

Assignment 1

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Introduction

This report is written for the 1st assignment of the Financial Trading Systems course 2018 at the Bond University. During the first weeks, we learned how to use the Blotter Framework in R to implement a trading strategy, backtest the approach on a set of instruments (stock, futures, etc.) and visualize meaningful results which give insights about the strategy. Moreover, we learned how to compare the strategy to another alternative investment (e.g., a buy and hold strategy). The results of the assignment, the chosen trading idea, implementation, analysis and results are summarized in the following report.

Trading Idea

Smash Day by Larry Williams

The trading idea which is used for this report is based on the Smash Day strategy introduced by Larry Williams in his book “Long-Term Secrets to short-term trading” 2012. The basic theoretical foundation is set by the concept of autocorrelation. There are two autocorrelation principles which can be empirically observed. The positive autocorrelation which describes the fact that if we see an upward movement, it is more likely to observe an upward movement in the future. The same is valid for a negative trend. However, the negative autocorrelation can be observed on short-term time periods. We can expect a price to bounce up again after a sharp down movement and vice versa. Larry William’s Smash Day pattern is based on the observation of this autocorrelation behavior. A Smash Day pattern is initialized when we observe a closing price which is lower than the previous day’s low price. This pattern looks like a breakout to the downside. If the very next day the price moves opposite the Smash Day and trades above the high of the Smash Day this is according to Williams a buy signal. Williams explains this buy signal with a feeling of hurt felt by the public as a result of an unfulfilled breakout. The public would want to get back on track, and the price responds with a reversal. The exact opposite is true for a Sell Setup. The Smash Day is set up when we observe a close above the previous day’s high. The sell signal is initiated when the price reverses immediately the next day and falls below the smash day’s low.

Own variation of the Smash Day trading strategy

In addition to the Smash Day pattern, I have incorporated another rule for the buy signal and two additional components for the sell signal. I want to make sure that I only enter long when we observe a longlasting upward trend. To do this, buy orders are only executed when the current price is above the exponential moving average of the last 400 days. After that, the Smash Day pattern is checked. For the sell, I incorporated two more conditions before checking whether we see a Smash Day (Sell) pattern. The first is that a maximum holding period can be set to make sure that a position is not open for too long. The second sell case is when the price falls below the 400-day exponential moving average. If both conditions are not the matched a check for the smash day pattern is performed. If we observe it, we sell the current position.

These variations are incorporated to reduce the risk of falling prices.

Implementation of the trading idea

Part A: Initialization

Step 1: General Setup

The environment has to be cleared to ensure a reproducible setup. Moreover, the blotter library and the INF361Course library are loaded.

```
# Clear Environment
rm(list=ls())

# Loading libraries
library(blotter)
library(INFT361Course)
```

Step 2: Setting the Variables

The variables set in the next section can be adjusted to test the strategy with different parameters. The critical variables which should be adjusted to test the strategy are: daterange, emaPeriod, maxHoldingPeriod, instrumentlist and BuyHoldInstrument.

```
# Set values:
startCapital <- 1e+6
transactionCost <- -100
daterange <- '2000::2018'
emaPeriod <- 400
maxHoldingPeriod <- 4

InstrumentDirectory <- "~/Desktop/R/DownloadedData/DAX/"
instrumentlist <- c("CON.csv", "DB1.csv", "IFX.csv", "MRK.csv", "WDI.csv")
BuyHoldDirectory <- "~/Desktop/R/DownloadedData/DAX/"
BuyHoldInstrument <- "DAXEX.csv"

currency("EUR")
Sys.setenv(TZ="UTC")
initdate <- '1999-12-31'
startdate <- '2000-01-01'
enddate <- '2018-12-31'
portfolioname <- "Smash Day"
accountname <- portfolioname
```

Step 3: Presetup for plotting graphs

Theme setup for plotting the graphs in the visualization is performed here to ensure that the theme is available later, when it is needed and used.

```
# Settings for graph
myTheme <- chart_theme()
myTheme$col$up.col <- 'lightblue'
myTheme$col$dn.col <- 'brown'
myTheme$col$dn.border <- 'lightgray'
myTheme$col$up.border <- 'lightgray'

# Concatenate string for EMA with input parameter
addEMAStrng <- paste("add_EMA(n=",emaPeriod,")",sep = "")
```

Step 4: Initializing the portfolio

The portfolio and account are initialized.

```
# Clear portfolio and Account
suppressWarnings(rm("account.Smash Day","portfolio.Smash Day",
                    "account.buyhold","portfolio.buyhold",
                    pos=.blotter))

# Initialize Portfolio and Account
initPortf(portfolioname,
          instrumentlist,
          initDate=initdate,
          currency="EUR")

initAcct(accountname,
         portfolios=portfolioname,
         initDate=initdate,
         initEq=startCapital,
         currency="EUR")
```

Part B: Bar by bar processing

Step 1: Go through the data bar by bar

In this step the bar by bar processing is implemented. Therefore, a for loop is used to go through the instrumentlist. For each instrument in the list the data is loaded and the exponential moving average is added to the data. Furthermore, another for loop is used to go through the dates bar by bar. In this step the chosen strategy is applied.

```
for (instrument in instrumentlist) {
  LoadCourseFile(InstrumentDirectory, instrument, debugme = TRUE, dates = daterange)

  # Initialize the instrument
  stock(instrument, currency = "EUR")

  # Load the XTS file
  symbol <- get(instrument)

  # Calculate the Exponential Moving Average
  ema <- EMA(symbol$Close, n=emaPeriod)

  # Merge the xts file with the Exponential Moving Average
  symbol <- merge(symbol,ema)
  assign(instrument,symbol)

  # Starting to go bar by bar through using a "for loop"
  for (i in (emaPeriod + 1):(nrow(symbol) - 1)) {
    # Dates
    CurrentDate <- time(symbol[i])
    TomorrowDate <- time(symbol[i + 1])

    # Today's variables
    CloseToday <- as.numeric(symbol[i, "Close"])
    EMA_today <- as.numeric(symbol[i, "EMA"])
    LowToday <- as.numeric(symbol[i, "Low"])
    HighToday <- as.numeric(symbol[i, "High"])
```

```

# Yesterday's variables
LowYesterday <- as.numeric(symbol[i - 1, "Low"])
HighYesterday <- as.numeric(symbol[i - 1, "High"])

# Tomorrow's variables
OpenTomorrow <- as.numeric(symbol[i + 1, "Open"])
LowTomorrow <- as.numeric(symbol[i + 1, "Low"])
HighTomorrow <- as.numeric(symbol[i + 1, "High"])

# Config
Equity <- getEndEq(accountname, CurrentDate)
Position <-
  getPosQty(portfolioname, Symbol = instrument, Date = CurrentDate)

# Check whether we have a position
if (Position == 0) {
  # Start checking BUY rules

  # Check whether we have a Smash Day (Buy).
  # Smash Day (Buy) is when Todays Close is below Yesterdays Low.
  if (CloseToday < LowYesterday) {
    # Smash Day (Buy)

    #Check whether todays close is above today's EMA
    if (CloseToday > EMA_today) {

      # BUY RULE: If today was a smash day place a STOP BUY order
      # at todays high price for the next day.
      # (Buy tomorrow for 'price >= todays high')

      #####
      # Simulate STOP BUY order:
      #####

      # Option 1 to check: Check whether the open price tomorrow
      # is above today's high and add the transaction tomorrow at
      # tomorrow's open price.

      # Option 2 to check: Check whether today's high was lower
      # than tomorrows high and add the transaction tomorrow
      # at today's high price

      # Check Option 1
      if (OpenTomorrow > HighToday) {
        # Don't trade at the day before the last day
        if (CurrentDate != time(symbol[nrow(symbol) - 1])) {
          # Calculate the buy quantity
          BuyQuantity <- as.numeric(trunc(Equity / OpenTomorrow))
          # Add transaction
          addTxn(
            portfolioname,
            Symbol = instrument,
            TxnDate = TomorrowDate ,

```

```

        TxnPrice = OpenTomorrow,
        TxnQty = BuyQuantity,
        TxnFees = transactionCost
    )
    # Store the bar at which we placed the transaction
    BuyBar <- i
}

} else {
    # Check Option 2
    if (HighToday < HighTomorrow) {
        # Don't trade at the day before the last day
        if (CurrentDate != time(symbol[nrow(symbol) - 1])) {
            # Calculate the buy quantity
            BuyQuantity <- as.numeric(trunc(Equity / HighToday))
            # Add transaction
            addTxn(
                portfolioname,
                Symbol = instrument,
                TxnDate = TomorrowDate ,
                TxnPrice = HighToday,
                TxnQty = BuyQuantity,
                TxnFees = transactionCost
            )
            # Store the bar at which we placed the transaction
            BuyBar <- i
        }
    }
}

}
} else {
    # We already have a position

    # Check the sell rules in the following order and sell at the
# first condition which is satisfied.

    #####
    # SELL rules:
    #####

    # Rule 1: Sell if we hold the position longer than the specified
# maximum holding period

    # Rule 2: Sell at tomorrow's opening price if the close price
# today falls below the EMA

    # Rule 3: Sell if we meet the Smash Day (Sell) requirements.
# Today's close must be higher than yesterday's high

    # Rule 4: If no sell rule can be applied and we reach the
# second last day. Sell at the last day.

```

```

# Check Rule 1:
if ((i - BuyBar) > maxHoldingPeriod) {
  # Place the sell transaction at today's close price
  addTxn(
    portfolioname,
    Symbol = instrument,
    TxnDate = CurrentDate,
    TxnPrice = as.numeric(symbol[i, "Close"]),
    TxnQty = -Position,
    TxnFees = transactionCost
  )

} else {
  # Check Rule 2:
  if (as.numeric(symbol[i, "Close"]) < EMA_today) {
    # Place the sell transaction at tomorrow's open price
    addTxn(
      portfolioname,
      Symbol = instrument,
      TxnDate = time(symbol[i + 1]),
      TxnPrice = OpenTomorrow,
      TxnQty = -Position,
      TxnFees = transactionCost
    )

  } else {
    # Check Rule 3:

    # Sell Rule 3: If today is a Smash Day (Sell) place an order tomorrow at today's
    # low price.

    # Simulate this behaviour:

    # Option 1 to check: Check whether the open price tomorrow is below today's
    # low and add the transaction tomorrow at tomorrow's open price.

    # Option 2 to check: Check whether today's low was larger than tomorrow's
    # low and add the transaction tomorrow at today's low price.

    # Check for Smash Day (Sell)
    if (CloseToday > HighYesterday) {
      # Check for Option 1
      if (OpenTomorrow < LowToday) {
        # Add Sell transaction tomorrow at tomorrow's open price
        addTxn(
          portfolioname,
          Symbol = instrument,
          TxnDate = time(symbol[i + 1]),
          TxnPrice = OpenTomorrow,
          TxnQty = -Position,
          TxnFees = transactionCost
        )
      }
    }
  }
}

```

```

    } else {
      # Check for Option 2
      if (LowToday > LowTomorrow) {
        # Add Sell transaction tomorrow at today's low price
        addTxn(
          portfolioname,
          Symbol = instrument,
          TxnDate = time(symbol[i + 1]),
          TxnPrice = LowToday,
          TxnQty = -Position,
          TxnFees = transactionCost
        )
      }
    }
  } else {
    # Check Rule 4
    if (i == nrow(symbol) - 1) {
      # Add Sell transaction for the last day at the close price
      addTxn(
        portfolioname,
        Symbol = instrument,
        TxnDate = time(symbol[i + 1]),
        TxnPrice = as.numeric(symbol[i, "Close"]),
        TxnQty = -Position,
        TxnFees = transactionCost
      )
    }
  }
}
}

updatePortf(portfolioname, Symbols = instrument, Dates = CurrentDate)
updateAcct(accountname, Dates = CurrentDate)
updateEndEq(accountname, CurrentDate)

} # End Bar-by-bar processing
} # End for loop for multiple instruments

```

Step 2: System Check

In order to make sure that the system works as designed, the plots of some chosen transactions are printed in the following section. The plots for the first, third and the 5th last transaction are plotted for every instrument in the instrumentlist. The plots can be checked manually and by this it can be ensured that the transactions were performed as expected.

```

# Loop through all instruments in the instrumentlist
for (instrument in instrumentlist){
  rm(daterange_check)
  daterange_check <- c()
  transactionsInstrument <- getTxns(Portfolio=portfolioname,Symbol=instrument)

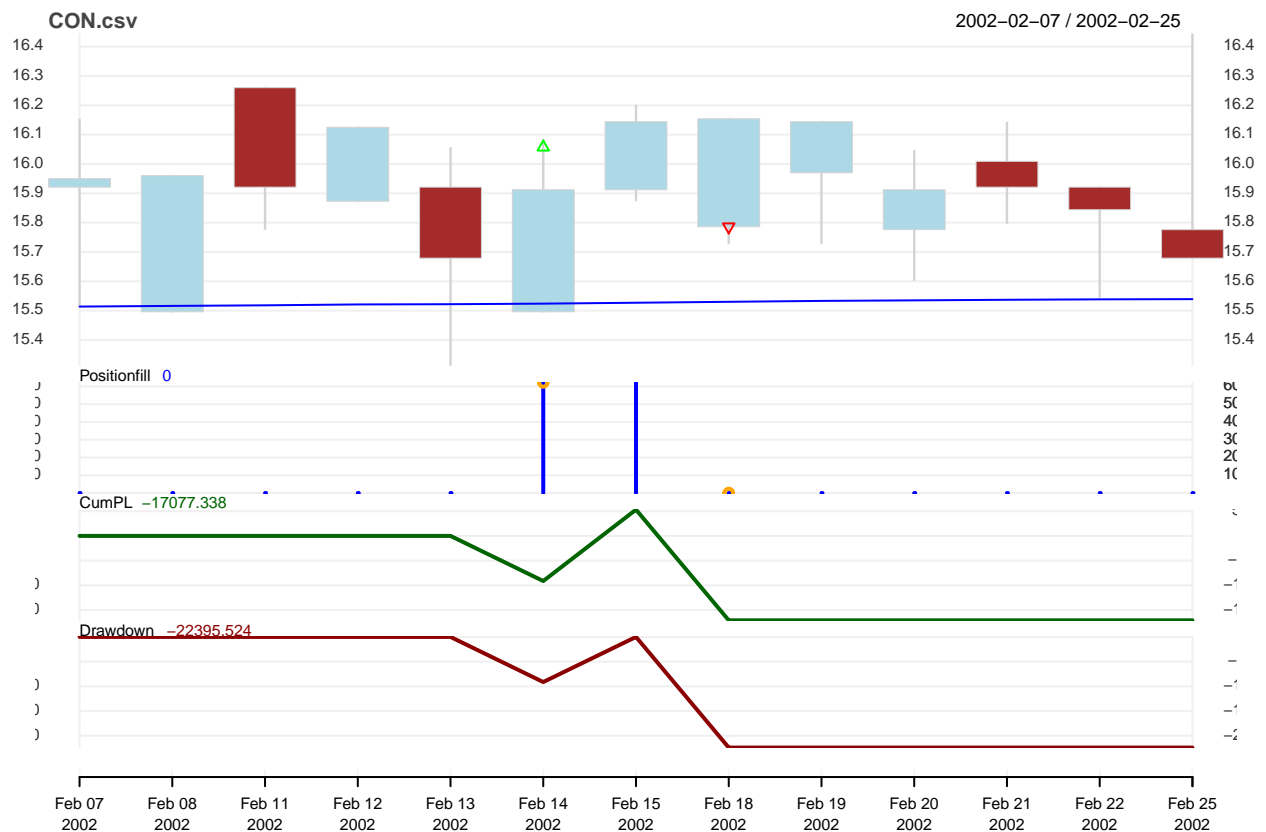
  # Create a list of transactions to check
  for (i in

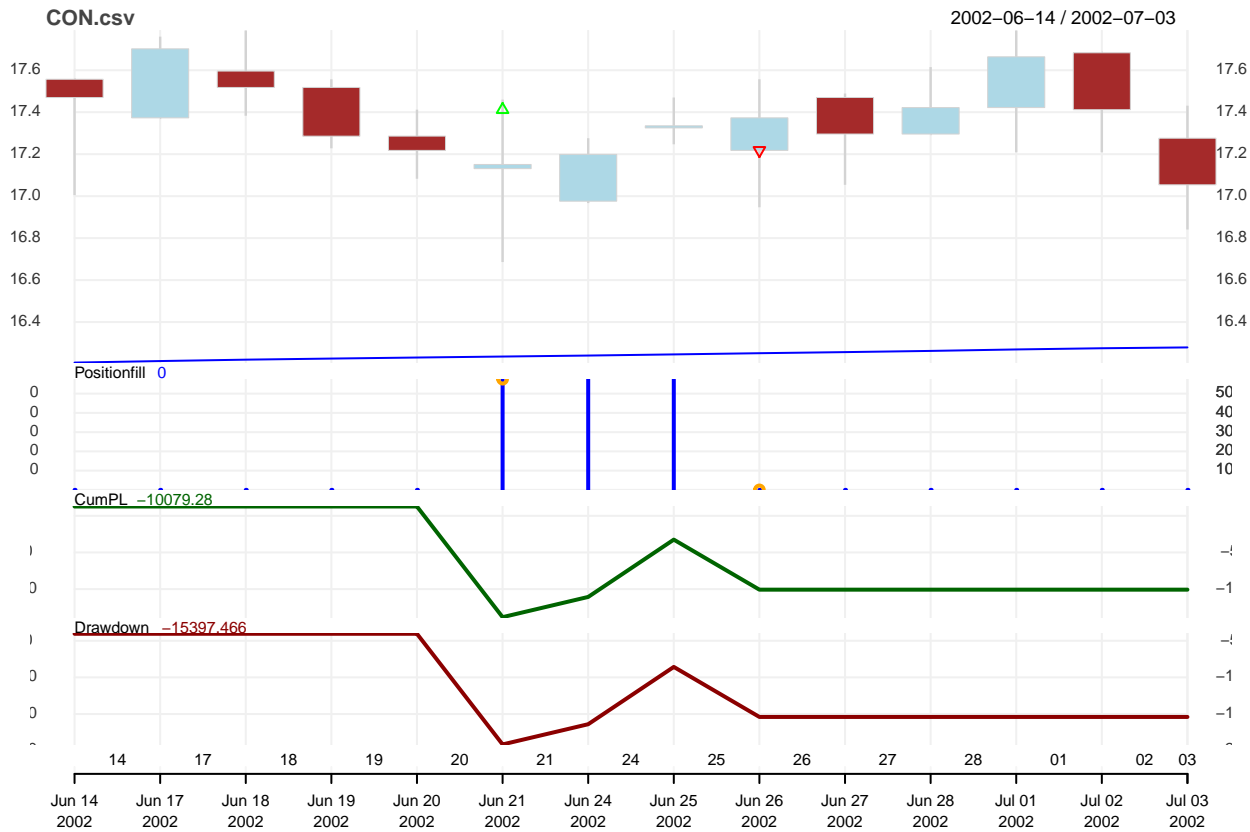
```

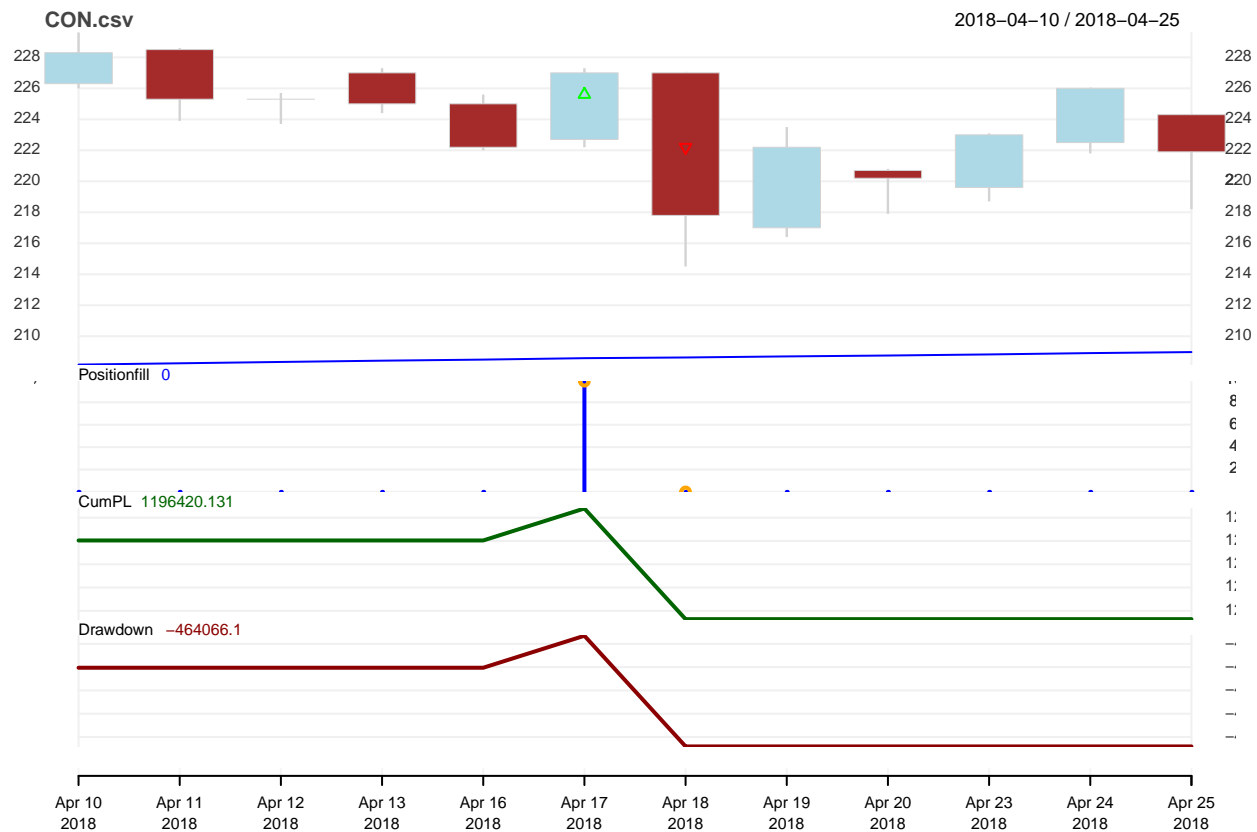
```

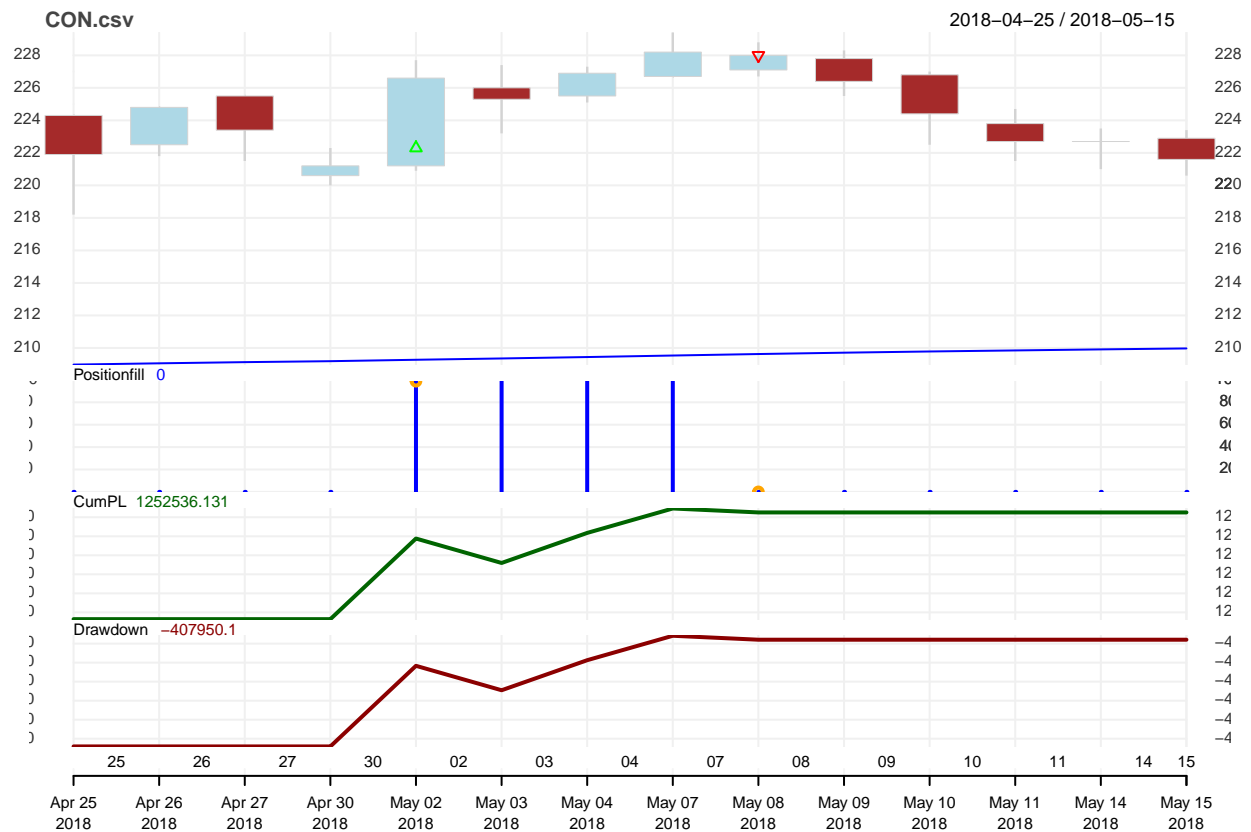
      c(2,6, (nrow(transactionsInstrument)-7),(nrow(transactionsInstrument)-5))) {
    from <- as.Date(index(transactionsInstrument[i,1]))-7
    to <- as.Date(index(transactionsInstrument[i+1,1]))+7
    daterange_check <- c(daterange_check, paste(from, ":", to, sep = ""))
  }
  # Plot the transactions and check them manually
  for (daterange_check_i in daterange_check){
    print(chart.Posn(portfolioname,
                     Symbol=instrument,
                     type='candlesticks',
                     theme=myTheme,
                     subset=daterange_check_i,
                     TA=addEMAStrng))
  }
}

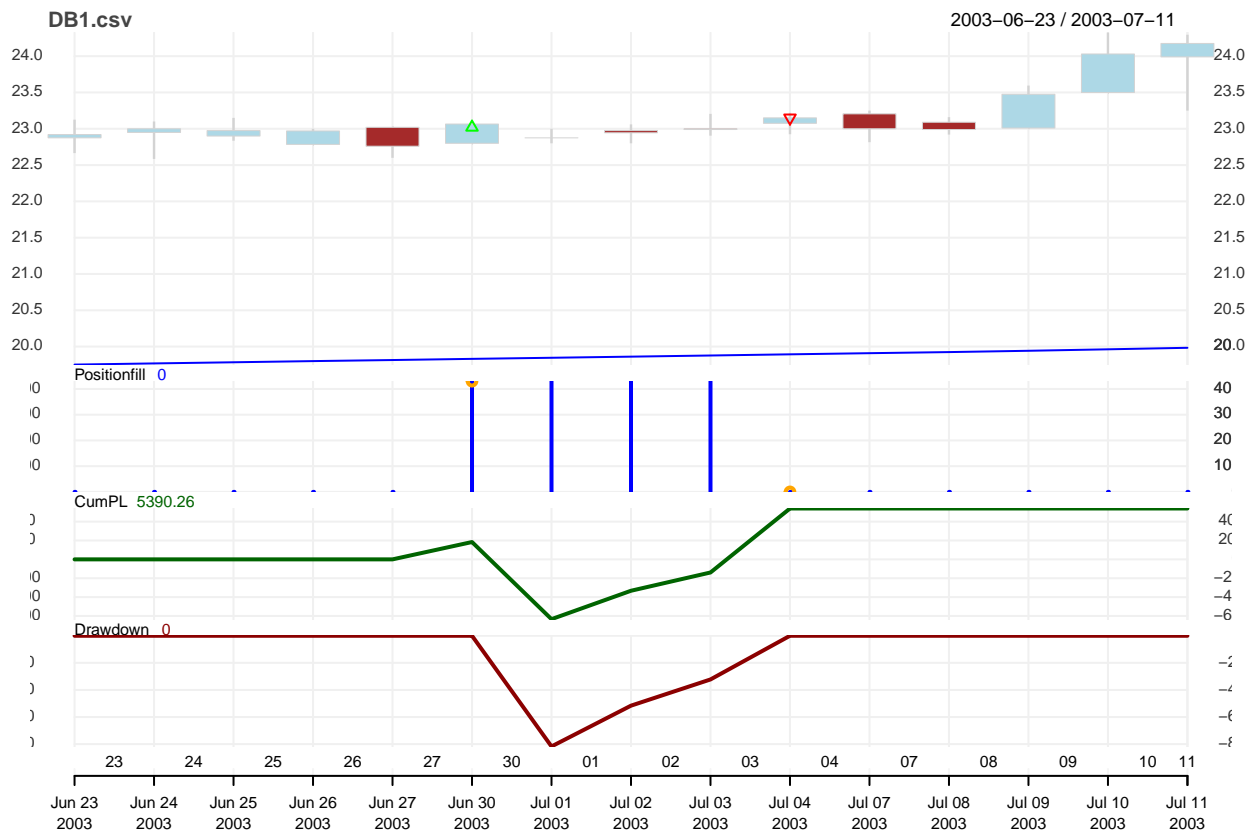
```

