

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 strategy 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 (e.g. a buy and hold strategy). The trading idea, implementation and 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 observe 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 behaviour. A Smash Day pattern is initialized when we observe a close which is lower than the previous day’s low. This 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 2 additional components for the sell signal. I want to make sure that I only enter long when we are observing a longlasting upward trend. In order to do this buy orders are only performed when the current price is above the exponential moving average of the last 200 days. After that the Smash Day pattern is checked. For the sell I incorporated two “harder” conditions before checking whether we observe a Smash Day (sell). The first is that a maximum holding period can be set in order to make sure that a position is not open for too long. The second sell case is when the price falls below the 200 day exponential moving average the position is liquidated. If both is not the case 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 in order 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(INF361Course)
```

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 * BuyHoldInstrument

```
# Set values:
startCapital <- 1e+6
transactionCost <- -20
daterange <- '2000::2018'
emaPeriod <- 400
maxHoldingPeriod <- 4

InstrumentDirectory <- "~/Desktop/R/DownloadedData/"
instrumentlist <- c("BMW.csv", "DAI.csv", "DTE.csv", "FME.csv", "FRE.csv")
BuyHoldDirectory <- "~/Desktop/R/DownloadedData/"
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

Some 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
addEMAString <- paste("add_EMA(n=", emaPeriod, ")", sep = "")
```

Step 4: Initializing the portfolio

The portfolio takes the instrumentlist which includes all the stocks we defined in Step 2.

```
# 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. Thus, a for loop is implemented to loop 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 loop through the dates bar by bar. In this step the defined 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 Today's Close is below Yesterday's Low.
  if (CloseToday < LowYesterday) {
    # Smash Day (Buy)

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

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

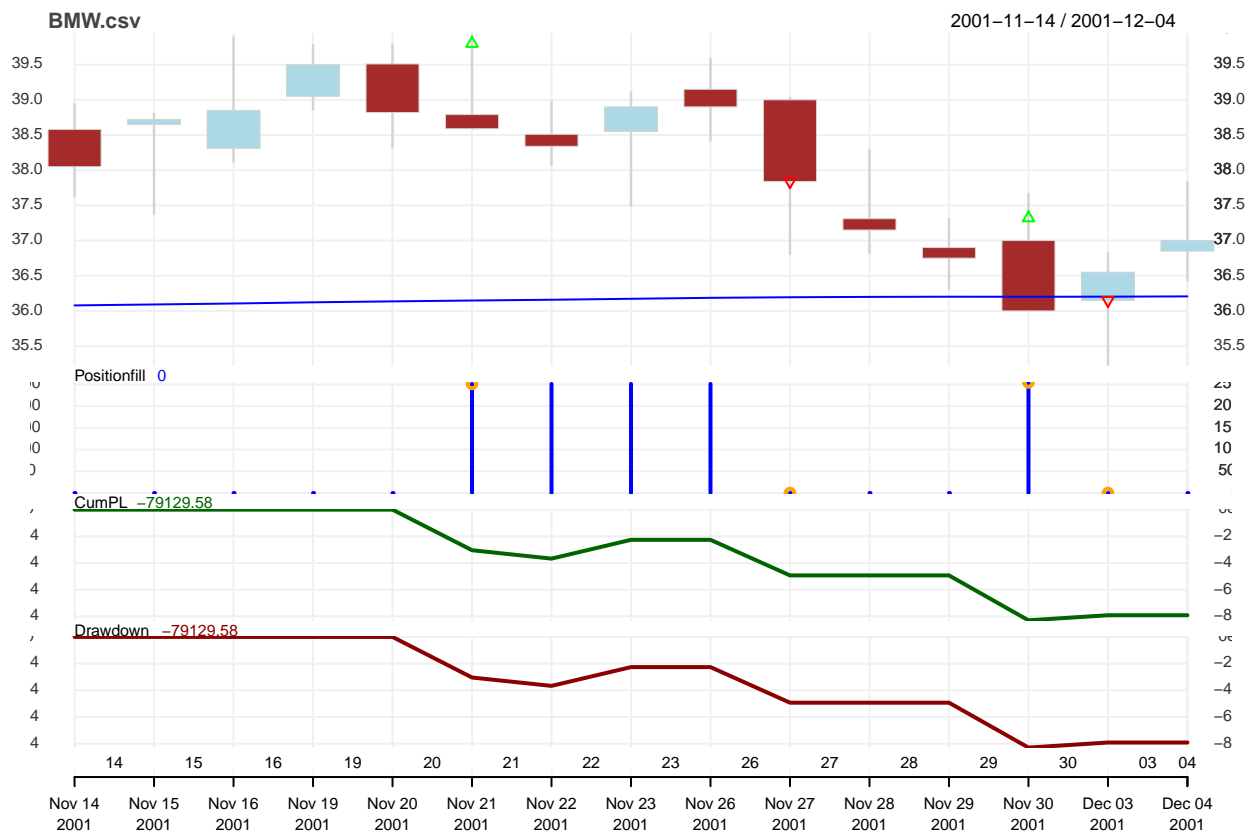
  # Create a list of transactions to check
  for (i in

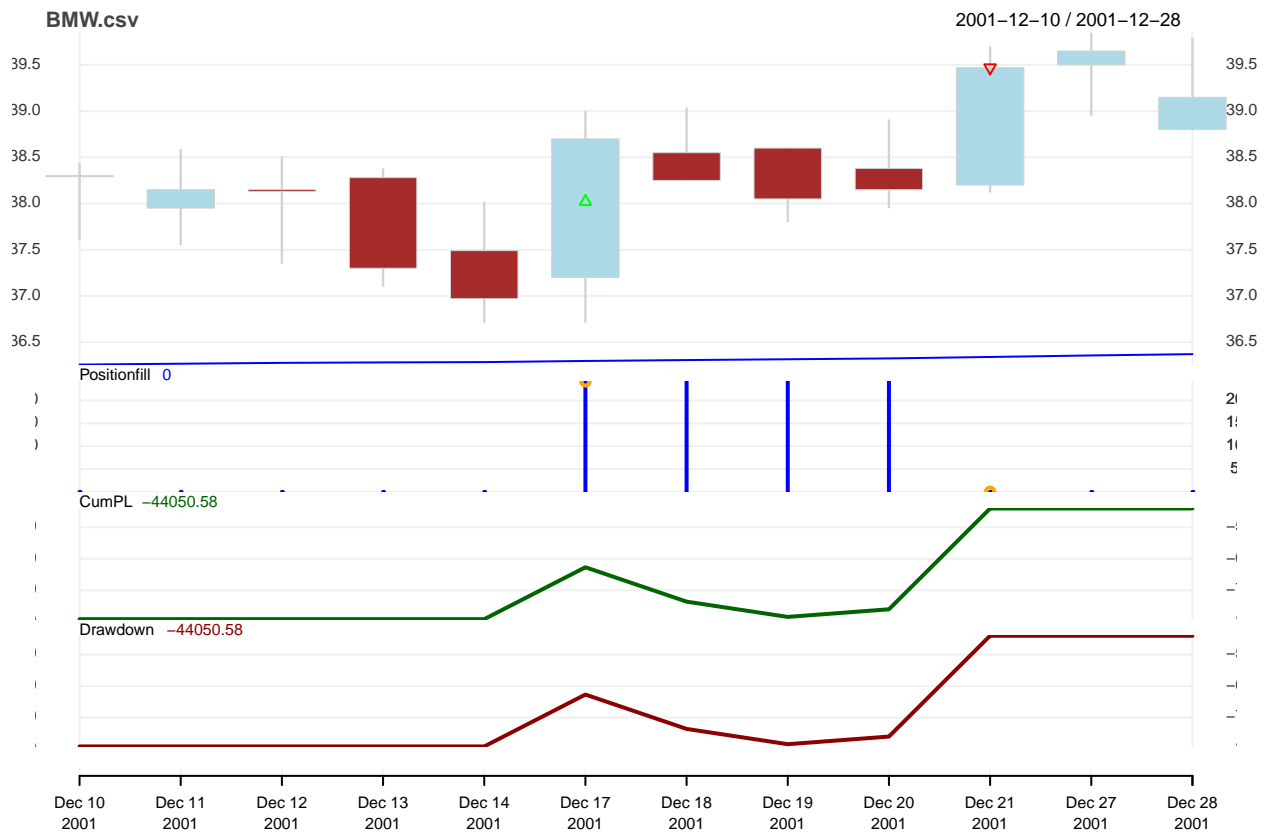
```

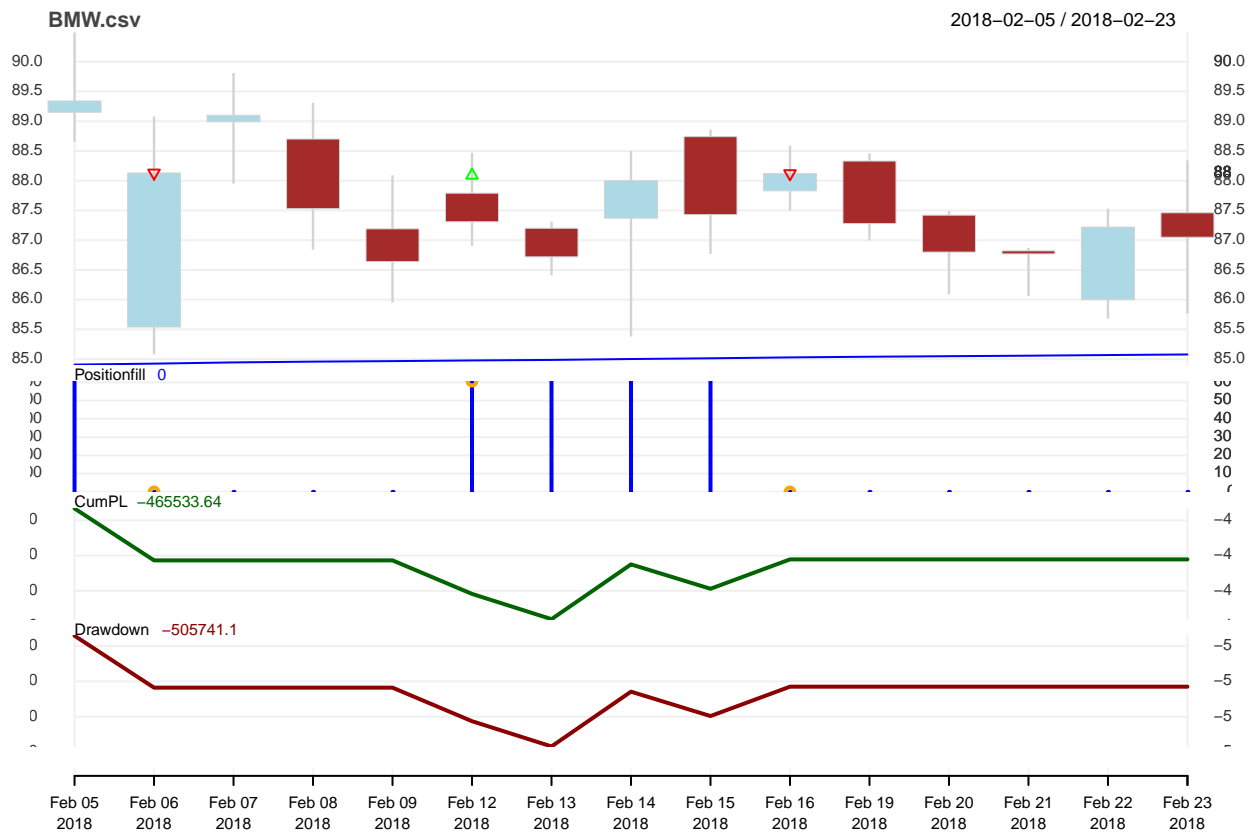
```

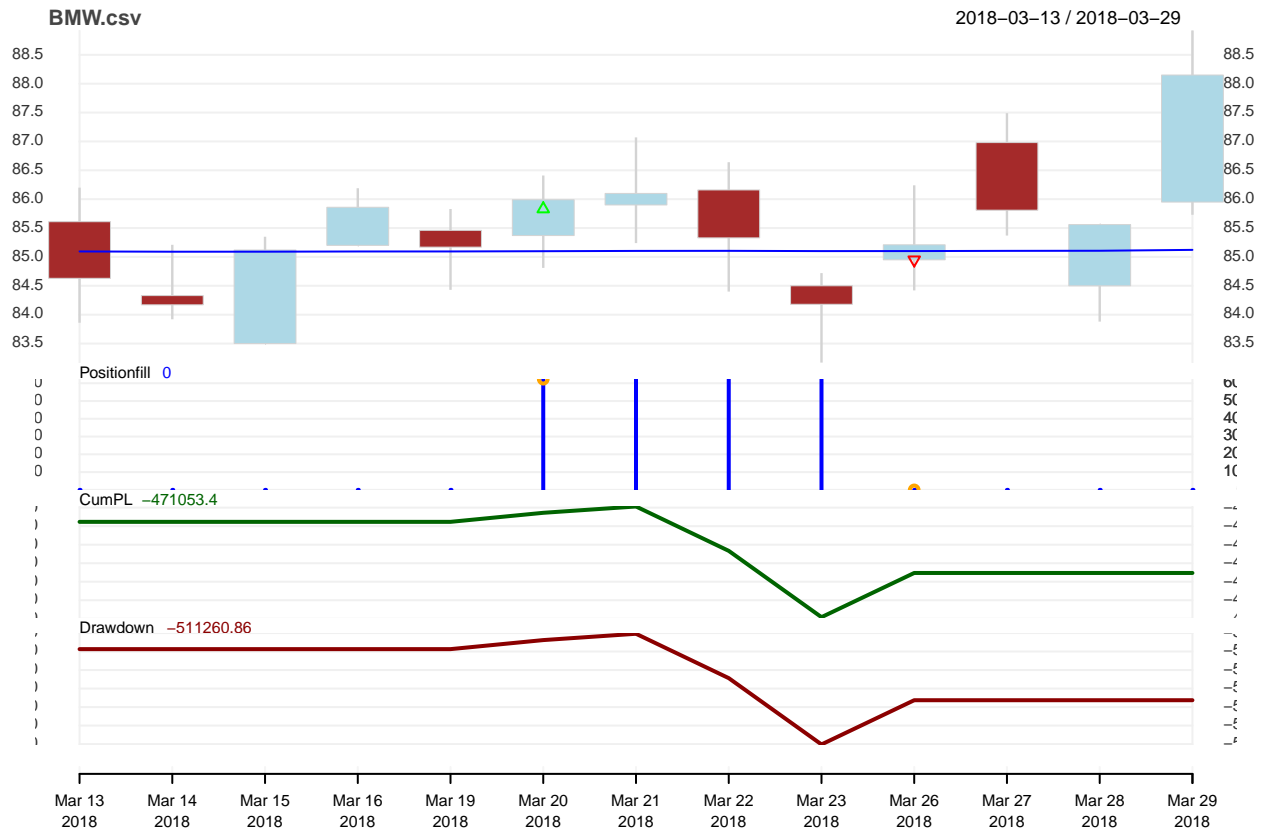
    c(2,6, (nrow(transactionsInstrument)-7),(nrow(transactionsInstrument)-5))) {
  from <- as.Date(index(transactionsInstrument[i,1]))-7
  to <- as.Date(index(transactionsInstrument[i+1,1]))+7
  daterange_check <- c(daterange_check, paste(from, ":", to, sep = ""))
}
# Plot the transactions and check them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

