

# Drawdowns and Streaks

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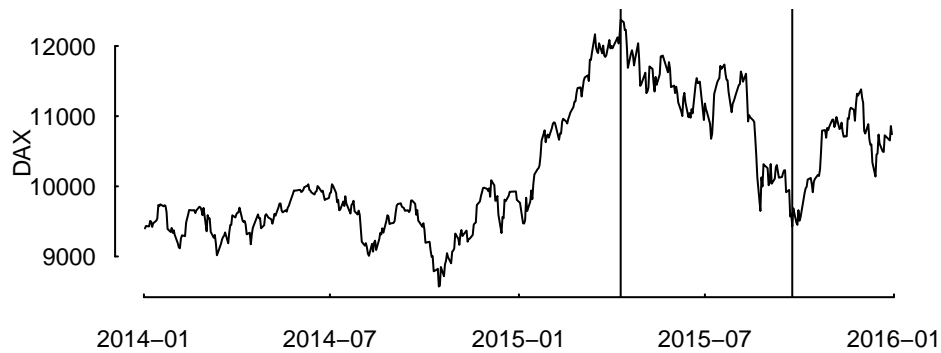
## Drawdowns

The drawdowns function returns magnitudes of drawdowns, as well as their peaks, troughs, and times of recovery.

```
> library("PMwR")
> library("zoo")
> dax <- zoo(DAX[[1]], as.Date(row.names(DAX)))
> dd <- drawdowns(dax)
> dd <- dd[order(dd$max, decreasing = TRUE), ] ## sort by size
> dd
```

	peak	trough	recover	max
18	2015-04-10	2015-09-24	<NA>	0.238154
9	2014-07-03	2014-10-15	2014-12-05	0.145320
10	2014-12-05	2014-12-15	2015-01-16	0.074661
4	2014-01-17	2014-03-13	2014-05-13	0.074430
17	2015-03-16	2015-03-26	2015-04-10	0.026631
12	2015-02-04	2015-02-09	2015-02-12	0.022711
8	2014-06-10	2014-06-26	2014-07-03	0.022326
11	2015-01-26	2015-01-27	2015-02-02	0.015720
5	2014-05-13	2014-05-16	2014-05-23	0.012849
14	2015-03-02	2015-03-03	2015-03-05	0.011393
2	2014-01-07	2014-01-09	2014-01-13	0.008898
15	2015-03-09	2015-03-10	2015-03-11	0.007057
13	2015-02-13	2015-02-17	2015-02-19	0.006182
7	2014-06-02	2014-06-03	2014-06-06	0.003053
3	2014-01-15	2014-01-16	2014-01-17	0.001654
1	2014-01-03	2014-01-06	2014-01-07	0.000758
16	2015-03-11	2015-03-12	2015-03-13	0.000559
6	2014-05-27	2014-05-29	2014-05-30	0.000193

```
> par(bty = "n", las = 1, tck = 0.01,
      mar = c(3, 3, 1, 1), mgp = c(2, 0.5, 0), ps = 9)
> plot(dax, xlab = "", ylab = "DAX")
> abline(v = dd$peak[1])
> abline(v = dd$trough[1])
```



## Streaks

The `streaks` function returns a data-frame of uninterrupted up and down movements, with uninterrupted meaning that no countermovement occurred of down (up) percent or more during up (down) movements.

```
> up_down <- streaks(dax, up = 0.1, down = -0.1)
> up_down
```

	start	end	state	return
1	2014-01-02	2014-03-13	<NA>	-0.0407
2	2014-03-13	2014-07-03	up	0.1122
3	2014-07-03	2014-10-15	down	-0.1453
4	2014-10-15	2015-04-10	up	0.4436
5	2015-04-10	2015-09-24	down	-0.2382
6	2015-09-24	2015-11-30	up	0.2073
7	2015-11-30	2015-12-30	down	-0.0562

You may use this information, for instance, to produce charts of up and down phases, such as the following. Note that the vertical scale is a log scale, i.e. a drop of 50% takes the same vertical distance as a rise of 100%.

