
Interactively Exploring Seasonality Patterns in R

Michael Kapler

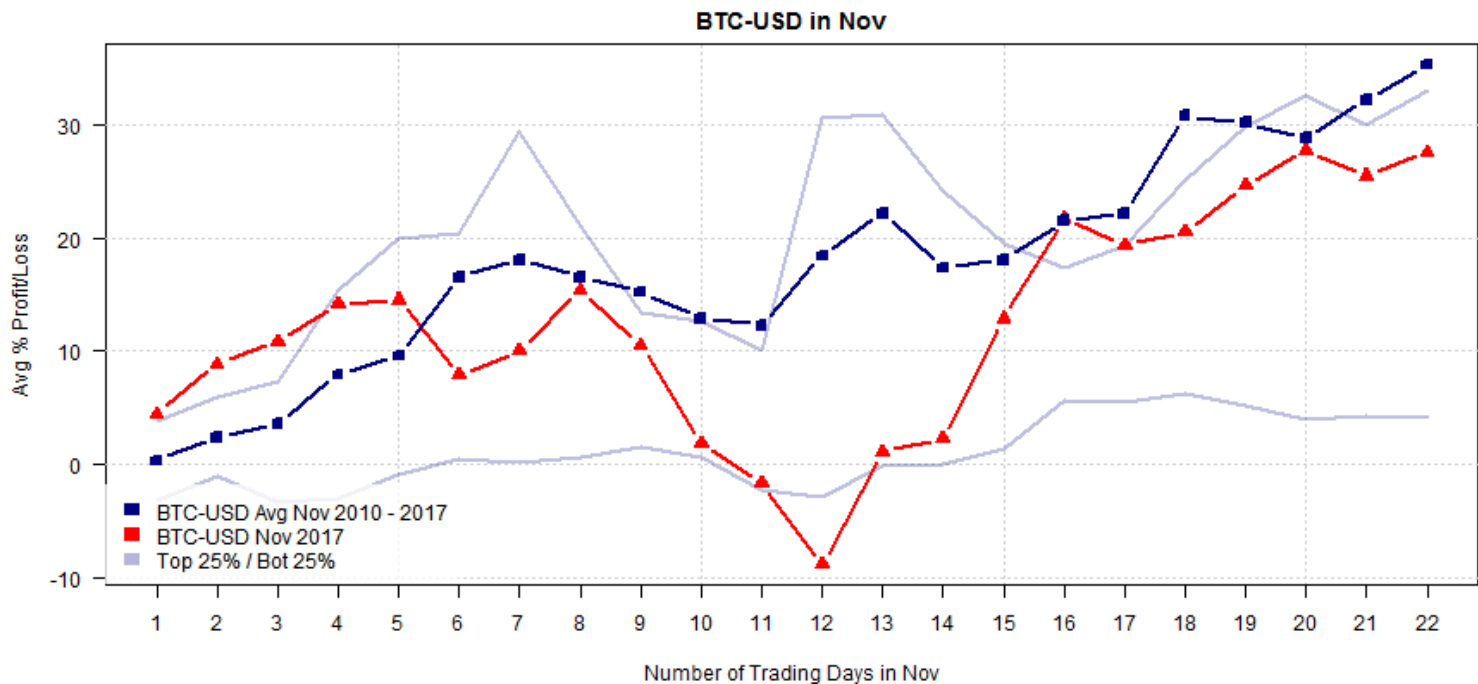
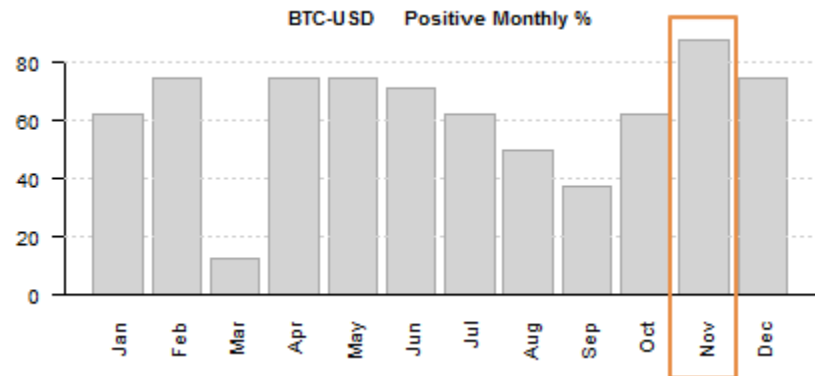
Seasonality

Seasonality

Seasonality analysis can be very useful:

- Cryptocurrency
- Financial backtest
- Google trends

Cryptocurrency



RTSViz package

The screenshot shows the RTSViz web interface. At the top, there is a navigation bar with a home icon, 'Seasonality', and 'Tools'. Below this is a secondary navigation bar with tabs: 'Summary', 'Details', 'Month', 'Month details', and 'Help'. The 'Month details' tab is currently selected. A yellow callout box above the tabs says 'Click "Run" button to get started.' On the left side, there is a form with the following fields: 'Ticker:' with a text input containing 'SPY'; a date range from '2000-01-01' to '2018-05-18'; 'Source' with a dropdown menu set to 'yahoo'; a blue 'Run' button; 'Month' with a dropdown menu set to 'Jan'; and a green 'Run Monthly' button. At the bottom left, there is a circular progress indicator showing '0%'. Red arrows point from the 'Run' button to the 'Run' button and from the 'Ticker' input to the text '1. Select Symbol to Analyze, e.g. SPY'. A blue arrow points from the '0%' progress indicator to the text 'Display Progress'. A green arrow points from the 'Month details' tab to the text 'Navigation Tabs'.

To run Seasonality Analysis

1. Select Symbol to Analyze, e.g. SPY
2. Click "Run" button

Display Progress

Navigation Tabs

rtsviz package - R Time Series Visualization

Summary Tab


Seasonality Tools

Ticker:

to

Source

Month



Elapsed: 2.3s

Summary

Details

Month

Month details

Help

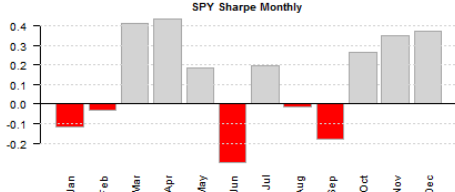
Performance Summary:

[Historical Monthly Performance](#)
[Historical Annual Performance](#)
[Overall Performance](#)
[Last 6 Months Performance](#)
[Download Reports](#)

Click on the link to scroll to selected

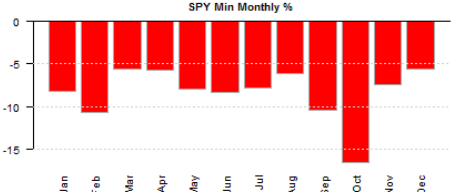
Historical Monthly Performance: ↑

SPY Sharpe Monthly




Month	Sharpe Ratio
Jan	-0.05
Feb	-0.02
Mar	0.40
Apr	0.42
May	0.18
Jun	-0.15
Jul	0.18
Aug	-0.02
Sep	-0.08
Oct	0.25
Nov	0.35
Dec	0.38

SPY Min Monthly %




Month	Min Monthly %
Jan	-8
Feb	-10
Mar	-5
Apr	-5
May	-8
Jun	-8
Jul	-8
Aug	-6
Sep	-10
Oct	-15
Nov	-8
Dec	-6

SPY % Positive Monthly %



Month	% Positive
Jan	45
Feb	50
Mar	65
Apr	70
May	60
Jun	48
Jul	52
Aug	62
Sep	50
Oct	60
Nov	68
Dec	60

SPY Avg Monthly %



Month	Avg Monthly %
Jan	1.2
Feb	1.2
Mar	1.6
Apr	1.7
May	0.5
Jun	0.5
Jul	0.8
Aug	1.2
Sep	1.2
Oct	1.5
Nov	1.4
Dec	1.0

Reports

Last 6 Months Performance: [↑](#) ← Click on the "Up" arrow to scroll up



Download Reports: [↑](#)

- [Rmd](#)
- [PDF](#)
- [CSV](#)

Download Reports as
* RMarkdown
* PDF
* CSV

Details Tab

Seasonality Tools

Ticker: SPY
2000-01-01 to 2018-05-18
Source: yahoo
Run
Month: Jan
Run Monthly

100%

Summary **Details** Month Month details Help

Performance Details:

[Historical Monthly Table](#)
[Historical Performance Table](#)

Historical Monthly Table: ↑

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sharpe	-0.12	-0.03	0.41	0.43	0.18	-0.3	0.2	-0.01	-0.18	0.27	0.35	0.37
% Positive	47.4%	52.6%	68.4%	73.7%	63.2%	50%	55.6%	66.7%	55.6%	66.7%	72.2%	66.7%
Min	-8.2%	-10.7%	-5.6%	-5.8%	-7.9%	-8.4%	-7.9%	-6.1%	-10.5%	-16.5%	-7.5%	-5.7%
Max	5.6%	5.6%	9.7%	9.9%	5.8%	4.1%	7.5%	6.5%	9%	10.9%	7.8%	6.7%
Avg	-0.5%	-0.2%	1.6%	1.8%	0.6%	-1%	0.8%	-0.1%	-0.9%	1.6%	1.5%	1%
Med	-1%	0.6%	0.8%	1%	1.5%	0%	0.8%	0.5%	0.4%	1.9%	2.4%	1%
Risk	4.1%	4.4%	4%	4.1%	3.5%	3.3%	3.9%	3.6%	5.3%	5.9%	4.2%	2.6%