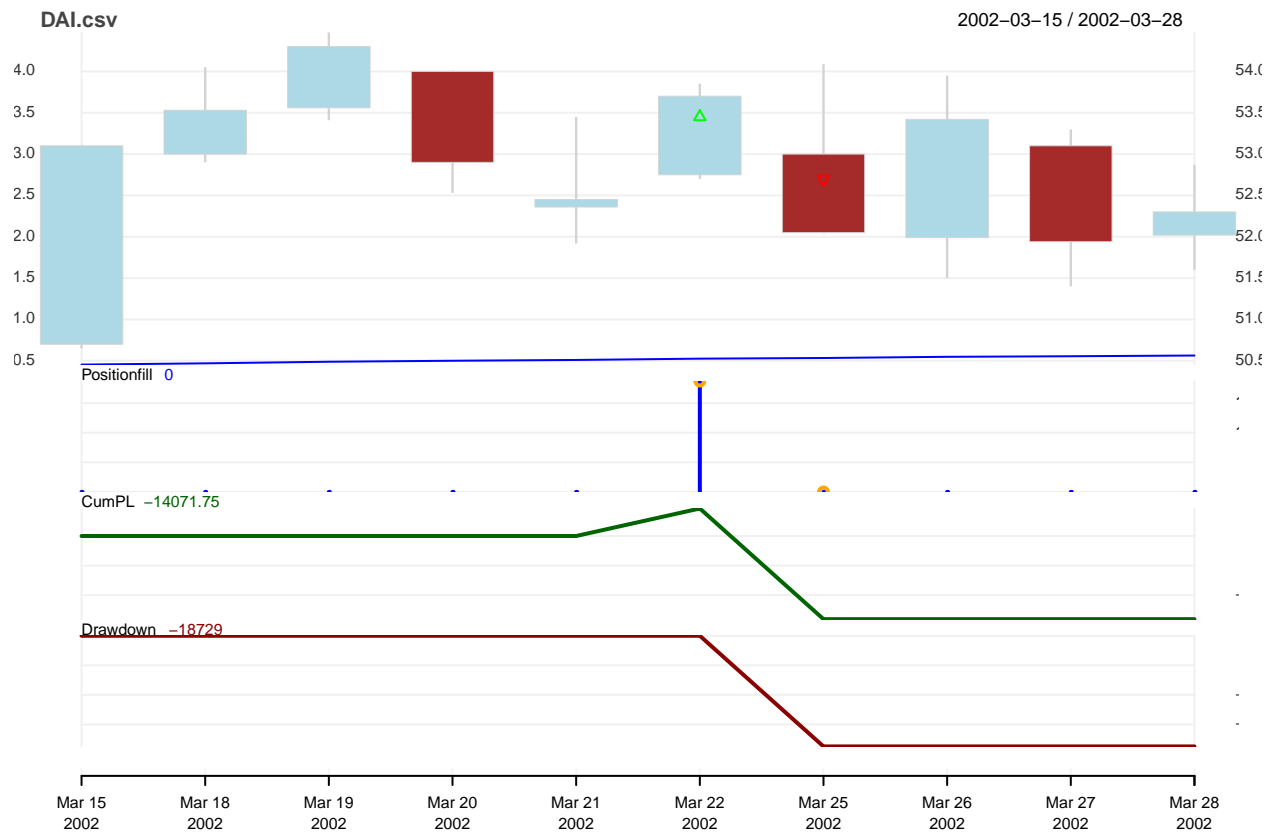
```

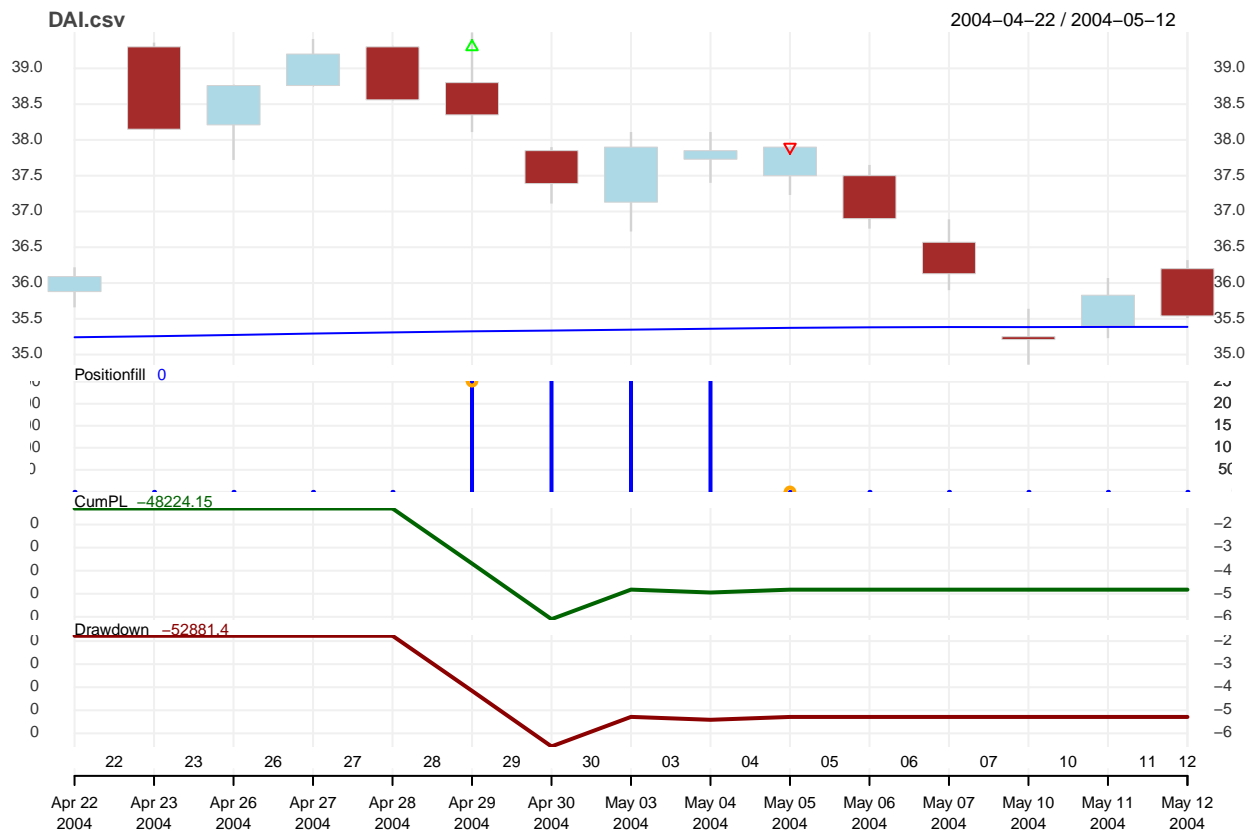


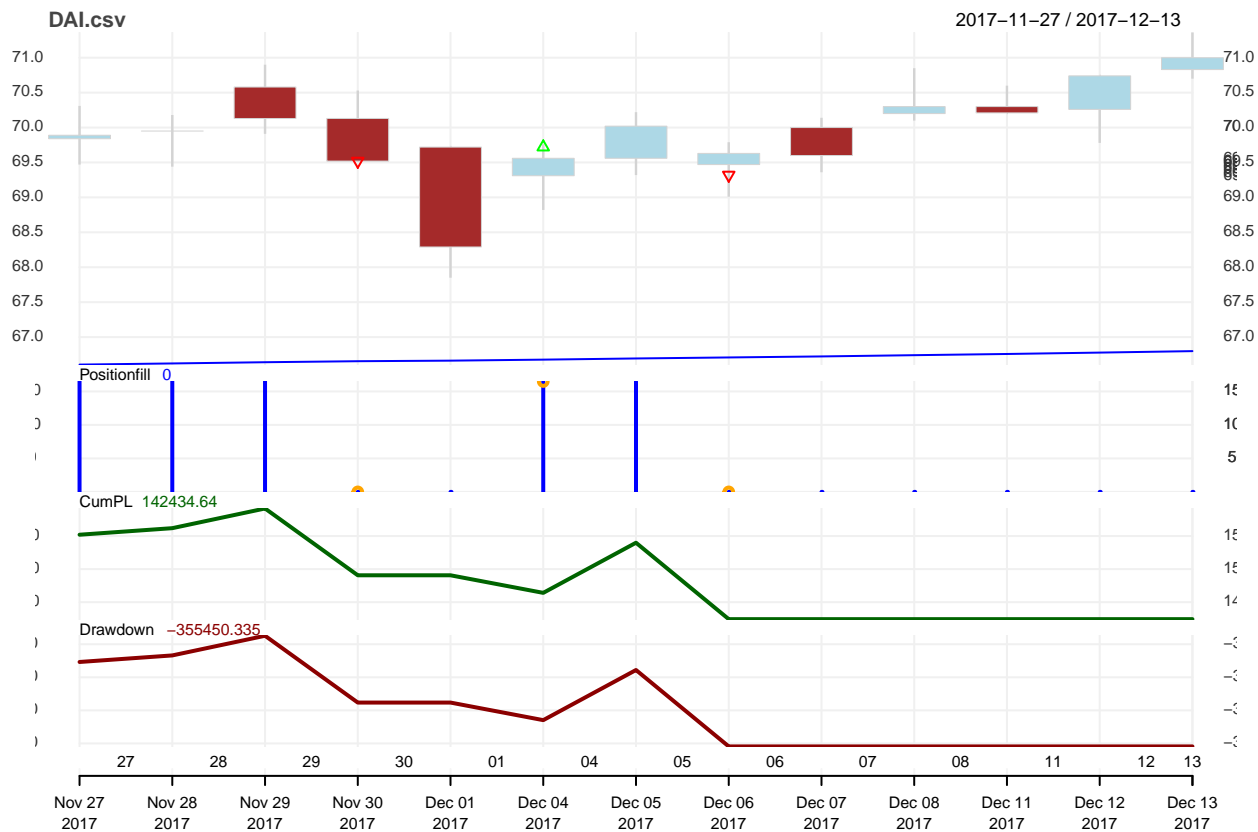


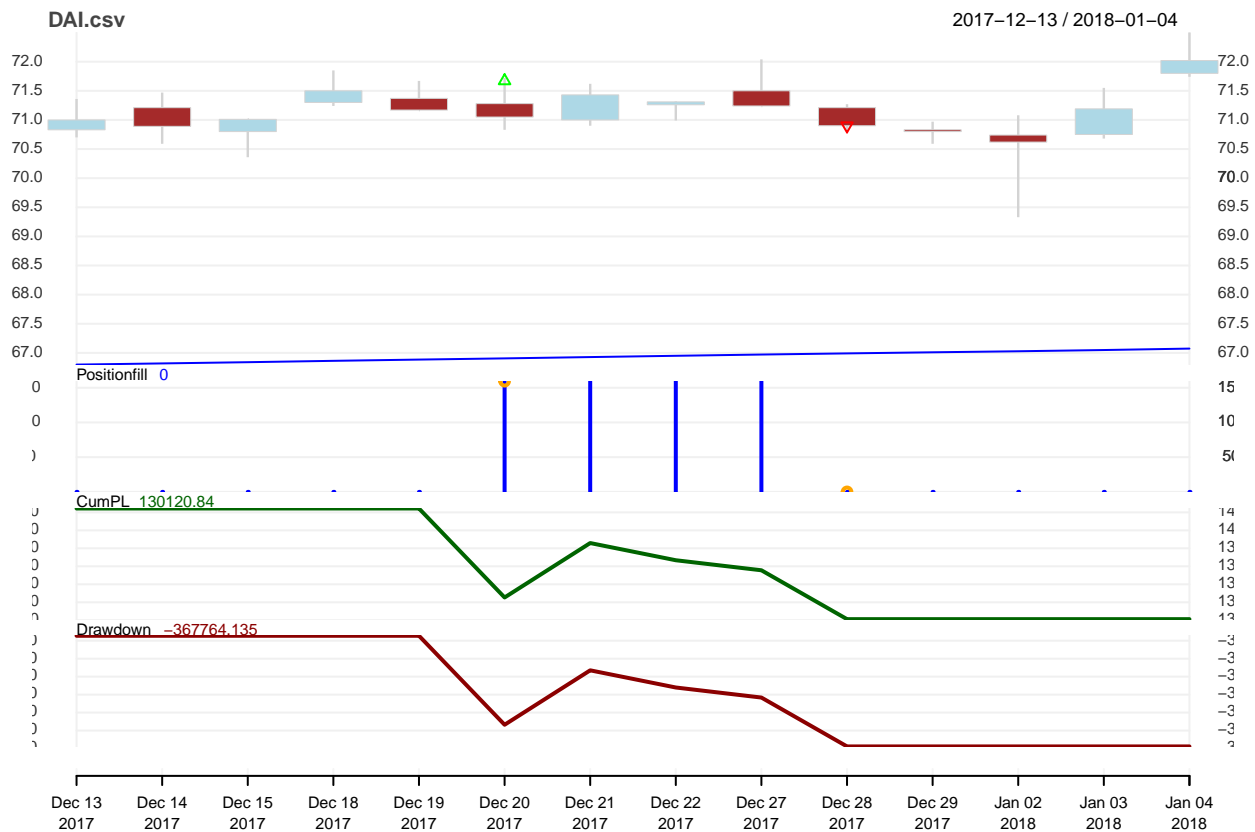


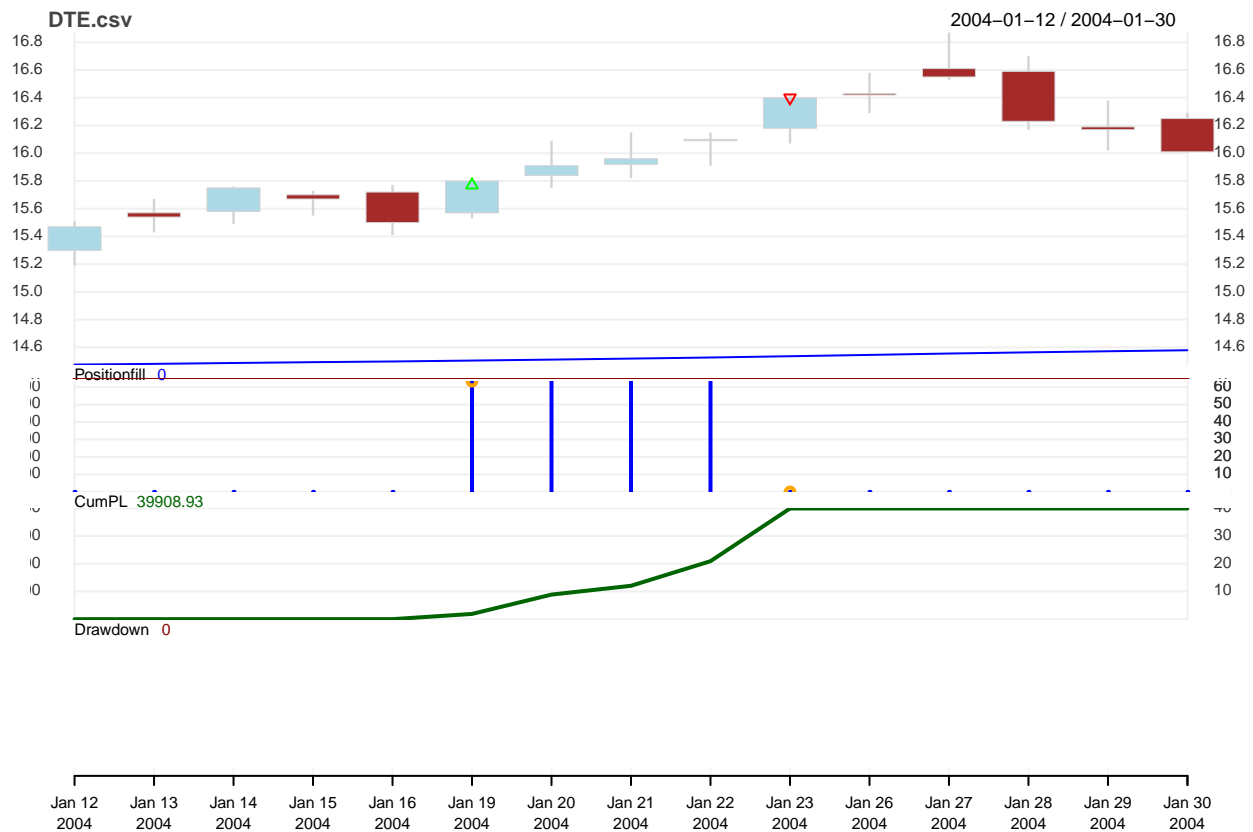


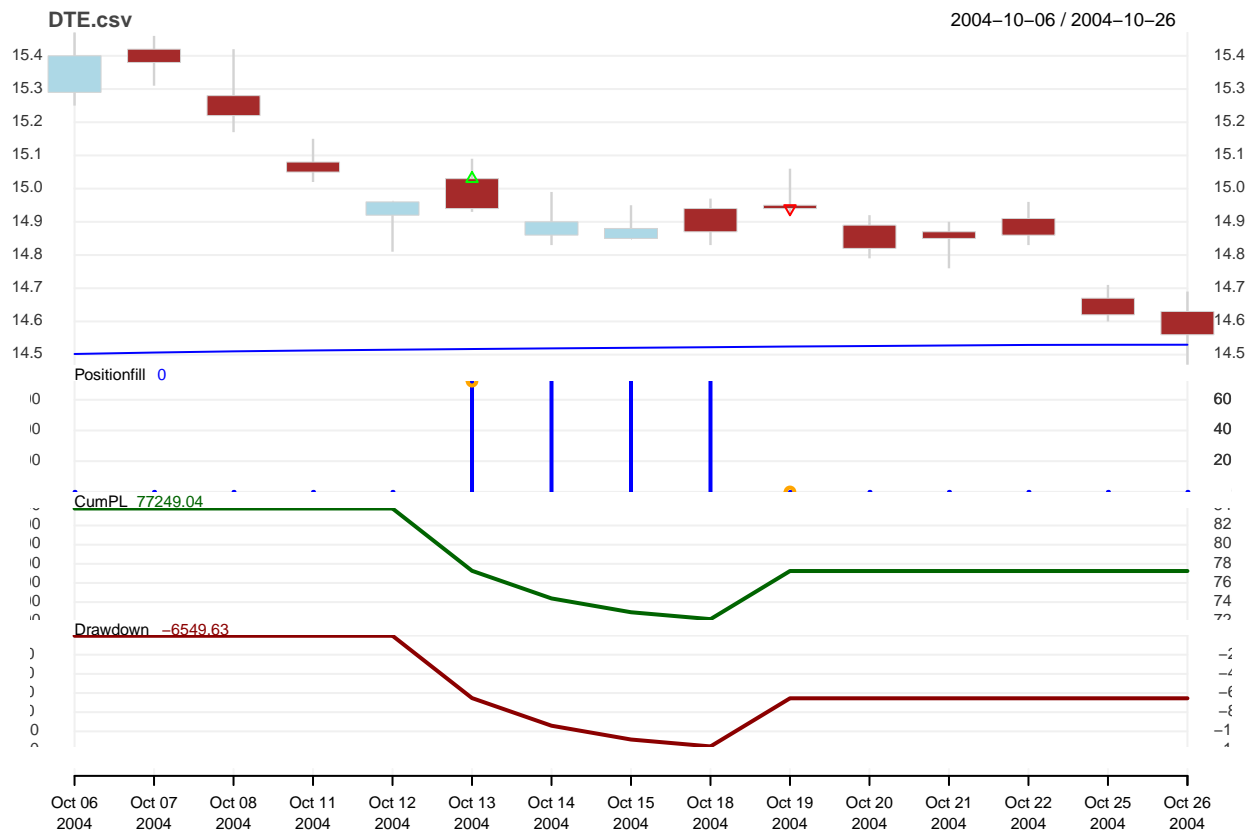


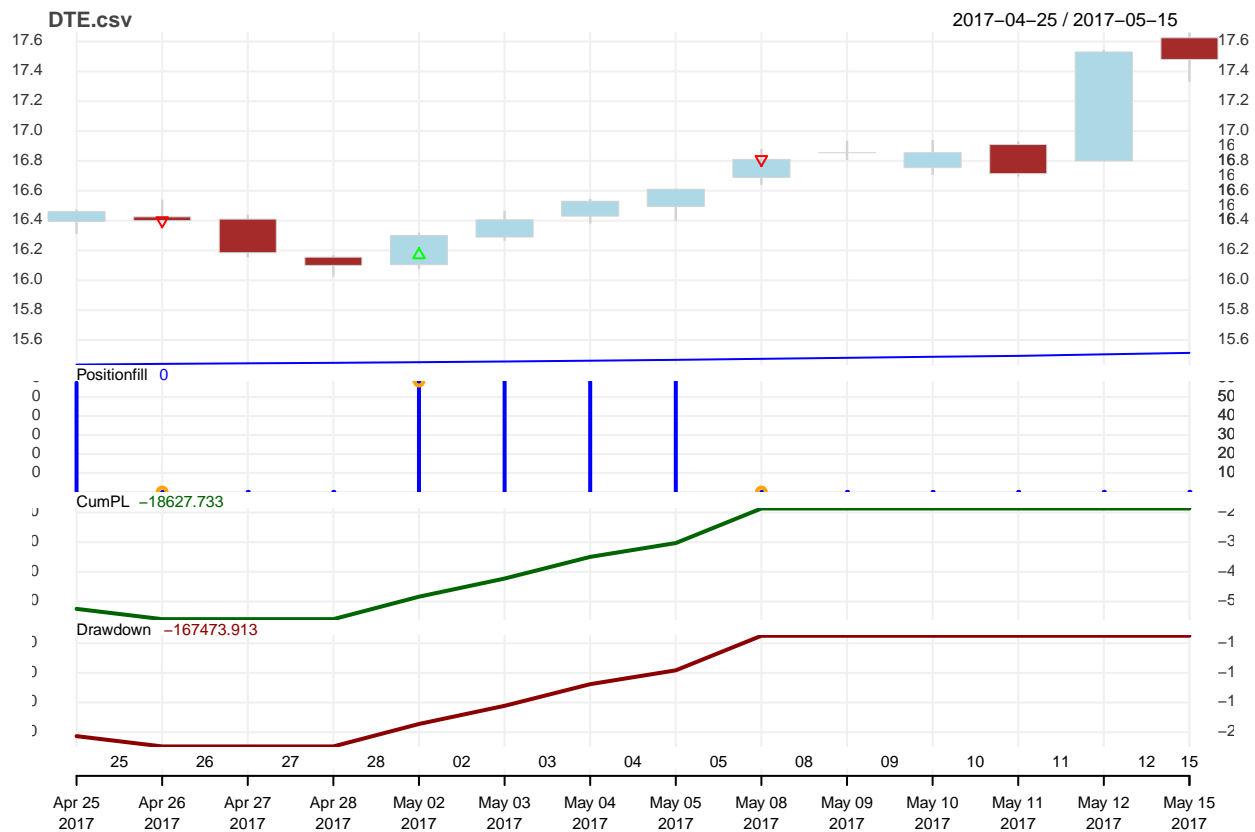


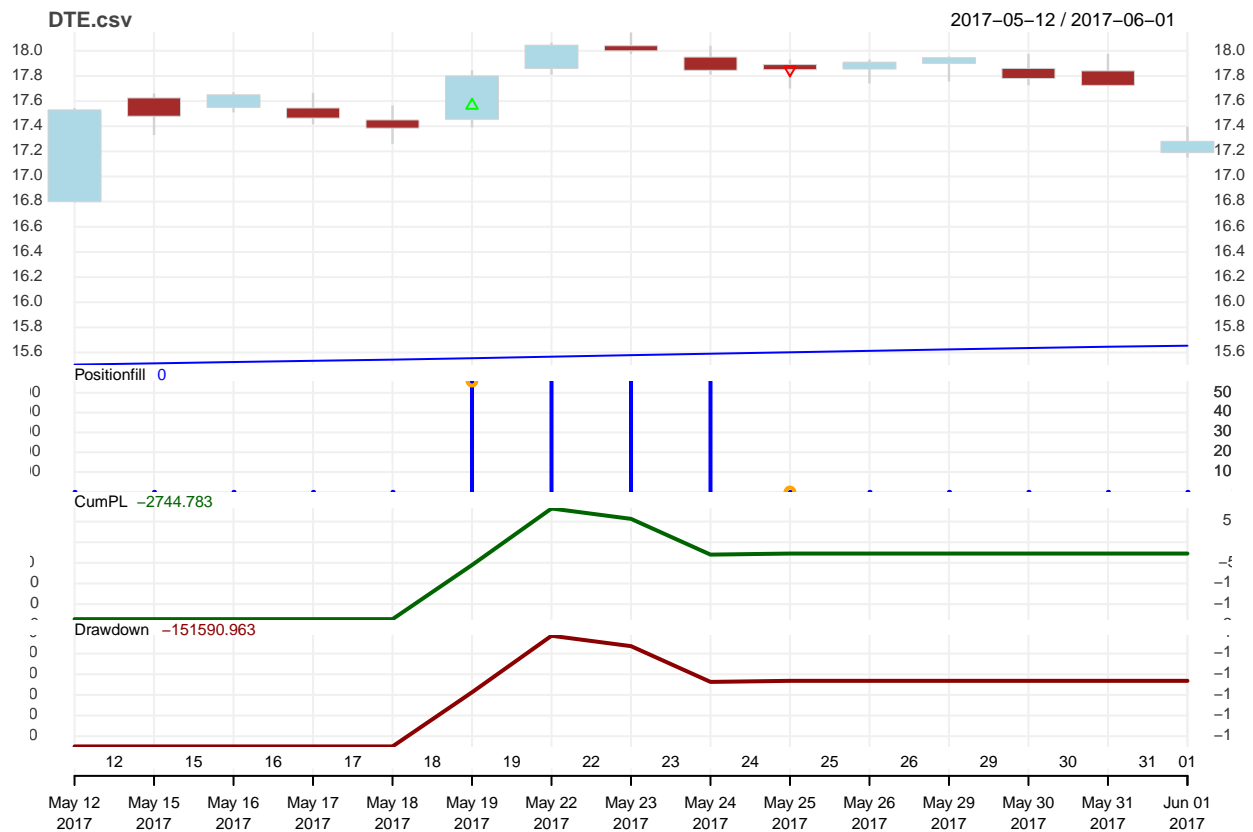


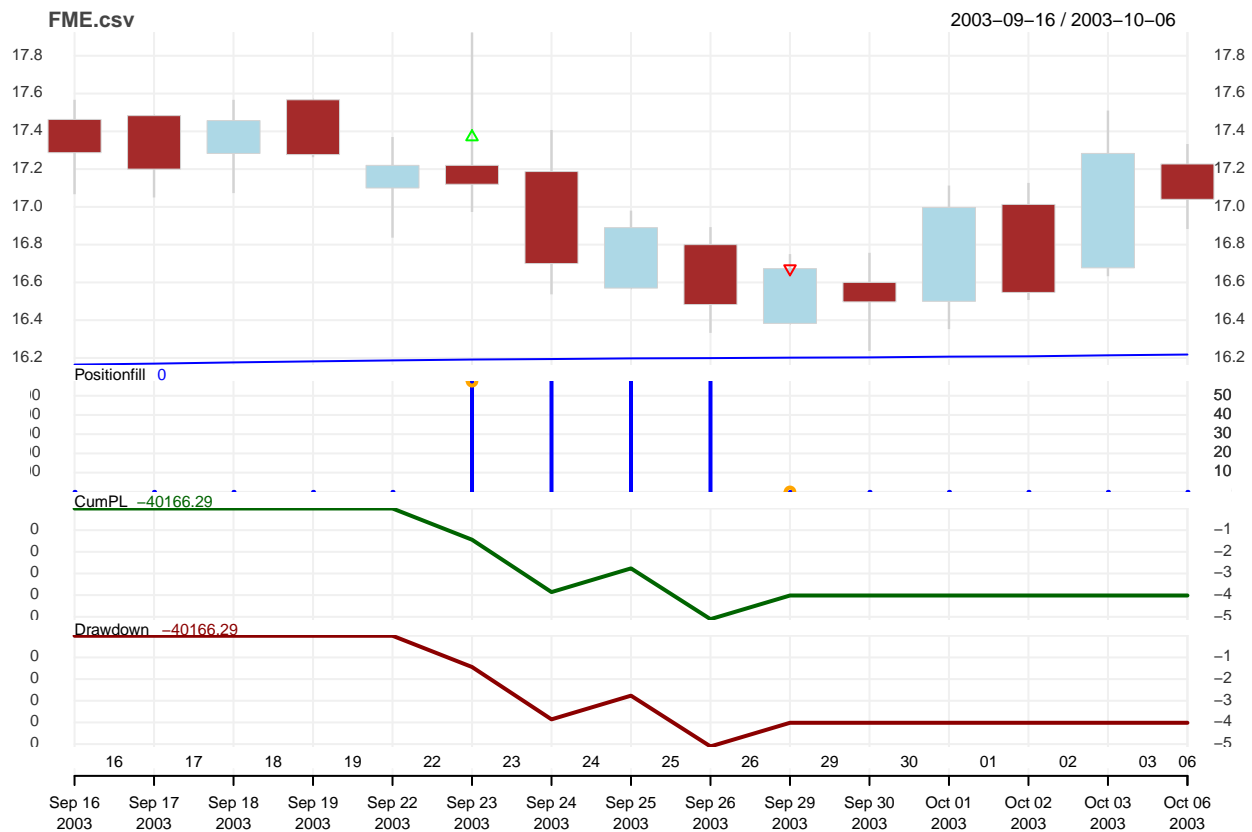


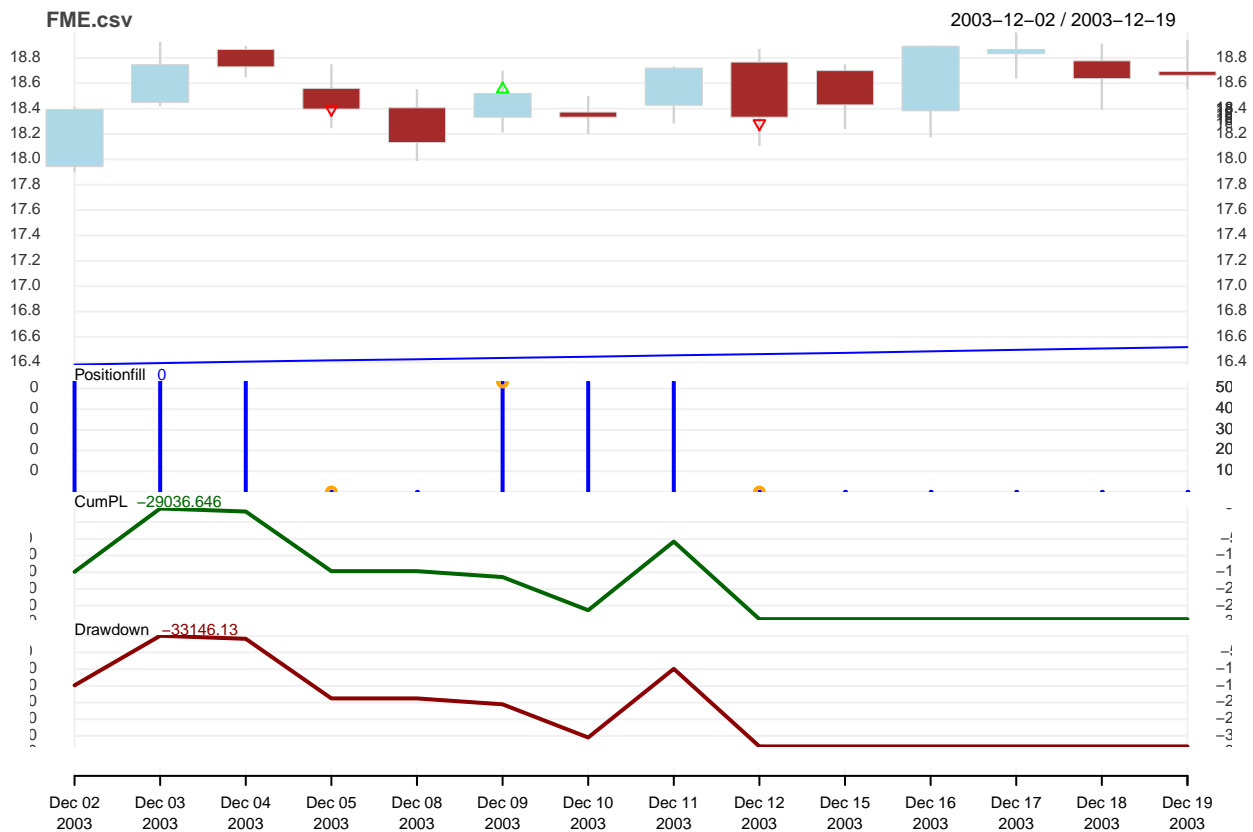


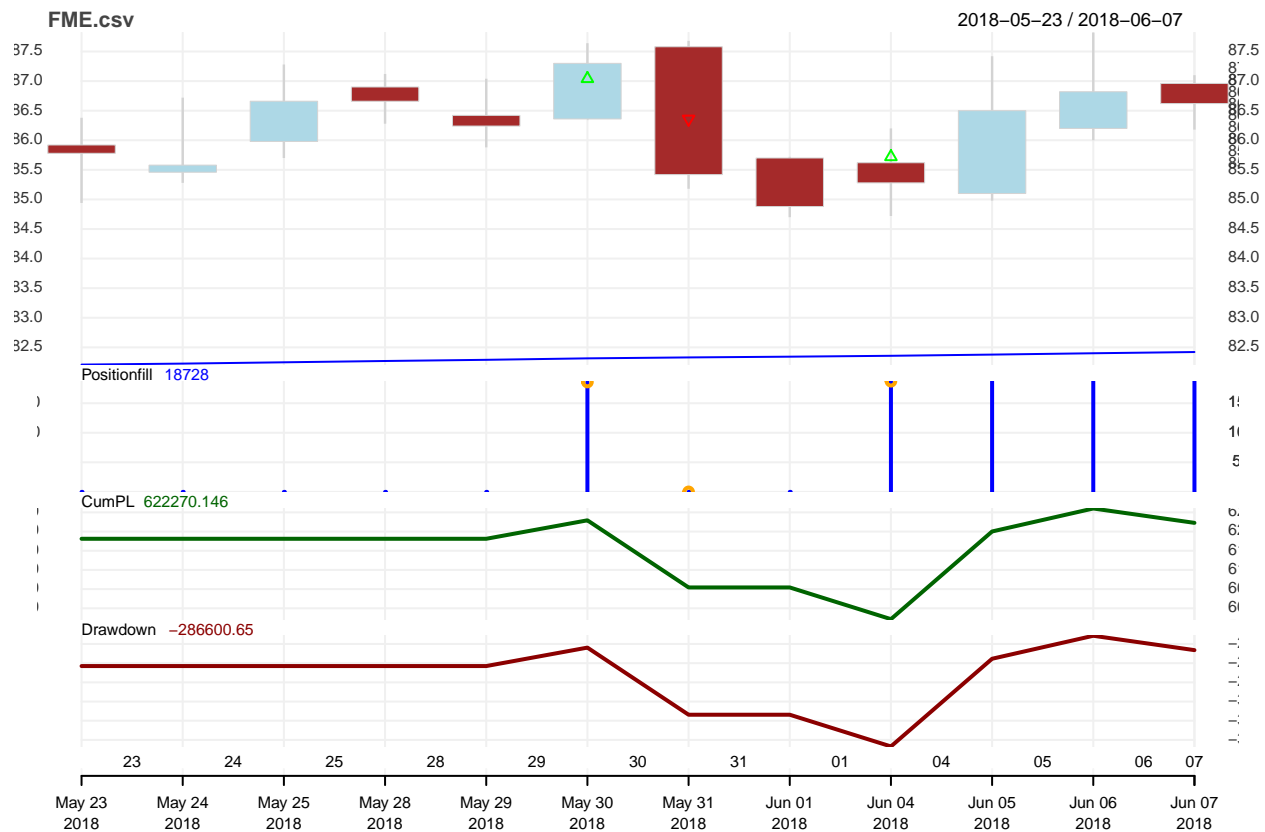


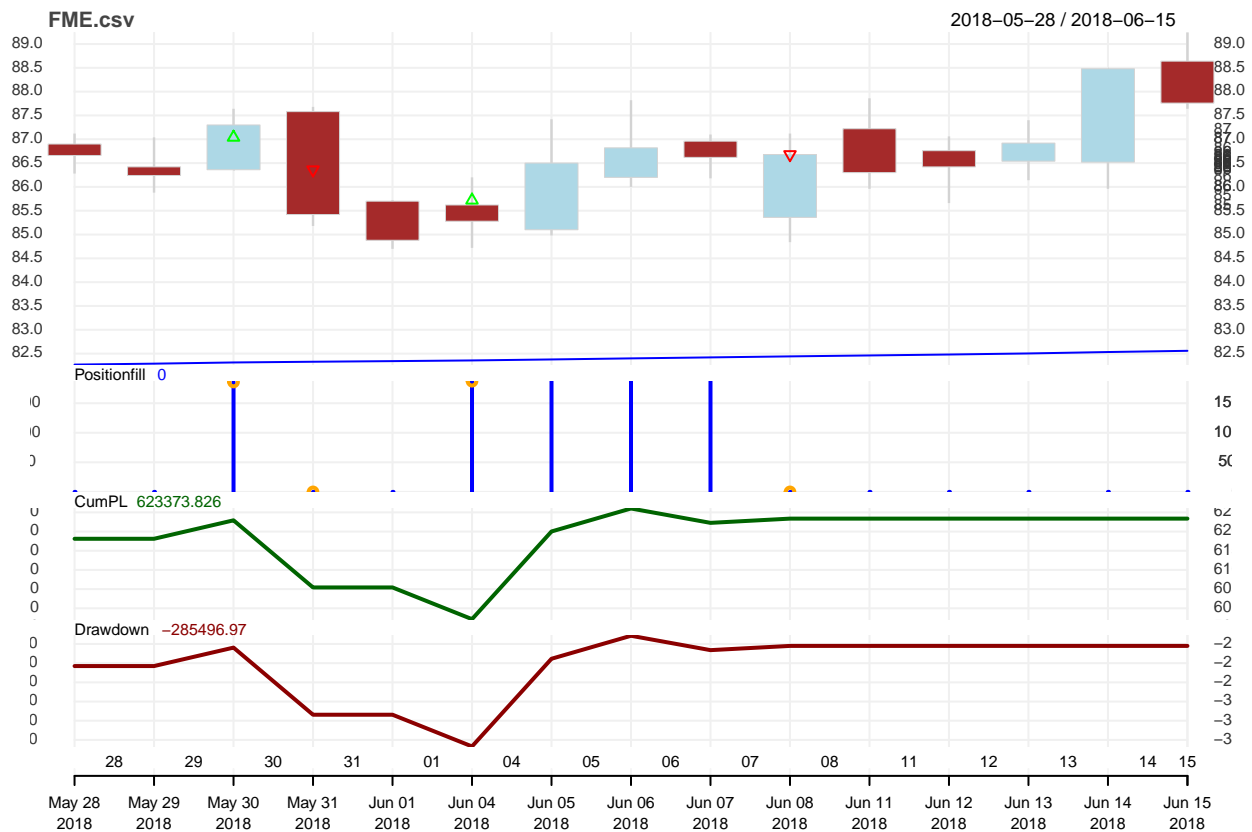


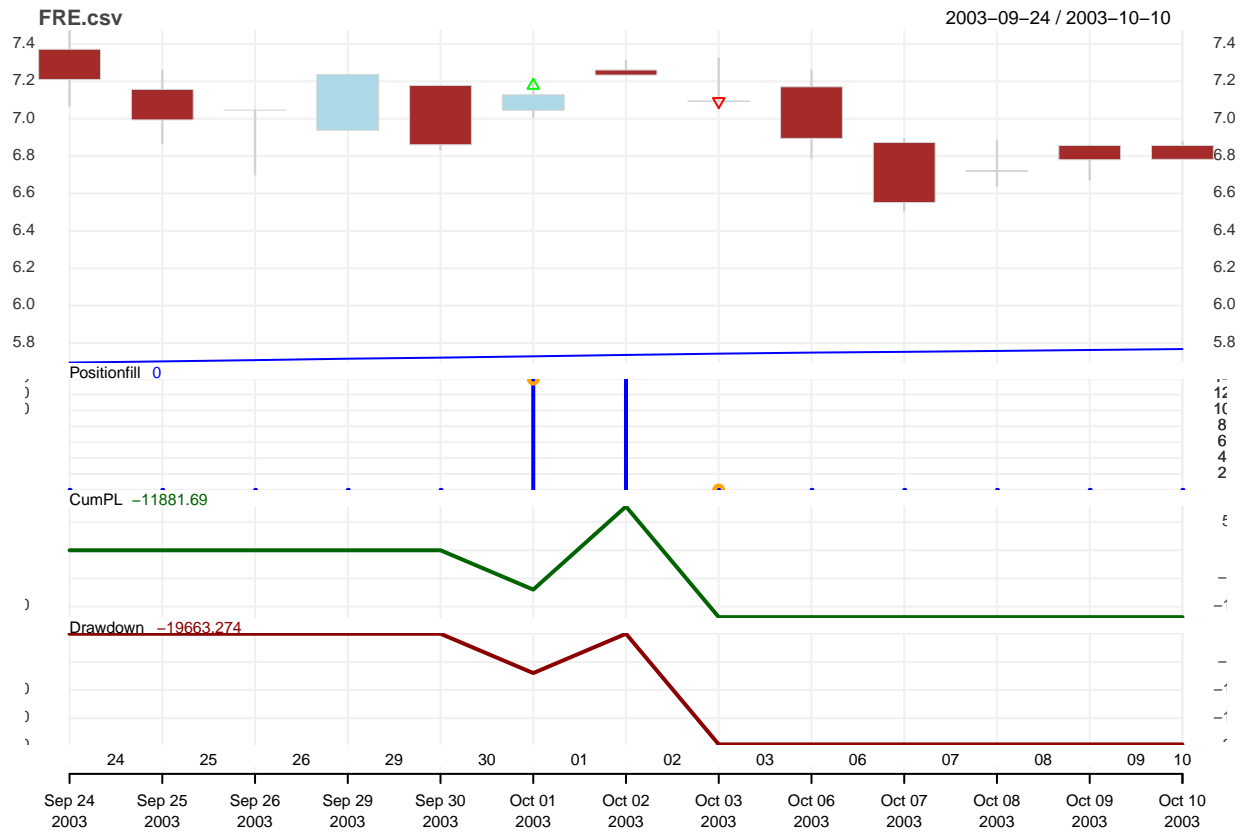


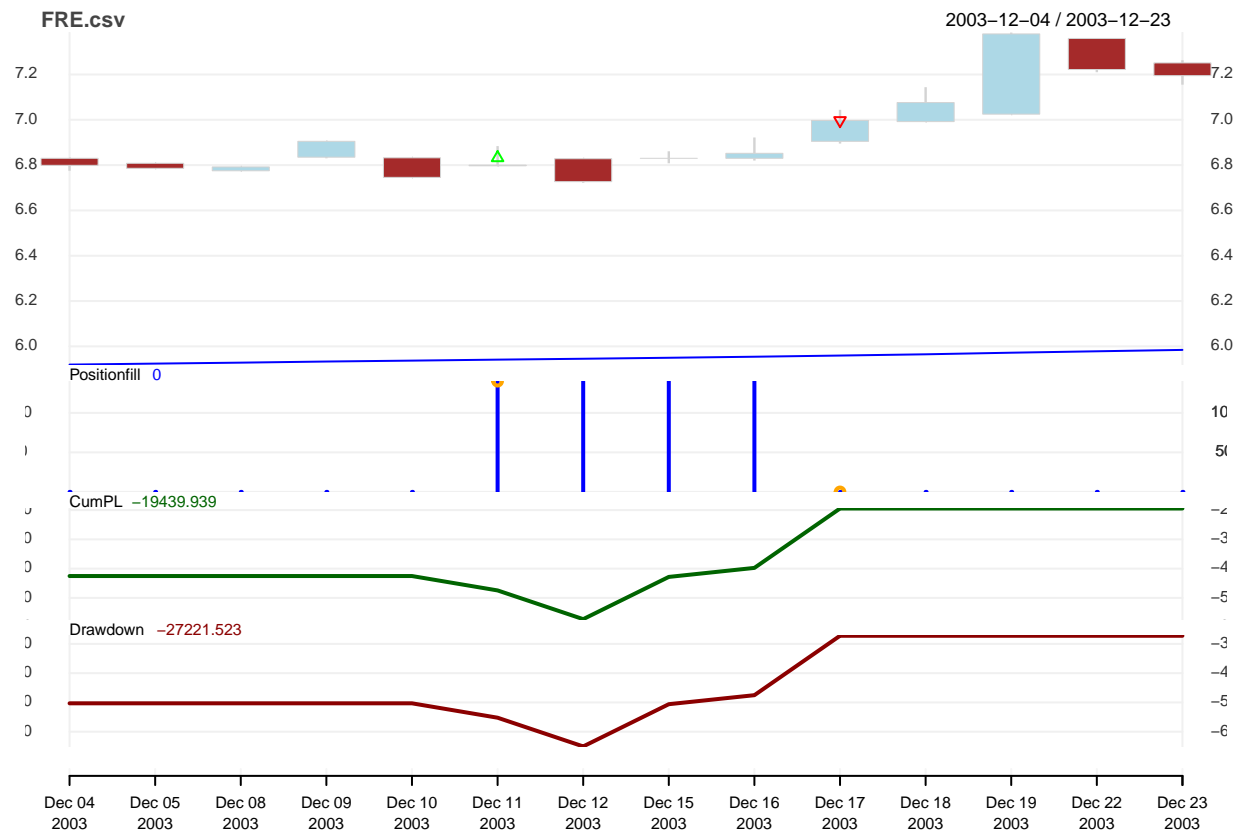


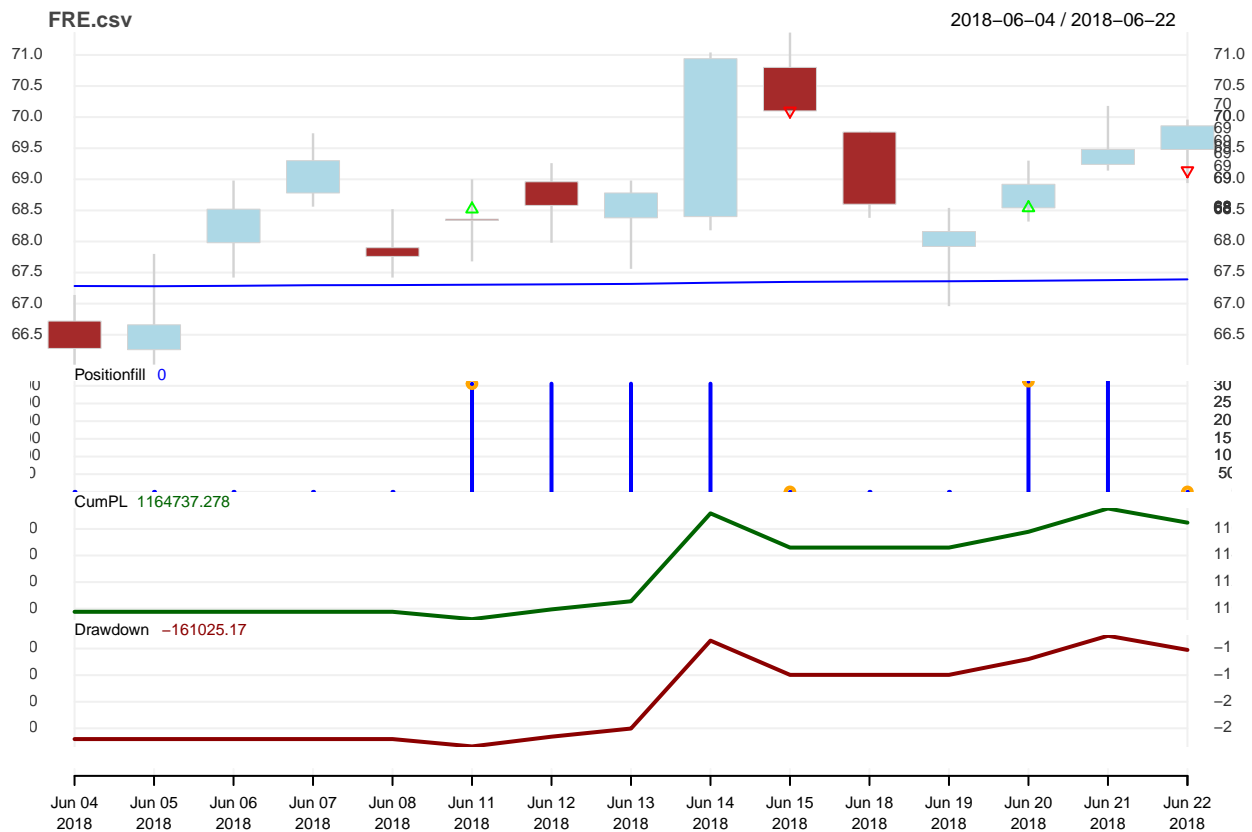


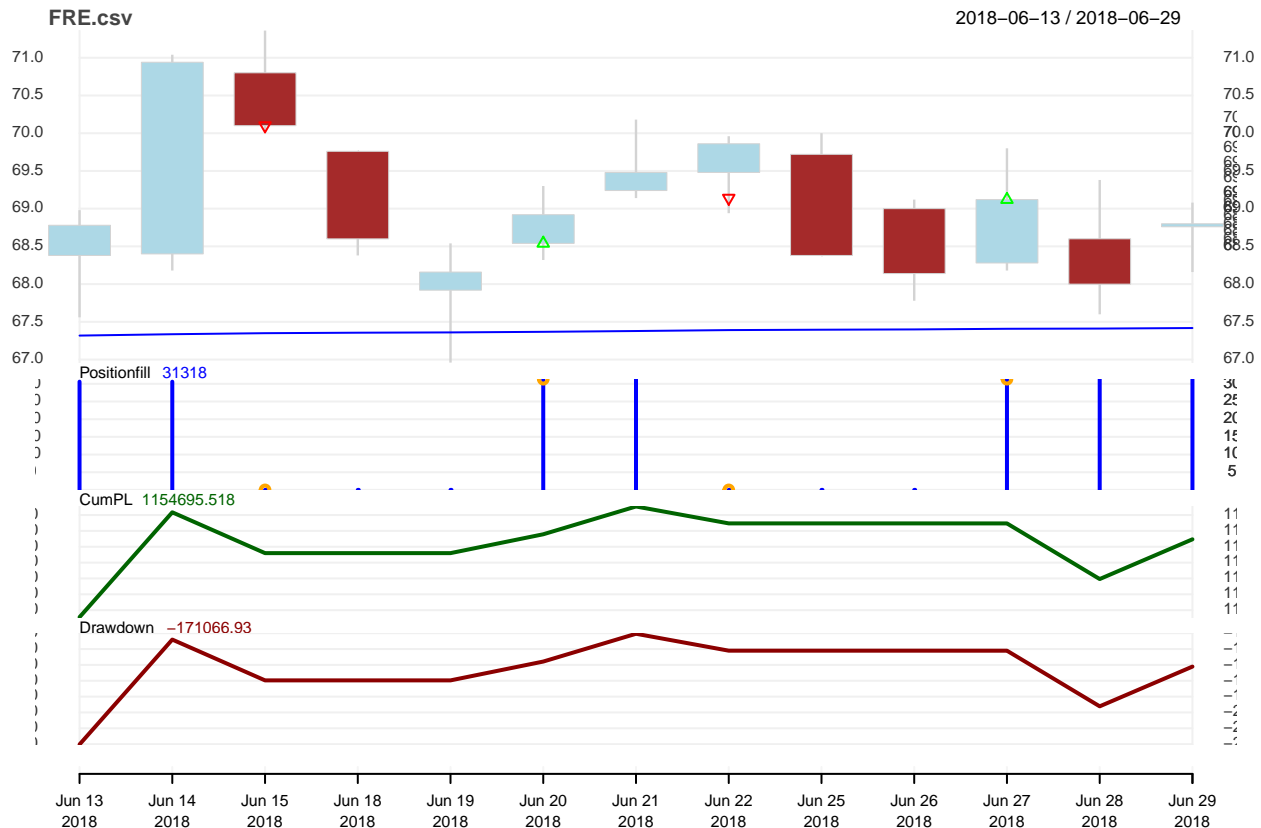










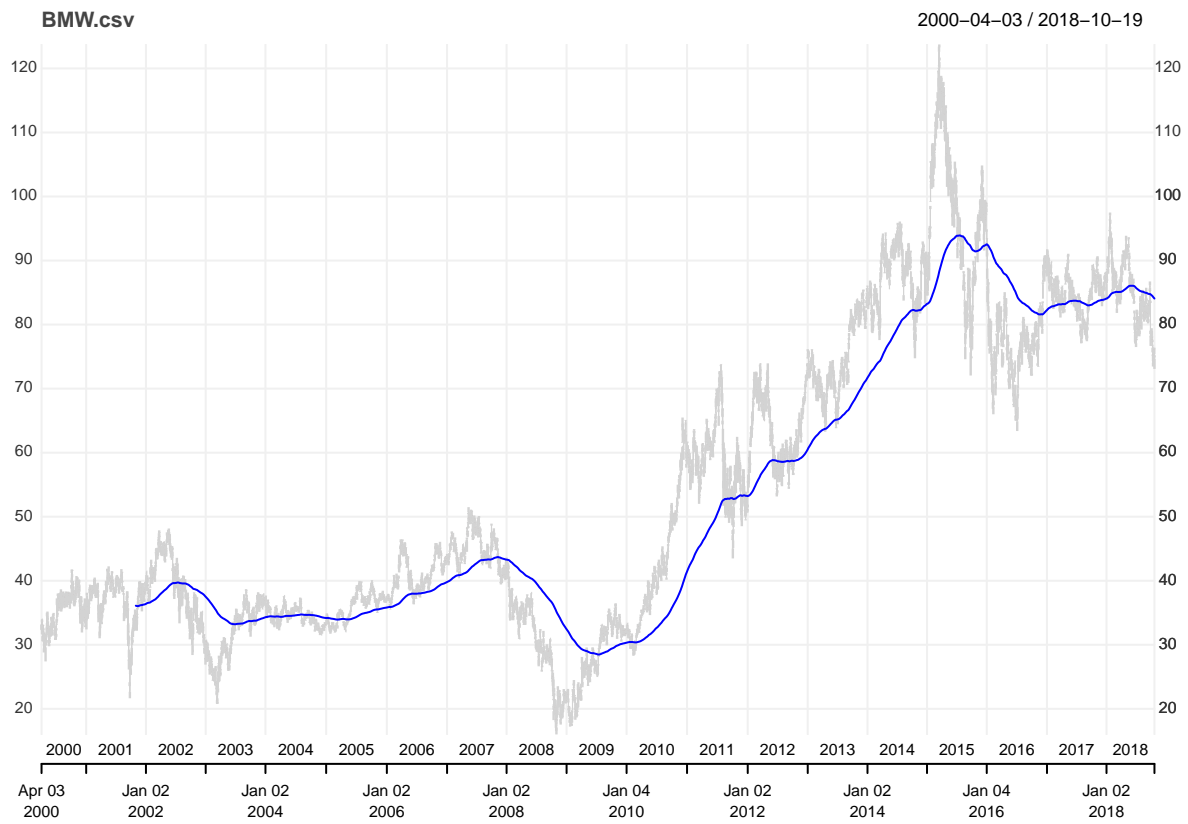


Part C: Analysis and Reporting

Step 1: Visualize original data

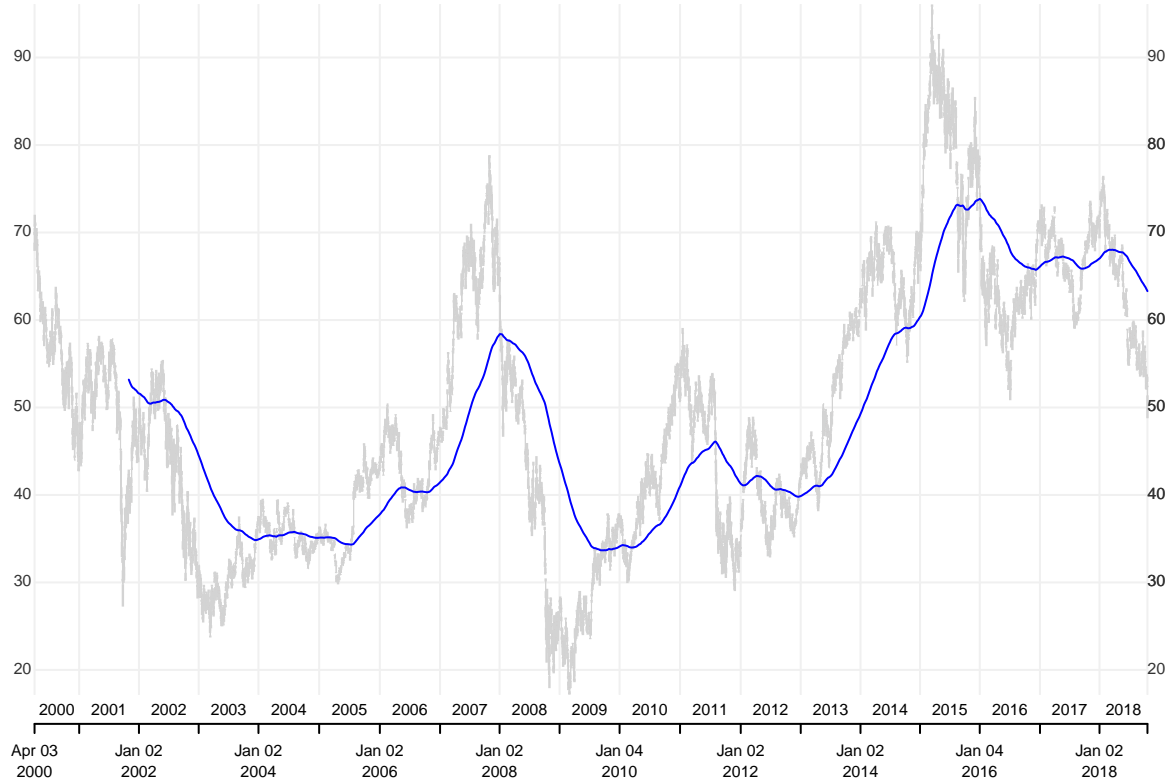
Plot of the instrument with the EMA line which indicates the general trend of the stock exponentially smoothed for the last 200 days. Moreover, the tradevolume is added below the graph. This plots can be used to get a first impression of the long term trend of the instrument and to see which general behaviour of the price 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')"))
}
```



