | 0,00%   |
| Alpha (log/arith) (%)                       | -5,956%  | -7,773%  | 0,00%   | 4,453%  | 3,319%  | 0,00%   | 1,054%  | 0,473%  | 0,00%   | 2,244%  | 0,473%  | 0,00%   |
| Treynor ratio                               | 0,08     | 0,07     | 0,12    | 0,26    | 0,22    | 0,12    | 0,13    | 0,13    | 0,12    | 0,14    | 0,13    | 0,12    |
| Active Treynor ratio                        | -0,03    | -0,04    | 0,00    | 0,17    | 0,14    | 0,00    | 0,01    | 0,00    | 0,00    | 0,02    | 0,00    | 0,00    |
| Modified Treynor ratio                      | 0,56     | 0,50     | 0,87    | 1,81    | 1,54    | 0,87    | 0,94    | 0,90    | 0,87    | 1,01    | 0,90    | 0,87    |

|                                             | SHANAM  | REGNAM  | BENCH   | SHAROK  | REGROK  | BENCH   | SHAUK    | REGUK    | BENCH   | SHAUS   | REGUS   | BENCH   |
|---------------------------------------------|---------|---------|---------|---------|---------|---------|----------|----------|---------|---------|---------|---------|
| Correlation                                 | 0,90    | 0,90    | 1,00    | 0,43    | 0,46    | 1,00    | 0,84     | 0,86     | 1,00    | 0,88    | 0,89    | 1,00    |
| Beta                                        | 0,988   | 1,019   | 1,000   | 0,746   | 0,731   | 1,000   | 1,155    | 1,149    | 1,000   | 0,970   | 1,010   | 1,000   |
|                                             |         |         |         |         |         |         |          |          |         |         |         |         |
| t* with H0: beta= 0                         | 80,84   | 83,28   |         | 19,00   | 20,30   |         | 62,21    | 66,98    |         | 74,33   | 75,50   |         |
| Two-tailed p-value                          | 0,00%   | 0,00%   |         | 0,00%   | 0,00%   |         | 0,00%    | 0,00%    |         | 0,00%   | 0,00%   |         |
| t* with H0: beta = 1                        | -0,97   | 1,53    |         | -6,45   | -7,48   |         | 8,37     | 8,67     |         | -2,29   | 0,78    |         |
| Two-tailed p-value                          | 33,11%  | 12,66%  |         | 0,00%   | 0,00%   |         | 0,00%    | 0,00%    |         | 2,22%   | 43,45%  |         |
|                                             |         |         |         |         |         |         |          |          |         |         |         |         |
| Daily Jensen's Alpha (arith/arith) (%)      | 0,0034% | 0,0048% | 0,0000% | 0,0226% | 0,0131% | 0,0000% | -0,0139% | -0,0091% | 0,0000% | 0,0142% | 0,0157% | 0,0000% |
| Daily CAPM Alpha (regres.) (%)              | 0,0034% | 0,0048% | 0,0000% | 0,0226% | 0,0131% | 0,0000% | -0,0139% | -0,0091% | 0,0000% | 0,0142% | 0,0157% | 0,0000% |
| t* with H0: alpha = 0                       | 0,32    | 0,44    |         | 0,64    | 0,41    |         | -0,84    | -0,60    |         | 1,22    | 1,31    |         |
| Two-tailed p-value                          | 75,28%  | 66,10%  |         | 52,03%  | 68,47%  |         | 40,29%   | 55,03%   |         | 22,25%  | 18,91%  |         |
| R-squared                                   | 0,8074  | 0,8165  |         | 0,1880  | 0,2090  |         | 0,7129   | 0,7421   |         | 0,7799  | 0,7852  |         |
| Annual Jensen's Alpha (arith/arith) (%)     | 0,87%   | 1,21%   | 0,00%   | 5,68%   | 3,29%   | 0,00%   | -3,49%   | -2,30%   | 0,00%   | 3,58%   | 3,95%   | 0,00%   |
| Modified Jensen's alpha                     | 0,009   | 0,012   | 0,000   | 0,078   | 0,046   | 0,000   | -0,030   | -0,020   | 0,000   | 0,038   | 0,040   | 0,000   |
| Annualized Jensen's Alpha (arith/arith) (%) | 0,87%   | 1,21%   | 0,00%   | 5,85%   | 3,34%   | 0,00%   | -3,43%   | -2,28%   | 0,00%   | 3,65%   | 4,03%   | 0,00%   |
| Alpha (geom/geom) (%)                       | 0,716%  | 1,091%  | 0,00%   | 3,702%  | 1,455%  | 0,00%   | -4,583%  | -3,176%  | 0,00%   | 3,783%  | 4,200%  | 0,00%   |
| Alpha (log/log) (%)                         | 0,716%  | 1,091%  | 0,00%   | 3,702%  | 1,455%  | 0,00%   | -4,583%  | -3,176%  | 0,00%   | 3,783%  | 4,200%  | 0,00%   |
| Alpha (log/arith) (%)                       | 0,716%  | 1,091%  | 0,00%   | 3,702%  | 1,455%  | 0,00%   | -4,583%  | -3,176%  | 0,00%   | 3,783%  | 4,200%  | 0,00%   |
|                                             |         |         |         |         |         |         |          |          |         |         |         |         |
| Treynor ratio                               | 0,13    | 0,13    | 0,12    | 0,17    | 0,14    | 0,12    | 0,08     | 0,09     | 0,12    | 0,16    | 0,16    | 0,12    |
| Active Treynor ratio                        | 0,01    | 0,01    | 0,00    | 0,08    | 0,05    | 0,00    | -0,03    | -0,02    | 0,00    | 0,04    | 0,04    | 0,00    |
| Modified Treynor ratio                      | 0,92    | 0,94    | 0,87    | 1,22    | 1,01    | 0,87    | 0,59     | 0,67     | 0,87    | 1,14    | 1,16    | 0,87    |

## 12. Beta and CAPM-derived metrics (R)

```
> # CAPM
> table.CAPM(mydata500[,1:2], mydata500[,3,drop=FALSE], Rf = mydata500[,4,drop=FALSE])
              SHA500 to BENCH REG500 to BENCH
Alpha                0.0001          0.0002
Beta                 0.9286          0.9689
Beta+                0.9404          0.9723
Beta-                0.9412          0.9930
R-squared            0.7789          0.7852
Annualized Alpha     0.0374          0.0424
Correlation           0.8825          0.8861
Correlation p-value   0.0000          0.0000
Tracking Error        0.0723          0.0735
Active Premium        0.0300          0.0406
Information Ratio      0.4147          0.5531
Treynor Ratio         0.1690          0.1730
>
> # Appraisal Ratio
> AppraisalRatio(mydata500[,1:2], mydata500[,3])
              SHA500 REG500
Appraisal ratio (Risk free = 0) 0.5462731 0.608416
>
> # Modified Treynor Ratio
> TreynorRatio(mydata500[,1:2], mydata500[,3], Rf = mydata500[,4,drop=FALSE],modified = TRUE)
              SHA500 REG500
Treynor Ratio: BENCH 1.168099 1.195319
```

```
> # CAPM
> table.CAPM(mydataaspac[,1:2], mydataaspac[,3,drop=FALSE], Rf = mydataaspac[,4,drop=FALSE])
              SHAASPAC to BENCH REGASPAC to BENCH
Alpha                0.0001          0.0001
Beta                 0.5849          0.5583
Beta+                0.5001          0.4647
Beta-                0.6127          0.5763
R-squared            0.2646          0.2523
Annualized Alpha     0.0182          0.0264
Correlation           0.5144          0.5023
Correlation p-value   0.0000          0.0000
Tracking Error        0.1500          0.1497
Active Premium        -0.0413         -0.0356
Information Ratio      -0.2753         -0.2375
Treynor Ratio         0.1405          0.1575
>
> # Appraisal Ratio
> AppraisalRatio(mydataaspac[,1:2], mydataaspac[,3])
              SHAASPAC REGASPAC
Appraisal ratio (Risk free = 0) 0.07372623 0.141165
>
> # Modified Treynor Ratio
> TreynorRatio(mydataaspac[,1:2], mydataaspac[,3], Rf = mydataaspac[,4,drop=FALSE],modified = TRUE)
              SHAASPAC REGASPAC
Treynor Ratio: BENCH 0.9928765 1.112639
```

```

> # CAPM
> table.CAPM(mydatabel[,1:2], mydatabel[,3,drop=FALSE], Rf = mydatabel[,4,drop=FALSE])
              SHABEL to BENCH REGBEL to BENCH
Alpha                -0.0003      0.0000
Beta                 1.2672      1.2665
Beta+                1.3977      1.3711
Beta-                1.1939      1.1883
R-squared            0.6534      0.6752
Annualized Alpha     -0.0700     -0.0046
Correlation           0.8084      0.8217
Correlation p-value   0.0000      0.0000
Tracking Error        0.1360      0.1299
Active Premium        -0.0583      0.0174
Information Ratio     -0.4289      0.1336
Treyndor Ratio        0.0514      0.1112
>
> # Appraisal Ratio
> AppraisalRatio(mydatabel[,1:2], mydatabel[,3])
              SHABEL      REGBEL
Appraisal ratio (Risk free = 0) -0.7003864 -0.1261276
>
> # Modified Treynor Ratio
> TreynorRatio(mydatabel[,1:2], mydatabel[,3], Rf = mydatabel[,4,drop=FALSE],modified = TRUE)
              SHABEL      REGBEL
Treyndor Ratio: BENCH 0.3634056 0.7856245

```

```

> # CAPM
> table.CAPM(mydatabra[,1:2], mydatabra[,3,drop=FALSE], Rf = mydatabra[,4,drop=FALSE])
              SHABRA to BENCH REGBRA to BENCH
Alpha                -0.0007     -0.0006
Beta                 1.3366      1.3279
Beta+                1.4019      1.3628
Beta-                1.3628      1.2985
R-squared            0.5024      0.4861
Annualized Alpha     -0.1549     -0.1498
Correlation           0.7088      0.6972
Correlation p-value   0.0000      0.0000
Tracking Error        0.1941      0.1986
Active Premium        -0.1579     -0.1538
Information Ratio     -0.8135     -0.7745
Treyndor Ratio       -0.0265     -0.0236
>
> # Appraisal Ratio
> AppraisalRatio(mydatabra[,1:2], mydatabra[,3])
              SHABRA      REGBRA
Appraisal ratio (Risk free = 0) -1.059433 -1.005593
>
> # Modified Treynor Ratio
> TreynorRatio(mydatabra[,1:2], mydatabra[,3], Rf = mydatabra[,4,drop=FALSE],modified = TRUE)
              SHABRA      REGBRA
Treyndor Ratio: BENCH -0.1872505 -0.1668692

```

```

> # CAPM
> table.CAPM(mydataachi[,1:2], mydataachi[,3,drop=FALSE], Rf = mydataachi[,4,drop=FALSE])
              SHACHI to BENCH REGCHI to BENCH
Alpha                0.0001          0.0000
Beta                 0.7325          0.7354
Beta+                0.6565          0.6454
Beta-                0.7614          0.7613
R-squared            0.3089          0.2728
Annualized Alpha     0.0343          0.0121
Correlation          0.5558          0.5223
Correlation p-value  0.0000          0.0000
Tracking Error       0.1596          0.1740
Active Premium       -0.0084         -0.0345
Information Ratio    -0.0526         -0.1985
Treyner Ratio        0.1571          0.1209
>
> # Appraisal Ratio
> AppraisalRatio(mydataachi[,1:2], mydataachi[,3])
              SHACHI      REGCHI
Appraisal ratio (Risk free = 0) 0.159807 -0.01022021
>
> # Modified Treynor Ratio
> TreynorRatio(mydataachi[,1:2], mydataachi[,3], Rf = mydataachi[,4,drop=FALSE],modified = TRUE)
              SHACHI      REGCHI
Treyner Ratio: BENCH 1.110247 0.8547233

```

```

> # CAPM
> table.CAPM(mydataeme[,1:2], mydataeme[,3,drop=FALSE], Rf = mydataeme[,4,drop=FALSE])
              SHAEME to BENCH REGEME to BENCH
Alpha                -0.0002         -0.0001
Beta                 0.8323          0.8841
Beta+                0.8016          0.8553
Beta-                0.8557          0.8878
R-squared            0.6328          0.6579
Annualized Alpha     -0.0450         -0.0318
Correlation          0.7955          0.8111
Correlation p-value  0.0000          0.0000
Tracking Error       0.0928          0.0917
Active Premium       -0.0738         -0.0534
Information Ratio    -0.7954         -0.5823
Treyner Ratio        0.0585          0.0781
>
> # Appraisal Ratio
> AppraisalRatio(mydataeme[,1:2], mydataeme[,3])
              SHAEME      REGEME
Appraisal ratio (Risk free = 0) -0.5931334 -0.4340805
>
> # Modified Treynor Ratio
> TreynorRatio(mydataeme[,1:2], mydataeme[,3], Rf = mydataeme[,4,drop=FALSE],modified = TRUE)
              SHAEME      REGEME
Treyner Ratio: BENCH 0.4132676 0.5522101

```

```

> # CAPM
> table.CAPM(mydataeur[,1:2], mydataeur[,3,drop=FALSE], Rf = mydataeur[,4,drop=FALSE])
              SHAEUR to BENCH REGEUR to BENCH
Alpha                -0.0002      -0.0004
Beta                 1.1447       1.3040
Beta+                1.2125       1.3893
Beta-                1.0850       1.2090
R-squared            0.7597       0.7891
Annualized Alpha     -0.0547     -0.0847
Correlation           0.8716       0.8883
Correlation p-value   0.0000       0.0000
Tracking Error        0.0942       0.1056
Active Premium        -0.0497     -0.0671
Information Ratio     -0.5272     -0.6359
Treynor Ratio         0.0652       0.0438
>
> # Appraisal Ratio
> AppraisalRatio(mydataeur[,1:2], mydataeur[,3])
              SHAEUR REGEUR
Appraisal ratio (Risk free = 0) -0.7369567 -1.092021
>
> # Modified Treynor Ratio
> TreynorRatio(mydataeur[,1:2], mydataeur[,3], Rf = mydataeur[,4,drop=FALSE],modified = TRUE)
              SHAEUR REGEUR
Treynor Ratio: BENCH 0.4566849 0.3070468

```

```

> # CAPM
> table.CAPM(mydatafra[,1:2], mydatafra[,3,drop=FALSE], Rf = mydatafra[,4,drop=FALSE])
              SHAFRA to BENCH REGFRA to BENCH
Alpha                -0.0002      -0.0003
Beta                 1.3175       1.5204
Beta+                1.4226       1.6482
Beta-                1.2208       1.3861
R-squared            0.6864       0.7526
Annualized Alpha     -0.0497     -0.0791
Correlation           0.8285       0.8675
Correlation p-value   0.0000       0.0000
Tracking Error        0.1337       0.1436
Active Premium        -0.0292     -0.0416
Information Ratio     -0.2181     -0.2898
Treynor Ratio         0.0708       0.0532
>
> # Appraisal Ratio
> AppraisalRatio(mydatafra[,1:2], mydatafra[,3])
              SHAFRA REGFRA
Appraisal ratio (Risk free = 0) -0.5414932 -0.8564694
>
> # Modified Treynor Ratio
> TreynorRatio(mydatafra[,1:2], mydatafra[,3], Rf = mydatafra[,4,drop=FALSE],modified = TRUE)
              SHAFRA REGFRA
Treynor Ratio: BENCH 0.5004274 0.3757598

```

```

> # CAPM
> table.CAPM(mydatager[,1:2], mydatager[,3,drop=FALSE], Rf = mydatager[,4,drop=FALSE])
              SHAGER to BENCH REGGER to BENCH
Alpha          -0.0002          -0.0002
Beta           1.3935           1.4826
Beta+          1.4626           1.5763
Beta-          1.2950           1.3791
R-squared       0.7015           0.7468
Annualized Alpha -0.0410          -0.0562
Correlation      0.8376           0.8642
Correlation p-value 0.0000          0.0000
Tracking Error   0.1401           0.1399
Active Premium   -0.0114          -0.0186
Information Ratio -0.0811          -0.1327
Treyner Ratio    0.0797           0.0701
>
> # Appraisal Ratio
> AppraisalRatio(mydatager[,1:2], mydatager[,3])
              SHAGER REGGER
Appraisal ratio (Risk free = 0) -0.4646626 -0.6380687
>
> # Modified Treyner Ratio
> TreynerRatio(mydatager[,1:2], mydatager[,3], Rf = mydatager[,4,drop=FALSE],modified = TRUE)
              SHAGER REGGER
Treyner Ratio: BENCH 0.5634265 0.4951925

```

```

> # CAPM
> table.CAPM(mydatajap[,1:2], mydatajap[,3,drop=FALSE], Rf = mydatajap[,4,drop=FALSE])
              SHAJAP to BENCH REGJAP to BENCH
Alpha          0.0002           0.0002
Beta           0.3340           0.3485
Beta+          0.1623           0.1771
Beta-          0.3636           0.3592
R-squared       0.0715           0.0716
Annualized Alpha 0.0572           0.0475
Correlation      0.2674           0.2677
Correlation p-value 0.0000          0.0000
Tracking Error   0.1946           0.2000
Active Premium   -0.0370          -0.0466
Information Ratio -0.1903          -0.2330
Treyner Ratio    0.2557           0.2176
>
> # Appraisal Ratio
> AppraisalRatio(mydatajap[,1:2], mydatajap[,3])
              SHAJAP REGJAP
Appraisal ratio (Risk free = 0) 0.2634077 0.188814
>
> # Modified Treyner Ratio
> TreynerRatio(mydatajap[,1:2], mydatajap[,3], Rf = mydatajap[,4,drop=FALSE],modified = TRUE)
              SHAJAP REGJAP
Treyner Ratio: BENCH 1.807434 1.538567

```

```

> # CAPM
> table.CAPM(mydatadvl[,1:2], mydatadvl[,3,drop=FALSE], Rf = mydatadvl[,4,drop=FALSE])
              SHADVL to BENCH REGDVL to BENCH
Alpha                0.0000                0.0000
Beta                 0.9550                1.0151
Beta+                0.9653                1.0200
Beta-                0.9535                1.0142
R-squared            0.9619                0.9939
Annualized Alpha     0.0096                0.0043
Correlation           0.9808                0.9970
Correlation p-value   0.0000                0.0000
Tracking Error        0.0276                0.0114
Active Premium        0.0050                0.0066
Information Ratio      0.1819                0.5772
Treyndor Ratio        0.1334                0.1271
>
> # Appraisal Ratio
> AppraisalRatio(mydatadvl[,1:2], mydatadvl[,3])
              SHADVL REGDVL
Appraisal ratio (Risk free = 0) 0.3926672 0.4219281
>
> # Modified Treyndor Ratio
> TreyndorRatio(mydatadvl[,1:2], mydatadvl[,3], Rf = mydatadvl[,4,drop=FALSE],modified = TRUE)
              SHADVL REGDVL
Treyndor Ratio: BENCH 0.9433617 0.8983659

```

```

> # CAPM
> table.CAPM(mydatadvl[,1:2], mydatadvl[,3,drop=FALSE], Rf = mydatadvl[,4,drop=FALSE])
              SHADVL to BENCH REGDVL to BENCH
Alpha                0.0001                0.0000
Beta                 1.1056                1.0151
Beta+                1.0938                1.0200
Beta-                1.1349                1.0142
R-squared            0.9137                0.9939
Annualized Alpha     0.0214                0.0043
Correlation           0.9559                0.9970
Correlation p-value   0.0000                0.0000
Tracking Error        0.0503                0.0114
Active Premium        0.0354                0.0066
Information Ratio      0.7032                0.5772
Treyndor Ratio        0.1427                0.1271
>
> # Appraisal Ratio
> AppraisalRatio(mydatadvl[,1:2], mydatadvl[,3])
              SHADVL REGDVL
Appraisal ratio (Risk free = 0) 0.4663717 0.4219281
>
> # Modified Treyndor Ratio
> TreyndorRatio(mydatadvl[,1:2], mydatadvl[,3], Rf = mydatadvl[,4,drop=FALSE],modified = TRUE)
              SHADVL REGDVL
Treyndor Ratio: BENCH 1.008893 0.8983659

```

```

> # CAPM
> table.CAPM(mydatanam[,1:2], mydatanam[,3,drop=FALSE], Rf = mydatanam[,4,drop=FALSE])
              SHANAM to BENCH REGNAM to BENCH
Alpha                0.0000                0.0000
Beta                 0.9881                1.0187
Beta+                0.9986                1.0239
Beta-                1.0131                1.0556
R-squared            0.8074                0.8164
Annualized Alpha     0.0087                0.0121
Correlation           0.8985                0.9036
Correlation p-value   0.0000                0.0000
Tracking Error        0.0683                0.0684
Active Premium        0.0057                0.0132
Information Ratio     0.0832                0.1932
Treyndor Ratio        0.1296                0.1331
>
> # Appraisal Ratio
> AppraisalRatio(mydatanam[,1:2], mydatanam[,3])
              SHANAM REGNAM
Appraisal ratio (Risk free = 0) 0.1047028 0.1597605
>
> # Modified Treynor Ratio
> TreynorRatio(mydatanam[,1:2], mydatanam[,3], Rf = mydatanam[,4,drop=FALSE],modified = TRUE)
              SHANAM REGNAM
Treyndor Ratio: BENCH 0.9164597 0.9411463

```

```

> # CAPM
> table.CAPM(mydatarok[,1:2], mydatarok[,3,drop=FALSE], Rf = mydatarok[,4,drop=FALSE])
              SHAROK to BENCH REGROK to BENCH
Alpha                0.0002                0.0001
Beta                 0.7464                0.7307
Beta+                0.7273                0.7132
Beta-                0.7964                0.7795
R-squared            0.1879                0.2090
Annualized Alpha     0.0585                0.0334
Correlation           0.4335                0.4572
Correlation p-value   0.0000                0.0000
Tracking Error        0.2225                0.2047
Active Premium        0.0057                -0.0187
Information Ratio     0.0257                -0.0914
Treyndor Ratio        0.1730                0.1433
>
> # Appraisal Ratio
> AppraisalRatio(mydatarok[,1:2], mydatarok[,3])
              SHAROK REGROK
Appraisal ratio (Risk free = 0) 0.1692688 0.07293268
>
> # Modified Treynor Ratio
> TreynorRatio(mydatarok[,1:2], mydatarok[,3], Rf = mydatarok[,4,drop=FALSE],modified = TRUE)
              SHAROK REGROK
Treyndor Ratio: BENCH 1.222833 1.012933

