

# IBrokers: Examples To Go

AMATH 557: Trading Strategies

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# IBrokers

We will cover examples here using

- ▶ Equities and ETFs
- ▶ Futures
- ▶ Currencies

For the most part, we will just be using the default exchange settings in IBrokers functions for now.

## Make connection with IB and verify

```
library(IBrokers)
library(xts)

twc <- twsConnect(port=7497) # 7497 is fixed by IB
twc # Show connection information

## <twsConnection,2 @ 20170328 13:44:27 PST, nextId=9>
```

## Equity and ETF Objects

A TWS Equity object can be instantiated using either `twseEquity(.)` or `twseSTK(.)`.

```
# Defaults to exch = SMART  
# (IB's Smart routing:  
# https://www.interactivebrokers.com/en/index.php?f=1685&ns=T)  
aapl <- twseEquity("AAPL")    # Apple stock  
qqq  <- twseSTK("QQQ")       # NASDAQ tracking ETF  
vxx  <- twseEquity('VXX')     # VIX futures tracking ETF (single quotes also OK)
```

## Accessing Contract Details

The `reqContractDetails(.)` function returns an R list

```
ctrAapl <- reqContractDetails(tws, aapl)
ctrQqq <- reqContractDetails(tws, qqg)
ctrVxx <- reqContractDetails(tws, twsEquity("VXX")) # Also OK

ctrAapl[[1]]$contract$symbol
```

```
## [1] "AAPL"
```

```
ctrAapl[[1]]$contract$sectype
```

```
## [1] "STK"
```

```
ctrAapl[[1]]$contract$exch
```

```
## [1] "SMART"
```

## Accessing Contract Details (cont'd)

```
ctrAapl[[1]]$contract$primary
```

```
## [1] "NASDAQ"
```

```
ctrAapl[[1]]$longName
```

```
## [1] "APPLE INC"
```

```
ctrAapl[[1]]$validExchanges
```

```
## [1] "SMART"      "CBOE"      "ISE"      "CHX"      "ARCA"      "ISLAND"
## [7] "VWAP"      "DRCTEDGE" "NSX"      "BEX"      "BATS"      "EDGEA"
## [13] "CSFBALGO" "JEFFALGO" "BYX"      "IEX"      "TPLUS2"    "CVGXALGO"
## [19] "PSX"
```

```
ctrAapl[[1]]$industry
```

```
## [1] "Technology"
```

```
ctrAapl[[1]]$tradingHours
```

```
## [1] "20170328:0400-2000;20170329:0400-2000"
```

## Accessing Contract Details (cont'd)

```
ctrAapl[[1]]$industry
```

```
## [1] "Technology"
```

```
ctrAapl[[1]]$tradingHours
```

```
## [1] "20170328:0400-2000;20170329:0400-2000"
```

```
ctrAapl[[1]]$liquidHours
```

```
## [1] "20170328:0930-1600;20170329:0930-1600"
```

## Retrieving Historical Data

```
# Default case: 1 day bar, duration of one month:  
hstAapl <- reqHistoricalData(tws, aapl)
```

```
## waiting for TWS reply on AAPL .... done.
```

```
# We can go as low as one minute bars with IBrokers (default one month):  
hstQqq <- reqHistoricalData(tws, qqq, barSize = '1 min')
```

```
## waiting for TWS reply on QQQ .... done.
```

```
# Five minute bars for one year (duration limit = 1 year)  
# This can take a little while. Note: double quotes are also OK:  
hstVxx <- reqHistoricalData(tws, vxx, barSize = "5 mins", duration = "1 M") #
```

```
## waiting for TWS reply on VXX .... done.
```



## Retrieving Historical Data (cont'd)

```
tail(hstAapl[,1:5], 2)
```

##		AAPL.Open	AAPL.High	AAPL.Low	AAPL.Close	AAPL.Volume
##	2017-03-27	139.39	141.22	138.62	140.88	183679
##	2017-03-28	140.91	144.04	140.63	143.82	65163

```
head(hstQqq[,1:5], 2)
```

##			QQQ.Open	QQQ.High	QQQ.Low	QQQ.Close	QQQ.Volume
##	2017-02-27	06:30:00	130.02	130.03	129.88	129.95	2515
##	2017-02-27	06:31:00	129.95	129.98	129.92	129.95	1199

```
head(hstVxx[,1:5], 2)
```

##			VXX.Open	VXX.High	VXX.Low	VXX.Close	VXX.Volume
##	2017-02-27	06:30:00	18.07	18.08	18.00	18.02	10871
##	2017-02-27	06:35:00	18.02	18.20	18.02	18.18	9101

## Plot the Results Using quantmod

```
library(quantmod)
theme<-chart_theme()
theme$col$up.col<-'darkgreen'
theme$col$up.border<-'darkgreen'
theme$col$dn.col<-'red'
theme$col$dn.border<-'red'
```

## Plot the Results Using quantmod (cont'd)

```
plot(chart_Series(hstVxx,theme=theme,name="VXX, 5-Day Bars"))
```



## Plot the Results Using quantmod (cont'd)

```
plot(chart_Series(hstAapl,theme=theme,name="AAPL, 1-Day Bars"))
```



Useful link for quantmod plots:

<http://www.quantmod.com/examples/charting/>

## Place some equity trades:

```
# Use reqIds(tws) to get the next available trade ID
myAcct <- "DI658056"
ord <- twsOrder(orderId = reqIds(tws), action = "BUY", totalQuantity = "100",
                orderType = "MKT", account = myAcct)

(placeOrder(tws, qq, ord))  # If successful, returns trade ID
```

```
## [1] 9
```

```
# "Rev" = "Reverse"
ordRev <- twsOrder(orderId = reqIds(tws), action = "SELL", totalQuantity = "1",
                  orderType = "MKT", account = myAcct)

(placeOrder(tws, qq, ordRev))  # If successful, returns trade ID
```

```
## [1] 10
```

## Futures Contracts

```
# No default exchange -- need to supply on your own.
gc <- twsFUT('GC', 'NYMEX', '201705')           # gold (OK without day)
es <- twsFuture("ES", "GLOBEX", "20170616")     # SP500 futures (day required)

gc05 <- reqContractDetails(tws, gc)
es06 <- reqContractDetails(tws, es)
```

## Futures Contract Details

```
gc05[[1]]$contract$symbol
```

```
## [1] "GC"
```

```
gc05[[1]]$contract$sectype
```

```
## [1] "FUT"
```

```
gc05[[1]]$contract$exch
```

```
## [1] "NYMEX"
```

```
gc05[[1]]$contract$primary
```

```
## [1] ""
```

```
gc05[[1]]$contract$expiry
```

```
## [1] "20170526"
```



## Futures Contract Details (cont'd)

```
gc05[[1]]$longName
```

```
## [1] "Gold"
```

```
gc05[[1]]$contractMonth
```

```
## [1] "201705"
```

```
gc05[[1]]$validExchanges
```

```
## [1] "NYMEX"
```

```
gc05[[1]]$tradingHours
```

```
## [1] "20170328:1800-1700;20170329:1800-1700"
```

```
gc05[[1]]$liquidHours
```

```
## [1] "20170328:0930-1700;20170329:0930-1700"
```

## Historical Market Data for Futures Contracts

```
hstGc05 <- reqHistoricalData(tws, gc, barSize = "30 mins", duration = "5 D")
```

```
## TWS OrderStatus: orderId=9 status=PreSubmitted filled=0 remaining=100 average
## TWS Message: 2 10 399 Order Message:
## SELL 1 QQQ NASDAQ.NMS
## Warning: your order will not be placed at the exchange until 2017-03-29 09:3
## TWS OrderStatus: orderId=10 status=PreSubmitted filled=0 remaining=1 average
## TWS OrderStatus: orderId=9 status=PreSubmitted filled=0 remaining=100 average
## TWS OrderStatus: orderId=10 status=PreSubmitted filled=0 remaining=1 average
## waiting for TWS reply on GC .... done.
```

```
hstEs06 <- reqHistoricalData(tws, es, barSize = "1 day", duration = "1 M")
```

```
## waiting for TWS reply on ES .... done.
```

```
head(hstGc05[,1:5], 2)
```

		GCK7.Open	GCK7.High	GCK7.Low	GCK7.Close	GCK7.Volume
##	2017-03-22 06:30:00	1250.3	1250.3	1248.6	1250.3	12
##	2017-03-22 07:00:00	1251.1	1251.8	1251.1	1251.4	65

```
tail(hstEs06[,1:5], 2)
```

## Plot: Gold

```
plot(chart_Series(hstGc05,theme=theme,  
name="Gold May 2017 Future contract, 30-Min Bars"))
```



## Plot: SP 500

```
plot(chart_Series(hstEs06,theme=theme,  
name="SP500 June 2017 Future Contract, 1-Day Bars"))
```



## Currencies

Default exchange is IDEALPRO: IdealPro Forex market center

```
gbp <- twsCurrency("GBP")
gbp2 <- twsCASH('GBP')      # Alternative

# Note: JPY FX trading does not appear to
# be available in our TWS setup

ctrGbp <- reqContractDetails(tws, gbp)
```

## Currencies: Contract Details

Default exchange is IDEALPRO: IdealPro Forex market center

```
ctrGbp[[1]]$contract$symbol
```

```
## [1] "GBP"
```

```
ctrGbp[[1]]$contract$sectype
```

```
## [1] "CASH"
```

```
ctrGbp[[1]]$contract$exch
```

```
## [1] "IDEALPRO"
```

```
ctrGbp[[1]]$contract$primary
```

```
## [1] ""
```

## Currencies: Contract Details (cont'd)

Default exchange is IDEALPRO: IdealPro Forex market center

```
ctrGbp[[1]]$longName
```

```
## [1] "British pound"
```

```
ctrGbp[[1]]$validExchanges
```

```
## [1] "IDEALPRO"
```

```
ctrGbp[[1]]$tradingHours
```

```
## [1] "20170328:1715-1700;20170329:1715-1700"
```

```
ctrGbp[[1]]$liquidHours
```

```
## [1] "20170328:1715-1700;20170329:1715-1700"
```