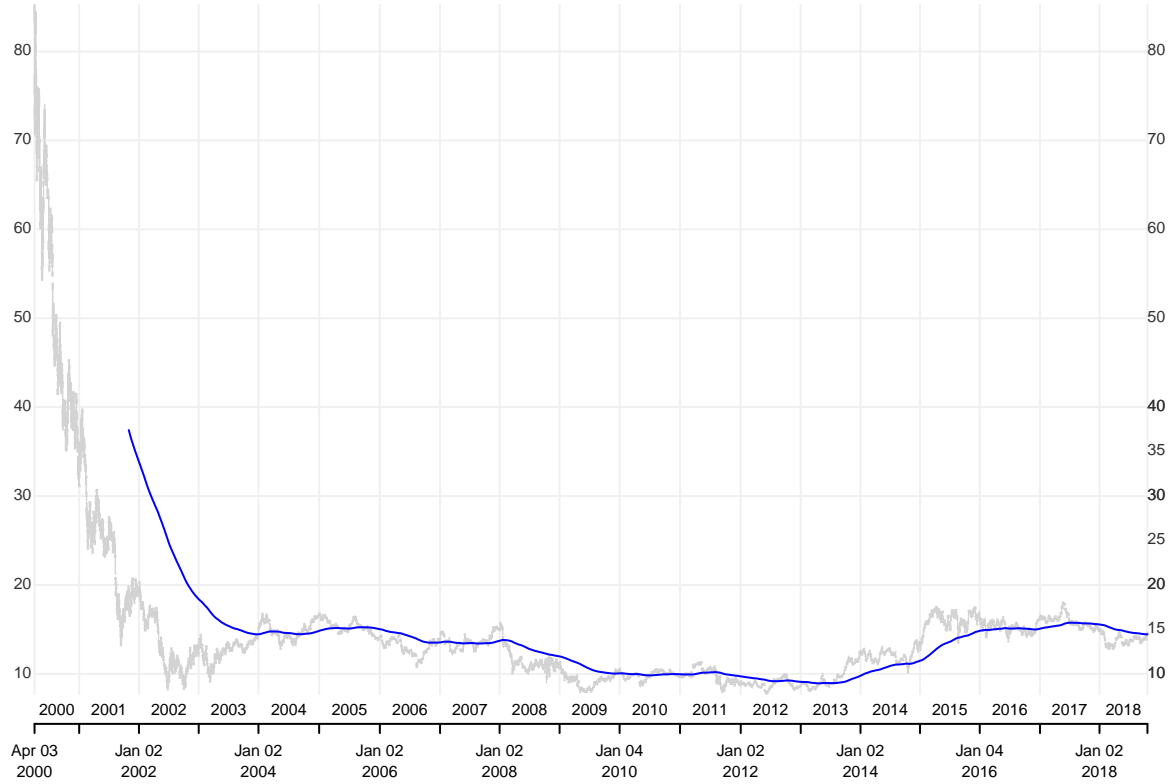
DAI.csv

2000-04-03 / 2018-10-19



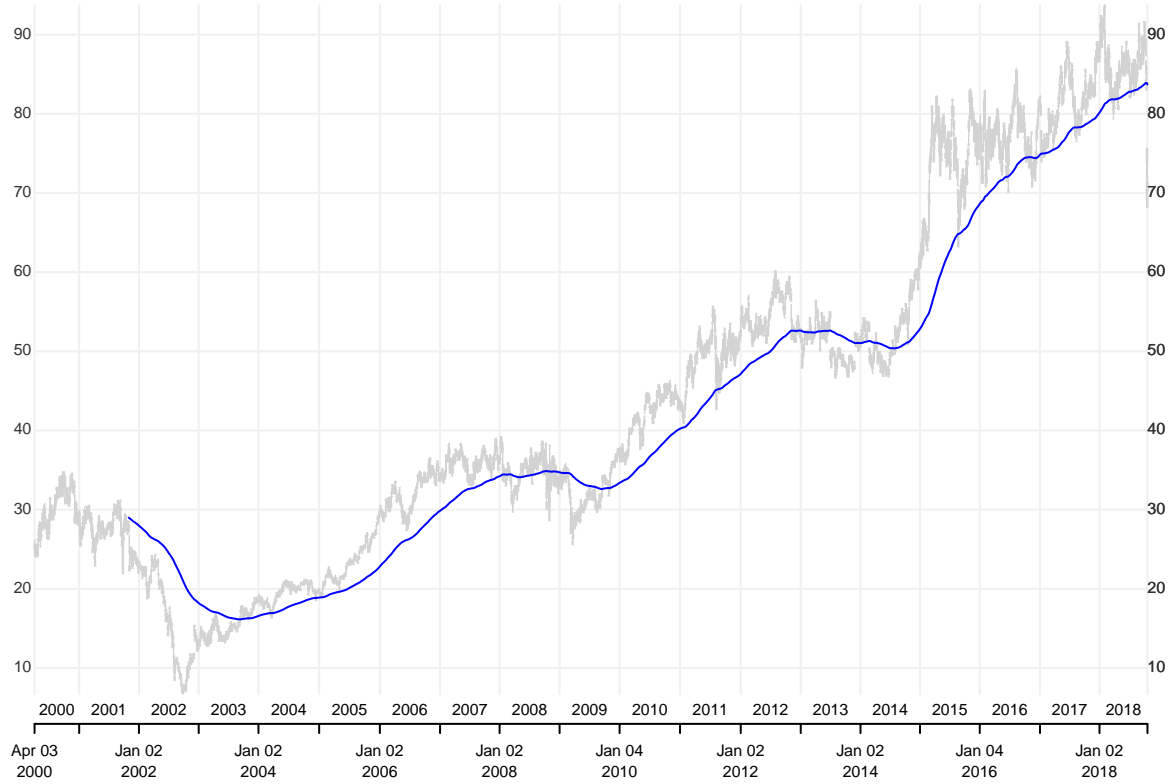
DTE.csv

2000-04-03 / 2018-10-19



FME.csv

2000-04-03 / 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.

```
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: BMW.csv"
##           Quantity    Price      Value Net realized Profit
## 1999-12-31         0    0.000        0.0          0.000
## 2001-11-21      25125  39.800   999975.0         -20.000
## 2001-11-27     -25125  37.840  -950730.0        -49265.000
## 2001-11-30      25474  37.320   950689.7         -20.000
## 2001-12-03     -25474  36.150  -920885.1       -29824.580
## 2001-12-17      24220  38.020   920844.4         -20.000
## 2001-12-21     -24220  39.470  -955963.4        35099.000
## 2002-01-17      25057  38.150   955924.5         -20.000
## 2002-01-23     -25057  38.170  -956425.7         481.140
## 2002-02-25      23281  41.080   956383.5         -20.000
## 2002-02-28     -23281  41.620  -968955.2       12551.740
```


## 2002-04-26	21479	45.110	968917.7	-20.000
## 2002-05-03	-21479	44.500	-955815.5	-13122.190
## 2002-06-05	21444	44.570	955759.1	-20.000
## 2002-06-07	-21444	43.510	-933028.4	-22750.640
## 2002-06-10	21608	44.500	961556.0	-20.000
## 2002-06-14	-21608	39.880	-861727.0	-99848.960
## 2003-07-11	24304	34.280	833141.1	-20.000
## 2003-07-17	-24304	33.720	-819530.9	-13630.240
## 2003-11-06	22632	36.210	819504.7	-20.000
## 2003-11-12	-22632	37.620	-851415.8	31891.120
## 2003-12-09	23486	36.250	851367.5	-20.000
## 2003-12-15	-23486	37.060	-870391.2	19003.660
## 2003-12-18	23491	37.050	870341.5	-20.000
## 2003-12-29	-23491	36.970	-868462.3	-1899.280
## 2004-04-15	24720	35.130	868413.6	-20.000
## 2004-04-21	-24720	35.900	-887448.0	19014.400
## 2004-05-21	25479	34.830	887433.6	-20.000
## 2004-05-24	-25479	34.490	-878770.7	-8682.860
## 2004-07-13	24409	36.000	878724.0	-20.000
## 2004-07-19	-24409	35.250	-860417.2	-18326.750
## 2004-07-23	24073	35.740	860369.0	-20.000
## 2004-07-29	-24073	37.130	-893830.5	33441.470
## 2005-06-21	24235	36.880	893786.8	-20.000
## 2005-06-24	-24235	37.200	-901542.0	7735.200
## 2005-06-28	24511	36.780	901514.6	-20.000
## 2005-07-04	-24511	38.900	-953477.9	51943.320
## 2005-07-08	24764	38.500	953414.0	-20.000
## 2005-07-12	-24764	38.500	-953414.0	-20.000
## 2005-07-25	24198	39.400	953401.2	-20.000
## 2005-07-29	-24198	38.760	-937914.5	-15506.720
## 2005-08-17	25576	36.670	937871.9	-20.000
## 2005-08-23	-25576	37.030	-947079.3	9187.360
## 2005-10-07	24239	39.070	947017.7	-20.000
## 2005-10-13	-24239	38.430	-931504.8	-15532.960
## 2005-10-20	24610	37.850	931488.5	-20.000
## 2005-10-25	-24610	36.850	-906878.5	-24630.000
## 2005-10-31	24676	36.750	906843.0	-20.000
## 2005-11-03	-24676	35.740	-881920.2	-24942.760
## 2005-11-11	24042	36.680	881860.6	-20.000
## 2005-11-17	-24042	37.310	-897007.0	15126.460
## 2006-01-02	23945	37.460	896979.7	-20.000
## 2006-01-06	-23945	37.780	-904642.1	7642.400
## 2006-01-19	24913	36.310	904591.0	-20.000
## 2006-01-23	-24913	35.600	-886902.8	-17708.230
## 2006-04-25	19783	44.830	886871.9	-20.000
## 2006-05-02	-19783	43.410	-858780.0	-28111.860
## 2006-05-09	19896	43.160	858711.4	-20.000
## 2006-05-15	-19896	40.850	-812751.6	-45979.760
## 2006-05-23	20426	39.790	812750.5	-20.000
## 2006-05-29	-20426	40.980	-837057.5	24286.940
## 2006-07-06	21418	39.080	837015.4	-20.000
## 2006-07-12	-21418	39.090	-837229.6	194.180
## 2006-08-02	20504	40.830	837178.3	-20.000
## 2006-08-08	-20504	38.750	-794530.0	-42668.320

##	2006-08-22	19778	40.170	794482.3	-20.000
##	2006-08-28	-19778	40.330	-797646.7	3144.480
##	2006-10-10	18932	42.130	797605.2	-20.000
##	2006-10-16	-18932	43.890	-830925.5	33300.320
##	2006-12-20	19127	43.440	830876.9	-20.000
##	2006-12-21	-19127	43.380	-829729.3	-1167.620
##	2006-12-27	19197	43.220	829694.3	-20.000
##	2007-01-03	-19197	44.050	-845627.8	15913.510
##	2007-01-05	19306	43.800	845602.8	-20.000
##	2007-01-11	-19306	43.500	-839811.0	-5811.800
##	2007-02-01	17829	47.100	839745.9	-20.000
##	2007-02-02	-17829	47.000	-837963.0	-1802.900
##	2007-02-09	18336	45.700	837955.2	-20.000
##	2007-02-15	-18336	45.960	-842722.6	4747.360
##	2007-03-12	19837	42.480	842675.8	-20.000
##	2007-03-15	-19837	41.200	-817284.4	-25411.360
##	2007-03-29	18731	43.630	817233.5	-20.000
##	2007-04-04	-18731	45.400	-850387.4	33133.870
##	2007-05-09	17827	47.700	850347.9	-20.000
##	2007-05-15	-17827	50.620	-902402.7	52034.840
##	2007-07-06	18367	49.130	902370.7	-20.000
##	2007-07-10	-18367	49.110	-902003.4	-387.340
##	2007-07-12	18635	48.400	901934.0	-20.000
##	2007-07-18	-18635	47.960	-893734.6	-8219.400
##	2007-08-17	20111	44.440	893732.8	-20.000
##	2007-08-23	-20111	43.890	-882671.8	-11081.050
##	2007-10-23	19313	45.700	882604.1	-20.000
##	2007-10-29	-19313	46.330	-894771.3	12147.190
##	2007-10-31	19312	46.330	894725.0	-20.000
##	2007-11-06	-19312	43.310	-836402.7	-58342.240
##	2009-09-01	26199	31.925	836403.1	-20.000
##	2009-09-07	-26199	32.315	-846620.7	10197.610
##	2009-09-21	24613	34.395	846564.1	-20.000
##	2009-09-23	-24613	34.160	-840780.1	-5804.055
##	2009-10-19	24597	34.180	840725.5	-20.000
##	2009-10-23	-24597	35.940	-884016.2	43270.720
##	2009-11-27	27681	31.935	883992.7	-20.000
##	2009-12-03	-27681	32.195	-891189.8	7177.060
##	2010-04-23	24010	37.115	891131.2	-20.000
##	2010-04-27	-24010	37.260	-894612.6	3461.450
##	2010-05-26	24989	35.800	894606.2	-20.000
##	2010-06-01	-24989	37.490	-936837.6	42211.410
##	2010-06-28	22638	41.380	936760.4	-20.000
##	2010-07-02	-22638	37.885	-857640.6	-79139.810
##	2010-07-20	20376	42.090	857625.8	-20.000
##	2010-07-26	-20376	42.110	-858033.4	387.520
##	2010-08-25	20546	41.760	858001.0	-20.000
##	2010-08-31	-20546	41.665	-856049.1	-1971.870
##	2010-10-05	17402	49.190	856004.4	-20.000
##	2010-10-11	-17402	49.870	-867837.7	11813.360
##	2010-10-19	17561	49.415	867776.8	-20.000
##	2010-10-25	-17561	50.720	-890693.9	22897.105
##	2010-10-28	17654	50.450	890644.3	-20.000
##	2010-11-03	-17654	51.640	-911652.6	20988.260

## 2010-11-09	16954	53.770	911616.6	-20.000
## 2010-11-15	-16954	56.060	-950441.2	38804.660
## 2010-11-18	17293	54.960	950423.3	-20.000
## 2010-11-23	-17293	57.150	-988294.9	37851.670
## 2010-11-24	17018	58.620	997595.2	-20.000
## 2010-11-26	-17018	58.840	-1001339.1	3723.960
## 2010-12-10	15831	62.660	991970.5	-20.000
## 2010-12-16	-15831	62.800	-994186.8	2196.340
## 2011-01-11	16736	59.400	994118.4	-20.000
## 2011-01-17	-16736	58.550	-979892.8	-14245.600
## 2011-02-01	17181	57.030	979832.4	-20.000
## 2011-02-07	-17181	58.850	-1011101.8	31249.420
## 2011-02-25	17433	58.000	1011114.0	-20.000
## 2011-03-02	-17433	58.850	-1025932.1	14798.050
## 2011-03-03	17615	59.050	1040165.8	-20.000
## 2011-03-09	-17615	58.140	-1024136.1	-16049.650
## 2011-03-16	18400	54.880	1009792.0	-20.000
## 2011-03-22	-18400	54.590	-1004456.0	-5356.000
## 2011-04-13	17538	57.270	1004401.3	-20.000
## 2011-04-19	-17538	58.790	-1031059.0	26637.760
## 2011-05-04	15911	64.800	1031032.8	-20.000
## 2011-05-10	-15911	62.670	-997142.4	-33910.430
## 2011-05-24	16610	60.030	997098.3	-20.000
## 2011-05-26	-16610	59.400	-986634.0	-10484.300
## 2011-07-07	14270	69.140	986627.8	-20.000
## 2011-07-13	-14270	70.180	-1001468.6	14820.800
## 2011-08-17	16944	59.100	1001390.4	-20.000
## 2011-08-22	-16944	50.330	-852791.5	-148618.880
## 2011-09-20	14759	57.780	852775.0	-20.000
## 2011-09-26	-14759	51.450	-759350.6	-93444.470
## 2011-11-02	13224	57.420	759322.1	-20.000
## 2011-11-08	-13224	58.420	-772546.1	13204.000
## 2012-02-15	10868	71.080	772497.4	-20.000
## 2012-02-21	-10868	71.620	-778366.2	5848.720
## 2012-02-28	11183	69.600	778336.8	-20.000
## 2012-03-05	-11183	70.630	-789855.3	11498.490
## 2012-03-30	11728	67.340	789763.5	-20.000
## 2012-04-05	-11728	66.780	-783195.8	-6587.680
## 2012-04-11	11772	66.530	783191.2	-20.000
## 2012-04-13	-11772	67.260	-791784.7	8573.560
## 2012-05-03	10859	72.910	791729.7	-20.000
## 2012-05-09	-10859	67.700	-735154.3	-56595.390
## 2012-05-21	11811	62.240	735116.6	-20.000
## 2012-05-23	-11811	62.480	-737951.3	2814.640
## 2012-08-27	12155	60.710	737930.1	-20.000
## 2012-08-31	-12155	57.350	-697089.2	-40860.800
## 2012-09-19	11369	61.310	697033.4	-20.000
## 2012-09-25	-11369	58.810	-668610.9	-28442.500
## 2012-10-09	11022	60.660	668594.5	-20.000
## 2012-10-15	-11022	60.460	-666390.1	-2224.400
## 2012-11-19	10560	63.100	666336.0	-20.000
## 2012-11-23	-10560	65.780	-694636.8	28280.800
## 2012-12-05	10109	68.710	694589.4	-20.000
## 2012-12-11	-10109	70.590	-713594.3	18984.920

## 2013-02-01	9533	74.850	713545.0	-20.000
## 2013-02-07	-9533	71.740	-683897.4	-29667.630
## 2013-02-13	9481	72.130	683864.5	-20.000
## 2013-02-19	-9481	71.790	-680641.0	-3243.540
## 2013-03-14	9470	71.870	680608.9	-20.000
## 2013-03-20	-9470	70.150	-664320.5	-16308.400
## 2013-04-16	9840	67.510	664298.4	-20.000
## 2013-04-22	-9840	65.240	-641961.6	-22356.800
## 2013-05-24	8959	71.650	641912.4	-20.000
## 2013-05-29	-8959	71.760	-642897.8	965.490
## 2013-06-07	8854	72.600	642800.4	-20.000
## 2013-06-13	-8854	69.160	-612342.6	-30477.760
## 2013-06-19	8733	70.120	612358.0	-20.000
## 2013-06-24	-8733	64.520	-563453.2	-48924.800
## 2013-08-08	7925	71.090	563388.2	-20.000
## 2013-08-12	-7925	71.800	-569015.0	5606.750
## 2013-08-29	7825	72.710	568955.8	-20.000
## 2013-09-03	-7825	72.330	-565982.2	-2993.500
## 2013-11-06	6903	81.990	565977.0	-20.000
## 2013-11-12	-6903	81.540	-562870.6	-3126.350
## 2013-11-14	6864	82.000	562848.0	-20.000
## 2013-11-15	-6864	81.420	-558866.9	-4001.120
## 2013-12-02	6575	84.990	558809.2	-20.000
## 2013-12-03	-6575	84.520	-555719.0	-3110.250
## 2013-12-06	6736	82.490	555652.6	-20.000
## 2013-12-12	-6736	79.780	-537398.1	-18274.560
## 2014-01-13	6384	84.180	537405.1	-20.000
## 2014-01-16	-6384	84.610	-540150.2	2725.120
## 2014-02-19	6343	85.150	540106.5	-20.000
## 2014-02-24	-6343	84.150	-533763.5	-6363.000
## 2014-03-04	6424	83.080	533705.9	-20.000
## 2014-03-10	-6424	80.520	-517260.5	-16465.440
## 2014-03-13	6398	80.840	517214.3	-20.000
## 2014-03-19	-6398	86.600	-554066.8	36832.480
## 2014-05-19	6369	86.980	553975.6	-20.000
## 2014-05-23	-6369	89.880	-572445.7	18450.100
## 2014-06-24	6156	92.990	572446.4	-20.000
## 2014-06-25	-6156	92.850	-571584.6	-881.840
## 2014-07-11	6165	92.700	571495.5	-20.000
## 2014-07-17	-6165	94.470	-582407.6	10892.050
## 2014-07-22	6206	93.850	582433.1	-20.000
## 2014-07-28	-6206	92.210	-572255.3	-10197.840
## 2014-09-11	6291	90.950	572166.5	-20.000
## 2014-09-17	-6291	89.800	-564931.8	-7254.650
## 2014-09-24	6539	86.390	564904.2	-20.000
## 2014-09-30	-6539	85.020	-555945.8	-8978.430
## 2014-12-04	6043	91.990	555895.6	-20.000
## 2014-12-10	-6043	89.790	-542601.0	-13314.600
## 2015-03-11	4720	114.950	542564.0	-20.000
## 2015-03-17	-4720	120.350	-568052.0	25468.000
## 2015-04-09	4933	115.150	568035.0	-20.000
## 2015-04-15	-4933	115.400	-569268.2	1213.250
## 2015-07-23	5918	96.190	569252.4	-20.000
## 2015-07-24	-5918	93.330	-552326.9	-16945.480

## 2015-10-28	5922	93.260	552285.7	-20.000
## 2015-11-03	-5922	92.710	-549028.6	-3277.100
## 2015-11-13	5733	95.760	548992.1	-20.000
## 2015-11-19	-5733	98.730	-566019.1	17007.010
## 2015-11-25	5735	98.680	565929.8	-20.000
## 2015-12-01	-5735	103.300	-592425.5	26475.700
## 2015-12-03	5704	103.850	592360.4	-20.000
## 2015-12-08	-5704	98.940	-564353.8	-28026.640
## 2015-12-21	5728	98.520	564322.6	-20.000
## 2015-12-28	-5728	97.620	-559167.4	-5175.200
## 2017-01-17	6415	87.160	559131.4	-20.000
## 2017-01-23	-6415	86.260	-553357.9	-5793.500
## 2017-02-20	6457	85.700	553364.9	-20.000
## 2017-02-23	-6457	86.220	-556722.5	3337.640
## 2017-05-04	6349	87.680	556680.3	-20.000
## 2017-05-09	-6349	88.900	-564426.1	7725.780
## 2017-05-19	6540	86.290	564336.6	-20.000
## 2017-05-25	-6540	85.240	-557469.6	-6887.000
## 2017-09-29	6556	85.030	557456.7	-20.000
## 2017-10-06	-6556	89.050	-583811.8	26335.120
## 2017-11-16	6791	85.960	583754.4	-20.000
## 2017-11-22	-6791	86.580	-587964.8	4190.420
## 2017-11-24	6748	87.130	587953.2	-20.000
## 2017-11-30	-6748	84.680	-571420.6	-16552.600
## 2017-12-29	6537	87.410	571399.2	-20.000
## 2018-01-05	-6537	87.000	-568719.0	-2700.170
## 2018-01-12	6345	89.620	568638.9	-20.000
## 2018-01-15	-6345	89.020	-564831.9	-3827.000
## 2018-01-31	6063	93.160	564829.1	-20.000
## 2018-02-06	-6063	88.130	-534332.2	-30516.890
## 2018-02-12	6065	88.090	534265.8	-20.000
## 2018-02-16	-6065	88.120	-534447.8	161.950
## 2018-03-20	6227	85.830	534463.4	-20.000
## 2018-03-26	-6227	84.950	-528983.7	-5499.760
## 2018-05-22	5896	89.700	528871.2	-20.000
## 2018-05-23	-5896	89.280	-526394.9	-2496.320
## 2018-05-25	5986	87.930	526349.0	-20.000
## 2018-05-31	-5986	85.380	-511084.7	-15284.300
##				
## [1] "Transactions for the instrument: DAI.csv"				
##	Quantity	Price	Value	Net realized Profit
## 1999-12-31	0	0.000	0.0	0.00
## 2002-03-22	18709	53.450	999996.1	-20.00
## 2002-03-25	-18709	52.700	-985964.3	-14051.75
## 2004-02-17	27145	36.320	985906.4	-20.00
## 2004-02-19	-27145	36.360	-986992.2	1065.80
## 2004-04-29	25113	39.300	986940.9	-20.00
## 2004-05-05	-25113	37.900	-951782.7	-35178.20
## 2004-06-15	24994	38.080	951771.5	-20.00
## 2004-06-17	-24994	37.890	-947022.7	-4768.86
## 2004-07-07	25456	37.200	946963.2	-20.00
## 2004-07-13	-25456	36.690	-933980.6	-13002.56
## 2004-07-23	25546	36.560	933961.8	-20.00
## 2004-07-27	-25546	35.890	-916845.9	-17135.82

## 2005-02-11	25659	35.730	916796.1	-20.00
## 2005-02-14	-25659	35.310	-906019.3	-10796.78
## 2005-08-08	22509	40.250	905987.2	-20.00
## 2005-08-11	-22509	41.670	-937950.0	31942.78
## 2005-09-05	22698	41.320	937881.4	-20.00
## 2005-09-09	-22698	41.850	-949911.3	12009.94
## 2005-10-20	22861	41.550	949874.5	-20.00
## 2005-10-26	-22861	41.510	-948960.1	-934.44
## 2005-11-11	22171	42.800	948918.8	-20.00
## 2005-11-17	-22171	43.030	-954018.1	5079.33
## 2006-01-02	21961	43.440	953985.8	-20.00
## 2006-01-04	-21961	43.700	-959695.7	5689.86
## 2006-01-19	21940	43.740	959655.6	-20.00
## 2006-01-25	-21940	45.320	-994320.8	34645.20
## 2006-02-09	20862	47.660	994282.9	-20.00
## 2006-02-15	-20862	50.090	-1044977.6	50674.66
## 2006-03-09	22569	46.300	1044944.7	-20.00
## 2006-03-15	-22569	47.820	-1079249.6	34284.88
## 2006-03-22	23385	46.150	1079217.8	-20.00
## 2006-03-28	-23385	46.280	-1082257.8	3020.05
## 2006-04-10	22504	48.090	1082217.4	-20.00
## 2006-04-18	-22504	45.640	-1027082.6	-55154.80
## 2006-04-25	22293	46.070	1027038.5	-20.00
## 2006-04-27	-22293	45.420	-1012548.1	-14510.45
## 2006-11-29	22840	44.330	1012497.2	-20.00
## 2006-11-30	-22840	44.060	-1006330.4	-6186.80
## 2006-12-27	21447	46.920	1006293.2	-20.00
## 2007-01-03	-21447	47.200	-1012298.4	5985.16
## 2007-01-11	21690	46.670	1012272.3	-20.00
## 2007-01-17	-21690	46.580	-1010320.2	-1972.10
## 2007-01-29	20792	48.590	1010283.3	-20.00
## 2007-01-30	-20792	48.210	-1002382.3	-7920.96
## 2007-02-01	20722	48.370	1002323.1	-20.00
## 2007-02-07	-20722	48.300	-1000872.6	-1470.54
## 2007-02-09	20471	48.890	1000827.2	-20.00
## 2007-02-15	-20471	53.420	-1093560.8	92713.63
## 2007-03-01	20821	52.520	1093518.9	-20.00
## 2007-03-07	-20821	52.350	-1089979.4	-3559.57
## 2007-03-15	20796	52.410	1089918.4	-20.00
## 2007-03-21	-20796	57.000	-1185372.0	95433.64
## 2007-04-10	18966	62.500	1185375.0	-20.00
## 2007-04-16	-18966	60.960	-1156167.4	-29227.64
## 2007-04-20	19333	59.800	1156113.4	-20.00
## 2007-04-26	-19333	60.400	-1167713.2	11579.80
## 2007-05-04	19316	60.450	1167652.2	-20.00
## 2007-05-10	-19316	59.060	-1140803.0	-26869.24
## 2007-06-28	17111	66.670	1140790.4	-20.00
## 2007-07-04	-17111	68.210	-1167141.3	26330.94
## 2007-07-06	16988	68.700	1167075.6	-20.00
## 2007-07-12	-16988	69.340	-1177947.9	10852.32
## 2007-07-19	17482	67.380	1177937.2	-20.00
## 2007-07-25	-17482	66.930	-1170070.3	-7886.90
## 2007-08-02	17578	66.560	1169991.7	-20.00
## 2007-08-08	-17578	64.560	-1134835.7	-35176.00

## 2007-08-13	18363	61.800	1134833.4	-20.00
## 2007-08-17	-18363	60.140	-1104350.8	-30502.58
## 2007-08-27	17390	63.500	1104265.0	-20.00
## 2007-08-31	-17390	65.180	-1133480.2	29195.20
## 2007-10-09	15484	73.200	1133428.8	-20.00
## 2007-10-12	-15484	74.100	-1147364.4	13915.60
## 2007-10-23	15837	72.450	1147390.7	-20.00
## 2007-10-29	-15837	77.120	-1221349.4	73938.79
## 2007-11-09	16728	73.010	1221311.3	-20.00
## 2007-11-15	-16728	68.290	-1142355.1	-78976.16
## 2007-11-20	17162	66.560	1142302.7	-20.00
## 2007-11-21	-17162	64.500	-1106949.0	-35373.72
## 2007-11-28	16848	65.700	1106913.6	-20.00
## 2007-12-04	-16848	68.210	-1149202.1	42268.48
## 2007-12-18	17625	65.200	1149150.0	-20.00
## 2007-12-27	-17625	66.500	-1172062.5	22892.50
## 2009-11-23	32720	35.820	1172030.4	-20.00
## 2009-11-27	-32720	34.625	-1132930.0	-39120.40
## 2010-04-09	31912	35.500	1132876.0	-20.00
## 2010-04-15	-31912	36.715	-1171649.1	38753.08
## 2010-04-23	30072	38.960	1171605.1	-20.00
## 2010-04-27	-30072	38.750	-1165290.0	-6335.12
## 2010-04-29	30520	38.180	1165253.6	-20.00
## 2010-05-05	-30520	37.020	-1129850.4	-35423.20
## 2010-05-10	30569	36.960	1129830.2	-20.00
## 2010-05-14	-30569	40.575	-1240337.2	110486.94
## 2010-05-26	33021	37.560	1240268.8	-20.00
## 2010-06-01	-33021	40.310	-1331076.5	90787.75
## 2010-06-28	30969	42.980	1331047.6	-20.00
## 2010-06-29	-30969	41.860	-1296362.3	-34705.28
## 2010-07-06	31734	40.850	1296333.9	-20.00
## 2010-07-12	-31734	41.565	-1319023.7	22669.81
## 2010-07-22	31367	42.050	1318982.3	-20.00
## 2010-07-27	-31367	42.360	-1328706.1	9703.77
## 2010-10-20	27796	47.800	1328648.8	-20.00
## 2010-10-26	-27796	49.220	-1368119.1	39450.32
## 2010-11-18	27340	50.040	1368093.6	-20.00
## 2010-11-24	-27340	52.040	-1422773.6	54660.00
## 2010-12-20	26115	54.480	1422745.2	-20.00
## 2010-12-27	-26115	51.570	-1346750.6	-76014.65
## 2011-01-03	26048	51.700	1346681.6	-20.00
## 2011-01-07	-26048	54.530	-1420397.4	73695.84
## 2011-01-11	25759	55.140	1420351.3	-20.00
## 2011-01-17	-25759	56.890	-1465429.5	45058.25
## 2011-01-25	26619	55.050	1465375.9	-20.00
## 2011-01-31	-26619	53.420	-1421987.0	-43408.97
## 2011-02-25	27827	51.100	1421959.7	-20.00
## 2011-03-03	-27827	49.180	-1368531.9	-53447.84
## 2011-03-16	29848	45.850	1368530.8	-20.00
## 2011-03-22	-29848	46.465	-1386887.3	18336.52
## 2011-04-15	27609	50.230	1386800.1	-20.00
## 2011-04-21	-27609	51.300	-1416341.7	29521.63
## 2011-05-02	26901	52.650	1416337.6	-20.00
## 2011-05-06	-26901	51.330	-1380828.3	-35529.32