```

```

> # CAPM
> table.CAPM(mydatauk[,1:2], mydatauk[,3,drop=FALSE], Rf = mydatauk[,4,drop=FALSE])
              SHAUK to BENCH REGUK to BENCH
Alpha          -0.0001          -0.0001
Beta            1.1554           1.1487
Beta+           1.2024           1.1828
Beta-           1.0987           1.0965
R-squared        0.7129           0.7421
Annualized Alpha -0.0343          -0.0228
Correlation       0.8443           0.8615
Correlation p-value 0.0000           0.0000
Tracking Error    0.1060           0.0981
Active Premium    -0.0268          -0.0136
Information Ratio -0.2523          -0.1383
Treyndor Ratio    0.0828           0.0948
>
> # Appraisal Ratio
> AppraisalRatio(mydatauk[,1:2], mydatauk[,3])
              SHAUK      REGUK
Appraisal ratio (Risk free = 0) -0.4422191 -0.3325295
>
> # Modified Treynor Ratio
> TreynorRatio(mydatauk[,1:2], mydatauk[,3], Rf = mydatauk[,4,drop=FALSE],modified = TRUE)
              SHAUK      REGUK
Treyndor Ratio: BENCH 0.5853869 0.6699417

```

```

> # CAPM
> table.CAPM(mydataus[,1:2], mydataus[,3,drop=FALSE], Rf = mydataus[,4,drop=FALSE])
              SHAUS to BENCH REGUS to BENCH
Alpha          0.0001           0.0002
Beta            0.9701           1.0104
Beta+           0.9823           1.0176
Beta-           1.0000           1.0523
R-squared        0.7799           0.7852
Annualized Alpha 0.0365           0.0403
Correlation       0.8831           0.8861
Correlation p-value 0.0000           0.0000
Tracking Error    0.0730           0.0748
Active Premium    0.0342           0.0433
Information Ratio 0.4679           0.5791
Treyndor Ratio    0.1614           0.1640
>
> # Appraisal Ratio
> AppraisalRatio(mydataus[,1:2], mydataus[,3])
              SHAUS      REGUS
Appraisal ratio (Risk free = 0) 0.5193347 0.562276
>
> # Modified Treynor Ratio
> TreynorRatio(mydataus[,1:2], mydataus[,3], Rf = mydataus[,4,drop=FALSE],modified = TRUE)
              SHAUS      REGUS
Treyndor Ratio: BENCH 1.140956 1.159275

```

### 13. Sharpe ratio (Excel)

|                                                                    | SHA500 | REG500 | BENCH   | SHAASPA<br>C | REGASPA<br>C | BENCH   | SHABEL | REGBEL | BENCH   | SHABRA | REGBRA | BENCH   |
|--------------------------------------------------------------------|--------|--------|---------|--------------|--------------|---------|--------|--------|---------|--------|--------|---------|
| <b>Sharpe ratio</b>                                                | 0,066  | 0,067  | 0,057   | 0,036        | 0,039        | 0,056   | 0,025  | 0,045  | 0,056   | 0,000  | 0,001  | 0,056   |
| Jobson-Korkie t test<br>t-ratio test with H0<br>(H0: SR are equal) | 0,41   | 0,49   | 0,00    | -0,73        | -0,62        | 0,00    | -1,70  | -0,59  | 0,00    | -2,69  | -2,59  | 0,00    |
| <b>Two-tailed p-value</b>                                          | 67,88% | 62,07% | 100,00% | 46,39%       | 53,27%       | 100,00% | 8,88%  | 55,57% | 100,00% | 0,72%  | 0,96%  | 100,00% |
| Annualised Excess Return: Geometric average (%)                    | 15,80% | 16,89% | 12,80%  | 8,22%        | 8,80%        | 12,35%  | 6,52%  | 14,08% | 12,35%  | -3,54% | -3,13% | 12,24%  |
| Volatility of excess returns (%)                                   | 0,1522 | 0,1582 | 0,1447  | 0,1609       | 0,1573       | 0,1415  | 0,2218 | 0,2181 | 0,1415  | 0,2667 | 0,2694 | 0,1415  |
| <b>Annualized Sharpe ratio</b>                                     | 1,04   | 1,07   | 0,88    | 0,51         | 0,56         | 0,87    | 0,29   | 0,65   | 0,87    | -0,13  | -0,12  | 0,87    |
| t-ratio test with H0: SR= 0                                        | 2,54   | 2,61   | 2,16    | 1,27         | 1,39         | 2,17    | 0,73   | 1,61   | 2,17    | -0,33  | -0,29  | 2,15    |
| <b>Two-tailed p-value</b>                                          | 1,12%  | 0,91%  | 3,06%   | 20,40%       | 16,44%       | 3,01%   | 46,48% | 10,84% | 3,01%   | 74,13% | 77,24% | 3,14%   |
| First order autocorrelation in the returns                         | -0,04  | -0,06  | 0,15    | -0,01        | -0,01        | 0,15    | 0,02   | -0,03  | 0,15    | 0,07   | 0,05   | 0,15    |
| Lo's Adjusted Sharpe ratio                                         | 1,08   | 1,13   | 0,78    | 0,58         | 0,62         | 0,77    | 0,39   | 0,73   | 0,77    | 0,00   | 0,02   | 0,76    |

|                                                                    | SHACHI | REGCHI | BENCH   | SHAEME | REGEME | BENCH   | SHAEUR | REGEUR | BENCH   | SHAFRA | REGFRA | BENCH   |
|--------------------------------------------------------------------|--------|--------|---------|--------|--------|---------|--------|--------|---------|--------|--------|---------|
| <b>Sharpe ratio</b>                                                | 0,043  | 0,033  | 0,056   | 0,025  | 0,032  | 0,056   | 0,031  | 0,024  | 0,057   | 0,032  | 0,028  | 0,056   |
| Jobson-Korkie t test<br>t-ratio test with H0<br>(H0: SR are equal) | -0,508 | -0,854 | 0,000   | -1,569 | -1,217 | 0,000   | -1,530 | -2,105 | 0,000   | -1,32  | -1,76  | 0,00    |
| <b>Two-tailed p-value</b>                                          | 61,15% | 39,33% | 100,00% | 11,70% | 22,36% | 100,00% | 12,62% | 3,55%  | 100,00% | 18,67% | 7,89%  | 100,00% |
| Annualised Excess Return: Geometric average (%)                    | 11,51% | 8,89%  | 12,35%  | 4,87%  | 6,91%  | 12,24%  | 7,64%  | 5,87%  | 12,53%  | 9,33%  | 8,08%  | 12,24%  |
| Volatility of excess returns (%)                                   | 0,1865 | 0,1992 | 0,1415  | 0,1480 | 0,1542 | 0,1415  | 0,1875 | 0,2095 | 0,1427  | 0,2250 | 0,2479 | 0,1415  |
| <b>Annualized Sharpe ratio</b>                                     | 0,62   | 0,45   | 0,87    | 0,33   | 0,45   | 0,87    | 0,41   | 0,28   | 0,88    | 0,41   | 0,33   | 0,87    |
| t-ratio test with H0: SR= 0                                        | 1,54   | 1,11   | 2,17    | 0,82   | 1,11   | 2,15    | 1,01   | 0,69   | 2,17    | 1,03   | 0,81   | 2,15    |
| <b>Two-tailed p-value</b>                                          | 12,48% | 26,69% | 3,00%   | 41,34% | 26,54% | 3,14%   | 31,39% | 48,86% | 3,03%   | 30,23% | 41,74% | 3,14%   |
| First order autocorrelation in the returns                         | 0,11   | 0,08   | 0,15    | 0,23   | 0,23   | 0,15    | -0,02  | 0,01   | 0,15    | -0,06  | -0,01  | 0,15    |
| Lo's Adjusted Sharpe ratio                                         | 0,61   | 0,49   | 0,77    | 0,31   | 0,40   | 0,76    | 0,50   | 0,37   | 0,77    | 0,54   | 0,44   | 0,76    |

|                                                                    | SHAGER | REGGER | BENCH   | SHAJAP | REGJAP | BENCH   | SHADVL | REGDVL | BENCH   | SHADVS | REGDVS | BENCH   |
|--------------------------------------------------------------------|--------|--------|---------|--------|--------|---------|--------|--------|---------|--------|--------|---------|
| Sharpe ratio                                                       | 0,036  | 0,033  | 0,056   | 0,035  | 0,031  | 0,056   | 0,059  | 0,058  | 0,056   | 0,062  | 0,058  | 0,056   |
| Jobson-Korkie t test<br>t-ratio test with H0<br>(H0: SR are equal) | -1,13  | -1,36  | 0,00    | -0,65  | -0,77  | 0,00    | 0,20   | 0,11   | 0,00    | 0,34   | 0,11   | 0,00    |
| Two-tailed p-value                                                 | 25,66% | 17,52% | 100,00% | 51,89% | 44,06% | 100,00% | 83,80% | 90,98% | 100,00% | 73,71% | 90,98% | 100,00% |
| Annualised Excess Return: Geometric average (%)                    | 11,11% | 10,38% | 12,24%  | 8,54%  | 7,58%  | 12,24%  | 12,75% | 12,90% | 12,24%  | 15,78% | 12,90% | 12,24%  |
| Volatility of excess returns (%)                                   | 0,2354 | 0,2427 | 0,1415  | 0,1767 | 0,1842 | 0,1415  | 0,1377 | 0,1440 | 0,1415  | 0,1636 | 0,1440 | 0,1415  |
| Annualized Sharpe ratio                                            | 0,47   | 0,43   | 0,87    | 0,48   | 0,41   | 0,87    | 0,93   | 0,90   | 0,87    | 0,96   | 0,90   | 0,87    |
| t-ratio test with H0: SR= 0                                        | 1,17   | 1,06   | 2,15    | 1,20   | 1,02   | 2,15    | 2,30   | 2,23   | 2,15    | 2,40   | 2,23   | 2,15    |
| Two-tailed p-value                                                 | 24,04% | 28,72% | 3,14%   | 22,93% | 30,57% | 3,14%   | 2,14%  | 2,60%  | 3,14%   | 1,65%  | 2,60%  | 3,14%   |
| First order autocorrelation in the returns                         | -0,01  | 0,01   | 0,15    | -0,15  | -0,12  | 0,15    | 0,10   | 0,12   | 0,15    | 0,12   | 0,12   | 0,15    |
| Lo's Adjusted Sharpe ratio                                         | 0,57   | 0,52   | 0,76    | 0,64   | 0,55   | 0,76    | 0,85   | 0,81   | 0,76    | 0,86   | 0,81   | 0,76    |

|                                                                    | SHANAM | REGNAM | BENCH   | SHAROK | REGROK | BENCH   | SHAUK  | REGUK  | BENCH   | SHAUS  | REGUS  | BENCH   |
|--------------------------------------------------------------------|--------|--------|---------|--------|--------|---------|--------|--------|---------|--------|--------|---------|
| Sharpe ratio                                                       | 0,054  | 0,055  | 0,056   | 0,039  | 0,035  | 0,056   | 0,036  | 0,040  | 0,056   | 0,064  | 0,065  | 0,056   |
| Jobson-Korkie t test<br>t-ratio test with H0<br>(H0: SR are equal) | -0,12  | -0,03  | 0,00    | -0,59  | -0,75  | 0,00    | -1,11  | -0,86  | 0,00    | 0,40   | 0,46   | 0,00    |
| Two-tailed p-value                                                 | 90,56% | 97,26% | 100,00% | 55,44% | 45,20% | 100,00% | 26,66% | 38,74% | 100,00% | 68,81% | 64,71% | 100,00% |
| Annualised Excess Return: Geometric average (%)                    | 12,81% | 13,56% | 12,24%  | 12,92% | 10,48% | 12,35%  | 9,57%  | 10,89% | 12,24%  | 15,66% | 16,57% | 12,24%  |
| Volatility of excess returns (%)                                   | 0,1556 | 0,1595 | 0,1415  | 0,2437 | 0,2262 | 0,1415  | 0,1936 | 0,1886 | 0,1415  | 0,1554 | 0,1613 | 0,1415  |
| Annualized Sharpe ratio                                            | 0,82   | 0,85   | 0,87    | 0,53   | 0,46   | 0,87    | 0,49   | 0,58   | 0,87    | 1,01   | 1,03   | 0,87    |
| t-ratio test with H0: SR= 0                                        | 2,05   | 2,12   | 2,15    | 1,32   | 1,15   | 2,17    | 1,23   | 1,44   | 2,15    | 2,51   | 2,56   | 2,15    |
| Two-tailed p-value                                                 | 4,06%  | 3,45%  | 3,14%   | 18,74% | 24,93% | 3,01%   | 21,90% | 15,11% | 3,14%   | 1,23%  | 1,07%  | 3,14%   |
| First order autocorrelation in the returns                         | -0,02  | -0,04  | 0,15    | -0,01  | 0,00   | 0,15    | 0,00   | 0,00   | 0,15    | -0,04  | -0,06  | 0,15    |
| Lo's Adjusted Sharpe ratio                                         | 0,87   | 0,91   | 0,76    | 0,63   | 0,55   | 0,77    | 0,57   | 0,64   | 0,76    | 1,05   | 1,09   | 0,76    |

## 14. Sharpe ratio (R)

```
> # Traditional Sharpe ratio
> SharpeRatio(mydata500[,1:2], Rf = mydata500[,4], FUN="StdDev")
          SHA500    REG500
StdDev Sharpe (Rf=0%, p=95%): 0.06513843 0.06669785
>
> # Sharpe Ratio annualized
> SharpeRatio.annualized(mydata500[,1:2], Rf = mydata500[,4,drop=FALSE])
          SHA500    REG500
Annualized Sharpe Ratio (Rf=0%) 1.03088 1.059218
>
> # Value at Risk
> VaR(mydata500[,1:3], p=.99,method="gaussian")
          SHA500    REG500    BENCH
VaR -0.02168025 -0.02251227 -0.02068136
> VaR(mydata500[,1:3], p=.99,method="historical")
          SHA500    REG500    BENCH
VaR -0.0255453 -0.0280516 -0.0269383
> VaR(mydata500[,1:3], p=.99,method="modified")
          SHA500    REG500    BENCH
VaR -0.03111949 -0.03388873 -0.030073
>
> # Conditional Value at Risk
> ES(mydata500[,1:3], p=.99,method="gaussian")
          SHA500    REG500    BENCH
ES -0.02492958 -0.02588862 -0.02376935
> ES(mydata500[,1:3], p=.99,method="historical")
          SHA500    REG500    BENCH
ES -0.03433937 -0.03639563 -0.03349875
> ES(mydata500[,1:3], p=.99,method="modified")
          SHA500    REG500    BENCH
ES -0.03111949 -0.03388873 -0.030073
>
> # Different Sharpe Ratios
> SharpeRatio(mydata500[,1:3], Rf = mydata500[,4,drop=FALSE],p=0.99, method="gaussian")
          SHA500    REG500    BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.06513843 0.06669785 0.05661435
VaR Sharpe (Rf=0%, p=99%): 0.02881921 0.02952943 0.02495391
ES Sharpe (Rf=0%, p=99%): 0.02506291 0.02567825 0.02171203
> SharpeRatio(mydata500[,1:3], Rf = mydata500[,4,drop=FALSE],p=0.99, method="historical")
          SHA500    REG500    BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.06513843 0.06669785 0.05661435
VaR Sharpe (Rf=0%, p=99%): 0.02445881 0.02369828 0.01915789
ES Sharpe (Rf=0%, p=99%): 0.01819508 0.01826523 0.01540597
> SharpeRatio(mydata500[,1:3], Rf = mydata500[,4,drop=FALSE],p=0.99, method="modified")
          SHA500    REG500    BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.06513843 0.06669785 0.05661435
VaR Sharpe (Rf=0%, p=99%): 0.02007770 0.01961639 0.01716094
ES Sharpe (Rf=0%, p=99%): 0.02007770 0.01961639 0.01716094
>
> # Adjusted Sharpe Ratio
> AdjustedSharpeRatio(mydata500[,1:2], Rf = 0)
          SHA500    REG500
Adjusted Sharpe ratio (Risk free = 0) 0.82352 0.7973267
```

```
> # Traditional Sharpe ratio
> SharpeRatio(mydataaspac[,1:2], Rf = mydataaspac[,4], FUN="StdDev")
          SHAASPAC REGASPAC
StdDev Sharpe (Rf=0%, p=95%): 0.03600018 0.0387116
>
> # Sharpe Ratio annualized
> SharpeRatio.annualized(mydataaspac[,1:2], Rf = mydataaspac[,4,drop=FALSE])
          SHAASPAC REGASPAC
Annualized Sharpe Ratio (Rf=0%) 0.5107487 0.55886
>
> # Value at Risk
> VaR(mydataaspac[,1:3], p=.99,method="gaussian")
          SHAASPAC REGASPAC    BENCH
VaR -0.02320457 -0.02265941 -0.02022834
> VaR(mydataaspac[,1:3], p=.99,method="historical")
          SHAASPAC REGASPAC    BENCH
VaR -0.027326 -0.028118 -0.02656
> VaR(mydataaspac[,1:3], p=.99,method="modified")
          SHAASPAC REGASPAC    BENCH
VaR -0.02903667 -0.0296134 -0.02987265
>
> # Conditional Value at Risk
> ES(mydataaspac[,1:3], p=.99,method="gaussian")
          SHAASPAC REGASPAC    BENCH
ES -0.02663806 -0.02601623 -0.02324824
> ES(mydataaspac[,1:3], p=.99,method="historical")
          SHAASPAC REGASPAC    BENCH
ES -0.03442937 -0.0345375 -0.03337562
> ES(mydataaspac[,1:3], p=.99,method="modified")
          SHAASPAC REGASPAC    BENCH
ES -0.03524606 -0.03376643 -0.02987265
>
> # Different Sharpe Ratios
> SharpeRatio(mydataaspac[,1:3], Rf = mydataaspac[,4,drop=FALSE],p=0.99, method="gaussian")
          SHAASPAC REGASPAC    BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.03600018 0.03871160 0.05628865
VaR Sharpe (Rf=0%, p=99%): 0.01572455 0.01692896 0.02480648
ES Sharpe (Rf=0%, p=99%): 0.01369775 0.01474465 0.02158416
> SharpeRatio(mydataaspac[,1:3], Rf = mydataaspac[,4,drop=FALSE],p=0.99, method="historical")
          SHAASPAC REGASPAC    BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.03600018 0.03871160 0.05628865
VaR Sharpe (Rf=0%, p=99%): 0.01335291 0.01364252 0.01889284
ES Sharpe (Rf=0%, p=99%): 0.01059797 0.01110678 0.01503474
> SharpeRatio(mydataaspac[,1:3], Rf = mydataaspac[,4,drop=FALSE],p=0.99, method="modified")
          SHAASPAC REGASPAC    BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.03600018 0.0387116 0.05628865
VaR Sharpe (Rf=0%, p=99%): 0.01256623 0.0129536 0.01679776
ES Sharpe (Rf=0%, p=99%): 0.01035241 0.0113604 0.01679776
>
> # Adjusted Sharpe Ratio
> AdjustedSharpeRatio(mydataaspac[,1:2], Rf = 0)
          SHAASPAC REGASPAC
Adjusted Sharpe ratio (Risk free = 0) 0.5431951 0.5723518
```

```

> # Traditional Sharpe ratio
> SharpeRatio(mydatabel[,1:2], Rf = mydatabel[,4], FUN="StdDev")
              SHABEL      REGBEL
StdDev Sharpe (Rf=0%, p=95%): 0.02491323 0.04491346
>
> # Sharpe Ratio annualized
> SharpeRatio.annualized(mydatabel[,1:2], Rf = mydatabel[,4,drop=FALSE])
              SHABEL      REGBEL
Annualized Sharpe Ratio (Rf=0%) 0.29376 0.6455321
>
> # Value at Risk
> VaR(mydatabel[,1:3], p=.99,method="gaussian")
              SHABEL      REGBEL      BENCH
VaR -0.03214845 -0.03133537 -0.02022791
> VaR(mydatabel[,1:3], p=.99,method="historical")
              SHABEL      REGBEL      BENCH
VaR -0.0387559 -0.03832842 -0.02655654
> VaR(mydatabel[,1:3], p=.99,method="modified")
              SHABEL      REGBEL      BENCH
VaR -0.03872277 -0.04263295 -0.02987211
>
> # Conditional Value at Risk
> ES(mydatabel[,1:3], p=.99,method="gaussian")
              SHABEL      REGBEL      BENCH
ES -0.03688231 -0.03598998 -0.02324776
> ES(mydatabel[,1:3], p=.99,method="historical")
              SHABEL      REGBEL      BENCH
ES -0.04506359 -0.04568896 -0.03337625
> ES(mydatabel[,1:3], p=.99,method="modified")
              SHABEL      REGBEL      BENCH
ES -0.05219712 -0.04948695 -0.02987211
>
> # Different Sharpe Ratios
> SharpeRatio(mydatabel[,1:3], Rf = mydatabel[,4,drop=FALSE],p=0.99, method="gaussian")
              SHABEL      REGBEL      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.024913230 0.04491346 0.05629129
VaR Sharpe (Rf=0%, p=99%): 0.010829202 0.01969407 0.02480767
ES Sharpe (Rf=0%, p=99%): 0.009439269 0.01714702 0.02158519
> SharpeRatio(mydatabel[,1:3], Rf = mydatabel[,4,drop=FALSE],p=0.99, method="historical")
              SHABEL      REGBEL      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.024913230 0.04491346 0.05629129
VaR Sharpe (Rf=0%, p=99%): 0.008982943 0.01610087 0.01889581
ES Sharpe (Rf=0%, p=99%): 0.007725572 0.01350700 0.01503486
> SharpeRatio(mydatabel[,1:3], Rf = mydatabel[,4,drop=FALSE],p=0.99, method="modified")
              SHABEL      REGBEL      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.024913230 0.04491346 0.05629129
VaR Sharpe (Rf=0%, p=99%): 0.008990627 0.01447521 0.01679852
ES Sharpe (Rf=0%, p=99%): 0.006669756 0.01247038 0.01679852
>
> # Adjusted Sharpe Ratio
> AdjustedSharpeRatio(mydatabel[,1:2], Rf = 0)
              SHABEL      REGBEL
Adjusted Sharpe ratio (Risk free = 0) 0.3912824 0.6650916