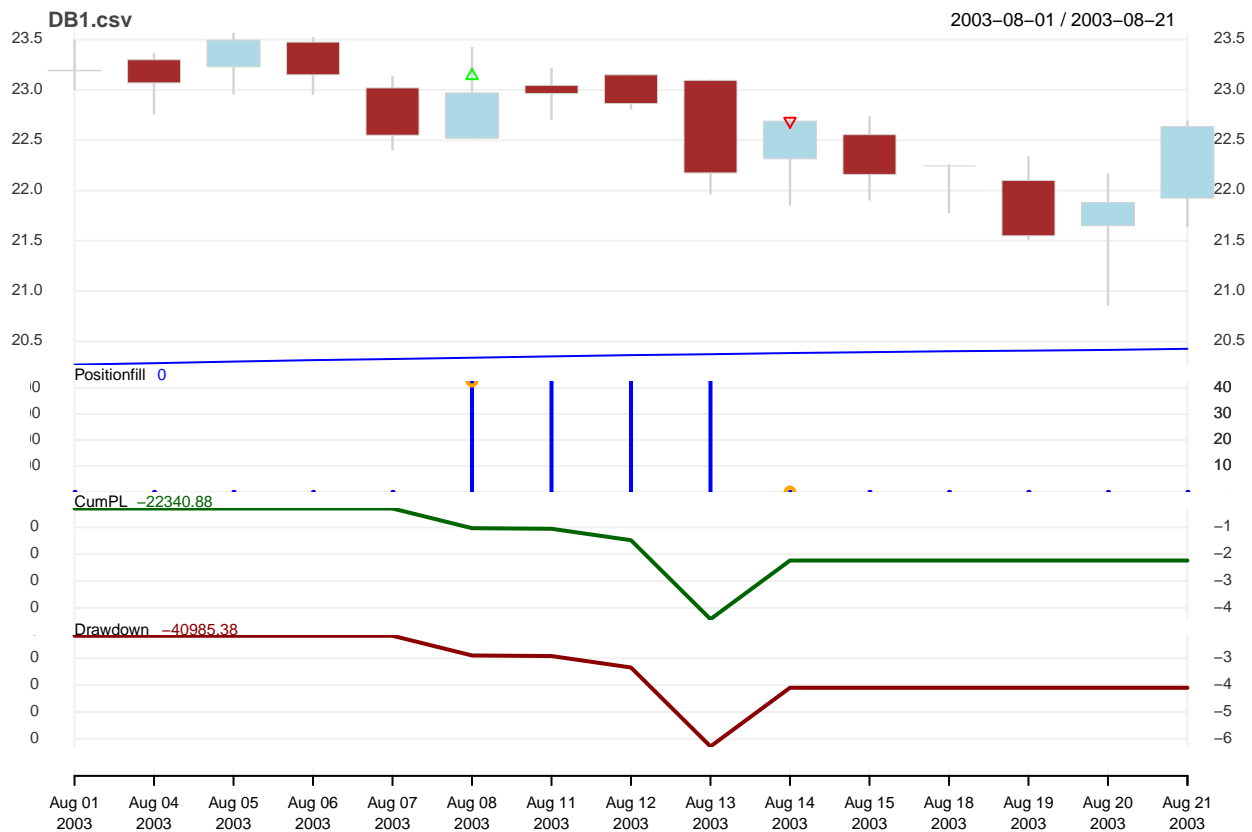


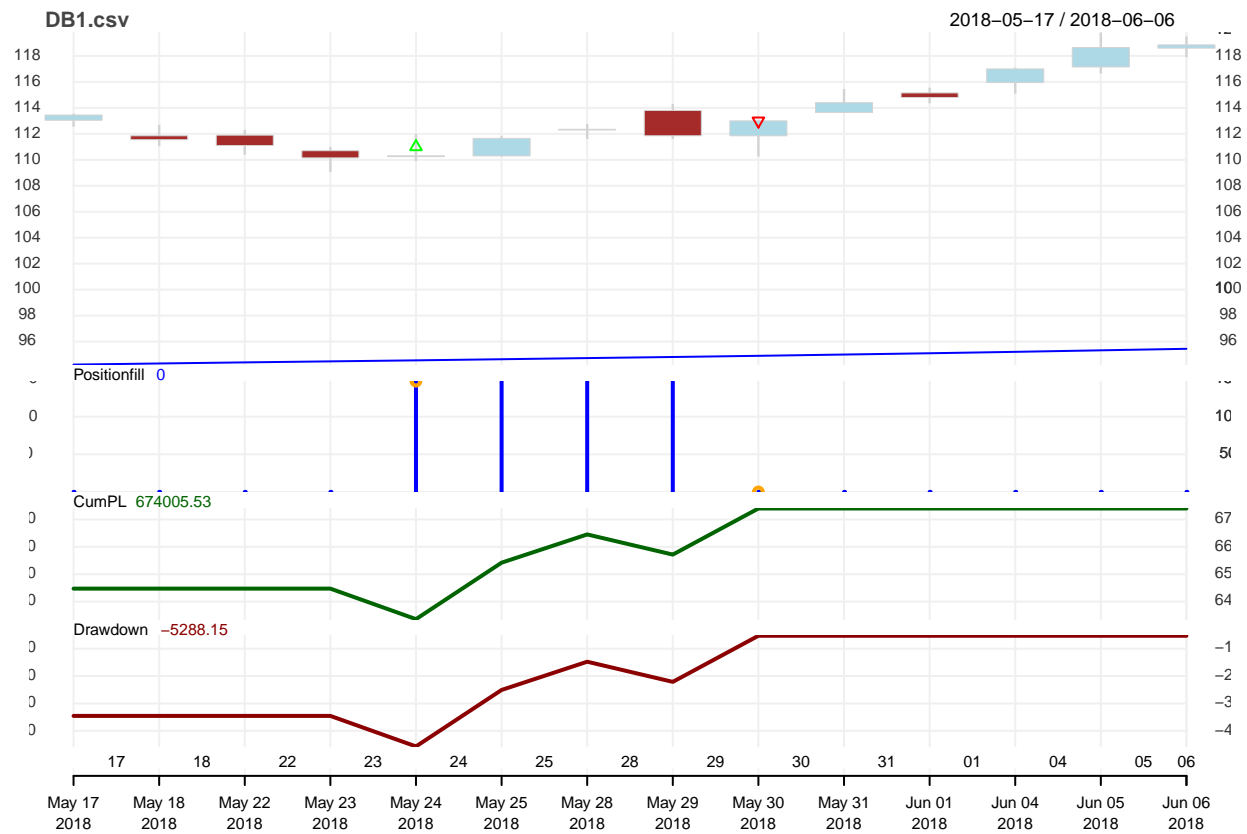


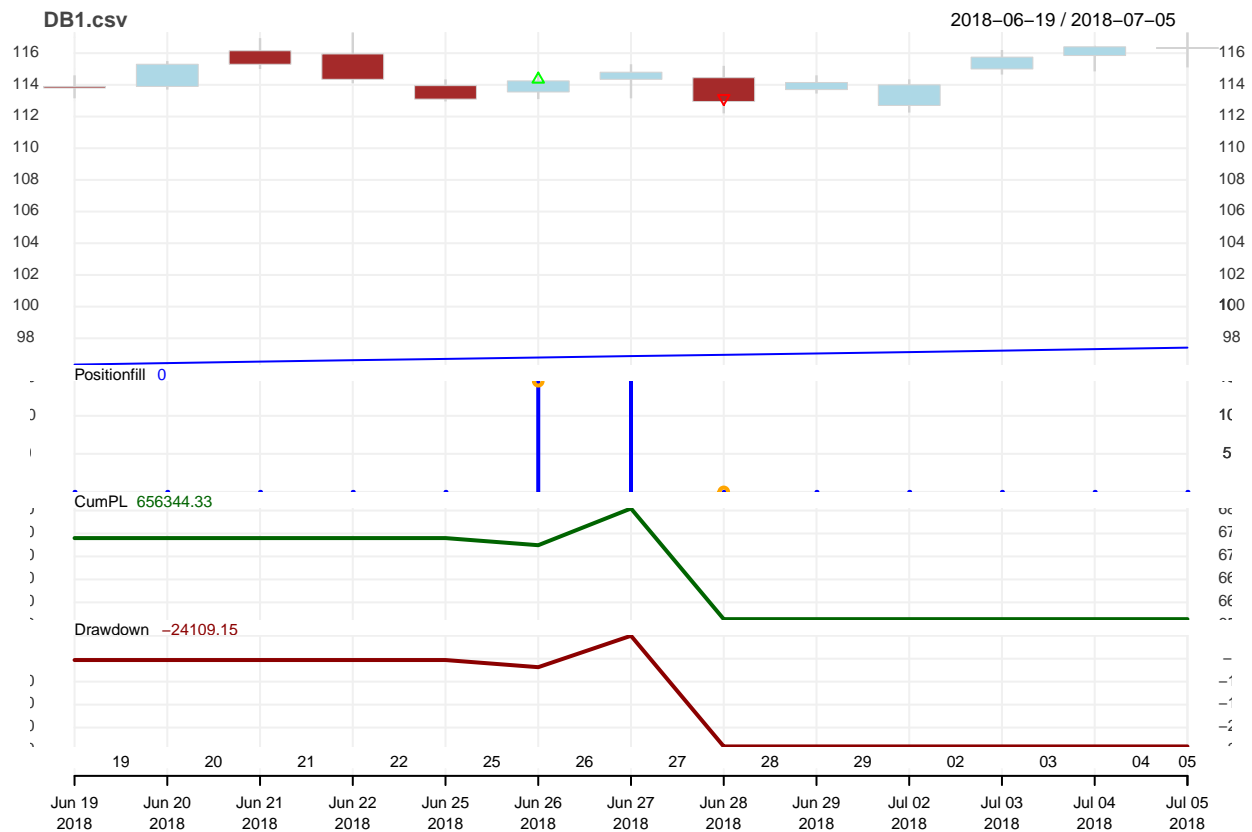


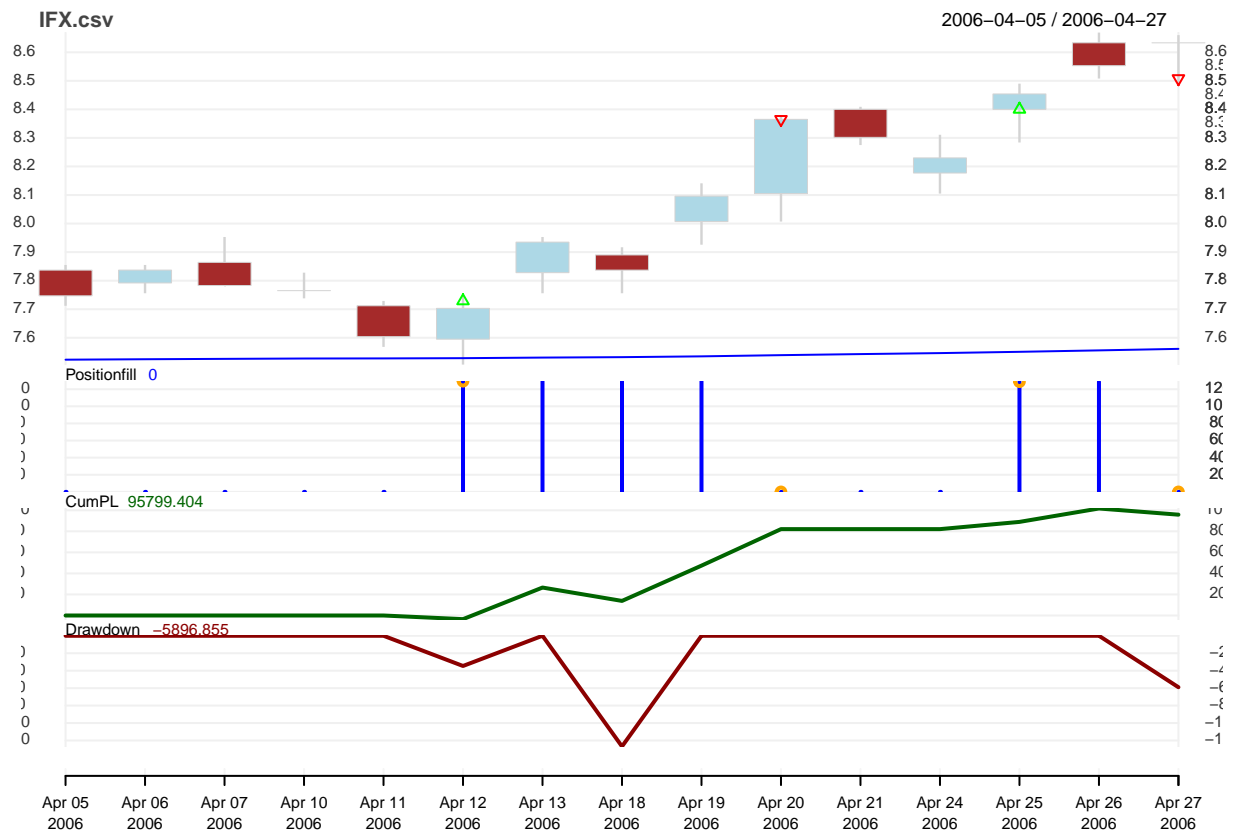


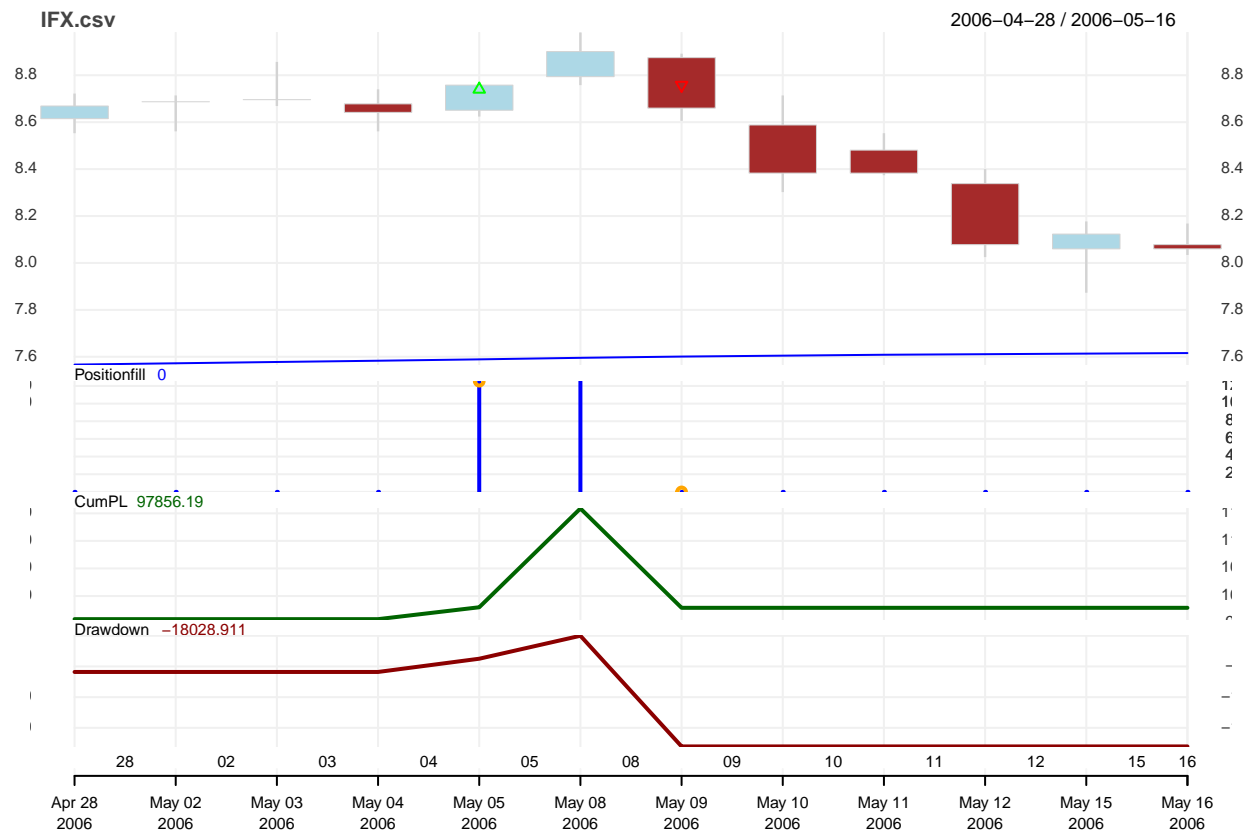


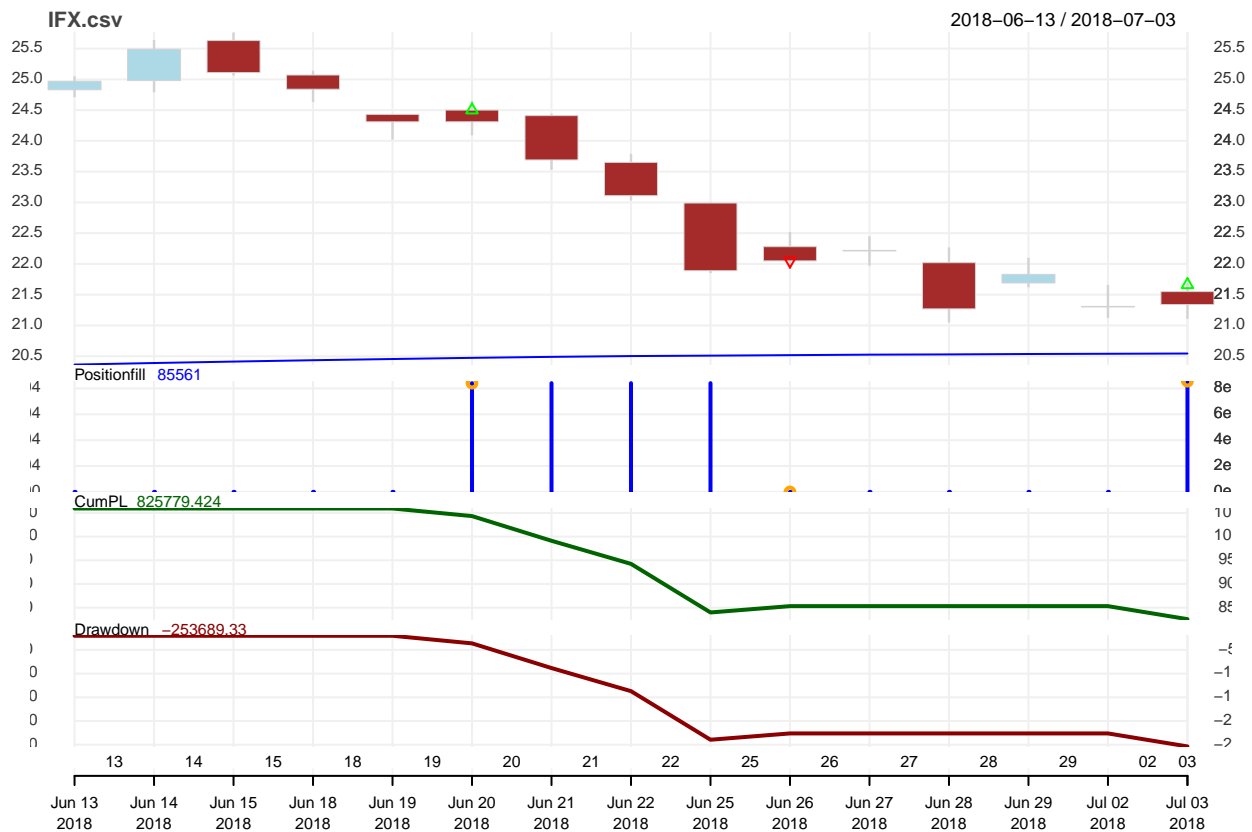




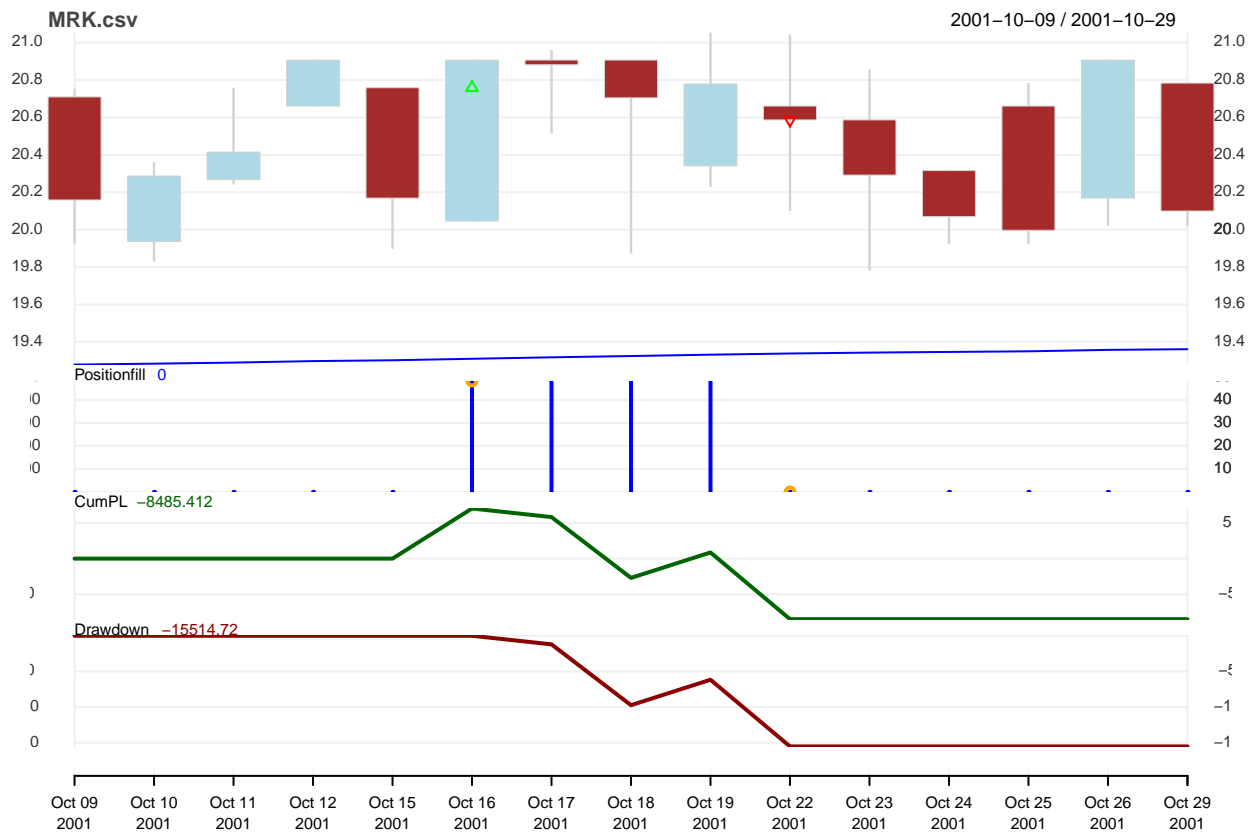


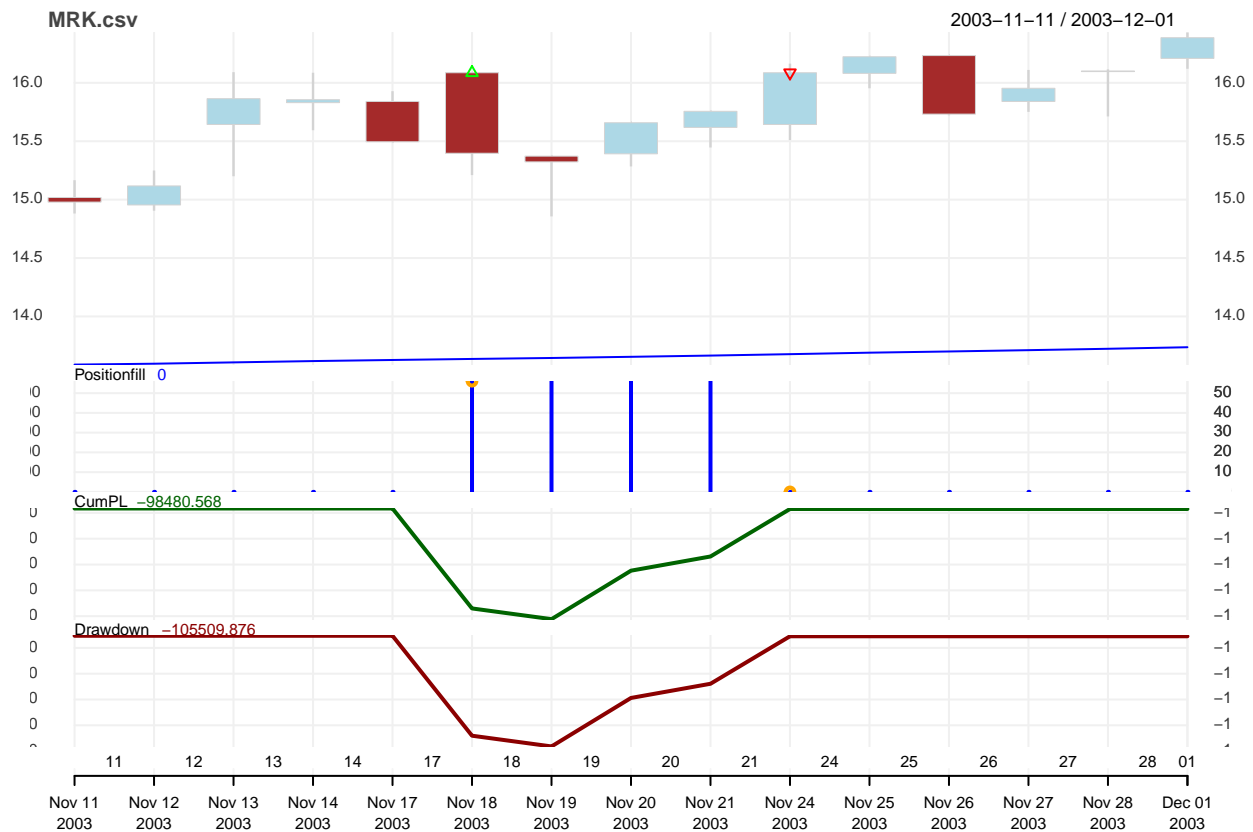


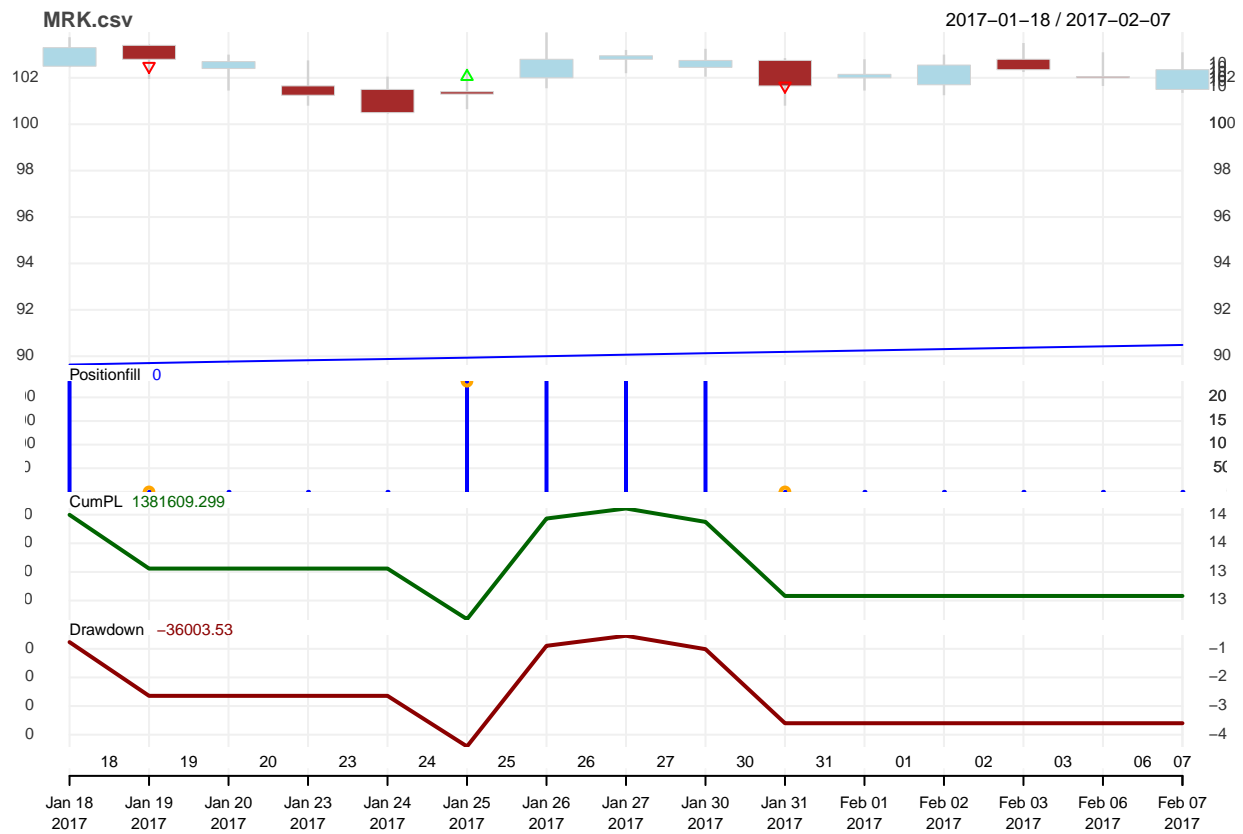


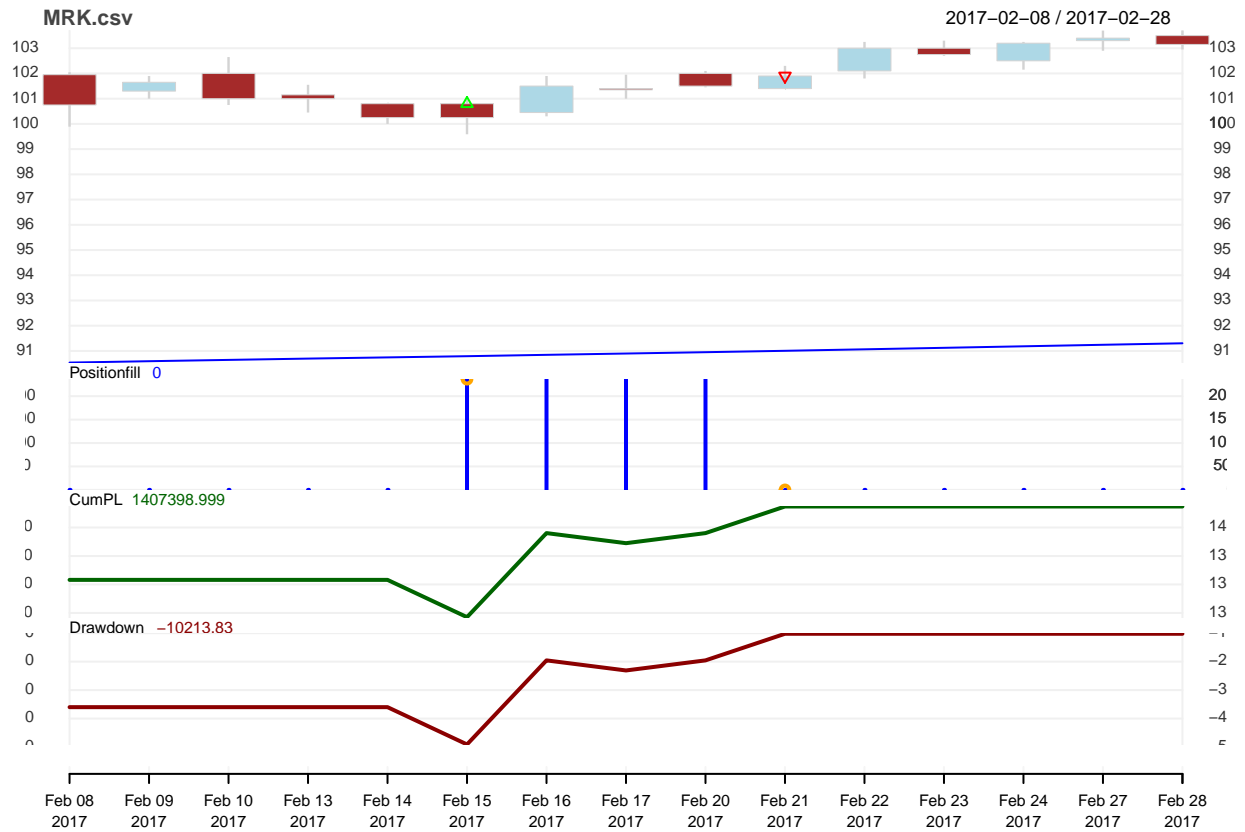


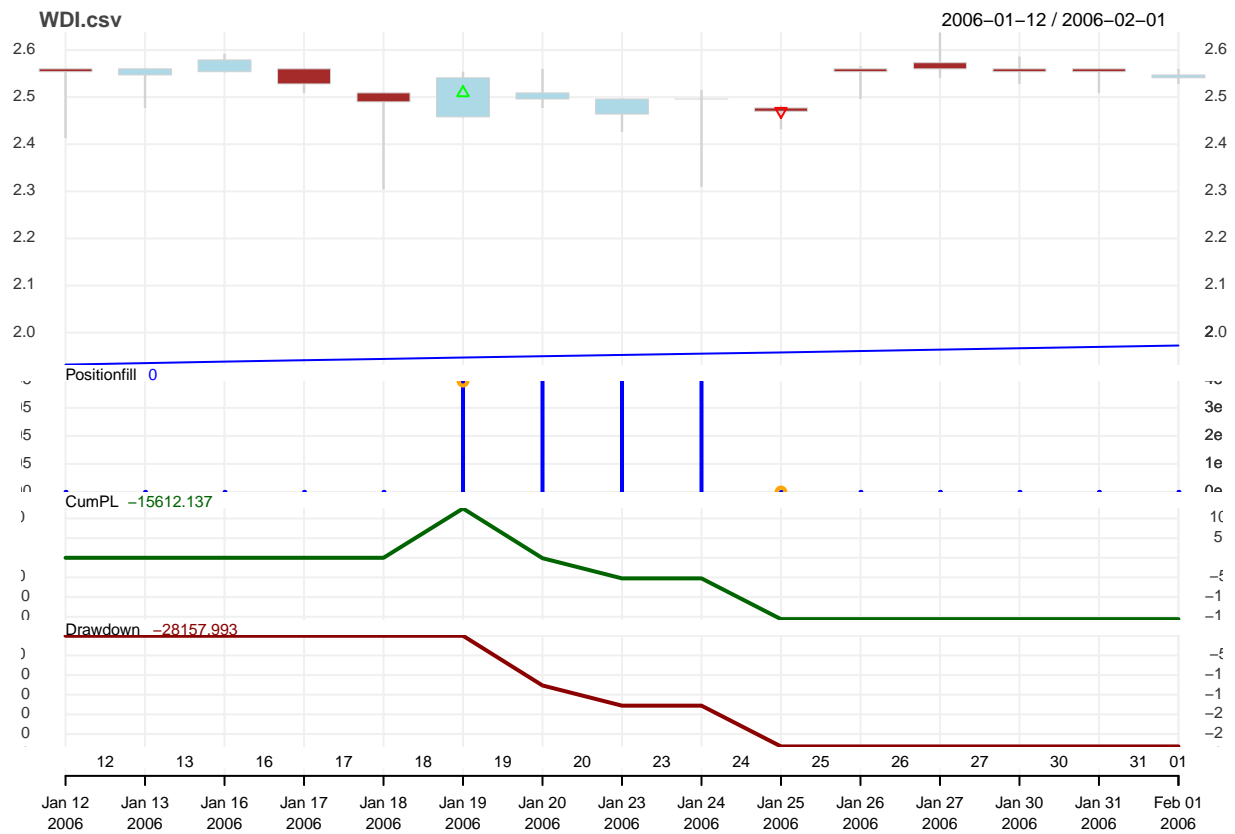




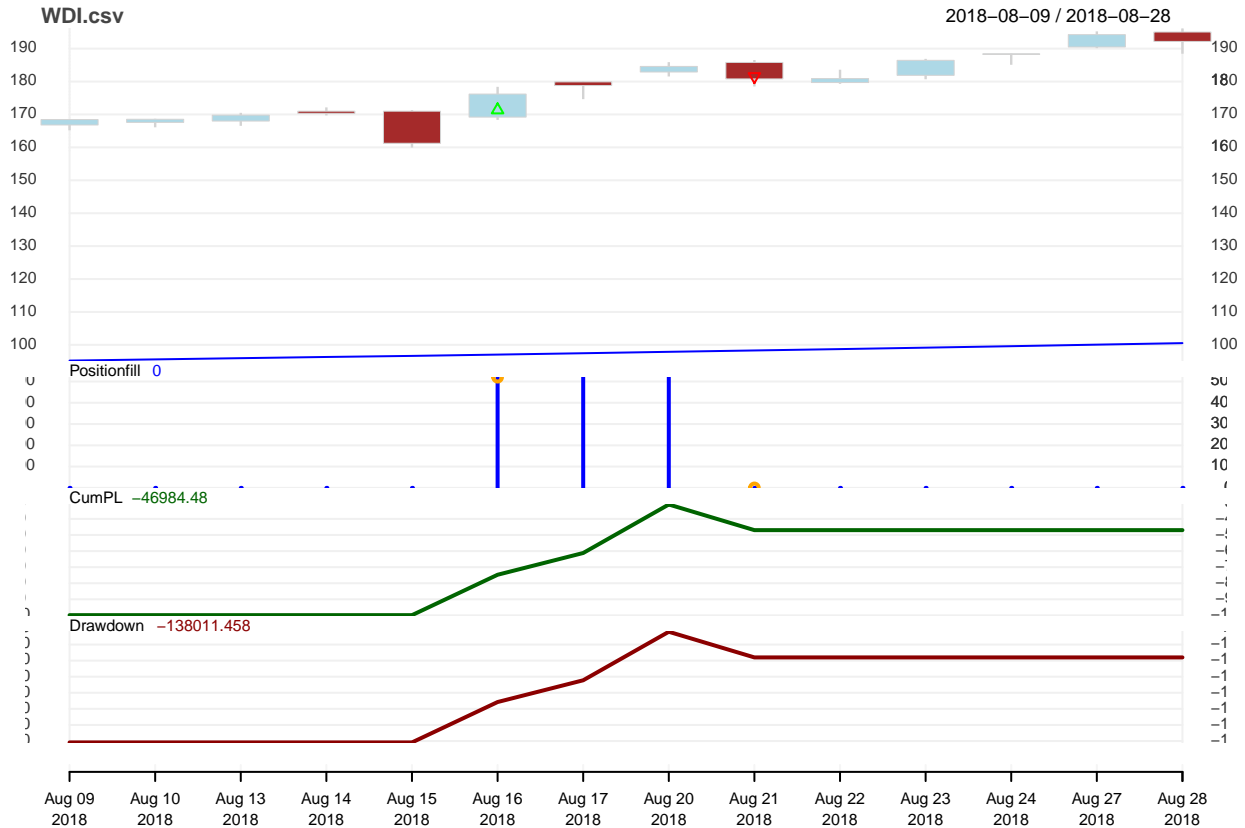












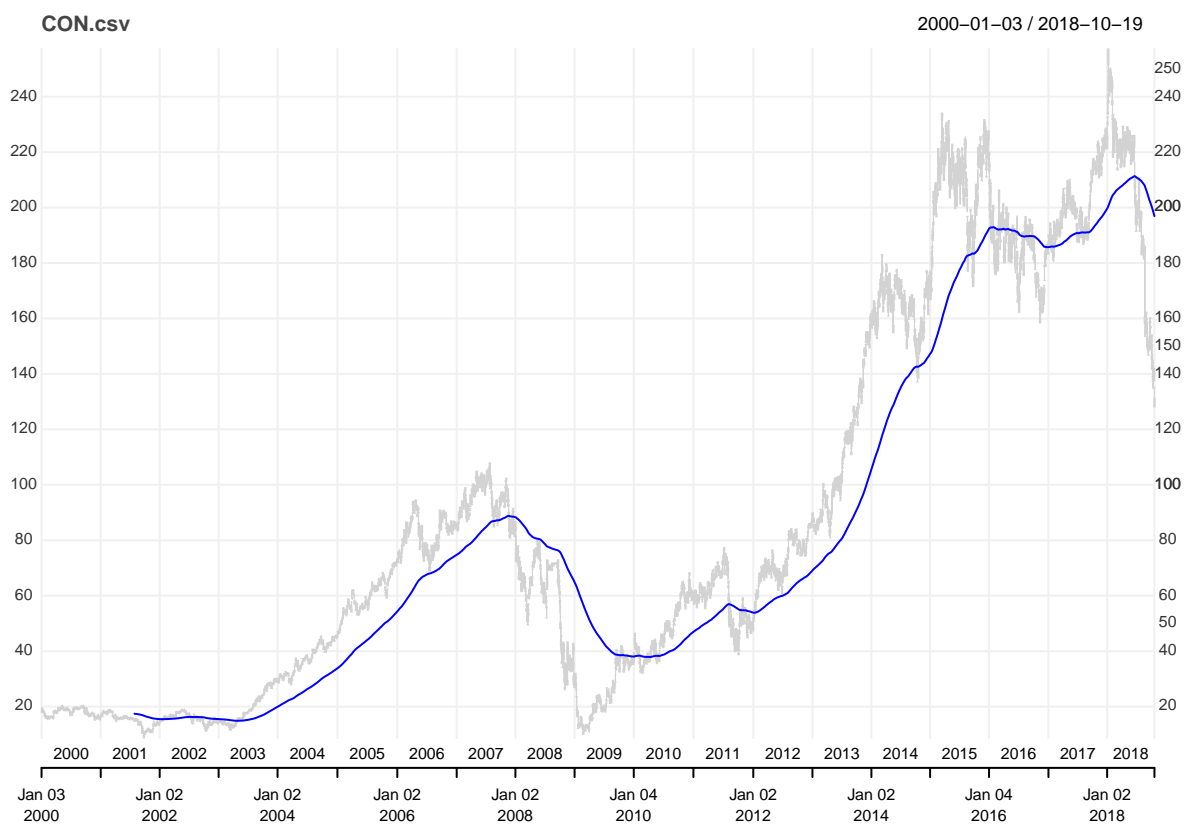
The plots of the chosen transactions show that the system works as designed. As a variety of transactions is plotted across many different instruments, we observe all possible patterns. The buy orders are all performed correctly after observing a Smash Day pattern. The sell orders do work as expected. The maximum holding period is applied and sell orders are placed after a maximum holding period of 4 days. Price drops below the EMA line lead to a sell transaction and also the smash day pattern can be observed which leads to a sell transaction.