## 2011-05-24	28689	48.130	1380801.6	-20.00
## 2011-05-30	-28689	48.060	-1378793.3	-2028.23
## 2012-01-25	32988	41.795	1378733.5	-20.00
## 2012-01-31	-32988	42.245	-1393578.1	14824.60
## 2012-03-23	30641	45.480	1393552.7	-20.00
## 2012-03-29	-30641	44.265	-1356323.9	-37248.81
## 2012-08-23	32296	41.995	1356270.5	-20.00
## 2012-08-29	-32296	41.340	-1335116.6	-21173.88
## 2013-01-02	31765	42.030	1335082.9	-20.00
## 2013-01-08	-31765	42.900	-1362718.5	27615.55
## 2013-02-01	31362	43.450	1362678.9	-20.00
## 2013-02-07	-31362	44.205	-1386357.2	23658.31
## 2013-02-13	30955	44.785	1386319.7	-20.00
## 2013-02-14	-30955	44.300	-1371306.5	-15033.17
## 2013-02-18	30829	44.480	1371273.9	-20.00
## 2013-02-22	-30829	44.590	-1374665.1	3371.19
## 2013-02-27	30564	44.975	1374615.9	-20.00
## 2013-03-01	-30564	45.230	-1382409.7	7773.82
## 2013-05-08	31811	43.455	1382347.0	-20.00
## 2013-05-14	-31811	45.970	-1462351.7	79984.67
## 2013-05-30	30046	48.670	1462338.8	-20.00
## 2013-06-05	-30046	47.945	-1440555.5	-21803.35
## 2013-06-07	29954	48.090	1440487.9	-20.00
## 2013-06-11	-29954	48.400	-1449773.6	9265.74
## 2013-06-14	30601	47.375	1449722.4	-20.00
## 2013-06-18	-30601	47.305	-1447580.3	-2162.07
## 2013-06-19	30646	47.545	1457064.1	-20.00
## 2013-06-25	-30646	45.625	-1398223.8	-58860.32
## 2013-07-24	26005	53.400	1388667.0	-20.00
## 2013-07-26	-26005	52.280	-1359541.4	-29145.60
## 2013-08-01	25593	53.120	1359500.2	-20.00
## 2013-08-07	-25593	53.740	-1375367.8	15847.66
## 2013-08-21	25061	54.880	1375347.7	-20.00
## 2013-08-27	-25061	52.890	-1325476.3	-49891.39
## 2013-08-29	25098	52.810	1325425.4	-20.00
## 2013-09-04	-25098	53.300	-1337723.4	12278.02
## 2013-09-18	23280	57.460	1337668.8	-20.00
## 2013-09-20	-23280	57.920	-1348377.6	10688.80
## 2013-10-03	23296	57.880	1348372.5	-20.00
## 2013-10-09	-23296	57.340	-1335792.6	-12599.84
## 2013-11-06	22273	59.970	1335711.8	-20.00
## 2013-11-08	-22273	59.290	-1320566.2	-15165.64
## 2013-11-14	22458	58.800	1320530.4	-20.00
## 2013-11-20	-22458	59.640	-1339395.1	18844.72
## 2013-12-06	22469	59.610	1339377.1	-20.00
## 2013-12-12	-22469	58.880	-1322974.7	-16422.37
## 2014-01-28	20956	63.130	1322952.3	-20.00
## 2014-02-03	-20956	60.690	-1271819.6	-51152.64
## 2014-03-04	19231	66.130	1271746.0	-20.00
## 2014-03-10	-19231	66.540	-1279630.7	7864.71
## 2014-03-13	19073	67.090	1279607.6	-20.00
## 2014-03-19	-19073	65.940	-1257673.6	-21953.95
## 2014-05-02	18762	67.030	1257616.9	-20.00
## 2014-05-08	-18762	65.000	-1219530.0	-38106.86

## 2014-06-16	17577	69.380	1219492.3	-20.00
## 2014-06-20	-17577	70.080	-1231796.2	12283.90
## 2014-06-25	17785	69.260	1231789.1	-20.00
## 2014-07-01	-17785	69.190	-1230544.1	-1264.95
## 2014-08-04	19936	61.720	1230449.9	-20.00
## 2014-08-08	-19936	59.270	-1181606.7	-48863.20
## 2014-08-13	19383	60.960	1181587.7	-20.00
## 2014-08-15	-19383	60.110	-1165112.1	-16495.55
## 2014-09-11	18204	64.000	1165056.0	-20.00
## 2014-09-17	-18204	63.210	-1150674.8	-14401.16
## 2014-11-05	18458	62.340	1150671.7	-20.00
## 2014-11-07	-18458	61.960	-1143657.7	-7034.04
## 2014-12-05	16349	69.950	1143612.6	-20.00
## 2014-12-11	-16349	68.310	-1116800.2	-26832.36
## 2015-02-10	13650	81.810	1116706.5	-20.00
## 2015-02-16	-13650	82.830	-1130629.5	13903.00
## 2015-02-18	13588	83.210	1130657.5	-20.00
## 2015-02-19	-13588	82.740	-1124271.1	-6406.36
## 2015-03-04	12867	87.370	1124189.8	-20.00
## 2015-03-10	-12867	88.700	-1141302.9	17093.11
## 2015-03-25	12793	89.210	1141263.5	-20.00
## 2015-03-31	-12793	89.080	-1139600.4	-1683.09
## 2015-04-07	12895	88.370	1139531.2	-20.00
## 2015-04-13	-12895	88.170	-1136952.1	-2599.00
## 2015-05-14	13121	86.650	1136934.7	-20.00
## 2015-05-20	-13121	89.710	-1177084.9	40130.26
## 2015-06-25	13531	86.990	1177061.7	-20.00
## 2015-07-01	-13531	84.100	-1137957.1	-39124.59
## 2015-07-09	14228	79.980	1137955.4	-20.00
## 2015-07-14	-14228	82.580	-1174948.2	36972.80
## 2015-07-23	13593	86.430	1174843.0	-20.00
## 2015-07-29	-13593	81.080	-1102120.4	-72742.55
## 2015-11-05	14031	78.550	1102135.1	-20.00
## 2015-11-11	-14031	78.330	-1099048.2	-3106.82
## 2015-11-25	13818	79.530	1098945.5	-20.00
## 2015-12-01	-13818	83.210	-1149795.8	50830.24
## 2015-12-21	14668	78.390	1149824.5	-20.00
## 2015-12-28	-14668	77.090	-1130756.1	-19088.40
## 2016-12-30	16004	70.650	1130682.6	-20.00
## 2017-01-02	-16004	70.010	-1120440.0	-10262.56
## 2017-01-17	15892	70.500	1120386.0	-20.00
## 2017-01-23	-15892	70.170	-1115141.6	-5264.36
## 2017-03-01	16114	69.200	1115088.8	-20.00
## 2017-03-07	-16114	70.100	-1129591.4	14482.60
## 2017-03-23	16025	70.490	1129602.2	-20.00
## 2017-03-29	-16025	72.360	-1159569.0	29946.75
## 2017-05-19	17022	68.120	1159538.6	-20.00
## 2017-05-24	-17022	66.400	-1130260.8	-29297.84
## 2017-09-29	16808	67.240	1130169.9	-20.00
## 2017-10-06	-16808	68.700	-1154709.6	24519.68
## 2017-10-11	16847	68.540	1154693.4	-20.00
## 2017-10-17	-16847	68.720	-1157725.8	3012.46
## 2017-11-16	16610	69.700	1157717.0	-20.00
## 2017-11-22	-16610	69.980	-1162367.8	4630.80

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## 2017-11-24      16529 70.320 1162319.3      -20.00
## 2017-11-30     -16529 69.520 -1149096.1     -13243.20
## 2017-12-04      16481 69.720 1149055.3      -20.00
## 2017-12-06     -16481 69.320 -1142462.9     -6612.40
## 2017-12-20      15940 71.670 1142419.8      -20.00
## 2017-12-28     -15940 70.900 -1130146.0    -12293.80
## 2018-01-12      15197 74.360 1130048.9      -20.00
## 2018-01-17     -15197 73.770 -1121082.7     -8986.23
## 2018-02-07      15888 70.560 1121057.3      -20.00
## 2018-02-13     -15888 70.620 -1122010.6      933.28
##
## [1] "Transactions for the instrument: DTE.csv"
##      Quantity Price      Value Net realized Profit
## 1999-12-31         0 0.000         0.0         0.000
## 2004-01-19      63411 15.770   999991.5        -20.000
## 2004-01-23     -63411 16.400 -1039940.4      39928.930
## 2004-09-28      69698 14.920  1039894.2        -20.000
## 2004-10-04     -69698 15.550 -1083803.9      43889.740
## 2004-10-13      72107 15.030  1083768.2        -20.000
## 2004-10-19     -72107 14.940 -1077278.6     -6509.630
## 2004-10-27      73332 14.690  1077247.1        -20.000
## 2004-11-02     -73332 15.250 -1118313.0      41045.920
## 2004-11-17      70199 15.930  1118270.1        -20.000
## 2004-11-19     -70199 16.030 -1125290.0       6999.900
## 2004-12-07      68404 16.450  1125245.8        -20.000
## 2004-12-13     -68404 16.400 -1121825.6     -3440.200
## 2005-01-13      68864 16.290  1121794.6        -20.000
## 2005-01-19     -68864 16.230 -1117662.7     -4151.840
## 2005-01-25      68989 16.200  1117621.8        -20.000
## 2005-01-27     -68989 16.430 -1133489.3      15847.470
## 2005-04-13      73409 15.440  1133435.0        -20.000
## 2005-04-19     -73409 15.270 -1120955.4    -12499.530
## 2005-07-08      73024 15.350  1120918.4        -20.000
## 2005-07-14     -73024 15.570 -1136983.7      16045.280
## 2006-12-19      81560 13.940  1136946.4        -20.000
## 2006-12-27     -81560 13.910 -1134499.6     -2466.800
## 2007-01-11      77438 14.650  1134466.7        -20.000
## 2007-01-15     -77438 14.680 -1136789.8       2303.140
## 2007-06-20      81957 13.870  1136743.6        -20.000
## 2007-06-26     -81957 13.400 -1098223.8    -38539.790
## 2007-09-26      79694 13.780  1098183.3        -20.000
## 2007-10-02     -79694 13.710 -1092604.7    -5598.580
## 2007-10-31      77323 14.130  1092574.0        -20.000
## 2007-11-01     -77323 14.020 -1084068.5    -8525.530
## 2007-11-22      71223 15.220  1084014.1        -20.000
## 2007-11-28     -71223 15.200 -1082589.6    -1444.460
## 2007-12-07      70709 15.310  1082554.8        -20.000
## 2007-12-13     -70709 15.090 -1066998.8   -15575.980
## 2008-01-15      69509 15.350  1066963.1        -20.000
## 2008-01-21     -69509 14.390 -1000234.5   -66748.640
## 2010-01-04      95804 10.440  1000193.8        -20.000
## 2010-01-08     -95804 10.075  -965225.3   -34988.460
## 2010-04-20      96134 10.040   965185.4        -20.000
## 2010-04-22     -96134  9.989  -960282.5   -4922.834

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## 2010-07-13	96313	9.970	960240.6	-20.000
## 2010-07-16	-96313	10.035	-966501.0	6240.345
## 2010-08-09	93650	10.320	966468.0	-20.000
## 2010-08-13	-93650	10.485	-981920.2	15432.250
## 2010-10-05	97408	10.080	981872.6	-20.000
## 2010-10-11	-97408	9.952	-969404.4	-12488.224
## 2010-11-09	95316	10.170	969363.7	-20.000
## 2010-11-15	-95316	10.105	-963168.2	-6215.540
## 2011-04-08	86690	11.110	963125.9	-20.000
## 2011-04-12	-86690	11.035	-956624.2	-6521.750
## 2011-04-20	85793	11.150	956592.0	-20.000
## 2011-04-21	-85793	11.030	-946296.8	-10315.160
## 2011-05-17	90162	10.495	946250.2	-20.000
## 2011-05-23	-90162	10.415	-939037.2	-7232.960
## 2011-05-26	90989	10.320	939006.5	-20.000
## 2011-06-01	-90989	10.220	-929907.6	-9118.900
## 2011-08-03	88601	10.495	929867.5	-20.000
## 2011-08-05	-88601	9.950	-881579.9	-48307.545
## 2012-09-11	91011	9.686	881532.5	-20.000
## 2012-09-17	-91011	9.762	-888449.4	6896.836
## 2012-09-27	90424	9.825	888415.8	-20.000
## 2012-10-03	-90424	9.750	-881634.0	-6801.800
## 2013-05-20	94734	9.306	881594.6	-20.000
## 2013-05-24	-94734	9.260	-877236.8	-4377.764
## 2013-08-01	95182	9.216	877197.3	-20.000
## 2013-08-02	-95182	9.169	-872723.8	-4493.554
## 2013-08-21	90546	9.638	872682.3	-20.000
## 2013-08-27	-90546	9.691	-877481.3	4778.938
## 2013-08-29	91153	9.626	877438.8	-20.000
## 2013-09-03	-91153	9.759	-889562.1	12103.349
## 2013-10-01	82669	10.760	889518.4	-20.000
## 2013-10-02	-82669	10.715	-885798.3	-3740.105
## 2013-10-10	79227	11.180	885757.9	-20.000
## 2013-10-16	-79227	11.930	-945178.1	59400.250
## 2013-10-24	81760	11.560	945145.6	-20.000
## 2013-10-25	-81760	11.490	-939422.4	-5743.200
## 2013-10-28	81935	11.565	947578.3	-20.000
## 2013-10-30	-81935	11.610	-951265.3	3667.075
## 2014-03-04	77551	12.160	943020.2	-20.000
## 2014-03-10	-77551	11.435	-886795.7	-56244.475
## 2014-03-17	78509	11.295	886759.2	-20.000
## 2014-03-21	-78509	11.500	-902853.5	16074.345
## 2014-05-29	72720	12.415	902818.8	-20.000
## 2014-06-03	-72720	12.310	-895183.2	-7655.600
## 2014-06-12	70567	12.685	895142.4	-20.000
## 2014-06-18	-70567	12.660	-893378.2	-1784.175
## 2014-06-24	70203	12.725	893333.2	-20.000
## 2014-06-30	-70203	12.800	-898598.4	5245.225
## 2014-08-01	71885	12.500	898562.5	-20.000
## 2014-08-07	-71885	11.360	-816613.6	-81968.900
## 2014-08-11	72616	11.245	816566.9	-20.000
## 2014-08-15	-72616	11.110	-806763.8	-9823.160
## 2014-09-24	66699	12.095	806724.4	-20.000
## 2014-09-25	-66699	11.930	-795719.1	-11025.335

## 2014-11-05	66529	11.960	795686.8	-20.000
## 2014-11-11	-66529	12.530	-833608.4	37901.530
## 2015-01-07	64844	12.855	833569.6	-20.000
## 2015-01-13	-64844	13.855	-898413.6	64824.000
## 2015-02-10	57039	15.750	898364.2	-20.000
## 2015-02-16	-57039	15.840	-903497.8	5113.510
## 2015-02-18	57091	15.825	903465.1	-20.000
## 2015-02-24	-57091	16.095	-918879.6	15394.570
## 2015-03-11	54774	16.775	918833.8	-20.000
## 2015-03-17	-54774	16.900	-925680.6	6826.750
## 2015-04-24	54290	17.050	925644.5	-20.000
## 2015-04-30	-54290	16.475	-894427.8	-31236.750
## 2015-06-10	58002	15.420	894390.8	-20.000
## 2015-06-12	-58002	15.260	-885110.5	-9300.320
## 2015-07-07	58056	15.245	885063.7	-20.000
## 2015-07-13	-58056	16.550	-960826.8	75743.080
## 2015-08-10	56368	17.045	960792.6	-20.000
## 2015-08-14	-56368	16.415	-925280.7	-35531.840
## 2015-09-02	61375	15.075	925228.1	-20.000
## 2015-09-08	-61375	15.905	-976169.4	50921.250
## 2015-09-25	61644	15.835	976132.7	-20.000
## 2015-10-01	-61644	15.720	-969043.7	-7109.060
## 2015-10-05	63375	15.290	969003.8	-20.000
## 2015-10-09	-63375	15.205	-963616.9	-5406.875
## 2015-10-15	64757	14.880	963584.2	-20.000
## 2015-10-21	-64757	15.735	-1018951.4	55347.235
## 2015-11-06	60290	16.900	1018901.0	-20.000
## 2015-11-12	-60290	16.510	-995387.9	-23533.100
## 2015-11-25	58055	17.145	995353.0	-20.000
## 2015-12-01	-58055	17.305	-1004641.8	9268.800
## 2015-12-07	61014	16.465	1004595.5	-20.000
## 2015-12-08	-61014	16.340	-996968.8	-7646.750
## 2015-12-15	62211	16.025	996931.3	-20.000
## 2015-12-18	-62211	16.485	-1025548.3	28597.060
## 2015-12-23	62077	16.520	1025512.0	-20.000
## 2015-12-30	-62077	16.680	-1035444.4	9912.320
## 2016-01-12	65038	15.920	1035405.0	-20.000
## 2016-01-18	-65038	15.255	-992154.7	-43270.270
## 2016-01-21	65292	15.195	992111.9	-20.000
## 2016-01-26	-65292	15.570	-1016596.4	24464.500
## 2016-02-04	64136	15.850	1016555.6	-20.000
## 2016-02-08	-64136	14.930	-957550.5	-59025.120
## 2016-02-25	62277	15.375	957508.9	-20.000
## 2016-03-02	-62277	15.705	-978060.3	20531.410
## 2016-06-07	62414	15.670	978027.4	-20.000
## 2016-06-10	-62414	14.950	-933089.3	-44958.080
## 2016-07-20	60904	15.320	933049.3	-20.000
## 2016-07-26	-60904	15.140	-922086.6	-10982.720
## 2017-01-11	56222	16.400	922040.8	-20.000
## 2017-01-12	-56222	16.195	-910515.3	-11545.510
## 2017-01-13	56654	16.240	920061.0	-20.000
## 2017-01-19	-56654	16.220	-918927.9	-1153.080
## 2017-02-03	56672	16.045	909302.2	-20.000
## 2017-02-09	-56672	15.930	-902785.0	-6537.280