```

```

> # Traditional Sharpe ratio
> SharpeRatio(mydatabra[,1:2], Rf = mydatabra[,4], FUN="StdDev")
              SHABRA      REGBRA
StdDev Sharpe (Rf=0%, p=95%): -9.950414e-05 0.001042532
>
> # Sharpe Ratio annualized
> SharpeRatio.annualized(mydatabra[,1:2], Rf = mydatabra[,4,drop=FALSE])
              SHABRA      REGBRA
Annualized Sharpe Ratio (Rf=0%) -0.1327278 -0.1163463
>
> # Value at Risk
> VaR(mydatabra[,1:3], p=.99,method="gaussian")
              SHABRA      REGBRA      BENCH
VaR -0.03907783 -0.03945049 -0.02022423
> VaR(mydatabra[,1:3], p=.99,method="historical")
              SHABRA      REGBRA      BENCH
VaR -0.04444 -0.044096 -0.02656
> VaR(mydatabra[,1:3], p=.99,method="modified")
              SHABRA      REGBRA      BENCH
VaR -0.04857343 -0.04758042 -0.0298818
>
> # Conditional Value at Risk
> ES(mydatabra[,1:3], p=.99,method="gaussian")
              SHABRA      REGBRA      BENCH
ES -0.0447701 -0.04519986 -0.023243
> ES(mydatabra[,1:3], p=.99,method="historical")
              SHABRA      REGBRA      BENCH
ES -0.05596938 -0.05356 -0.03337562
> ES(mydatabra[,1:3], p=.99,method="modified")
              SHABRA      REGBRA      BENCH
ES -0.06132998 -0.0634235 -0.0298818
>
> # Different Sharpe Ratios
> SharpeRatio(mydatabra[,1:3], Rf = mydatabra[,4,drop=FALSE],p=0.99, method="gaussian")
              SHABRA      REGBRA      BENCH
StdDev Sharpe (Rf=0%, p=99%): -9.950414e-05 0.0010425317 0.05589927
VaR Sharpe (Rf=0%, p=99%): -4.278654e-05 0.0004485061 0.02463065
ES Sharpe (Rf=0%, p=99%): -3.734647e-05 0.0003914566 0.02143165
> SharpeRatio(mydatabra[,1:3], Rf = mydatabra[,4,drop=FALSE],p=0.99, method="historical")
              SHABRA      REGBRA      BENCH
StdDev Sharpe (Rf=0%, p=99%): -9.950414e-05 0.0010425317 0.05589927
VaR Sharpe (Rf=0%, p=99%): -3.762388e-05 0.0004012560 0.01875511
ES Sharpe (Rf=0%, p=99%): -2.987357e-05 0.0003303545 0.01492514
> SharpeRatio(mydatabra[,1:3], Rf = mydatabra[,4,drop=FALSE],p=0.99, method="modified")
              SHABRA      REGBRA      BENCH
StdDev Sharpe (Rf=0%, p=99%): -9.950414e-05 0.0010425317 0.05589927
VaR Sharpe (Rf=0%, p=99%): -3.442222e-05 0.0003718711 0.01667021
ES Sharpe (Rf=0%, p=99%): -2.726244e-05 0.0002789784 0.01667021
>
> # Adjusted Sharpe Ratio
> AdjustedSharpeRatio(mydatabra[,1:2], Rf = 0)
              SHABRA      REGBRA
Adjusted Sharpe ratio (Risk free = 0) -0.001206209 0.01689716

```

```

> # Traditional Sharpe ratio
> SharpeRatio(mydatachi[,1:2], Rf = mydatachi[,4], FUN="StdDev")
      SHACHI      REGCHI
StdDev Sharpe (Rf=0%, p=95%): 0.04267388 0.03321727
>
> # Sharpe Ratio annualized
> SharpeRatio.annualized(mydatachi[,1:2], Rf = mydatachi[,4,drop=FALSE])
      SHACHI      REGCHI
Annualized Sharpe Ratio (Rf=0%) 0.6170232 0.4464037
>
> # Value at Risk
> VaR(mydatachi[,1:3], p=.99,method="gaussian")
      SHACHI      REGCHI      BENCH
VaR -0.02681528 -0.02876521 -0.02022271
> VaR(mydatachi[,1:3], p=.99,method="historical")
      SHACHI      REGCHI      BENCH
VaR -0.031648 -0.031904 -0.02656
> VaR(mydatachi[,1:3], p=.99,method="modified")
      SHACHI      REGCHI      BENCH
VaR -0.03263859 -0.03590054 -0.02988111
>
> # Conditional Value at Risk
> ES(mydatachi[,1:3], p=.99,method="gaussian")
      SHACHI      REGCHI      BENCH
ES -0.0307946 -0.03301627 -0.02324179
> ES(mydatachi[,1:3], p=.99,method="historical")
      SHACHI      REGCHI      BENCH
ES -0.03791937 -0.0413575 -0.03337562
> ES(mydatachi[,1:3], p=.99,method="modified")
      SHACHI      REGCHI      BENCH
ES -0.04168122 -0.04646204 -0.02988111
>
> # Different Sharpe Ratios
> SharpeRatio(mydatachi[,1:3], Rf = mydatachi[,4,drop=FALSE],p=0.99, method="gaussian")
      SHACHI      REGCHI      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.04267388 0.03321727 0.05630113
VaR Sharpe (Rf=0%, p=99%): 0.01869386 0.01449118 0.02481211
ES Sharpe (Rf=0%, p=99%): 0.01627822 0.01262534 0.02158904
> SharpeRatio(mydatachi[,1:3], Rf = mydatachi[,4,drop=FALSE],p=0.99, method="historical")
      SHACHI      REGCHI      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.04267388 0.03321727 0.05630113
VaR Sharpe (Rf=0%, p=99%): 0.01583927 0.01306550 0.01889187
ES Sharpe (Rf=0%, p=99%): 0.01321966 0.01007899 0.01503397
> SharpeRatio(mydatachi[,1:3], Rf = mydatachi[,4,drop=FALSE],p=0.99, method="modified")
      SHACHI      REGCHI      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.04267388 0.03321727 0.05630113
VaR Sharpe (Rf=0%, p=99%): 0.01535854 0.011611017 0.01679215
ES Sharpe (Rf=0%, p=99%): 0.01202655 0.008971664 0.01679215
>
> # Adjusted Sharpe Ratio
> AdjustedSharpeRatio(mydatachi[,1:2], Rf = 0)
      SHACHI      REGCHI
Adjusted Sharpe ratio (Risk free = 0) 0.6459853 0.5126561

```

```

> # Traditional Sharpe ratio
> SharpeRatio(mydataeme[,1:2], Rf = mydataeme[,4], FUN="StdDev")
      SHAEME      REGEME
StdDev Sharpe (Rf=0%, p=95%): 0.02489295 0.03215079
>
> # Sharpe Ratio annualized
> SharpeRatio.annualized(mydataeme[,1:2], Rf = mydataeme[,4,drop=FALSE])
      SHAEME      REGEME
Annualized Sharpe Ratio (Rf=0%) 0.3287414 0.4478959
>
> # Value at Risk
> VaR(mydataeme[,1:3], p=.99,method="gaussian")
      SHAEME      REGEME      BENCH
VaR -0.02144936 -0.02227586 -0.02022423
> VaR(mydataeme[,1:3], p=.99,method="historical")
      SHAEME      REGEME      BENCH
VaR -0.026546 -0.027244 -0.02656
> VaR(mydataeme[,1:3], p=.99,method="modified")
      SHAEME      REGEME      BENCH
VaR -0.03033033 -0.03095882 -0.0298818
>
> # Conditional Value at Risk
> ES(mydataeme[,1:3], p=.99,method="gaussian")
      SHAEME      REGEME      BENCH
ES -0.02460784 -0.02556642 -0.023243
> ES(mydataeme[,1:3], p=.99,method="historical")
      SHAEME      REGEME      BENCH
ES -0.03343938 -0.03447563 -0.03337562
> ES(mydataeme[,1:3], p=.99,method="modified")
      SHAEME      REGEME      BENCH
ES -0.03033033 -0.03095882 -0.0298818
>
> # Different Sharpe Ratios
> SharpeRatio(mydataeme[,1:3], Rf = mydataeme[,4,drop=FALSE],p=0.99, method="gaussian")
      SHAEME      REGEME      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.024892949 0.03215079 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.010820594 0.01401965 0.02463065
ES Sharpe (Rf=0%, p=99%): 0.009431742 0.01221523 0.02143165
> SharpeRatio(mydataeme[,1:3], Rf = mydataeme[,4,drop=FALSE],p=0.99, method="historical")
      SHAEME      REGEME      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.024892949 0.032150787 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.008743118 0.011463067 0.01875511
ES Sharpe (Rf=0%, p=99%): 0.006940764 0.009058568 0.01492514
> SharpeRatio(mydataeme[,1:3], Rf = mydataeme[,4,drop=FALSE],p=0.99, method="modified")
      SHAEME      REGEME      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.024892949 0.03215079 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.007652235 0.01008759 0.01667021
ES Sharpe (Rf=0%, p=99%): 0.007652235 0.01008759 0.01667021
>
> # Adjusted Sharpe Ratio
> AdjustedSharpeRatio(mydataeme[,1:2], Rf = 0)
      SHAEME      REGEME
Adjusted Sharpe ratio (Risk free = 0) 0.3791922 0.4814029

```

```

> # Traditional Sharpe ratio
> SharpeRatio(mydataeur[,1:2], Rf = mydataeur[,4], FUN="StdDev")
      SHAEUR      REGEUR
StdDev Sharpe (Rf=0%, p=95%): 0.03009274 0.02331152
>
> # Sharpe Ratio annualized
> SharpeRatio.annualized(mydataeur[,1:2], Rf = mydataeur[,4,drop=FALSE])
      SHAEUR      REGEUR
Annualized Sharpe Ratio (Rf=0%) 0.3980456 0.2727481
>
> # Value at Risk
> VaR(mydataeur[,1:3], p=.99,method="gaussian")
      SHAEUR      REGEUR      BENCH
VaR -0.02710984 -0.03039155 -0.02040755
> VaR(mydataeur[,1:3], p=.99,method="historical")
      SHAEUR      REGEUR      BENCH
VaR -0.0318592 -0.0364938 -0.026593
> VaR(mydataeur[,1:3], p=.99,method="modified")
      SHAEUR      REGEUR      BENCH
VaR -0.03399239 -0.03940243 -0.02993621
>
> # Conditional Value at Risk
> ES(mydataeur[,1:3], p=.99,method="gaussian")
      SHAEUR      REGEUR      BENCH
ES -0.03111082 -0.03486362 -0.02345409
> ES(mydataeur[,1:3], p=.99,method="historical")
      SHAEUR      REGEUR      BENCH
ES -0.0394175 -0.0444625 -0.03337562
> ES(mydataeur[,1:3], p=.99,method="modified")
      SHAEUR      REGEUR      BENCH
ES -0.04283243 -0.04763682 -0.02993621
>
> # Different Sharpe Ratios
> SharpeRatio(mydataeur[,1:3], Rf = mydataeur[,4,drop=FALSE],p=0.99, method="gaussian")
      SHAEUR      REGEUR      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.03009274 0.023311517 0.05619725
VaR Sharpe (Rf=0%, p=99%): 0.01311034 0.010126013 0.02476533
ES Sharpe (Rf=0%, p=99%): 0.01142429 0.008827118 0.02154846
> SharpeRatio(mydataeur[,1:3], Rf = mydataeur[,4,drop=FALSE],p=0.99, method="historical")
      SHAEUR      REGEUR      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.030092735 0.023311517 0.05619725
VaR Sharpe (Rf=0%, p=99%): 0.011155933 0.008432810 0.01900499
ES Sharpe (Rf=0%, p=99%): 0.009016785 0.006921457 0.01514278
> SharpeRatio(mydataeur[,1:3], Rf = mydataeur[,4,drop=FALSE],p=0.99, method="modified")
      SHAEUR      REGEUR      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.030092735 0.023311517 0.05619725
VaR Sharpe (Rf=0%, p=99%): 0.010455843 0.007810312 0.01688255
ES Sharpe (Rf=0%, p=99%): 0.008297897 0.006460240 0.01688255
>
> # Adjusted Sharpe Ratio
> AdjustedSharpeRatio(mydataeur[,1:2], Rf = 0)
      SHAEUR      REGEUR
Adjusted Sharpe ratio (Risk free = 0) 0.465495 0.3641194

```

```

> # Traditional Sharpe ratio
> SharpeRatio(mydatafra[,1:2], Rf = mydatafra[,4], FUN="StdDev")
      SHAFRA      REGFRA
StdDev Sharpe (Rf=0%, p=95%): 0.03205158 0.02754984
>
> # Sharpe Ratio annualized
> SharpeRatio.annualized(mydatafra[,1:2], Rf = mydatafra[,4,drop=FALSE])
      SHAFRA      REGFRA
Annualized Sharpe Ratio (Rf=0%) 0.4145958 0.3259702
>
> # Value at Risk
> VaR(mydatafra[,1:3], p=.99,method="gaussian")
      SHAFRA      REGFRA      BENCH
VaR -0.03250052 -0.03588881 -0.02022423
> VaR(mydatafra[,1:3], p=.99,method="historical")
      SHAFRA      REGFRA      BENCH
VaR -0.037714 -0.043706 -0.02656
> VaR(mydatafra[,1:3], p=.99,method="modified")
      SHAFRA      REGFRA      BENCH
VaR -0.03972503 -0.04765529 -0.0298818
>
> # Conditional Value at Risk
> ES(mydatafra[,1:3], p=.99,method="gaussian")
      SHAFRA      REGFRA      BENCH
ES -0.03730112 -0.04117948 -0.023243
> ES(mydatafra[,1:3], p=.99,method="historical")
      SHAFRA      REGFRA      BENCH
ES -0.04480438 -0.0519325 -0.03337562
> ES(mydatafra[,1:3], p=.99,method="modified")
      SHAFRA      REGFRA      BENCH
ES -0.05508746 -0.057897 -0.0298818
>
> # Different Sharpe Ratios
> SharpeRatio(mydatafra[,1:3], Rf = mydatafra[,4,drop=FALSE],p=0.99, method="gaussian")
      SHAFRA      REGFRA      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.03205158 0.02754984 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.01397543 0.01198895 0.02463065
ES Sharpe (Rf=0%, p=99%): 0.01217681 0.01044863 0.02143165
> SharpeRatio(mydatafra[,1:3], Rf = mydatafra[,4,drop=FALSE],p=0.99, method="historical")
      SHAFRA      REGFRA      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.03205158 0.027549844 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.01204351 0.009844622 0.01875511
ES Sharpe (Rf=0%, p=99%): 0.01013760 0.008285160 0.01492514
> SharpeRatio(mydatafra[,1:3], Rf = mydatafra[,4,drop=FALSE],p=0.99, method="modified")
      SHAFRA      REGFRA      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.032051583 0.027549844 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.011433820 0.009028779 0.01667021
ES Sharpe (Rf=0%, p=99%): 0.008245231 0.007431629 0.01667021
>
> # Adjusted Sharpe Ratio
> AdjustedSharpeRatio(mydatafra[,1:2], Rf = 0)
      SHAFRA      REGFRA
Adjusted Sharpe ratio (Risk free = 0) 0.4996138 0.428493

```

```

> # Traditional Sharpe ratio
> SharpeRatio(mydatager[,1:2], Rf = mydatager[,4], FUN="StdDev")
          SHAGER      REGGER
StdDev Sharpe (Rf=0%, p=95%): 0.03561036 0.03329789
>
> # Sharpe Ratio annualized
> SharpeRatio.annualized(mydatager[,1:2], Rf = mydatager[,4,drop=FALSE])
          SHAGER      REGGER
Annualized Sharpe Ratio (Rf=0%) 0.4718954 0.4279294
>
> # Value at Risk
> VaR(mydatager[,1:3], p=.99,method="gaussian")
          SHAGER      REGGER      BENCH
VaR -0.03395026 -0.03504384 -0.02022423
> VaR(mydatager[,1:3], p=.99,method="historical")
          SHAGER      REGGER      BENCH
VaR -0.039884 -0.041928 -0.02656
> VaR(mydatager[,1:3], p=.99,method="modified")
          SHAGER      REGGER      BENCH
VaR -0.04102013 -0.04434984 -0.0298818
>
> # Conditional Value at Risk
> ES(mydatager[,1:3], p=.99,method="gaussian")
          SHAGER      REGGER      BENCH
ES -0.03897278 -0.0402229 -0.023243
> ES(mydatager[,1:3], p=.99,method="historical")
          SHAGER      REGGER      BENCH
ES -0.04791812 -0.05125688 -0.03337562
> ES(mydatager[,1:3], p=.99,method="modified")
          SHAGER      REGGER      BENCH
ES -0.05320118 -0.05580576 -0.0298818
>
> # Different Sharpe Ratios
> SharpeRatio(mydatager[,1:3], Rf = mydatager[,4,drop=FALSE],p=0.99, method="gaussian")
          SHAGER      REGGER      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.03561036 0.03329789 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.01555126 0.01452669 0.02463065
ES Sharpe (Rf=0%, p=99%): 0.01354713 0.01265625 0.02143165
> SharpeRatio(mydatager[,1:3], Rf = mydatager[,4,drop=FALSE],p=0.99, method="historical")
          SHAGER      REGGER      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.03561036 0.03329789 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.01323762 0.012141555 0.01875511
ES Sharpe (Rf=0%, p=99%): 0.01101815 0.009931762 0.01492514
> SharpeRatio(mydatager[,1:3], Rf = mydatager[,4,drop=FALSE],p=0.99, method="modified")
          SHAGER      REGGER      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.035610361 0.033297892 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.012870980 0.011478533 0.01667021
ES Sharpe (Rf=0%, p=99%): 0.009924014 0.009122196 0.01667021
>
> # Adjusted Sharpe Ratio
> AdjustedSharpeRatio(mydatager[,1:2], Rf = 0)
          SHAGER      REGGER
Adjusted Sharpe ratio (Risk free = 0) 0.5477814 0.5114382

```

```

> # Traditional Sharpe ratio
> SharpeRatio(mydatajap[,1:2], Rf = mydatajap[,4], FUN="StdDev")
          SHAJAP      REGJAP
StdDev Sharpe (Rf=0%, p=95%): 0.03479112 0.03082172
>
> # Sharpe Ratio annualized
> SharpeRatio.annualized(mydatajap[,1:2], Rf = mydatajap[,4,drop=FALSE])
          SHAJAP      REGJAP
Annualized Sharpe Ratio (Rf=0%) 0.4833311 0.4118234
>
> # Value at Risk
> VaR(mydatajap[,1:3], p=.99,method="gaussian")
          SHAJAP      REGJAP      BENCH
VaR -0.02549667 -0.02662207 -0.02022423
> VaR(mydatajap[,1:3], p=.99,method="historical")
          SHAJAP      REGJAP      BENCH
VaR -0.026912 -0.027196 -0.02656
> VaR(mydatajap[,1:3], p=.99,method="modified")
          SHAJAP      REGJAP      BENCH
VaR -0.03520909 -0.04084059 -0.0298818
>
> # Conditional Value at Risk
> ES(mydatajap[,1:3], p=.99,method="gaussian")
          SHAJAP      REGJAP      BENCH
ES -0.02926731 -0.03055231 -0.023243
> ES(mydatajap[,1:3], p=.99,method="historical")
          SHAJAP      REGJAP      BENCH
ES -0.0382125 -0.04065688 -0.03337562
> ES(mydatajap[,1:3], p=.99,method="modified")
          SHAJAP      REGJAP      BENCH
ES -0.03520909 -0.04084059 -0.0298818
>
> # Different Sharpe Ratios
> SharpeRatio(mydatajap[,1:3], Rf = mydatajap[,4,drop=FALSE],p=0.99, method="gaussian")
          SHAJAP      REGJAP      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.03479112 0.03082172 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.01518832 0.01343214 0.02463065
ES Sharpe (Rf=0%, p=99%): 0.01323155 0.01170423 0.02143165
> SharpeRatio(mydatajap[,1:3], Rf = mydatajap[,4,drop=FALSE],p=0.99, method="historical")
          SHAJAP      REGJAP      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.03479112 0.030821725 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.01438956 0.013148672 0.01875511
ES Sharpe (Rf=0%, p=99%): 0.01013416 0.008795346 0.01492514
> SharpeRatio(mydatajap[,1:3], Rf = mydatajap[,4,drop=FALSE],p=0.99, method="modified")
          SHAJAP      REGJAP      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.03479112 0.030821725 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.01099863 0.008755782 0.01667021
ES Sharpe (Rf=0%, p=99%): 0.01099863 0.008755782 0.01667021
>
> # Adjusted Sharpe Ratio
> AdjustedSharpeRatio(mydatajap[,1:2], Rf = 0)
          SHAJAP      REGJAP
Adjusted Sharpe ratio (Risk free = 0) 0.5215972 0.4564296