Part C: Analysis and Reporting

Step 1: Visualize original data

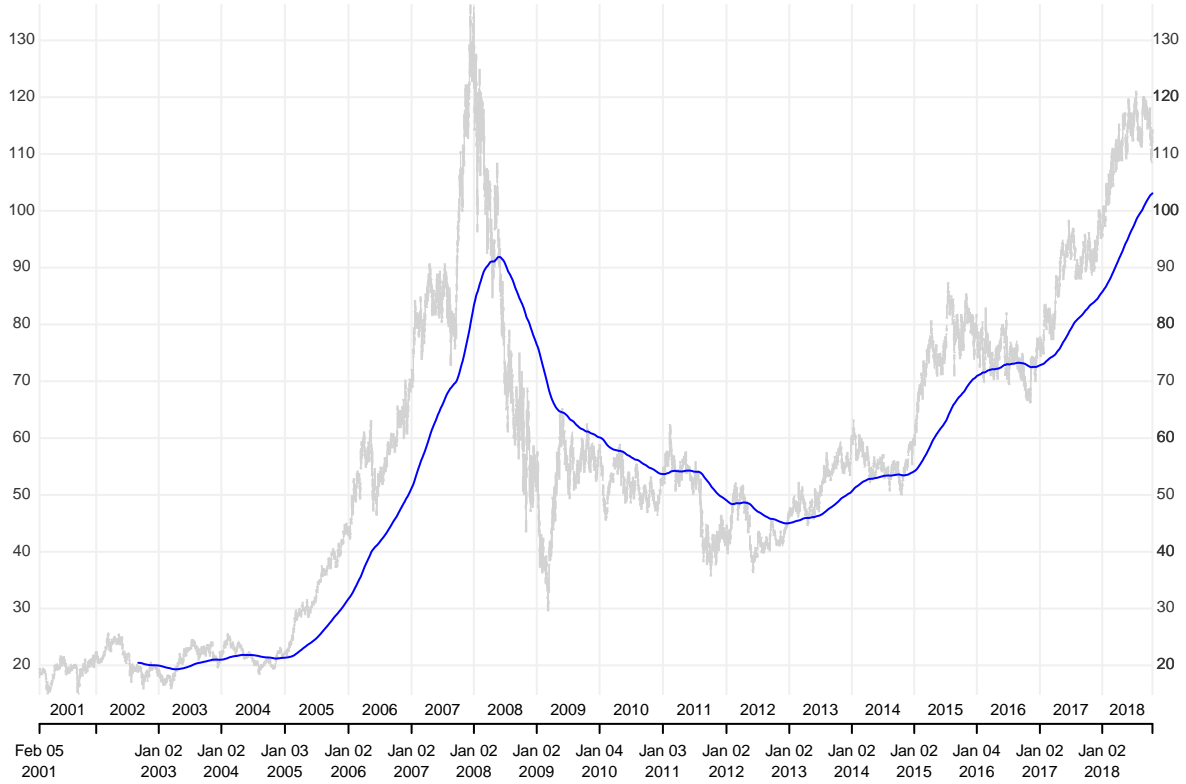
The following section shows plots of the instruments with the EMA line which indicates the general trend of the stock exponentially smoothed for the last 400 days. This plots can be used to get a first impression of the long term trend of the instrument and to see which general behaviour of the price movement can be observed.

```
for (instrument in instrumentlist){
  chart <- get(instrument)
  print(chart_Series(x=chart,name=instrument,
    theme=myTheme,
    subset=daterange,
    TA="add_TA((chart$EMA), on=1,type='l',col='blue')"))
}
```



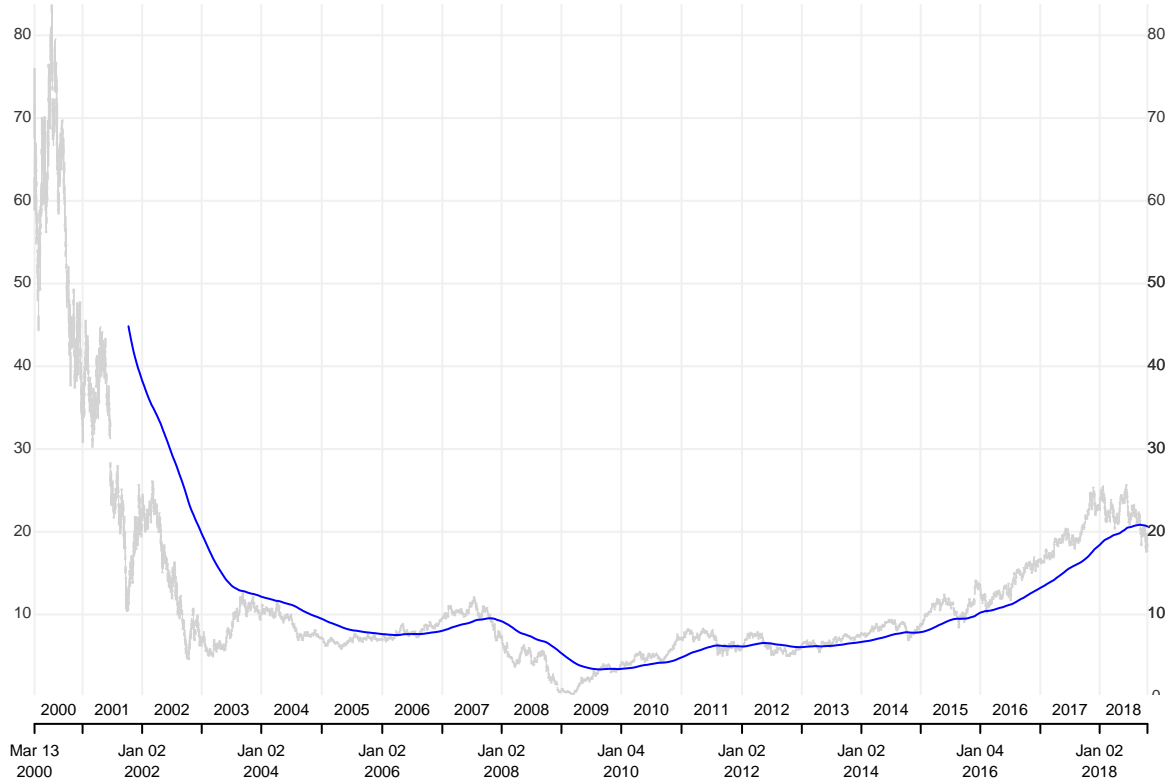
DB1.csv

2001-02-05 / 2018-10-19

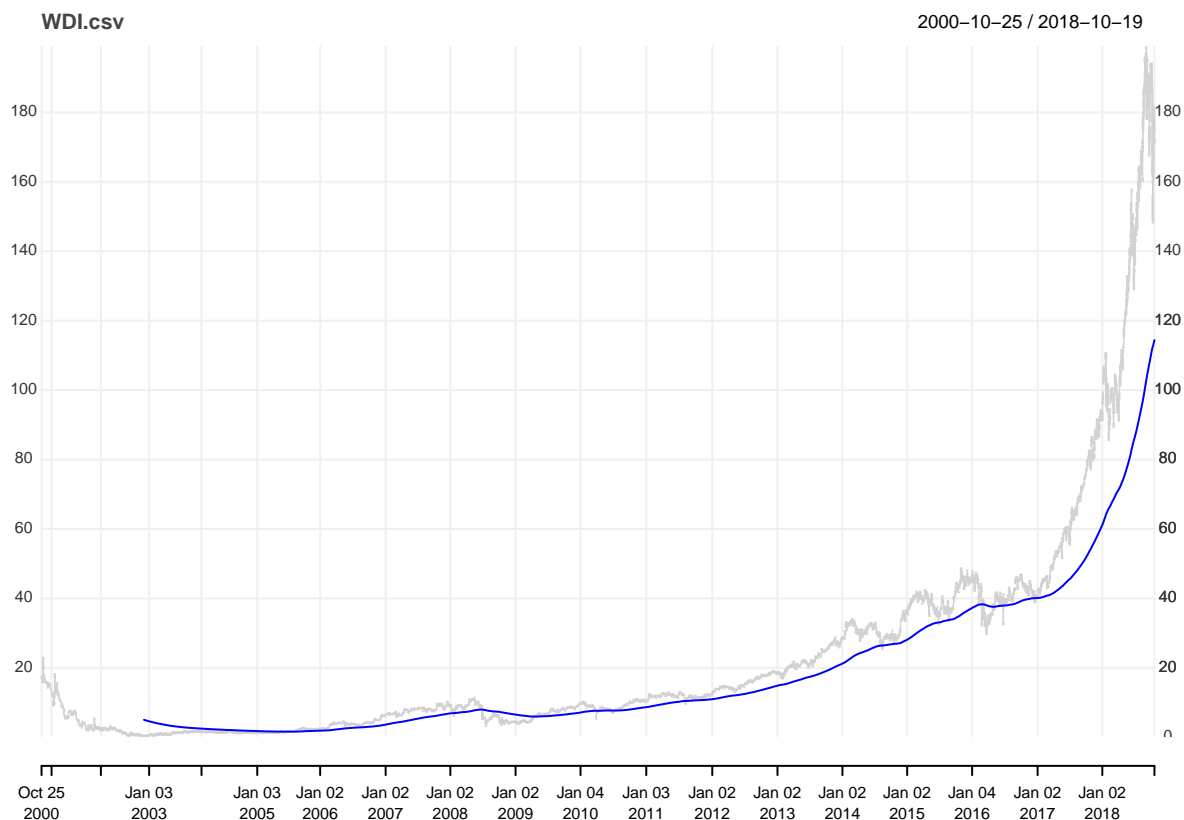


IFX.csv

2000-03-13 / 2018-10-19







Step 2: All transactions performed by the trading system

The following table can be used to get a better overview of the transactions performed and the exact details like the quantity, price and value per transaction. The table can be used to compare certain trades, make sure that the trades were executed as expected and use it as a reference, when looking for trades of a specific instrument at a specific time.

```
for (instrument in instrumentlist){
  print(sprintf("Transactions for the instrument: %s", instrument))
  txns <- getTxns(Portfolio = portfolioname, Symbol = instrument)
  txns.pr <- txns[,c(1,2,4,6)]
  colnames(txns.pr) <- c("Quantity", "Price", "Value", "Net realized Profit")
  print(txns.pr)
  writeLines("")
}
```

```
## [1] "Transactions for the instrument: CON.csv"
##      Quantity   Price    Value Net realized Profit
## 1999-12-31      0  0.000      0.0          0.000
## 2002-02-14   62278 16.057 999997.8        -100.000
## 2002-02-18  -62278 15.786 -983120.5       -16977.338
## 2002-04-30   54893 17.906  982914.1        -100.000
## 2002-05-07  -54893 18.244 -1001467.9        18453.834
## 2002-06-21   57504 17.412 1001259.6        -100.000
## 2002-06-26  -57504 17.218 -990103.9       -11255.776
## 2003-06-11   55373 17.877  989903.1        -100.000
## 2003-06-17  -55373 17.809 -986137.8       -3865.364
```


## 2003-07-18	52106	18.922	985949.7	-100.000
## 2003-07-24	-52106	19.019	-991004.0	4954.282
## 2003-08-13	47992	20.645	990794.8	-100.000
## 2003-08-18	-47992	21.206	-1017718.4	26823.512
## 2003-09-11	44546	22.842	1017519.7	-100.000
## 2003-09-17	-44546	23.229	-1034759.0	17139.302
## 2003-11-07	37064	27.913	1034567.4	-100.000
## 2003-11-11	-37064	28.068	-1040312.4	5644.920
## 2003-12-01	36428	28.552	1040092.3	-100.000
## 2003-12-02	-36428	28.233	-1028471.7	-11720.532
## 2004-02-09	34495	29.810	1028295.9	-100.000
## 2004-02-13	-34495	31.349	-1081383.8	52987.805
## 2004-03-25	37273	29.007	1081177.9	-100.000
## 2004-03-30	-37273	29.278	-1091278.9	10000.983
## 2004-04-08	34036	32.056	1091058.0	-100.000
## 2004-04-16	-34036	34.330	-1168455.9	77297.864
## 2004-05-26	33764	34.601	1168268.2	-100.000
## 2004-06-01	-33764	35.434	-1196393.6	28025.412
## 2004-06-02	33608	36.082	1212643.9	-100.000
## 2004-06-08	-33608	36.837	-1238017.9	25274.040
## 2004-06-15	32948	37.069	1221349.4	-100.000
## 2004-06-17	-32948	37.040	-1220393.9	-1055.492
## 2004-08-02	31338	38.937	1220207.7	-100.000
## 2004-08-06	-31338	39.528	-1238728.5	18420.758
## 2004-08-23	31097	39.828	1238531.3	-100.000
## 2004-08-27	-31097	41.192	-1280947.6	42316.308
## 2004-09-09	29884	42.857	1280738.6	-100.000
## 2004-09-15	-29884	43.448	-1298400.0	17561.444
## 2004-10-15	31732	40.912	1298219.6	-100.000
## 2004-10-21	-31732	40.854	-1296379.1	-1940.456
## 2004-10-26	31992	40.515	1296155.9	-100.000
## 2004-10-29	-31992	41.618	-1331443.1	35187.176
## 2004-11-01	31916	42.054	1342195.5	-100.000
## 2004-11-03	-31916	42.054	-1342195.5	-100.000
## 2004-11-17	31135	42.751	1331052.4	-100.000
## 2004-11-23	-31135	42.848	-1334072.5	2920.095
## 2004-12-09	30038	44.406	1333867.4	-100.000
## 2004-12-15	-30038	45.045	-1353061.7	19094.282
## 2005-01-31	26829	50.426	1352879.2	-100.000
## 2005-02-03	-26829	51.887	-1392076.3	39097.169
## 2005-02-11	25684	54.191	1391841.6	-100.000
## 2005-02-15	-25684	54.017	-1387372.6	-4569.016
## 2005-03-18	24801	55.933	1387194.3	-100.000
## 2005-03-24	-24801	55.604	-1379034.8	-8259.529
## 2005-03-31	24949	55.265	1378806.5	-100.000
## 2005-04-06	-24949	61.711	-1539627.7	160721.254
## 2005-04-19	26334	58.459	1539459.3	-100.000
## 2005-04-25	-26334	57.346	-1510149.6	-29409.742
## 2005-04-28	26963	56.001	1509955.0	-100.000
## 2005-05-04	-26963	55.846	-1505775.7	-4279.265
## 2005-05-10	27902	53.959	1505564.0	-100.000
## 2005-05-13	-27902	53.378	-1489353.0	-16311.062
## 2005-06-08	26569	56.049	1489165.9	-100.000
## 2005-06-14	-26569	55.314	-1469637.7	-19628.215

## 2005-06-28	25658	57.269	1469408.0	-100.000
## 2005-07-04	-25658	57.888	-1485290.3	15782.302
## 2005-08-10	23555	63.047	1485072.1	-100.000
## 2005-08-16	-23555	62.466	-1471386.6	-13785.455
## 2005-09-01	23509	62.582	1471240.2	-100.000
## 2005-09-02	-23509	62.118	-1460332.1	-11008.176
## 2005-09-30	21863	66.783	1460076.7	-100.000
## 2005-10-06	-21863	66.551	-1455004.5	-5172.216
## 2005-10-10	21643	67.218	1454799.2	-100.000
## 2005-10-14	-21643	65.515	-1417941.1	-36958.029
## 2005-10-24	23141	61.266	1417756.5	-100.000
## 2005-10-28	-23141	60.221	-1393574.2	-24282.345
## 2005-12-09	19667	70.848	1393367.6	-100.000
## 2005-12-15	-19667	71.942	-1414883.3	21415.698
## 2006-01-19	19077	74.158	1414712.2	-100.000
## 2006-01-25	-19077	73.587	-1403819.2	-10992.967
## 2006-03-20	16388	85.647	1403583.0	-100.000
## 2006-03-24	-16388	86.527	-1418004.5	14321.440
## 2006-04-19	15614	90.805	1417829.3	-100.000
## 2006-04-24	-15614	92.073	-1437627.8	19698.552
## 2006-05-08	15716	91.464	1437448.2	-100.000
## 2006-05-12	-15716	86.344	-1356982.3	-80565.920
## 2006-05-23	16482	82.317	1356748.8	-100.000
## 2006-05-29	-16482	84.659	-1395349.6	38500.844
## 2006-06-09	18132	76.946	1395184.9	-100.000
## 2006-06-15	-18132	76.849	-1393426.1	-1858.804
## 2006-06-29	18509	75.271	1393190.9	-100.000
## 2006-07-05	-18509	77.565	-1435650.6	42359.646
## 2006-07-19	20378	70.441	1435446.7	-100.000
## 2006-07-21	-20378	71.584	-1458738.8	23192.054
## 2006-09-27	16652	87.592	1458582.0	-100.000
## 2006-10-03	-16652	87.437	-1456000.9	-2681.060
## 2006-10-18	16278	89.431	1455757.8	-100.000
## 2006-10-24	-16278	89.528	-1457336.8	1478.966
## 2006-11-02	17167	84.882	1457169.3	-100.000
## 2006-11-08	-17167	82.840	-1422114.3	-35155.014
## 2006-11-20	16753	84.872	1421860.6	-100.000
## 2006-11-24	-16753	86.334	-1446353.5	24392.886
## 2006-11-29	17302	83.585	1446187.7	-100.000
## 2006-11-30	-17302	83.256	-1440495.3	-5792.358
## 2006-12-27	16834	85.560	1440317.0	-100.000
## 2007-01-03	-16834	85.772	-1443885.8	3468.808
## 2007-01-09	17047	84.688	1443676.3	-100.000
## 2007-01-10	-17047	83.856	-1429493.2	-14283.104
## 2007-01-24	15727	90.883	1429316.9	-100.000
## 2007-01-30	-15727	88.792	-1396431.8	-32985.157
## 2007-02-22	14226	98.142	1396168.1	-100.000
## 2007-02-28	-14226	91.280	-1298549.3	-97718.812
## 2007-03-06	14426	90.002	1298368.9	-100.000
## 2007-03-12	-14426	91.580	-1321133.1	22664.228
## 2007-03-15	14869	88.841	1320976.8	-100.000
## 2007-03-21	-14869	89.789	-1335072.6	13995.812
## 2007-03-29	14255	93.641	1334852.5	-100.000
## 2007-03-30	-14255	93.525	-1333198.9	-1753.580

## 2007-05-14	13217	100.852	1332960.9	-100.000
## 2007-05-15	-13217	99.884	-1320166.8	-12894.056
## 2007-05-25	13102	100.745	1319961.0	-100.000
## 2007-06-01	-13102	103.078	-1350528.0	30466.966
## 2007-06-14	13593	99.342	1350355.8	-100.000
## 2007-06-20	-13593	101.771	-1383373.2	32917.397
## 2007-07-19	13358	103.543	1383127.4	-100.000
## 2007-07-25	-13358	105.014	-1402777.0	19549.618
## 2007-08-13	15447	90.805	1402664.8	-100.000
## 2007-08-17	-15447	86.043	-1329106.2	-73658.614
## 2007-08-30	14733	90.196	1328857.7	-100.000
## 2007-09-05	-14733	93.061	-1371067.7	42110.045
## 2007-09-26	14523	94.396	1370913.1	-100.000
## 2007-10-02	-14523	96.380	-1399726.7	28713.632
## 2007-10-09	14458	96.796	1399476.6	-100.000
## 2007-10-15	-14458	95.354	-1378628.1	-20948.436
## 2007-10-17	14447	95.412	1378417.2	-100.000
## 2007-10-23	-14447	94.290	-1362207.6	-16309.534
## 2007-11-09	14087	96.690	1362072.0	-100.000
## 2007-11-15	-14087	90.263	-1271534.9	-90637.149
## 2010-01-13	29949	42.450	1271335.1	-100.000
## 2010-01-19	-29949	42.200	-1263847.8	-7587.250
## 2010-04-20	31395	40.250	1263648.8	-100.000
## 2010-04-26	-31395	43.235	-1357362.8	93614.075
## 2010-05-10	33971	39.950	1357141.5	-100.000
## 2010-05-14	-33971	43.000	-1460753.0	103511.550
## 2010-06-28	32507	44.930	1460539.5	-100.000
## 2010-07-02	-32507	43.310	-1407878.2	-52761.340
## 2010-07-08	31708	44.395	1407676.7	-100.000
## 2010-07-14	-31708	48.900	-1550521.2	142744.540
## 2010-08-05	30597	50.670	1550350.0	-100.000
## 2010-08-11	-30597	47.055	-1439741.8	-110708.155
## 2010-08-23	30628	47.000	1439516.0	-100.000
## 2010-08-27	-30628	47.390	-1451460.9	11844.920
## 2010-09-08	28473	50.970	1451268.8	-100.000
## 2010-09-14	-28473	54.830	-1561174.6	109805.780
## 2010-10-29	24900	62.690	1560981.0	-100.000
## 2010-11-02	-24900	62.500	-1556250.0	-4831.000
## 2010-11-12	26631	58.430	1556049.3	-100.000
## 2010-11-18	-26631	60.020	-1598392.6	42243.290
## 2011-02-01	27024	59.140	1598199.4	-100.000
## 2011-02-07	-27024	59.000	-1594416.0	-3883.360
## 2011-02-25	27066	58.900	1594187.4	-100.000
## 2011-03-02	-27066	60.700	-1642906.2	48618.800
## 2011-03-16	27711	59.280	1642708.1	-100.000
## 2011-03-22	-27711	59.020	-1635503.2	-7304.860
## 2011-04-13	27048	60.460	1635322.1	-100.000
## 2011-04-19	-27048	61.670	-1668050.2	32628.080
## 2011-05-06	25198	66.190	1667855.6	-100.000
## 2011-05-12	-25198	67.460	-1699857.1	31901.460
## 2011-05-24	24910	68.230	1699609.3	-100.000
## 2011-05-30	-24910	70.090	-1745941.9	46232.600
## 2011-06-03	24742	70.560	1745795.5	-100.000
## 2011-06-09	-24742	70.120	-1734909.0	-10986.480

## 2011-06-24	25316	68.520	1734652.3	-100.000
## 2011-06-30	-25316	72.450	-1834144.2	99391.880
## 2011-08-04	28202	65.030	1833976.1	-100.000
## 2011-08-09	-28202	53.000	-1494706.0	-339370.060
## 2012-02-13	22296	67.030	1494500.9	-100.000
## 2012-02-16	-22296	66.220	-1476441.1	-18159.760
## 2012-02-23	21201	69.630	1476225.6	-100.000
## 2012-02-29	-21201	68.330	-1448664.3	-27661.300
## 2012-03-30	20508	70.630	1448480.0	-100.000
## 2012-04-05	-20508	70.870	-1453402.0	4821.920
## 2012-04-24	21236	68.430	1453179.5	-100.000
## 2012-04-30	-21236	73.220	-1554899.9	101620.440
## 2012-05-21	23267	66.820	1554700.9	-100.000
## 2012-05-23	-23267	67.400	-1568195.8	13394.860
## 2012-06-05	24682	63.530	1568047.5	-100.000
## 2012-06-11	-24682	67.490	-1665788.2	97640.720
## 2012-06-27	26907	61.900	1665543.3	-100.000
## 2012-07-03	-26907	69.160	-1860888.1	195244.820
## 2012-07-10	27018	68.870	1860729.7	-100.000
## 2012-07-16	-27018	71.440	-1930165.9	69336.260
## 2012-08-16	23588	81.820	1929970.2	-100.000
## 2012-08-22	-23588	82.500	-1946010.0	15939.840
## 2012-11-14	25609	75.980	1945771.8	-100.000
## 2012-11-20	-25609	78.670	-2014660.0	68788.210
## 2012-12-14	23443	85.930	2014457.0	-100.000
## 2012-12-20	-23443	85.760	-2010471.7	-4085.310
## 2013-01-14	23419	85.840	2010287.0	-100.000
## 2013-01-18	-23419	84.400	-1976563.6	-33823.360
## 2013-02-25	22206	89.000	1976334.0	-100.000
## 2013-03-01	-22206	89.200	-1980775.2	4341.200
## 2013-03-12	20418	97.000	1980546.0	-100.000
## 2013-03-18	-20418	98.040	-2001780.7	21134.720
## 2013-04-10	22345	89.580	2001665.1	-100.000
## 2013-04-16	-22345	85.890	-1919212.1	-82553.050
## 2013-04-19	22957	83.590	1918975.6	-100.000
## 2013-04-25	-22957	89.550	-2055799.3	136723.720
## 2013-05-17	21081	97.510	2055608.3	-100.000
## 2013-05-23	-21081	99.270	-2092710.9	37002.560
## 2013-06-14	20821	100.500	2092510.5	-100.000
## 2013-06-20	-20821	97.860	-2037543.1	-55067.440
## 2013-07-24	17420	116.950	2037269.0	-100.000
## 2013-07-30	-17420	119.050	-2073851.0	36482.000
## 2013-08-29	17838	116.250	2073667.5	-100.000
## 2013-09-04	-17838	119.100	-2124505.8	50738.300
## 2013-09-16	16727	127.000	2124329.0	-100.000
## 2013-09-17	-16727	122.400	-2047384.8	-77044.200
## 2013-09-18	17201	123.450	2123463.5	-100.000
## 2013-09-20	-17201	124.650	-2144104.6	20541.200
## 2013-09-27	16371	126.300	2067657.3	-100.000
## 2013-09-30	-16371	125.850	-2060290.3	-7466.950
## 2013-10-01	16545	126.500	2092942.5	-100.000
## 2013-10-02	-16545	125.550	-2077224.8	-15817.750
## 2013-10-30	15445	132.350	2044145.8	-100.000
## 2013-11-05	-15445	136.050	-2101292.2	57046.500

## 2013-11-07	15242	137.850	2101109.7	-100.000
## 2013-11-13	-15242	145.450	-2216948.9	115739.200
## 2013-12-04	14376	154.200	2216779.2	-100.000
## 2013-12-10	-14376	153.850	-2211747.6	-5131.600
## 2013-12-16	14511	152.400	2211476.4	-100.000
## 2013-12-20	-14511	159.200	-2310151.2	98574.800
## 2014-01-06	14533	158.950	2310020.3	-100.000
## 2014-01-10	-14533	158.100	-2297667.3	-12453.050
## 2014-01-28	14422	159.300	2297424.6	-100.000
## 2014-02-03	-14422	157.300	-2268580.6	-28944.000
## 2014-02-06	14541	156.000	2268396.0	-100.000
## 2014-02-12	-14541	165.000	-2399265.0	130769.000
## 2014-03-04	13899	172.600	2398967.4	-100.000
## 2014-03-10	-13899	172.000	-2390628.0	-8439.400
## 2014-03-17	14340	166.700	2390478.0	-100.000
## 2014-03-21	-14340	170.750	-2448555.0	57977.000
## 2014-04-16	14678	166.800	2448290.4	-100.000
## 2014-04-24	-14678	174.300	-2558375.4	109985.000
## 2014-05-06	15346	166.700	2558178.2	-100.000
## 2014-05-07	-15346	165.500	-2539763.0	-18515.200
## 2014-06-04	14655	173.300	2539711.5	-100.000
## 2014-06-10	-14655	174.350	-2555099.2	15287.750
## 2014-06-26	15011	170.200	2554872.2	-100.000
## 2014-07-02	-15011	172.200	-2584894.2	29922.000
## 2014-07-16	15326	168.650	2584729.9	-100.000
## 2014-07-22	-15326	165.400	-2534920.4	-49909.500
## 2014-08-18	16042	158.000	2534636.0	-100.000
## 2014-08-22	-16042	163.300	-2619658.6	84922.600
## 2014-09-17	16095	162.750	2619461.2	-100.000
## 2014-09-23	-16095	153.650	-2472996.8	-146564.500
## 2014-10-01	16274	151.950	2472834.3	-100.000
## 2014-10-08	-16274	142.050	-2311721.7	-161212.600
## 2014-12-10	13300	173.800	2311540.0	-100.000
## 2014-12-16	-13300	169.250	-2251025.0	-60615.000
## 2015-04-15	9904	227.250	2250684.0	-100.000
## 2015-04-21	-9904	225.500	-2233352.0	-17432.000
## 2015-05-07	10688	208.950	2233257.6	-100.000
## 2015-05-13	-10688	210.100	-2245548.8	12191.200
## 2015-06-03	10512	213.600	2245363.2	-100.000
## 2015-06-09	-10512	205.300	-2158113.6	-87349.600
## 2015-06-16	10322	209.050	2157814.1	-100.000
## 2015-06-22	-10322	218.150	-2251744.3	93830.200
## 2015-06-25	10274	219.150	2251547.1	-100.000
## 2015-06-29	-10274	209.300	-2150348.2	-101298.900
## 2015-07-09	10313	208.500	2150260.5	-100.000
## 2015-07-14	-10313	211.300	-2179136.9	28776.400
## 2015-07-16	10229	213.000	2178777.0	-100.000
## 2015-07-22	-10229	216.450	-2214067.0	35190.050
## 2015-09-02	11817	187.350	2213914.9	-100.000
## 2015-09-04	-11817	187.200	-2212142.4	-1872.550
## 2015-11-13	10243	215.950	2211975.9	-100.000
## 2015-11-19	-10243	221.000	-2263703.0	51627.150
## 2015-11-25	10224	221.400	2263593.6	-100.000
## 2015-12-01	-10224	226.350	-2314202.4	50508.800

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## 2015-12-15      10698 216.300 2313977.4      -100.000
## 2015-12-18     -10698 221.400 -2368537.2      54459.800
## 2015-12-21      10716 222.750 2386989.0      -100.000
## 2015-12-28     -10716 223.150 -2391275.4      4186.400
## 2015-12-29      10593 226.350 2397725.5      -100.000
## 2015-12-30     -10593 224.600 -2379187.8     -18637.750
## 2016-01-05      10742 219.100 2353572.2      -100.000
## 2016-01-11     -10742 201.300 -2162364.6    -191307.600
## 2017-03-10      11247 192.250 2162235.8      -100.000
## 2017-03-16     -11247 197.550 -2221844.9      59509.100
## 2017-03-23      11440 194.200 2221648.0      -100.000
## 2017-03-27     -11440 196.350 -2246244.0      24496.000
## 2017-05-23      11086 202.600 2246023.6      -100.000
## 2017-05-29     -11086 198.800 -2203896.8     -42226.800
## 2017-06-28      11348 194.200 2203781.6      -100.000
## 2017-06-30     -11348 189.100 -2145906.8     -57974.800
## 2017-09-14      10632 201.800 2145537.6      -100.000
## 2017-09-20     -10632 208.850 -2220493.2      74855.600
## 2017-10-10      10261 216.400 2220480.4      -100.000
## 2017-10-16     -10261 214.750 -2203549.8     -17030.650
## 2017-11-07       9880 223.000 2203240.0      -100.000
## 2017-11-13     -9880 216.150 -2135562.0     -67778.000
## 2017-11-24       9930 215.050 2135446.5      -100.000
## 2017-11-30     -9930 223.750 -2221837.5      86291.000
## 2018-01-03       9826 226.100 2221658.6      -100.000
## 2018-01-09     -9826 251.300 -2469273.8      247515.200
## 2018-01-16      10144 243.400 2469049.6      -100.000
## 2018-01-22     -10144 247.900 -2514697.6      45548.000
## 2018-01-31      10259 245.100 2514480.9      -100.000
## 2018-02-06     -10259 227.700 -2335974.3    -178606.600
## 2018-03-05      10656 219.200 2335795.2      -100.000
## 2018-03-07     -10656 218.600 -2329401.6     -6493.600
## 2018-03-20      10468 222.500 2329130.0      -100.000
## 2018-03-26     -10468 215.400 -2254807.2     -74422.800
## 2018-04-05      10115 222.900 2254633.5      -100.000
## 2018-04-06     -10115 220.500 -2230357.5     -24376.000
## 2018-04-17       9885 225.600 2230056.0      -100.000
## 2018-04-18     -9885 222.200 -2196447.0     -33709.000
## 2018-05-02       9880 222.300 2196324.0      -100.000
## 2018-05-08     -9880 228.000 -2252640.0      56216.000
## 2018-05-25      10105 222.900 2252404.5      -100.000
## 2018-05-31     -10105 217.100 -2193795.5     -58709.000
## 2018-06-11       9872 222.200 2193558.4      -100.000
## 2018-06-15     -9872 225.200 -2223174.4      29516.000
##
## [1] "Transactions for the instrument: DB1.csv"
##           Quantity   Price   Value Net realized Profit
## 1999-12-31         0  0.000     0.0         0.000
## 2003-06-30      43002 23.020  989906.0      -100.000
## 2003-07-04     -43002 23.150 -995496.3      5490.260
## 2003-07-24      41732 23.850  995308.2      -100.000
## 2003-07-30     -41732 23.655 -987170.5     -8237.740
## 2003-08-08      42652 23.140  986967.3      -100.000
## 2003-08-14     -42652 22.690 -967773.9    -19293.400

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## 2003-09-03	43771	22.105	967558.0	-100.000
## 2003-09-09	-43771	22.905	-1002574.8	34916.800
## 2003-09-12	44550	22.500	1002375.0	-100.000
## 2003-09-18	-44550	22.750	-1013512.5	11037.500
## 2003-10-01	45461	22.290	1013325.7	-100.000
## 2003-10-07	-45461	22.905	-1041284.2	27858.515
## 2003-10-23	46456	22.410	1041079.0	-100.000
## 2003-10-29	-46456	23.495	-1091483.7	50304.760
## 2004-01-06	49458	22.065	1091290.8	-100.000
## 2004-01-12	-49458	22.475	-1111568.6	20177.780
## 2004-01-26	46794	23.750	1111357.5	-100.000
## 2004-01-30	-46794	23.875	-1117206.8	5749.250
## 2004-02-05	45639	24.475	1117014.5	-100.000
## 2004-02-11	-45639	24.885	-1135726.5	18611.990
## 2004-03-12	48735	23.300	1135525.5	-100.000
## 2004-03-18	-48735	22.750	-1108721.2	-26904.250
## 2004-04-13	45987	24.105	1108516.6	-100.000
## 2004-04-19	-45987	23.535	-1082304.0	-26312.590
## 2004-12-08	47513	22.775	1082108.6	-100.000
## 2004-12-14	-47513	21.940	-1042435.2	-39773.355
## 2004-12-30	47107	22.125	1042242.4	-100.000
## 2005-01-03	-47107	22.025	-1037531.7	-4810.700
## 2005-01-17	46642	22.240	1037318.1	-100.000
## 2005-01-20	-46642	22.800	-1063437.6	26019.520
## 2005-01-21	46648	22.995	1072670.8	-100.000
## 2005-01-27	-46648	23.600	-1100892.8	28122.040
## 2005-03-09	38189	28.575	1091250.7	-100.000
## 2005-03-15	-38189	29.090	-1110918.0	19567.335
## 2005-03-31	37883	29.320	1110729.6	-100.000
## 2005-04-06	-37883	28.710	-1087620.9	-23208.630
## 2005-05-18	36987	29.400	1087417.8	-100.000
## 2005-05-24	-36987	29.585	-1094260.4	6742.595
## 2005-06-21	35016	31.245	1094074.9	-100.000
## 2005-06-27	-35016	31.315	-1096526.0	2351.120
## 2005-07-15	31481	34.825	1096325.8	-100.000
## 2005-07-21	-31481	34.660	-1091131.5	-5294.365
## 2005-09-16	28731	37.970	1090916.1	-100.000
## 2005-09-19	-28731	37.365	-1073533.8	-17482.255
## 2005-10-10	27040	39.695	1073352.8	-100.000
## 2005-10-14	-27040	39.000	-1054560.0	-18892.800
## 2005-10-20	27640	38.145	1054327.8	-100.000
## 2005-10-26	-27640	38.485	-1063725.4	9297.600
## 2005-12-14	24351	43.675	1063529.9	-100.000
## 2005-12-20	-24351	44.230	-1077044.7	13414.805
## 2006-01-02	24812	43.400	1076840.8	-100.000
## 2006-01-06	-24812	43.390	-1076592.7	-348.120
## 2006-01-11	24960	43.125	1076400.0	-100.000
## 2006-01-17	-24960	45.650	-1139424.0	62924.000
## 2006-02-13	22807	49.950	1139209.7	-100.000
## 2006-02-17	-22807	53.070	-1210367.5	71057.840
## 2006-02-24	22726	53.250	1210159.5	-100.000
## 2006-03-02	-22726	52.280	-1188115.3	-22144.220
## 2006-04-06	20487	57.985	1187938.7	-100.000
## 2006-04-12	-20487	56.240	-1152188.9	-35849.815

## 2006-05-11	19060	60.440	1151986.4	-100.000
## 2006-05-17	-19060	54.735	-1043249.1	-108837.300
## 2006-05-19	18807	55.460	1043036.2	-100.000
## 2006-05-25	-18807	48.875	-919192.1	-123944.095
## 2006-06-07	18314	50.180	918996.5	-100.000
## 2006-06-12	-18314	49.150	-900133.1	-18963.420
## 2006-07-18	17112	52.590	899920.1	-100.000
## 2006-07-24	-17112	53.885	-922080.1	22060.040
## 2006-08-02	16489	55.910	921900.0	-100.000
## 2006-08-08	-16489	55.900	-921735.1	-264.890
## 2006-08-11	16493	55.875	921546.4	-100.000
## 2006-08-17	-16493	58.955	-972344.8	50698.440
## 2006-10-18	15267	63.675	972126.2	-100.000
## 2006-10-24	-15267	64.540	-985332.2	13105.955
## 2007-01-08	14028	70.225	985116.3	-100.000
## 2007-01-10	-14028	70.310	-986308.7	1092.380
## 2007-01-24	11937	82.610	986115.6	-100.000
## 2007-01-30	-11937	80.275	-958242.7	-27972.895
## 2007-03-01	12566	76.240	958031.8	-100.000
## 2007-03-05	-12566	76.500	-961299.0	3167.160
## 2007-03-15	12287	78.220	961089.1	-100.000
## 2007-03-21	-12287	83.545	-1026517.4	65328.275
## 2007-03-29	12091	84.885	1026344.5	-100.000
## 2007-04-04	-12091	86.125	-1041337.4	14892.840
## 2007-04-20	11764	88.500	1041114.0	-100.000
## 2007-04-26	-11764	86.700	-1019938.8	-21275.200
## 2007-06-11	12157	83.880	1019729.2	-100.000
## 2007-06-12	-12157	82.750	-1005991.8	-13837.410
## 2007-06-28	12317	81.660	1005806.2	-100.000
## 2007-07-04	-12317	86.260	-1062464.4	56558.200
## 2007-07-19	12013	88.430	1062309.6	-100.000
## 2007-07-25	-12013	87.230	-1047894.0	-14515.600
## 2007-07-30	12397	84.510	1047670.5	-100.000
## 2007-08-01	-12397	80.500	-997958.5	-49811.970
## 2007-08-17	12906	77.310	997762.9	-100.000
## 2007-08-23	-12906	81.370	-1050161.2	52298.360
## 2007-09-11	13550	77.490	1049989.5	-100.000
## 2007-09-17	-13550	82.370	-1116113.5	66024.000
## 2007-11-01	10027	111.280	1115804.6	-100.000
## 2007-11-07	-10027	117.620	-1179375.7	63471.180
## 2007-11-16	9937	118.670	1179223.8	-100.000
## 2007-11-22	-9937	116.190	-1154580.0	-24743.760
## 2007-12-12	8983	128.500	1154315.5	-100.000
## 2007-12-18	-8983	126.590	-1137158.0	-17257.530
## 2008-01-08	9636	118.000	1137048.0	-100.000
## 2008-01-14	-9636	126.690	-1220784.8	83636.840
## 2008-02-08	10912	111.860	1220616.3	-100.000
## 2008-02-13	-10912	117.150	-1278340.8	57624.480
## 2008-02-18	10719	119.240	1278133.6	-100.000
## 2008-02-22	-10719	114.840	-1230970.0	-47263.600
## 2008-03-14	11722	104.990	1230692.8	-100.000
## 2008-03-20	-11722	97.850	-1146997.7	-83795.080
## 2008-04-11	12047	95.200	1146874.4	-100.000
## 2008-04-17	-12047	89.500	-1078206.5	-68767.900

## 2008-04-30	11559	93.260	1077992.3	-100.000
## 2008-05-06	-11559	100.250	-1158789.8	80697.410
## 2011-01-21	20499	56.520	1158603.5	-100.000
## 2011-01-27	-20499	56.850	-1165368.2	6664.670
## 2011-02-25	20821	55.960	1165143.2	-100.000
## 2011-03-03	-20821	55.870	-1163269.3	-1973.890
## 2011-05-04	20622	56.400	1163080.8	-100.000
## 2011-05-10	-20622	57.000	-1175454.0	12273.200
## 2011-05-16	21141	55.590	1175228.2	-100.000
## 2011-05-18	-21141	54.190	-1145630.8	-29697.400
## 2011-05-24	20991	54.570	1145478.9	-100.000
## 2011-05-25	-20991	54.090	-1135403.2	-10175.680
## 2012-02-24	22483	50.490	1135166.7	-100.000
## 2012-02-29	-22483	50.590	-1137415.0	2148.300
## 2013-01-02	24289	46.820	1137211.0	-100.000
## 2013-01-08	-24289	47.090	-1143769.0	6458.030
## 2013-01-23	24096	47.460	1143596.2	-100.000
## 2013-01-29	-24096	49.650	-1196366.4	52670.240
## 2013-03-14	23672	50.530	1196146.2	-100.000
## 2013-03-18	-23672	50.840	-1203484.5	7238.320
## 2013-03-25	24447	49.220	1203281.3	-100.000
## 2013-04-02	-24447	48.600	-1188124.2	-15257.140
## 2013-06-14	24514	48.460	1187948.4	-100.000
## 2013-06-17	-24514	48.360	-1185497.0	-2551.400
## 2013-06-21	24266	48.845	1185272.8	-100.000
## 2013-06-27	-24266	49.810	-1208689.5	23316.690
## 2013-07-04	23659	51.080	1208501.7	-100.000
## 2013-07-05	-23659	50.300	-1190047.7	-18554.020
## 2013-07-25	22055	53.950	1189867.2	-100.000
## 2013-07-26	-22055	53.320	-1175972.6	-13994.650
## 2013-08-08	21044	55.870	1175728.3	-100.000
## 2013-08-14	-21044	54.170	-1139953.5	-35874.800
## 2013-09-16	20803	54.790	1139796.4	-100.000
## 2013-09-17	-20803	54.410	-1131891.2	-8005.140
## 2013-09-30	20413	55.440	1131696.7	-100.000
## 2013-10-04	-20413	56.300	-1149251.9	17455.180
## 2013-10-10	20478	56.110	1149020.6	-100.000
## 2013-10-16	-20478	57.760	-1182809.3	33688.700
## 2013-10-30	20726	57.060	1182625.6	-100.000
## 2013-11-05	-20726	54.770	-1135163.0	-47562.540
## 2013-11-14	20636	55.000	1134980.0	-100.000
## 2013-11-15	-20636	54.550	-1125693.8	-9386.200
## 2013-12-06	20275	55.510	1125465.2	-100.000
## 2013-12-12	-20275	54.240	-1099716.0	-25849.250
## 2013-12-16	20160	54.540	1099526.4	-100.000
## 2013-12-18	-20160	55.390	-1116662.4	17036.000
## 2014-01-08	18758	59.520	1116476.2	-100.000
## 2014-01-13	-18758	61.490	-1153429.4	36853.260
## 2014-01-21	19080	60.440	1153195.2	-100.000
## 2014-01-27	-19080	56.530	-1078592.4	-74702.800
## 2014-02-21	18266	59.040	1078424.6	-100.000
## 2014-02-27	-18266	58.530	-1069109.0	-9415.660
## 2014-03-04	18341	58.280	1068913.5	-100.000
## 2014-03-10	-18341	56.920	-1043969.7	-25043.760