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## 2017-02-15      56705 15.920   902743.6      -20.000
## 2017-02-21     -56705 16.295  -924008.0     21244.375
## 2017-03-09      57622 16.035   923968.8      -20.000
## 2017-03-15     -57622 15.990  -921375.8     -2612.990
## 2017-04-20      57566 16.005   921343.8      -20.000
## 2017-04-26     -57566 16.400  -944082.4     22718.570
## 2017-05-02      58382 16.170   944036.9      -20.000
## 2017-05-08     -58382 16.810  -981401.4     37344.480
## 2017-05-19      55870 17.565   981356.6      -20.000
## 2017-05-25     -55870 17.850  -997279.5     15902.950
## 2017-06-02      57297 17.405   997254.3      -20.000
## 2017-06-09     -57297 17.125  -981211.1    -16063.160
## 2017-06-16      58929 16.650   981167.8      -20.000
## 2017-06-22     -58929 16.695  -983819.7     2631.805
##
## [1] "Transactions for the instrument: FME.csv"
##      Quantity  Price      Value Net realized Profit
## 1999-12-31         0  0.000         0.0         0.000
## 2003-09-23      57570 17.370   999990.9      -20.000
## 2003-09-29     -57570 16.673  -959864.6    -40146.290
## 2003-12-01      53562 17.920   959831.0      -20.000
## 2003-12-05     -53562 18.397  -985380.1     25529.074
## 2003-12-09      53109 18.553   985331.3      -20.000
## 2003-12-12     -53109 18.283  -970991.8    -14359.430
## 2004-01-16      52721 18.417   970962.7      -20.000
## 2004-01-20     -52721 18.507  -975707.5     4724.890
## 2004-01-27      52362 18.633   975661.1      -20.000
## 2004-02-02     -52362 18.133  -949480.1    -26201.000
## 2004-02-06      52991 17.917   949439.7      -20.000
## 2004-02-12     -52991 18.317  -970636.1     21176.400
## 2004-02-23      52960 18.327   970597.9      -20.000
## 2004-02-25     -52960 18.237  -965831.5    -4786.400
## 2004-02-27      53211 18.150   965779.6      -20.000
## 2004-03-04     -53211 17.727  -943271.4    -22528.253
## 2004-04-30      48413 19.483   943230.5      -20.000
## 2004-05-06     -48413 19.333  -935968.5    -7281.950
## 2004-06-10      44852 20.867   935926.7      -20.000
## 2004-06-16     -44852 21.110  -946825.7     10879.036
## 2004-07-07      45834 20.657   946792.9      -20.000
## 2004-07-13     -45834 20.217  -926626.0    -20186.960
## 2004-08-18      46868 19.770   926580.4      -20.000
## 2004-08-24     -46868 20.223  -947811.6     21211.204
## 2004-09-09      47515 19.947   947781.7      -20.000
## 2004-09-15     -47515 20.650  -981184.7     33383.045
## 2004-10-01      46893 20.923   981142.2      -20.000
## 2004-10-07     -46893 20.843  -977390.8    -3771.440
## 2004-10-28      48924 19.977   977354.7      -20.000
## 2004-11-03     -48924 20.573 -1006513.5     29138.704
## 2004-12-20      50832 19.800  1006473.6      -20.000
## 2004-12-27     -50832 19.660  -999357.1    -7136.480
## 2005-01-17      51778 19.300   999315.4      -20.000
## 2005-01-21     -51778 19.867 -1028673.5     29338.126
## 2005-02-24      47622 21.600  1028635.2      -20.000
## 2005-03-02     -47622 22.460 -1069590.1     40934.920

```

##	2005-04-19	50987	20.977	1069554.3	-20.000
##	2005-04-25	-50987	20.893	-1065271.4	-4302.908
##	2005-05-05	51287	20.770	1065231.0	-20.000
##	2005-05-11	-51287	21.523	-1103850.1	38599.111
##	2005-07-13	47004	23.483	1103794.9	-20.000
##	2005-07-15	-47004	23.413	-1100504.7	-3310.280
##	2005-07-21	46962	23.433	1100460.5	-20.000
##	2005-07-27	-46962	23.533	-1105156.7	4676.200
##	2005-08-03	45894	24.080	1105127.5	-20.000
##	2005-08-09	-45894	23.833	-1093791.7	-11355.818
##	2005-10-24	43271	25.277	1093761.1	-20.000
##	2005-10-28	-43271	24.840	-1074851.6	-18929.427
##	2005-12-07	39573	27.160	1074802.7	-20.000
##	2005-12-13	-39573	28.313	-1120430.3	45607.669
##	2006-01-11	37538	29.847	1120396.7	-20.000
##	2006-01-12	-37538	29.593	-1110862.0	-9554.652
##	2006-01-25	37999	29.233	1110824.8	-20.000
##	2006-01-31	-37999	29.243	-1111204.8	359.990
##	2006-02-22	35844	31.000	1111164.0	-20.000
##	2006-02-28	-35844	30.067	-1077721.5	-33462.452
##	2006-03-09	35241	30.580	1077669.8	-20.000
##	2006-03-15	-35241	32.617	-1149455.7	71765.917
##	2006-03-21	34743	33.083	1149402.7	-20.000
##	2006-03-27	-34743	32.217	-1119315.2	-30107.438
##	2006-04-06	34264	32.667	1119302.1	-20.000
##	2006-04-12	-34264	31.083	-1065027.9	-54294.176
##	2006-05-02	33094	32.180	1064964.9	-20.000
##	2006-05-03	-33094	31.687	-1048649.6	-16335.342
##	2006-05-09	33645	31.167	1048613.7	-20.000
##	2006-05-15	-33645	30.033	-1010460.3	-38173.430
##	2006-05-23	34524	29.267	1010413.9	-20.000
##	2006-05-29	-34524	29.443	-1016490.1	6056.224
##	2006-08-08	31931	31.833	1016459.5	-20.000
##	2006-08-14	-31931	32.860	-1049252.7	32773.137
##	2006-10-18	30957	33.893	1049225.6	-20.000
##	2006-10-24	-30957	36.000	-1114452.0	65206.399
##	2006-11-13	32032	34.790	1114393.3	-20.000
##	2006-11-16	-32032	34.940	-1119198.1	4784.800
##	2006-12-27	32852	34.067	1119169.1	-20.000
##	2007-01-03	-32852	34.647	-1138223.2	19034.160
##	2007-01-11	33205	34.277	1138167.8	-20.000
##	2007-01-16	-33205	34.900	-1158854.5	20666.715
##	2007-02-09	31734	36.517	1158830.5	-20.000
##	2007-02-15	-31734	36.337	-1153118.4	-5732.120
##	2007-03-15	32976	34.967	1153071.8	-20.000
##	2007-03-21	-32976	36.233	-1194819.4	41727.616
##	2007-04-13	32081	37.243	1194792.7	-20.000
##	2007-04-19	-32081	36.683	-1176827.3	-17985.360
##	2007-07-12	35138	33.490	1176771.6	-20.000
##	2007-07-18	-35138	33.390	-1173257.8	-3533.800
##	2007-07-19	35231	33.700	1187284.7	-20.000
##	2007-07-25	-35231	35.150	-1238369.6	51064.950
##	2007-09-07	33857	36.160	1224269.1	-20.000
##	2007-09-13	-33857	37.120	-1256771.8	32482.720

## 2007-09-21	33966	37.000	1256742.0	-20.000
## 2007-09-27	-33966	37.660	-1279159.6	22397.560
## 2007-10-16	35541	35.990	1279120.6	-20.000
## 2007-10-18	-35541	35.680	-1268102.9	-11037.710
## 2007-10-25	35669	35.550	1268032.9	-20.000
## 2007-10-31	-35669	36.460	-1300491.7	32438.790
## 2008-05-22	37263	34.900	1300478.7	-20.000
## 2008-05-28	-37263	35.780	-1333270.1	32771.440
## 2008-06-19	37747	35.320	1333224.0	-20.000
## 2008-06-25	-37747	35.240	-1330204.3	-3039.760
## 2008-07-30	36846	36.100	1330140.6	-20.000
## 2008-08-05	-36846	36.830	-1357038.2	26877.580
## 2008-09-08	37077	36.600	1357018.2	-20.000
## 2008-09-12	-37077	38.270	-1418936.8	61898.590
## 2009-09-25	41720	34.010	1418897.2	-20.000
## 2009-09-28	-41720	33.610	-1402209.2	-16708.000
## 2009-10-05	41620	33.690	1402177.8	-20.000
## 2009-10-08	-41620	33.540	-1395934.8	-6263.000
## 2009-11-03	42300	33.000	1395900.0	-20.000
## 2009-11-09	-42300	34.900	-1476270.0	80350.000
## 2009-12-09	40093	36.820	1476224.3	-20.000
## 2009-12-15	-40093	36.950	-1481436.4	5192.090
## 2009-12-29	39294	37.700	1481383.8	-20.000
## 2010-01-05	-39294	37.300	-1465666.2	-15737.600
## 2010-01-11	40121	36.530	1465620.1	-20.000
## 2010-01-15	-40121	36.930	-1481668.5	16028.400
## 2010-02-08	40559	36.530	1481620.3	-20.000
## 2010-02-12	-40559	36.945	-1498452.3	16811.985
## 2010-02-24	39714	37.730	1498409.2	-20.000
## 2010-03-02	-39714	40.190	-1596105.7	97676.440
## 2010-03-09	39972	39.930	1596082.0	-20.000
## 2010-03-15	-39972	40.175	-1605875.1	9773.140
## 2010-04-13	38583	41.620	1605824.5	-20.000
## 2010-04-19	-38583	41.625	-1606017.4	172.915
## 2010-05-03	38862	41.325	1605972.2	-20.000
## 2010-05-07	-38862	38.860	-1510177.3	-95814.830
## 2010-06-15	34132	44.245	1510170.3	-20.000
## 2010-06-18	-34132	44.420	-1516143.4	5953.100
## 2010-09-06	34367	44.115	1516100.2	-20.000
## 2010-09-09	-34367	43.890	-1508367.6	-7752.575
## 2010-10-01	33019	45.680	1508307.9	-20.000
## 2010-10-07	-33019	44.465	-1468189.8	-40138.085
## 2010-11-30	32749	44.830	1468137.7	-20.000
## 2010-12-03	-32749	44.870	-1469447.6	1289.960
## 2010-12-14	33028	44.490	1469415.7	-20.000
## 2010-12-20	-33028	43.010	-1420534.3	-48901.440
## 2011-01-03	32502	43.705	1420499.9	-20.000
## 2011-01-07	-32502	43.440	-1411886.9	-8633.030
## 2011-01-12	32595	43.315	1411852.4	-20.000
## 2011-01-18	-32595	42.045	-1370456.8	-41415.650
## 2011-01-20	32571	42.075	1370424.8	-20.000
## 2011-01-26	-32571	42.060	-1369936.3	-508.565
## 2011-03-30	28659	47.800	1369900.2	-20.000
## 2011-04-05	-28659	48.440	-1388242.0	18321.760

## 2011-04-13	28112	49.380	1388170.6	-20.000
## 2011-04-19	-28112	50.900	-1430900.8	42710.240
## 2011-05-06	28200	50.740	1430868.0	-20.000
## 2011-05-12	-28200	50.380	-1420716.0	-10172.000
## 2011-05-24	28402	50.020	1420668.0	-20.000
## 2011-05-30	-28402	49.575	-1408029.2	-12658.890
## 2011-07-13	27015	52.120	1408021.8	-20.000
## 2011-07-19	-27015	54.470	-1471507.1	63465.250
## 2011-08-01	27194	54.110	1471467.3	-20.000
## 2011-08-05	-27194	48.600	-1321628.4	-149858.940
## 2011-08-10	28251	46.780	1321581.8	-20.000
## 2011-08-16	-28251	47.985	-1355624.2	34022.455
## 2011-08-31	29052	46.660	1355566.3	-20.000
## 2011-09-05	-29052	46.870	-1361667.2	6080.920
## 2011-09-06	29439	47.310	1392759.1	-20.000
## 2011-09-12	-29439	48.405	-1424994.8	32215.705
## 2011-10-28	26249	53.100	1393821.9	-20.000
## 2011-11-03	-26249	50.920	-1336599.1	-57242.820
## 2011-12-29	25502	52.410	1336559.8	-20.000
## 2012-01-04	-25502	54.420	-1387818.8	51239.020
## 2012-02-10	25362	54.720	1387808.6	-20.000
## 2012-02-16	-25362	55.670	-1411902.5	24073.900
## 2012-03-08	27109	52.080	1411836.7	-20.000
## 2012-03-14	-27109	52.380	-1419969.4	8112.700
## 2012-03-26	27291	52.030	1419950.7	-20.000
## 2012-03-30	-27291	53.140	-1450243.7	30273.010
## 2012-04-12	27476	52.780	1450183.3	-20.000
## 2012-04-18	-27476	53.020	-1456777.5	6574.240
## 2012-05-08	27403	53.160	1456743.5	-20.000
## 2012-05-14	-27403	52.350	-1434547.1	-22216.430
## 2012-06-06	27656	51.870	1434516.7	-20.000
## 2012-06-12	-27656	52.500	-1451940.0	17403.280
## 2012-06-18	27446	52.900	1451893.4	-20.000
## 2012-06-22	-27446	55.070	-1511451.2	59537.820
## 2012-07-13	26586	56.850	1511414.1	-20.000
## 2012-07-19	-26586	58.600	-1557939.6	46505.500
## 2012-08-20	26888	57.940	1557890.7	-20.000
## 2012-08-24	-26888	56.660	-1523474.1	-34436.640
## 2012-09-05	26545	57.390	1523417.6	-20.000
## 2012-09-11	-26545	56.710	-1505366.9	-18070.600
## 2012-09-20	27370	55.000	1505350.0	-20.000
## 2012-09-26	-27370	56.540	-1547499.8	42129.800
## 2012-10-15	26680	58.000	1547440.0	-20.000
## 2012-10-19	-26680	59.250	-1580790.0	33330.000
## 2012-10-25	27316	57.870	1580776.9	-20.000
## 2012-10-31	-27316	54.190	-1480254.0	-100542.880
## 2013-12-10	28731	51.520	1480221.1	-20.000
## 2013-12-11	-28731	50.900	-1462407.9	-17833.220
## 2014-02-03	27722	52.750	1462335.5	-20.000
## 2014-02-07	-27722	51.840	-1437108.5	-25247.020
## 2014-02-19	26856	53.510	1437064.6	-20.000
## 2014-02-25	-26856	49.820	-1337965.9	-99118.640
## 2014-08-11	25710	52.040	1337948.4	-20.000
## 2014-08-15	-25710	51.180	-1315837.8	-22130.600

## 2014-09-29	24236	54.290	1315772.4	-20.000
## 2014-10-06	-24236	54.920	-1331041.1	15248.680
## 2014-10-17	25484	52.230	1331029.3	-20.000
## 2014-10-23	-25484	55.650	-1418184.6	87135.280
## 2014-11-04	24167	58.680	1418119.6	-20.000
## 2014-11-10	-24167	58.620	-1416669.5	-1470.020
## 2014-11-13	24245	58.430	1416635.4	-20.000
## 2014-11-19	-24245	58.100	-1408634.5	-8020.850
## 2014-12-01	23524	59.880	1408617.1	-20.000
## 2014-12-05	-23524	59.590	-1401795.2	-6841.960
## 2014-12-16	23448	59.780	1401721.4	-20.000
## 2014-12-22	-23448	61.610	-1444631.3	42889.840
## 2015-01-05	23154	62.390	1444578.1	-20.000
## 2015-01-09	-23154	62.260	-1441568.0	-3030.020
## 2015-02-17	22666	63.600	1441557.6	-20.000
## 2015-02-23	-22666	65.130	-1476236.6	34658.980
## 2015-03-24	19102	77.280	1476202.6	-20.000
## 2015-03-25	-19102	76.310	-1457673.6	-18548.940
## 2015-03-27	19116	76.250	1457595.0	-20.000
## 2015-04-02	-19116	77.680	-1484930.9	27315.880
## 2015-04-20	18536	80.110	1484919.0	-20.000
## 2015-04-24	-18536	79.790	-1478987.4	-5951.520
## 2015-04-30	18735	78.940	1478940.9	-20.000
## 2015-05-07	-18735	74.940	-1404000.9	-74960.000
## 2015-05-21	17860	78.610	1403974.6	-20.000
## 2015-05-28	-17860	79.190	-1414333.4	10338.800
## 2015-06-03	18051	78.350	1414295.8	-20.000
## 2015-06-09	-18051	75.070	-1355088.6	-59227.280
## 2015-06-16	18154	74.640	1355014.6	-20.000
## 2015-06-22	-18154	76.350	-1386057.9	31023.340
## 2015-07-07	18751	73.920	1386073.9	-20.000
## 2015-07-13	-18751	77.720	-1457327.7	71233.800
## 2015-08-13	19666	74.100	1457250.6	-20.000
## 2015-08-19	-19666	73.450	-1444467.7	-12802.900
## 2015-08-25	21597	66.880	1444407.4	-20.000
## 2015-08-26	-21597	65.620	-1417195.1	-27232.220
## 2015-09-02	21061	67.290	1417194.7	-20.000
## 2015-09-08	-21061	70.570	-1486274.8	69060.080
## 2015-09-21	20671	71.900	1486244.9	-20.000
## 2015-09-25	-20671	71.820	-1484591.2	-1673.680
## 2015-09-30	21192	70.050	1484499.6	-20.000
## 2015-10-06	-21192	71.620	-1517771.0	33251.440
## 2015-10-15	21071	72.030	1517744.1	-20.000
## 2015-10-21	-21071	74.910	-1578428.6	60664.480
## 2015-10-28	19949	79.120	1578364.9	-20.000
## 2015-11-03	-19949	81.860	-1633025.1	54640.260
## 2015-12-15	21695	75.270	1632982.6	-20.000
## 2015-12-18	-21695	77.160	-1673986.2	40983.550
## 2015-12-23	22009	76.060	1674004.5	-20.000
## 2016-01-04	-22009	74.600	-1641871.4	-32153.140
## 2016-01-21	22715	72.280	1641840.2	-20.000
## 2016-01-27	-22715	81.350	-1847865.2	206005.050
## 2016-02-25	24230	76.260	1847779.8	-20.000
## 2016-03-02	-24230	77.790	-1884851.7	37051.900

## 2016-03-17	24358	77.380	1884822.0	-20.000
## 2016-03-22	-24358	75.140	-1830260.1	-54581.920
## 2016-03-29	23791	76.930	1830241.6	-20.000
## 2016-04-04	-23791	78.260	-1861883.7	31622.030
## 2016-04-06	24064	77.370	1861831.7	-20.000
## 2016-04-12	-24064	78.340	-1885173.8	23322.080
## 2016-04-18	23823	79.130	1885114.0	-20.000
## 2016-04-22	-23823	79.050	-1883208.1	-1925.840
## 2016-05-12	24930	75.540	1883212.2	-20.000
## 2016-05-19	-24930	73.060	-1821385.8	-61846.400
## 2016-06-03	23474	77.590	1821347.7	-20.000
## 2016-06-08	-23474	76.380	-1792944.1	-28423.540
## 2016-06-15	24536	73.070	1792845.5	-20.000
## 2016-06-17	-24536	72.250	-1772726.0	-20139.520
## 2016-07-07	22675	78.180	1772731.5	-20.000
## 2016-07-12	-22675	79.200	-1795860.0	23108.500
## 2016-09-02	22572	79.560	1795828.3	-20.000
## 2016-09-08	-22572	79.880	-1803051.4	7203.040
## 2016-09-13	22799	79.080	1802944.9	-20.000
## 2016-09-19	-22799	78.540	-1790633.5	-12331.460
## 2016-09-28	22692	78.910	1790625.7	-20.000
## 2016-10-05	-22692	76.090	-1726634.3	-64011.440
## 2016-12-15	22130	78.020	1726582.6	-20.000
## 2016-12-21	-22130	81.080	-1794300.4	67697.800
## 2017-01-02	21994	81.580	1794270.5	-20.000
## 2017-01-06	-21994	80.600	-1772716.4	-21574.120
## 2017-01-13	23297	76.090	1772668.7	-20.000
## 2017-01-17	-23297	75.960	-1769640.1	-3048.610
## 2017-02-01	23405	75.610	1769652.1	-20.000
## 2017-02-07	-23405	75.940	-1777375.7	7703.650
## 2017-02-15	23037	77.150	1777304.6	-20.000
## 2017-02-21	-23037	77.620	-1788131.9	10807.390
## 2017-02-27	22866	78.200	1788121.2	-20.000
## 2017-03-03	-22866	79.070	-1808014.6	19873.420
## 2017-03-20	22865	79.070	1807935.5	-20.000
## 2017-03-21	-22865	77.010	-1760833.7	-47121.900
## 2017-05-02	21255	82.840	1760764.2	-20.000
## 2017-05-08	-21255	84.830	-1803061.6	42277.450
## 2017-05-25	21996	81.970	1803012.1	-20.000
## 2017-05-31	-21996	85.160	-1873179.4	70147.240
## 2017-06-22	21262	88.100	1873182.2	-20.000
## 2017-06-28	-21262	86.200	-1832784.4	-40417.800
## 2017-07-12	21787	84.120	1832722.4	-20.000
## 2017-07-17	-21787	85.160	-1855380.9	22638.480
## 2017-07-20	21980	84.410	1855331.8	-20.000
## 2017-07-26	-21980	81.410	-1789391.8	-65960.000
## 2017-07-31	22176	80.690	1789381.4	-20.000
## 2017-08-03	-22176	77.760	-1724405.8	-64995.680
## 2017-08-22	21783	79.160	1724342.3	-20.000
## 2017-08-28	-21783	78.240	-1704301.9	-20060.360
## 2017-09-05	21483	79.330	1704246.4	-20.000
## 2017-09-06	-21483	78.800	-1692860.4	-11405.990
## 2017-09-22	20569	82.300	1692828.7	-20.000
## 2017-09-28	-20569	82.670	-1700439.2	7590.530

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## 2017-10-11      20915 81.300 1700389.5      -20.000
## 2017-10-17     -20915 80.850 -1690977.7     -9431.750
## 2017-11-01      20023 84.450 1690942.4      -20.000
## 2017-11-07     -20023 84.190 -1685736.4     -5225.980
## 2017-11-09      19961 84.450 1685706.4      -20.000
## 2017-11-15     -19961 83.000 -1656763.0    -28963.450
## 2017-11-16      19980 83.440 1667131.2      -20.000
## 2017-11-22     -19980 82.700 -1652346.0    -14805.200
## 2017-11-24      19816 82.860 1641953.8      -20.000
## 2017-11-30     -19816 82.600 -1636801.6     -5172.160
## 2017-12-21      18603 87.980 1636691.9      -20.000
## 2017-12-29     -18603 87.780 -1632971.3     -3740.600
## 2018-01-03      18641 87.600 1632951.6      -20.000
## 2018-01-09     -18641 92.040 -1715717.6     82746.040
## 2018-01-16      19148 89.600 1715660.8      -20.000
## 2018-01-22     -19148 90.300 -1729064.4    13383.600
## 2018-01-26      18831 91.820 1729062.4      -20.000
## 2018-02-01     -18831 90.240 -1699309.4    -29772.980
## 2018-02-07      19604 86.680 1699274.7      -20.000
## 2018-02-08     -19604 84.960 -1665555.8    -33738.880
## 2018-02-12      19411 85.800 1665463.8      -20.000
## 2018-02-16     -19411 87.880 -1705838.7     40354.880
## 2018-02-28      19495 87.500 1705812.5      -20.000
## 2018-03-06     -19495 83.000 -1618085.0    -87747.500
## 2018-05-30      18590 87.040 1618073.6      -20.000
## 2018-05-31     -18590 86.360 -1605432.4    -12661.200
## 2018-06-04      18728 85.720 1605364.2      -20.000
## 2018-06-08     -18728 86.680 -1623343.0    17958.880
## 2018-07-24      19275 84.220 1623340.5      -20.000
## 2018-07-30     -19275 85.720 -1652253.0    28892.500
## 2018-09-07      19083 86.580 1652206.1      -20.000
## 2018-09-13     -19083 89.040 -1699150.3    46924.180
##
## [1] "Transactions for the instrument: FRE.csv"
##      Quantity  Price      Value Net realized Profit
## 1999-12-31         0  0.000         0.0         0.000
## 2003-10-01    139314  7.178    999995.9        -20.000
## 2003-10-03   -139314  7.093   -988154.2       -11861.690
## 2003-10-14    145034  6.813    988116.6        -20.000
## 2003-10-20   -145034  6.602   -957514.5       -30622.174
## 2003-12-11    140145  6.832    957470.6        -20.000
## 2003-12-17   -140145  6.997   -980594.6        23103.925
## 2004-01-02    137699  7.121    980554.6        -20.000
## 2004-01-08   -137699  7.350  -1012087.6       31513.071
## 2004-01-22    135319  7.479   1012050.8        -20.000
## 2004-01-26   -135319  7.482  -1012456.8         385.957
## 2004-01-29    139183  7.274   1012417.1        -20.000
## 2004-02-03   -139183  7.318  -1018541.2        6104.052
## 2004-02-04    139180  7.372   1026035.0        -20.000
## 2004-02-10   -139180  7.534  -1048582.1       22527.160
## 2004-03-05    147744  7.046   1041004.2        -20.000
## 2004-03-11   -147744  7.025  -1037901.6       -3122.624
## 2004-04-13    145054  7.155   1037861.4        -20.000
## 2004-04-14   -145054  7.142  -1035975.7       -1905.702

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##	2004-04-15	145316	7.142	1037846.9	-20.000
##	2004-04-21	-145316	7.263	-1055430.1	17563.236
##	2004-06-07	134065	7.858	1053482.8	-20.000
##	2004-06-11	-134065	7.631	-1023050.0	-30452.755
##	2004-06-15	135588	7.545	1023011.5	-20.000
##	2004-06-21	-135588	7.643	-1036299.1	13267.624
##	2004-06-29	139507	7.428	1036258.0	-20.000
##	2004-07-01	-139507	7.480	-1043512.4	7234.364
##	2004-07-14	154109	6.771	1043472.0	-20.000
##	2004-07-20	-154109	7.101	-1094328.0	50835.970
##	2004-08-16	152940	7.155	1094285.7	-20.000
##	2004-08-20	-152940	7.176	-1097497.4	3191.740
##	2004-09-02	155690	7.049	1097458.8	-20.000
##	2004-09-08	-155690	7.155	-1113961.9	16483.140
##	2004-10-07	138858	8.022	1113918.9	-20.000
##	2004-10-13	-138858	7.854	-1090590.7	-23348.144
##	2004-11-17	130652	8.347	1090552.2	-20.000
##	2004-11-23	-130652	8.618	-1125958.9	35386.692
##	2004-12-09	127122	8.857	1125919.6	-20.000
##	2004-12-10	-127122	8.607	-1094139.1	-31800.500
##	2004-12-22	127265	8.597	1094097.2	-20.000
##	2004-12-30	-127265	8.092	-1029828.4	-64288.825
##	2005-01-12	121166	8.499	1029789.8	-20.000
##	2005-01-18	-121166	8.542	-1035000.0	5190.138
##	2005-02-17	113321	9.133	1034960.7	-20.000
##	2005-02-18	-113321	9.019	-1022042.1	-12938.594
##	2005-03-23	113041	9.041	1022003.7	-20.000
##	2005-03-31	-113041	9.431	-1066089.7	44065.990
##	2005-04-07	113700	9.376	1066051.2	-20.000
##	2005-04-13	-113700	9.410	-1069917.0	3845.800
##	2005-06-22	106001	10.093	1069868.1	-20.000
##	2005-06-24	-106001	9.965	-1056300.0	-13588.128
##	2005-07-08	100914	10.467	1056266.8	-20.000
##	2005-07-14	-100914	10.429	-1052432.1	-3854.732
##	2005-07-20	100707	10.450	1052388.1	-20.000
##	2005-07-26	-100707	10.665	-1074040.2	21632.005
##	2005-08-16	102150	10.514	1074005.1	-20.000
##	2005-08-22	-102150	10.201	-1042032.2	-31992.950
##	2005-09-19	98079	10.624	1041991.3	-20.000
##	2005-09-22	-98079	11.107	-1089363.5	47352.157
##	2005-09-23	98965	11.270	1115335.6	-20.000
##	2005-09-29	-98965	11.404	-1128596.9	13241.310
##	2005-10-07	98564	11.186	1102536.9	-20.000
##	2005-10-11	-98564	11.366	-1120278.4	17721.520
##	2005-10-17	101361	11.052	1120241.8	-20.000
##	2005-10-21	-101361	11.166	-1131796.9	11535.154
##	2005-10-31	97205	11.643	1131757.8	-20.000
##	2005-11-04	-97205	11.784	-1145463.7	13685.905
##	2005-11-23	102932	11.128	1145427.3	-20.000
##	2005-11-29	-102932	11.222	-1155102.9	9655.608
##	2005-12-01	102435	11.276	1155057.1	-20.000
##	2005-12-07	-102435	11.600	-1188246.0	33168.940
##	2005-12-12	102822	11.556	1188211.0	-20.000
##	2005-12-15	-102822	11.472	-1179574.0	-8657.048

##	2005-12-16	103607	11.499	1191376.9	-20.000
##	2005-12-19	-103607	11.444	-1185678.5	-5718.385
##	2006-02-14	82696	14.194	1173787.0	-20.000
##	2006-02-20	-82696	14.168	-1171636.9	-2170.096
##	2006-03-21	77079	15.200	1171600.8	-20.000
##	2006-03-27	-77079	15.239	-1174606.9	2986.081
##	2006-05-02	79037	14.861	1174568.9	-20.000
##	2006-05-08	-79037	14.667	-1159235.7	-15353.178
##	2006-05-25	86006	13.478	1159188.9	-20.000
##	2006-05-31	-86006	13.660	-1174842.0	15633.092
##	2006-06-09	87450	13.434	1174803.3	-20.000
##	2006-06-15	-87450	13.178	-1152416.1	-22407.200
##	2006-06-29	81665	14.111	1152374.8	-20.000
##	2006-07-05	-81665	14.346	-1171566.1	19171.275
##	2006-07-20	88304	13.267	1171529.2	-20.000
##	2006-07-26	-88304	13.611	-1201905.7	30356.576
##	2006-08-08	85848	14.000	1201872.0	-20.000
##	2006-08-14	-85848	14.130	-1213032.2	11140.240
##	2006-08-15	85559	14.328	1225889.4	-20.000
##	2006-08-21	-85559	14.911	-1275770.2	49860.897
##	2006-09-08	82657	15.278	1262833.6	-20.000
##	2006-09-14	-82657	15.071	-1245723.6	-17129.999
##	2006-10-18	79713	15.627	1245675.1	-20.000
##	2006-10-24	-79713	16.022	-1277161.7	31466.635
##	2006-12-22	76612	16.670	1277122.0	-20.000
##	2007-01-02	-76612	16.956	-1299033.1	21891.032
##	2007-01-22	75911	17.112	1298989.0	-20.000
##	2007-01-25	-75911	17.000	-1290487.0	-8522.032
##	2007-02-09	72784	17.730	1290460.3	-20.000
##	2007-02-15	-72784	18.320	-1333402.9	42922.560
##	2007-03-15	74669	17.857	1333364.3	-20.000
##	2007-03-21	-74669	19.867	-1483449.0	150064.690
##	2007-03-26	74181	19.997	1483397.5	-20.000
##	2007-03-30	-74181	20.043	-1486809.8	3392.326
##	2007-05-14	73519	20.223	1486774.7	-20.000
##	2007-05-18	-73519	19.577	-1439281.5	-47513.274
##	2007-06-14	74638	19.283	1439244.6	-20.000
##	2007-06-20	-74638	19.367	-1445514.1	6249.592
##	2007-06-28	77092	18.750	1445475.0	-20.000
##	2007-07-04	-77092	19.290	-1487104.7	41609.680
##	2007-07-30	79906	18.610	1487050.7	-20.000
##	2007-08-03	-79906	18.433	-1472907.3	-14163.362
##	2007-08-13	83058	17.733	1472867.5	-20.000
##	2007-08-17	-83058	17.397	-1444960.0	-27927.488
##	2007-09-11	81866	17.650	1444934.9	-20.000
##	2007-09-14	-81866	17.823	-1459097.7	14142.818
##	2007-09-18	81616	17.877	1459049.2	-20.000
##	2007-09-24	-81616	18.410	-1502550.6	43481.328
##	2007-10-04	81512	18.433	1502510.7	-20.000
##	2007-10-10	-81512	18.970	-1546282.6	43751.944
##	2007-10-23	85984	17.983	1546250.3	-20.000
##	2007-10-26	-85984	17.500	-1504720.0	-41550.272
##	2007-10-31	88096	17.080	1504679.7	-20.000
##	2007-11-06	-88096	18.167	-1600440.0	95740.352

## 2008-01-22	86089	18.590	1600394.5	-20.000
## 2008-01-28	-86089	18.160	-1563376.2	-37038.270
## 2008-02-01	85742	18.233	1563333.9	-20.000
## 2008-02-05	-85742	18.133	-1554759.7	-8594.200
## 2008-03-05	78908	19.703	1554724.3	-20.000
## 2008-03-07	-78908	19.480	-1537127.8	-17616.484
## 2008-05-02	83583	18.390	1537091.4	-20.000
## 2008-05-08	-83583	19.603	-1638477.5	101366.179
## 2008-06-03	81526	20.097	1638428.0	-20.000
## 2008-06-06	-81526	19.863	-1619350.9	-19097.084
## 2008-06-19	82631	19.597	1619319.7	-20.000
## 2008-06-25	-82631	18.817	-1554867.5	-64472.180
## 2008-07-16	86221	18.033	1554823.3	-20.000
## 2008-07-18	-86221	17.973	-1549650.0	-5193.260
## 2008-09-08	82677	18.743	1549615.0	-20.000
## 2008-09-11	-82677	18.920	-1564248.8	14613.829
## 2010-01-13	111149	14.073	1564199.9	-20.000
## 2010-01-18	-111149	14.687	-1632445.4	68225.486
## 2010-02-08	111603	14.627	1632417.1	-20.000
## 2010-02-12	-111603	14.707	-1641345.3	8908.240
## 2010-02-24	105604	15.542	1641297.4	-20.000
## 2010-03-02	-105604	16.437	-1735812.9	94495.580
## 2010-03-24	106047	16.368	1735777.3	-20.000
## 2010-03-26	-106047	16.298	-1728354.0	-7443.290
## 2010-04-07	93437	18.497	1728304.2	-20.000
## 2010-04-13	-93437	18.500	-1728584.5	260.311
## 2010-04-29	96228	17.963	1728543.6	-20.000
## 2010-05-05	-96228	16.927	-1628851.4	-99712.208
## 2010-05-10	97243	16.750	1628820.2	-20.000
## 2010-05-14	-97243	17.407	-1692708.9	63868.651
## 2010-07-06	96027	17.627	1692667.9	-20.000
## 2010-07-07	-96027	17.490	-1679512.2	-13175.699
## 2010-08-02	93133	18.033	1679467.4	-20.000
## 2010-08-06	-93133	19.023	-1771669.1	92181.670
## 2010-08-12	92887	19.073	1771633.8	-20.000
## 2010-08-18	-92887	19.003	-1765131.7	-6522.090
## 2010-08-25	95240	18.533	1765082.9	-20.000
## 2010-08-31	-95240	18.663	-1777464.1	12361.200
## 2010-10-06	90871	19.560	1777436.8	-20.000
## 2010-10-12	-90871	19.493	-1771348.4	-6108.357
## 2010-11-12	83355	21.250	1771293.8	-20.000
## 2010-11-18	-83355	22.030	-1836310.7	64996.900
## 2010-12-08	83467	22.000	1836274.0	-20.000
## 2010-12-14	-83467	21.667	-1808479.5	-27814.511
## 2010-12-21	85830	21.070	1808438.1	-20.000
## 2010-12-28	-85830	21.197	-1819338.5	10880.410
## 2011-03-09	81667	22.277	1819295.8	-20.000
## 2011-03-11	-81667	21.940	-1791774.0	-27541.779
## 2011-03-16	84226	21.273	1791739.7	-20.000
## 2011-03-22	-84226	21.333	-1796793.3	5033.560
## 2011-05-24	76231	23.570	1796764.7	-20.000
## 2011-05-25	-76231	23.343	-1779460.2	-17324.437
## 2011-06-09	73896	24.080	1779415.7	-20.000
## 2011-06-10	-73896	23.753	-1755251.7	-24183.992

## 2011-08-10	82238	21.343	1755205.6	-20.000
## 2011-08-16	-82238	22.947	-1887115.4	131889.752
## 2011-09-06	79089	23.860	1887063.5	-20.000
## 2011-09-07	-79089	23.397	-1850445.3	-36638.207
## 2011-09-13	78034	23.713	1850420.2	-20.000
## 2011-09-16	-78034	23.253	-1814524.6	-35915.640
## 2011-09-26	78153	23.217	1814478.2	-20.000
## 2011-09-30	-78153	22.217	-1736325.2	-78173.000
## 2011-11-02	73728	23.550	1736294.4	-20.000
## 2011-11-08	-73728	24.327	-1793581.1	57266.656
## 2011-12-07	76441	23.463	1793535.2	-20.000
## 2011-12-13	-76441	23.303	-1781304.6	-12250.560
## 2011-12-15	76361	23.327	1781273.0	-20.000
## 2011-12-21	-76361	23.433	-1789367.3	8074.266
## 2011-12-29	75330	23.753	1789313.5	-20.000
## 2012-01-04	-75330	24.560	-1850104.8	60771.310
## 2012-04-02	71800	25.767	1850070.6	-20.000
## 2012-04-10	-71800	24.867	-1785450.6	-64640.000
## 2012-04-12	71294	25.043	1785415.6	-20.000
## 2012-04-13	-71294	24.683	-1759749.8	-25685.840
## 2012-04-24	72694	24.207	1759703.7	-20.000
## 2012-04-26	-72694	24.250	-1762829.5	3105.842
## 2012-05-08	67990	25.927	1762776.7	-20.000
## 2012-05-09	-67990	25.517	-1734900.8	-27895.900
## 2012-09-11	59156	29.327	1734868.0	-20.000
## 2012-09-17	-59156	28.763	-1701504.0	-33383.984
## 2012-10-25	55363	30.733	1701471.1	-20.000
## 2012-10-26	-55363	30.503	-1688737.6	-12753.490
## 2012-11-27	58271	28.980	1688693.6	-20.000
## 2012-12-03	-58271	29.800	-1736475.8	47762.220
## 2012-12-14	58697	29.583	1736433.4	-20.000
## 2012-12-17	-58697	29.427	-1727276.6	-9176.732
## 2012-12-27	58525	29.513	1727248.3	-20.000
## 2013-01-04	-58525	28.807	-1685929.7	-41338.650
## 2013-01-08	58680	28.730	1685876.4	-20.000
## 2013-01-14	-58680	27.567	-1617631.6	-68264.840
## 2013-02-21	54342	29.767	1617598.3	-20.000
## 2013-02-27	-54342	31.103	-1690199.2	72580.912
## 2013-04-02	51624	32.740	1690169.8	-20.000
## 2013-04-08	-51624	32.617	-1683820.0	-6369.752
## 2013-05-22	52920	31.817	1683755.6	-20.000
## 2013-05-28	-52920	31.460	-1664863.2	-18912.440
## 2013-06-03	53866	30.907	1664836.5	-20.000
## 2013-06-07	-53866	30.573	-1646845.2	-18011.244
## 2013-07-03	53490	30.787	1646796.6	-20.000
## 2013-07-05	-53490	30.980	-1657120.2	10303.570
## 2013-12-05	47120	35.167	1657069.0	-20.000
## 2013-12-11	-47120	34.833	-1641331.0	-15758.080
## 2014-01-03	44042	37.267	1641313.2	-20.000
## 2014-01-07	-44042	37.333	-1644220.0	2886.772
## 2014-02-26	43078	38.167	1644158.0	-20.000
## 2014-03-03	-43078	36.883	-1588845.9	-55332.152
## 2014-03-04	43698	37.000	1616826.0	-20.000
## 2014-03-05	-43698	36.767	-1606644.4	-10201.634

## 2014-03-11	43911	35.950	1578600.5	-20.000
## 2014-03-17	-43911	35.633	-1564680.7	-13939.787
## 2014-03-25	42770	36.583	1564654.9	-20.000
## 2014-03-31	-42770	37.867	-1619571.6	54896.680
## 2014-04-16	45407	35.667	1619531.5	-20.000
## 2014-04-24	-45407	36.433	-1654313.2	34761.762
## 2014-04-29	45550	36.317	1654239.4	-20.000
## 2014-05-06	-45550	35.767	-1629186.9	-25072.500
## 2014-06-02	44513	36.600	1629175.8	-20.000
## 2014-06-06	-44513	36.867	-1641060.8	11864.971
## 2014-06-24	44877	36.567	1641017.3	-20.000
## 2014-06-30	-44877	36.300	-1629035.1	-12002.159
## 2014-07-10	43751	37.233	1628981.0	-20.000
## 2014-07-16	-43751	37.850	-1655975.4	26974.367
## 2014-09-24	43090	38.430	1655948.7	-20.000
## 2014-09-30	-43090	39.195	-1688912.6	32943.850
## 2014-10-08	44286	38.135	1688846.6	-20.000
## 2014-10-14	-44286	37.960	-1681096.6	-7770.050
## 2014-10-17	45057	37.310	1681076.7	-20.000
## 2014-10-23	-45057	38.655	-1741678.3	60581.665
## 2014-12-04	40158	43.370	1741652.5	-20.000
## 2014-12-09	-40158	43.070	-1729605.1	-12067.400
## 2015-01-23	35653	48.510	1729527.0	-20.000
## 2015-01-29	-35653	50.520	-1801189.6	71642.530
## 2015-02-05	36099	49.895	1801159.6	-20.000
## 2015-02-11	-36099	48.480	-1750079.5	-51100.085
## 2015-03-24	31652	55.290	1750039.1	-20.000
## 2015-03-30	-31652	56.020	-1773145.0	23085.960
## 2015-04-09	31948	55.500	1773114.0	-20.000
## 2015-04-15	-31948	56.250	-1797075.0	23941.000
## 2015-04-30	32228	55.760	1797033.3	-20.000
## 2015-05-07	-32228	53.860	-1735800.1	-61253.200
## 2015-06-10	31314	55.430	1735735.0	-20.000
## 2015-06-12	-31314	55.470	-1736987.6	1232.560
## 2015-06-16	31455	55.220	1736945.1	-20.000
## 2015-06-22	-31455	57.950	-1822817.2	85852.150
## 2015-07-07	31520	57.830	1822801.6	-20.000
## 2015-07-13	-31520	61.260	-1930915.2	108093.600
## 2015-07-24	30412	63.490	1930857.9	-20.000
## 2015-07-30	-30412	62.050	-1887064.6	-43813.280
## 2015-08-10	29315	64.370	1887006.6	-20.000
## 2015-08-14	-29315	65.390	-1916907.9	29881.300
## 2015-08-25	32424	59.120	1916906.9	-20.000
## 2015-08-31	-32424	63.050	-2044333.2	127406.320
## 2015-09-02	32740	62.440	2044285.6	-20.000
## 2015-09-04	-32740	62.380	-2042321.2	-1984.400
## 2015-10-05	34382	59.400	2042290.8	-20.000
## 2015-10-09	-34382	57.670	-1982809.9	-59500.860
## 2015-10-15	34531	57.420	1982770.0	-20.000
## 2015-10-21	-34531	60.050	-2073586.5	90796.530
## 2015-11-25	30346	68.330	2073542.2	-20.000
## 2015-12-01	-30346	68.770	-2086894.4	13332.240
## 2015-12-23	32440	64.330	2086865.2	-20.000
## 2016-01-04	-32440	62.570	-2029770.8	-57114.400

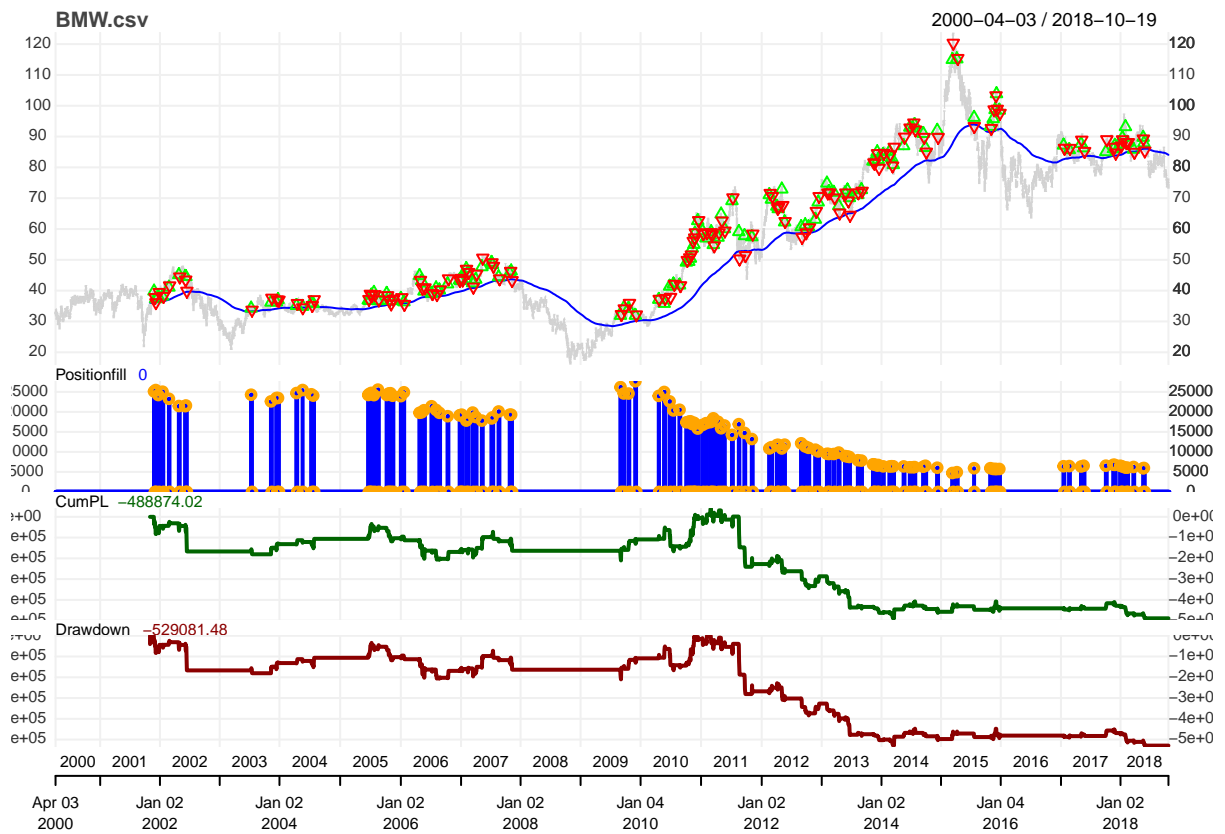
## 2016-01-08	32849	61.790	2029739.7	-20.000
## 2016-01-14	-32849	60.050	-1972582.4	-57177.260
## 2016-01-21	33695	58.540	1972505.3	-20.000
## 2016-01-26	-33695	59.670	-2010580.7	38055.350
## 2016-03-08	33398	60.200	2010559.6	-20.000
## 2016-03-10	-33398	60.100	-2007219.8	-3359.800
## 2016-03-21	32296	62.150	2007196.4	-20.000
## 2016-03-24	-32296	62.220	-2009457.1	2240.720
## 2016-03-29	32492	62.490	2030425.1	-20.000
## 2016-04-01	-32492	63.350	-2058368.2	27923.120
## 2016-04-04	32381	63.780	2065260.2	-20.000
## 2016-04-08	-32381	63.360	-2051660.2	-13620.020
## 2016-04-18	31014	65.250	2023663.5	-20.000
## 2016-04-22	-31014	65.260	-2023973.6	290.140
## 2016-06-03	29966	67.540	2023903.6	-20.000
## 2016-06-08	-29966	66.580	-1995136.3	-28787.360
## 2016-06-15	31714	62.910	1995127.7	-20.000
## 2016-06-21	-31714	64.620	-2049358.7	54210.940
## 2016-07-07	31278	65.520	2049334.6	-20.000
## 2016-07-13	-31278	67.200	-2101881.6	52527.040
## 2016-07-14	31199	67.740	2113420.3	-20.000
## 2016-07-20	-31199	67.210	-2096884.8	-16555.470
## 2016-08-01	30729	67.860	2085269.9	-20.000
## 2016-08-05	-30729	67.210	-2065296.1	-19993.850
## 2016-09-02	31449	65.670	2065255.8	-20.000
## 2016-09-08	-31449	70.520	-2217783.5	152507.650
## 2016-09-13	31905	69.510	2217716.6	-20.000
## 2016-09-16	-31905	69.400	-2214207.0	-3529.550
## 2016-10-10	31482	70.330	2214129.1	-20.000
## 2016-10-14	-31482	69.860	-2199332.5	-14816.540
## 2016-10-18	31559	69.690	2199346.7	-20.000
## 2016-10-20	-31559	70.130	-2213232.7	13865.960
## 2016-10-27	32243	68.640	2213159.5	-20.000
## 2016-11-02	-32243	66.100	-2131262.3	-81917.220
## 2016-11-07	32331	65.920	2131259.5	-20.000
## 2016-11-11	-32331	68.020	-2199154.6	67875.100
## 2016-11-24	33054	66.530	2199082.6	-20.000
## 2016-11-30	-33054	67.750	-2239408.5	40305.880
## 2017-01-25	30295	73.920	2239406.4	-20.000
## 2017-01-27	-30295	73.980	-2241224.1	1797.700
## 2017-03-28	30508	73.460	2241117.7	-20.000
## 2017-04-03	-30508	74.840	-2283218.7	42081.040
## 2017-04-24	30573	74.680	2283191.6	-20.000
## 2017-04-25	-30573	74.520	-2278300.0	-4911.680
## 2017-05-31	29938	76.100	2278281.8	-20.000
## 2017-06-06	-29938	76.290	-2283970.0	5668.220
## 2017-06-07	30098	76.400	2299487.2	-20.000
## 2017-06-13	-30098	77.790	-2341323.4	41816.220
## 2017-06-22	29454	78.960	2325687.8	-20.000
## 2017-06-28	-29454	76.600	-2256176.4	-69531.440
## 2017-07-05	29883	75.500	2256166.5	-20.000
## 2017-07-06	-29883	74.700	-2232260.1	-23926.400
## 2017-08-01	30700	72.710	2232197.0	-20.000
## 2017-08-02	-30700	70.650	-2168955.0	-63262.000

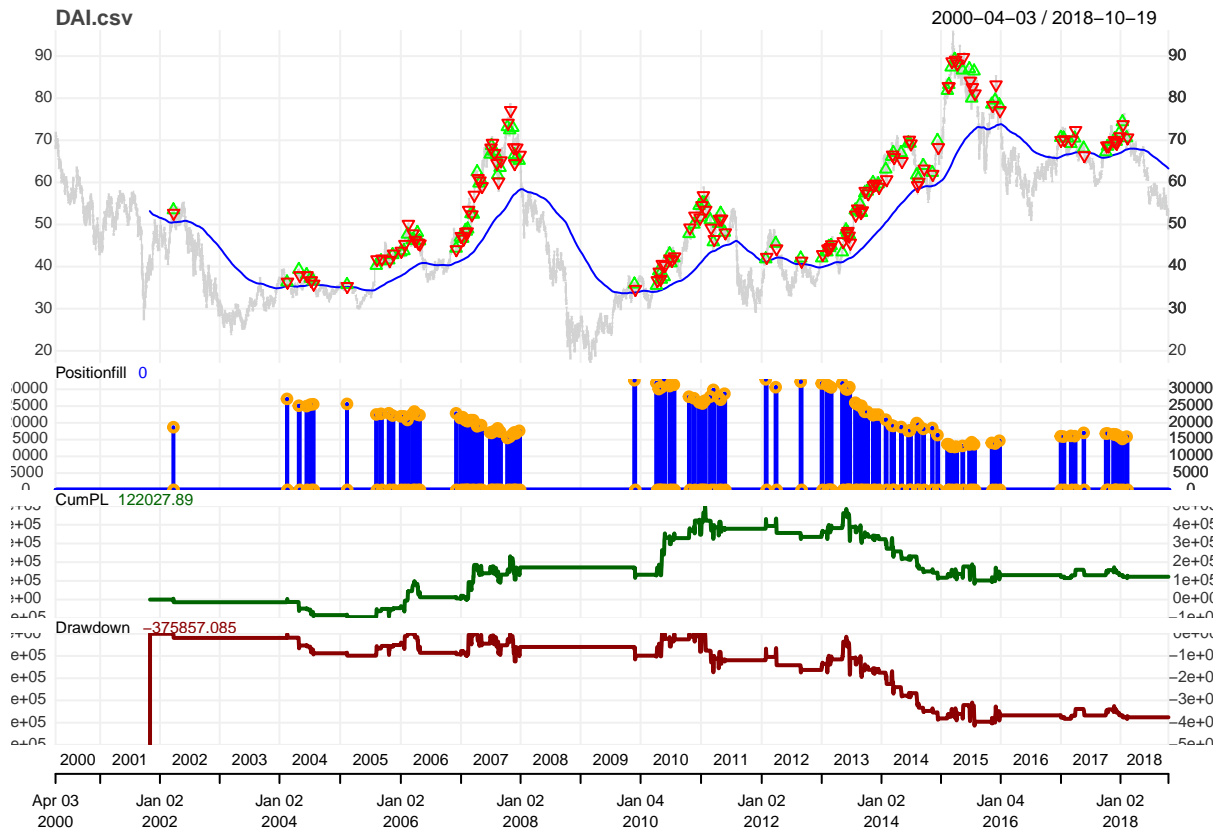
## 2017-09-05	30631	70.810	2168981.1	-20.000
## 2017-09-11	-30631	70.490	-2159179.2	-9821.920
## 2017-10-26	30265	71.340	2159105.1	-20.000
## 2017-11-02	-30265	69.310	-2097667.1	-61457.950
## 2018-06-11	30613	68.520	2097602.8	-20.000
## 2018-06-15	-30613	70.100	-2145971.3	48348.540
## 2018-06-20	31310	68.540	2145987.4	-20.000
## 2018-06-22	-31310	69.140	-2164773.4	18766.000
## 2018-06-27	31318	69.120	2164700.2	-20.000
## 2018-07-03	-31318	67.720	-2120855.0	-43865.200
## 2018-07-24	30621	69.260	2120810.5	-20.000
## 2018-07-30	-30621	69.300	-2122035.3	1204.840

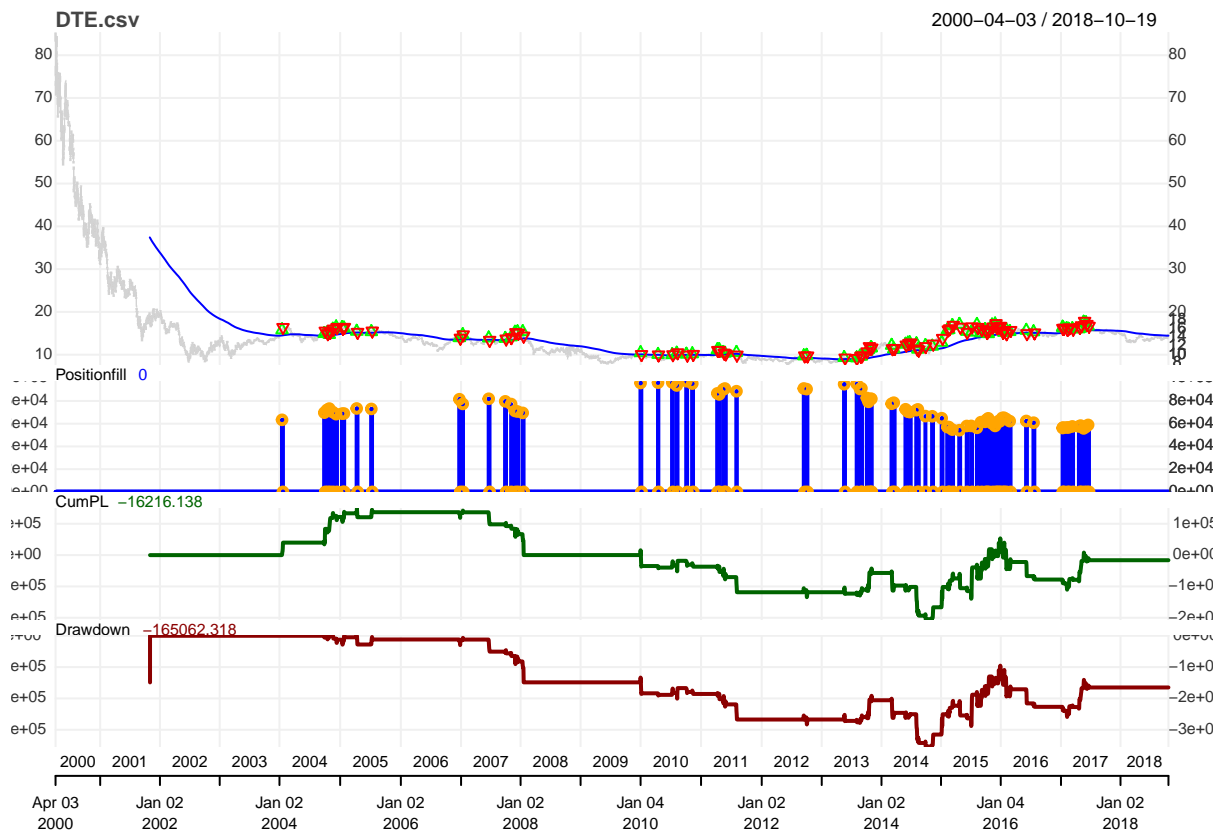
Step 3: Graph which visualize transactions

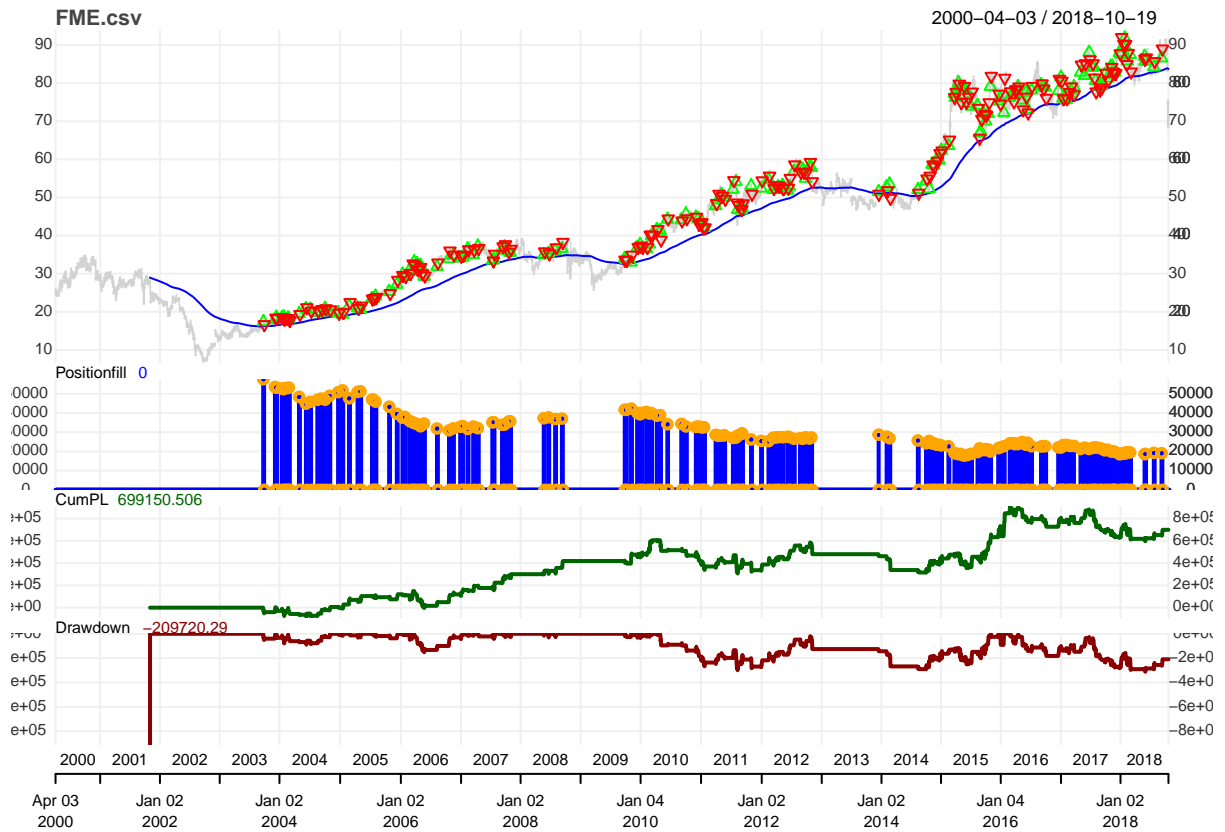
The following graphs show the combined view of the performance of the Smash Day trading system. It visualizes the trades (buy-transactions are visualized in green and sell-transactions are visualized in red). Moreover, the size of the blue squares indicates the size of the position (height) and the holding 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.

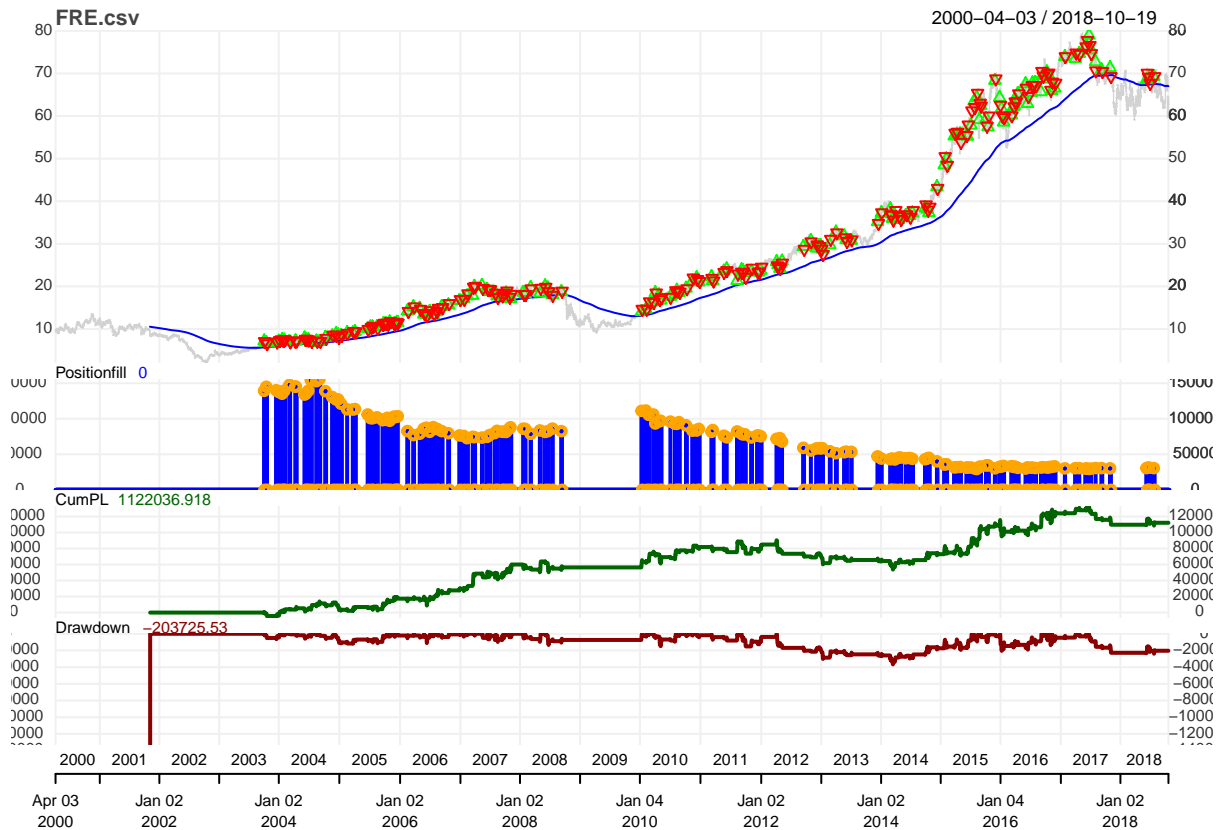
```
# Plot graph with indicators for transaction
for (instrument in instrumentlist){
  chart.Posn(portfolioname,
    Symbol=instrument,
    type='candlesticks',
    theme=myTheme,
    subset=daterange,
    TA=addEMAStrng)
}
```











Step 4: Performance Statistics

The following table summarizes some important trading statistics for all instruments. This statistic is just an excerpt of the overall statistics which can be calculated. 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] "BMW.csv"
##      Trades  Win Percent Loss Percent      W/L Ratio
##      "132"    "45.45"    "53.79"    "0.85"
##
## [1] "DAI.csv"
##      Trades  Win Percent Loss Percent      W/L Ratio
##      "119"    "46.22"    "53.78"    "0.86"
##
## [1] "DTE.csv"
##      Trades  Win Percent Loss Percent      W/L Ratio
##      "81"     "41.98"    "58.02"    "0.72"
##
## [1] "FME.csv"
##      Trades  Win Percent Loss Percent      W/L Ratio
##      "169"    "50.89"    "49.11"    "1.04"
##
## [1] "FRE.csv"
##      Trades  Win Percent Loss Percent      W/L Ratio
##      "177"    "53.11"    "46.89"    "1.13"
```