```

```

> # Traditional Sharpe ratio
> SharpeRatio(mydatadvl[,1:2], Rf = mydatadvl[,4], FUN="StdDev")
              SHADVL      REGDVL
StdDev Sharpe (Rf=0%, p=95%): 0.05921155 0.05761972
>
> # Sharpe Ratio annualized
> SharpeRatio.annualized(mydatadvl[,1:2], Rf = mydatadvl[,4,drop=FALSE])
              SHADVL      REGDVL
Annualized Sharpe Ratio (Rf=0%) 0.9251958 0.8956303
>
> # Value at Risk
> VaR(mydatadvl[,1:3], p=.99,method="gaussian")
              SHADVL      REGDVL      BENCH
VaR -0.01966469 -0.02057698 -0.02022423
> VaR(mydatadvl[,1:3], p=.99,method="historical")
              SHADVL      REGDVL      BENCH
VaR -0.024338 -0.02772 -0.02656
> VaR(mydatadvl[,1:3], p=.99,method="modified")
              SHADVL      REGDVL      BENCH
VaR -0.0282271 -0.03029926 -0.0298818
>
> # Conditional Value at Risk
> ES(mydatadvl[,1:3], p=.99,method="gaussian")
              SHADVL      REGDVL      BENCH
ES -0.02260424 -0.02365074 -0.023243
> ES(mydatadvl[,1:3], p=.99,method="historical")
              SHADVL      REGDVL      BENCH
ES -0.0319425 -0.03388313 -0.03337562
> ES(mydatadvl[,1:3], p=.99,method="modified")
              SHADVL      REGDVL      BENCH
ES -0.0282271 -0.03029926 -0.0298818
>
> # Different Sharpe Ratios
> SharpeRatio(mydatadvl[,1:3], Rf = mydatadvl[,4,drop=FALSE],p=0.99, method="gaussian")
              SHADVL      REGDVL      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.05921155 0.05761972 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.02612832 0.02540794 0.02463065
ES Sharpe (Rf=0%, p=99%): 0.02273048 0.02210581 0.02143165
> SharpeRatio(mydatadvl[,1:3], Rf = mydatadvl[,4,drop=FALSE],p=0.99, method="historical")
              SHADVL      REGDVL      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.05921155 0.05761972 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.02111124 0.01886070 0.01875511
ES Sharpe (Rf=0%, p=99%): 0.01608532 0.01543006 0.01492514
> SharpeRatio(mydatadvl[,1:3], Rf = mydatadvl[,4,drop=FALSE],p=0.99, method="modified")
              SHADVL      REGDVL      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.05921155 0.05761972 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.01820255 0.01725516 0.01667021
ES Sharpe (Rf=0%, p=99%): 0.01820255 0.01725516 0.01667021
>
> # Adjusted Sharpe Ratio
> AdjustedSharpeRatio(mydatadvl[,1:2], Rf = 0)
              SHADVL      REGDVL
Adjusted Sharpe ratio (Risk free = 0) 0.7785458 0.7528229

```

```

> # Traditional Sharpe ratio
> SharpeRatio(mydatadvs[,1:2], Rf = mydatadvs[,4], FUN="StdDev")
              SHADVS      REGDVS
StdDev Sharpe (Rf=0%, p=95%): 0.06158808 0.05761972
>
> # Sharpe Ratio annualized
> SharpeRatio.annualized(mydatadvs[,1:2], Rf = mydatadvs[,4,drop=FALSE])
              SHADVS      REGDVS
Annualized Sharpe Ratio (Rf=0%) 0.9643854 0.8956303
>
> # Value at Risk
> VaR(mydatadvs[,1:3], p=.99,method="gaussian")
              SHADVS      REGDVS      BENCH
VaR -0.02333399 -0.02057698 -0.02022423
> VaR(mydatadvs[,1:3], p=.99,method="historical")
              SHADVS      REGDVS      BENCH
VaR -0.027954 -0.02772 -0.02656
> VaR(mydatadvs[,1:3], p=.99,method="modified")
              SHADVS      REGDVS      BENCH
VaR -0.03493458 -0.03029926 -0.0298818
>
> # Conditional Value at Risk
> ES(mydatadvs[,1:3], p=.99,method="gaussian")
              SHADVS      REGDVS      BENCH
ES -0.02682566 -0.02365074 -0.023243
> ES(mydatadvs[,1:3], p=.99,method="historical")
              SHADVS      REGDVS      BENCH
ES -0.03824562 -0.03388313 -0.03337562
> ES(mydatadvs[,1:3], p=.99,method="modified")
              SHADVS      REGDVS      BENCH
ES -0.03493458 -0.03029926 -0.0298818
>
> # Different Sharpe Ratios
> SharpeRatio(mydatadvs[,1:3], Rf = mydatadvs[,4,drop=FALSE],p=0.99, method="gaussian")
              SHADVS      REGDVS      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.06158808 0.05761972 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.02720515 0.02540794 0.02463065
ES Sharpe (Rf=0%, p=99%): 0.02366408 0.02210581 0.02143165
> SharpeRatio(mydatadvs[,1:3], Rf = mydatadvs[,4,drop=FALSE],p=0.99, method="historical")
              SHADVS      REGDVS      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.06158808 0.05761972 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.02270890 0.01886070 0.01875511
ES Sharpe (Rf=0%, p=99%): 0.01659810 0.01543006 0.01492514
> SharpeRatio(mydatadvs[,1:3], Rf = mydatadvs[,4,drop=FALSE],p=0.99, method="modified")
              SHADVS      REGDVS      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.06158808 0.05761972 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.01817124 0.01725516 0.01667021
ES Sharpe (Rf=0%, p=99%): 0.01817124 0.01725516 0.01667021
>
> # Adjusted Sharpe Ratio
> AdjustedSharpeRatio(mydatadvs[,1:2], Rf = 0)
              SHADVS      REGDVS
Adjusted Sharpe ratio (Risk free = 0) 0.7662863 0.7528229

```

```

> # Traditional Sharpe ratio
> SharpeRatio(mydatanam[,1:2], Rf = mydatanam[,4], FUN="StdDev")
              SHANAM      REGNAM
StdDev Sharpe (Rf=0%, p=95%): 0.05372773 0.05527921
>
> # Sharpe Ratio annualized
> SharpeRatio.annualized(mydatanam[,1:2], Rf = mydatanam[,4,drop=FALSE])
              SHANAM      REGNAM
Annualized Sharpe Ratio (Rf=0%) 0.8234644 0.8503909
>
> # Value at Risk
> VaR(mydatanam[,1:3], p=.99,method="gaussian")
              SHANAM      REGNAM      BENCH
VaR -0.02226105 -0.02280671 -0.02022423
> VaR(mydatanam[,1:3], p=.99,method="historical")
              SHANAM      REGNAM      BENCH
VaR -0.02682 -0.029242 -0.02656
> VaR(mydatanam[,1:3], p=.99,method="modified")
              SHANAM      REGNAM      BENCH
VaR -0.03251304 -0.03480431 -0.0298818
>
> # Conditional Value at Risk
> ES(mydatanam[,1:3], p=.99,method="gaussian")
              SHANAM      REGNAM      BENCH
ES -0.02558065 -0.02621 -0.023243
> ES(mydatanam[,1:3], p=.99,method="historical")
              SHANAM      REGNAM      BENCH
ES -0.03576937 -0.03751 -0.03337562
> ES(mydatanam[,1:3], p=.99,method="modified")
              SHANAM      REGNAM      BENCH
ES -0.03251304 -0.03480431 -0.0298818
>
> # Different Sharpe Ratios
> SharpeRatio(mydatanam[,1:3], Rf = mydatanam[,4,drop=FALSE],p=0.99, method="gaussian")
              SHANAM      REGNAM      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.05372773 0.05527921 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.02365099 0.02435053 0.02463065
ES Sharpe (Rf=0%, p=99%): 0.02058180 0.02118869 0.02143165
> SharpeRatio(mydatanam[,1:3], Rf = mydatanam[,4,drop=FALSE],p=0.99, method="historical")
              SHANAM      REGNAM      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.05372773 0.05527921 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.01963072 0.01899171 0.01875511
ES Sharpe (Rf=0%, p=99%): 0.01471918 0.01480553 0.01492514
> SharpeRatio(mydatanam[,1:3], Rf = mydatanam[,4,drop=FALSE],p=0.99, method="modified")
              SHANAM      REGNAM      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.05372773 0.05527921 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.01619337 0.01595652 0.01667021
ES Sharpe (Rf=0%, p=99%): 0.01619337 0.01595652 0.01667021
>
> # Adjusted Sharpe Ratio
> AdjustedSharpeRatio(mydatanam[,1:2], Rf = 0)
              SHANAM      REGNAM
Adjusted Sharpe ratio (Risk free = 0) 0.7207364 0.7142142

```

```

> # Traditional Sharpe ratio
> SharpeRatio(mydatarok[,1:2], Rf = mydatarok[,4], FUN="StdDev")
              SHAROK      REGROK
StdDev Sharpe (Rf=0%, p=95%): 0.03910254 0.03489046
>
> # Sharpe Ratio annualized
> SharpeRatio.annualized(mydatarok[,1:2], Rf = mydatarok[,4,drop=FALSE])
              SHAROK      REGROK
Annualized Sharpe Ratio (Rf=0%) 0.5301203 0.4630863
>
> # Value at Risk
> VaR(mydatarok[,1:3], p=.99,method="gaussian")
              SHAROK      REGROK      BENCH
VaR -0.03509449 -0.03263823 -0.02022834
> VaR(mydatarok[,1:3], p=.99,method="historical")
              SHAROK      REGROK      BENCH
VaR -0.044706 -0.04318 -0.02656
> VaR(mydatarok[,1:3], p=.99,method="modified")
              SHAROK      REGROK      BENCH
VaR -0.04533356 -0.04512777 -0.02987265
>
> # Conditional Value at Risk
> ES(mydatarok[,1:3], p=.99,method="gaussian")
              SHAROK      REGROK      BENCH
ES -0.0402942 -0.03746514 -0.02324824
> ES(mydatarok[,1:3], p=.99,method="historical")
              SHAROK      REGROK      BENCH
ES -0.05442625 -0.05347188 -0.03337562
> ES(mydatarok[,1:3], p=.99,method="modified")
              SHAROK      REGROK      BENCH
ES -0.05310535 -0.04512777 -0.02987265
>
> # Different Sharpe Ratios
> SharpeRatio(mydatarok[,1:3], Rf = mydatarok[,4,drop=FALSE],p=0.99, method="gaussian")
              SHAROK      REGROK      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.03910254 0.03489046 0.05628865
VaR Sharpe (Rf=0%, p=99%): 0.01710236 0.01523211 0.02480648
ES Sharpe (Rf=0%, p=99%): 0.01489541 0.01326965 0.02158416
> SharpeRatio(mydatarok[,1:3], Rf = mydatarok[,4,drop=FALSE],p=0.99, method="historical")
              SHAROK      REGROK      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.03910254 0.034890458 0.05628865
VaR Sharpe (Rf=0%, p=99%): 0.01342546 0.011513415 0.01889284
ES Sharpe (Rf=0%, p=99%): 0.01102774 0.009297397 0.01503474
> SharpeRatio(mydatarok[,1:3], Rf = mydatarok[,4,drop=FALSE],p=0.99, method="modified")
              SHAROK      REGROK      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.03910254 0.03489046 0.05628865
VaR Sharpe (Rf=0%, p=99%): 0.01323961 0.01101648 0.01679776
ES Sharpe (Rf=0%, p=99%): 0.01130204 0.01101648 0.01679776
>
> # Adjusted Sharpe Ratio
> AdjustedSharpeRatio(mydatarok[,1:2], Rf = 0)
              SHAROK      REGROK
Adjusted Sharpe ratio (Risk free = 0) 0.5847206 0.5178834

```

```

> # Traditional Sharpe ratio
> SharpeRatio(mydatauk[,1:2], Rf = mydatauk[,4], FUN="StdDev")
          SHAUK      REGUK
StdDev Sharpe (Rf=0%, p=95%): 0.03583859 0.0404584
>
> # Sharpe Ratio annualized
> SharpeRatio.annualized(mydatauk[,1:2], Rf = mydatauk[,4,drop=FALSE])
          SHAUK      REGUK
Annualized Sharpe Ratio (Rf=0%) 0.4942449 0.577122
>
> # Value at Risk
> VaR(mydatauk[,1:3], p=.99,method="gaussian")
          SHAUK      REGUK      BENCH
VaR -0.02792115 -0.02715265 -0.02022423
> VaR(mydatauk[,1:3], p=.99,method="historical")
          SHAUK      REGUK      BENCH
VaR -0.032496 -0.032388 -0.02656
> VaR(mydatauk[,1:3], p=.99,method="modified")
          SHAUK      REGUK      BENCH
VaR -0.03508268 -0.03537409 -0.0298818
>
> # Conditional Value at Risk
> ES(mydatauk[,1:3], p=.99,method="gaussian")
          SHAUK      REGUK      BENCH
ES -0.0320522 -0.03117812 -0.023243
> ES(mydatauk[,1:3], p=.99,method="historical")
          SHAUK      REGUK      BENCH
ES -0.04004312 -0.0398 -0.03337562
> ES(mydatauk[,1:3], p=.99,method="modified")
          SHAUK      REGUK      BENCH
ES -0.04376629 -0.04193276 -0.0298818
>
> # Different Sharpe Ratios
> SharpeRatio(mydatauk[,1:3], Rf = mydatauk[,4,drop=FALSE],p=0.99, method="gaussian")
          SHAUK      REGUK      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.03583859 0.04045840 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.01565266 0.01770614 0.02463065
ES Sharpe (Rf=0%, p=99%): 0.01363527 0.01542007 0.02143165
> SharpeRatio(mydatauk[,1:3], Rf = mydatauk[,4,drop=FALSE],p=0.99, method="historical")
          SHAUK      REGUK      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.03583859 0.04045840 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.01344905 0.01484404 0.01875511
ES Sharpe (Rf=0%, p=99%): 0.01091424 0.01207962 0.01492514
> SharpeRatio(mydatauk[,1:3], Rf = mydatauk[,4,drop=FALSE],p=0.99, method="modified")
          SHAUK      REGUK      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.035838586 0.04045840 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.012457441 0.01359099 0.01667021
ES Sharpe (Rf=0%, p=99%): 0.009985777 0.01146523 0.01667021
>
> # Adjusted Sharpe Ratio
> AdjustedSharpeRatio(mydatauk[,1:2], Rf = 0)
          SHAUK      REGUK
Adjusted Sharpe ratio (Risk free = 0) 0.5470641 0.6072956

```

```

> # Traditional Sharpe ratio
> SharpeRatio(mydataus[,1:2], Rf = mydataus[,4], FUN="StdDev")
          SHAUS      REGUS
StdDev Sharpe (Rf=0%, p=95%): 0.06388611 0.06498342
>
> # Sharpe Ratio annualized
> SharpeRatio.annualized(mydataus[,1:2], Rf = mydataus[,4,drop=FALSE])
          SHAUS      REGUS
Annualized Sharpe Ratio (Rf=0%) 1.007609 1.027255
>
> # Value at Risk
> VaR(mydataus[,1:3], p=.99,method="gaussian")
          SHAUS      REGUS      BENCH
VaR -0.02213768 -0.02296828 -0.02022423
> VaR(mydataus[,1:3], p=.99,method="historical")
          SHAUS      REGUS      BENCH
VaR -0.026456 -0.028976 -0.02656
> VaR(mydataus[,1:3], p=.99,method="modified")
          SHAUS      REGUS      BENCH
VaR -0.03263771 -0.03552676 -0.0298818
>
> # Conditional Value at Risk
> ES(mydataus[,1:3], p=.99,method="gaussian")
          SHAUS      REGUS      BENCH
ES -0.02545372 -0.02641039 -0.023243
> ES(mydataus[,1:3], p=.99,method="historical")
          SHAUS      REGUS      BENCH
ES -0.03570625 -0.03787313 -0.03337562
> ES(mydataus[,1:3], p=.99,method="modified")
          SHAUS      REGUS      BENCH
ES -0.03263771 -0.03552676 -0.0298818
>
> # Different Sharpe Ratios
> SharpeRatio(mydataus[,1:3], Rf = mydataus[,4,drop=FALSE],p=0.99, method="gaussian")
          SHAUS      REGUS      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.06388611 0.06498342 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.02824904 0.02874811 0.02463065
ES Sharpe (Rf=0%, p=99%): 0.02456884 0.02500132 0.02143165
> SharpeRatio(mydataus[,1:3], Rf = mydataus[,4,drop=FALSE],p=0.99, method="historical")
          SHAUS      REGUS      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.06388611 0.06498342 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.02363805 0.02278764 0.01875511
ES Sharpe (Rf=0%, p=99%): 0.01751425 0.01743439 0.01492514
> SharpeRatio(mydataus[,1:3], Rf = mydataus[,4,drop=FALSE],p=0.99, method="modified")
          SHAUS      REGUS      BENCH
StdDev Sharpe (Rf=0%, p=99%): 0.06388611 0.06498342 0.05589927
VaR Sharpe (Rf=0%, p=99%): 0.01916092 0.01858584 0.01667021
ES Sharpe (Rf=0%, p=99%): 0.01916092 0.01858584 0.01667021
>
> # Adjusted Sharpe Ratio
> AdjustedSharpeRatio(mydataus[,1:2], Rf = 0)
          SHAUS      REGUS
Adjusted Sharpe ratio (Risk free = 0) 0.7965161 0.7685172

```

### 15. Information ratio (Excel)

|                                                         | SHA500 | REG500 | BENCH   | SHAASP<br>AC | REGASP<br>AC | BENCH   | SHABEL | REGBEL | BENCH   | SHABRA  | REGBRA  | BENCH   |
|---------------------------------------------------------|--------|--------|---------|--------------|--------------|---------|--------|--------|---------|---------|---------|---------|
| Tracking error (index-based) (%)                        | 0,46%  | 0,46%  | 0,00%   | 0,95%        | 0,94%        | 0,00%   | 0,86%  | 0,82%  | 0,00%   | 1,22%   | 1,25%   | 0,00%   |
| Tracking volatility index-based) (%)                    | 7,23%  | 7,34%  | 0,00%   | 15,01%       | 14,98%       | 0,00%   | 13,60% | 12,97% | 0,00%   | 19,42%  | 19,86%  | 0,00%   |
| (Annualized) return premium (over the index) (%)        | 3,00%  | 4,09%  | 0,00%   | -4,13%       | -3,55%       | 0,00%   | -5,83% | 1,74%  | 0,00%   | -15,79% | -15,38% | 0,00%   |
| (Passive) Information ratio - Index Based               | 0,41   | 0,56   | #DIV/0! | -0,28        | -0,24        | #DIV/0! | -0,43  | 0,13   | #DIV/0! | -0,81   | -0,77   | #DIV/0! |
| t-ratio test with H0: IR= 0                             | 1,01   | 1,36   | #DIV/0! | -0,68        | -0,59        | #DIV/0! | -1,07  | 0,33   | #DIV/0! | -2,02   | -1,93   | #DIV/0! |
| Two-tailed p-value                                      | 31,05% | 17,32% | #DIV/0! | 49,35%       | 55,53%       | #DIV/0! | 28,62% | 73,92% | #DIV/0! | 4,32%   | 5,41%   | #DIV/0! |
| Years required for the IR to be significant at 5% level | 24     | 13     | #DIV/0! | 50           | 67           | #DIV/0! | 21     | 211    | #DIV/0! | 6       | 6       | #DIV/0! |

|                                                         | SHACHI | REGCHI | BENCH   | SHAEME | REGEME | BENCH   | SHAEUR | REGEUR | BENCH   | SHAFRA | REGFRA | BENCH   |
|---------------------------------------------------------|--------|--------|---------|--------|--------|---------|--------|--------|---------|--------|--------|---------|
| Tracking error (index-based) (%)                        | 1,01%  | 1,10%  | 0,00%   | 0,58%  | 0,58%  | 0,00%   | 0,59%  | 0,67%  | 0,00%   | 0,84%  | 0,90%  | 0,00%   |
| Tracking volatility index-based) (%)                    | 15,96% | 17,39% | 0,00%   | 9,29%  | 9,17%  | 0,00%   | 9,43%  | 10,57% | 0,00%   | 13,36% | 14,35% | 0,00%   |
| (Annualized) return premium (over the index) (%)        | -0,84% | -3,46% | 0,00%   | -7,38% | -5,34% | 0,00%   | -4,89% | -6,65% | 0,00%   | -2,92% | -4,16% | 0,00%   |
| (Passive) Information ratio - Index Based               | -0,05  | -0,20  | #DIV/0! | -0,79  | -0,58  | #DIV/0! | -0,52  | -0,63  | #DIV/0! | -0,22  | -0,29  | #DIV/0! |
| t-ratio test with H0: IR= 0                             | -0,13  | -0,49  | #DIV/0! | -1,98  | -1,45  | #DIV/0! | -1,28  | -1,56  | #DIV/0! | -0,54  | -0,72  | #DIV/0! |
| Two-tailed p-value                                      | 89,61% | 62,10% | #DIV/0! | 4,81%  | 14,76% | #DIV/0! | 20,05% | 11,98% | #DIV/0! | 58,72% | 47,06% | #DIV/0! |
| Years required for the IR to be significant at 5% level | 1369   | 96     | #DIV/0! | 6      | 11     | #DIV/0! | 14     | 10     | #DIV/0! | 79     | 45     | #DIV/0! |

|                                                         | SHAGER | REGGER | BENCH   | SHAJAP | REGJAP | BENCH   | SHADVL | REGDVL | BENCH   | SHADVS | REGDVS | BENCH   |
|---------------------------------------------------------|--------|--------|---------|--------|--------|---------|--------|--------|---------|--------|--------|---------|
| Tracking error (index-based) (%)                        | 0,88%  | 0,88%  | 0,00%   | 1,23%  | 1,26%  | 0,00%   | 0,17%  | 0,07%  | 0,00%   | 0,32%  | 0,07%  | 0,00%   |
| Tracking volatility index-based) (%)                    | 14,02% | 14,00% | 0,00%   | 19,46% | 20,01% | 0,00%   | 2,76%  | 1,14%  | 0,00%   | 5,04%  | 1,14%  | 0,00%   |
| (Annualized) return premium (over the index) (%)        | -1,14% | -1,86% | 0,00%   | -3,70% | -4,66% | 0,00%   | 0,50%  | 0,66%  | 0,00%   | 3,54%  | 0,66%  | 0,00%   |
| (Passive) Information ratio - Index Based               | -0,08  | -0,13  | #DIV/0! | -0,19  | -0,23  | #DIV/0! | 0,18   | 0,58   | #DIV/0! | 0,70   | 0,58   | #DIV/0! |
| t-ratio test with H0: IR= 0                             | -0,20  | -0,33  | #DIV/0! | -0,47  | -0,58  | #DIV/0! | 0,45   | 1,44   | #DIV/0! | 1,75   | 1,44   | #DIV/0! |
| Two-tailed p-value                                      | 84,03% | 74,09% | #DIV/0! | 63,58% | 56,23% | #DIV/0! | 65,04% | 15,14% | #DIV/0! | 8,08%  | 15,14% | #DIV/0! |
| Years required for the IR to be significant at 5% level | 575    | 214    | #DIV/0! | 104    | 70     | #DIV/0! | 114    | 11     | #DIV/0! | 8      | 11     | #DIV/0! |

|                                                         | SHANAM | REGNAM | BENCH   | SHAROK | REGROK | BENCH   | SHAUK  | REGUK  | BENCH   | SHAUS  | REGUS  | BENCH   |
|---------------------------------------------------------|--------|--------|---------|--------|--------|---------|--------|--------|---------|--------|--------|---------|
| Tracking error (index-based) (%)                        | 0,43%  | 0,43%  | 0,00%   | 1,40%  | 1,29%  | 0,00%   | 0,67%  | 0,62%  | 0,00%   | 0,46%  | 0,47%  | 0,00%   |
| Tracking volatility index-based) (%)                    | 6,83%  | 6,84%  | 0,00%   | 22,28% | 20,52% | 0,00%   | 10,61% | 9,81%  | 0,00%   | 7,30%  | 7,48%  | 0,00%   |
| (Annualized) return premium (over the index) (%)        | 0,57%  | 1,32%  | 0,00%   | 0,57%  | -1,87% | 0,00%   | -2,68% | -1,35% | 0,00%   | 3,42%  | 4,33%  | 0,00%   |
| (Passive) Information ratio - Index Based               | 0,08   | 0,19   | #DIV/0! | 0,03   | -0,09  | #DIV/0! | -0,25  | -0,14  | #DIV/0! | 0,47   | 0,58   | #DIV/0! |
| t-ratio test with H0: IR= 0                             | 0,21   | 0,48   | #DIV/0! | 0,06   | -0,23  | #DIV/0! | -0,63  | -0,34  | #DIV/0! | 1,16   | 1,44   | #DIV/0! |
| Two-tailed p-value                                      | 83,55% | 63,11% | #DIV/0! | 94,92% | 82,06% | #DIV/0! | 53,00% | 73,13% | #DIV/0! | 24,44% | 15,00% | #DIV/0! |
| Years required for the IR to be significant at 5% level | 542    | 101    | #DIV/0! | 5760   | 455    | #DIV/0! | 59     | 198    | #DIV/0! | 17     | 11     | #DIV/0! |