## 2014-05-08	19289	54.110	1043727.8	-100.000
## 2014-05-14	-19289	55.800	-1076326.2	32498.410
## 2014-05-19	20096	53.550	1076140.8	-100.000
## 2014-05-23	-20096	54.100	-1087193.6	10952.800
## 2014-06-04	19600	55.460	1087016.0	-100.000
## 2014-06-10	-19600	55.400	-1085840.0	-1276.000
## 2014-09-01	19887	54.590	1085631.3	-100.000
## 2014-09-04	-19887	55.140	-1096569.2	10837.850
## 2014-09-08	19829	55.290	1096345.4	-100.000
## 2014-09-12	-19829	54.350	-1077706.2	-18739.260
## 2014-11-04	19804	54.410	1077535.6	-100.000
## 2014-11-10	-19804	55.550	-1100112.2	22476.560
## 2014-12-16	19249	57.140	1099887.9	-100.000
## 2014-12-22	-19249	59.790	-1150897.7	50909.850
## 2015-01-07	19268	59.720	1150685.0	-100.000
## 2015-01-13	-19268	62.700	-1208103.6	57318.640
## 2015-02-10	17572	68.740	1207899.3	-100.000
## 2015-02-16	-17572	69.970	-1229512.8	21513.560
## 2015-03-10	17191	71.510	1229328.4	-100.000
## 2015-03-16	-17191	75.020	-1289668.8	60240.410
## 2015-03-27	17262	74.700	1289471.4	-100.000
## 2015-04-02	-17262	76.760	-1325031.1	35459.720
## 2015-04-09	17183	77.100	1324809.3	-100.000
## 2015-04-15	-17183	78.500	-1348865.5	23956.200
## 2015-05-15	18480	72.980	1348670.4	-100.000
## 2015-05-21	-18480	74.200	-1371216.0	22445.600
## 2015-06-10	18864	72.680	1371035.5	-100.000
## 2015-06-12	-18864	72.530	-1368205.9	-2929.600
## 2015-07-07	17668	77.430	1368033.2	-100.000
## 2015-07-13	-17668	83.320	-1472097.8	103964.520
## 2015-07-23	17215	85.500	1471882.5	-100.000
## 2015-07-29	-17215	82.390	-1418343.9	-53638.650
## 2015-08-13	17277	82.080	1418096.2	-100.000
## 2015-08-17	-17277	82.620	-1427425.7	9229.580
## 2015-08-25	18987	75.170	1427252.8	-100.000
## 2015-08-28	-18987	79.130	-1502441.3	75088.520
## 2015-09-02	19050	78.860	1502283.0	-100.000
## 2015-09-04	-19050	79.940	-1522857.0	20474.000
## 2015-09-30	19982	76.200	1522628.4	-100.000
## 2015-10-02	-19982	77.710	-1552801.2	30072.820
## 2015-11-04	18639	83.300	1552628.7	-100.000
## 2015-11-10	-18639	81.970	-1527838.8	-24889.870
## 2015-11-17	18764	81.410	1527577.2	-100.000
## 2015-11-18	-18764	80.920	-1518382.9	-9294.360
## 2015-11-19	18735	81.610	1528963.4	-100.000
## 2015-11-20	-18735	81.400	-1525029.0	-4034.350
## 2015-12-02	18537	81.680	1514102.2	-100.000
## 2015-12-08	-18537	79.720	-1477769.6	-36432.520
## 2016-01-08	19526	75.670	1477532.4	-100.000
## 2016-01-14	-19526	76.400	-1491786.4	14153.980
## 2016-01-21	20062	74.350	1491609.7	-100.000
## 2016-01-26	-20062	75.870	-1522103.9	30394.240
## 2016-01-27	19849	77.820	1544649.2	-100.000
## 2016-01-28	-19849	77.200	-1532342.8	-12406.380

## 2016-02-22	20010	75.430	1509354.3	-100.000
## 2016-02-24	-20010	75.790	-1516557.9	7103.600
## 2016-03-01	19488	77.810	1516361.3	-100.000
## 2016-03-07	-19488	75.310	-1467641.3	-48820.000
## 2016-03-09	19452	75.440	1467458.9	-100.000
## 2016-03-15	-19452	75.330	-1465319.2	-2239.720
## 2016-05-09	19462	75.280	1465099.4	-100.000
## 2016-05-12	-19462	74.340	-1446805.1	-18394.280
## 2016-05-13	19592	75.900	1487032.8	-100.000
## 2016-05-20	-19592	76.660	-1501922.7	14789.920
## 2016-06-01	18267	80.000	1461360.0	-100.000
## 2016-06-07	-18267	79.190	-1446563.7	-14896.270
## 2016-07-01	19495	74.190	1446334.1	-100.000
## 2016-07-05	-19495	71.810	-1399935.9	-46498.100
## 2017-01-06	18297	76.500	1399720.5	-100.000
## 2017-01-12	-18297	75.960	-1389840.1	-9980.380
## 2017-01-18	18227	76.240	1389626.5	-100.000
## 2017-01-24	-18227	79.120	-1442120.2	52393.760
## 2017-02-09	17872	80.680	1441913.0	-100.000
## 2017-02-15	-17872	81.600	-1458355.2	16342.240
## 2017-02-28	18159	80.300	1458167.7	-100.000
## 2017-03-06	-18159	78.880	-1432381.9	-25885.780
## 2017-03-23	17690	80.960	1432182.4	-100.000
## 2017-03-27	-17690	80.140	-1417676.6	-14605.800
## 2017-04-18	16486	85.980	1417466.3	-100.000
## 2017-04-24	-16486	86.370	-1423895.8	6329.540
## 2017-06-02	15333	92.850	1423669.0	-100.000
## 2017-06-09	-15333	92.770	-1422442.4	-1326.640
## 2017-06-13	15368	92.550	1422308.4	-100.000
## 2017-06-19	-15368	97.300	-1495306.4	72898.000
## 2017-07-25	16137	92.650	1495093.1	-100.000
## 2017-07-31	-16137	88.410	-1426672.2	-68520.880
## 2017-08-14	16062	88.810	1426466.2	-100.000
## 2017-08-18	-16062	89.440	-1436585.3	10019.060
## 2017-08-30	16101	89.210	1436370.2	-100.000
## 2017-09-01	-16101	89.010	-1433150.0	-3320.200
## 2017-11-01	15832	90.510	1432954.3	-100.000
## 2017-11-07	-15832	90.410	-1431371.1	-1683.200
## 2017-11-24	15507	92.290	1431141.0	-100.000
## 2017-11-30	-15507	95.250	-1477041.8	45800.720
## 2017-12-04	15492	95.330	1476852.4	-100.000
## 2017-12-08	-15492	99.020	-1534017.8	57065.480
## 2018-01-03	15868	96.660	1533800.9	-100.000
## 2018-01-09	-15868	98.800	-1567758.4	33857.520
## 2018-01-16	15834	99.000	1567566.0	-100.000
## 2018-01-22	-15834	98.920	-1566299.3	-1366.720
## 2018-02-05	15198	103.050	1566153.9	-100.000
## 2018-02-08	-15198	102.150	-1552475.7	-13778.200
## 2018-02-21	14568	106.550	1552220.4	-100.000
## 2018-02-27	-14568	108.600	-1582084.8	29764.400
## 2018-03-05	14791	106.950	1581897.4	-100.000
## 2018-03-09	-14791	109.900	-1625530.9	43533.450
## 2018-03-20	14857	109.400	1625355.8	-100.000
## 2018-03-26	-14857	107.400	-1595641.8	-29814.000

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## 2018-04-26      14335 111.300 1595485.5      -100.000
## 2018-05-03     -14335 115.500 -1655692.5      60107.000
## 2018-05-15      14222 116.400 1655440.8      -100.000
## 2018-05-16     -14222 114.950 -1634818.9     -20721.900
## 2018-05-24      14726 111.000 1634586.0      -100.000
## 2018-05-30     -14726 113.000 -1664038.0      29352.000
## 2018-06-26      14551 114.350 1663906.8      -100.000
## 2018-06-28     -14551 113.150 -1646445.7     -17561.200
## 2018-07-24      14034 117.300 1646188.2      -100.000
## 2018-07-30     -14034 112.900 -1584438.6     -61849.600
## 2018-08-13      14051 112.750 1584250.2      -100.000
## 2018-08-17     -14051 111.800 -1570901.8     -13448.450
##
## [1] "Transactions for the instrument: IFX.csv"
##      Quantity  Price      Value Net realized Profit
## 1999-12-31         0  0.000         0.0         0.000
## 2006-04-12    129382  7.729   999993.5        -100.000
## 2006-04-20   -129382  8.365  -1082280.4      82186.952
## 2006-04-25    128819  8.400   1082079.6        -100.000
## 2006-04-27   -128819  8.508  -1095992.1      13812.452
## 2006-05-05    125377  8.740   1095795.0        -100.000
## 2006-05-09   -125377  8.758  -1098051.8       2156.786
## 2006-05-23    139145  7.890   1097854.1        -100.000
## 2006-05-29   -139145  7.962  -1107872.5       9918.440
## 2006-06-29    142649  7.765   1107669.5        -100.000
## 2006-07-05   -142649  7.792  -1111521.0       3751.523
## 2006-08-22    140995  7.882   1111322.6        -100.000
## 2006-08-28   -140995  8.078  -1138957.6      27535.020
## 2006-09-06    139110  8.186   1138754.5        -100.000
## 2006-09-12   -139110  8.660  -1204692.6      65838.140
## 2006-11-17    138368  8.705   1204493.4        -100.000
## 2006-11-23   -138368  8.857  -1225525.4      20931.936
## 2006-11-29    141787  8.642   1225323.3        -100.000
## 2006-12-05   -141787  8.866  -1257083.5      31660.288
## 2006-12-20    135353  9.286   1256888.0        -100.000
## 2006-12-28   -135353  9.447  -1278679.8      21691.833
## 2007-01-22    130271  9.814   1278479.6        -100.000
## 2007-01-26   -130271  9.921  -1292418.6      13838.997
## 2007-02-07    131430  9.832   1292219.8        -100.000
## 2007-02-13   -131430 10.825  -1422729.8     130409.990
## 2007-03-08    140095 10.154   1422524.6        -100.000
## 2007-03-14   -140095  9.921  -1389882.5     -32742.135
## 2007-04-24    135553 10.252   1389689.4        -100.000
## 2007-04-30   -135553 10.252  -1389689.4        -100.000
## 2007-05-04    136963 10.145   1389489.6        -100.000
## 2007-05-10   -136963 10.029  -1373601.9     -15987.708
## 2007-05-15    137684  9.975   1373397.9        -100.000
## 2007-05-21   -137684  9.859  -1357426.6     -16071.344
## 2007-06-28    122937 11.040   1357224.5        -100.000
## 2007-07-04   -122937 11.388  -1400006.6      42682.076
## 2007-07-19    118537 11.809   1399803.4        -100.000
## 2007-07-25   -118537 11.227  -1330814.9     -69088.534
## 2007-07-27    118235 11.254   1330616.7        -100.000
## 2007-08-02   -118235 10.619  -1255537.5     -75179.225

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##	2007-08-08	122880	10.216	1255342.1	-100.000
##	2007-08-14	-122880	9.984	-1226833.9	-28608.160
##	2007-08-17	125218	9.796	1226635.5	-100.000
##	2007-08-23	-125218	9.868	-1235651.2	8915.696
##	2009-09-03	341285	3.620	1235451.7	-100.000
##	2009-09-09	-341285	3.845	-1312240.8	76689.125
##	2009-09-15	333005	3.940	1312039.7	-100.000
##	2009-09-21	-333005	3.595	-1197153.0	-114986.725
##	2009-10-05	322629	3.710	1196953.6	-100.000
##	2009-10-09	-322629	3.780	-1219537.6	22484.030
##	2009-10-23	334983	3.640	1219338.1	-100.000
##	2009-10-27	-334983	3.405	-1140617.1	-78821.005
##	2010-01-08	273088	4.176	1140415.5	-100.000
##	2010-01-11	-273088	4.116	-1124030.2	-16485.280
##	2010-01-13	275449	4.080	1123831.9	-100.000
##	2010-01-19	-275449	4.017	-1106478.6	-17453.287
##	2010-01-28	281567	3.929	1106276.7	-100.000
##	2010-02-03	-281567	4.208	-1184833.9	78457.193
##	2010-03-16	264427	4.480	1184633.0	-100.000
##	2010-03-18	-264427	4.490	-1187277.2	2544.270
##	2010-03-19	263412	4.525	1191939.3	-100.000
##	2010-03-25	-263412	4.800	-1264377.6	72338.300
##	2010-04-20	242971	5.183	1259318.7	-100.000
##	2010-04-22	-242971	5.301	-1287989.3	28570.578
##	2010-04-23	241654	5.429	1311939.6	-100.000
##	2010-04-27	-241654	5.430	-1312181.2	141.654
##	2010-05-10	265587	4.849	1287831.4	-100.000
##	2010-05-11	-265587	4.824	-1281191.7	-6739.675
##	2010-05-17	245919	5.209	1280992.1	-100.000
##	2010-05-21	-245919	4.706	-1157294.8	-123797.257
##	2010-05-26	260021	4.450	1157093.4	-100.000
##	2010-06-01	-260021	4.465	-1160993.8	3800.315
##	2010-07-21	232159	5.000	1160795.0	-100.000
##	2010-07-27	-232159	5.049	-1172170.8	11275.791
##	2010-09-01	264076	4.438	1171969.3	-100.000
##	2010-09-03	-264076	4.518	-1193095.4	21026.080
##	2010-09-09	277547	4.298	1192897.0	-100.000
##	2010-09-15	-277547	4.452	-1235639.2	42642.238
##	2010-10-05	241768	5.110	1235434.5	-100.000
##	2010-10-11	-241768	5.292	-1279436.3	43901.776
##	2010-10-20	230493	5.550	1279236.1	-100.000
##	2010-10-26	-230493	5.850	-1348384.0	69047.900
##	2010-11-24	208343	6.471	1348187.6	-100.000
##	2010-11-30	-208343	6.846	-1426316.2	78028.625
##	2010-12-16	200889	7.099	1426111.0	-100.000
##	2010-12-22	-200889	7.250	-1456445.2	30234.239
##	2011-01-03	207266	7.026	1456250.9	-100.000
##	2011-01-07	-207266	7.034	-1457909.0	1558.128
##	2011-01-11	206914	7.045	1457709.1	-100.000
##	2011-01-13	-206914	7.160	-1481504.2	23695.110
##	2011-01-25	201977	7.334	1481299.3	-100.000
##	2011-01-31	-201977	7.721	-1559464.4	78065.099
##	2011-02-21	193842	8.044	1559265.0	-100.000
##	2011-02-25	-193842	7.777	-1507509.2	-51855.814

##	2011-03-03	192014	7.850	1507309.9	-100.000
##	2011-03-09	-192014	7.482	-1436648.7	-70761.152
##	2011-03-16	202118	7.107	1436452.6	-100.000
##	2011-03-22	-202118	7.140	-1443122.5	6569.894
##	2011-03-30	199850	7.220	1442917.0	-100.000
##	2011-04-05	-199850	7.750	-1548837.5	105820.500
##	2011-04-15	219696	7.049	1548637.1	-100.000
##	2011-04-21	-219696	7.416	-1629265.5	80528.432
##	2011-05-24	205327	7.934	1629064.4	-100.000
##	2011-05-30	-205327	7.852	-1612227.6	-16936.814
##	2011-06-10	210723	7.650	1612031.0	-100.000
##	2011-06-15	-210723	7.515	-1583583.3	-28547.605
##	2011-07-19	218217	7.256	1583382.6	-100.000
##	2011-07-25	-218217	7.263	-1584910.1	1427.519
##	2012-02-10	209065	7.580	1584712.7	-100.000
##	2012-02-16	-209065	7.312	-1528683.3	-56129.420
##	2012-02-23	199281	7.670	1528485.3	-100.000
##	2012-02-29	-199281	7.591	-1512742.1	-15843.199
##	2012-03-02	198783	7.609	1512539.8	-100.000
##	2012-03-05	-198783	7.530	-1496836.0	-15803.857
##	2012-03-15	196512	7.616	1496635.4	-100.000
##	2012-03-21	-196512	7.375	-1449276.0	-47459.392
##	2013-01-02	228922	6.330	1449076.3	-100.000
##	2013-01-07	-228922	6.400	-1465100.8	15924.540
##	2013-01-09	226414	6.470	1464898.6	-100.000
##	2013-01-15	-226414	6.642	-1503841.8	38843.208
##	2013-01-23	222531	6.757	1503642.0	-100.000
##	2013-01-29	-222531	6.498	-1446006.4	-57735.529
##	2013-01-31	217841	6.637	1445810.7	-100.000
##	2013-02-04	-217841	6.700	-1459534.7	13623.983
##	2013-02-15	228700	6.381	1459334.7	-100.000
##	2013-02-21	-228700	6.561	-1500500.7	41066.000
##	2013-02-22	230099	6.627	1524866.1	-100.000
##	2013-02-28	-230099	6.561	-1509679.5	-15286.534
##	2013-03-08	223732	6.637	1484909.3	-100.000
##	2013-03-14	-223732	6.559	-1467458.2	-17551.096
##	2013-03-19	224971	6.522	1467260.9	-100.000
##	2013-03-25	-224971	6.249	-1405843.8	-61517.083
##	2013-06-04	214602	6.550	1405643.1	-100.000
##	2013-06-05	-214602	6.540	-1403497.1	-2246.020
##	2013-07-04	219574	6.391	1403297.4	-100.000
##	2013-07-10	-219574	6.628	-1455336.5	51939.038
##	2013-07-17	208323	6.985	1455136.2	-100.000
##	2013-07-19	-208323	7.055	-1469718.8	14482.610
##	2013-07-22	209190	7.093	1483784.7	-100.000
##	2013-07-26	-209190	6.991	-1462447.3	-21437.380
##	2013-08-29	212688	6.808	1447979.9	-100.000
##	2013-09-04	-212688	7.165	-1523909.5	75829.616
##	2013-09-16	202891	7.510	1523711.4	-100.000
##	2013-09-17	-202891	7.452	-1511943.7	-11867.678
##	2013-10-01	201405	7.506	1511745.9	-100.000
##	2013-10-07	-201405	7.297	-1469652.3	-42193.645
##	2013-10-10	200992	7.311	1469452.5	-100.000
##	2013-10-14	-200992	7.302	-1467643.6	-1908.928

##	2013-10-15	203124	7.400	1503117.6	-100.000
##	2013-10-21	-203124	7.290	-1480774.0	-22443.640
##	2014-01-08	186921	7.730	1444899.3	-100.000
##	2014-01-14	-186921	7.430	-1388823.0	-56176.300
##	2014-02-05	185868	7.471	1388619.8	-100.000
##	2014-02-11	-185868	7.723	-1435458.6	46738.736
##	2014-02-21	185266	7.747	1435255.7	-100.000
##	2014-02-27	-185266	8.003	-1482683.8	47328.096
##	2014-03-04	183931	8.060	1482483.9	-100.000
##	2014-03-10	-183931	8.346	-1535088.1	52504.266
##	2014-03-17	191885	7.999	1534888.1	-100.000
##	2014-03-20	-191885	8.260	-1584970.1	49981.985
##	2014-04-09	187348	8.459	1584776.7	-100.000
##	2014-04-10	-187348	8.433	-1579905.7	-4971.048
##	2014-04-24	187569	8.422	1579706.1	-100.000
##	2014-04-25	-187569	8.323	-1561136.8	-18669.331
##	2014-04-29	183639	8.500	1560931.5	-100.000
##	2014-04-30	-183639	8.482	-1557626.0	-3405.502
##	2014-05-06	188802	8.249	1557427.7	-100.000
##	2014-05-12	-188802	8.789	-1659380.8	101853.080
##	2014-05-19	192704	8.610	1659181.4	-100.000
##	2014-05-23	-192704	8.646	-1666118.8	6837.344
##	2014-06-04	184528	9.028	1665918.8	-100.000
##	2014-06-09	-184528	9.106	-1680312.0	14293.184
##	2014-07-16	188565	8.910	1680114.2	-100.000
##	2014-07-22	-188565	9.333	-1759877.1	79662.995
##	2014-07-29	196020	8.977	1759671.5	-100.000
##	2014-08-04	-196020	8.214	-1610108.3	-149663.260
##	2014-08-21	184750	8.714	1609911.5	-100.000
##	2014-08-26	-184750	8.783	-1622659.2	12647.750
##	2014-09-17	183640	8.835	1622459.4	-100.000
##	2014-09-23	-183640	8.682	-1594362.5	-28196.920
##	2014-11-26	196060	8.131	1594163.9	-100.000
##	2014-12-02	-196060	7.890	-1546913.4	-47350.460
##	2014-12-10	180396	8.574	1546715.3	-100.000
##	2014-12-16	-180396	8.323	-1501435.9	-45379.396
##	2015-02-03	150469	9.977	1501229.2	-100.000
##	2015-02-04	-150469	9.915	-1491900.1	-9429.078
##	2015-02-18	148650	10.035	1491702.8	-100.000
##	2015-02-24	-148650	10.375	-1542243.8	50441.000
##	2015-03-27	142124	10.850	1542045.4	-100.000
##	2015-04-02	-142124	11.195	-1591078.2	48932.780
##	2015-05-04	148057	10.745	1590872.5	-100.000
##	2015-05-08	-148057	11.400	-1687849.8	96877.335
##	2015-05-27	143325	11.775	1687651.9	-100.000
##	2015-06-02	-143325	11.885	-1703417.6	15665.750
##	2015-06-19	148429	11.475	1703222.8	-100.000
##	2015-06-25	-148429	11.870	-1761852.2	58529.455
##	2015-08-05	173476	10.155	1761648.8	-100.000
##	2015-08-11	-173476	9.853	-1709259.0	-52489.752
##	2015-08-13	174608	9.788	1709063.1	-100.000
##	2015-08-19	-174608	9.337	-1630314.9	-78848.208
##	2015-09-14	166287	9.803	1630111.5	-100.000
##	2015-09-17	-166287	10.145	-1686981.6	56770.154

##	2015-10-14	159130	10.600	1686778.0	-100.000
##	2015-10-20	-159130	11.035	-1755999.6	69121.550
##	2015-12-04	125235	14.020	1755794.7	-100.000
##	2015-12-10	-125235	13.435	-1682532.2	-73362.475
##	2015-12-15	124895	13.470	1682335.7	-100.000
##	2015-12-18	-124895	13.320	-1663601.4	-18834.250
##	2016-01-05	125777	13.225	1663400.8	-100.000
##	2016-01-11	-125777	12.000	-1509324.0	-154176.825
##	2016-02-04	128546	11.740	1509130.0	-100.000
##	2016-02-10	-128546	10.500	-1349733.0	-159497.040
##	2016-03-09	118484	11.390	1349532.8	-100.000
##	2016-03-15	-118484	11.885	-1408182.3	58549.580
##	2016-04-25	111171	12.665	1407980.7	-100.000
##	2016-04-29	-111171	12.585	-1399087.0	-8993.680
##	2016-06-15	110366	12.675	1398889.1	-100.000
##	2016-06-21	-110366	13.085	-1444139.1	45150.060
##	2016-07-14	106016	13.620	1443937.9	-100.000
##	2016-07-19	-106016	13.770	-1459840.3	15802.400
##	2016-09-27	94414	15.460	1459640.4	-100.000
##	2016-10-04	-94414	15.985	-1509207.8	49467.350
##	2016-10-14	96023	15.715	1509001.4	-100.000
##	2016-10-20	-96023	15.990	-1535407.8	26306.325
##	2016-10-21	95691	16.180	1548280.4	-100.000
##	2016-10-27	-95691	16.280	-1557849.5	9469.100
##	2016-11-18	97388	15.860	1544573.7	-100.000
##	2016-11-23	-97388	16.050	-1563077.4	18403.720
##	2016-12-15	97772	15.985	1562885.4	-100.000
##	2016-12-21	-97772	16.640	-1626926.1	63940.660
##	2016-12-30	97613	16.665	1626720.6	-100.000
##	2017-01-05	-97613	16.275	-1588651.6	-38169.070
##	2017-01-24	96798	16.410	1588455.2	-100.000
##	2017-01-27	-96798	16.915	-1637338.2	48782.990
##	2017-02-01	95349	17.170	1637142.3	-100.000
##	2017-02-07	-95349	17.500	-1668607.5	31365.170
##	2017-02-10	97682	17.080	1668408.6	-100.000
##	2017-02-16	-97682	17.255	-1685502.9	16994.350
##	2017-03-01	98758	17.065	1685305.3	-100.000
##	2017-03-07	-98758	16.925	-1671479.2	-13926.120
##	2017-03-23	97535	17.135	1671262.2	-100.000
##	2017-03-29	-97535	19.030	-1856091.1	184728.825
##	2017-06-13	93355	19.880	1855897.4	-100.000
##	2017-06-19	-93355	20.020	-1868967.1	12969.700
##	2017-06-29	97332	19.200	1868774.4	-100.000
##	2017-07-05	-97332	18.660	-1816215.1	-52659.280
##	2017-07-19	94387	19.240	1816005.9	-100.000
##	2017-07-25	-94387	18.400	-1736720.8	-79385.080
##	2017-08-04	92491	18.775	1736518.5	-100.000
##	2017-08-10	-92491	19.100	-1766578.1	29959.575
##	2017-08-14	92384	19.120	1766382.1	-100.000
##	2017-08-15	-92384	19.040	-1758991.4	-7490.720
##	2017-08-22	93329	18.845	1758785.0	-100.000
##	2017-08-28	-93329	19.220	-1793783.4	34898.375
##	2018-01-02	77494	23.145	1793598.6	-100.000
##	2018-01-08	-77494	24.690	-1913326.9	119628.230


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## 2018-01-18      78086 24.500 1913107.0      -100.000
## 2018-01-24     -78086 23.980 -1872502.3     -40704.720
## 2018-03-05      86721 21.590 1872306.4      -100.000
## 2018-03-07     -86721 22.220 -1926940.6      54534.230
## 2018-03-26      86673 22.230 1926740.8      -100.000
## 2018-03-28     -86673 21.820 -1891204.9     -35635.930
## 2018-04-23      88406 21.390 1891004.3      -100.000
## 2018-04-27     -88406 21.550 -1905149.3      14044.960
## 2018-05-02      88233 21.590 1904950.5      -100.000
## 2018-05-08     -88233 23.570 -2079651.8      174601.340
## 2018-05-24      86392 24.070 2079455.4      -100.000
## 2018-05-30     -86392 23.840 -2059585.3     -19970.160
## 2018-06-20      84057 24.500 2059396.5      -100.000
## 2018-06-26     -84057 22.050 -1853456.9     -206039.650
## 2018-07-03      85561 21.660 1853251.3      -100.000
## 2018-07-09     -85561 21.830 -1867796.6      14445.370
## 2018-07-31      81733 22.850 1867599.1      -100.000
## 2018-08-06     -81733 22.280 -1821011.2     -46687.810
## 2018-08-20      85084 21.400 1820797.6      -100.000
## 2018-08-22     -85084 21.260 -1808885.8     -12011.760
##
## [1] "Transactions for the instrument: MRK.csv"
##      Quantity    Price    Value Net realized Profit
## 1999-12-31         0    0.000         0.0         0.000
## 2001-10-16      48171 20.759    999981.8        -100.000
## 2001-10-22     -48171 20.587   -991696.4       -8385.412
## 2003-06-02      66962 14.807    991506.3        -100.000
## 2003-06-04     -66962 13.469   -901911.2      -89695.156
## 2003-11-18      56056 16.086    901716.8        -100.000
## 2003-11-24     -56056 16.086   -901716.8        -100.000
## 2003-12-18      56232 16.032    901511.4        -100.000
## 2003-12-29     -56232 16.317   -917537.5      15926.120
## 2004-01-08      54688 16.774    917336.5        -100.000
## 2004-01-14     -54688 16.420   -897977.0     -19459.552
## 2004-02-13      47404 18.939    897784.4        -100.000
## 2004-02-19     -47404 18.437   -873987.5     -23896.808
## 2004-03-30      47129 18.540    873771.7        -100.000
## 2004-04-05     -47129 20.484   -965390.4      91518.776
## 2004-05-11      45629 21.153    965190.2        -100.000
## 2004-05-17     -45629 21.251   -969661.9      4371.642
## 2004-07-08      43143 22.471    969466.4        -100.000
## 2004-07-12     -43143 23.174   -999795.9      30229.529
## 2004-07-28      44301 22.564    999607.8        -100.000
## 2004-08-03     -44301 23.037  -1020562.1      20854.373
## 2004-08-10      44520 22.919   1020353.9        -100.000
## 2004-08-16     -44520 21.989   -978950.3     -41503.600
## 2004-09-24      45373 21.571    978741.0        -100.000
## 2004-09-30     -45373 22.648  -1027607.7      48766.721
## 2004-10-21      46116 22.279   1027418.4        -100.000
## 2004-10-27     -46116 21.394   -986605.7     -40912.660
## 2004-11-25      46150 21.374    986410.1        -100.000
## 2004-11-26     -46150 21.231   -979810.7     -6699.450
## 2005-01-14      40641 24.104    979610.7        -100.000
## 2005-01-20     -40641 25.181  -1023381.0      43670.357

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##	2005-02-14	40309	25.383	1023163.3	-100.000
##	2005-02-18	-40309	27.424	-1105434.0	82170.669
##	2005-02-24	39816	27.759	1105252.3	-100.000
##	2005-03-02	-39816	28.335	-1128186.4	22834.016
##	2005-03-15	39331	28.679	1127973.7	-100.000
##	2005-03-16	-39331	28.098	-1105122.4	-22951.311
##	2005-03-31	40699	27.149	1104937.2	-100.000
##	2005-04-06	-40699	30.046	-1222842.2	117805.003
##	2005-04-14	40752	30.002	1222641.5	-100.000
##	2005-04-20	-40752	30.819	-1255935.9	33194.384
##	2005-05-04	42545	29.515	1255715.7	-100.000
##	2005-05-10	-42545	30.991	-1318512.1	62696.420
##	2005-05-26	42539	30.991	1318326.1	-100.000
##	2005-05-30	-42539	30.868	-1313093.9	-5332.297
##	2005-06-13	41865	31.360	1312886.4	-100.000
##	2005-06-14	-41865	30.942	-1295386.8	-17599.570
##	2005-08-16	36593	35.394	1295172.6	-100.000
##	2005-08-22	-36593	35.094	-1284194.7	-11077.900
##	2005-08-30	37617	34.134	1284018.7	-100.000
##	2005-09-05	-37617	34.597	-1301435.3	17316.671
##	2005-10-31	39130	33.254	1301229.0	-100.000
##	2005-11-03	-39130	34.110	-1334724.3	33395.280
##	2005-12-22	38650	34.528	1334507.2	-100.000
##	2005-12-29	-38650	34.365	-1328207.2	-6399.950
##	2006-04-03	33915	39.157	1328009.7	-100.000
##	2006-04-07	-33915	37.863	-1284123.6	-43986.010
##	2006-04-11	33945	37.824	1283935.7	-100.000
##	2006-04-19	-33945	38.370	-1302469.6	18433.970
##	2006-05-02	31259	41.661	1302281.2	-100.000
##	2006-05-08	-31259	42.826	-1338697.9	36316.735
##	2006-05-19	33122	40.411	1338493.1	-100.000
##	2006-05-25	-33122	39.324	-1302489.5	-36103.614
##	2006-06-09	36077	36.097	1302271.5	-100.000
##	2006-06-12	-36077	35.207	-1270162.9	-32208.530
##	2006-09-06	33571	37.829	1269957.4	-100.000
##	2006-09-11	-33571	36.751	-1233767.8	-36289.538
##	2006-09-22	33214	37.140	1233568.0	-100.000
##	2006-09-28	-33214	40.214	-1335667.8	101999.836
##	2006-10-18	34003	39.275	1335467.8	-100.000
##	2006-10-24	-34003	40.042	-1361548.1	25980.301
##	2006-11-13	32743	41.577	1361355.7	-100.000
##	2006-11-17	-32743	42.236	-1382933.3	21477.637
##	2006-11-29	34137	40.505	1382719.2	-100.000
##	2006-12-05	-34137	40.396	-1378998.3	-3820.933
##	2006-12-18	34033	40.514	1378813.0	-100.000
##	2006-12-19	-34033	40.165	-1366935.4	-11977.517
##	2007-01-12	31869	42.886	1366733.9	-100.000
##	2007-01-18	-31869	43.269	-1378939.8	12105.827
##	2007-03-15	29587	46.600	1378754.2	-100.000
##	2007-03-21	-29587	46.720	-1382304.6	3450.440
##	2007-03-29	28500	48.495	1382107.5	-100.000
##	2007-04-04	-28500	49.735	-1417447.5	35240.000
##	2007-04-13	28718	49.350	1417233.3	-100.000
##	2007-04-19	-28718	47.760	-1371571.7	-45761.620

## 2007-05-02	27621	49.650	1371382.6	-100.000
## 2007-05-08	-27621	49.120	-1356743.5	-14739.130
## 2007-05-31	26881	50.465	1356549.7	-100.000
## 2007-06-06	-26881	51.340	-1380070.5	23420.875
## 2007-06-13	26671	51.735	1379824.2	-100.000
## 2007-06-19	-26671	51.255	-1367022.1	-12902.080
## 2007-07-31	29978	45.595	1366846.9	-100.000
## 2007-08-06	-29978	47.600	-1426952.8	60005.890
## 2007-08-13	30532	46.730	1426760.4	-100.000
## 2007-08-17	-30532	46.150	-1409051.8	-17808.560
## 2007-08-27	30571	46.085	1408864.5	-100.000
## 2007-08-31	-30571	47.070	-1438977.0	30012.435
## 2007-09-11	29819	48.250	1438766.8	-100.000
## 2007-09-17	-29819	48.790	-1454869.0	16002.260
## 2007-12-18	32722	44.455	1454656.5	-100.000
## 2007-12-27	-32722	44.000	-1439768.0	-14988.510
## 2008-04-29	31514	45.680	1439559.5	-100.000
## 2008-05-06	-31514	44.855	-1413560.5	-26099.050
## 2008-05-13	32195	43.900	1413360.5	-100.000
## 2008-05-19	-32195	44.045	-1418028.8	4568.275
## 2010-08-09	40743	34.800	1417856.4	-100.000
## 2010-08-13	-40743	33.900	-1381187.7	-36768.700
## 2010-08-23	40719	33.915	1380984.9	-100.000
## 2010-08-27	-40719	34.500	-1404805.5	23720.615
## 2011-04-26	40772	34.450	1404595.4	-100.000
## 2011-05-02	-40772	36.005	-1467995.9	63300.460
## 2011-05-06	39489	37.170	1467806.1	-100.000
## 2011-05-12	-39489	38.865	-1534740.0	66833.855
## 2011-05-24	41140	37.300	1534522.0	-100.000
## 2011-05-30	-41140	37.815	-1555709.1	21087.100
## 2011-06-23	41849	37.170	1555527.3	-100.000
## 2011-06-29	-41849	37.660	-1576033.3	20406.010
## 2011-07-13	41144	38.300	1575815.2	-100.000
## 2011-07-19	-41144	37.985	-1562854.8	-13060.360
## 2011-07-28	41688	37.485	1562674.7	-100.000
## 2011-08-03	-41688	35.680	-1487427.8	-75346.840
## 2011-11-02	43748	33.995	1487213.3	-100.000
## 2011-11-07	-43748	35.750	-1563991.0	76677.740
## 2011-11-22	44508	35.135	1563788.6	-100.000
## 2011-11-28	-44508	35.520	-1580924.2	17035.580
## 2011-12-13	43101	36.675	1580729.2	-100.000
## 2011-12-16	-43101	36.830	-1587409.8	6580.655
## 2011-12-20	42553	37.300	1587226.9	-100.000
## 2011-12-27	-42553	37.900	-1612758.7	25431.800
## 2012-01-10	41390	38.960	1612554.4	-100.000
## 2012-01-16	-41390	37.855	-1566818.4	-45835.950
## 2012-04-12	38210	41.000	1566610.0	-100.000
## 2012-04-13	-38210	40.485	-1546931.9	-19778.150
## 2012-05-21	41033	37.695	1546738.9	-100.000
## 2012-05-25	-41033	37.500	-1538737.5	-8101.435
## 2012-06-11	40670	37.830	1538546.1	-100.000
## 2012-06-15	-40670	38.085	-1548916.9	10270.850
## 2012-07-13	39543	39.165	1548701.6	-100.000
## 2012-07-19	-39543	41.250	-1631148.8	82347.155

## 2012-08-03	39876	40.900	1630928.4	-100.000
## 2012-08-09	-39876	40.570	-1617769.3	-13259.080
## 2012-08-23	36071	44.845	1617604.0	-100.000
## 2012-08-29	-36071	45.005	-1623375.4	5671.360
## 2012-10-09	32864	49.390	1623153.0	-100.000
## 2012-10-15	-32864	49.270	-1619209.3	-4043.680
## 2012-10-25	33088	48.930	1618995.8	-100.000
## 2012-10-31	-33088	49.300	-1631238.4	12142.560
## 2012-12-05	31686	51.475	1631036.9	-100.000
## 2012-12-11	-31686	52.475	-1662722.9	31586.000
## 2012-12-20	33184	50.100	1662518.4	-100.000
## 2012-12-27	-33184	49.725	-1650074.4	-12544.000
## 2012-12-28	33582	49.850	1674062.7	-100.000
## 2013-01-07	-33582	49.910	-1676077.6	1914.920
## 2013-01-16	32610	50.650	1651696.5	-100.000
## 2013-01-22	-32610	49.640	-1618760.4	-33036.100
## 2013-01-31	31752	50.975	1618558.2	-100.000
## 2013-02-04	-31752	51.225	-1626496.2	7838.000
## 2013-02-11	32935	49.380	1626330.3	-100.000
## 2013-02-15	-32935	51.675	-1701916.1	75485.825
## 2013-03-07	30333	56.100	1701681.3	-100.000
## 2013-03-13	-30333	56.725	-1720639.4	18858.125
## 2013-03-26	29843	57.650	1720448.9	-100.000
## 2013-04-03	-29843	59.850	-1786103.6	65554.600
## 2013-05-16	29827	59.875	1785891.6	-100.000
## 2013-05-21	-29827	59.400	-1771723.8	-14267.825
## 2013-05-31	28782	61.550	1771532.1	-100.000
## 2013-06-06	-28782	60.375	-1737713.2	-33918.850
## 2013-06-14	28426	61.125	1737539.2	-100.000
## 2013-06-20	-28426	61.550	-1749620.3	11981.050
## 2013-06-26	30033	58.250	1749422.2	-100.000
## 2013-06-28	-30033	58.825	-1766691.2	17168.975
## 2013-07-04	30170	58.550	1766453.5	-100.000
## 2013-07-05	-30170	58.200	-1755894.0	-10659.500
## 2013-07-17	29607	59.300	1755695.1	-100.000
## 2013-07-23	-29607	60.500	-1791223.5	35428.400
## 2013-09-13	31969	56.025	1791063.2	-100.000
## 2013-09-19	-31969	56.800	-1815839.2	24675.975
## 2013-10-08	32036	56.675	1815640.3	-100.000
## 2013-10-14	-32036	57.600	-1845273.6	29533.300
## 2013-11-14	29521	62.500	1845062.5	-100.000
## 2013-11-20	-29521	62.500	-1845062.5	-100.000
## 2013-12-05	29365	62.825	1844856.1	-100.000
## 2013-12-11	-29365	62.250	-1827971.2	-16984.875
## 2014-01-03	28001	65.275	1827765.3	-100.000
## 2014-01-09	-28001	65.225	-1826365.2	-1500.050
## 2014-01-14	27966	65.300	1826179.8	-100.000
## 2014-01-20	-27966	65.975	-1845056.8	18777.050
## 2014-02-06	31904	57.825	1844848.8	-100.000
## 2014-02-12	-31904	60.550	-1931787.2	86838.400
## 2014-03-04	30992	62.325	1931576.4	-100.000
## 2014-03-10	-30992	59.350	-1839375.2	-92301.200
## 2014-03-25	30463	60.375	1839203.6	-100.000
## 2014-03-31	-30463	61.125	-1862050.9	22747.250