Step 5: Calculate statistics of the Portfolio and all instruments in the portfolio

Performance Metrics

```
##
##           BMW           DAI           DTE           FME
## Cumulative Return   -0.41606383 0.033476349 -0.042351790 0.76139225
## Annualized Return   -0.03095035 0.001926229 -0.002525850 0.03363739
## Annualized Sharp Ratio -0.41012729 0.018875382 -0.044906520 0.26979452
## Calmar Ratio        -0.07299321 0.005274452 -0.008299237 0.11679340
##
##           FRE
## Cumulative Return    1.44248299
## Annualized Return     0.05357506
## Annualized Sharp Ratio 0.32582635
## Calmar Ratio          0.16924103
```

Risk Metrics

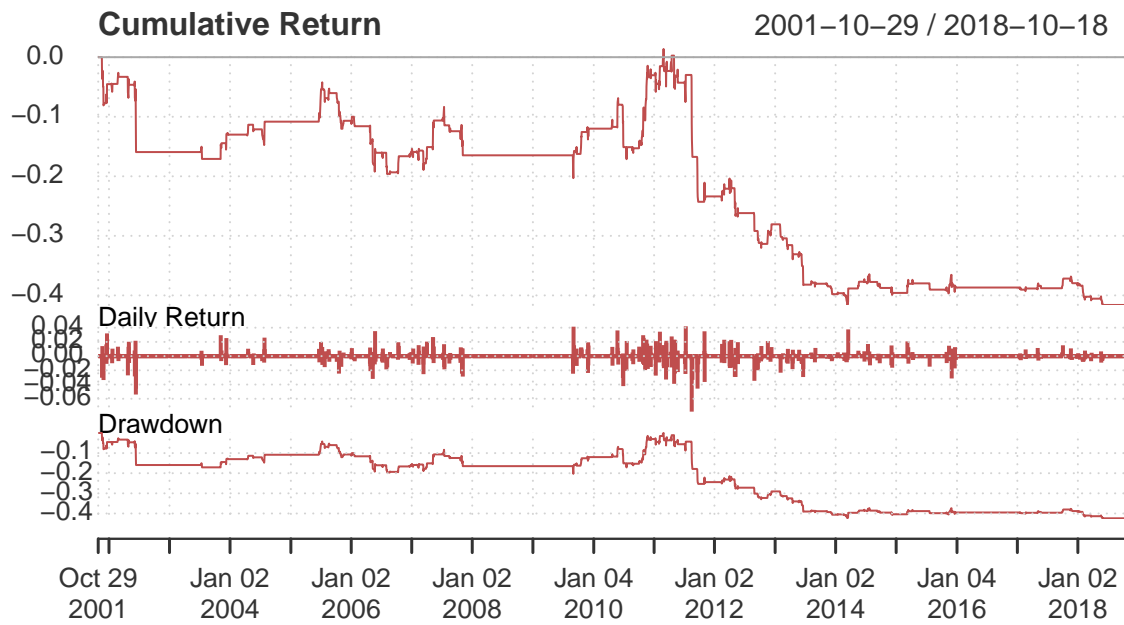
```
##
##           BMW           DAI           DTE           FME
## Annualized StdDev   0.075465231 0.102049805 0.056246851 0.124677825
## Max Drawdown         0.424016842 0.365199814 0.304347280 0.288007662
## Value-at-Risk        -0.003569137 -0.002739521 0.000000000 -0.008262372
## Conditional VaR      -0.012643352 -0.015690678 -0.009294073 -0.020103471
##
##           FRE
## Annualized StdDev   0.16442825
## Max Drawdown         0.31656068
## Value-at-Risk        -0.01096759
## Conditional VaR      -0.02556600
```

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

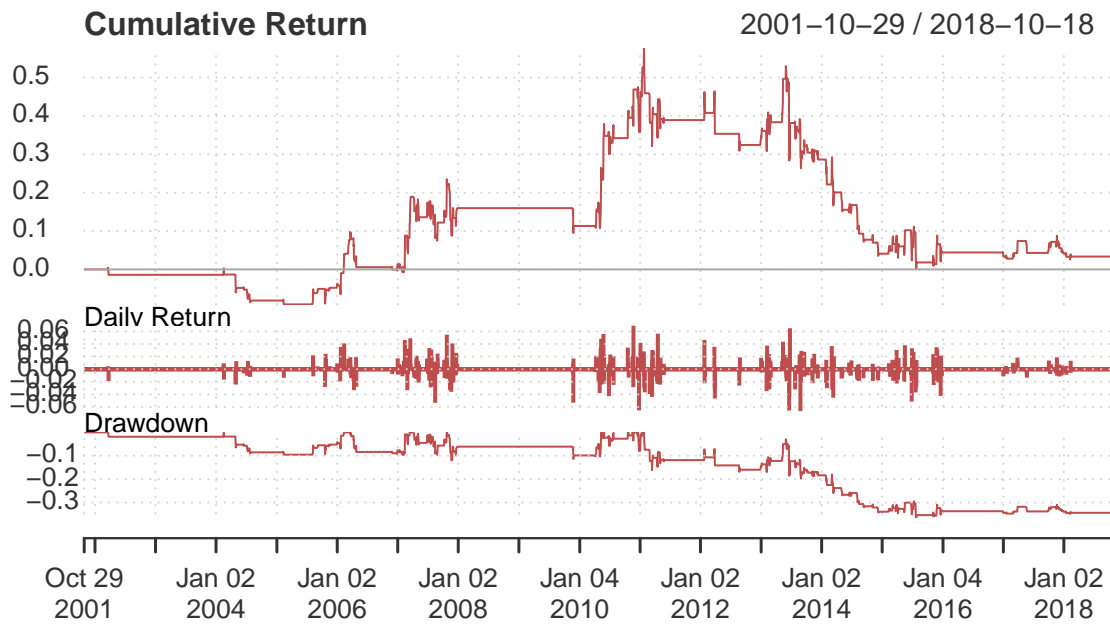
The following plots visualizes some important information about the returns of the strategy applied to the instruments on the instrumentlist. The cumulative return over the entire period, the daily returns and the drawdown for each instrument is illustrated.


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

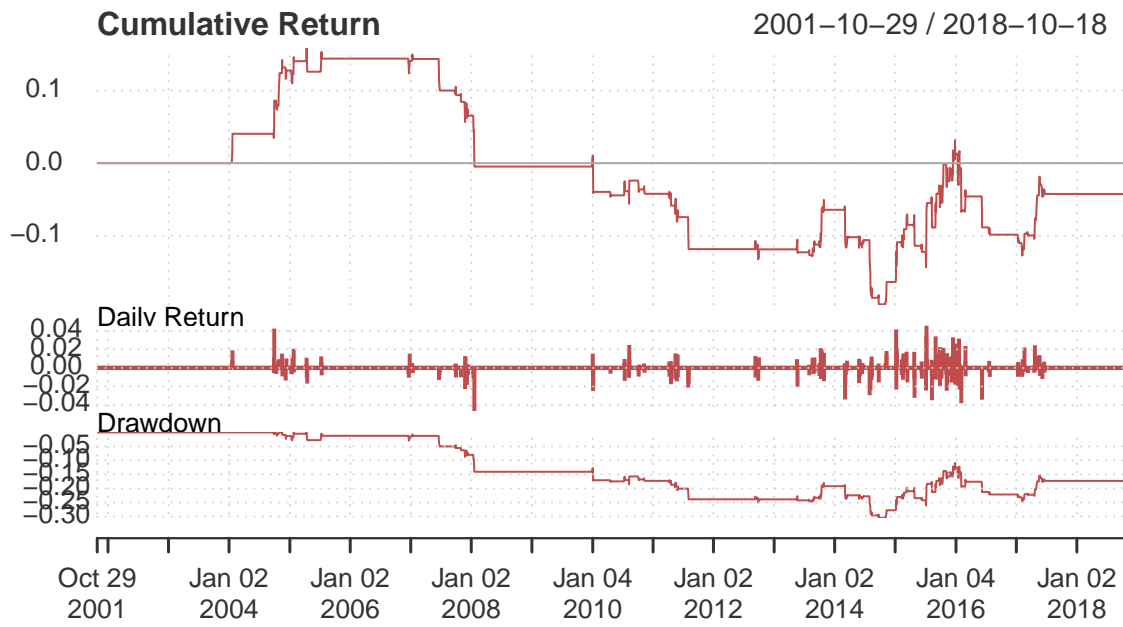
BMW



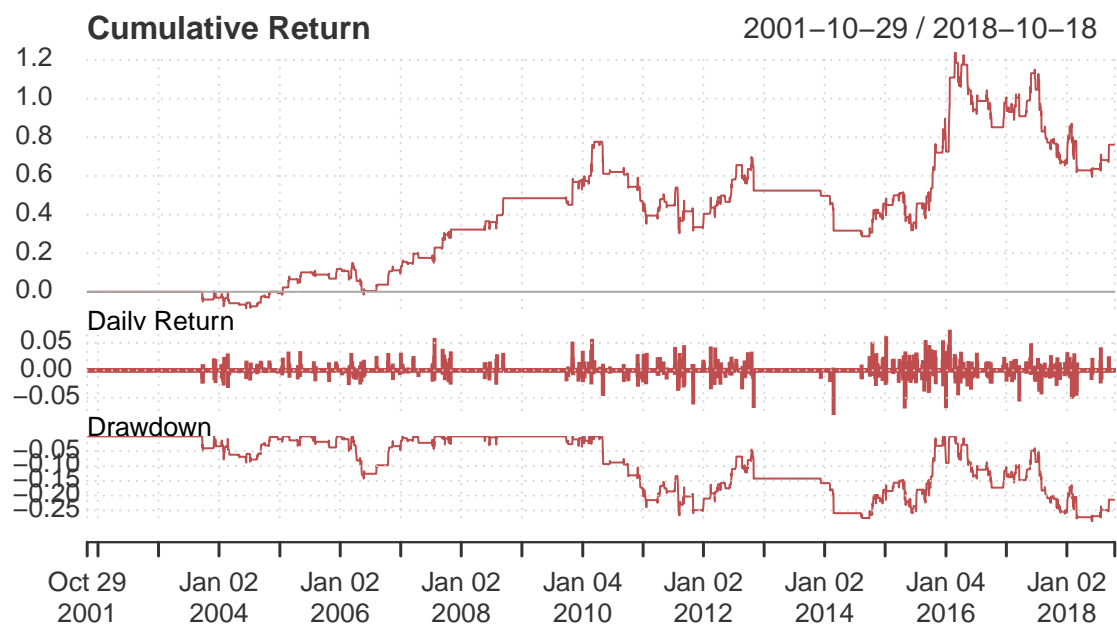
DAI



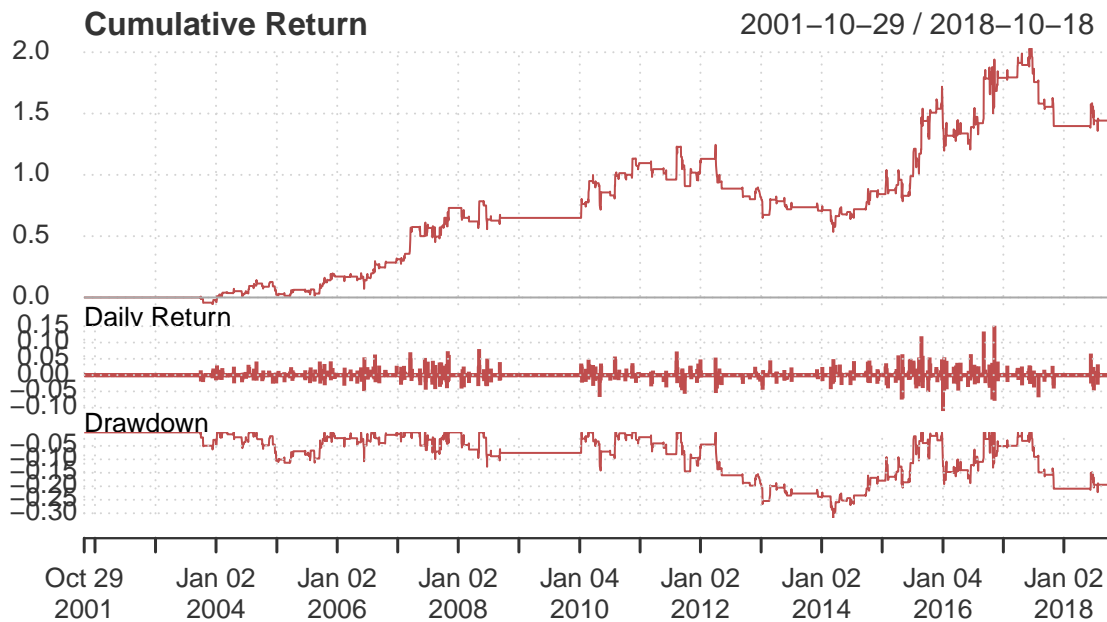
DTE



FME



FRE



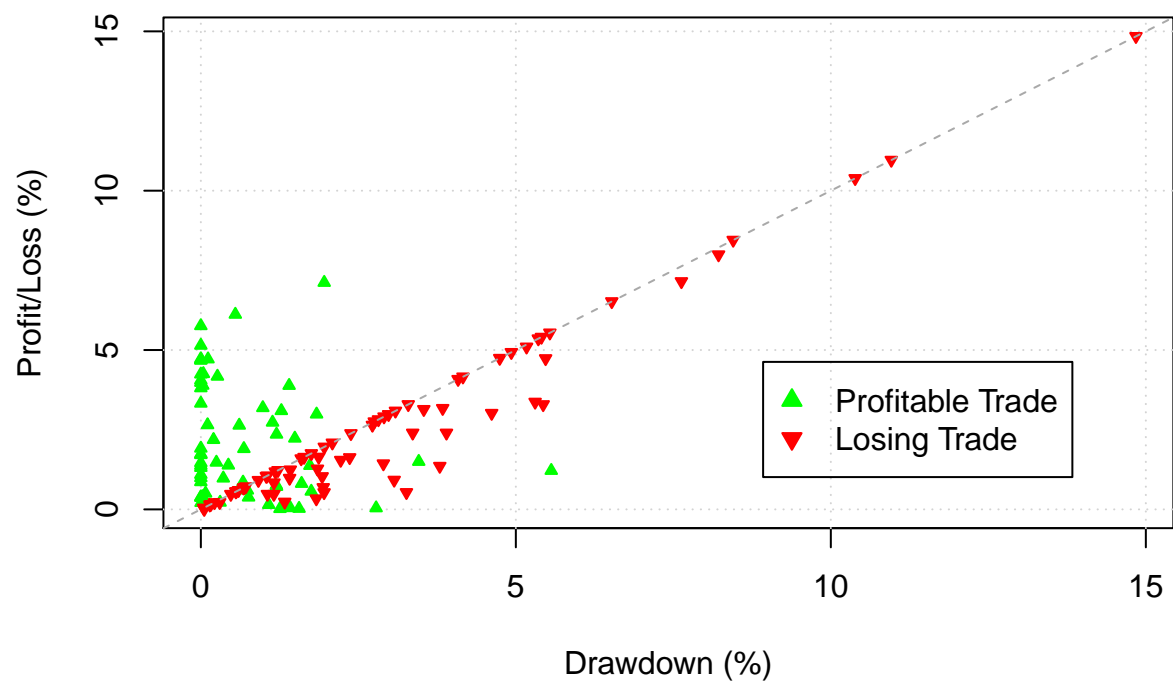
Step 7: Could we have performed better or even worse? MAE / MFE

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.

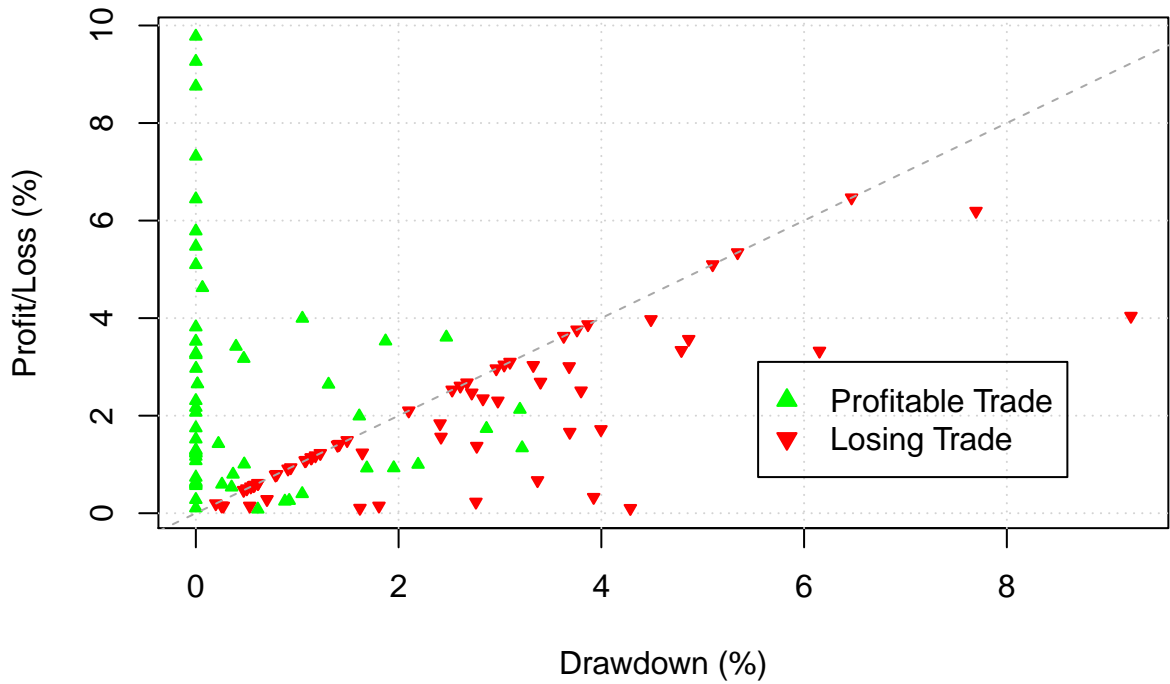
MAE

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

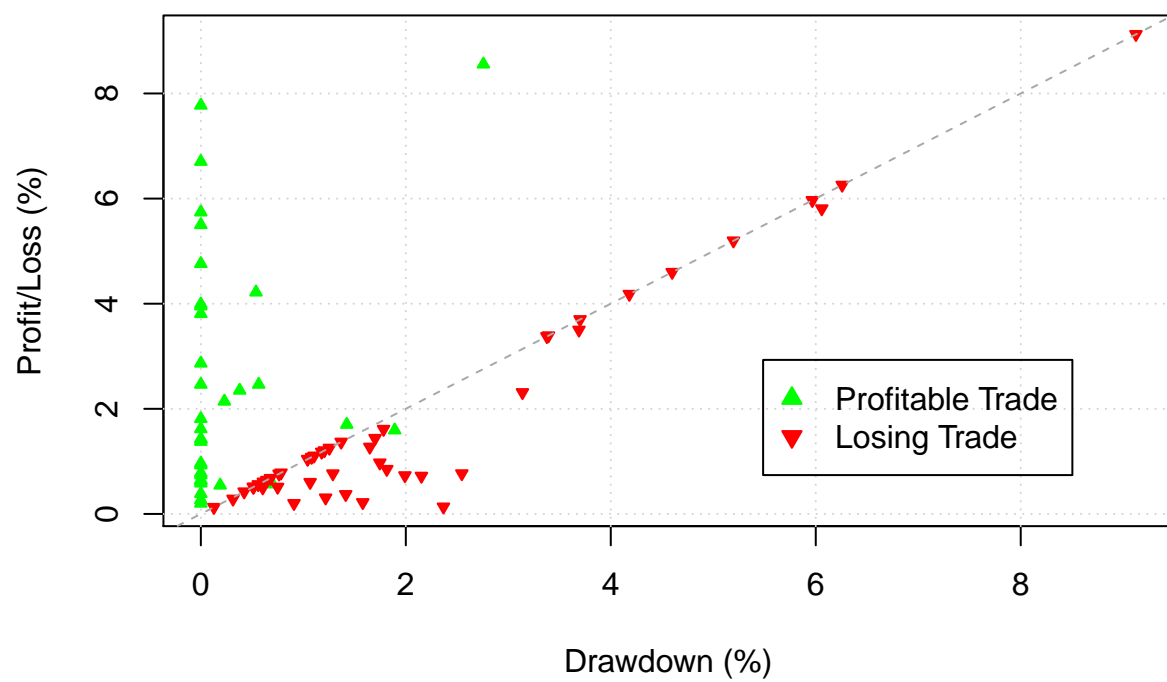
BMW.csv Maximum Adverse Excursion (MAE)



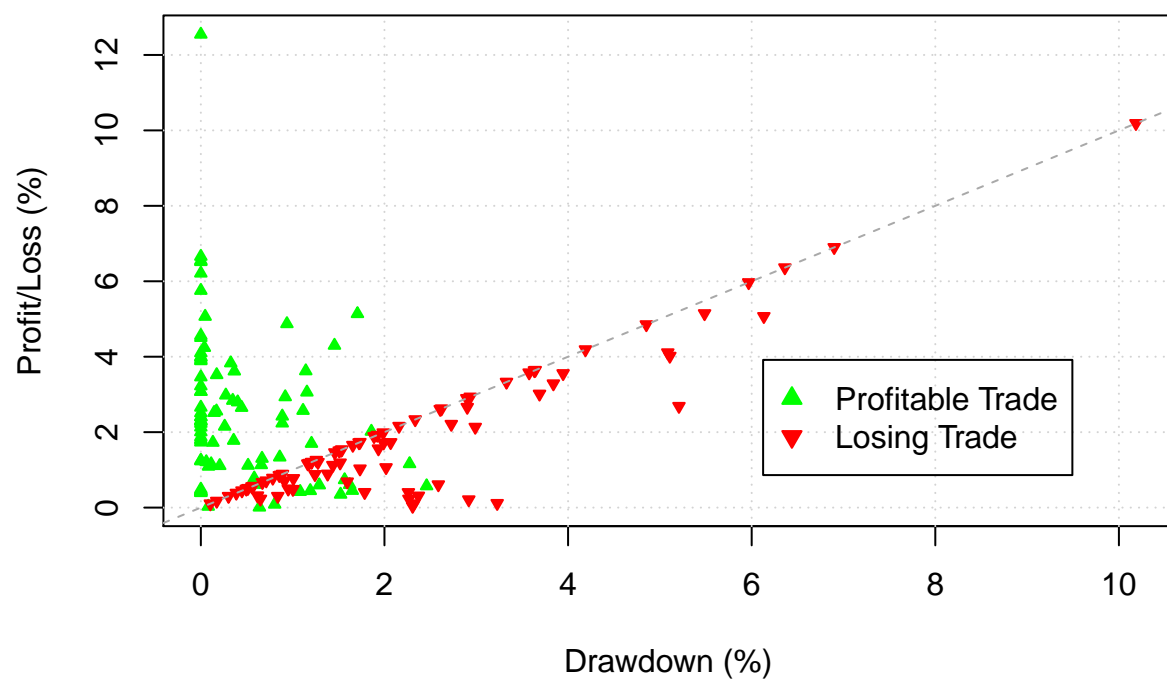
DAI.csv Maximum Adverse Excursion (MAE)



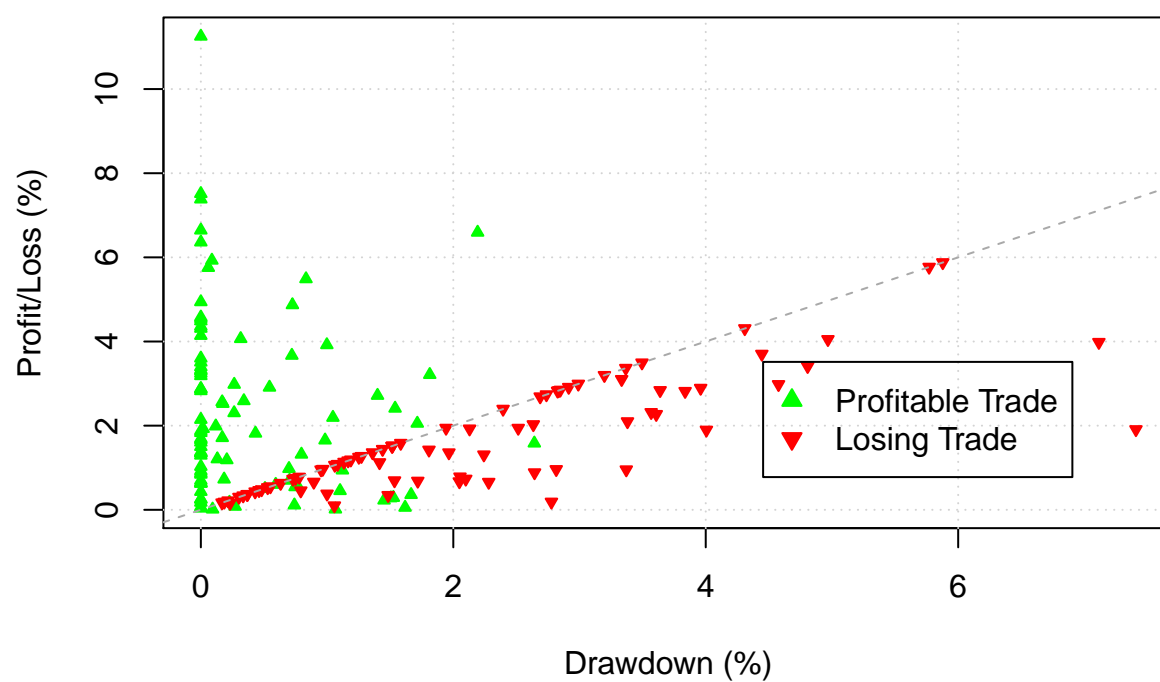
DTE.csv Maximum Adverse Excursion (MAE)