## 16. Downside Risk (Excel)

|                                                      | SHA500  | REG500  | BENCH   | SHAASP<br>AC | REGASP<br>AC | BENCH   | SHABEL  | REGBEL  | BENCH   | SHABRA  | REGBRA  | BENCH   |
|------------------------------------------------------|---------|---------|---------|--------------|--------------|---------|---------|---------|---------|---------|---------|---------|
| <i>Annualised minimum acceptable return</i>          | 4%      | 0,0159% |         | 4%           | 0,0159%      |         | 4%      | 0,0159% |         | 4%      | 0,0159% |         |
|                                                      |         |         |         |              |              |         |         |         |         |         |         |         |
| (Daily) Downside risk                                | 0,0066  | 0,0069  | 0,0064  | 0,0073       | 0,0072       | 0,0064  | 0,0098  | 0,0095  | 0,0064  | 0,0121  | 0,0122  | 0,0064  |
| <b>Downside volatility</b>                           | 10,55%  | 11,01%  | 10,16%  | 11,64%       | 11,37%       | 10,10%  | 15,57%  | 15,12%  | 10,10%  | 19,25%  | 19,32%  | 10,10%  |
| Sortino ratio = Kappa-2                              | 0,071   | 0,074   | 0,057   | 0,028        | 0,032        | 0,054   | 0,019   | 0,048   | 0,054   | -0,013  | -0,011  | 0,054   |
|                                                      |         |         |         |              |              |         |         |         |         |         |         |         |
| (Average) down (return) = Downside potential         | 0,00306 | 0,00315 | 0,00297 | 0,00371      | 0,00363      | 0,00297 | 0,00500 | 0,00475 | 0,00297 | 0,00626 | 0,00633 | 0,00297 |
| (Average) up (return) = Upside potential             | 0,00351 | 0,00364 | 0,00331 | 0,00392      | 0,00386      | 0,00332 | 0,00519 | 0,00521 | 0,00332 | 0,00610 | 0,00619 | 0,00331 |
| <b>Omega</b>                                         | 1,15    | 1,16    | 1,12    | 1,06         | 1,06         | 1,12    | 1,04    | 1,10    | 1,12    | 0,97    | 0,98    | 1,11    |
| Omega Sharpe ratio = Kappa-1                         | 0,1538  | 0,1627  | 0,1222  | 0,0561       | 0,0625       | 0,1160  | 0,0382  | 0,0969  | 0,1160  | -0,0254 | -0,0220 | 0,1147  |
| Upside potential ratio = Upside downside ratio (UDR) | 0,529   | 0,524   | 0,518   | 0,534        | 0,538        | 0,522   | 0,529   | 0,547   | 0,522   | 0,503   | 0,509   | 0,521   |

|                                                      | SHACHI  | REGCHI  | BENCH   | SHAEME  | REGEME  | BENCH   | SHAEUR  | REGEUR  | BENCH   | SHAFRA  | REGFRA  | BENCH   |
|------------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <i>Annualised minimum acceptable return</i>          | 4%      | 0,0159% |         | 4%      | 0,0159% |         | 4%      | 0,0159% |         | 4%      | 0,0159% |         |
|                                                      |         |         |         |         |         |         |         |         |         |         |         |         |
| (Daily) Downside risk                                | 0,0083  | 0,0088  | 0,0064  | 0,0068  | 0,0070  | 0,0064  | 0,0084  | 0,0094  | 0,0064  | 0,0099  | 0,0110  | 0,0064  |
| <b>Downside volatility</b>                           | 13,15%  | 13,99%  | 10,10%  | 10,82%  | 11,15%  | 10,10%  | 13,29%  | 14,87%  | 10,20%  | 15,70%  | 17,40%  | 10,10%  |
| Sortino ratio = Kappa-2                              | 0,042   | 0,029   | 0,054   | 0,011   | 0,022   | 0,054   | 0,025   | 0,017   | 0,055   | 0,030   | 0,025   | 0,054   |
|                                                      |         |         |         |         |         |         |         |         |         |         |         |         |
| (Average) down (return) = Downside potential         | 0,00420 | 0,00444 | 0,00297 | 0,00336 | 0,00348 | 0,00297 | 0,00421 | 0,00468 | 0,00301 | 0,00504 | 0,00546 | 0,00297 |
| (Average) up (return) = Upside potential             | 0,00455 | 0,00470 | 0,00332 | 0,00343 | 0,00363 | 0,00331 | 0,00442 | 0,00484 | 0,00337 | 0,00534 | 0,00573 | 0,00331 |
| <b>Omega</b>                                         | 1,08    | 1,06    | 1,12    | 1,02    | 1,04    | 1,11    | 1,05    | 1,03    | 1,12    | 1,06    | 1,05    | 1,11    |
| Omega Sharpe ratio = Kappa-1                         | 0,0819  | 0,0585  | 0,1160  | 0,0224  | 0,0446  | 0,1147  | 0,0487  | 0,0335  | 0,1168  | 0,0590  | 0,0501  | 0,1147  |
| Upside potential ratio = Upside downside ratio (UDR) | 0,549   | 0,533   | 0,522   | 0,504   | 0,517   | 0,521   | 0,528   | 0,516   | 0,524   | 0,540   | 0,523   | 0,521   |

|                                                      | SHAGER  | REGGER  | BENCH   | SHAJAP  | REGJAP  | BENCH   | SHADV L | REGDVL  | BENCH   | SHADVS  | REGDVS  | BENCH   |
|------------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <i>Annualised minimum acceptable return</i>          | 4%      | 0,0159% |         | 4%      | 0,0159% |         | 4%      | 0,0159% |         | 4%      | 0,0159% |         |
|                                                      |         |         |         |         |         |         |         |         |         |         |         |         |
| (Daily) Downside risk                                | 0,0104  | 0,0107  | 0,0064  | 0,0079  | 0,0083  | 0,0064  | 0,0061  | 0,0065  | 0,0064  | 0,0074  | 0,0065  | 0,0064  |
| <b>Downside volatility</b>                           | 16,59%  | 17,06%  | 10,10%  | 12,50%  | 13,13%  | 10,10%  | 9,76%   | 10,25%  | 10,10%  | 11,69%  | 10,25%  | 10,10%  |
| Sortino ratio = Kappa-2                              | 0,036   | 0,033   | 0,054   | 0,029   | 0,024   | 0,054   | 0,058   | 0,057   | 0,054   | 0,065   | 0,057   | 0,054   |
|                                                      |         |         |         |         |         |         |         |         |         |         |         |         |
| (Average) down (return) = Downside potential         | 0,00527 | 0,00533 | 0,00297 | 0,00407 | 0,00425 | 0,00297 | 0,00288 | 0,00301 | 0,00297 | 0,00344 | 0,00301 | 0,00297 |
| (Average) up (return) = Upside potential             | 0,00564 | 0,00568 | 0,00331 | 0,00430 | 0,00445 | 0,00331 | 0,00324 | 0,00338 | 0,00331 | 0,00392 | 0,00338 | 0,00331 |
| <b>Omega</b>                                         | 1,07    | 1,07    | 1,11    | 1,06    | 1,05    | 1,11    | 1,12    | 1,12    | 1,11    | 1,14    | 1,12    | 1,11    |
| Omega Sharpe ratio = Kappa-1                         | 0,0704  | 0,0660  | 0,1147  | 0,0566  | 0,0472  | 0,1147  | 0,1237  | 0,1215  | 0,1147  | 0,1388  | 0,1215  | 0,1147  |
| Upside potential ratio = Upside downside ratio (UDR) | 0,540   | 0,529   | 0,521   | 0,546   | 0,538   | 0,521   | 0,527   | 0,523   | 0,521   | 0,532   | 0,523   | 0,521   |

|                                                      | SHANA<br>M | REGNA<br>M | BENCH   | SHAROK  | REGROK  | BENCH   | SHAUK   | REGUK   | BENCH   | SHAUS   | REGUS   | BENCH   |
|------------------------------------------------------|------------|------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <i>Annualised minimum acceptable return</i>          | 4%         | 0,0159%    |         | 4%      | 0,0159% |         | 4%      | 0,0159% |         | 4%      | 0,0159% |         |
|                                                      |            |            |         |         |         |         |         |         |         |         |         |         |
| (Daily) Downside risk                                | 0,0070     | 0,0072     | 0,0064  | 0,0109  | 0,0102  | 0,0064  | 0,0086  | 0,0084  | 0,0064  | 0,0069  | 0,0072  | 0,0064  |
| <b>Downside volatility</b>                           | 11,07%     | 11,39%     | 10,10%  | 17,31%  | 16,22%  | 10,10%  | 13,70%  | 13,32%  | 10,10%  | 10,98%  | 11,44%  | 10,10%  |
| Sortino ratio = Kappa-2                              | 0,053      | 0,056      | 0,054   | 0,041   | 0,033   | 0,054   | 0,032   | 0,039   | 0,054   | 0,068   | 0,070   | 0,054   |
|                                                      |            |            |         |         |         |         |         |         |         |         |         |         |
| (Average) down (return) = Downside potential         | 0,00324    | 0,00329    | 0,00297 | 0,00537 | 0,00491 | 0,00297 | 0,00430 | 0,00413 | 0,00297 | 0,00318 | 0,00327 | 0,00297 |
| (Average) up (return) = Upside potential             | 0,00361    | 0,00369    | 0,00331 | 0,00582 | 0,00525 | 0,00332 | 0,00458 | 0,00445 | 0,00331 | 0,00365 | 0,00377 | 0,00331 |
| <b>Omega</b>                                         | 1,11       | 1,12       | 1,11    | 1,08    | 1,07    | 1,12    | 1,07    | 1,08    | 1,11    | 1,15    | 1,15    | 1,11    |
| Omega Sharpe ratio = Kappa-1                         | 0,1140     | 0,1210     | 0,1147  | 0,0825  | 0,0693  | 0,1160  | 0,0651  | 0,0785  | 0,1147  | 0,1473  | 0,1539  | 0,1147  |
| Upside potential ratio = Upside downside ratio (UDR) | 0,518      | 0,514      | 0,521   | 0,533   | 0,514   | 0,522   | 0,531   | 0,531   | 0,521   | 0,527   | 0,524   | 0,521   |

## 17. Downside Risk (R)

```
> # Downside Risk Ratios
> table.DownsideRiskRatio(mydata500[,1:2],MAR=0.04/252)
```

|                          | SHA500 | REG500 |
|--------------------------|--------|--------|
| Monthly downside risk    | 0.0068 | 0.0071 |
| Annualised downside risk | 0.1074 | 0.1120 |
| Downside potential       | 0.0032 | 0.0033 |
| Omega                    | 1.1478 | 1.1562 |
| Sortino ratio            | 0.0692 | 0.0720 |
| Upside potential         | 0.0036 | 0.0038 |
| Upside potential ratio   | 0.6792 | 0.6530 |
| Omega-sharpe ratio       | 0.1478 | 0.1562 |

```
> # Downside Risk Ratios
> table.DownsideRiskRatio(mydataaspac[,1:2],MAR=0.04/252)
```

|                          | SHAASPAC | REGASPAC |
|--------------------------|----------|----------|
| Monthly downside risk    | 0.0073   | 0.0072   |
| Annualised downside risk | 0.1164   | 0.1137   |
| Downside potential       | 0.0037   | 0.0036   |
| Omega                    | 1.0561   | 1.0625   |
| Sortino ratio            | 0.0284   | 0.0317   |
| Upside potential         | 0.0039   | 0.0039   |
| Upside potential ratio   | 0.7020   | 0.7294   |
| Omega-sharpe ratio       | 0.0561   | 0.0625   |

```
> # Downside Risk Ratios
> table.DownsideRiskRatio(mydatabel[,1:2],MAR=0.04/252)
```

|                          | SHABEL | REGBEL |
|--------------------------|--------|--------|
| Monthly downside risk    | 0.0098 | 0.0095 |
| Annualised downside risk | 0.1557 | 0.1512 |
| Downside potential       | 0.0050 | 0.0047 |
| Omega                    | 1.0382 | 1.0969 |
| Sortino ratio            | 0.0195 | 0.0483 |
| Upside potential         | 0.0052 | 0.0052 |
| Upside potential ratio   | 0.7596 | 0.7410 |
| Omega-sharpe ratio       | 0.0382 | 0.0969 |

```
> # Downside Risk Ratios
> table.DownsideRiskRatio(mydatabra[,1:2],MAR=0.04/252)
```

|                          | SHABRA  | REGBRA  |
|--------------------------|---------|---------|
| Monthly downside risk    | 0.0121  | 0.0122  |
| Annualised downside risk | 0.1925  | 0.1932  |
| Downside potential       | 0.0063  | 0.0063  |
| Omega                    | 0.9746  | 0.9780  |
| Sortino ratio            | -0.0131 | -0.0114 |
| Upside potential         | 0.0061  | 0.0062  |
| Upside potential ratio   | 0.7091  | 0.7290  |
| Omega-sharpe ratio       | -0.0254 | -0.0220 |

```
> # Downside Risk Ratios
> table.DownsideRiskRatio(mydatachi[,1:2],MAR=0.04/252)
```

|                          | SHACHI | REGCHI |
|--------------------------|--------|--------|
| Monthly downside risk    | 0.0083 | 0.0088 |
| Annualised downside risk | 0.1315 | 0.1399 |
| Downside potential       | 0.0042 | 0.0044 |
| Omega                    | 1.0819 | 1.0585 |
| Sortino ratio            | 0.0416 | 0.0295 |
| Upside potential         | 0.0045 | 0.0047 |
| Upside potential ratio   | 0.7173 | 0.7435 |
| Omega-sharpe ratio       | 0.0819 | 0.0585 |

```
> # Downside Risk Ratios
> table.DownsideRiskRatio(mydataeme[,1:2],MAR=0.04/252)
```

|                          | SHAEME | REGEME |
|--------------------------|--------|--------|
| Monthly downside risk    | 0.0068 | 0.0070 |
| Annualised downside risk | 0.1082 | 0.1115 |
| Downside potential       | 0.0034 | 0.0035 |
| Omega                    | 1.0224 | 1.0447 |
| Sortino ratio            | 0.0110 | 0.0221 |
| Upside potential         | 0.0034 | 0.0036 |
| Upside potential ratio   | 0.6635 | 0.6917 |
| Omega-sharpe ratio       | 0.0224 | 0.0447 |

```
> # Downside Risk Ratios
> table.DownsideRiskRatio(mydataeur[,1:2],MAR=0.04/252)
```

|                          | SHAEUR | REGEUR |
|--------------------------|--------|--------|
| Monthly downside risk    | 0.0084 | 0.0094 |
| Annualised downside risk | 0.1329 | 0.1488 |
| Downside potential       | 0.0042 | 0.0047 |
| Omega                    | 1.0471 | 1.0322 |
| Sortino ratio            | 0.0237 | 0.0161 |
| Upside potential         | 0.0044 | 0.0048 |
| Upside potential ratio   | 0.7058 | 0.7106 |
| Omega-sharpe ratio       | 0.0471 | 0.0322 |

```
> # Downside Risk Ratios
> table.DownsideRiskRatio(mydatafra[,1:2],MAR=0.04/252)
```

|                          | SHAFRA | REGFRA |
|--------------------------|--------|--------|
| Monthly downside risk    | 0.0099 | 0.0110 |
| Annualised downside risk | 0.1570 | 0.1740 |
| Downside potential       | 0.0050 | 0.0055 |
| Omega                    | 1.0589 | 1.0501 |
| Sortino ratio            | 0.0301 | 0.0249 |
| Upside potential         | 0.0053 | 0.0057 |
| Upside potential ratio   | 0.7313 | 0.7206 |
| Omega-sharpe ratio       | 0.0589 | 0.0501 |

```
> # Downside Risk Ratios
> table.DownsideRiskRatio(mydatager[,1:2],MAR=0.04/252)
```

|                          | SHAGER | REGGER |
|--------------------------|--------|--------|
| Monthly downside risk    | 0.0104 | 0.0107 |
| Annualised downside risk | 0.1659 | 0.1706 |
| Downside potential       | 0.0053 | 0.0053 |
| Omega                    | 1.0704 | 1.0661 |
| Sortino ratio            | 0.0355 | 0.0328 |
| Upside potential         | 0.0056 | 0.0057 |
| Upside potential ratio   | 0.7312 | 0.7258 |
| Omega-sharpe ratio       | 0.0704 | 0.0661 |

```
> # Downside Risk Ratios
> table.DownsideRiskRatio(mydatajap[,1:2],MAR=0.04/252)
```

|                          | SHAJAP | REGJAP |
|--------------------------|--------|--------|
| Monthly downside risk    | 0.0079 | 0.0083 |
| Annualised downside risk | 0.1250 | 0.1313 |
| Downside potential       | 0.0041 | 0.0043 |
| Omega                    | 1.0566 | 1.0472 |
| Sortino ratio            | 0.0293 | 0.0243 |
| Upside potential         | 0.0043 | 0.0045 |
| Upside potential ratio   | 0.7481 | 0.7520 |
| Omega-sharpe ratio       | 0.0566 | 0.0472 |

```
> # Downside Risk Ratios
> table.DownsideRiskRatio(mydatadvl[,1:2],MAR=0.04/252)
```

|                          | SHADV L | REGDVL |
|--------------------------|---------|--------|
| Monthly downside risk    | 0.0061  | 0.0065 |
| Annualised downside risk | 0.0976  | 0.1025 |
| Downside potential       | 0.0029  | 0.0030 |
| Omega                    | 1.1237  | 1.1214 |
| Sortino ratio            | 0.0580  | 0.0567 |
| Upside potential         | 0.0032  | 0.0034 |
| Upside potential ratio   | 0.6759  | 0.6546 |
| Omega-sharpe ratio       | 0.1237  | 0.1214 |

```
> # Downside Risk Ratios
> table.DownsideRiskRatio(mydatadv[,1:2],MAR=0.04/252)
```

|                          | SHADVS | REGDVS |
|--------------------------|--------|--------|
| Monthly downside risk    | 0.0074 | 0.0065 |
| Annualised downside risk | 0.1169 | 0.1025 |
| Downside potential       | 0.0034 | 0.0030 |
| Omega                    | 1.1388 | 1.1214 |
| Sortino ratio            | 0.0649 | 0.0567 |
| Upside potential         | 0.0039 | 0.0034 |
| Upside potential ratio   | 0.6500 | 0.6546 |
| Omega-sharpe ratio       | 0.1388 | 0.1214 |

```
> # Downside Risk Ratios
> table.DownsideRiskRatio(mydatanam[,1:2],MAR=0.04/252)
```

|                          | SHANAM | REGNAM |
|--------------------------|--------|--------|
| Monthly downside risk    | 0.0070 | 0.0072 |
| Annualised downside risk | 0.1107 | 0.1139 |
| Downside potential       | 0.0032 | 0.0033 |
| Omega                    | 1.1139 | 1.1210 |
| Sortino ratio            | 0.0530 | 0.0555 |
| Upside potential         | 0.0036 | 0.0037 |
| Upside potential ratio   | 0.6579 | 0.6409 |
| Omega-sharpe ratio       | 0.1139 | 0.1210 |

```
> # Downside Risk Ratios
> table.DownsideRiskRatio(mydatarok[,1:2],MAR=0.04/252)
```

|                          | SHAROK | REGROK |
|--------------------------|--------|--------|
| Monthly downside risk    | 0.0109 | 0.0102 |
| Annualised downside risk | 0.1731 | 0.1622 |
| Downside potential       | 0.0054 | 0.0049 |
| Omega                    | 1.0825 | 1.0693 |
| Sortino ratio            | 0.0407 | 0.0333 |
| Upside potential         | 0.0058 | 0.0053 |
| Upside potential ratio   | 0.7295 | 0.7372 |
| Omega-sharpe ratio       | 0.0825 | 0.0693 |

```
> # Downside Risk Ratios
> table.DownsideRiskRatio(mydatauk[,1:2],MAR=0.04/252)
```

|                          | SHAUK  | REGUK  |
|--------------------------|--------|--------|
| Monthly downside risk    | 0.0086 | 0.0084 |
| Annualised downside risk | 0.1370 | 0.1332 |
| Downside potential       | 0.0043 | 0.0041 |
| Omega                    | 1.0651 | 1.0784 |
| Sortino ratio            | 0.0325 | 0.0386 |
| Upside potential         | 0.0046 | 0.0045 |
| Upside potential ratio   | 0.7098 | 0.6973 |
| Omega-sharpe ratio       | 0.0651 | 0.0784 |

```
> # Downside Risk Ratios
> table.DownsideRiskRatio(mydataus[,1:2],MAR=0.04/252)
```

|                          | SHAUS  | REGUS  |
|--------------------------|--------|--------|
| Monthly downside risk    | 0.0069 | 0.0072 |
| Annualised downside risk | 0.1098 | 0.1144 |
| Downside potential       | 0.0032 | 0.0033 |
| Omega                    | 1.1473 | 1.1540 |
| Sortino ratio            | 0.0677 | 0.0699 |
| Upside potential         | 0.0036 | 0.0038 |
| Upside potential ratio   | 0.6864 | 0.6791 |
| Omega-sharpe ratio       | 0.1473 | 0.1540 |