## 2014-04-03	30685	60.675	1861812.4	-100.000
## 2014-04-09	-30685	58.400	-1792004.0	-69908.375
## 2014-04-14	31014	57.775	1791833.8	-100.000
## 2014-04-15	-31014	56.525	-1753066.3	-38867.500
## 2014-05-05	29021	60.400	1752868.4	-100.000
## 2014-05-09	-29021	61.275	-1778261.8	25293.375
## 2014-05-16	28586	62.200	1778049.2	-100.000
## 2014-05-22	-28586	62.675	-1791627.5	13478.350
## 2014-06-04	28245	63.425	1791439.1	-100.000
## 2014-06-10	-28245	64.325	-1816859.6	25320.500
## 2014-07-17	28052	64.760	1816647.5	-100.000
## 2014-07-18	-28052	64.120	-1798694.2	-18053.280
## 2014-08-05	27914	64.430	1798499.0	-100.000
## 2014-08-06	-27914	63.510	-1772818.1	-25780.880
## 2014-08-11	28213	62.830	1772622.8	-100.000
## 2014-08-15	-28213	64.100	-1808453.3	35730.510
## 2014-10-17	26471	68.310	1808234.0	-100.000
## 2014-10-23	-26471	71.280	-1886852.9	78518.870
## 2014-11-04	26174	72.080	1886621.9	-100.000
## 2014-11-10	-26174	71.880	-1881387.1	-5334.800
## 2014-11-13	26103	72.070	1881243.2	-100.000
## 2014-11-19	-26103	77.110	-2012802.3	131459.120
## 2014-12-16	25982	77.460	2012565.7	-100.000
## 2014-12-22	-25982	79.640	-2069206.5	56540.760
## 2015-03-24	19761	104.700	2068976.7	-100.000
## 2015-03-25	-19761	103.900	-2053167.9	-15908.800
## 2015-03-27	19893	103.200	2052957.6	-100.000
## 2015-04-02	-19893	105.650	-2101695.5	48637.850
## 2015-04-15	18950	110.900	2101555.0	-100.000
## 2015-04-21	-18950	106.500	-2018175.0	-83480.000
## 2015-06-10	21705	92.970	2017913.8	-100.000
## 2015-06-12	-21705	93.090	-2020518.5	2504.600
## 2015-06-16	21903	92.240	2020332.7	-100.000
## 2015-06-22	-21903	94.070	-2060415.2	39982.490
## 2015-07-07	22558	91.330	2060222.1	-100.000
## 2015-07-13	-22558	94.710	-2136468.2	76146.040
## 2015-09-02	25393	84.130	2136313.1	-100.000
## 2015-09-04	-25393	84.260	-2139614.2	3201.090
## 2015-09-08	25261	84.690	2139354.1	-100.000
## 2015-09-14	-25261	83.050	-2097926.0	-41528.040
## 2015-11-16	22598	92.830	2097772.3	-100.000
## 2015-11-20	-22598	95.470	-2157431.1	59558.720
## 2015-11-25	22893	94.230	2157207.4	-100.000
## 2015-12-01	-22893	96.170	-2201619.8	44312.420
## 2015-12-11	24644	89.330	2201448.5	-100.000
## 2015-12-17	-24644	89.010	-2193562.4	-7986.080
## 2015-12-21	24619	89.090	2193306.7	-100.000
## 2015-12-28	-24619	87.950	-2165241.1	-28165.660
## 2016-06-17	25010	86.570	2165115.7	-100.000
## 2016-06-23	-25010	90.090	-2253150.9	87935.200
## 2016-07-26	22958	98.130	2252868.5	-100.000
## 2016-08-01	-22958	99.480	-2283861.8	30893.300
## 2016-08-15	22936	99.570	2283737.5	-100.000
## 2016-08-19	-22936	96.840	-2221122.2	-62715.280

##	2016-09-01	23410	94.870	2220906.7	-100.000
##	2016-09-07	-23410	96.300	-2254383.0	33376.300
##	2016-10-14	23437	96.180	2254170.7	-100.000
##	2016-10-20	-23437	99.250	-2326122.2	71851.590
##	2016-10-27	24218	96.040	2325896.7	-100.000
##	2016-10-28	-24218	94.430	-2286905.7	-39090.980
##	2016-11-07	24799	92.210	2286715.8	-100.000
##	2016-11-11	-24799	94.870	-2352681.1	65865.340
##	2016-12-27	23643	99.500	2352478.5	-100.000
##	2017-01-02	-23643	101.250	-2393853.8	41275.250
##	2017-01-13	23330	102.600	2393658.0	-100.000
##	2017-01-19	-23330	102.500	-2391325.0	-2433.000
##	2017-01-25	23431	102.050	2391133.5	-100.000
##	2017-01-31	-23431	101.650	-2381761.1	-9472.400
##	2017-02-15	23627	100.800	2381601.6	-100.000
##	2017-02-21	-23627	101.900	-2407591.3	25889.700
##	2017-04-24	23092	104.250	2407341.0	-100.000
##	2017-04-28	-23092	107.800	-2489317.6	81876.600
##	2017-07-10	24190	102.900	2489151.0	-100.000
##	2017-07-14	-24190	103.300	-2498827.0	9576.000
##	[1] "Transactions for the instrument: WDI.csv"				
##		Quantity	Price	Value	Net realized Profit
##	1999-12-31	0	0.000	0.0	0.000
##	2006-01-19	395183	2.509	991514.1	-100.000
##	2006-01-25	-395183	2.470	-976102.0	-15512.137
##	2006-02-15	354615	2.752	975900.5	-100.000
##	2006-02-20	-354615	2.931	-1039376.6	63376.085
##	2006-08-04	292561	3.552	1039176.7	-100.000
##	2006-08-10	-292561	3.264	-954919.1	-84357.568
##	2006-10-12	230386	4.144	954719.6	-100.000
##	2006-10-18	-230386	4.128	-951033.4	-3786.176
##	2007-01-24	140822	6.752	950830.1	-100.000
##	2007-01-26	-140822	6.880	-968855.4	17925.216
##	2007-02-09	141616	6.840	968653.4	-100.000
##	2007-02-15	-141616	6.792	-961855.9	-6897.568
##	2007-03-01	147133	6.536	961661.3	-100.000
##	2007-03-07	-147133	6.200	-912224.6	-49536.688
##	2007-03-15	139198	6.552	912025.3	-100.000
##	2007-03-16	-139198	6.360	-885299.3	-26826.016
##	2007-03-29	137608	6.432	885094.7	-100.000
##	2007-04-04	-137608	6.992	-962155.1	76960.480
##	2007-05-04	122200	7.872	961958.4	-100.000
##	2007-05-10	-122200	7.360	-899392.0	-62666.400
##	2007-05-14	123515	7.280	899189.2	-100.000
##	2007-05-18	-123515	7.552	-932785.3	33496.080
##	2007-06-07	112522	8.288	932582.3	-100.000
##	2007-06-12	-112522	8.176	-919979.9	-12702.464
##	2007-06-22	113722	8.088	919783.5	-100.000
##	2007-06-25	-113722	7.952	-904317.3	-15566.192
##	2007-06-26	115415	8.000	923320.0	-100.000
##	2007-07-02	-115415	8.136	-939016.4	15596.440
##	2007-07-09	109896	8.368	919609.7	-100.000
##	2007-07-13	-109896	8.224	-903784.7	-15925.024

##	2007-08-07	108292	8.344	903588.4	-100.000
##	2007-08-13	-108292	7.800	-844677.6	-59010.848
##	2007-08-27	102785	8.216	844481.6	-100.000
##	2007-08-31	-102785	8.120	-834614.2	-9967.360
##	2007-09-11	104301	8.000	834408.0	-100.000
##	2007-09-17	-104301	7.592	-791853.2	-42654.808
##	2007-10-23	85014	9.312	791650.4	-100.000
##	2007-10-29	-85014	9.280	-788929.9	-2820.448
##	2007-12-18	84195	9.368	788738.8	-100.000
##	2007-12-27	-84195	9.240	-777961.8	-10876.960
##	2008-01-17	96832	8.032	777754.6	-100.000
##	2008-01-23	-96832	7.208	-697965.1	-79889.568
##	2008-03-11	82284	8.480	697768.3	-100.000
##	2008-03-17	-82284	7.968	-655638.9	-42229.408
##	2008-03-25	77002	8.512	655441.0	-100.000
##	2008-03-31	-77002	8.880	-683777.8	28236.736
##	2008-04-11	72969	9.368	683573.6	-100.000
##	2008-04-17	-72969	10.208	-744867.6	61193.960
##	2008-05-12	67208	11.080	744664.6	-100.000
##	2008-05-15	-67208	11.248	-755955.6	11190.944
##	2008-06-20	83380	9.064	755756.3	-100.000
##	2008-06-26	-83380	6.200	-516956.0	-238900.320
##	2009-05-18	78297	6.600	516760.2	-100.000
##	2009-05-20	-78297	6.700	-524589.9	7729.700
##	2009-05-29	81936	6.400	524390.4	-100.000
##	2009-06-04	-81936	6.550	-536680.8	12190.400
##	2009-06-18	80312	6.680	536484.2	-100.000
##	2009-06-24	-80312	6.810	-546924.7	10340.560
##	2009-07-27	67165	8.140	546723.1	-100.000
##	2009-07-31	-67165	8.010	-537991.7	-8831.450
##	2009-10-05	68683	7.830	537787.9	-100.000
##	2009-10-09	-68683	8.100	-556332.3	18444.410
##	2009-10-14	67004	8.300	556133.2	-100.000
##	2009-10-20	-67004	8.610	-576904.4	20671.240
##	2009-10-29	68168	8.460	576701.3	-100.000
##	2009-11-04	-68168	8.570	-584199.8	7398.480
##	2009-11-27	68305	8.550	584007.8	-100.000
##	2009-12-02	-68305	8.490	-579909.5	-4198.300
##	2010-01-08	58853	9.850	579702.0	-100.000
##	2010-01-12	-58853	9.990	-587941.5	8139.420
##	2010-01-13	58698	10.100	592849.8	-100.000
##	2010-01-19	-58698	10.250	-601654.5	8704.700
##	2010-02-08	66276	8.998	596351.4	-100.000
##	2010-02-12	-66276	9.000	-596484.0	32.552
##	2010-02-22	65167	9.150	596278.1	-100.000
##	2010-02-26	-65167	8.831	-575489.8	-20888.273
##	2010-03-16	63858	9.009	575296.7	-100.000
##	2010-03-22	-63858	8.020	-512141.2	-63255.562
##	2010-04-29	60952	8.399	511935.8	-100.000
##	2010-05-05	-60952	8.420	-513215.8	1179.992
##	2010-05-10	61513	8.340	513018.4	-100.000
##	2010-05-11	-61513	8.250	-507482.2	-5636.170
##	2010-05-26	63498	7.989	507285.5	-100.000
##	2010-06-01	-63498	8.320	-528303.4	20917.838

## 2010-06-08	64639	8.170	528100.6	-100.000
## 2010-06-14	-64639	8.010	-517758.4	-10442.240
## 2010-06-16	64695	8.000	517560.0	-100.000
## 2010-06-17	-64695	7.760	-502033.2	-15626.800
## 2010-10-06	49490	10.140	501828.6	-100.000
## 2010-10-12	-49490	9.829	-486437.2	-15491.390
## 2010-11-18	46220	10.520	486234.4	-100.000
## 2010-11-24	-46220	10.380	-479763.6	-6570.800
## 2010-12-09	44404	10.800	479563.2	-100.000
## 2010-12-15	-44404	10.375	-460691.5	-18971.700
## 2010-12-22	44236	10.410	460496.8	-100.000
## 2010-12-29	-44236	10.130	-448110.7	-12486.080
## 2011-01-06	42699	10.490	447912.5	-100.000
## 2011-01-10	-42699	10.450	-446204.5	-1807.960
## 2011-02-24	38267	11.655	446001.9	-100.000
## 2011-03-02	-38267	11.930	-456525.3	10423.425
## 2011-04-27	36800	12.400	456320.0	-100.000
## 2011-05-03	-36800	12.350	-454480.0	-1940.000
## 2011-06-09	38417	11.825	454281.0	-100.000
## 2011-06-10	-38417	11.600	-445637.2	-8743.825
## 2011-07-13	35102	12.690	445444.4	-100.000
## 2011-07-15	-35102	12.605	-442460.7	-3083.670
## 2011-07-20	35912	12.315	442256.3	-100.000
## 2011-07-21	-35912	12.155	-436510.4	-5845.920
## 2011-08-17	39254	11.115	436308.2	-100.000
## 2011-08-23	-39254	11.370	-446318.0	9909.770
## 2011-09-13	39939	11.170	446118.6	-100.000
## 2011-09-19	-39939	11.425	-456303.1	10084.445
## 2011-10-04	39713	11.485	456103.8	-100.000
## 2011-10-10	-39713	11.500	-456699.5	495.695
## 2011-11-16	39134	11.665	456498.1	-100.000
## 2011-11-21	-39134	11.950	-467651.3	11053.190
## 2011-11-24	39750	11.760	467460.0	-100.000
## 2011-11-30	-39750	12.280	-488130.0	20570.000
## 2011-12-13	40525	12.040	487921.0	-100.000
## 2011-12-19	-40525	12.055	-488528.9	507.875
## 2012-01-12	36981	13.205	488334.1	-100.000
## 2012-01-13	-36981	13.070	-483341.7	-5092.435
## 2012-02-08	35023	13.795	483142.3	-100.000
## 2012-02-14	-35023	14.520	-508534.0	25291.675
## 2012-03-30	35548	14.300	508336.4	-100.000
## 2012-04-03	-35548	14.220	-505492.6	-2943.840
## 2012-04-05	35384	14.280	505283.5	-100.000
## 2012-04-13	-35384	14.350	-507760.4	2376.880
## 2012-05-21	36780	13.800	507564.0	-100.000
## 2012-05-23	-36780	13.795	-507380.1	-283.900
## 2012-07-10	32459	15.625	507171.9	-100.000
## 2012-07-16	-32459	16.000	-519344.0	12072.125
## 2012-08-03	32508	15.970	519152.8	-100.000
## 2012-08-09	-32508	16.030	-521103.2	1850.480
## 2012-08-14	32055	16.250	520893.8	-100.000
## 2012-08-20	-32055	16.615	-532593.8	11600.075
## 2012-08-31	31290	17.015	532399.3	-100.000
## 2012-09-06	-31290	17.320	-541942.8	9443.450

##	2012-09-27	31506	17.195	541745.7	-100.000
##	2012-10-03	-31506	17.980	-566477.9	24632.210
##	2012-10-24	32038	17.675	566271.7	-100.000
##	2012-10-30	-32038	17.785	-569795.8	3424.180
##	2012-12-27	30982	18.385	569604.1	-100.000
##	2013-01-04	-30982	18.705	-579518.3	9814.240
##	2013-01-08	30831	18.790	579314.5	-100.000
##	2013-01-14	-30831	18.400	-567290.4	-12124.090
##	2013-02-05	32563	17.415	567084.6	-100.000
##	2013-02-11	-32563	18.255	-594437.6	27252.920
##	2013-02-22	31112	19.100	594239.2	-100.000
##	2013-02-26	-31112	19.600	-609795.2	15456.000
##	2013-02-27	31248	19.895	621679.0	-100.000
##	2013-03-05	-31248	20.385	-636990.5	15211.520
##	2013-04-17	31251	19.990	624707.5	-100.000
##	2013-04-22	-31251	20.730	-647833.2	23025.740
##	2013-04-29	31099	20.825	647636.7	-100.000
##	2013-05-06	-31099	20.280	-630687.7	-17048.955
##	2013-05-24	28928	21.795	630485.8	-100.000
##	2013-05-30	-28928	22.250	-643648.0	13062.240
##	2013-08-05	27639	23.280	643435.9	-100.000
##	2013-08-09	-27639	22.725	-628096.3	-15439.645
##	2013-08-29	27065	23.200	627908.0	-100.000
##	2013-09-04	-27065	25.000	-676625.0	48617.000
##	2013-10-10	26521	25.505	676418.1	-100.000
##	2013-10-16	-26521	26.430	-700950.0	24431.925
##	2013-11-25	25877	27.080	700749.2	-100.000
##	2013-11-29	-25877	27.545	-712782.0	11932.805
##	2014-01-10	24665	28.890	712571.8	-100.000
##	2014-01-16	-24665	30.250	-746116.2	33444.400
##	2014-03-11	22491	33.165	745914.0	-100.000
##	2014-03-12	-22491	32.845	-738716.9	-7297.120
##	2014-03-17	23724	31.130	738528.1	-100.000
##	2014-03-21	-23724	31.115	-738172.3	-455.860
##	2014-04-09	25317	29.150	737990.5	-100.000
##	2014-04-15	-25317	28.600	-724066.2	-14024.350
##	2014-04-29	24000	30.160	723840.0	-100.000
##	2014-05-05	-24000	30.090	-722160.0	-1780.000
##	2014-06-12	22011	32.800	721960.8	-100.000
##	2014-06-13	-22011	32.365	-712386.0	-9674.785
##	2014-06-17	22056	32.290	712188.2	-100.000
##	2014-06-23	-22056	31.160	-687265.0	-25023.280
##	2014-07-29	22505	30.530	687077.7	-100.000
##	2014-07-30	-22505	29.880	-672449.4	-14728.250
##	2014-09-10	23217	28.955	672248.2	-100.000
##	2014-09-16	-23217	28.560	-663077.5	-9270.715
##	2014-10-06	22470	29.500	662865.0	-100.000
##	2014-10-10	-22470	29.030	-652304.1	-10660.900
##	2014-10-17	23112	28.215	652105.1	-100.000
##	2014-10-23	-23112	29.145	-673599.2	21394.160
##	2014-10-31	23525	28.625	673403.1	-100.000
##	2014-11-06	-23525	28.645	-673873.6	370.500
##	2014-11-13	22652	29.740	673670.5	-100.000
##	2014-11-19	-22652	30.570	-692471.6	18701.160

## 2015-01-07	19302	35.865	692266.2	-100.000
## 2015-01-13	-19302	37.875	-731063.2	38697.020
## 2015-02-03	18368	39.790	730862.7	-100.000
## 2015-02-06	-18368	40.255	-739403.8	8441.120
## 2015-02-10	18218	40.575	739195.4	-100.000
## 2015-02-16	-18218	40.495	-737737.9	-1557.440
## 2015-03-27	18606	39.640	737541.8	-100.000
## 2015-04-02	-18606	39.640	-737541.8	-100.000
## 2015-04-09	18372	40.135	737360.2	-100.000
## 2015-04-15	-18372	41.560	-763540.3	26080.100
## 2015-04-20	18620	40.995	763326.9	-100.000
## 2015-04-22	-18620	40.900	-761558.0	-1868.900
## 2015-08-13	21003	36.250	761358.8	-100.000
## 2015-08-19	-21003	39.000	-819117.0	57658.250
## 2015-08-25	22641	36.170	818925.0	-100.000
## 2015-08-26	-22641	35.835	-811340.2	-7684.735
## 2015-08-27	22866	36.835	842269.1	-100.000
## 2015-09-01	-22866	36.365	-831522.1	-10847.020
## 2015-09-07	21914	36.515	800189.7	-100.000
## 2015-09-11	-21914	36.890	-808407.5	8117.750
## 2015-09-23	19985	40.440	808193.4	-100.000
## 2015-09-29	-19985	41.480	-828977.8	20684.400
## 2015-12-02	17267	48.000	828816.0	-100.000
## 2015-12-03	-17267	46.655	-805591.9	-23324.115
## 2015-12-07	17638	45.660	805351.1	-100.000
## 2015-12-08	-17638	45.350	-799883.3	-5567.780
## 2016-01-05	17436	45.865	799702.1	-100.000
## 2016-01-11	-17436	45.225	-788543.1	-11259.040
## 2016-02-10	19325	40.795	788363.4	-100.000
## 2016-02-11	-19325	39.850	-770101.2	-18362.125
## 2016-06-15	19791	38.900	769869.9	-100.000
## 2016-06-16	-19791	38.415	-760271.3	-9698.635
## 2016-06-17	19753	38.940	769181.8	-100.000
## 2016-06-21	-19753	39.610	-782416.3	13134.510
## 2016-07-07	19977	38.700	773109.9	-100.000
## 2016-07-12	-19977	39.300	-785096.1	11886.200
## 2016-07-18	19771	39.700	784908.7	-100.000
## 2016-07-22	-19771	41.000	-810611.0	25602.300
## 2016-09-13	17856	45.385	810394.6	-100.000
## 2016-09-19	-17856	44.925	-802180.8	-8313.760
## 2016-09-28	17292	46.380	802003.0	-100.000
## 2016-10-05	-17292	46.050	-796296.6	-5806.360
## 2016-10-14	18109	43.960	796071.6	-100.000
## 2016-10-20	-18109	43.770	-792630.9	-3540.710
## 2016-11-03	18931	41.860	792451.7	-100.000
## 2016-11-09	-18931	42.980	-813654.4	21102.720
## 2017-01-09	19095	42.600	813447.0	-100.000
## 2017-01-10	-19095	42.300	-807718.5	-5828.500
## 2017-01-16	19342	41.750	807528.5	-100.000
## 2017-01-20	-19342	43.875	-848630.2	41001.750
## 2017-04-12	15849	53.530	848397.0	-100.000
## 2017-04-20	-15849	52.620	-833974.4	-14522.590
## 2017-06-22	13816	60.350	833795.6	-100.000
## 2017-06-28	-13816	56.730	-783781.7	-50113.920

## 2017-07-20	12241	64.010	783546.4	-100.000
## 2017-07-21	-12241	63.300	-774855.3	-8791.110
## 2017-08-02	11900	65.100	774690.0	-100.000
## 2017-08-08	-11900	66.320	-789208.0	14418.000
## 2017-08-30	11377	69.350	788994.9	-100.000
## 2017-09-05	-11377	71.570	-814251.9	25156.940
## 2017-11-09	9750	83.490	814027.5	-100.000
## 2017-11-15	-9750	83.400	-813150.0	-977.500
## 2017-11-16	9682	84.310	816289.4	-100.000
## 2017-11-22	-9682	87.410	-846303.6	29914.200
## 2018-01-11	8046	104.750	842818.5	-100.000
## 2018-01-17	-8046	105.150	-846036.9	3118.400
## 2018-02-07	9256	91.380	845813.3	-100.000
## 2018-02-08	-9256	90.360	-836372.2	-9541.120
## 2018-02-14	9030	92.600	836178.0	-100.000
## 2018-02-19	-9030	97.800	-883134.0	46856.000
## 2018-03-05	9399	93.940	882942.1	-100.000
## 2018-03-07	-9399	94.140	-884821.9	1779.800
## 2018-03-20	8767	100.900	884590.3	-100.000
## 2018-03-26	-8767	94.300	-826728.1	-57962.200
## 2018-03-29	8686	95.160	826559.8	-100.000
## 2018-04-03	-8686	94.220	-818394.9	-8264.840
## 2018-04-04	8756	95.140	833045.8	-100.000
## 2018-04-10	-8756	102.650	-898803.4	65657.560
## 2018-04-26	8089	109.250	883723.2	-100.000
## 2018-05-03	-8089	117.000	-946413.0	62589.750
## 2018-06-20	6459	146.500	946243.5	-100.000
## 2018-06-21	-6459	145.600	-940430.4	-5913.100
## 2018-06-26	6391	147.100	940116.1	-100.000
## 2018-07-02	-6391	135.750	-867578.2	-72637.850
## 2018-07-20	5566	155.850	867461.1	-100.000
## 2018-07-25	-5566	158.450	-881932.7	14371.600
## 2018-08-01	5448	161.850	881758.8	-100.000
## 2018-08-07	-5448	163.700	-891837.6	9978.800
## 2018-08-16	5203	171.350	891534.0	-100.000
## 2018-08-21	-5203	181.550	-944604.7	52970.600
## 2018-09-14	4997	189.000	944433.0	-100.000
## 2018-09-20	-4997	176.200	-880471.4	-64061.600
## 2018-09-28	4612	190.850	880200.2	-100.000
## 2018-10-02	-4612	188.000	-867056.0	-13244.200

Step 3: Visualize all transactions, profit and drawdown

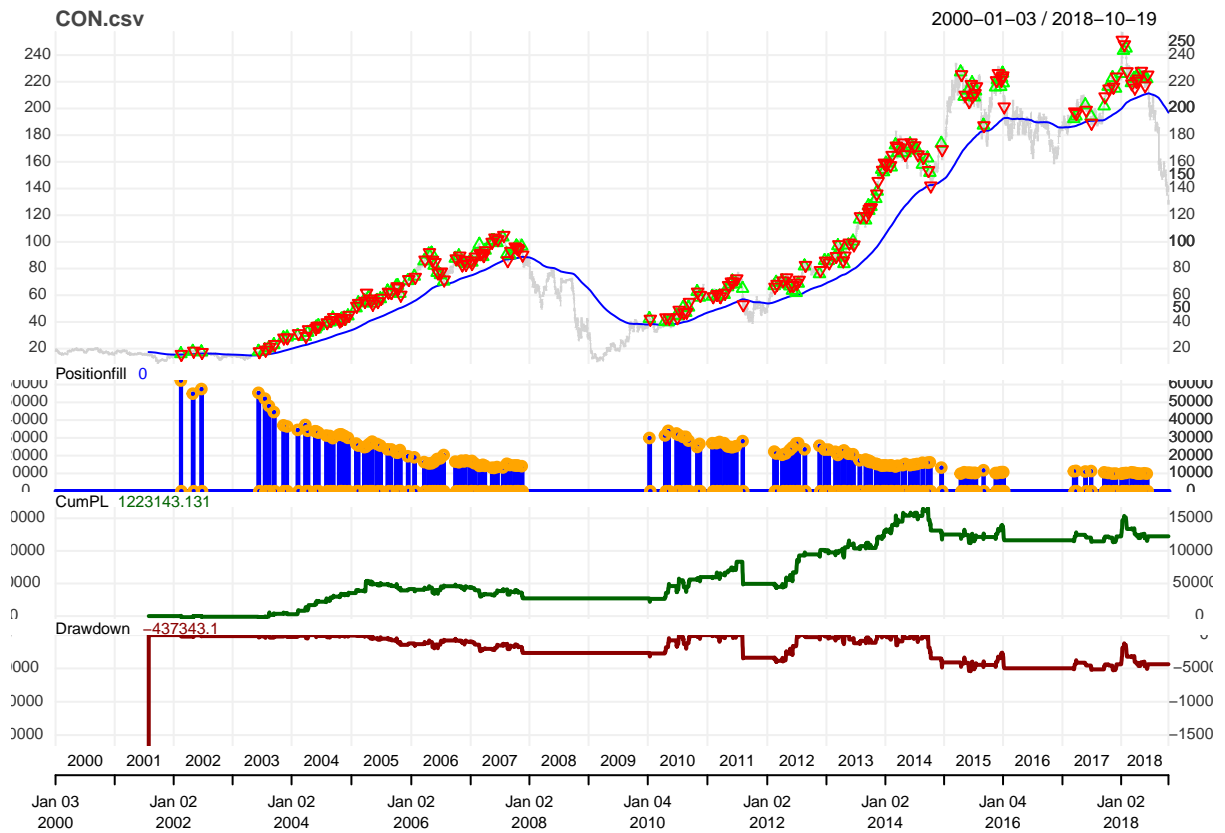
The following graphs show the combined view of the performance of the Smash Day trading system. It visualizes the trades (buy-transactions are visualized in green and sell-transactions are visualized in red). Moreover, the size of the blue squares indicates the size of the position (height) and the holding duration of the position (width). The green line shows the cumulative net profit curve, while the red line indicates the drawdown on each day compared to the last reached high. The first look on the graph shows us, that trades are only performed above the EMA line. Moreover, we see the cumulative profit / loss and drawdowns. The time series can be used for further investigation of the strategy.

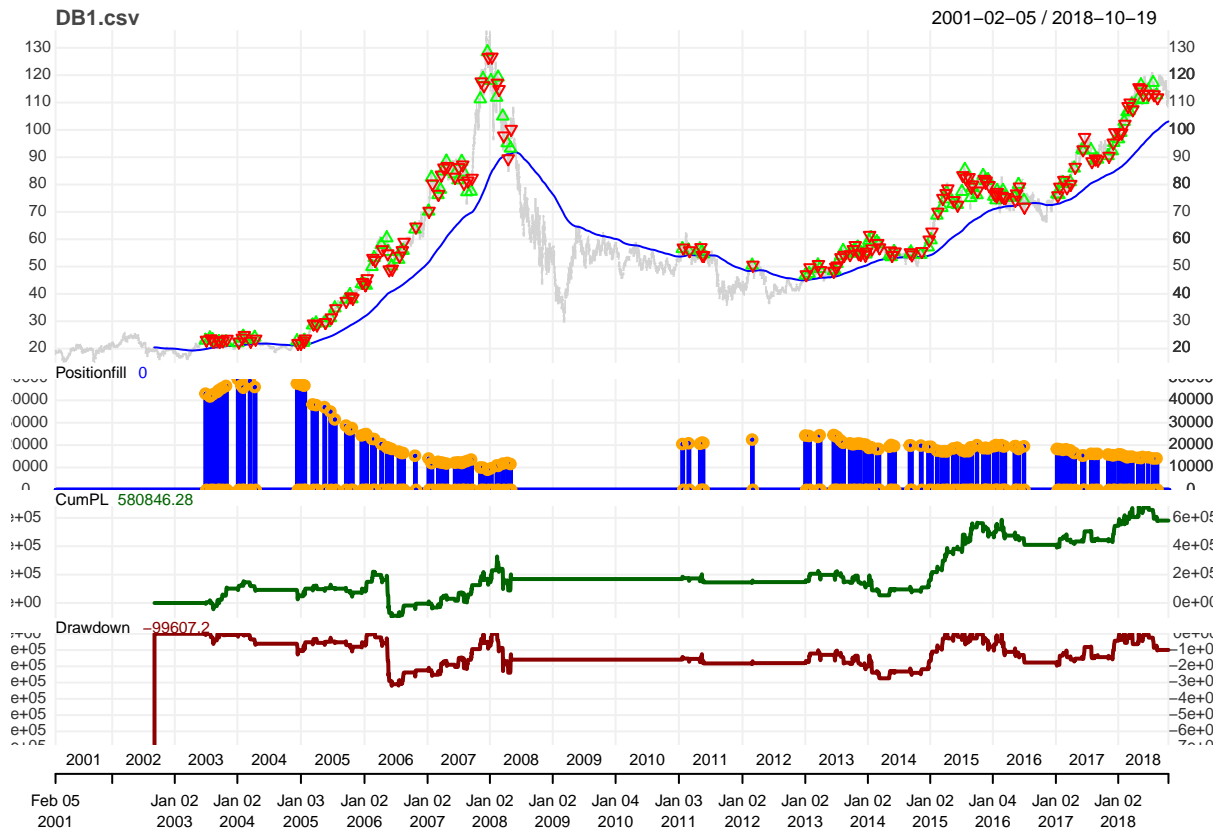
```
# Plot graph with indicators for transaction
for (instrument in instrumentlist){
  chart.Posn(portfolioname,
             Symbol=instrument,
```

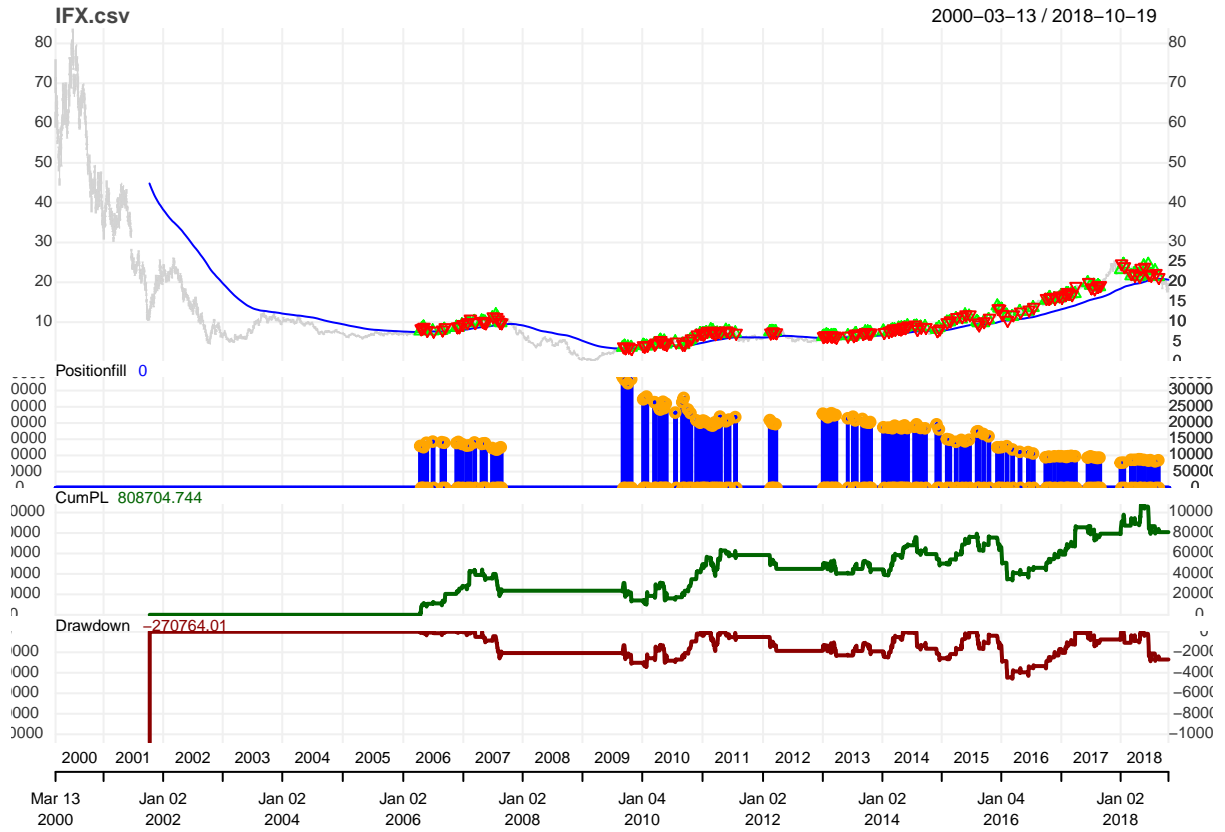
```

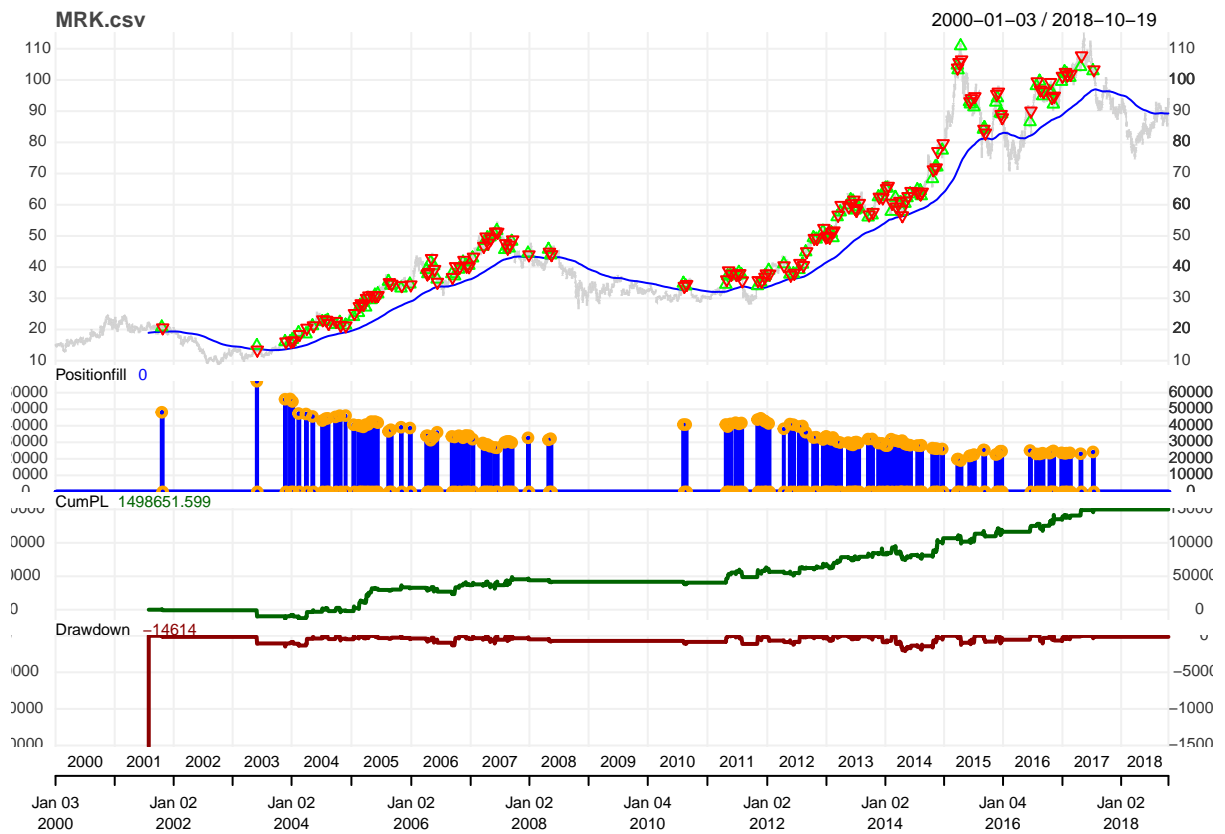
type='candlesticks',
theme=myTheme,
subset=daterange,
TA=addEMAString)
}

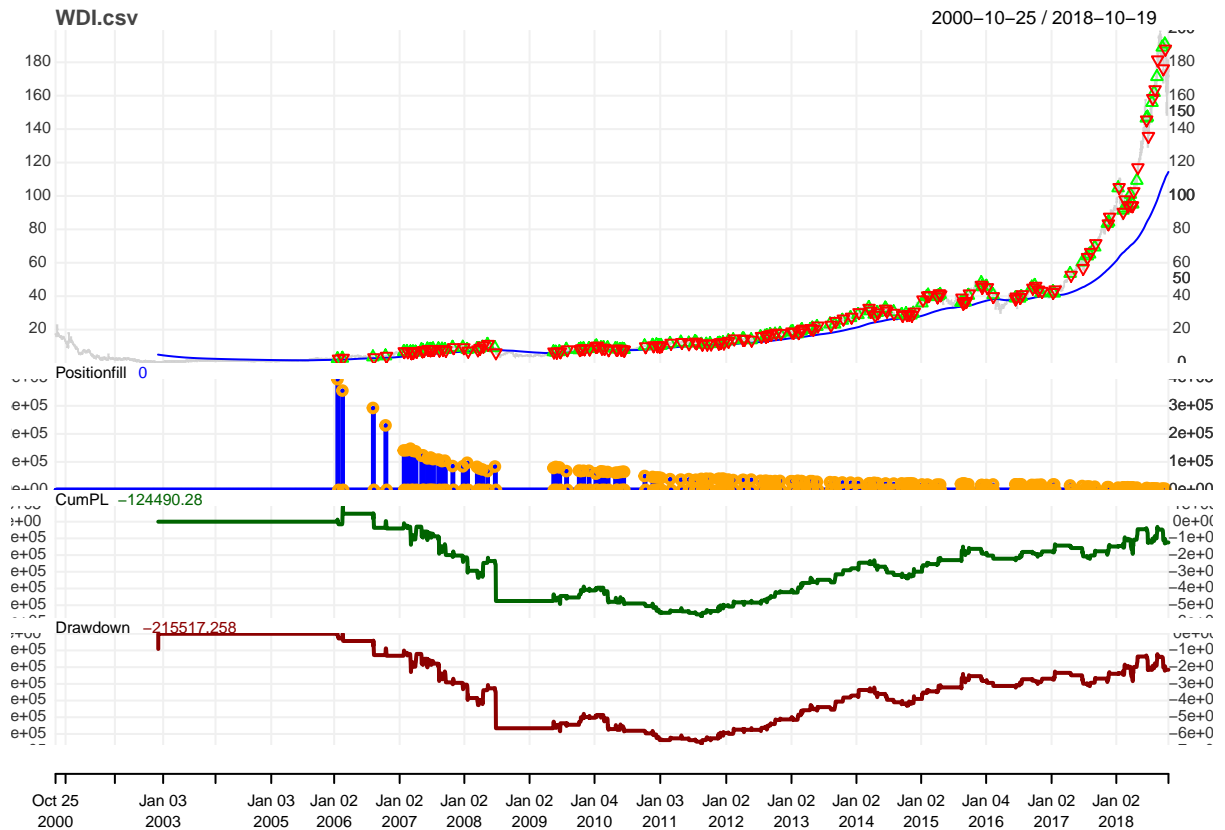
```











Step 4: Performance Statistics

To analyze the results of our strategy appropriately we need to create some statistical measures which indicates how well the strategy performs. The following table summarizes some important trading statistics for all instruments. This statistic is just an excerpt of the available statistics which can be calculated and displayed. It is printed here as it can be assumed that they are interesting for investors to rate the trading strategy.

```
library(PerformanceAnalytics)
# Get returns for the account
rets <- PortfReturns(Account=accountname)
rownames(rets) <- NULL
tstats <- tradeStats(Portfolio=portfolioname, Symbols=instrumentlist)
for (i in 1:nrow(tstats)) {
  trades.tab <- cbind(
    c("Trades", "Win Percent", "Loss Percent", "W/L Ratio"),
    c(tstats[i, "Num.Trades"],
      round(tstats[i, "Percent.Positive"], 2),
      round(tstats[i, "Percent.Negative"], 2),
      round((tstats[i, "Percent.Positive"] / tstats[i, "Percent.Negative"]), 2)))
  trades1 <- trades.tab
  rownames(trades1) <- c("Trades",
    "Win Percent",
    "Loss Percent",
    "W/L Ratio")
  trades1 <- trades1[, 2]
```



```

print(row.names(tstats[i,]))
print(trades1)
writeLines("")
}

```

```

## [1] "CON.csv"
##      Trades  Win Percent Loss Percent      W/L Ratio
##      "161"    "53.42"    "45.96"    "1.16"
##
## [1] "DB1.csv"
##      Trades  Win Percent Loss Percent      W/L Ratio
##      "144"    "51.39"    "48.61"    "1.06"
##
## [1] "IFX.csv"
##      Trades  Win Percent Loss Percent      W/L Ratio
##      "137"    "57.66"    "41.61"    "1.39"
##
## [1] "MRK.csv"
##      Trades  Win Percent Loss Percent      W/L Ratio
##      "133"    "57.89"    "40.6"    "1.43"
##
## [1] "WDI.csv"
##      Trades  Win Percent Loss Percent      W/L Ratio
##      "143"    "48.25"    "51.05"    "0.95"

```

Step 5: Portfolio statistics for all instruments

The following statistics are broken down for each instrument. The cumulative return, annualized return and the sharp ratio. Moreover, some risk metrics are also shown to make sure that both, the return and the risk can be evaluated.