Copy ↑ **Click "Copy" to copy table to clipboard**

Month Tab

Seasonality Tools

Ticker: SPY
2000-01-01 to 2018-05-18
Source: yahoo
Run

Month: Jan
Run Monthly

To run Month Analysis
1. Select Month to Analyze
2. Click "Run Monthly" button

Summary Details **Month** Month details Help

Jan Performance Summary:
Jan Historical Annual Performance
Jan Daily Historical Performance

Jan Historical Annual Performance:


SPY Monthly % Profit for Jan, Sharpe = -0.12, Positive = 47.4%

January Performance Each Year

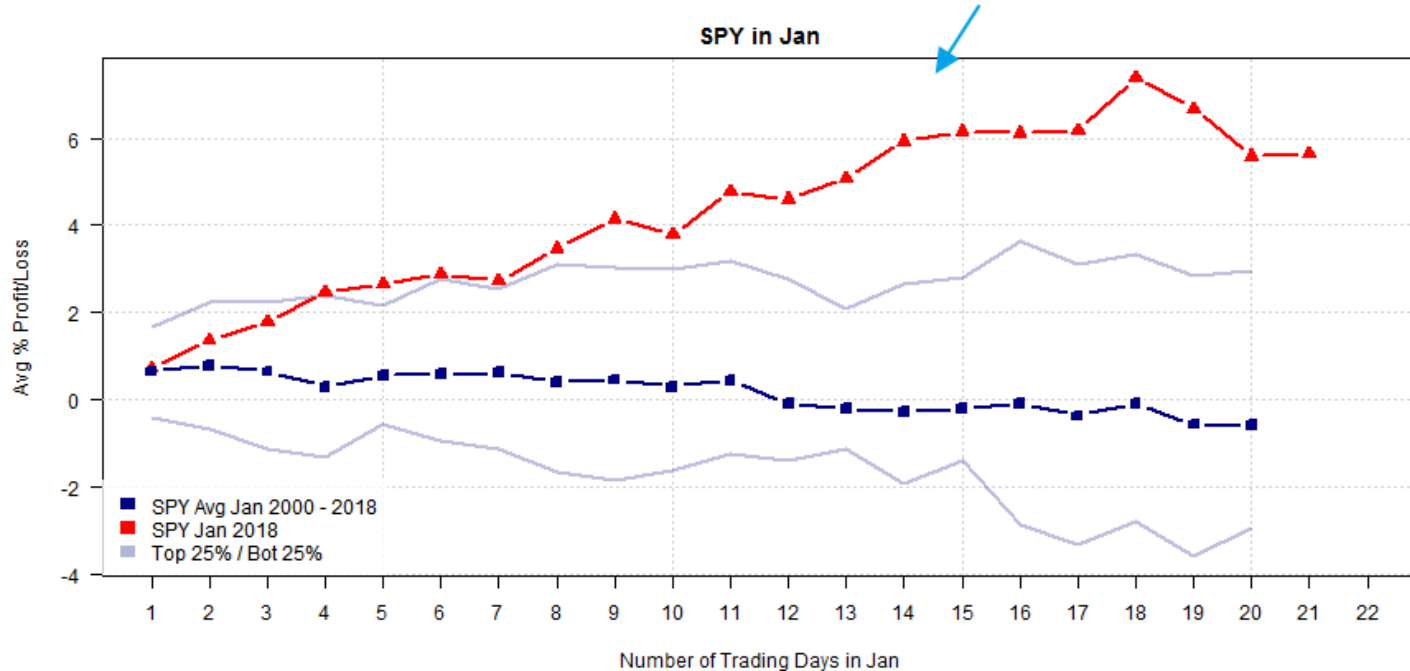
Year	SPY Monthly % Profit for Jan
2000	-4.0
2001	4.5
2002	-0.5
2003	-2.5
2004	2.0
2005	-2.0
2006	2.5
2007	1.5
2008	-6.0
2009	-8.0
2010	-3.5
2011	2.5
2012	4.5
2013	5.0
2014	-3.5
2015	-2.5
2016	-5.0
2017	2.0
2018	5.0