## 18. Cointegration (Eviews)

Null Hypothesis: SHA500 has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.783.226  | 0.2037 |
| Test critical values: 1% level         | -3.964.137  |        |
| 5% level                               | -3.412.791  |        |
| 10% level                              | -3.128.375  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHA500)

Method: Least Squares

Date: 08/06/15 Time: 11:50

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1509 after adjustments

| Variable            | Coefficient | Std. Error            | t-Statistic | Prob.  |
|---------------------|-------------|-----------------------|-------------|--------|
| SHA500(-1)          | -0.010181   | 0.003658              | -2.783.226  | 0.0054 |
| C                   | 9.973.531   | 3.401.464             | 2.932.129   | 0.0034 |
| @TREND("7/01/2009") | 0.009520    | 0.003443              | 2.765.153   | 0.0058 |
| R-squared           | 0.005166    | Mean dependent var    | 0.900423    |        |
| Adjusted R-squared  | 0.003844    | S.D. dependent var    | 1.424.712   |        |
| S.E. of regression  | 1.421.970   | Akaike info criterion | 8.149.120   |        |
| Sum squared resid   | 304513.2    | Schwarz criterion     | 8.159.695   |        |
| Log likelihood      | -6.145.511  | Hannan-Quinn criter.  | 8.153.059   |        |
| F-statistic         | 3.909.847   | Durbin-Watson stat    | 2.062.286   |        |
| Prob(F-statistic)   | 0.020247    |                       |             |        |

Null Hypothesis: D(SHA500) has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -4.017.617  | 0.0000 |
| Test critical values: 1% level         | -2.566.496  |        |
| 5% level                               | -1.941.034  |        |
| 10% level                              | -1.616.558  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHA500,2)

Method: Least Squares

Date: 08/06/15 Time: 11:51

Sample (adjusted): 7/06/2009 7/01/2015

Included observations: 1508 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| D(SHA500(-1))      | -1.033.543  | 0.025725              | -4.017.617  | 0.0000 |
| R-squared          | 0.517160    | Mean dependent var    | 0.025464    |        |
| Adjusted R-squared | 0.517160    | S.D. dependent var    | 2.051.793   |        |
| S.E. of regression | 1.425.722   | Akaike info criterion | 8.153.067   |        |
| Sum squared resid  | 306325.5    | Schwarz criterion     | 8.156.594   |        |
| Log likelihood     | -6.146.413  | Hannan-Quinn criter.  | 8.154.381   |        |
| Durbin-Watson stat | 1.997.826   |                       |             |        |

Null Hypothesis: REG500 has a unit root  
 Exogenous: Constant, Linear Trend  
 Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.738.956  | 0.2209 |
| Test critical values: 1% level         | -3.964.137  |        |
| 5% level                               | -3.412.791  |        |
| 10% level                              | -3.128.375  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REG500)

Method: Least Squares

Date: 08/06/15 Time: 11:51

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1509 after adjustments

| Variable            | Coefficient | Std. Error | t-Statistic | Prob.  |
|---------------------|-------------|------------|-------------|--------|
| REG500(-1)          | -0.009910   | 0.003618   | -2.738.956  | 0.0062 |
| C                   | 1.546.237   | 5.322.960  | 2.904.844   | 0.0037 |
| @TREND("7/01/2009") | 0.015736    | 0.005779   | 2.722.889   | 0.0065 |

|                    |            |                       |           |
|--------------------|------------|-----------------------|-----------|
| R-squared          | 0.005004   | Mean dependent var    | 1.549.119 |
| Adjusted R-squared | 0.003683   | S.D. dependent var    | 2.360.710 |
| S.E. of regression | 2.356.359  | Akaike info criterion | 9.159.269 |
| Sum squared resid  | 836195.8   | Schwarz criterion     | 9.169.844 |
| Log likelihood     | -6.907.668 | Hannan-Quinn criter.  | 9.163.207 |
| F-statistic        | 3.786.914  | Durbin-Watson stat    | 2.096.383 |
| Prob(F-statistic)  | 0.022882   |                       |           |

Null Hypothesis: D(REG500) has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -4.085.915  | 0.0000 |
| Test critical values: 1% level         | -2.566.496  |        |
| 5% level                               | -1.941.034  |        |
| 10% level                              | -1.616.558  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REG500,2)

Method: Least Squares

Date: 08/06/15 Time: 11:51

Sample (adjusted): 7/06/2009 7/01/2015

Included observations: 1508 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| D(REG500(-1))      | -1.050.454  | 0.025709              | -4.085.915  | 0.0000    |
| R-squared          | 0.525573    | Mean dependent var    |             | 0.047248  |
| Adjusted R-squared | 0.525573    | S.D. dependent var    |             | 3.427.571 |
| S.E. of regression | 2.360.865   | Akaike info criterion |             | 9.161.766 |
| Sum squared resid  | 839953.8    | Schwarz criterion     |             | 9.165.293 |
| Log likelihood     | -6.906.972  | Hannan-Quinn criter.  |             | 9.163.079 |
| Durbin-Watson stat | 1.995.561   |                       |             |           |

Null Hypothesis: ECT500 has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.520.314  | 0.0114 |
| Test critical values: 1% level         | -2.566.495  |        |
| 5% level                               | -1.941.033  |        |
| 10% level                              | -1.616.558  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECT500)

Method: Least Squares

Date: 08/06/15 Time: 11:53

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1509 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ECT500(-1)         | -0.008321   | 0.003301              | -2.520.314  | 0.0118    |
| R-squared          | 0.004156    | Mean dependent var    |             | 0.022283  |
| Adjusted R-squared | 0.004156    | S.D. dependent var    |             | 3.570.721 |
| S.E. of regression | 3.563.294   | Akaike info criterion |             | 5.379.910 |
| Sum squared resid  | 19147.17    | Schwarz criterion     |             | 5.383.435 |
| Log likelihood     | -4.058.142  | Hannan-Quinn criter.  |             | 5.381.223 |
| Durbin-Watson stat | 2.101.990   |                       |             |           |



Null Hypothesis: SHAASPAC has a unit root  
 Exogenous: Constant, Linear Trend  
 Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.885.103  | 0.0129 |
| Test critical values: 1% level         | -3.963.933  |        |
| 5% level                               | -3.412.691  |        |
| 10% level                              | -3.128.316  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHAASPAC)

Method: Least Squares

Date: 08/06/15 Time: 11:55

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable            | Coefficient | Std. Error | t-Statistic | Prob.  |
|---------------------|-------------|------------|-------------|--------|
| SHAASPAC(-1)        | -0.017797   | 0.004581   | -3.885.103  | 0.0001 |
| C                   | 1.390.679   | 0.350313   | 3.969.822   | 0.0001 |
| @TREND("7/01/2009") | 0.000310    | 9.75E-05   | 3.174.885   | 0.0015 |

|                    |            |                       |           |
|--------------------|------------|-----------------------|-----------|
| R-squared          | 0.009677   | Mean dependent var    | 0.026765  |
| Adjusted R-squared | 0.008406   | S.D. dependent var    | 0.877908  |
| S.E. of regression | 0.874211   | Akaike info criterion | 2.570.930 |
| Sum squared resid  | 1.190.693  | Schwarz criterion     | 2.581.217 |
| Log likelihood     | -2.003.610 | Hannan-Quinn criter.  | 2.574.754 |
| F-statistic        | 7.612.013  | Durbin-Watson stat    | 2.011.757 |
| Prob(F-statistic)  | 0.000513   |                       |           |

Null Hypothesis: REGASPAC has a unit root  
 Exogenous: Constant, Linear Trend  
 Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.390.162  | 0.0530 |
| Test critical values: 1% level         | -3.963.933  |        |
| 5% level                               | -3.412.691  |        |
| 10% level                              | -3.128.316  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGASPAC)

Method: Least Squares

Date: 08/06/15 Time: 11:56

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable            | Coefficient | Std. Error | t-Statistic | Prob.  |
|---------------------|-------------|------------|-------------|--------|
| REGASPAC(-1)        | -0.014271   | 0.004210   | -3.390.162  | 0.0007 |
| C                   | 2.584.072   | 0.742763   | 3.479.002   | 0.0005 |
| @TREND("7/01/2009") | 0.000835    | 0.000280   | 2.978.819   | 0.0029 |

|                    |            |                       |           |
|--------------------|------------|-----------------------|-----------|
| R-squared          | 0.007355   | Mean dependent var    | 0.071140  |
| Adjusted R-squared | 0.006081   | S.D. dependent var    | 2.110.658 |
| S.E. of regression | 2.104.231  | Akaike info criterion | 4.327.697 |
| Sum squared resid  | 6.898.493  | Schwarz criterion     | 4.337.985 |
| Log likelihood     | -3.374.768 | Hannan-Quinn criter.  | 4.331.522 |
| F-statistic        | 5.772.232  | Durbin-Watson stat    | 2.017.850 |
| Prob(F-statistic)  | 0.003180   |                       |           |



Null Hypothesis: SHABEL has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.288.706  | 0.0156 |
| Test critical values: 1% level         | -3.434.333  |        |
| 5% level                               | -2.863.186  |        |
| 10% level                              | -2.567.694  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHABEL)

Method: Least Squares

Date: 08/06/15 Time: 12:01

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| SHABEL(-1)         | -0.010059   | 0.003059              | -3.288.706  | 0.0010 |
| C                  | 0.888829    | 0.266430              | 3.336.074   | 0.0009 |
| R-squared          | 0.006890    | Mean dependent var    | 0.018052    |        |
| Adjusted R-squared | 0.006253    | S.D. dependent var    | 1.173.930   |        |
| S.E. of regression | 1.170.255   | Akaike info criterion | 3.153.600   |        |
| Sum squared resid  | 2.135.044   | Schwarz criterion     | 3.160.459   |        |
| Log likelihood     | -2.459.385  | Hannan-Quinn criter.  | 3.156.150   |        |
| F-statistic        | 1.081.559   | Durbin-Watson stat    | 1.944.306   |        |
| Prob(F-statistic)  | 0.001029    |                       |             |        |

Null Hypothesis: REGBEL has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.394.246  | 0.3824 |
| Test critical values: 1% level         | -3.963.933  |        |
| 5% level                               | -3.412.691  |        |
| 10% level                              | -3.128.316  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGBEL)

Method: Least Squares

Date: 08/06/15 Time: 12:01

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable            | Coefficient | Std. Error            | t-Statistic | Prob.  |
|---------------------|-------------|-----------------------|-------------|--------|
| REGBEL(-1)          | -0.007533   | 0.003146              | -2.394.246  | 0.0168 |
| C                   | 2.755.161   | 1.129.533             | 2.439.205   | 0.0148 |
| @TREND("7/01/2009") | 0.002127    | 0.000915              | 2.325.500   | 0.0202 |
| R-squared           | 0.003748    | Mean dependent var    | 0.286445    |        |
| Adjusted R-squared  | 0.002469    | S.D. dependent var    | 6.805.651   |        |
| S.E. of regression  | 6.797.245   | Akaike info criterion | 6.672.832   |        |
| Sum squared resid   | 71983.55    | Schwarz criterion     | 6.683.120   |        |
| Log likelihood      | -5.205.145  | Hannan-Quinn criter.  | 6.676.657   |        |
| F-statistic         | 2.930.600   | Durbin-Watson stat    | 2.064.974   |        |
| Prob(F-statistic)   | 0.053659    |                       |             |        |



Null Hypothesis: SHAEUR has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.354.995  | 0.0580 |
| Test critical values: 1% level         | -3.964.014  |        |
| 5% level                               | -3.412.730  |        |
| 10% level                              | -3.128.340  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHAEUR)

Method: Least Squares

Date: 08/06/15 Time: 12:13

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1540 after adjustments

| Variable            | Coefficient | Std. Error            | t-Statistic | Prob.  |
|---------------------|-------------|-----------------------|-------------|--------|
| SHAEUR(-1)          | -0.014796   | 0.004410              | -3.354.995  | 0.0008 |
| C                   | 1.640.136   | 4.748.508             | 3.454.003   | 0.0006 |
| @TREND("7/01/2009") | 0.005500    | 0.001958              | 2.808.988   | 0.0050 |
| R-squared           | 0.007406    | Mean dependent var    | 0.373299    |        |
| Adjusted R-squared  | 0.006115    | S.D. dependent var    | 1.509.256   |        |
| S.E. of regression  | 1.504.635   | Akaike info criterion | 8.262.094   |        |
| Sum squared resid   | 347965.4    | Schwarz criterion     | 8.272.495   |        |
| Log likelihood      | -6.358.812  | Hannan-Quinn criter.  | 8.265.964   |        |
| F-statistic         | 5.734.121   | Durbin-Watson stat    | 2.034.143   |        |
| Prob(F-statistic)   | 0.003303    |                       |             |        |

Null Hypothesis: D(SHAEUR) has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -4.028.680  | 0.0000 |
| Test critical values: 1% level         | -2.566.465  |        |
| 5% level                               | -1.941.029  |        |
| 10% level                              | -1.616.561  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHAEUR,2)

Method: Least Squares

Date: 08/06/15 Time: 12:13

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1539 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| D(SHAEUR(-1))      | -1.025.825  | 0.025463              | -4.028.680  | 0.0000 |
| R-squared          | 0.513448    | Mean dependent var    | 0.031287    |        |
| Adjusted R-squared | 0.513448    | S.D. dependent var    | 2.161.211   |        |
| S.E. of regression | 1.507.515   | Akaike info criterion | 8.264.622   |        |
| Sum squared resid  | 349526.2    | Schwarz criterion     | 8.268.091   |        |
| Log likelihood     | -6.358.627  | Hannan-Quinn criter.  | 8.265.913   |        |
| Durbin-Watson stat | 1.999.997   |                       |             |        |

Null Hypothesis: REGEUR has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.136.677  | 0.2303 |
| Test critical values: 1% level         | -3.434.390  |        |
| 5% level                               | -2.863.211  |        |
| 10% level                              | -2.567.708  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGEUR)

Method: Least Squares

Date: 08/06/15 Time: 12:14

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1540 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| REGEUR(-1)         | -0.005289   | 0.002475              | -2.136.677  | 0.0328 |
| C                  | 7.678.496   | 3.479.722             | 2.206.640   | 0.0275 |
| R-squared          | 0.002960    | Mean dependent var    | 0.302058    |        |
| Adjusted R-squared | 0.002311    | S.D. dependent var    | 1.713.155   |        |
| S.E. of regression | 1.711.174   | Akaike info criterion | 8.518.704   |        |
| Sum squared resid  | 450344.1    | Schwarz criterion     | 8.525.638   |        |
| Log likelihood     | -6.557.402  | Hannan-Quinn criter.  | 8.521.284   |        |
| F-statistic        | 4.565.391   | Durbin-Watson stat    | 1.981.967   |        |
| Prob(F-statistic)  | 0.032782    |                       |             |        |

Null Hypothesis: D(REGEUR) has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.908.675  | 0.0000 |
| Test critical values: 1% level         | -2.566.465  |        |
| 5% level                               | -1.941.029  |        |
| 10% level                              | -1.616.561  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGEUR,2)

Method: Least Squares

Date: 08/06/15 Time: 12:14

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1539 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| D(REGEUR(-1))      | -0.995060   | 0.025458              | -3.908.675  | 0.0000 |
| R-squared          | 0.498331    | Mean dependent var    | 0.035960    |        |
| Adjusted R-squared | 0.498331    | S.D. dependent var    | 2.415.417   |        |
| S.E. of regression | 1.710.806   | Akaike info criterion | 8.517.626   |        |
| Sum squared resid  | 450150.5    | Schwarz criterion     | 8.521.095   |        |
| Log likelihood     | -6.553.313  | Hannan-Quinn criter.  | 8.518.916   |        |
| Durbin-Watson stat | 1.999.868   |                       |             |        |

Null Hypothesis: ECTEUR has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -1.695.651  | 0.0852 |
| Test critical values: 1% level         | -2.566.464  |        |
| 5% level                               | -1.941.029  |        |
| 10% level                              | -1.616.561  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECTEUR)

Method: Least Squares

Date: 08/06/15 Time: 12:15

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1540 after adjustments

| Variable              | Coefficient | Std.<br>Error           | t-Statistic | Prob.     |
|-----------------------|-------------|-------------------------|-------------|-----------|
| ECTEUR(-1)            | -0.003497   | 0.002062                | -1.695.651  | 0.0902    |
| R-squared             | 0.001761    | Mean dependent var      |             | 0.054179  |
| Adjusted R-squared    | 0.001761    | S.D. dependent var      |             | 5.324.044 |
| S.E. of regression    | 5.319.354   | Akaike info criterion   |             | 6.181.230 |
| Sum squared resid     | 43546.81    | Schwarz criterion       |             | 6.184.697 |
|                       | -           | Hannan-Quinn<br>criter. |             | 6.182.520 |
| Log likelihood        | 4.758.547   |                         |             |           |
| Durbin-Watson<br>stat | 2.044.588   |                         |             |           |



Null Hypothesis: SHAFRA has a unit root  
 Exogenous: Constant, Linear Trend  
 Lag Length: 1 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.067.220  | 0.1146 |
| Test critical values: 1% level         | -3.963.933  |        |
| 5% level                               | -3.412.691  |        |
| 10% level                              | -3.128.316  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHAFRA)

Method: Least Squares

Date: 08/06/15 Time: 12:29

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable            | Coefficient | Std. Error | t-Statistic | Prob.  |
|---------------------|-------------|------------|-------------|--------|
| SHAFRA(-1)          | -0.013027   | 0.004247   | -3.067.220  | 0.0022 |
| D(SHAFRA(-1))       | -0.074705   | 0.025260   | -2.957.439  | 0.0031 |
| C                   | 0.928698    | 0.292609   | 3.173.853   | 0.0015 |
| @TREND("7/01/2009") | 0.000431    | 0.000162   | 2.653.934   | 0.0080 |

|                    |            |                       |           |
|--------------------|------------|-----------------------|-----------|
| R-squared          | 0.012627   | Mean dependent var    | 0.034233  |
| Adjusted R-squared | 0.010724   | S.D. dependent var    | 1.241.457 |
| S.E. of regression | 1.234.783  | Akaike info criterion | 3.262.226 |
| Sum squared resid  | 2.373.939  | Schwarz criterion     | 3.275.943 |
| Log likelihood     | -2.542.167 | Hannan-Quinn criter.  | 3.267.326 |
| F-statistic        | 6.637.122  | Durbin-Watson stat    | 2.001.859 |
| Prob(F-statistic)  | 0.000187   |                       |           |

Null Hypothesis: D(SHAFRA) has a unit root  
 Exogenous: None  
 Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -4.283.809  | 0.0001 |
| Test critical values: 1% level         | -2.566.444  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHAFRA,2)

Method: Least Squares

Date: 08/06/15 Time: 12:30

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| D(SHAFRA(-1))      | -1.080.509  | 0.025223              | -4.283.809  | 0.0000    |
| R-squared          | 0.540514    | Mean dependent var    |             | 0.002673  |
| Adjusted R-squared | 0.540514    | S.D. dependent var    |             | 1.826.195 |
| S.E. of regression | 1.237.894   | Akaike info criterion |             | 3.265.341 |
| Sum squared resid  | 2.390.515   | Schwarz criterion     |             | 3.268.770 |
|                    |             | Hannan-Quinn          |             |           |
| Log likelihood     | -2.547.598  | criter.               |             | 3.266.616 |
| Durbin-Watson stat | 2.002.593   |                       |             |           |

Null Hypothesis: REGFRA has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.523.092  | 0.3168 |
| Test critical values: 1% level         | -3.963.930  |        |
| 5% level                               | -3.412.689  |        |
| 10% level                              | -3.128.315  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGFRA)