FME.csv Maximum Adverse Excursion (MAE)



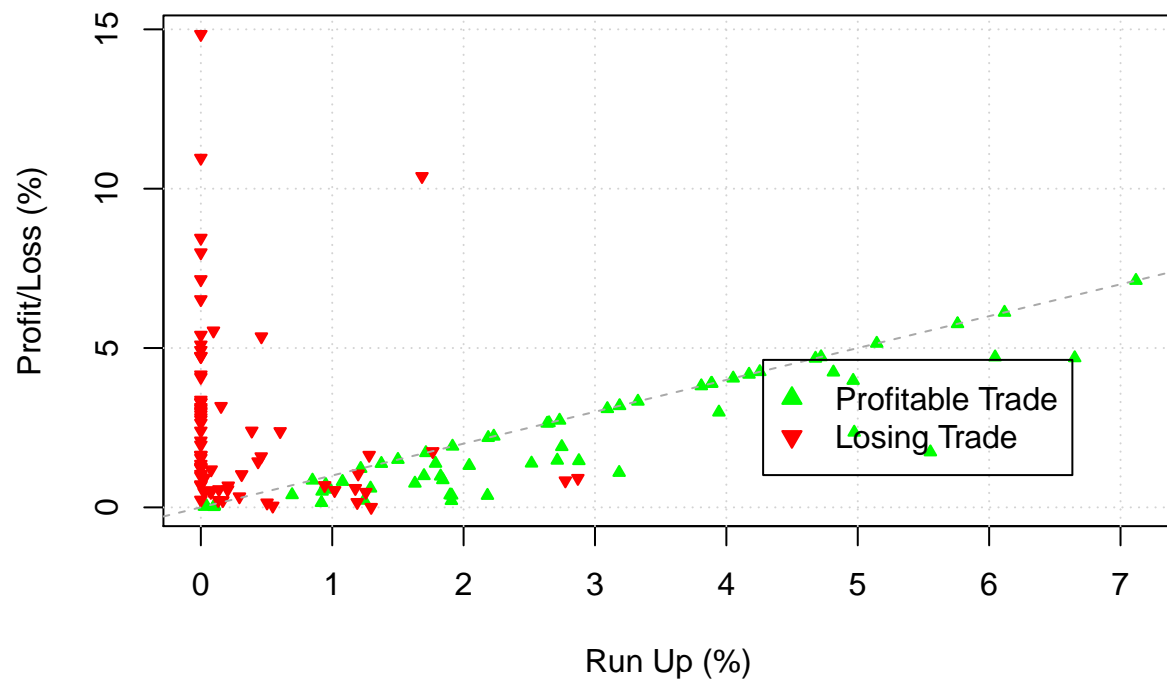
FRE.csv Maximum Adverse Excursion (MAE)



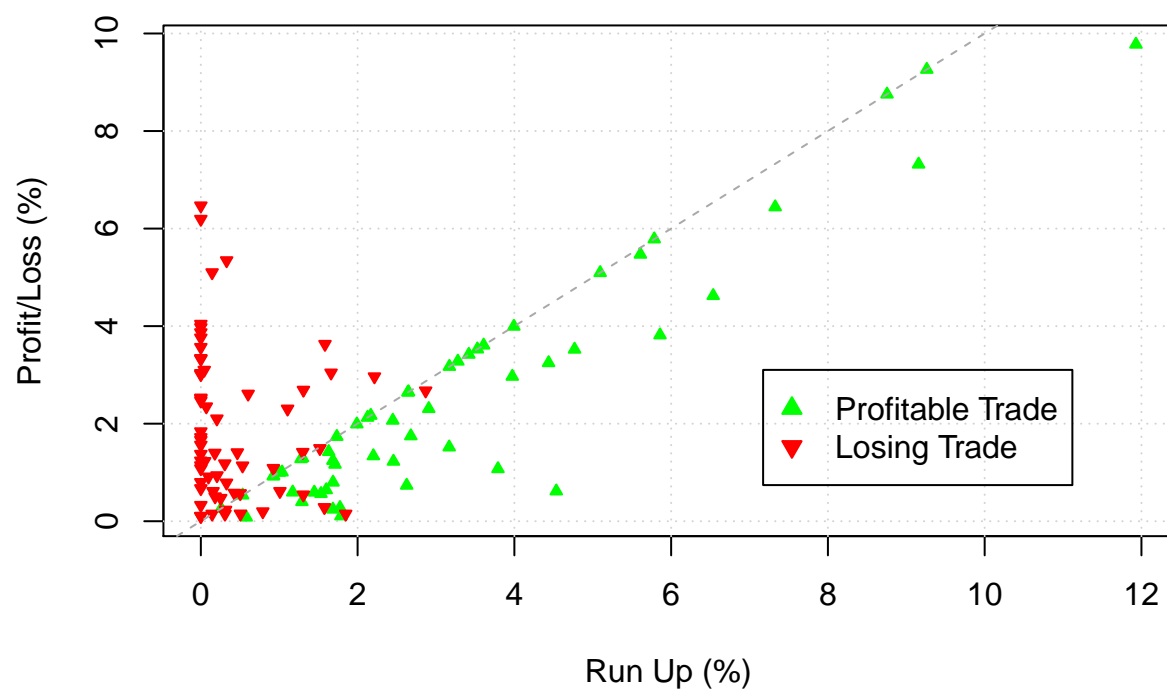
MFE

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

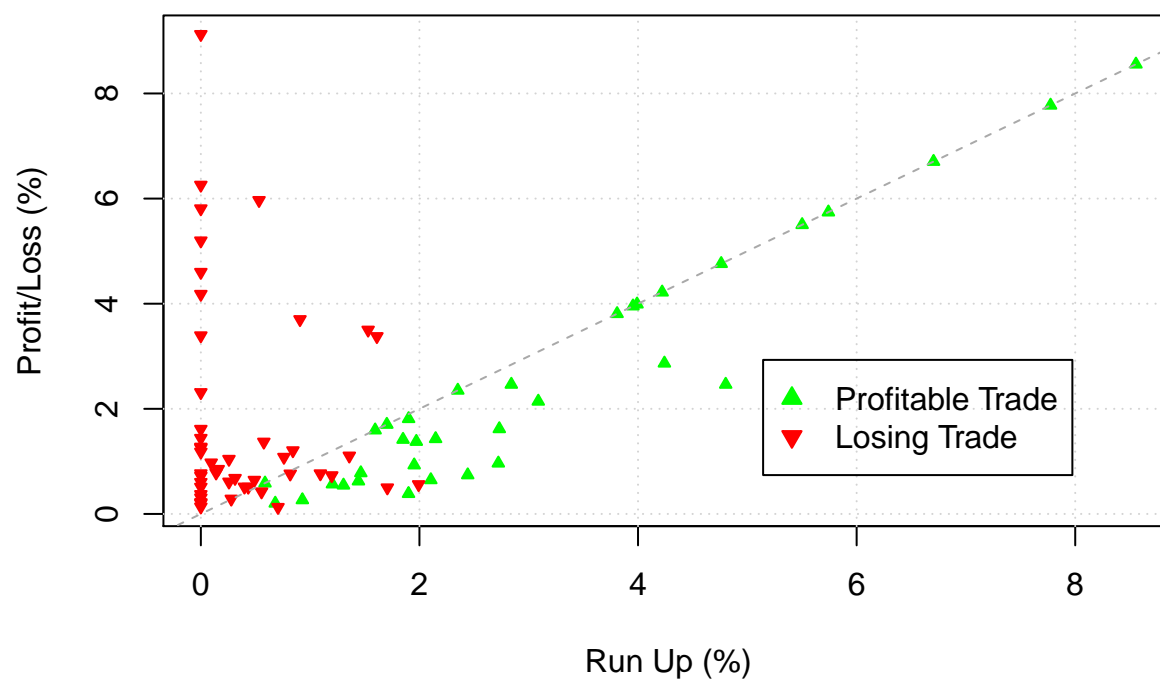
BMW.csv Maximum Favourable Excursion (MFE)



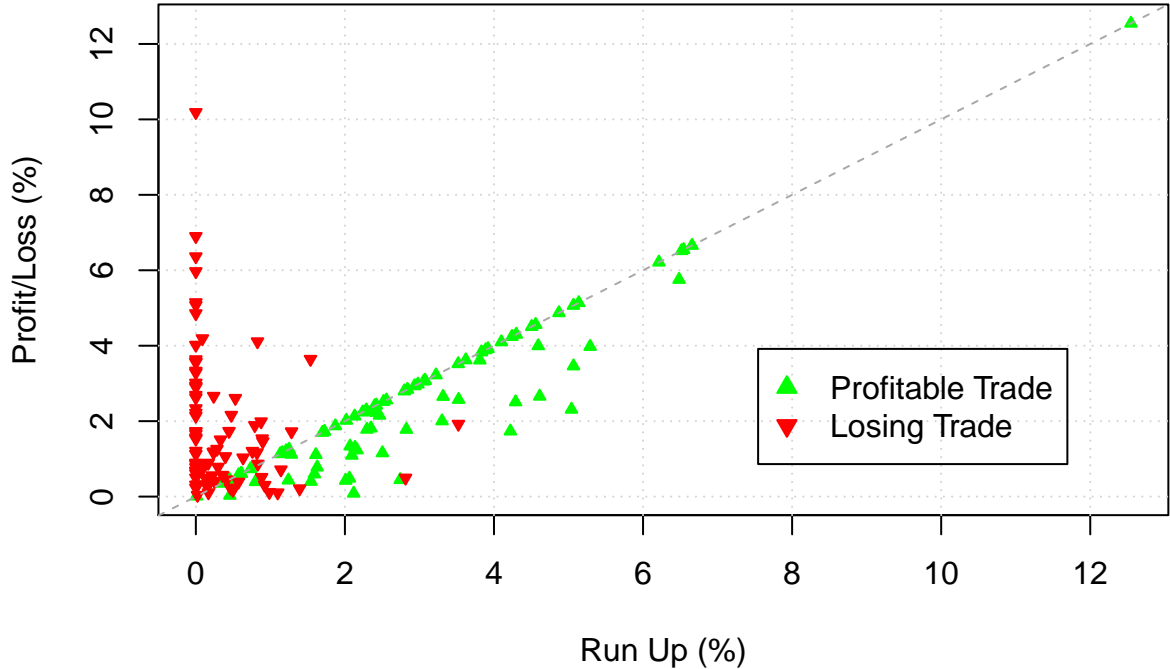
DAI.csv Maximum Favourable Excursion (MFE)



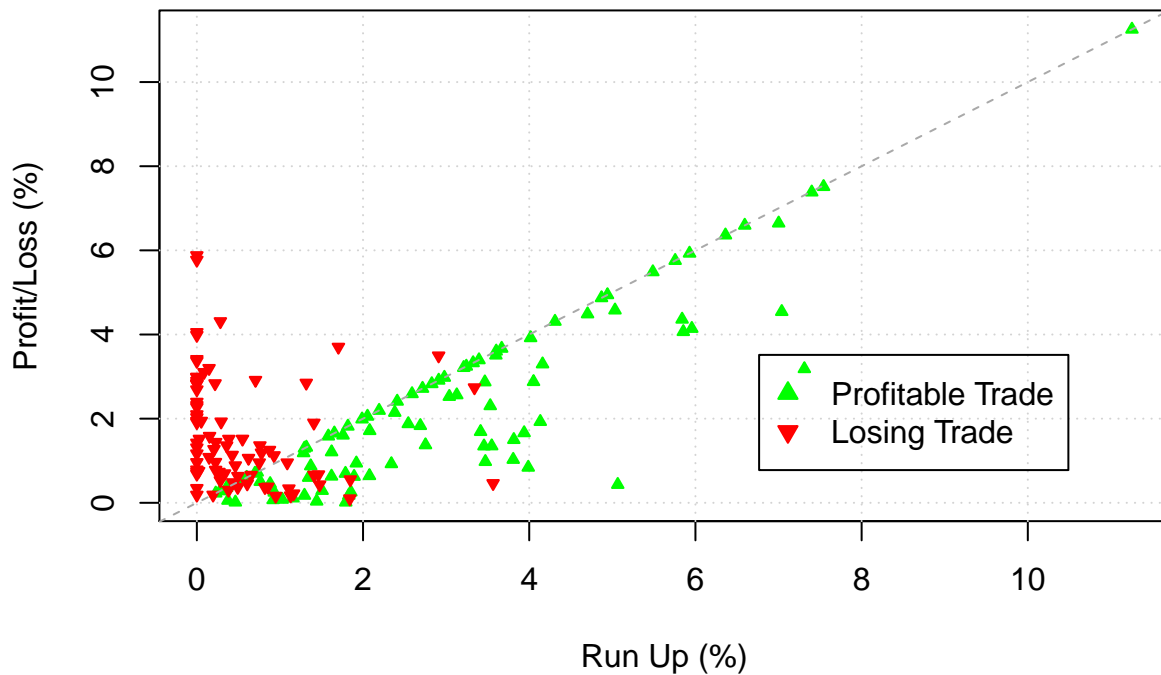
DTE.csv Maximum Favourable Excursion (MFE)



FME.csv Maximum Favourable Excursion (MFE)



FRE.csv Maximum Favourable Excursion (MFE)



Compare with Buy and Hold Strategy

In order to compare the trading strategy properly we need to define a benchmark against which we can measure the results. 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))

# 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")

```

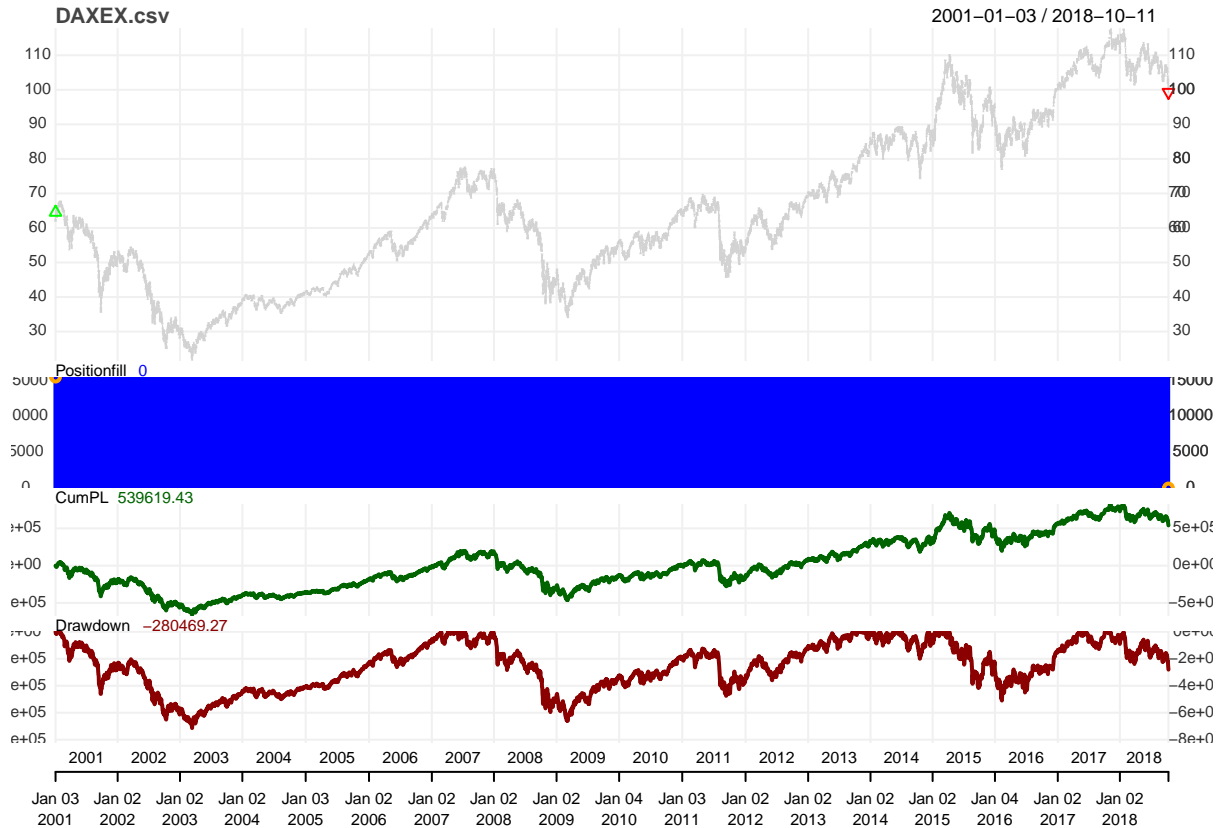
Step 2: Visualize the Buy and Hold strategy

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.

```
rets.bh <- PortfReturns(Account='buyhold')
returns <- cbind(rets,rets.bh)
colnames(returns) <- substr(colnames(returns),1,3)
```

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.

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

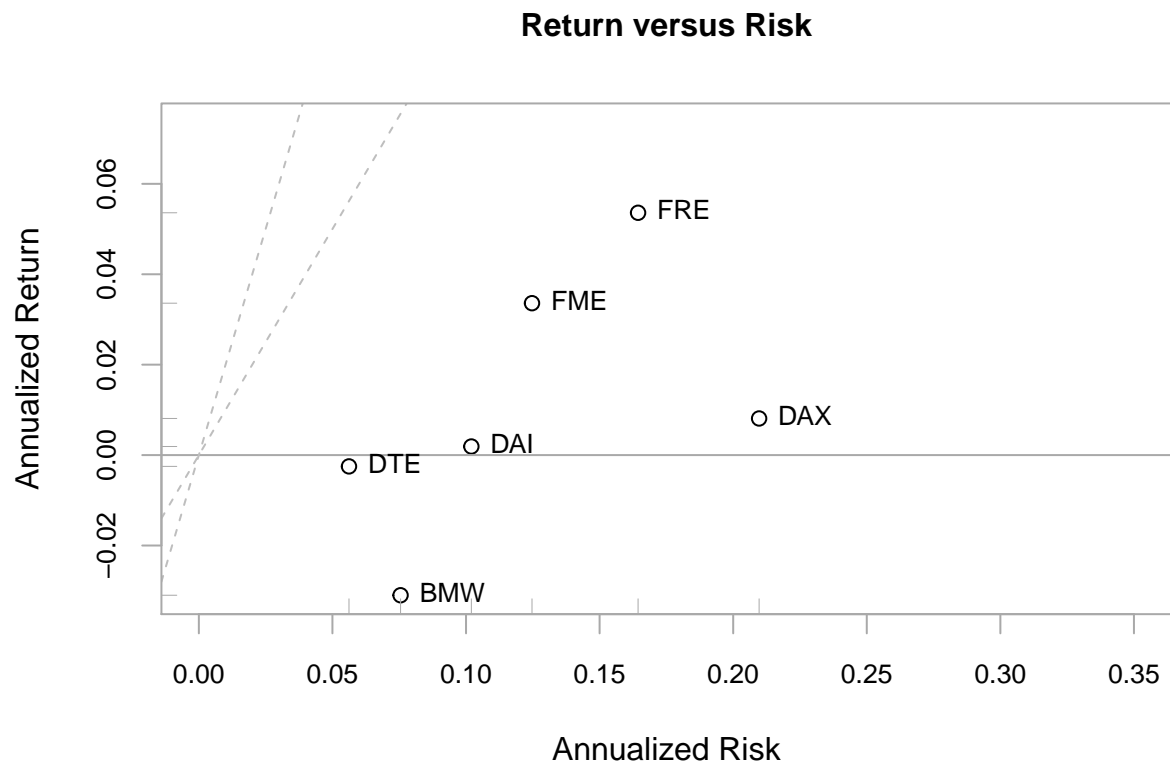
##	BMW	DAI	DTE	FME	FRE
## Observations	4312.0000	4312.0000	4312.0000	4312.0000	4312.0000
## NAs	210.0000	210.0000	210.0000	210.0000	210.0000
## Minimum	-0.0781	-0.0664	-0.0466	-0.0814	-0.1103
## Quartile 1	0.0000	0.0000	0.0000	0.0000	0.0000
## Median	0.0000	0.0000	0.0000	0.0000	0.0000
## Arithmetic Mean	-0.0001	0.0000	0.0000	0.0002	0.0003
## Geometric Mean	-0.0001	0.0000	0.0000	0.0001	0.0002
## Quartile 3	0.0000	0.0000	0.0000	0.0000	0.0000
## Maximum	0.0419	0.0690	0.0456	0.0740	0.1516
## SE Mean	0.0001	0.0001	0.0001	0.0001	0.0002
## LCL Mean (0.95)	-0.0003	-0.0002	-0.0001	-0.0001	0.0000
## UCL Mean (0.95)	0.0000	0.0002	0.0001	0.0004	0.0006

```
## Variance      0.0000    0.0000    0.0000    0.0001    0.0001
## Stdev         0.0048    0.0064    0.0035    0.0079    0.0104
## Skewness      -2.0086    0.1191    0.1920    0.0549    1.7171
## Kurtosis      46.4545   35.0565   54.0505   23.3811   37.2765
##              DAX
## Observations  4517.0000
## NAs           5.0000
## Minimum       -0.0935
## Quartile 1    -0.0065
## Median        0.0008
## Arithmetic Mean 0.0001
## Geometric Mean 0.0000
## Quartile 3    0.0071
## Maximum       0.0788
## SE Mean       0.0002
## LCL Mean (0.95) -0.0003
## UCL Mean (0.95) 0.0005
## Variance      0.0002
## Stdev         0.0132
## Skewness      -0.2480
## Kurtosis      2.9187
```

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

```
##              BMW      DAI      DTE      FME      FRE      DAX
## Annualized Return  -0.0310 0.0019 -0.0025 0.0336 0.0536 0.0081
## Annualized Std Dev   0.0755 0.1020 0.0562 0.1247 0.1644 0.2097
## Annualized Sharpe (Rf=0%) -0.4101 0.0189 -0.0449 0.2698 0.3258 0.0387
```