Performance Metrics

```

##              CON          DB1          IFX          MRK
## Cumulative Return  1.43364855 0.58405306 0.77288968 2.83499276
## Annualized Return  0.05253922 0.02683693 0.03351675 0.08046194
## Annualized Sharp Ratio 0.26846732 0.22804498 0.20289021 0.60102540
## Calmar Ratio       0.11538496 0.09546563 0.08754484 0.41392683
##
##              WDI
## Cumulative Return  -0.19611438
## Annualized Return  -0.01248959
## Annualized Sharp Ratio -0.12292544
## Calmar Ratio       -0.02420290

```

Risk Metrics

```

##              CON          DB1          IFX          MRK
## Annualized StdDev  0.195700611 0.11768260 0.165196511 0.133874444
## Max Drawdown       0.455338534 0.28111612 0.382852408 0.194386870
## Value-at-Risk      -0.009630203 -0.00501860 -0.007030405 -0.003691897
## Conditional VaR    -0.030140002 -0.01769196 -0.025754057 -0.019147460
##
##              WDI
## Annualized StdDev  0.101602935
## Max Drawdown       0.516036672
## Value-at-Risk      -0.003747704
## Conditional VaR    -0.014136036

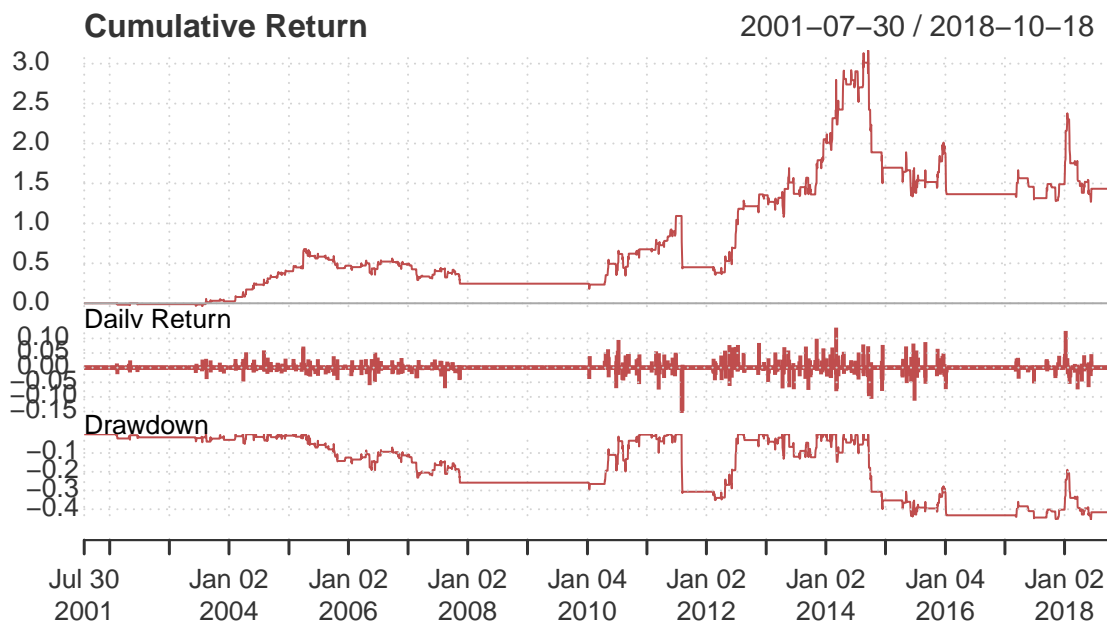
```

Step 6: Visualize returns of the trading strategy for every instrument

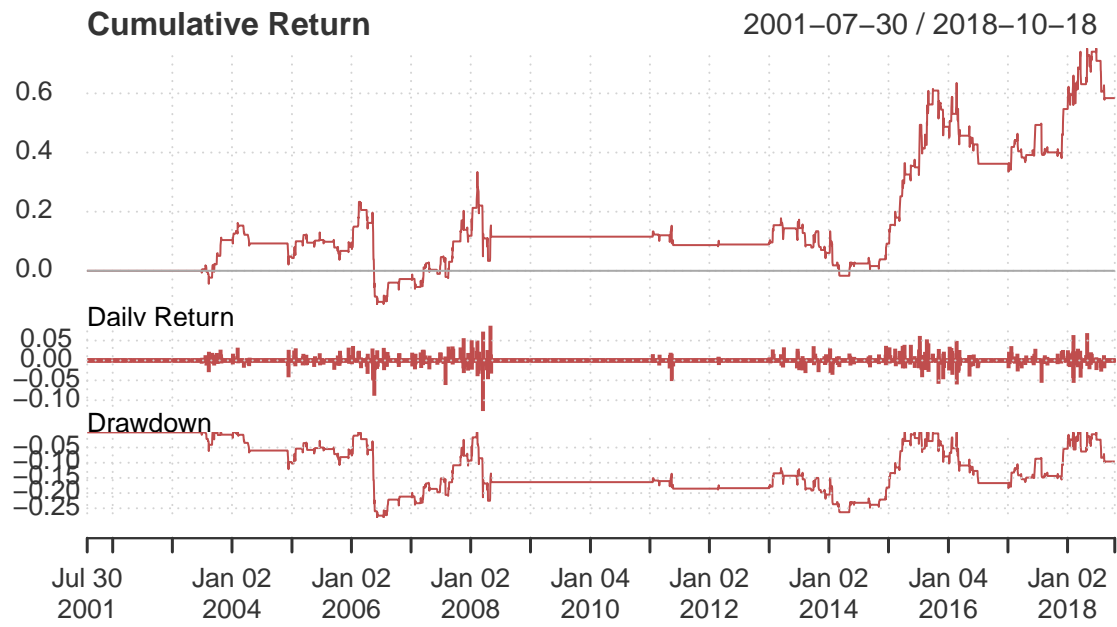
After performing the strategy, we have full access to the returns for each and every instrument which was tested. The following plots visualize the cumulative return, the daily return and the drawdown for each instrument. This allows a good first overview of the performance of the strategy for the instruments used.

```
for (i in 1:ncol(rets)){  
  charts.PerformanceSummary(rets[,i],  
                             colorset=rainbow12equal,  
                             lwd=1,  
                             main=substr(colnames(rets[,i]),1,3))  
}
```

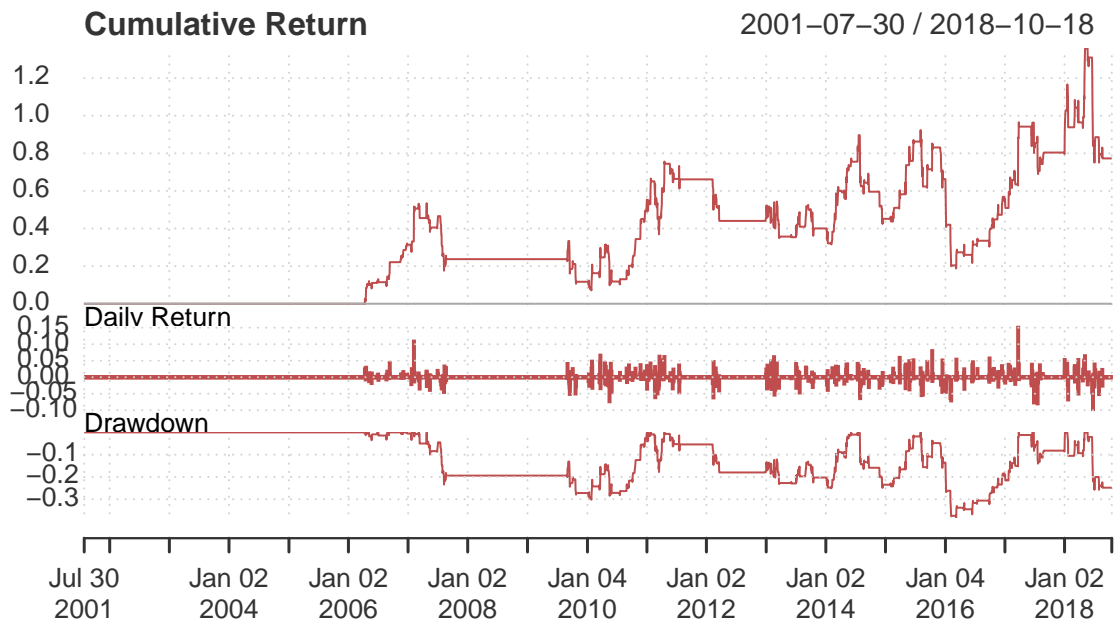
CON



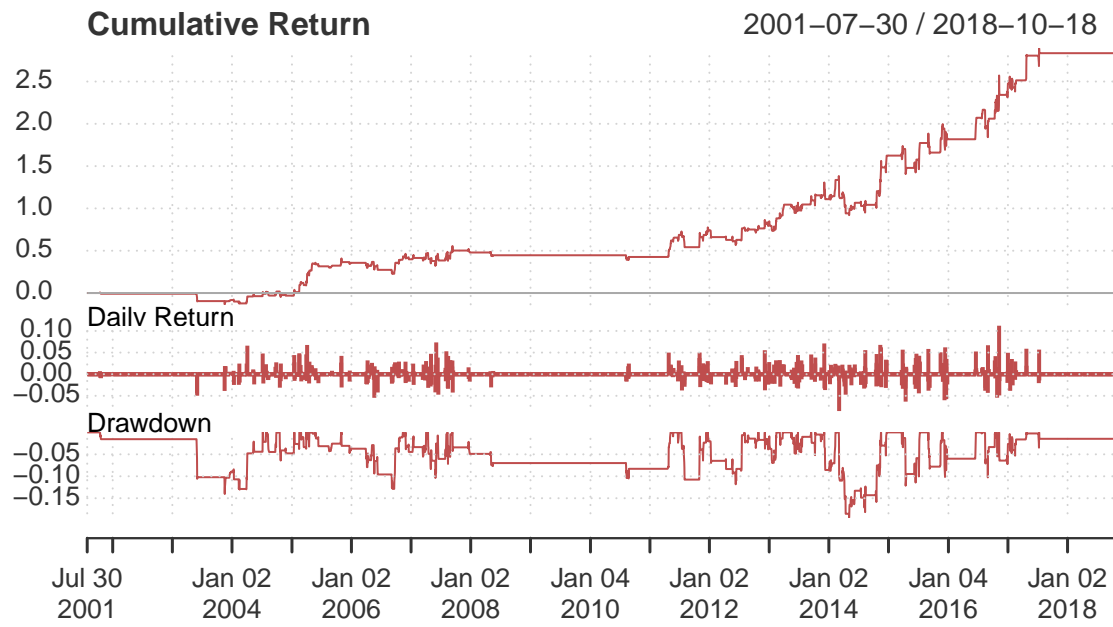
DB1



IFX



MRK



WDI



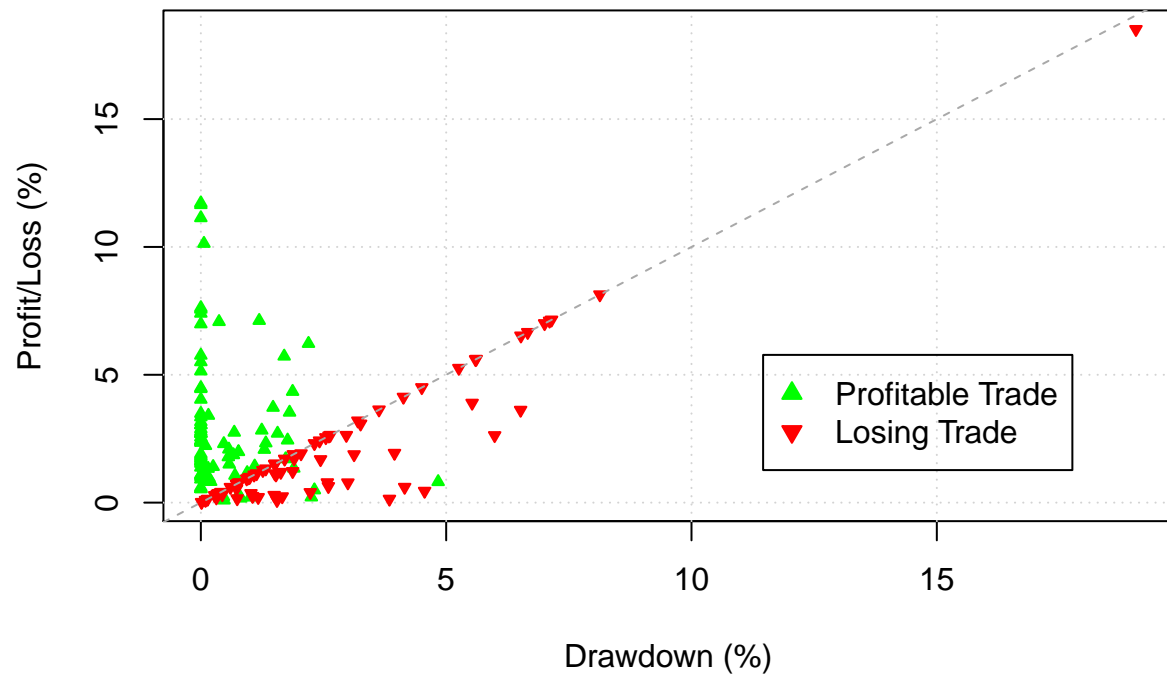
Step 7: Could we have performed better or even worse? MAE / MFE

The efficiency of a strategy is also dependent on the question whether we could have performed better or worse. This can be shown with the maximum adverse excursion and the maximum favorable excursion. The Maximum Adverse excursion shows how much we could have lost at most during the trade, while the maximum favorable excursion shows how much we could have earned more than we did. In the MFE case we want all trades to be as close to the diagonal line as possible. Every movement to the bottom right sight can be interpreted as a not realized opportunity to earn higher returns.

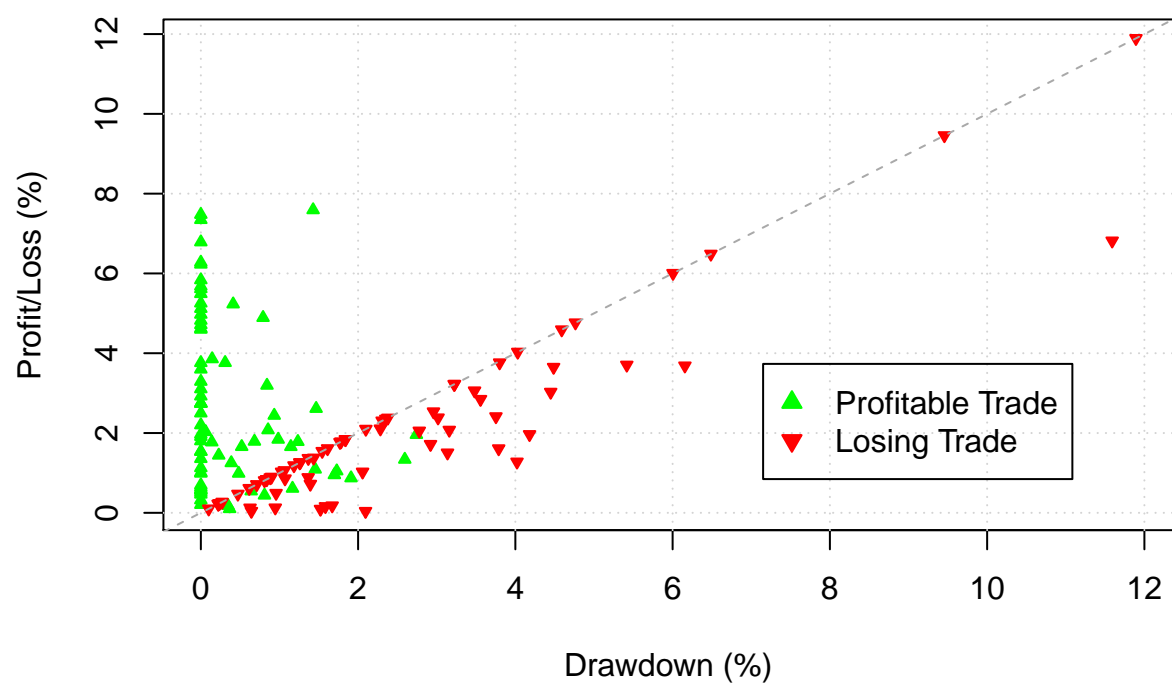
MAE

```
for (instrument in instrumentlist){  
  chart.ME(portfolioname, instrument, type="MAE", scale="percent")  
}
```

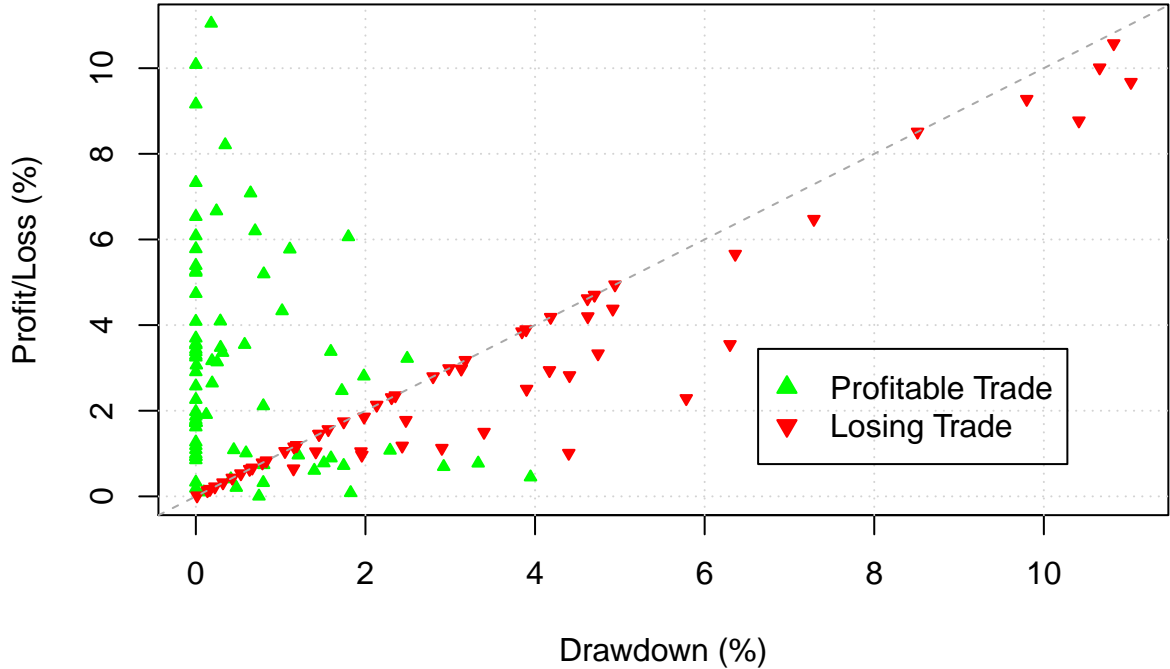
CON.csv Maximum Adverse Excursion (MAE)



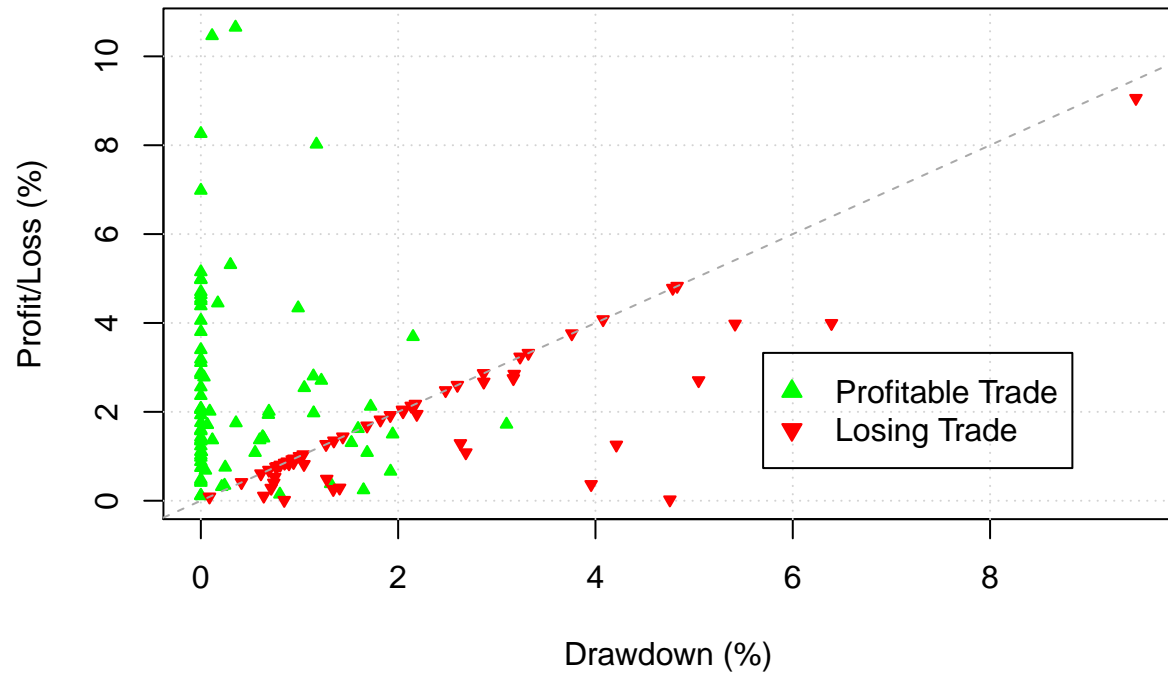
DB1.csv Maximum Adverse Excursion (MAE)



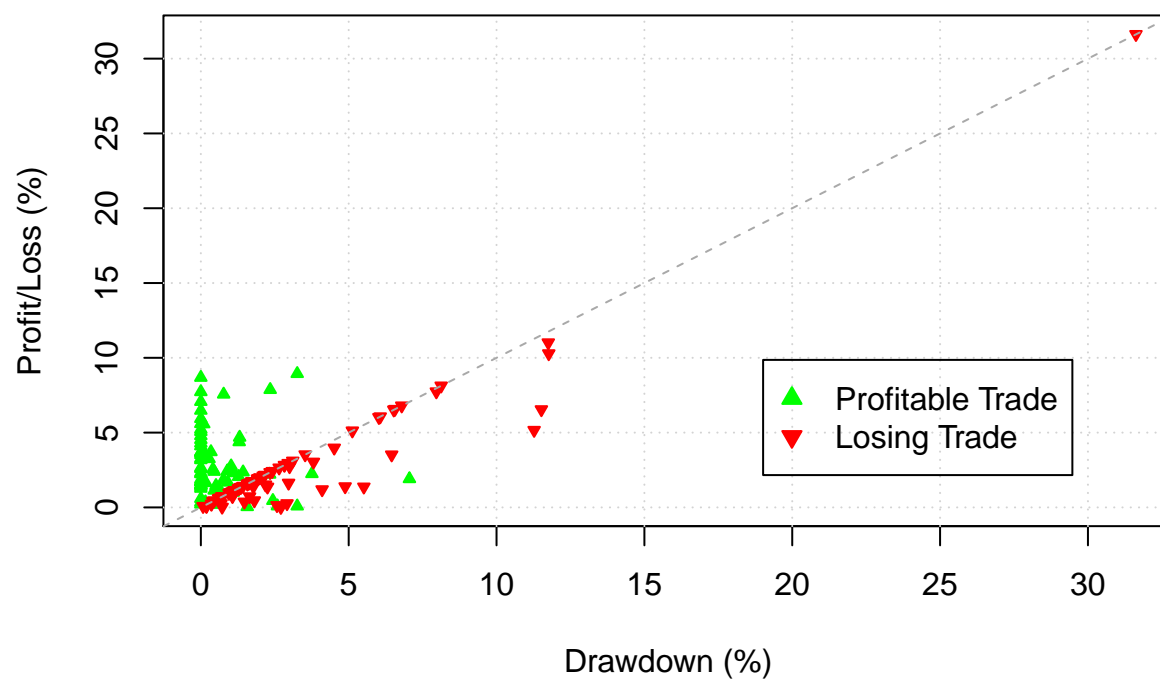
IFX.csv Maximum Adverse Excursion (MAE)



MRK.csv Maximum Adverse Excursion (MAE)



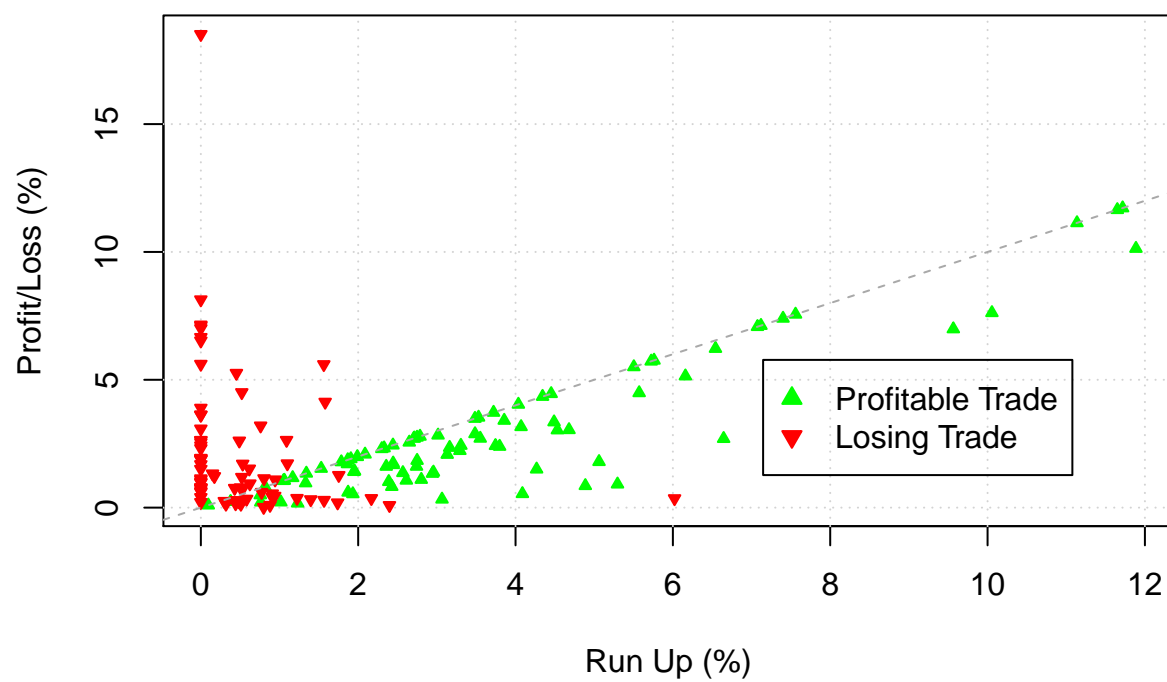
WDL.csv Maximum Adverse Excursion (MAE)



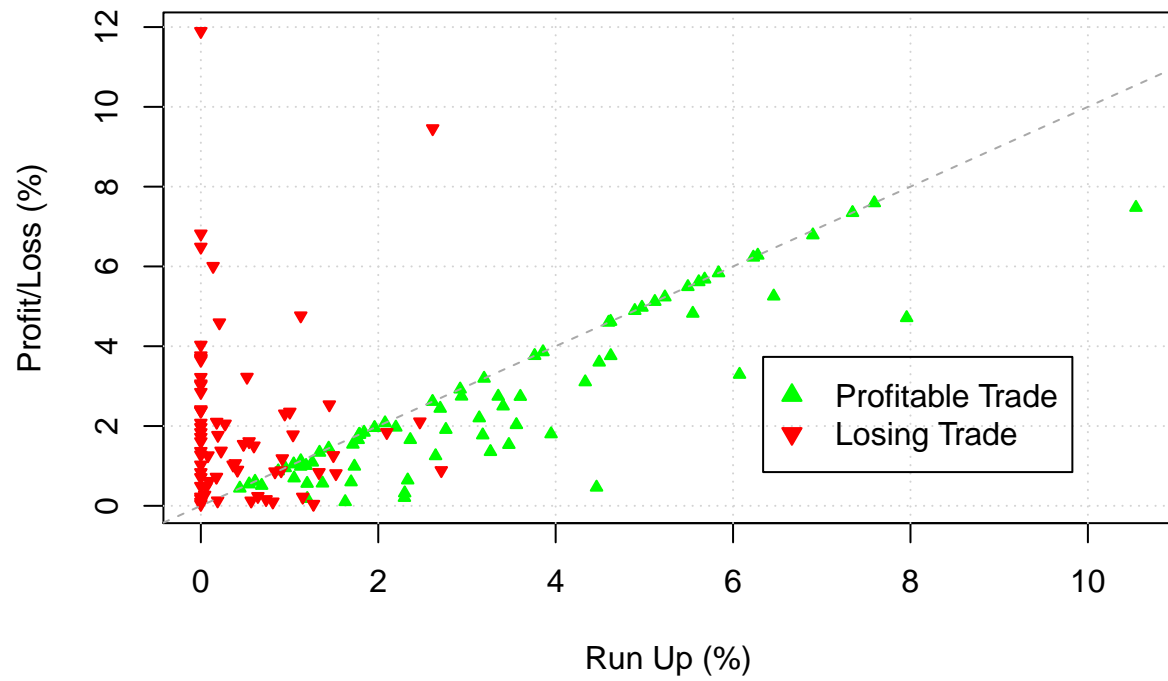
MFE

```
for (instrument in instrumentlist){  
  chart.ME(portfolioname, instrument, type="MFE", scale="percent")  
}
```

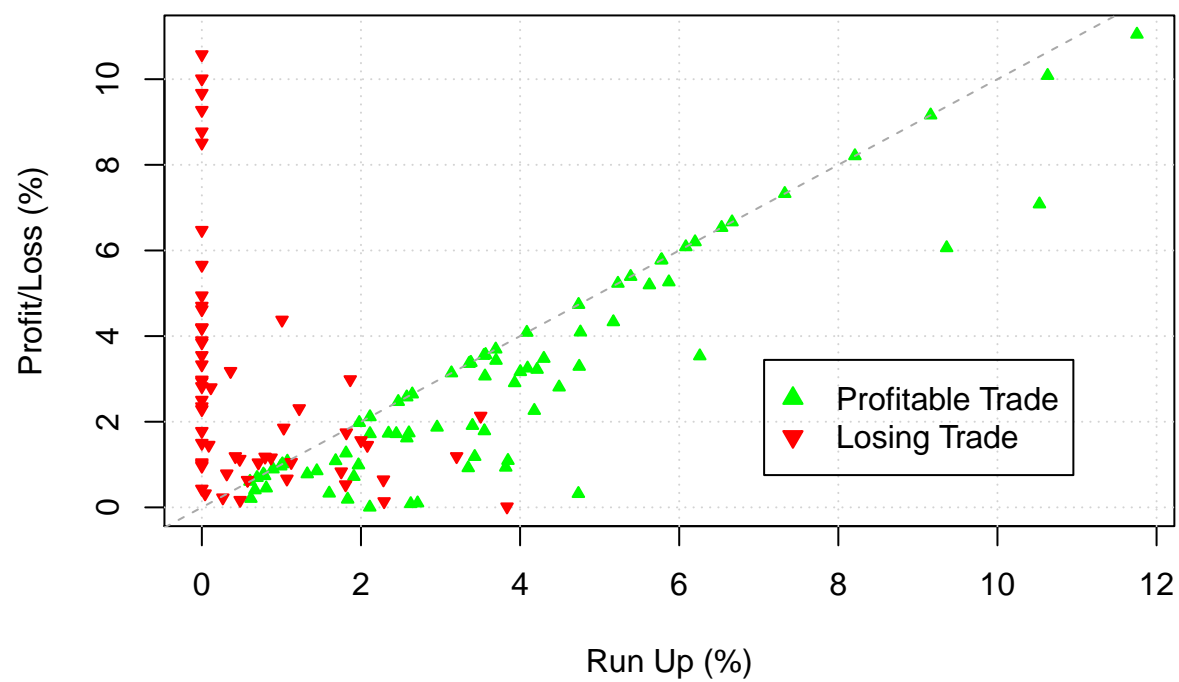
CON.csv Maximum Favourable Excursion (MFE)



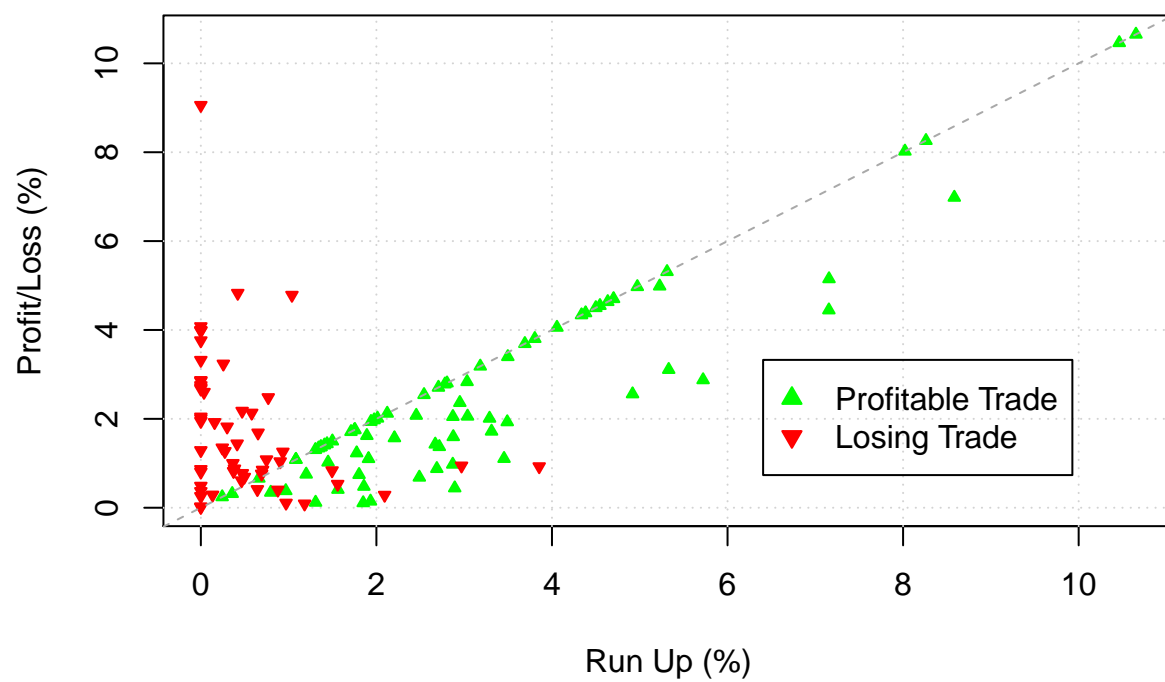
DB1.csv Maximum Favourable Excursion (MFE)



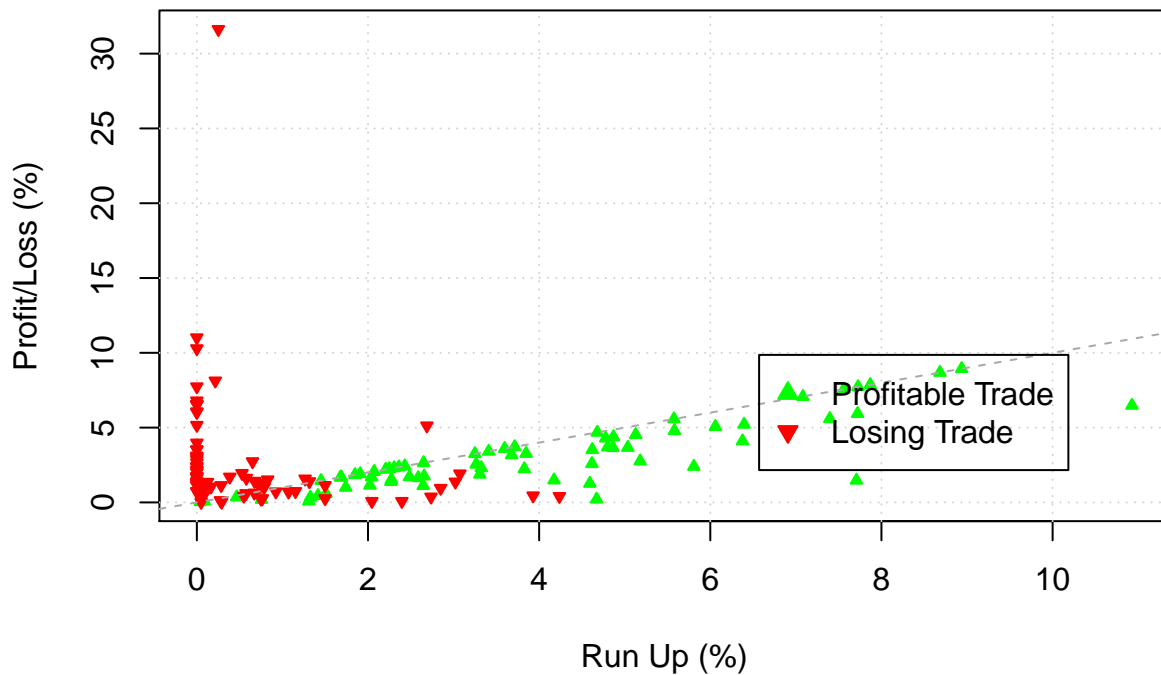
IFX.csv Maximum Favourable Excursion (MFE)



MRK.csv Maximum Favourable Excursion (MFE)



WDI.csv Maximum Favourable Excursion (MFE)



Compare with Buy and Hold Strategy

After having analyzed the strategy extensively, a comparison to another strategy should be made to evaluate the performance based on a benchmark which could have been an alternative investment. In this case a simple buy and hold strategy is used. At the first date of the trading period we place a buy order and sell our position at the last day of the selected period. In order to do this, we create a new Portfolio and a new Account. As stocks from the DAX (German Stocks Market Index) are used in the strategy, the buy and hold strategy is performed on an DAX ETF.

