Fast and Flexible Technical Analysis with TTR

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What is TTR?

- Extensive:
  - Over 50 technical analysis indicators
  - Additional supporting functions
- Flexible:
  - Alter traditional calculations
  - Automatically handles many time-series classes
- Fast:
  - Many functions use compiled code
  - Can handle tick frequency data

Extensive

Moving Averages	Oscillators	Volatility	Trend Detection / Strength	Volume Studies	Misc.
Simple	MA Convergence / Divergence	Garman-Klass	Aroon	On-Balance Volume	Bollinger Bands
Exponential	Stochastics	Parkinson	Commodity Channel Index	Money Flow Index	Parabolic Stop and Reverse
Weighted \ VWAP	Relative Strength Index	Rogers-Satchell	Vertical Horizontal Filter	Chaikin Money Flow	Zig-Zag
Zero-Lag	TRIX	(Average) True Range	Trend Detection Index	Chaikin Accumulation / Distribution	Close Location Value
Elastic, Volume-Weighted	Stochastic Momentum Index	Close Price Volatility	Average Directional Index	William's Accumulation / Distribution	Split / Dividend Adjustments

Flexible – Alter Calculations

Default RSI indicator:

```
rsi <- RSI(price, n=14)
```

Custom RSI with volume-weighted MA:

```
rsi <- RSI(price, n=14, maType="WMA", wts=volume)
```

Custom RSI with different up / down MAs:

```
rsi <- RSI( price, maType=list(
          maUp=list(EMA,n=14,ratio=1/5),
          maDown=list(WMA,n=16,wts=1:16)) )
```

Flexible – Time Series Classes

Thanks to xts, TTR automatically handles:

- zoo / xts
- timeSeries
- ts
- its
- irts
- fts
- data.frame
- matrix

```
> data(ttrc)
> x <- xts(ttrc[,-1],ttrc[,1])
> class(RSI(Cl(x),2))
[1] "xts" "zoo"
> class(RSI(as.timeSeries(Cl(x)),2))
[1] "timeSeries"
attr(,"package")
[1] "timeSeries"
> class(RSI(as.zoo(Cl(x)),2))
[1] "zoo"
```

Fast

This is one of the slowest compiled functions:

```
> # Parabolic Stop-And-Reverse
> data(ttrc)  # 5550 observations
> # Native R
> system.time({s <- sar(ttrc[,c('High','Low')])})
   user  system elapsed
  1.060   0.088   1.980
> # C
> system.time({S <- SAR(ttrc[,c('High','Low')])})
   user  system elapsed
  0.004   0.000   0.006
```

Fast

It's not just because the data set was small...

```
> # Parabolic Stop-And-Reverse, 6 million observations
> x <- .xts(cumprod(1+rnorm(6e6)/1e5),1:6e6)
> x <- merge(Low=x,High=x*(1+runif(6e6)/100))
>
> # Native R
> system.time({s <- sar(x[,c('High','Low')])})
   # still waiting for this to finish...
> # C
> system.time({S <- SAR(x[,c('High','Low')])})
    user  system elapsed
   1.584   1.332   2.919
```

What's Next?

- Breadth indicators
- Indicators for Inhomogeneous data
- ...other than that, it depends on useR requests

The most up-to-date package is on R-forge:
http://ttr.r-forge.r-project.org/

Examples and other ramblings are on FOSS Trading:
http://www.fosstrading.com