```
# 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"))
}
```

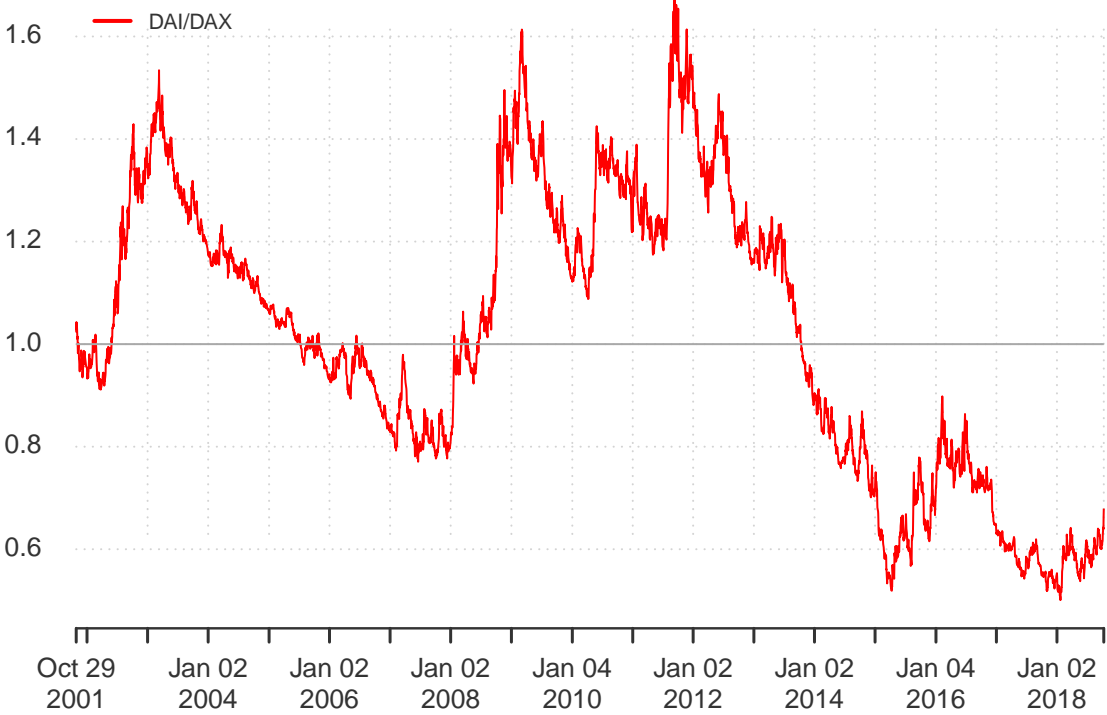
Relative Performance

2001-10-29 / 2018-10-11



Relative Performance

2001-10-29 / 2018-10-11



Relative Performance

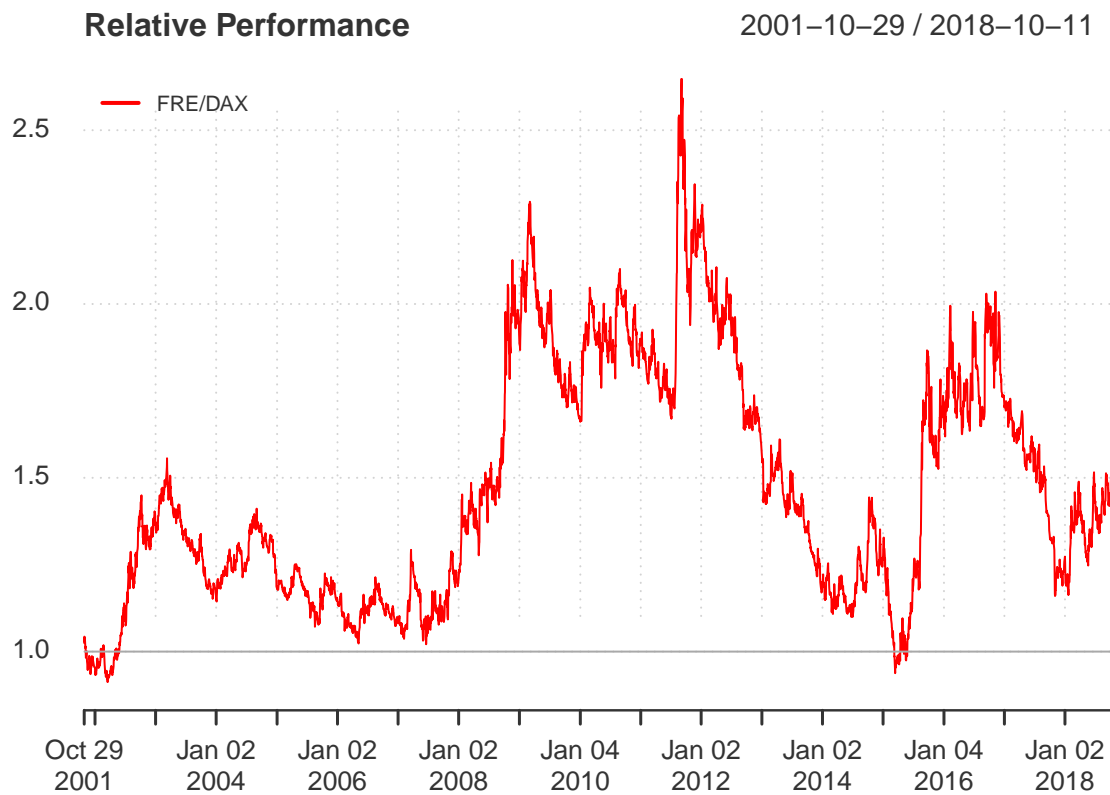
2001-10-29 / 2018-10-11



Relative Performance

2001-10-29 / 2018-10-11

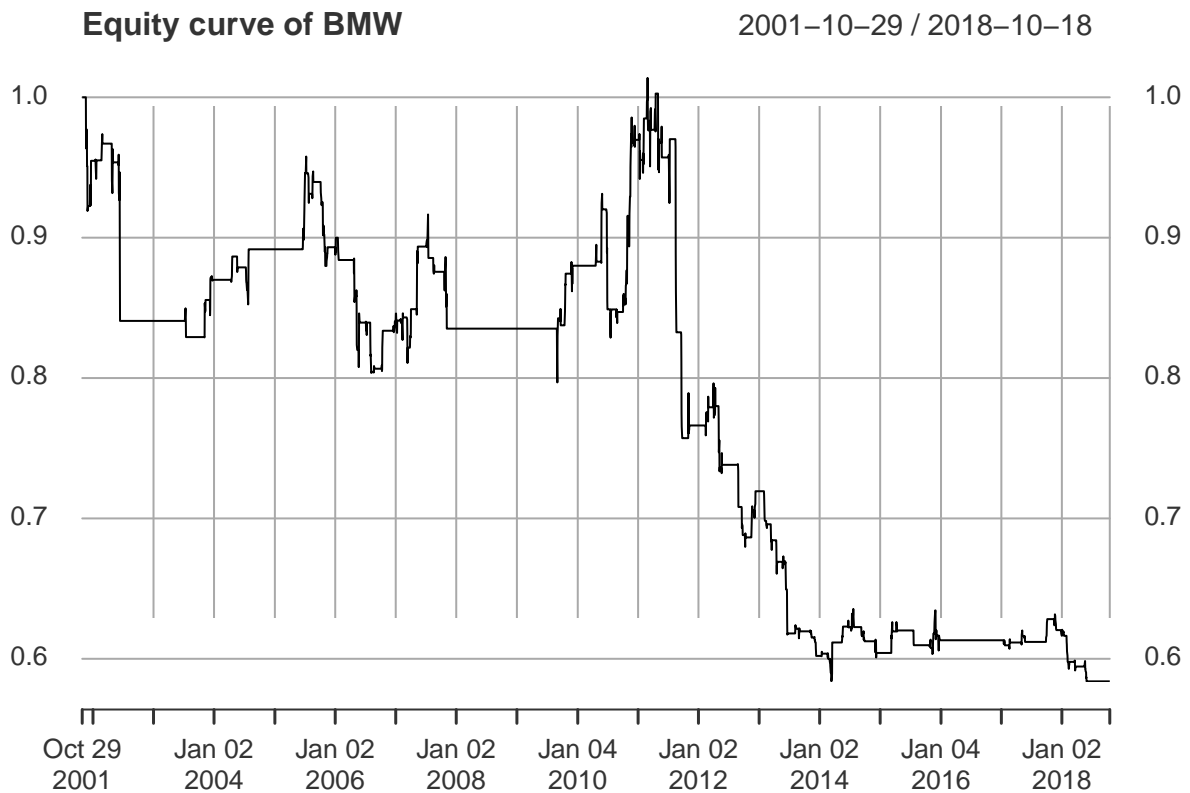
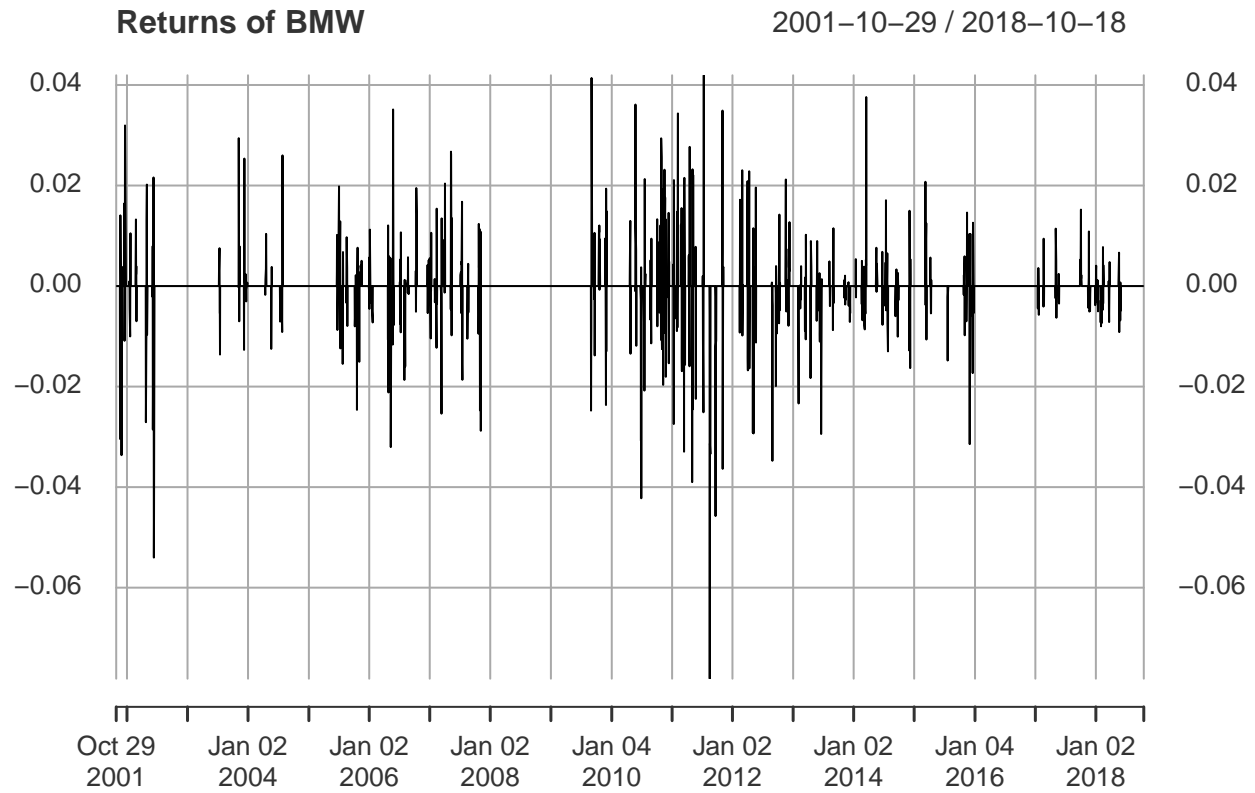




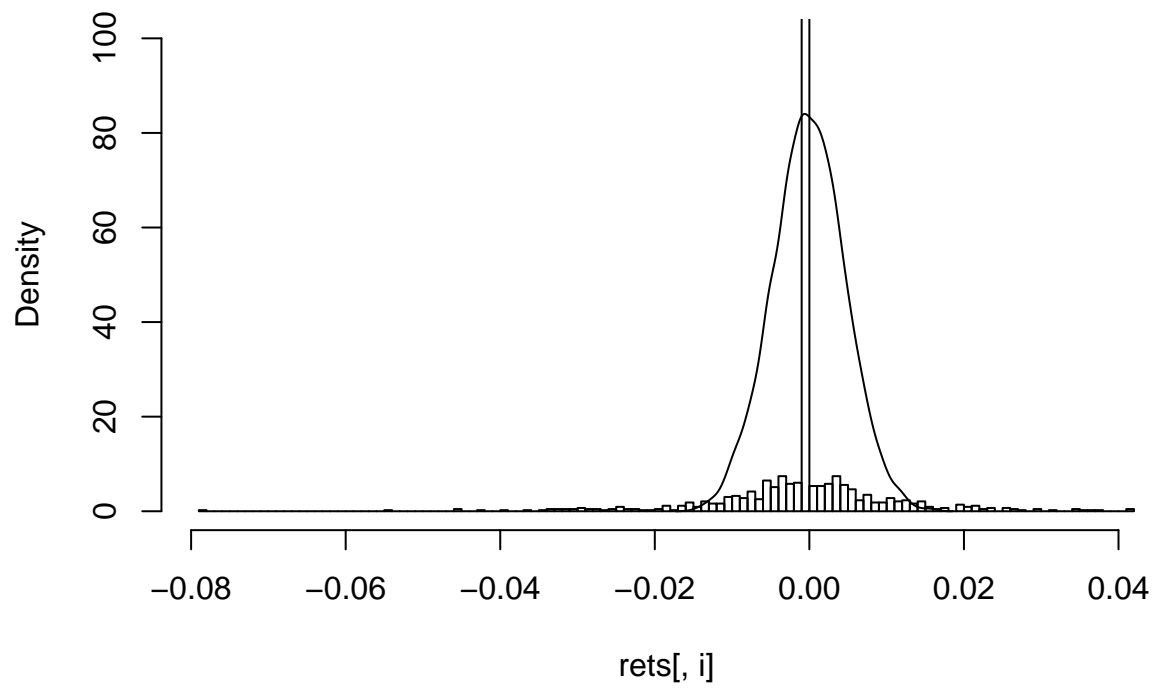
Calculations and visualizations based on returns

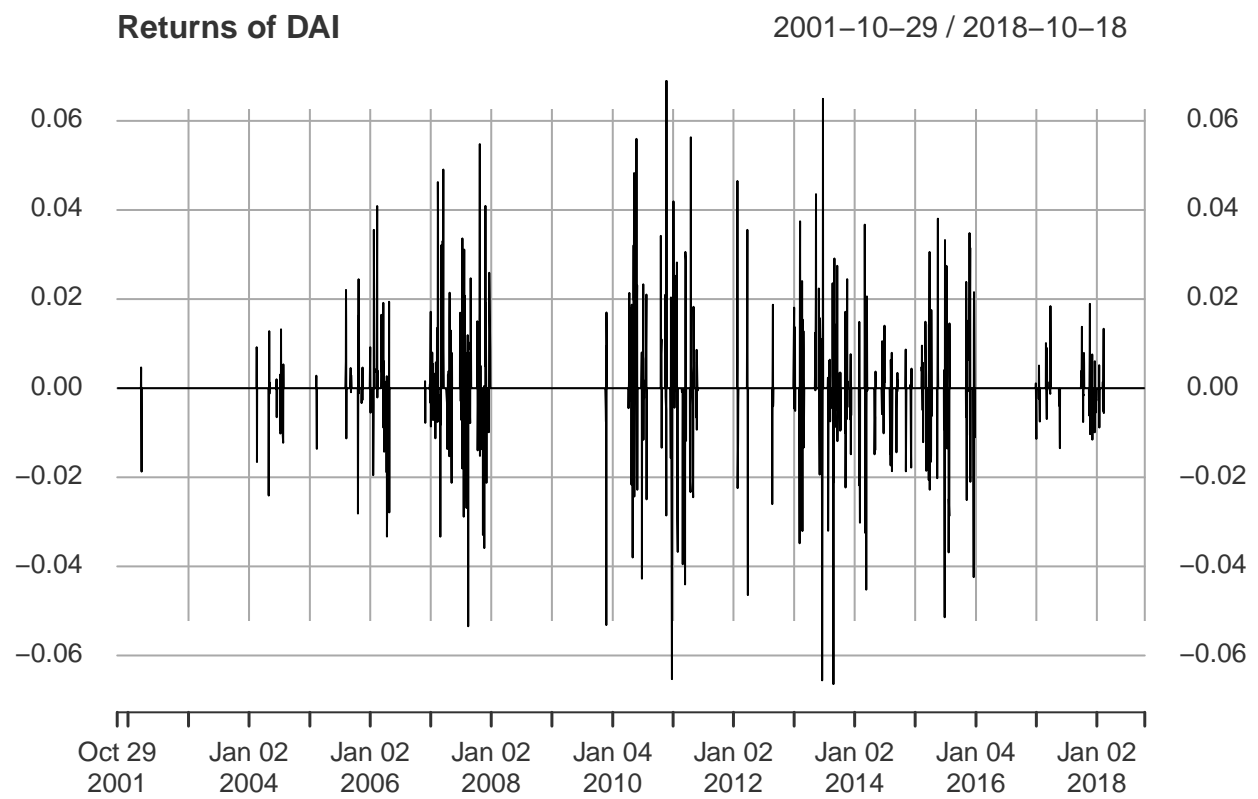
The visualization of returns, equity curve, value at risk and some other measure which can be calculated based on the returns of the trading strategy, can be observed in the following graphs.

Returns and Equity Curve



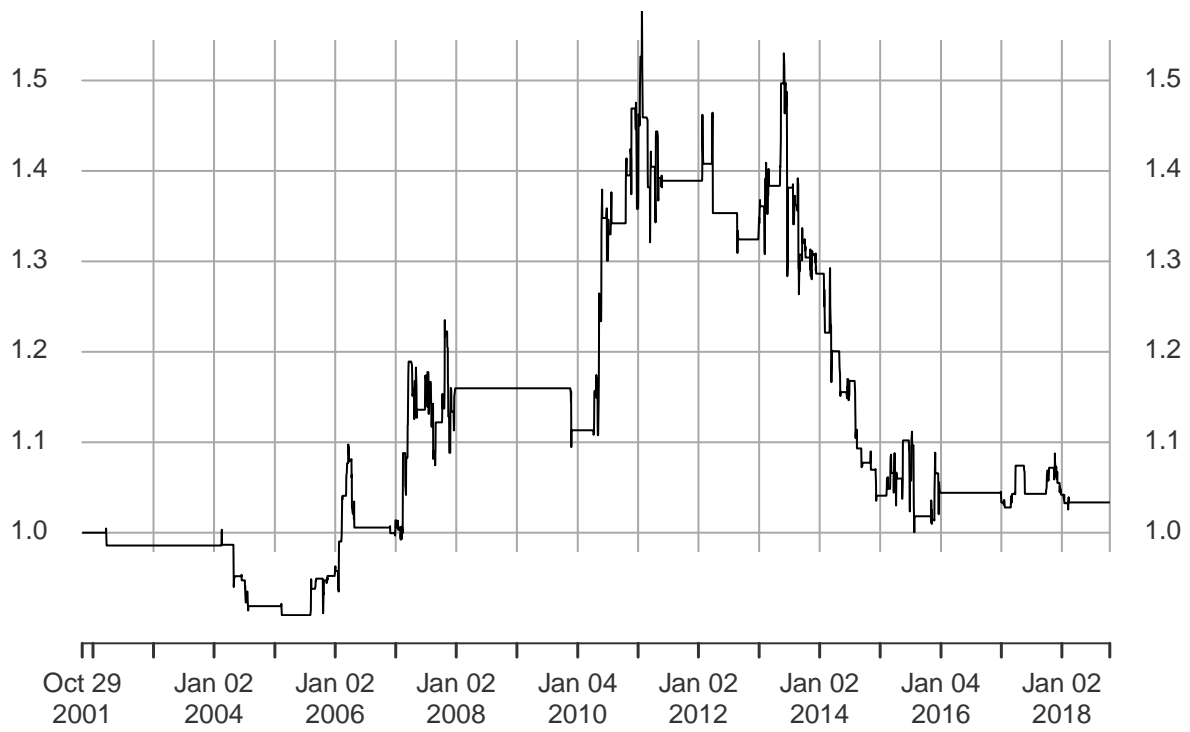
Histogram of Simple Returns of BMW



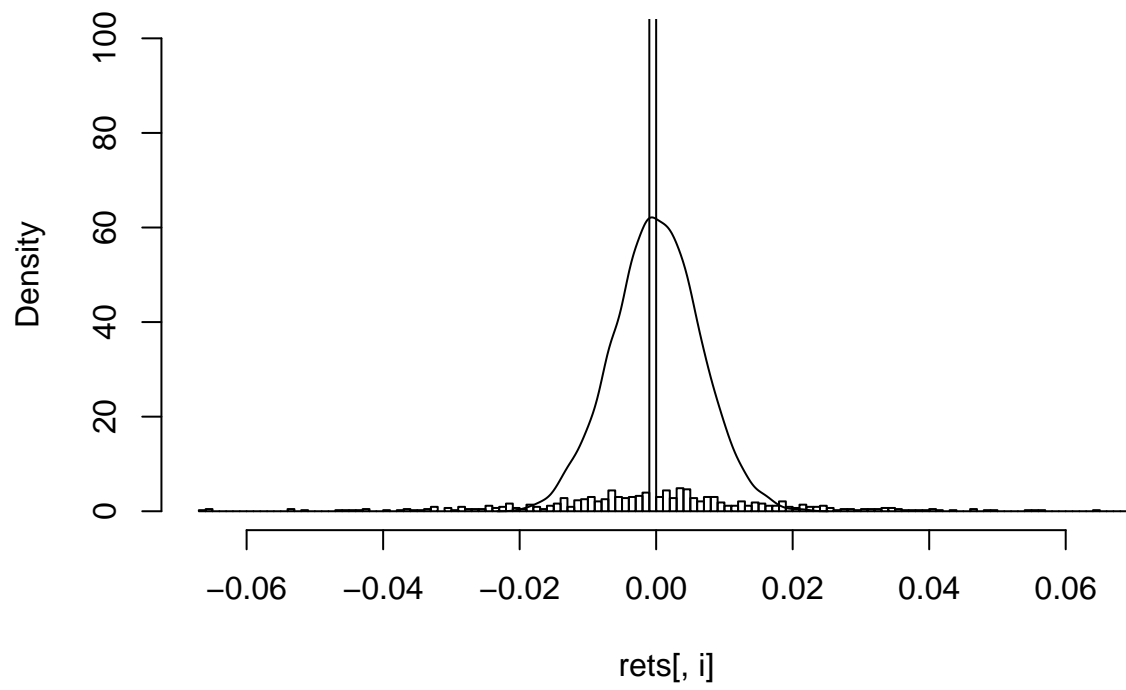


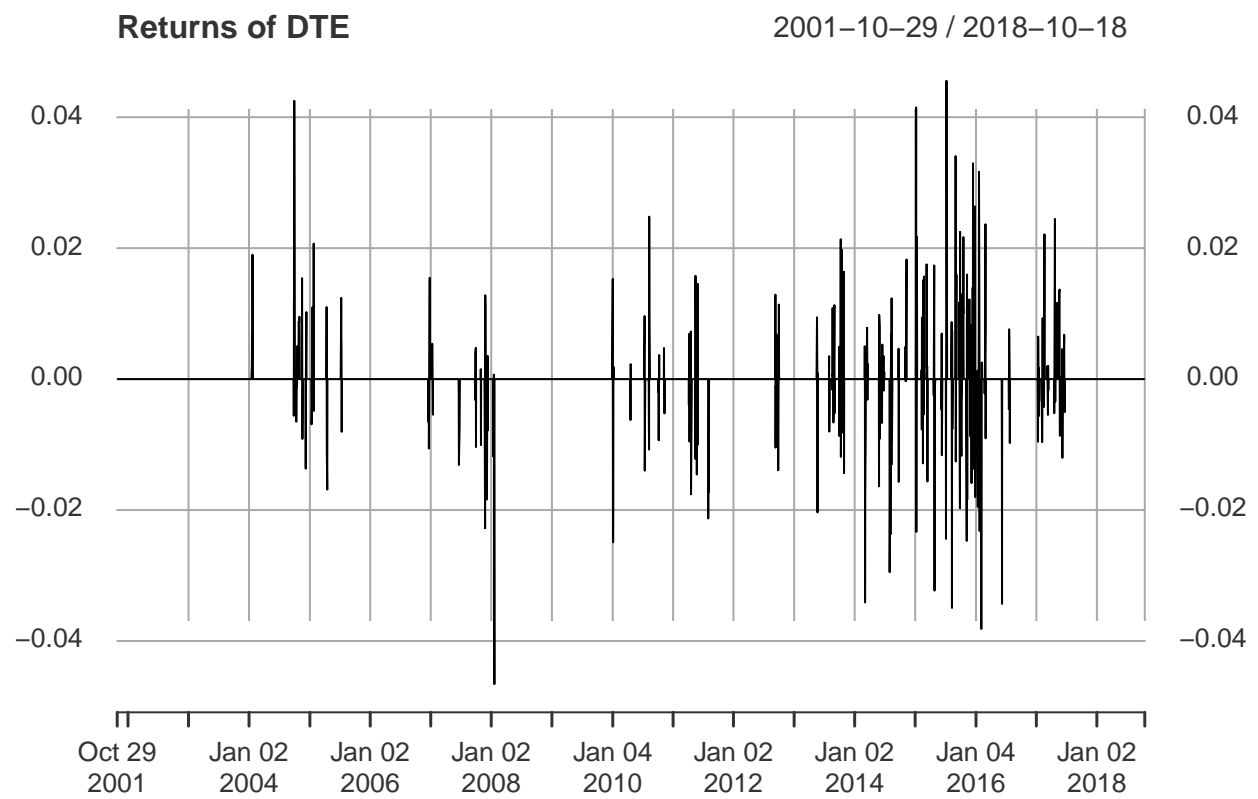
Equity curve of DAI

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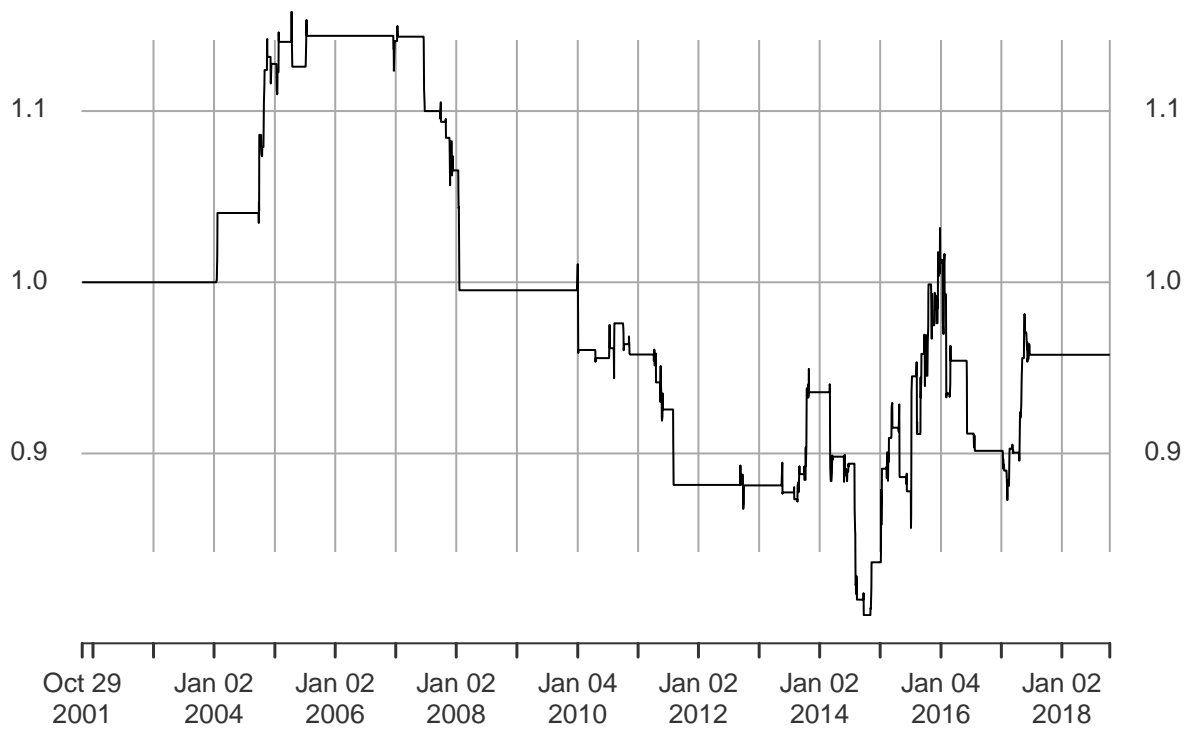
Histogram of Simple Returns of DAI



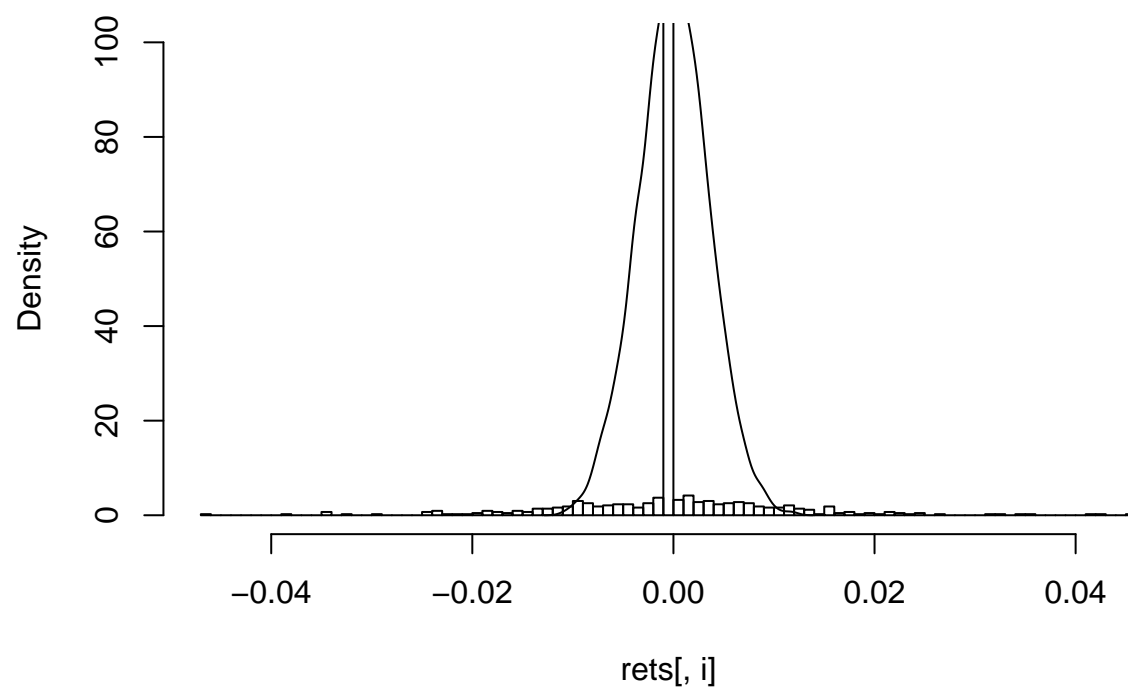


Equity curve of DTE

2001-10-29 / 2018-10-18

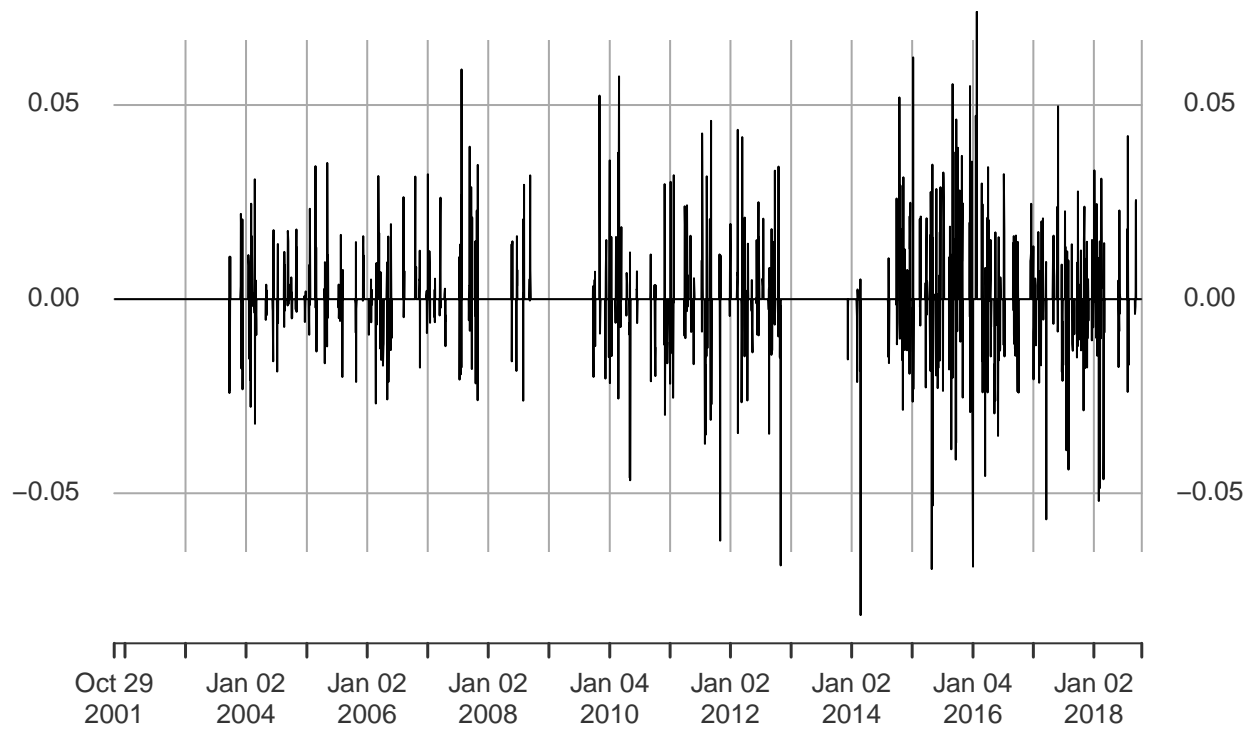


Histogram of Simple Returns of DTE



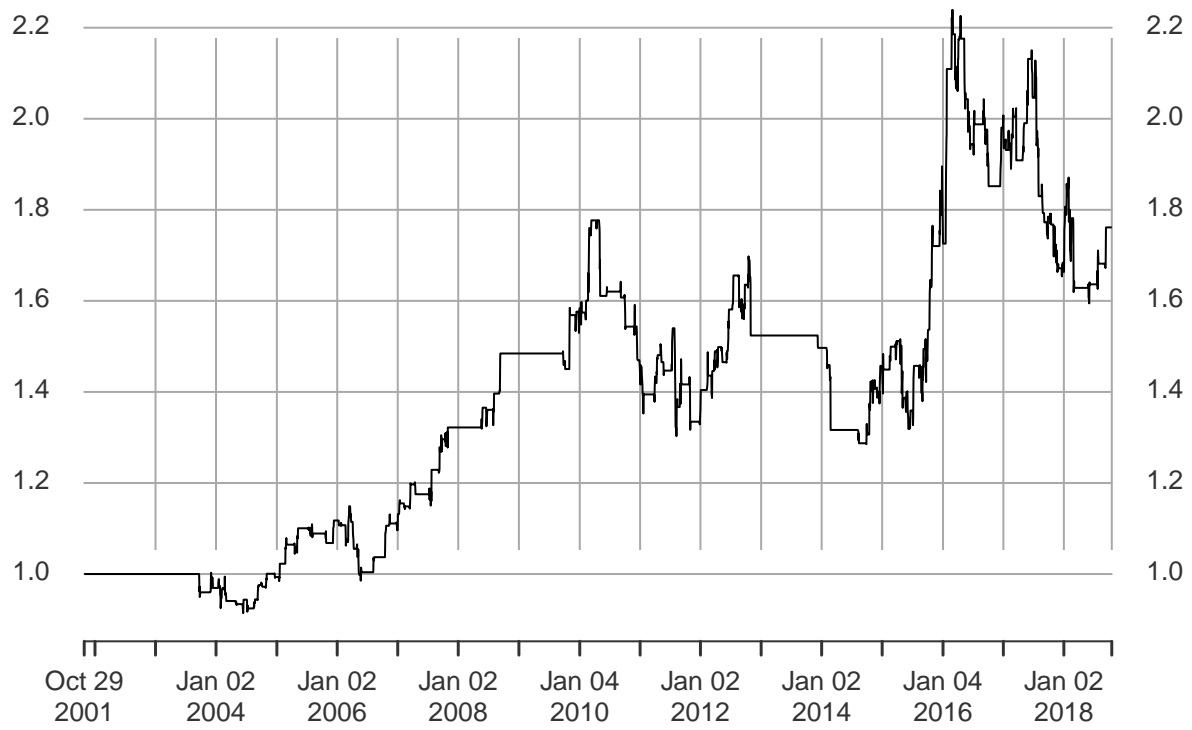
Returns of FME

2001-10-29 / 2018-10-18

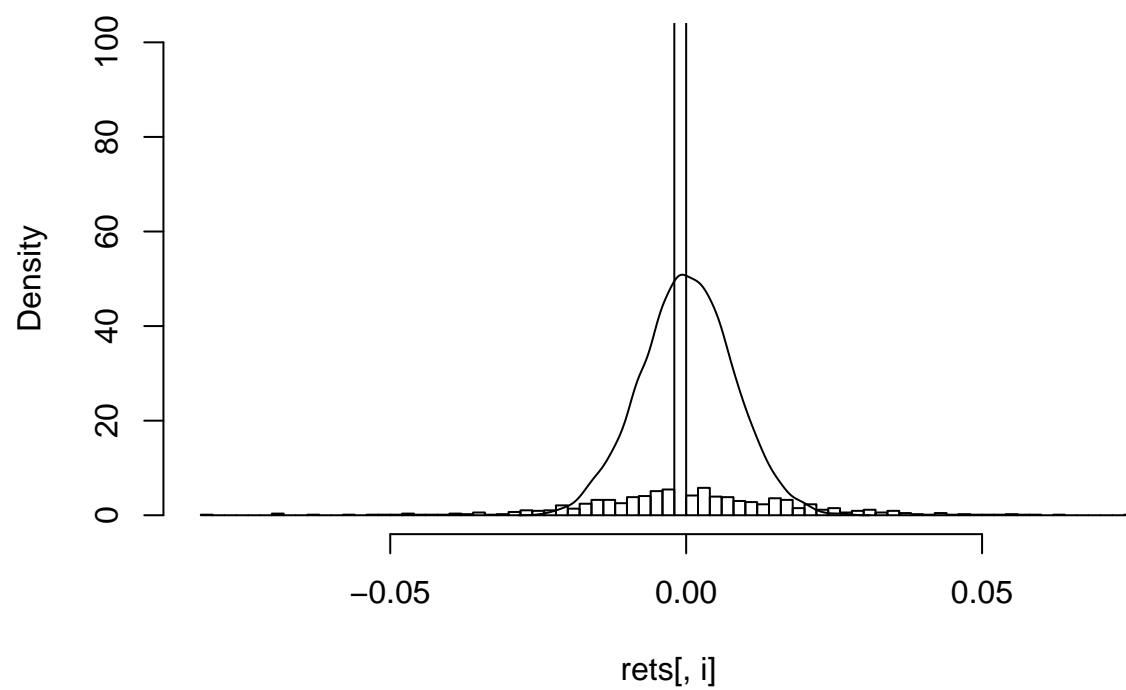


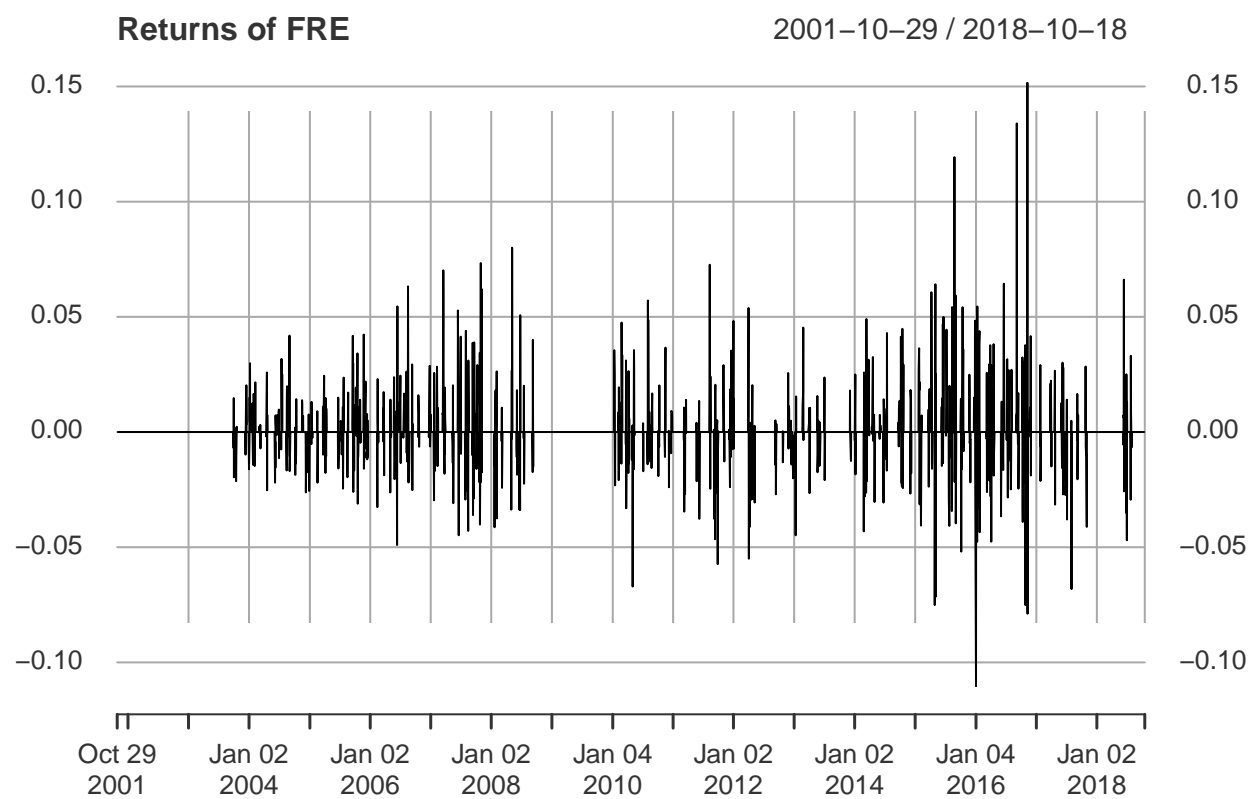
Equity curve of FME

2001-10-29 / 2018-10-18



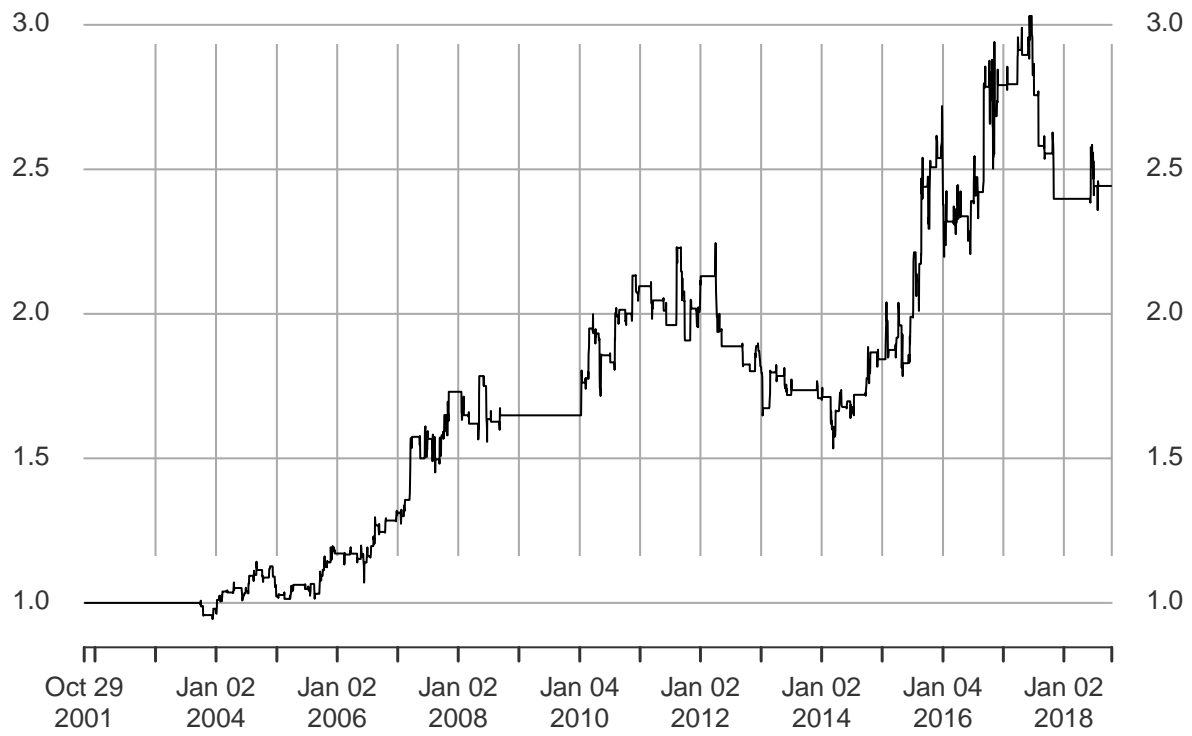
Histogram of Simple Returns of FME



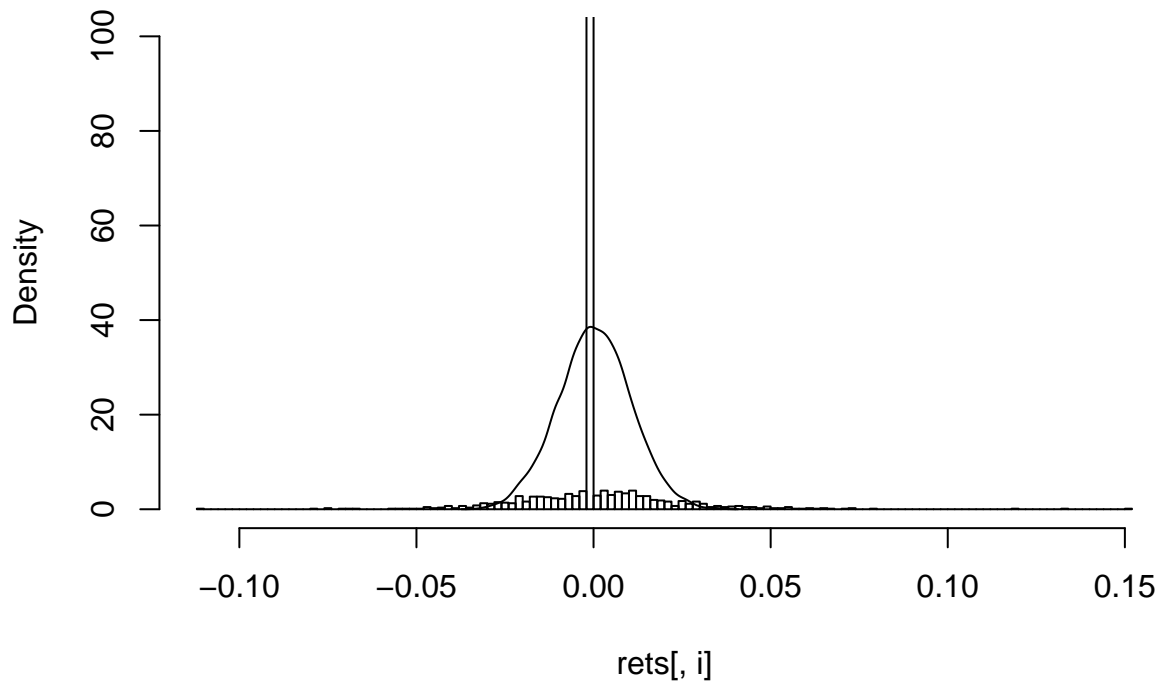


Equity curve of FRE

2001-10-29 / 2018-10-18



Histogram of Simple Returns of FRE



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.

```
## [1] "Investment: 10000"
```

```
## [1] "Confidence Level: 0.99"
```

```
## [1] "Given a 10000 investment in BMW we would expect a maximum loss of 172.76 per day."
```

```
## [1] "Given a 10000 investment in DAI we would expect a maximum loss of 238.17 per day."
```

```
## [1] "Given a 10000 investment in DTE we would expect a maximum loss of 125.71 per day."
```

```
## [1] "Given a 10000 investment in FME we would expect a maximum loss of 258.09 per day."
```

```
## [1] "Given a 10000 investment in FRE we would expect a maximum loss of 325.66 per day."
```

Conclusion and Suggestions