Step 1: Perform the Buy and Hold Strategy

```
# Any objects, in case there was a buyhold
# portfolio initialized before are removed
suppressWarnings(try(rm(list=c("account.buyhold",
                              "portfolio.buyhold"),
                        pos=.blotter)))

# The Buy and hold instrument is loaded
LoadCourseFile(BuyHoldDirectory,BuyHoldInstrument,debugme=TRUE,dates=daterange)
# The Buy and hold instrument is initialized
stock(BuyHoldInstrument,currency="EUR")

BuyHoldSymbol<-get(BuyHoldInstrument)

# The portfolio and account "buyhold" is initialized
initPortf("buyhold",
```



```

        BuyHoldInstrument,
        initDate=initdate,
        currency="EUR")
initAcct("buyhold",
        portfolios="buyhold",
        initDate=initdate,
        initEq=startCapital,
        currency="EUR")

# The first date of the defined daterange is selected
currentdate <- first(time(BuyHoldSymbol))

# Add 400 days, to start after the EMA period of the Smash Day
# strategy was calculated to better compare the performance of the strategies.
currentdate = as.Date(currentdate)+400

# The close price at this date is selected
closeprice <- as.numeric(Cl(BuyHoldSymbol[currentdate,]))

# Calculate the unitsize we can buy with our startingcapital
unitsize <- as.numeric(trunc(startCapital/closeprice))

# Place the transaction for the instrument at the first date
addTxn("buyhold",
        Symbol=BuyHoldInstrument,
        TxnDate=currentdate,
        TxnPrice=closeprice,
        TxnQty=unitsize,
        TxnFees=transactionCost)

# Select the last date of the daterange period
lastdate <-last(time(BuyHoldSymbol))

# Select the price at the last date
lastprice <- as.numeric(Cl(BuyHoldSymbol[lastdate,]))

# Sell the position at the last date of the daterange
addTxn("buyhold",
        Symbol=BuyHoldInstrument,
        TxnDate=lastdate,
        TxnPrice=lastprice,
        TxnQty=-unitsize,
        TxnFees=transactionCost)

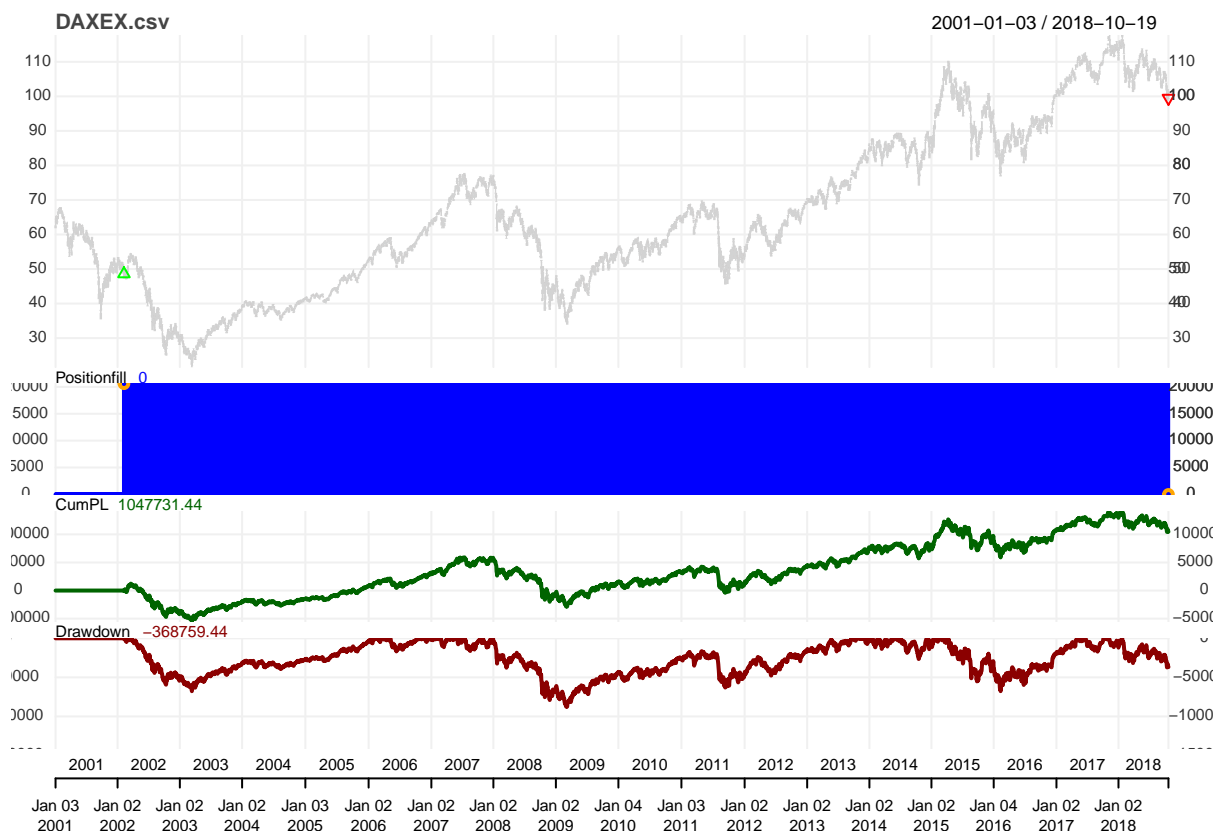
# update portfolio and account
updatePortf(Portfolio="buyhold")
updateAcct(name="buyhold")
updateEndEq(Account="buyhold")

```

Step 2: Visualize the Buy and Hold strategy

When visualizing the strategy in the same way we visualized the Smash Day strategy, we can see that we hold the position from the first until the last date. The cumulative profits are visualized by the green line.

```
chart.Posn("buyhold",Symbol=BuyHoldInstrument, theme=myTheme)
```



Step 3: Compare the returns of the trading strategy with the buy and hold strategy

In order to compare the results of both strategies, we calculate the returns for the buy and hold strategy and combine them with the returns of the trading strategy which were calculated before. Then the cumulative return, the daily return and the drawdown is plotted to visualize the performance of the buy and hold strategy.

```
rets.bh <- PortfReturns(Account='buyhold')
returns <- cbind(rets,rets.bh)
colnames(returns) <- substr(colnames(returns),1,3)
charts.PerformanceSummary(rets.bh,
                           colorset=rainbow12equal,
                           lwd=1,
                           main=substr(colnames(rets.bh),1,3))
```

DAX



In order to compare the performance between the strategy investment in one of the stocks and the alternative buy and hold strategy of the DAX ETF, the following graphs visualize the relative performance between each of the stocks used and the DAX ETF. Before that, more statistics are printed. These statistics compare information about the returns of the five instruments and the buy and hold strategy. Furthermore, annualized statistics are provided for the returns, standard deviation and the sharpe ration. These information can be used in order to form first assumptions when comparing the strategies.

The Return versus Risk Graph plots the five instruments and the DAX buy and hold instrument and visualizes the performance of the strategies versus the risk which was taken. This is the first visualization of a direct comparison of the strategies.

In order to better see the direct comparison of the instruments used and the alternative investment in the DAX ETF with a buy and hold strategy, relative performance plots are printed for each instrument and its relative performance compared to the DAX ETF.

```
table.Stats(returns)
```

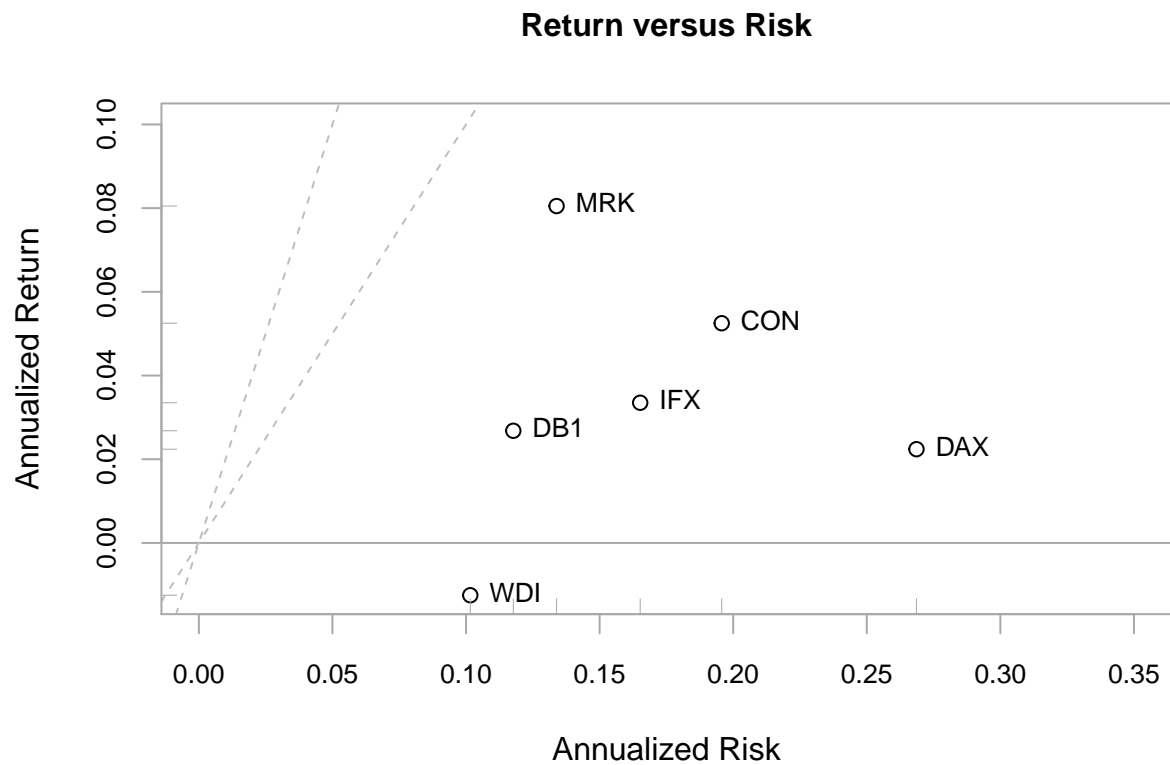
##	CON	DB1	IFX	MRK	WDI
## Observations	4377.0000	4377.0000	4377.0000	4377.0000	4377.0000
## NAs	146.0000	146.0000	146.0000	146.0000	146.0000
## Minimum	-0.1549	-0.1272	-0.1025	-0.0852	-0.2169
## Quartile 1	0.0000	0.0000	0.0000	0.0000	0.0000
## Median	0.0000	0.0000	0.0000	0.0000	0.0000
## Arithmetic Mean	0.0003	0.0001	0.0002	0.0003	0.0000
## Geometric Mean	0.0002	0.0001	0.0001	0.0003	0.0000
## Quartile 3	0.0000	0.0000	0.0000	0.0000	0.0000
## Maximum	0.1369	0.0874	0.1561	0.1121	0.0727
## SE Mean	0.0002	0.0001	0.0002	0.0001	0.0001

```
## LCL Mean (0.95)    -0.0001    -0.0001    -0.0001    0.0001    -0.0002
## UCL Mean (0.95)    0.0006    0.0004    0.0005    0.0006    0.0002
## Variance           0.0002    0.0001    0.0001    0.0001    0.0000
## Stdev              0.0123    0.0074    0.0104    0.0084    0.0064
## Skewness           -0.0953    -0.7149    0.7935    1.6702    -9.0138
## Kurtosis           34.5919    49.9128    34.4445    30.7712    326.6312
##                   DAX
## Observations      4523.0000
## NAs                0.0000
## Minimum           -0.1241
## Quartile 1        -0.0074
## Median             0.0000
## Arithmetic Mean    0.0002
## Geometric Mean     0.0001
## Quartile 3         0.0086
## Maximum            0.1046
## SE Mean            0.0003
## LCL Mean (0.95)    -0.0003
## UCL Mean (0.95)    0.0007
## Variance           0.0003
## Stdev              0.0169
## Skewness           -0.2609
## Kurtosis           3.4867
```

```
table.AnnualizedReturns(returns)
```

```
##                   CON    DB1    IFX    MRK    WDI    DAX
## Annualized Return    0.0525 0.0268 0.0335 0.0805 -0.0125 0.0224
## Annualized Std Dev    0.1957 0.1177 0.1652 0.1339 0.1016 0.2686
## Annualized Sharpe (Rf=0%) 0.2685 0.2280 0.2029 0.6010 -0.1229 0.0835
```

```
# charts.PerformanceSummary(returns,geometric=FALSE,wealth.index=TRUE)
chart.RiskReturnScatter(returns,Rf=0,
                        add.sharpe=c(1,2),
                        xlim=c(0,0.35),
                        main="Return versus Risk"
                        )
```



```
for (i in colnames(returns[,-which(names(returns) == "DAX")])){  
  print(chart.RelativePerformance(returns[,i],returns[, "DAX"],  
    colorset=c("red", "blue"),  
    lwd=1,  
    legend.loc="topleft"))  
}
```

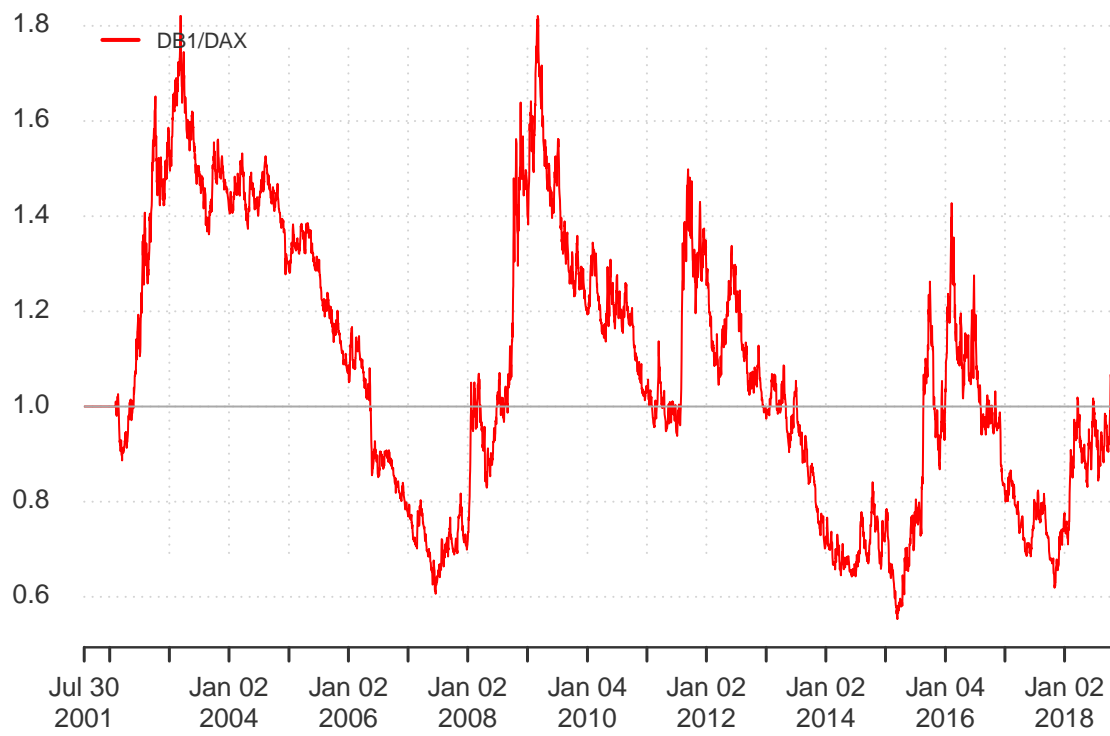
Relative Performance

2001-07-30 / 2018-10-18



Relative Performance

2001-07-30 / 2018-10-18



Relative Performance

2001-07-30 / 2018-10-18



Relative Performance

2001-07-30 / 2018-10-18



Relative Performance

2001-07-30 / 2018-10-18

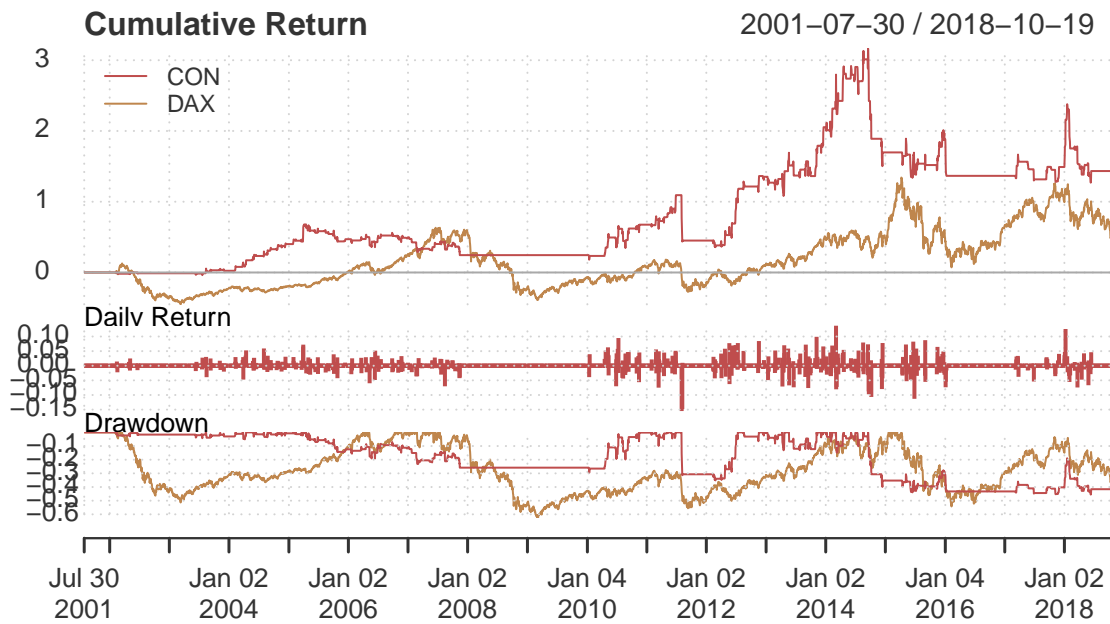


To compare the Smash Day strategy even better to the alternative buy and hold strategy, the following plots visualize the cumulative returns of the strategy including the performance of the DAX. Moreover, it can be used to compare the drawdown of the strategy and the DAX.

```
returns.con <- returns[,c(1,6)]
returns.db1 <- returns[,c(2,6)]
returns.ifx <- returns[,c(3,6)]
returns.mrk <- returns[,c(4,6)]
returns.wdi <- returns[,c(5,6)]

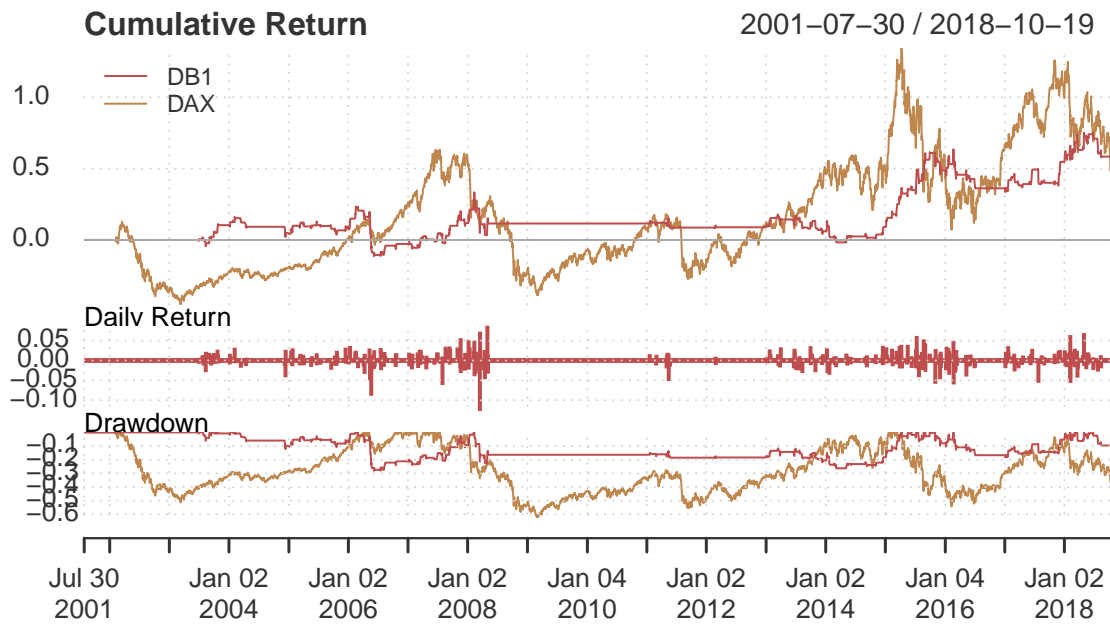
charts.PerformanceSummary(returns.con,
  colorset=rainbow12equal,
  lwd=1)
```

CON Performance



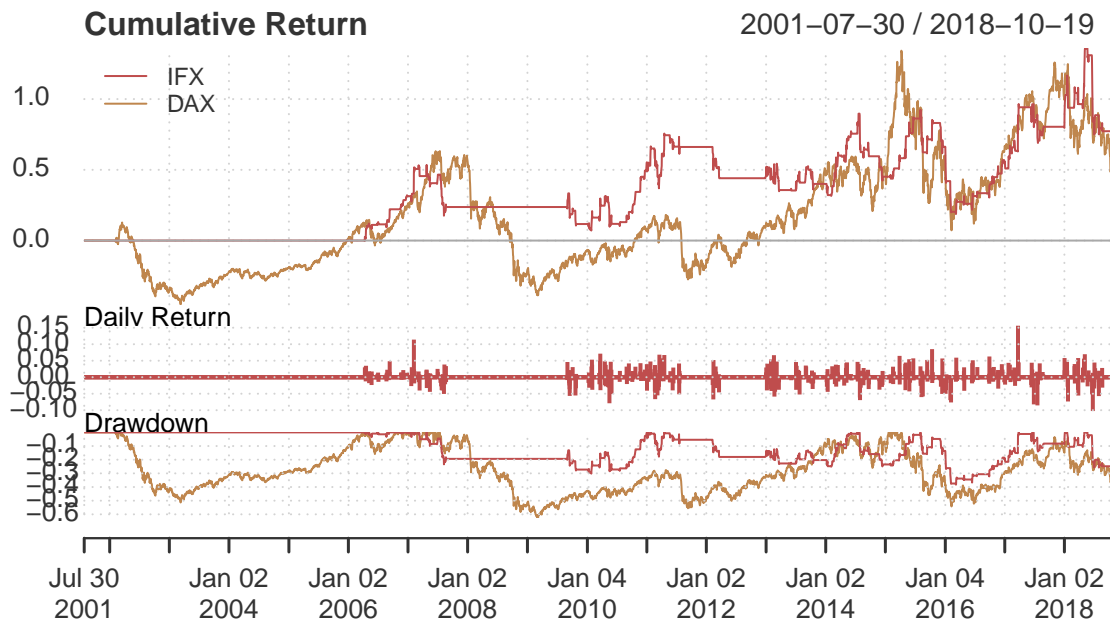
```
charts.PerformanceSummary(returns.db1,  
                           colorset=rainbow12equal,  
                           lwd=1)
```

DB1 Performance



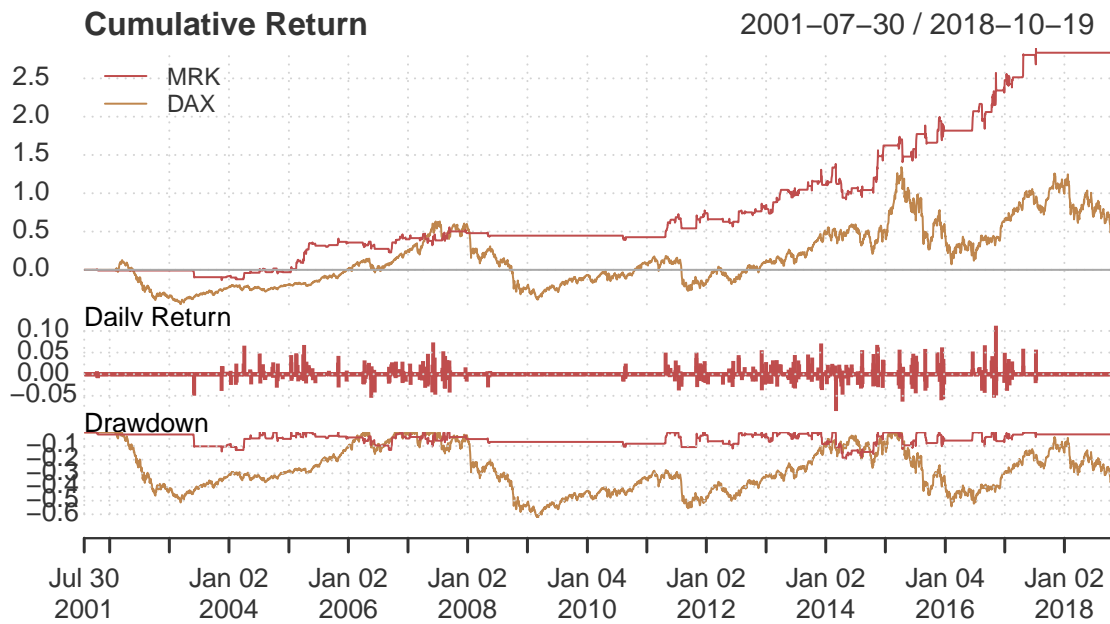
```
charts.PerformanceSummary(returns.ifx,  
                           colorset=rainbow12equal,  
                           lwd=1)
```

IFX Performance



```
charts.PerformanceSummary(returns.mrk,  
                           colorset=rainbow12equal,  
                           lwd=1)
```

MRK Performance



```
charts.PerformanceSummary(returns.wdi,  
                           colorset=rainbow12equal,  
                           lwd=1)
```

WDI Performance



Calculations and visualizations based on returns

As we have the returns of the instruments available, we can perform calculations and visualizations based on the returns of the strategies. The following section contains graphs of the returns, the equity curve and a histogram of the simple returns. Moreover, the histogram graph has an overlay with a randomly created normal distribution in order to compare the distribution of the returns with a normal distribution. As expected the returns are not normally distributed. We can observe fat tails, which means that large negative and large positive returns can be observed more often than expected and the excess kurtosis is visible.

Returns, Equity Curve and return distribution

```
for (i in 1:length(instrumentlist)){
  # Plot the Returns of each instrument
  print(plot(rets[,i], lwd = 1, main = paste("Returns of ",
                                             substr(colnames(rets[,i]),1,3),
                                             sep="")))

  # Plot the equity curve of each instrument
  equityCurve <- cumprod(1 + rets[,i])
  print(plot(equityCurve, lwd = 1,
             main = paste("Equity curve of ",
                           substr(colnames(rets[,i]),1,3),
                           sep="")))

  # Plot the Histogram of the returns to see the return
  # distribution and compare with a random distribution.
```

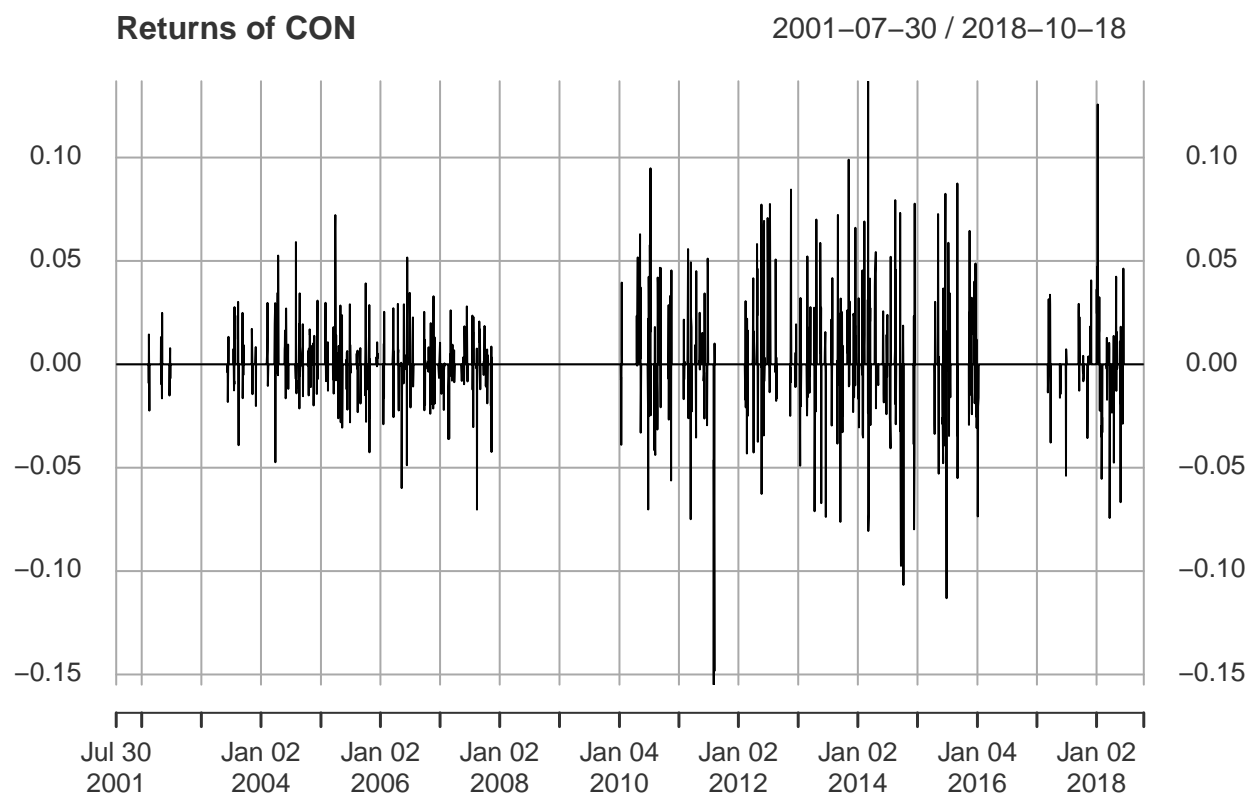
```

set.seed(123)
random_dist <- rnorm(length(rets[,i]),
                     mean=mean(rets[,i]),
                     sd=sd(rets[,i]))

# make them into an "index-matching" time series - just for plotting
random_dist_stats <- xts(random_dist,index(rets))

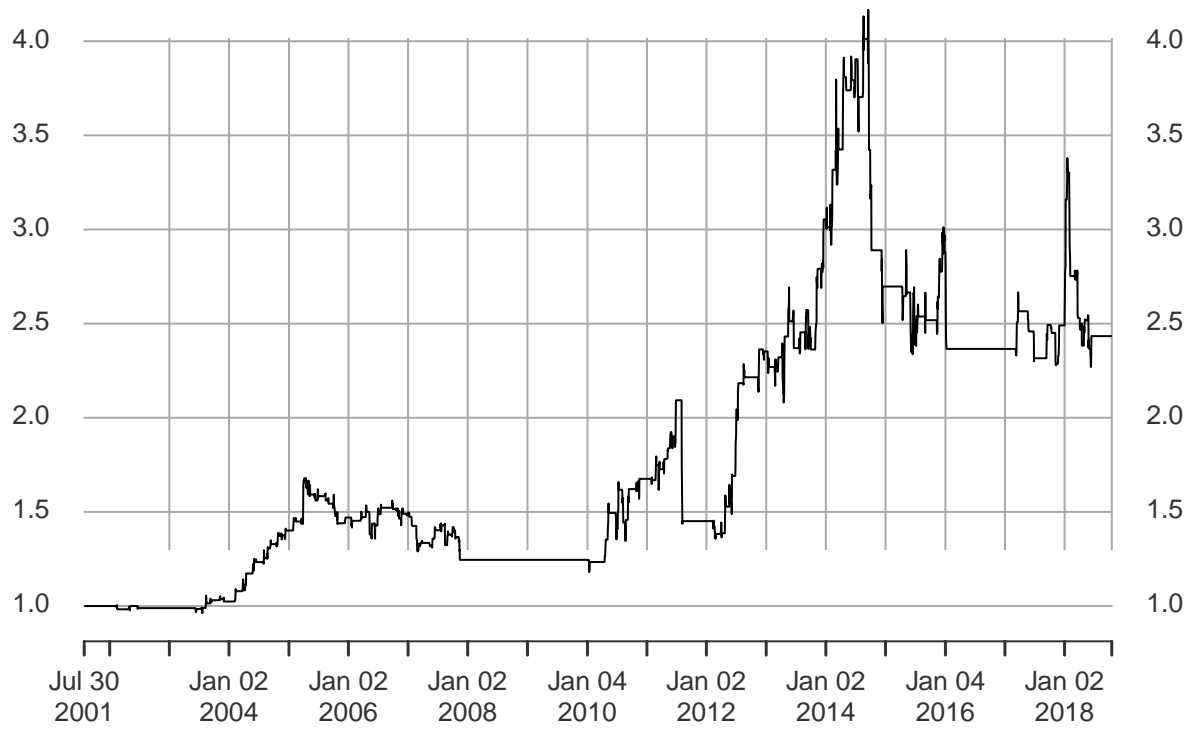
random_dist_stats_density <- density(random_dist_stats)
hist(rets[,i],probability=TRUE,breaks=100,main=paste("Histogram of Simple Returns of ",substr(colnames(
points(random_dist_stats_density,type="l")
}