Method: Least Squares

Date: 08/06/15 Time: 12:30

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1562 after adjustments

| Variable            | Coefficient | Std. Error            | t-Statistic | Prob.  |
|---------------------|-------------|-----------------------|-------------|--------|
| REGFRA(-1)          | -0.008120   | 0.003218              | -2.523.092  | 0.0117 |
| C                   | 3.431.995   | 1.339.227             | 2.562.669   | 0.0105 |
| @TREND("7/01/2009") | 0.001216    | 0.000646              | 1.881.911   | 0.0600 |
| R-squared           | 0.004071    | Mean dependent var    | 0.160749    |        |
| Adjusted R-squared  | 0.002793    | S.D. dependent var    | 7.400.218   |        |
| S.E. of regression  | 7.389.875   | Akaike info criterion | 6.840.017   |        |
| Sum squared resid   | 85137.38    | Schwarz criterion     | 6.850.300   |        |
| Log likelihood      | -5.339.054  | Hannan-Quinn criter.  | 6.843.840   |        |
| F-statistic         | 3.186.414   | Durbin-Watson stat    | 2.024.980   |        |
| Prob(F-statistic)   | 0.041589    |                       |             |        |

Null Hypothesis: D(REGFRA) has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -4.023.189  | 0.0000 |
| Test critical values: 1% level         | -2.566.444  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGFRA,2)

Method: Least Squares

Date: 08/06/15 Time: 12:31

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| D(REGFRA(-1))      | -1.017.837  | 0.025299              | -4.023.189  | 0.0000 |
| R-squared          | 0.509218    | Mean dependent var    | 0.015208    |        |
| Adjusted R-squared | 0.509218    | S.D. dependent var    | 1.055.534   |        |
| S.E. of regression | 7.394.634   | Akaike info criterion | 6.840.027   |        |
| Sum squared resid  | 85301.75    | Schwarz criterion     | 6.843.456   |        |
| Log likelihood     | -5.337.641  | Hannan-Quinn criter.  | 6.841.302   |        |
| Durbin-Watson stat | 1.999.443   |                       |             |        |

Null Hypothesis: ECTFRA has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -1.213.601  | 0.2066 |
| Test critical values: 1% level         | -2.566.443  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*Mackinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECTFRA)

Method: Least Squares

Date: 08/06/15 Time: 12:31

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1562 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| ECTFRA(-1)         | -0.001750   | 0.001442              | -1.213.601  | 0.2251   |
| R-squared          | 0.000807    | Mean dependent var    |             | 0.004286 |
| Adjusted R-squared | 0.000807    | S.D. dependent var    |             | 0.368427 |
| S.E. of regression | 0.368278    | Akaike info criterion |             | 0.840681 |
| Sum squared resid  | 2.117.161   | Schwarz criterion     |             | 0.844109 |
| Log likelihood     | -6.555.722  | Hannan-Quinn criter.  |             | 0.841956 |
| Durbin-Watson stat | 1.911.996   |                       |             |          |



Null Hypothesis: SHAGER has a unit root  
 Exogenous: Constant, Linear Trend  
 Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.689.445  | 0.2411 |
| Test critical values: 1% level         | -3.963.930  |        |
| 5% level                               | -3.412.689  |        |
| 10% level                              | -3.128.315  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHAGER)

Method: Least Squares

Date: 08/06/15 Time: 12:32

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1562 after adjustments

| Variable            | Coefficient | Std. Error            | t-Statistic | Prob.  |
|---------------------|-------------|-----------------------|-------------|--------|
| SHAGER(-1)          | -0.009383   | 0.003489              | -2.689.445  | 0.0072 |
| C                   | 0.623575    | 0.219931              | 2.835.316   | 0.0046 |
| @TREND("7/01/2009") | 0.000318    | 0.000146              | 2.183.692   | 0.0291 |
| R-squared           | 0.004719    | Mean dependent var    | 0.034659    |        |
| Adjusted R-squared  | 0.003442    | S.D. dependent var    | 1.225.217   |        |
| S.E. of regression  | 1.223.106   | Akaike info criterion | 3.242.583   |        |
| Sum squared resid   | 2.332.246   | Schwarz criterion     | 3.252.866   |        |
| Log likelihood      | -2.529.457  | Hannan-Quinn criter.  | 3.246.406   |        |
| F-statistic         | 3.695.800   | Durbin-Watson stat    | 2.056.737   |        |
| Prob(F-statistic)   | 0.025045    |                       |             |        |

Null Hypothesis: D(SHAGER) has a unit root  
 Exogenous: None  
 Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -4.088.810  | 0.0000 |
| Test critical values: 1% level         | -2.566.444  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHAGER,2)

Method: Least Squares

Date: 08/06/15 Time: 12:33

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| D(SHAGER(-1))      | -1.034.128  | 0.025292              | -4.088.810  | 0.0000 |
| R-squared          | 0.517301    | Mean dependent var    | 0.002564    |        |
| Adjusted R-squared | 0.517301    | S.D. dependent var    | 1.761.784   |        |
| S.E. of regression | 1.224.026   | Akaike info criterion | 3.242.808   |        |
| Sum squared resid  | 2.337.254   | Schwarz criterion     | 3.246.238   |        |
| Log likelihood     | -2.530.012  | Hannan-Quinn criter.  | 3.244.083   |        |
| Durbin-Watson stat | 1.999.523   |                       |             |        |

Null Hypothesis: REGGER has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.695.016  | 0.2388 |
| Test critical values: 1% level         | -3.963.930  |        |
| 5% level                               | -3.412.689  |        |
| 10% level                              | -3.128.315  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGGER)

Method: Least Squares

Date: 08/06/15 Time: 12:33

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1562 after adjustments

| Variable            | Coefficient | Std. Error            | t-Statistic | Prob.  |
|---------------------|-------------|-----------------------|-------------|--------|
| REGGER(-1)          | -0.009315   | 0.003456              | -2.695.016  | 0.0071 |
| C                   | 4.053.208   | 1.452.056             | 2.791.359   | 0.0053 |
| @TREND("7/01/2009") | 0.002004    | 0.000903              | 2.219.279   | 0.0266 |
| R-squared           | 0.004669    | Mean dependent var    | 0.219027    |        |
| Adjusted R-squared  | 0.003392    | S.D. dependent var    | 8.086.227   |        |
| S.E. of regression  | 8.072.501   | Akaike info criterion | 7.016.723   |        |
| Sum squared resid   | 101592.7    | Schwarz criterion     | 7.027.005   |        |
| Log likelihood      | -5.477.060  | Hannan-Quinn criter.  | 7.020.545   |        |
| F-statistic         | 3.656.506   | Durbin-Watson stat    | 1.999.495   |        |
| Prob(F-statistic)   | 0.026044    |                       |             |        |

Null Hypothesis: D(REGGER) has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                               |             |                       | t-Statistic | Prob.*    |
|-----------------------------------------------|-------------|-----------------------|-------------|-----------|
| Augmented Dickey-Fuller test statistic        |             |                       | -3.974.974  | 0.0000    |
| Test critical values:                         | 1% level    |                       | -2.566.444  |           |
|                                               | 5% level    |                       | -1.941.026  |           |
|                                               | 10% level   |                       | -1.616.563  |           |
| *MacKinnon (1996) one-sided p-values.         |             |                       |             |           |
| Augmented Dickey-Fuller Test Equation         |             |                       |             |           |
| Dependent Variable: D(REGGER,2)               |             |                       |             |           |
| Method: Least Squares                         |             |                       |             |           |
| Date: 08/06/15 Time: 12:33                    |             |                       |             |           |
| Sample (adjusted): 7/03/2009 7/01/2015        |             |                       |             |           |
| Included observations: 1561 after adjustments |             |                       |             |           |
| Variable                                      | Coefficient | Std. Error            | t-Statistic | Prob.     |
| D(REGGER(-1))                                 | -1.005.788  | 0.025303              | -3.974.974  | 0.0000    |
| R-squared                                     | 0.503190    | Mean dependent var    |             | 0.018655  |
| Adjusted R-squared                            | 0.503190    | S.D. dependent var    |             | 1.146.443 |
| S.E. of regression                            | 8.080.677   | Akaike info criterion |             | 7.017.469 |
| Sum squared resid                             | 101863.8    | Schwarz criterion     |             | 7.020.898 |
|                                               |             | Hannan-Quinn          |             |           |
| Log likelihood                                | -5.476.134  | criter.               |             | 7.018.744 |
| Durbin-Watson stat                            | 1.999.185   |                       |             |           |

Null Hypothesis: ECTGER has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.687.996  | 0.0070 |
| Test critical values: 1% level         | -2.566.443  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECTGER)

Method: Least Squares

Date: 08/06/15 Time: 12:34

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1562 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ECTGER(-1)         | -0.009466   | 0.003522              | -2.687.996  | 0.0073    |
| R-squared          | 0.004604    | Mean dependent var    |             | 0.003344  |
| Adjusted R-squared | 0.004604    | S.D. dependent var    |             | 1.877.671 |
| S.E. of regression | 1.873.344   | Akaike info criterion |             | 4.093.967 |
| Sum squared resid  | 5.478.200   | Schwarz criterion     |             | 4.097.394 |
| Log likelihood     | -3.196.388  | Hannan-Quinn criter.  |             | 4.095.241 |
| Durbin-Watson stat | 1.922.016   |                       |             |           |



Null Hypothesis: SHAJAP has a unit root  
 Exogenous: Constant, Linear Trend  
 Lag Length: 1 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.486.708  | 0.3348 |
| Test critical values: 1% level         | -3.963.933  |        |
| 5% level                               | -3.412.691  |        |
| 10% level                              | -3.128.316  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHAJAP)

Method: Least Squares

Date: 08/06/15 Time: 12:16

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable            | Coefficient | Std. Error            | t-Statistic | Prob.  |
|---------------------|-------------|-----------------------|-------------|--------|
| SHAJAP(-1)          | -0.010636   | 0.004277              | -2.486.708  | 0.0130 |
| D(SHAJAP(-1))       | -0.144786   | 0.025115              | -5.764.981  | 0.0000 |
| C                   | 0.750978    | 0.302028              | 2.486.453   | 0.0130 |
| @TREND("7/01/2009") | 0.000250    | 0.000102              | 2.443.031   | 0.0147 |
| R-squared           | 0.026731    | Mean dependent var    | 0.029102    |        |
| Adjusted R-squared  | 0.024855    | S.D. dependent var    | 0.940898    |        |
| S.E. of regression  | 0.929131    | Akaike info criterion | 2.693.426   |        |
| Sum squared resid   | 1.344.135   | Schwarz criterion     | 2.707.143   |        |
| Log likelihood      | -2.098.219  | Hannan-Quinn criter.  | 2.698.526   |        |
| F-statistic         | 1.425.421   | Durbin-Watson stat    | 2.016.681   |        |
| Prob(F-statistic)   | 0.000000    |                       |             |        |

Null Hypothesis: D(SHAJAP) has a unit root  
 Exogenous: None  
 Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -4.591.224  | 0.0001 |
| Test critical values: 1% level         | -2.566.444  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHAJAP,2)

Method: Least Squares

Date: 08/06/15 Time: 12:17

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| D(SHAJAP(-1))      | -1.149.367  | 0.025034              | -4.591.224  | 0.0000 |
| R-squared          | 0.574692    | Mean dependent var    | -7.24E-05   |        |
| Adjusted R-squared | 0.574692    | S.D. dependent var    | 1.427.247   |        |
| S.E. of regression | 0.930788    | Akaike info criterion | 2.695.070   |        |
| Sum squared resid  | 1.351.531   | Schwarz criterion     | 2.698.499   |        |
| Log likelihood     | -2.102.502  | Hannan-Quinn criter.  | 2.696.345   |        |
| Durbin-Watson stat | 2.018.266   |                       |             |        |

Null Hypothesis: REGJAP has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 1 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.634.634  | 0.2648 |
| Test critical values: 1% level         | -3.963.933  |        |
| 5% level                               | -3.412.691  |        |
| 10% level                              | -3.128.316  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGJAP)

Method: Least Squares

Date: 08/06/15 Time: 12:17

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable            | Coefficient | Std. Error            | t-Statistic | Prob.  |
|---------------------|-------------|-----------------------|-------------|--------|
| REGJAP(-1)          | -0.010441   | 0.003963              | -2.634.634  | 0.0085 |
| D(REGJAP(-1))       | -0.115411   | 0.025185              | -4.582.450  | 0.0000 |
| C                   | 1.099.123   | 0.421358              | 2.608.526   | 0.0092 |
| @TREND("7/01/2009") | 0.000416    | 0.000163              | 2.549.291   | 0.0109 |
| R-squared           | 0.019135    | Mean dependent var    | 0.040077    |        |
| Adjusted R-squared  | 0.017245    | S.D. dependent var    | 1.516.267   |        |
| S.E. of regression  | 1.503.136   | Akaike info criterion | 3.655.543   |        |
| Sum squared resid   | 3.517.913   | Schwarz criterion     | 3.669.260   |        |
| Log likelihood      | -2.849.152  | Hannan-Quinn criter.  | 3.660.643   |        |
| F-statistic         | 1.012.495   | Durbin-Watson stat    | 2.008.700   |        |
| Prob(F-statistic)   | 0.000001    |                       |             |        |

Null Hypothesis: D(REGJAP) has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -4.455.284  | 0.0001 |
| Test critical values: 1% level         | -2.566.444  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGJAP,2)

Method: Least Squares

Date: 08/06/15 Time: 12:17

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| D(REGJAP(-1))      | -1.119.864  | 0.025136              | -4.455.284  | 0.0000 |
| R-squared          | 0.559938    | Mean dependent var    | -0.000314   |        |
| Adjusted R-squared | 0.559938    | S.D. dependent var    | 2.270.011   |        |
| S.E. of regression | 1.505.861   | Akaike info criterion | 3.657.247   |        |
| Sum squared resid  | 3.537.483   | Schwarz criterion     | 3.660.676   |        |
| Log likelihood     | -2.853.481  | Hannan-Quinn criter.  | 3.658.522   |        |
| Durbin-Watson stat | 2.009.885   |                       |             |        |

Null Hypothesis: ECTJAP has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -1.548.835  | 0.1142 |
| Test critical values: 1% level         | -2.566.443  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECTJAP)

Method: Least Squares

Date: 08/06/15 Time: 12:18

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1562 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ECTJAP(-1)         | -0.003220   | 0.002079              | -1.548.835  | 0.1216    |
| R-squared          | 0.001056    | Mean dependent var    |             | -0.008440 |
| Adjusted R-squared | 0.001056    | S.D. dependent var    |             | 0.385552  |
| S.E. of regression | 0.385349    | Akaike info criterion |             | 0.931304  |
| Sum squared resid  | 2.317.986   | Schwarz criterion     |             | 0.934731  |
| Log likelihood     | -7.263.483  | Hannan-Quinn criter.  |             | 0.932578  |
| Durbin-Watson stat | 1.911.692   |                       |             |           |



Null Hypothesis: SHADVL has a unit root  
 Exogenous: Constant, Linear Trend  
 Lag Length: 1 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.192.287  | 0.0863 |
| Test critical values: 1% level         | -3.963.933  |        |
| 5% level                               | -3.412.691  |        |
| 10% level                              | -3.128.316  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHADVL)

Method: Least Squares

Date: 08/06/15 Time: 12:25

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable            | Coefficient | Std. Error            | t-Statistic | Prob.  |
|---------------------|-------------|-----------------------|-------------|--------|
| SHADVL(-1)          | -0.011663   | 0.003654              | -3.192.287  | 0.0014 |
| D(SHADVL(-1))       | 0.104057    | 0.025181              | 4.132.295   | 0.0000 |
| C                   | 1.032.359   | 0.308814              | 3.342.979   | 0.0008 |
| @TREND("7/01/2009") | 0.000674    | 0.000221              | 3.048.212   | 0.0023 |
| R-squared           | 0.016118    | Mean dependent var    | 0.060346    |        |
| Adjusted R-squared  | 0.014222    | S.D. dependent var    | 1.030.857   |        |
| S.E. of regression  | 1.023.500   | Akaike info criterion | 2.886.892   |        |
| Sum squared resid   | 1.631.038   | Schwarz criterion     | 2.900.609   |        |
| Log likelihood      | -2.249.219  | Hannan-Quinn criter.  | 2.891.992   |        |
| F-statistic         | 8.502.274   | Durbin-Watson stat    | 2.004.889   |        |
| Prob(F-statistic)   | 0.000013    |                       |             |        |

Null Hypothesis: D(SHADVL) has a unit root  
 Exogenous: None  
 Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.571.096  | 0.0000 |
| Test critical values: 1% level         | -2.566.444  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHADVL,2)

Method: Least Squares

Date: 08/06/15 Time: 12:26

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| D(SHADVL(-1))      | -0.898778   | 0.025168              | -3.571.096  | 0.0000 |
| R-squared          | 0.449787    | Mean dependent var    | 0.001915    |        |
| Adjusted R-squared | 0.449787    | S.D. dependent var    | 1.384.957   |        |
| S.E. of regression | 1.027.310   | Akaike info criterion | 2.892.406   |        |
| Sum squared resid  | 1.646.372   | Schwarz criterion     | 2.895.835   |        |
| Log likelihood     | -2.256.523  | Hannan-Quinn criter.  | 2.893.681   |        |
| Durbin-Watson stat | 2.003.643   |                       |             |        |

Null Hypothesis: REGDVL has a unit root  
 Exogenous: Constant, Linear Trend  
 Lag Length: 1 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.882.900  | 0.1683 |
| Test critical values: 1% level         | -3.963.933  |        |
| 5% level                               | -3.412.691  |        |
| 10% level                              | -3.128.316  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGDVL)

Method: Least Squares

Date: 08/06/15 Time: 12:26

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable            | Coefficient | Std. Error            | t-Statistic | Prob.  |
|---------------------|-------------|-----------------------|-------------|--------|
| REGDVL(-1)          | -0.009206   | 0.003193              | -2.882.900  | 0.0040 |
| D(REGDVL(-1))       | 0.129745    | 0.025103              | 5.168.571   | 0.0000 |
| C                   | 3.072.894   | 1.008.595             | 3.046.707   | 0.0024 |
| @TREND("7/01/2009") | 0.001934    | 0.000715              | 2.706.405   | 0.0069 |
| R-squared           | 0.020933    | Mean dependent var    | 0.225420    |        |
| Adjusted R-squared  | 0.019047    | S.D. dependent var    | 3.901.799   |        |
| S.E. of regression  | 3.864.462   | Akaike info criterion | 5.544.081   |        |
| Sum squared resid   | 23252.34    | Schwarz criterion     | 5.557.798   |        |
| Log likelihood      | -4.323.155  | Hannan-Quinn criter.  | 5.549.181   |        |
| F-statistic         | 1.109.661   | Durbin-Watson stat    | 2.005.814   |        |
| Prob(F-statistic)   | 0.000000    |                       |             |        |

Null Hypothesis: D(REGDVL) has a unit root  
 Exogenous: None  
 Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.475.759  | 0.0000 |
| Test critical values: 1% level         | -2.566.444  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGDVL,2)

Method: Least Squares

Date: 08/06/15 Time: 12:26

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| D(REGDVL(-1))      | -0.872014   | 0.025088              | -3.475.759  | 0.0000 |
| R-squared          | 0.436433    | Mean dependent var    | 0.007489    |        |
| Adjusted R-squared | 0.436433    | S.D. dependent var    | 5.163.255   |        |
| S.E. of regression | 3.876.111   | Akaike info criterion | 5.548.182   |        |
| Sum squared resid  | 23437.81    | Schwarz criterion     | 5.551.612   |        |
| Log likelihood     | -4.329.356  | Hannan-Quinn criter.  | 5.549.457   |        |
| Durbin-Watson stat | 2.004.680   |                       |             |        |

Null Hypothesis: ECTDVL has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -1.751.538  | 0.0758 |
| Test critical values: 1% level         | -2.566.443  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECTDVL)

Method: Least Squares

Date: 08/06/15 Time: 12:27

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1562 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ECTDVL(-1)         | -0.003920   | 0.002238              | -1.751.538  | 0.0800    |
| R-squared          | 0.001945    | Mean dependent var    |             | 0.002819  |
| Adjusted R-squared | 0.001945    | S.D. dependent var    |             | 0.694398  |
| S.E. of regression | 0.693722    | Akaike info criterion |             | 2.107.150 |
| Sum squared resid  | 7.512.322   | Schwarz criterion     |             | 2.110.577 |
| Log likelihood     | -1.644.684  | Hannan-Quinn criter.  |             | 2.108.424 |
| Durbin-Watson stat | 1.950.246   |                       |             |           |

Null Hypothesis: SHADVS has a unit root  
 Exogenous: Constant, Linear Trend  
 Lag Length: 1 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.195.194  | 0.0857 |
| Test critical values: 1% level         | -3.963.933  |        |
| 5% level                               | -3.412.691  |        |
| 10% level                              | -3.128.316  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHADVS)

Method: Least Squares

Date: 08/06/15 Time: 12:40

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable            | Coefficient | Std. Error            | t-Statistic | Prob.  |
|---------------------|-------------|-----------------------|-------------|--------|
| SHADVS(-1)          | -0.011263   | 0.003525              | -3.195.194  | 0.0014 |
| D(SHADVS(-1))       | 0.128368    | 0.025115              | 5.111.309   | 0.0000 |
| C                   | 0.849945    | 0.252668              | 3.363.876   | 0.0008 |
| @TREND("7/01/2009") | 0.000635    | 0.000210              | 3.026.964   | 0.0025 |
| R-squared           | 0.021522    | Mean dependent var    | 0.063261    |        |
| Adjusted R-squared  | 0.019637    | S.D. dependent var    | 1.077.817   |        |
| S.E. of regression  | 1.067.182   | Akaike info criterion | 2.970.479   |        |
| Sum squared resid   | 1.773.232   | Schwarz criterion     | 2.984.196   |        |
| Log likelihood      | -2.314.459  | Hannan-Quinn criter.  | 2.975.579   |        |
| F-statistic         | 1.141.557   | Durbin-Watson stat    | 2.007.704   |        |
| Prob(F-statistic)   | 0.000000    |                       |             |        |

Null Hypothesis: D(SHADVS) has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.482.486  | 0.0000 |
| Test critical values: 1% level         | -2.566.444  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHADVS,2)