```

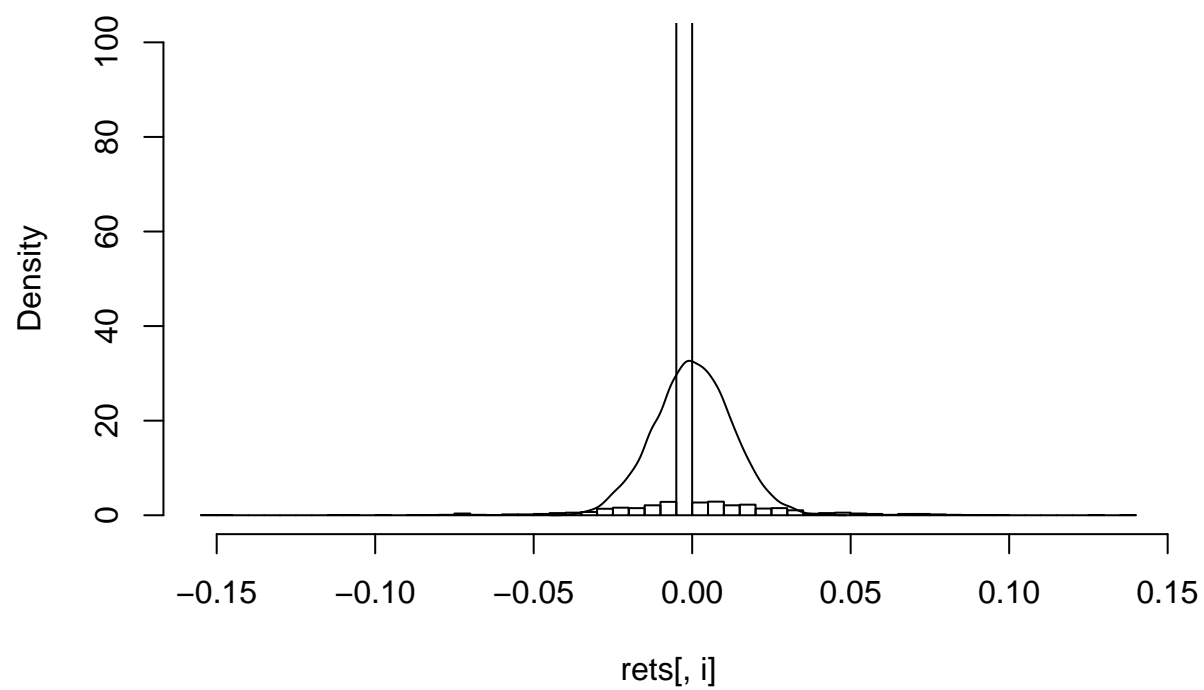


Equity curve of CON

2001-07-30 / 2018-10-18

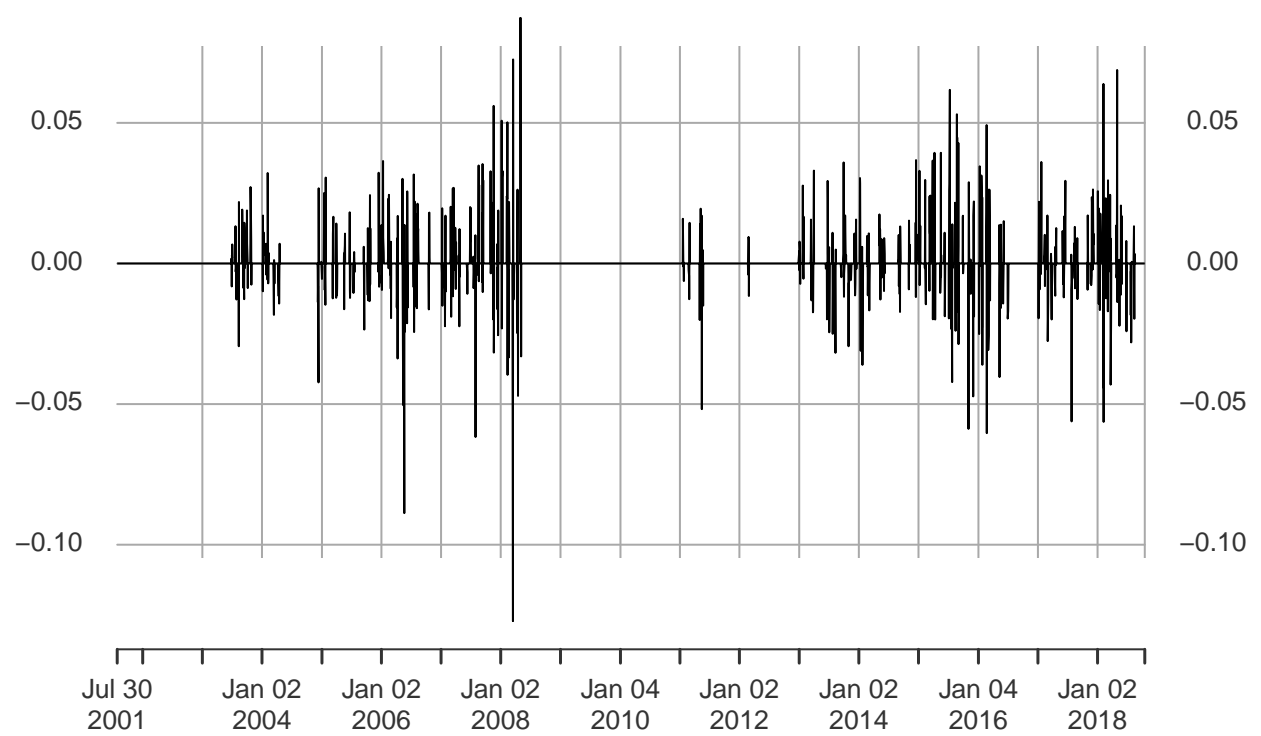


Histogram of Simple Returns of CON



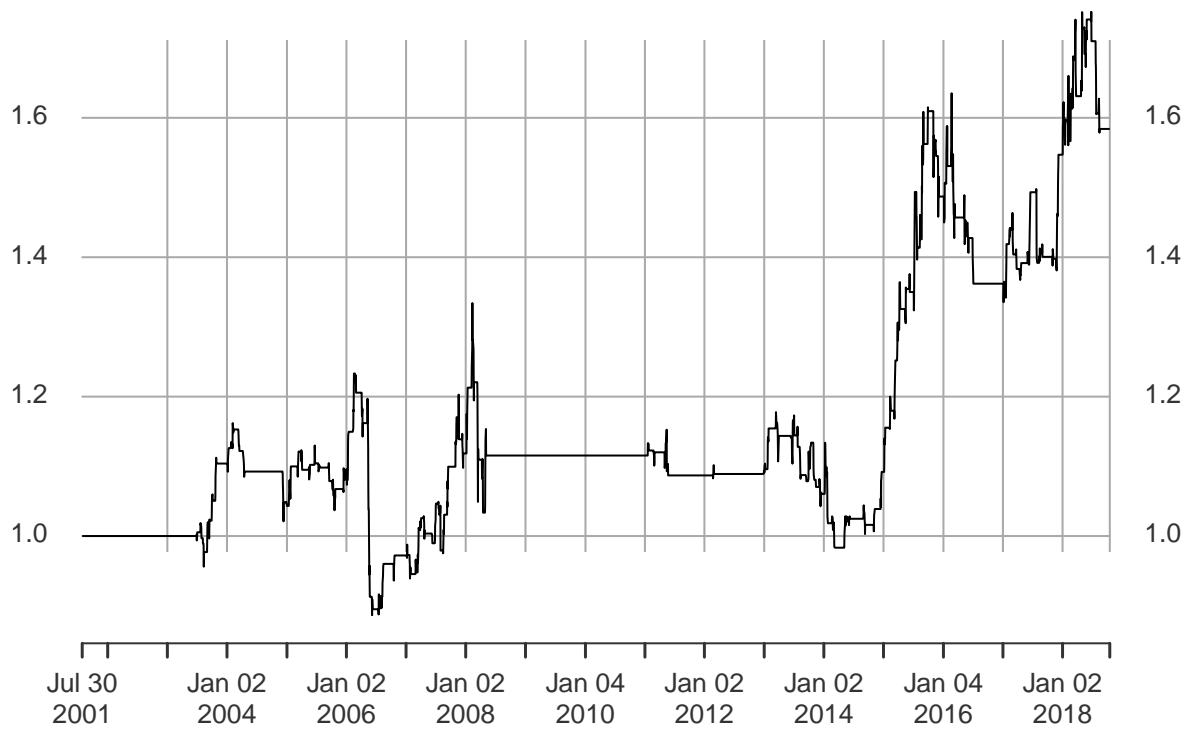
Returns of DB1

2001-07-30 / 2018-10-18

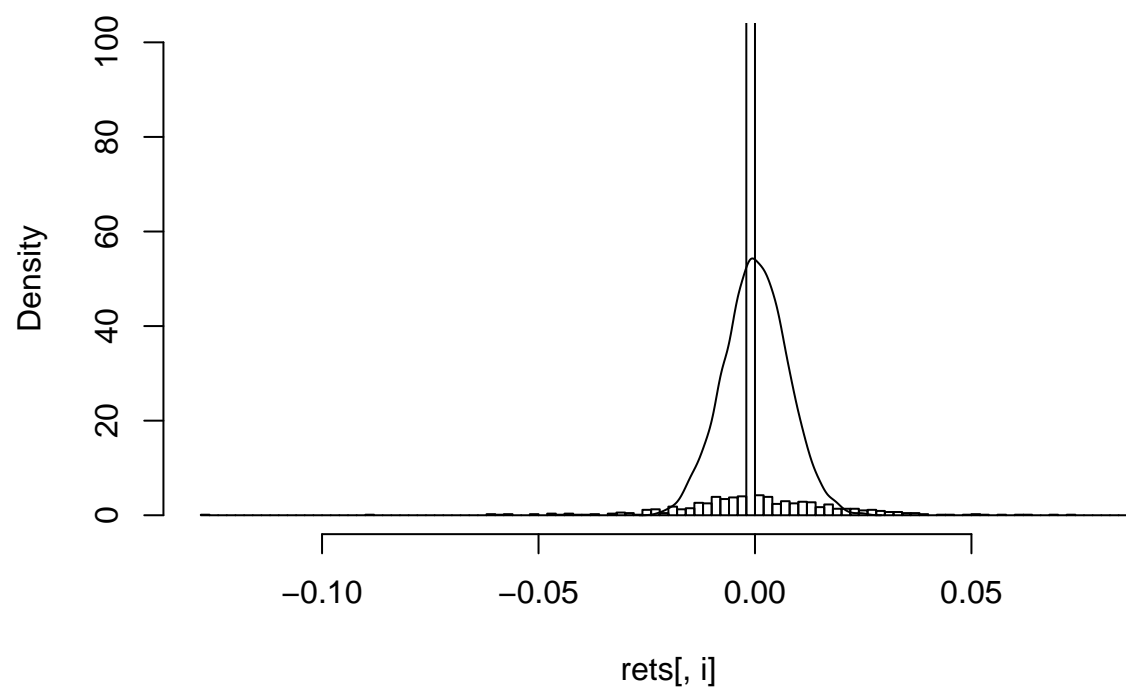


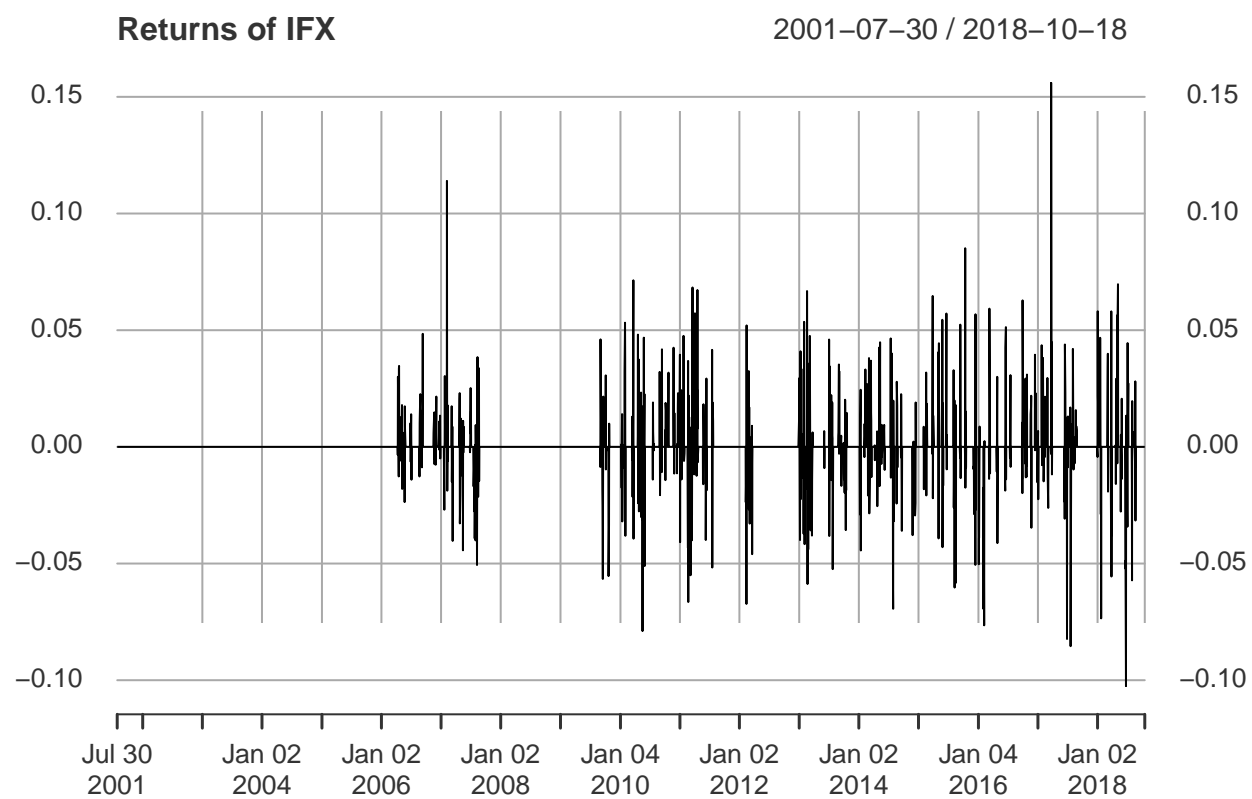
Equity curve of DB1

2001-07-30 / 2018-10-18



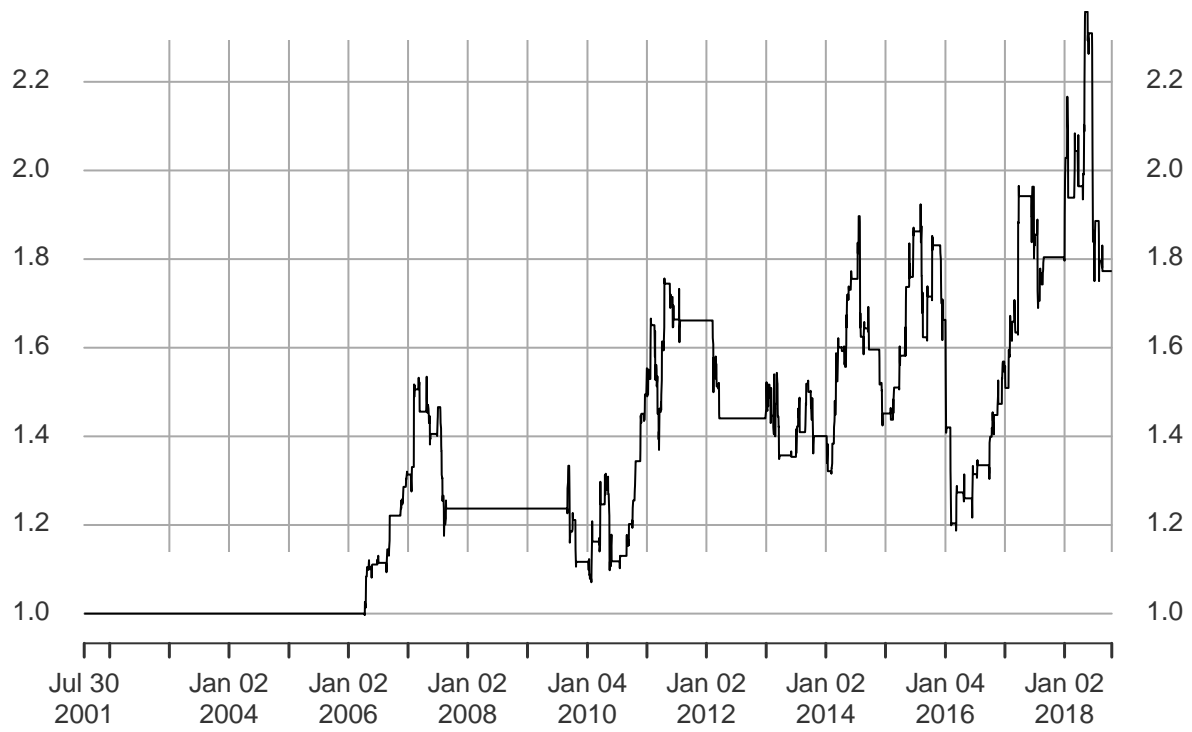
Histogram of Simple Returns of DB1



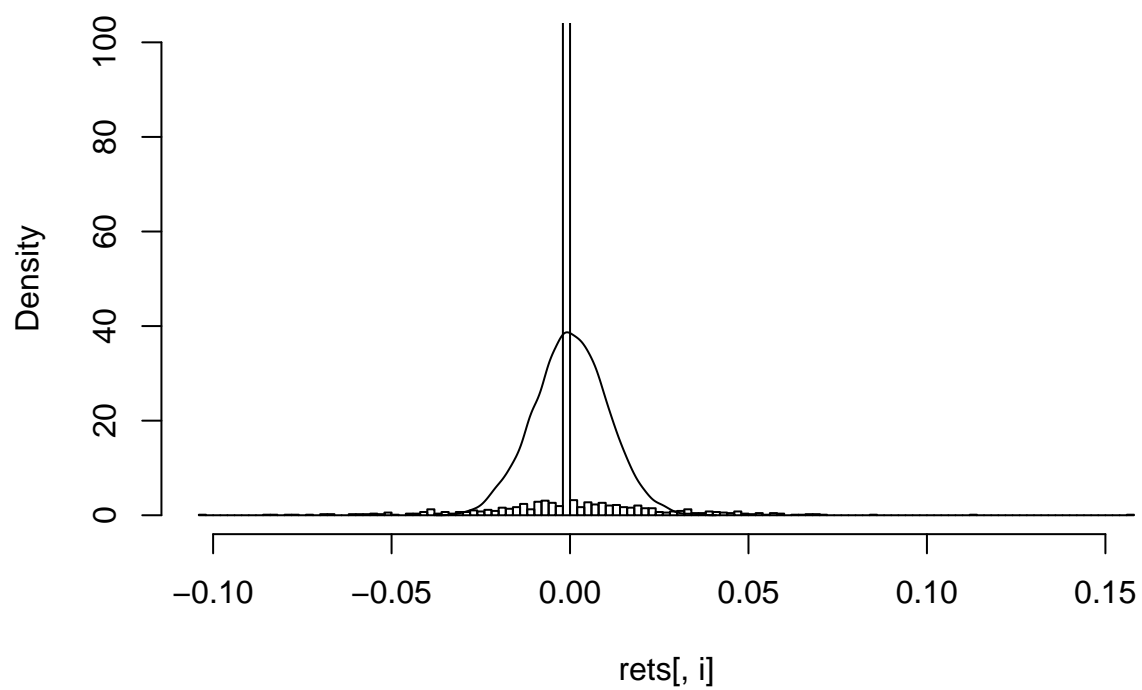


Equity curve of IFX

2001-07-30 / 2018-10-18

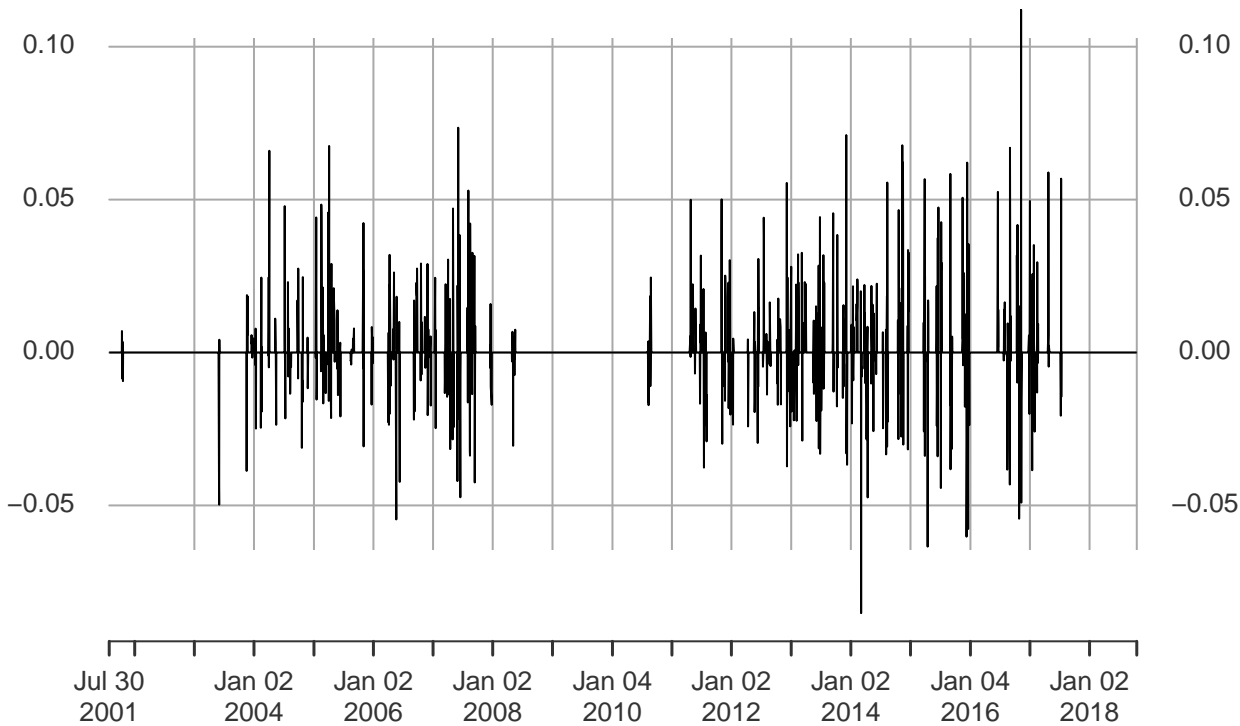


Histogram of Simple Returns of IFX



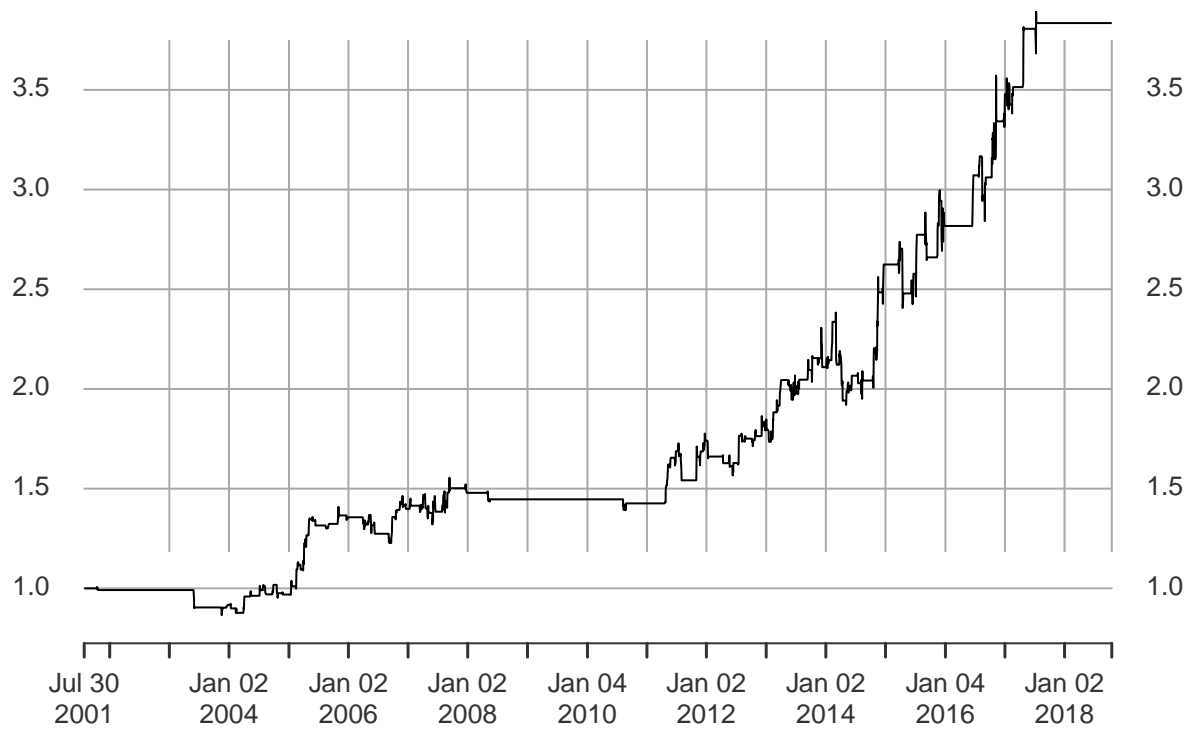
Returns of MRK

2001-07-30 / 2018-10-18

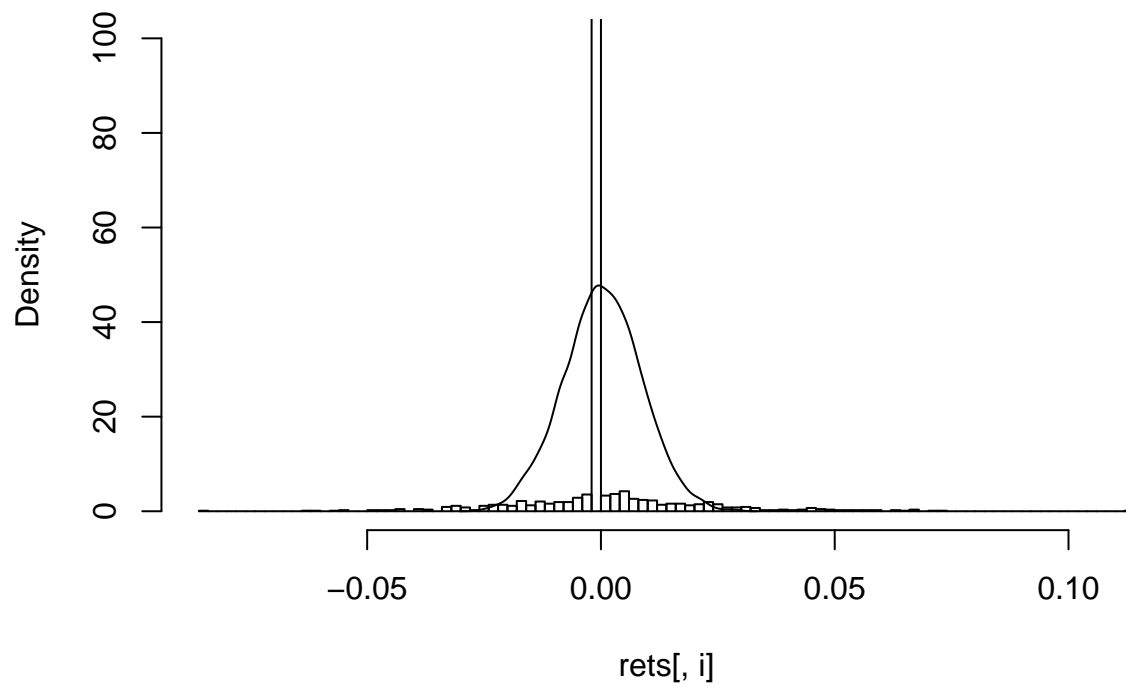


Equity curve of MRK

2001-07-30 / 2018-10-18

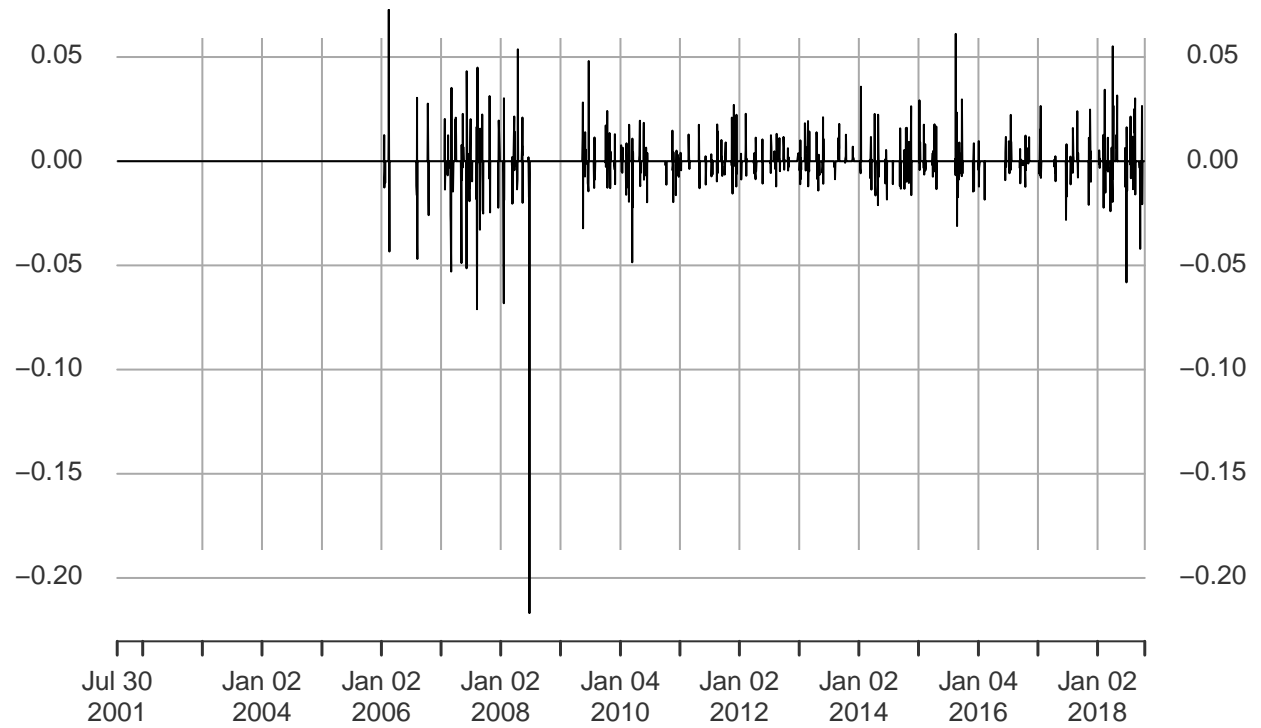


Histogram of Simple Returns of MRK



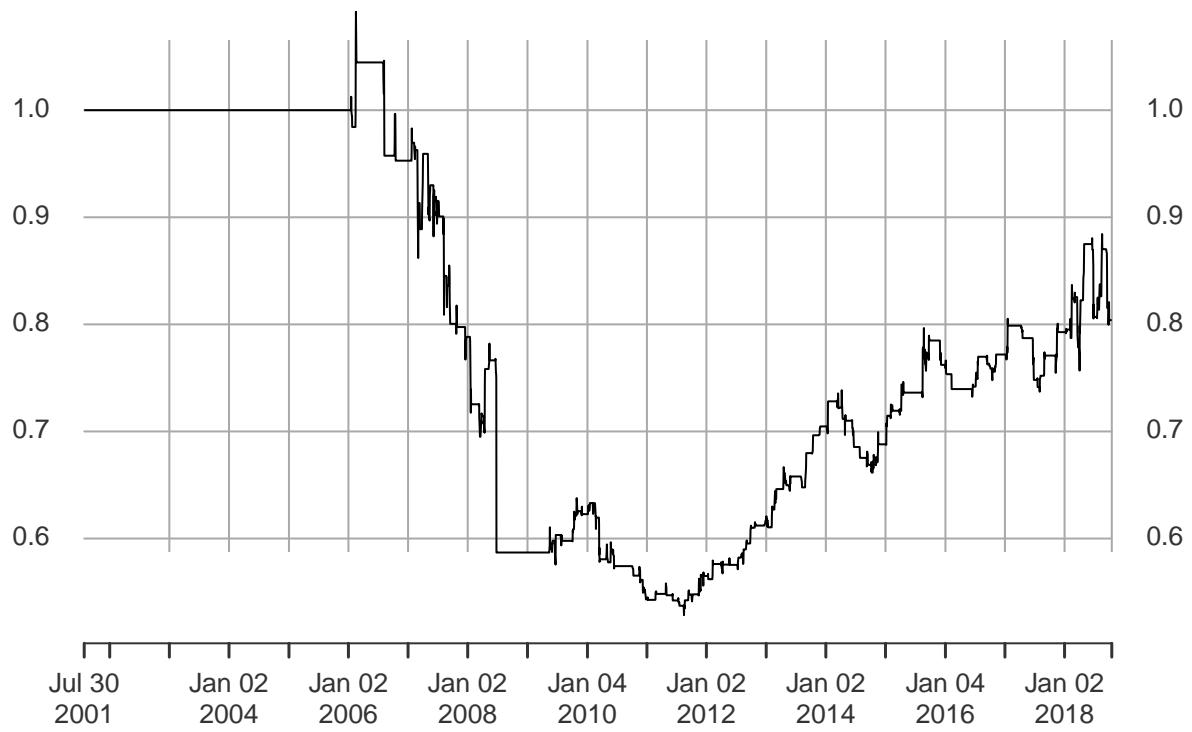
Returns of WDI

2001-07-30 / 2018-10-18

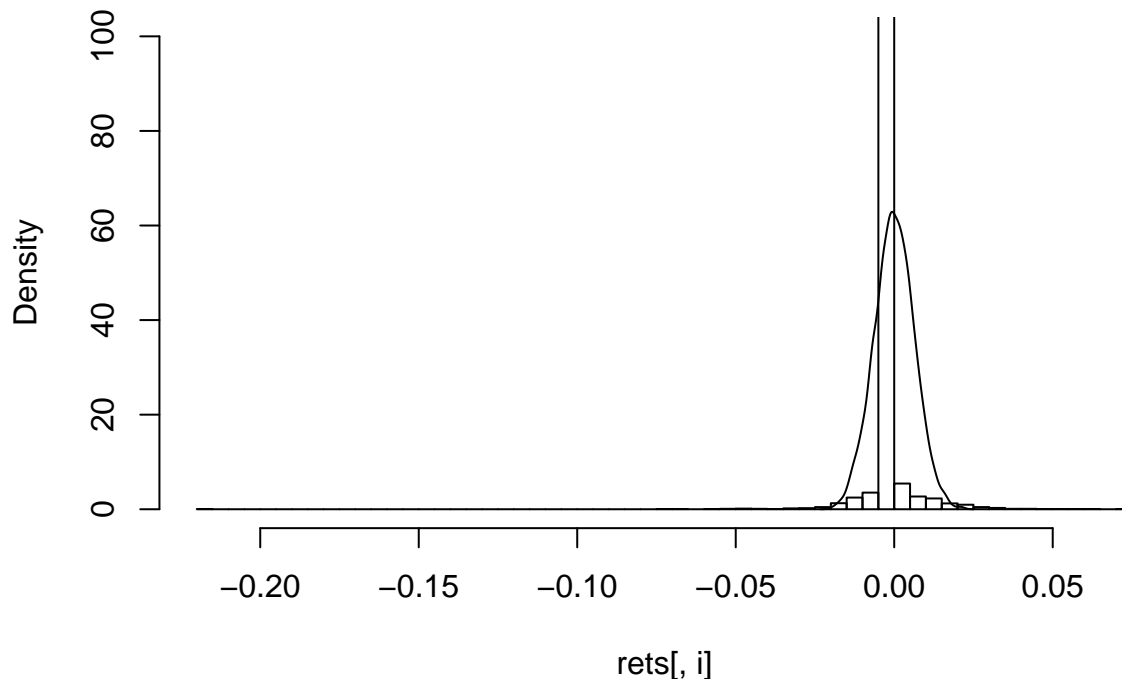


Equity curve of WDI

2001-07-30 / 2018-10-18



Histogram of Simple Returns of WDI



Value at Risk

The historical “Value at Risk” measures the risk of loss for investments. More specifically, it describes the maximum amount we would expect to lose per day with a confidence level of 99%, given an investment of 10000. This metric could be used to show potential investors the risk which is associated with their investment. Based on the following results, an investor could decide whether the risk is appropriate compared to the expected returns which were shown in the previous sections.

```
Investment <- 10000
probs <- 0.01
print(sprintf("Investment: %s", Investment))

## [1] "Investment: 10000"

writeLines("")

print(sprintf("Confidence Level: %s", (1-probs)))

## [1] "Confidence Level: 0.99"

writeLines("")

for (i in 1:length(instrumentlist)) {
  quantile(rets[,i])
  (discreteRQ <- quantile(rets[,i],probs=probs))
  loss <- Investment * discreteRQ
  print(sprintf("Given a %s investment in %s we would expect a maximum loss of %s per day.",
    Investment,
    substr(colnames(rets[,i]),1,3),
```

```

    round(loss,2)*-1))
}

## [1] "Given a 10000 investment in CON we would expect a maximum loss of 394.56 per day."
## [1] "Given a 10000 investment in DB1 we would expect a maximum loss of 236.18 per day."
## [1] "Given a 10000 investment in IFX we would expect a maximum loss of 390.49 per day."
## [1] "Given a 10000 investment in MRK we would expect a maximum loss of 288.78 per day."
## [1] "Given a 10000 investment in WDI we would expect a maximum loss of 183.2 per day."

```

Conclusion and Suggestions

Larry William's Smash Day strategy, as it was introduced in the first section, is based on the idea of the reversal. When talking about the reversal effect, the statistical foundation is the negative autocorrelation. The report guided the reader through all relevant stages of the process for implementing a trading strategy with the Blotter R Framework. The chosen strategy performed quite well and annualized returns between -1 % and 8.2 %, which is quite impressive compared to the DAX which had an annualized return of 2.24 %. Moreover, the five used instruments have shown a much lower annualized risk than the DAX. Thus, this strategy performed for four out of the five tested instruments better than the DAX while having a lower risk than the DAX over the time horizon of the last 18 years. The strategy is based on a 400 days exponential moving average. This is necessary to enter the market long only in long-term upward trends. This was tested before with a 200 days exponential moving average, which leads to worse performance. Thus, it seems to be important, that the upward trends are longlasting. The implementation of the maximum holding period was also very crucial. After testing the strategy without this, large drawdowns were observed as the Smash Day Sell Signal was triggered way too late. Longer holding periods of 20 - 40 days haven't improved the performance, while shorter holding periods improved the performance significantly. Further improvements could include short trades which could be used during periods of down-trends, making the strategy even more flexible to react to different market situations. We can see that four of the five tested instruments had a Trades Win / Lose Ration larger than 1 with approximately eight trades per year. What can be seen from the simulation of the buy and hold strategy is, that the moment when to place the buy order is very crucial. The DAX lost from 2000 to 2003 about 60 %, which means that it is necessary to compare the two strategies wisely. In the last section of the report, the returns show classical significant characteristics like volatility clusters and the typical distribution with an excess kurtosis and fat tails.

Overall, I would suggest testing the strategy on more instruments across different markets to clarify whether there are other effects responsible for the positive returns. As the strategy is based on a behavioral bias, we can expect the strategy to work also in the future.