Method: Least Squares

Date: 08/06/15 Time: 12:40

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| D(SHADVS(-1))      | -0.874247   | 0.025104              | -3.482.486  | 0.0000 |
| R-squared          | 0.437385    | Mean dependent var    | 0.001288    |        |
| Adjusted R-squared | 0.437385    | S.D. dependent var    | 1.427.979   |        |
| S.E. of regression | 1.071.093   | Akaike info criterion | 2.975.877   |        |
| Sum squared resid  | 1.789.695   | Schwarz criterion     | 2.979.306   |        |
| Log likelihood     | -2.321.672  | Hannan-Quinn criter.  | 2.977.152   |        |
| Durbin-Watson stat | 2.006.302   |                       |             |        |

Null Hypothesis: REGDVS has a unit root  
 Exogenous: Constant, Linear Trend  
 Lag Length: 1 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.882.900  | 0.1683 |
| Test critical values: 1% level         | -3.963.933  |        |
| 5% level                               | -3.412.691  |        |
| 10% level                              | -3.128.316  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGDVS)

Method: Least Squares

Date: 08/06/15 Time: 12:41

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable            | Coefficient | Std. Error            | t-Statistic | Prob.  |
|---------------------|-------------|-----------------------|-------------|--------|
| REGDVS(-1)          | -0.009206   | 0.003193              | -2.882.900  | 0.0040 |
| D(REGDVS(-1))       | 0.129745    | 0.025103              | 5.168.571   | 0.0000 |
| C                   | 3.072.894   | 1.008.595             | 3.046.707   | 0.0024 |
| @TREND("7/01/2009") | 0.001934    | 0.000715              | 2.706.405   | 0.0069 |
| R-squared           | 0.020933    | Mean dependent var    | 0.225420    |        |
| Adjusted R-squared  | 0.019047    | S.D. dependent var    | 3.901.799   |        |
| S.E. of regression  | 3.864.462   | Akaike info criterion | 5.544.081   |        |
| Sum squared resid   | 23252.34    | Schwarz criterion     | 5.557.798   |        |
| Log likelihood      | -4.323.155  | Hannan-Quinn criter.  | 5.549.181   |        |
| F-statistic         | 1.109.661   | Durbin-Watson stat    | 2.005.814   |        |
| Prob(F-statistic)   | 0.000000    |                       |             |        |

Null Hypothesis: D(REGDVS) has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.475.759  | 0.0000 |
| Test critical values: 1% level         | -2.566.444  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGDVS,2)

Method: Least Squares

Date: 08/06/15 Time: 12:41

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| D(REGDVS(-1))      | -0.872014   | 0.025088              | -3.475.759  | 0.0000 |
| R-squared          | 0.436433    | Mean dependent var    | 0.007489    |        |
| Adjusted R-squared | 0.436433    | S.D. dependent var    | 5.163.255   |        |
| S.E. of regression | 3.876.111   | Akaike info criterion | 5.548.182   |        |
| Sum squared resid  | 23437.81    | Schwarz criterion     | 5.551.612   |        |
|                    |             | Hannan-Quinn criter.  | 5.549.457   |        |
| Log likelihood     | -4.329.356  |                       |             |        |
| Durbin-Watson stat | 2.004.680   |                       |             |        |

Null Hypothesis: ECTDVS has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -1.898.296  | 0.0551 |
| Test critical values: 1% level         | -2.566.443  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECTDVS)

Method: Least Squares

Date: 08/06/15 Time: 12:42

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1562 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ECTDVS(-1)         | -0.004563   | 0.002404              | -1.898.296  | 0.0578    |
| R-squared          | 0.002218    | Mean dependent var    |             | -0.011765 |
| Adjusted R-squared | 0.002218    | S.D. dependent var    |             | 1.271.130 |
| S.E. of regression | 1.269.720   | Akaike info criterion |             | 3.316.110 |
| Sum squared resid  | 2.516.627   | Schwarz criterion     |             | 3.319.538 |
| Log likelihood     | -2.588.882  | Hannan-Quinn criter.  |             | 3.317.384 |
| Durbin-Watson stat | 1.908.816   |                       |             |           |

Null Hypothesis: SHANAM has a unit root  
Exogenous: Constant, Linear Trend  
Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.230.909  | 0.0787 |
| Test critical values: 1% level         | -3.963.930  |        |
| 5% level                               | -3.412.689  |        |
| 10% level                              | -3.128.315  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHANAM)

Method: Least Squares

Date: 08/06/15 Time: 12:43

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1562 after adjustments

| Variable            | Coefficient | Std. Error            | t-Statistic | Prob.  |
|---------------------|-------------|-----------------------|-------------|--------|
| SHANAM(-1)          | -0.013298   | 0.004116              | -3.230.909  | 0.0013 |
| C                   | 0.992245    | 0.295588              | 3.356.853   | 0.0008 |
| @TREND("7/01/2009") | 0.000659    | 0.000212              | 3.112.255   | 0.0019 |
| R-squared           | 0.006651    | Mean dependent var    | 0.050435    |        |
| Adjusted R-squared  | 0.005377    | S.D. dependent var    | 0.997279    |        |
| S.E. of regression  | 0.994594    | Akaike info criterion | 2.828.955   |        |
| Sum squared resid   | 1.542.191   | Schwarz criterion     | 2.839.238   |        |
| Log likelihood      | -2.206.414  | Hannan-Quinn criter.  | 2.832.778   |        |
| F-statistic         | 5.219.537   | Durbin-Watson stat    | 2.028.273   |        |
| Prob(F-statistic)   | 0.005505    |                       |             |        |

Null Hypothesis: D(SHANAM) has a unit root  
Exogenous: None  
Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -4.031.760  | 0.0000 |
| Test critical values: 1% level         | -2.566.444  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHANAM,2)

Method: Least Squares

Date: 08/06/15 Time: 12:44

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| D(SHANAM(-1))      | -1.019.560  | 0.025288              | -4.031.760  | 0.0000 |
| R-squared          | 0.510282    | Mean dependent var    | 0.001614    |        |
| Adjusted R-squared | 0.510282    | S.D. dependent var    | 1.425.479   |        |
| S.E. of regression | 0.997549    | Akaike info criterion | 2.833.609   |        |
| Sum squared resid  | 1.552.361   | Schwarz criterion     | 2.837.038   |        |
| Log likelihood     | -2.210.631  | Hannan-Quinn criter.  | 2.834.884   |        |
| Durbin-Watson stat | 1.998.371   |                       |             |        |

Null Hypothesis: REGNAM has a unit root  
 Exogenous: Constant, Linear Trend  
 Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.171.842  | 0.0905 |
| Test critical values: 1% level         | -3.963.930  |        |
| 5% level                               | -3.412.689  |        |
| 10% level                              | -3.128.315  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGNAM)

Method: Least Squares

Date: 08/06/15 Time: 12:43

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1562 after adjustments

| Variable            | Coefficient | Std. Error            | t-Statistic | Prob.  |
|---------------------|-------------|-----------------------|-------------|--------|
| REGNAM(-1)          | -0.012798   | 0.004035              | -3.171.842  | 0.0015 |
| C                   | 3.286.790   | 0.990378              | 3.318.722   | 0.0009 |
| @TREND("7/01/2009") | 0.002284    | 0.000751              | 3.041.241   | 0.0024 |
| R-squared           | 0.006416    | Mean dependent var    | 0.183496    |        |
| Adjusted R-squared  | 0.005141    | S.D. dependent var    | 3.496.963   |        |
| S.E. of regression  | 3.487.962   | Akaike info criterion | 5.338.431   |        |
| Sum squared resid   | 18966.60    | Schwarz criterion     | 5.348.713   |        |
| Log likelihood      | -4.166.315  | Hannan-Quinn criter.  | 5.342.254   |        |
| F-statistic         | 5.033.531   | Durbin-Watson stat    | 2.054.521   |        |
| Prob(F-statistic)   | 0.006622    |                       |             |        |

Null Hypothesis: D(REGNAM) has a unit root  
 Exogenous: None  
 Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -4.084.212  | 0.0000 |
| Test critical values: 1% level         | -2.566.444  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGNAM,2)

Method: Least Squares

Date: 08/06/15 Time: 12:43

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| D(REGNAM(-1))      | -1.032.460  | 0.025279              | -4.084.212  | 0.0000 |
| R-squared          | 0.516740    | Mean dependent var    | 0.006252    |        |
| Adjusted R-squared | 0.516740    | S.D. dependent var    | 5.030.024   |        |
| S.E. of regression | 3.496.718   | Akaike info criterion | 5.342.167   |        |
| Sum squared resid  | 19074.18    | Schwarz criterion     | 5.345.596   |        |
| Log likelihood     | -4.168.561  | Hannan-Quinn criter.  | 5.343.442   |        |
| Durbin-Watson stat | 1.996.701   |                       |             |        |

Null Hypothesis: ECTNAM has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.290.868  | 0.0213 |
| Test critical values: 1% level         | -2.566.443  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECTNAM)

Method: Least Squares

Date: 08/06/15 Time: 12:45

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1562 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.      |
|--------------------|-------------|-----------------------|-------------|------------|
| ECTNAM(-1)         | -0.006586   | 0.002875              | -2.290.868  | 0.0221     |
| R-squared          | 0.003348    | Mean dependent var    |             | -0.000245  |
| Adjusted R-squared | 0.003348    | S.D. dependent var    |             | 0.138966   |
| S.E. of regression | 0.138733    | Akaike info criterion |             | -1.111.892 |
| Sum squared resid  | 3.004.429   | Schwarz criterion     |             | -1.108.465 |
| Log likelihood     | 8.693.877   | Hannan-Quinn criter.  |             | -1.110.618 |
| Durbin-Watson stat | 2.096.668   |                       |             |            |



Null Hypothesis: SHAROK has a unit root  
 Exogenous: Constant, Linear Trend  
 Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -4.278.802  | 0.0034 |
| Test critical values: 1% level         | -3.963.933  |        |
| 5% level                               | -3.412.691  |        |
| 10% level                              | -3.128.316  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHAROK)

Method: Least Squares

Date: 08/06/15 Time: 12:46

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable            | Coefficient | Std. Error | t-Statistic | Prob.  |
|---------------------|-------------|------------|-------------|--------|
| SHAROK(-1)          | -0.021391   | 0.004999   | -4.278.802  | 0.0000 |
| C                   | 1.716.495   | 0.388728   | 4.415.675   | 0.0000 |
| @TREND("7/01/2009") | 0.000672    | 0.000188   | 3.567.939   | 0.0004 |

|                    |            |                       |           |
|--------------------|------------|-----------------------|-----------|
| R-squared          | 0.011873   | Mean dependent var    | 0.042549  |
| Adjusted R-squared | 0.010604   | S.D. dependent var    | 1.473.530 |
| S.E. of regression | 1.465.696  | Akaike info criterion | 3.604.457 |
| Sum squared resid  | 3.346.996  | Schwarz criterion     | 3.614.745 |
| Log likelihood     | -2.810.279 | Hannan-Quinn criter.  | 3.608.282 |
| F-statistic        | 9.360.024  | Durbin-Watson stat    | 2.002.435 |
| Prob(F-statistic)  | 0.000091   |                       |           |

Null Hypothesis: REGROK has a unit root  
 Exogenous: Constant, Linear Trend  
 Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.727.447  | 0.0208 |
| Test critical values: 1% level         | -3.963.933  |        |
| 5% level                               | -3.412.691  |        |
| 10% level                              | -3.128.316  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGROK)

Method: Least Squares

Date: 08/06/15 Time: 12:46

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable            | Coefficient | Std. Error | t-Statistic | Prob.  |
|---------------------|-------------|------------|-------------|--------|
| REGROK(-1)          | -0.015788   | 0.004236   | -3.727.447  | 0.0002 |
| C                   | 1.577.264   | 4.045.200  | 3.899.101   | 0.0001 |
| @TREND("7/01/2009") | 0.003910    | 0.001528   | 2.558.815   | 0.0106 |

|                    |            |                       |           |
|--------------------|------------|-----------------------|-----------|
| R-squared          | 0.009315   | Mean dependent var    | 0.390122  |
| Adjusted R-squared | 0.008043   | S.D. dependent var    | 1.563.579 |
| S.E. of regression | 1.557.279  | Akaike info criterion | 8.330.847 |
| Sum squared resid  | 377833.2   | Schwarz criterion     | 8.341.135 |
| Log likelihood     | -6.499.226 | Hannan-Quinn criter.  | 8.334.672 |
| F-statistic        | 7.324.473  | Durbin-Watson stat    | 1.982.209 |
| Prob(F-statistic)  | 0.000682   |                       |           |

Null Hypothesis: ECTROK has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.287.849  | 0.0214 |
| Test critical values: 1% level         | -2.566.444  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECTROK)

Method: Least Squares

Date: 08/06/15 Time: 12:47

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ECTROK(-1)         | -0.006924   | 0.003026              | -2.287.849  | 0.0223    |
| R-squared          | 0.003342    | Mean dependent var    |             | -0.006256 |
| Adjusted R-squared | 0.003342    | S.D. dependent var    |             | 4.472.945 |
| S.E. of regression | 4.465.464   | Akaike info criterion |             | 5.831.264 |
| Sum squared resid  | 31106.98    | Schwarz criterion     |             | 5.834.693 |
| Log likelihood     | -4.550.301  | Hannan-Quinn criter.  |             | 5.832.539 |
| Durbin-Watson stat | 1.883.091   |                       |             |           |

Null Hypothesis: SHAUK has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.554.320  | 0.0342 |
| Test critical values: 1% level         | -3.963.930  |        |
| 5% level                               | -3.412.689  |        |
| 10% level                              | -3.128.315  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHAUK)

Method: Least Squares

Date: 08/06/15 Time: 12:47

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1562 after adjustments

| Variable            | Coefficient | Std. Error | t-Statistic | Prob.  |
|---------------------|-------------|------------|-------------|--------|
| SHAUK(-1)           | -0.016253   | 0.004573   | -3.554.320  | 0.0004 |
| C                   | 1.556.815   | 0.422636   | 3.683.583   | 0.0002 |
| @TREND("7/01/2009") | 0.000649    | 0.000210   | 3.086.749   | 0.0021 |

|                    |            |                       |           |
|--------------------|------------|-----------------------|-----------|
| R-squared          | 0.008237   | Mean dependent var    | 0.041453  |
| Adjusted R-squared | 0.006965   | S.D. dependent var    | 1.406.431 |
| S.E. of regression | 1.401.525  | Akaike info criterion | 3.514.917 |
| Sum squared resid  | 3.062.300  | Schwarz criterion     | 3.525.200 |
| Log likelihood     | -2.742.150 | Hannan-Quinn criter.  | 3.518.740 |
| F-statistic        | 6.474.153  | Durbin-Watson stat    | 1.966.710 |
| Prob(F-statistic)  | 0.001585   |                       |           |

Null Hypothesis: REGUK has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.343.986  | 0.0596 |
| Test critical values: 1% level         | -3.963.930  |        |
| 5% level                               | -3.412.689  |        |
| 10% level                              | -3.128.315  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGUK)

Method: Least Squares

Date: 08/06/15 Time: 12:48

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1562 after adjustments

| Variable            | Coefficient | Std. Error | t-Statistic | Prob.  |
|---------------------|-------------|------------|-------------|--------|
| REGUK(-1)           | -0.014312   | 0.004280   | -3.343.986  | 0.0008 |
| C                   | 5.312.296   | 1.526.122  | 3.480.911   | 0.0005 |
| @TREND("7/01/2009") | 0.002649    | 0.000885   | 2.992.938   | 0.0028 |

|                    |            |                       |           |
|--------------------|------------|-----------------------|-----------|
| R-squared          | 0.007236   | Mean dependent var    | 0.191370  |
| Adjusted R-squared | 0.005962   | S.D. dependent var    | 5.450.721 |
| S.E. of regression | 5.434.448  | Akaike info criterion | 6.225.312 |
| Sum squared resid  | 46042.30   | Schwarz criterion     | 6.235.594 |
| Log likelihood     | -4.858.968 | Hannan-Quinn criter.  | 6.229.135 |
| F-statistic        | 5.681.314  | Durbin-Watson stat    | 1.956.981 |
| Prob(F-statistic)  | 0.003480   |                       |           |



Null Hypothesis: SHAUS has a unit root  
 Exogenous: Constant, Linear Trend  
 Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.871.191  | 0.1723 |
| Test critical values: 1% level         | -3.963.930  |        |
| 5% level                               | -3.412.689  |        |
| 10% level                              | -3.128.315  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHAUS)

Method: Least Squares

Date: 08/06/15 Time: 12:49

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1562 after adjustments

| Variable            | Coefficient | Std. Error            | t-Statistic | Prob.  |
|---------------------|-------------|-----------------------|-------------|--------|
| SHAUS(-1)           | -0.010504   | 0.003658              | -2.871.191  | 0.0041 |
| C                   | 0.776574    | 0.257098              | 3.020.534   | 0.0026 |
| @TREND("7/01/2009") | 0.000737    | 0.000259              | 2.848.654   | 0.0044 |
| R-squared           | 0.005301    | Mean dependent var    | 0.068355    |        |
| Adjusted R-squared  | 0.004025    | S.D. dependent var    | 1.105.675   |        |
| S.E. of regression  | 1.103.447   | Akaike info criterion | 3.036.674   |        |
| Sum squared resid   | 1.898.233   | Schwarz criterion     | 3.046.957   |        |
| Log likelihood      | -2.368.643  | Hannan-Quinn criter.  | 3.040.497   |        |
| F-statistic         | 4.154.286   | Durbin-Watson stat    | 2.065.345   |        |
| Prob(F-statistic)   | 0.015871    |                       |             |        |

Null Hypothesis: D(SHAUS) has a unit root  
 Exogenous: None  
 Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -4.094.965  | 0.0000 |
| Test critical values: 1% level         | -2.566.444  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SHAUS,2)

Method: Least Squares

Date: 08/06/15 Time: 12:50

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| D(SHAUS(-1))       | -1.035.300  | 0.025282              | -4.094.965  | 0.0000 |
| R-squared          | 0.518053    | Mean dependent var    | 0.001798    |        |
| Adjusted R-squared | 0.518053    | S.D. dependent var    | 1.593.646   |        |
| S.E. of regression | 1.106.347   | Akaike info criterion | 3.040.645   |        |
| Sum squared resid  | 1.909.447   | Schwarz criterion     | 3.044.075   |        |
| Log likelihood     | -2.372.224  | Hannan-Quinn criter.  | 3.041.920   |        |
| Durbin-Watson stat | 1.997.489   |                       |             |        |

Null Hypothesis: REGUS has a unit root  
 Exogenous: Constant, Linear Trend  
 Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.797.922  | 0.1982 |
| Test critical values: 1% level         | -3.963.930  |        |
| 5% level                               | -3.412.689  |        |
| 10% level                              | -3.128.315  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGUS)

Method: Least Squares

Date: 08/06/15 Time: 12:50

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1562 after adjustments

| Variable            | Coefficient | Std. Error            | t-Statistic | Prob.  |
|---------------------|-------------|-----------------------|-------------|--------|
| REGUS(-1)           | -0.010011   | 0.003578              | -2.797.922  | 0.0052 |
| C                   | 3.236.577   | 1.090.324             | 2.968.454   | 0.0030 |
| @TREND("7/01/2009") | 0.003220    | 0.001163              | 2.769.763   | 0.0057 |
| R-squared           | 0.005028    | Mean dependent var    | 0.317254    |        |
| Adjusted R-squared  | 0.003752    | S.D. dependent var    | 4.984.464   |        |
| S.E. of regression  | 4.975.106   | Akaike info criterion | 6.048.689   |        |
| Sum squared resid   | 38587.86    | Schwarz criterion     | 6.058.971   |        |
| Log likelihood      | -4.721.026  | Hannan-Quinn criter.  | 6.052.512   |        |
| F-statistic         | 3.939.198   | Durbin-Watson stat    | 2.094.470   |        |
| Prob(F-statistic)   | 0.019658    |                       |             |        |

Null Hypothesis: D(REGUS) has a unit root  
 Exogenous: None  
 Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -4.154.106  | 0.0000 |
| Test critical values: 1% level         | -2.566.444  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REGUS,2)

Method: Least Squares

Date: 08/06/15 Time: 12:50

Sample (adjusted): 7/03/2009 7/01/2015

Included observations: 1561 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| D(REGUS(-1))       | -1.049.670  | 0.025268              | -4.154.106  | 0.0000 |
| R-squared          | 0.525209    | Mean dependent var    | 0.009167    |        |
| Adjusted R-squared | 0.525209    | S.D. dependent var    | 7.233.960   |        |
| S.E. of regression | 4.984.567   | Akaike info criterion | 6.051.211   |        |
| Sum squared resid  | 38759.62    | Schwarz criterion     | 6.054.640   |        |
| Log likelihood     | -4.721.970  | Hannan-Quinn criter.  | 6.052.486   |        |
| Durbin-Watson stat | 1.995.437   |                       |             |        |

Null Hypothesis: ECTUS has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=23)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.481.209  | 0.0127 |
| Test critical values: 1% level         | -2.566.443  |        |
| 5% level                               | -1.941.026  |        |
| 10% level                              | -1.616.563  |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECTUS)

Method: Least Squares

Date: 08/06/15 Time: 12:51

Sample (adjusted): 7/02/2009 7/01/2015

Included observations: 1562 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ECTUS(-1)          | -0.007651   | 0.003084              | -2.481.209  | 0.0132    |
| R-squared          | 0.003906    | Mean dependent var    |             | 0.003349  |
| Adjusted R-squared | 0.003906    | S.D. dependent var    |             | 0.710541  |
| S.E. of regression | 0.709152    | Akaike info criterion |             | 2.151.146 |
| Sum squared resid  | 7.850.214   | Schwarz criterion     |             | 2.154.574 |
| Log likelihood     | -1.679.045  | Hannan-Quinn criter.  |             | 2.152.420 |
| Durbin-Watson stat | 2.116.262   |                       |             |           |

**19. Graphs of cointegration (Eviews)**