Elapsed: 1.0s
Status: **Ok** Plot: End

Month Tab - Daily Plot

Jan Daily Historical Performance: 

Daily Performance in January



Month Details Tab

Home Seasonality Tools

Summary Details **Month** **Month details** Help

Jan Annual Charts:

Jan 2018 Jan 2017 Jan 2016 Jan 2015 Jan 2014 Jan 2013 Jan 2012 Jan 2011 Jan 2010
Jan 2009 Jan 2008 Jan 2007 Jan 2006 Jan 2005 Jan 2004 Jan 2003 Jan 2002 Jan 2001
Jan 2000

Click on the link to scroll to selected

Jan 2018 Historical Performance: ⬆

■ SPY Nov2017 - 15Mar2018 274.78
■ MA 20 267.37
■ MA 50 267.27

January is highlighted

Volume 83.43 millions

Stoch 75.88

2017 Jan Mar

Try **RTSViz** when you need to quickly Visualize Seasonality Patterns.

Install with the following code:

```
remotes::install_bitbucket('rtsvizteam/rtsviz')
```

Thank you

I will be glad to answer your questions during the break

Appendices

Additional examples of seasonality analysis:

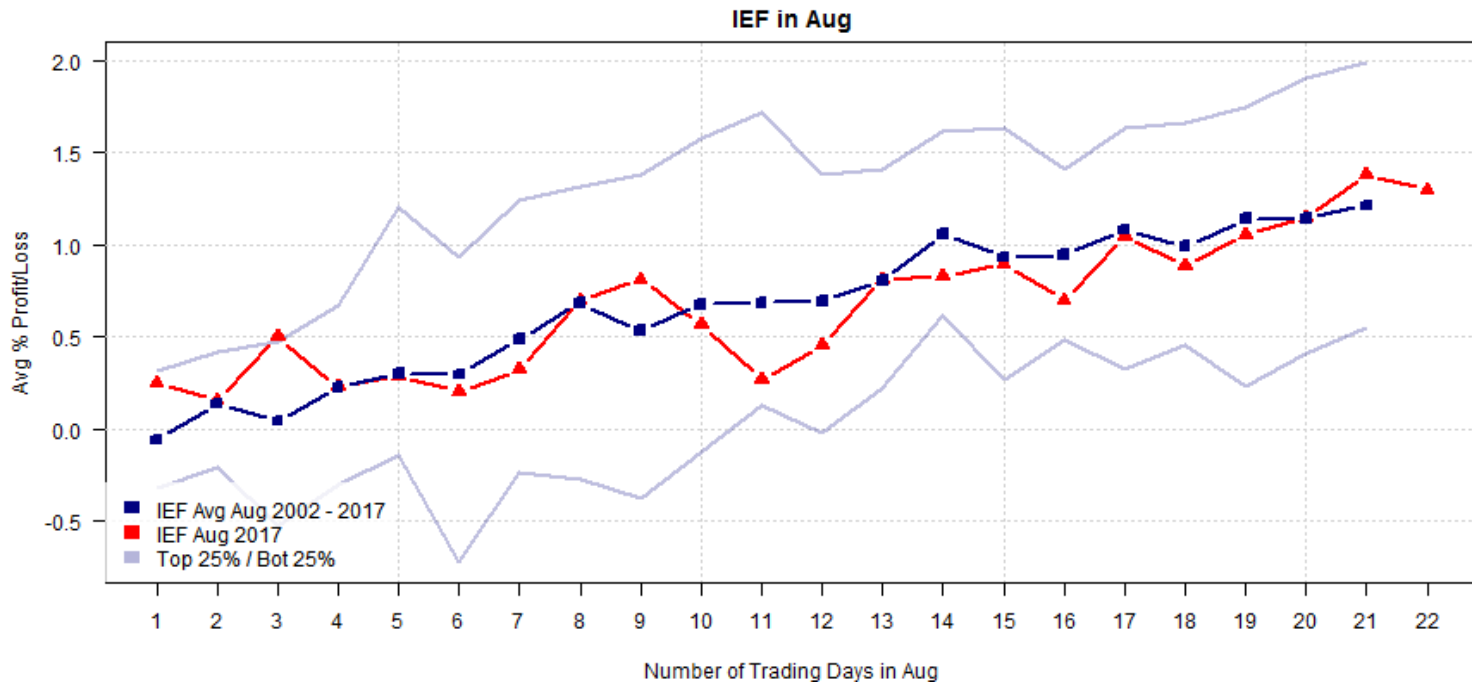
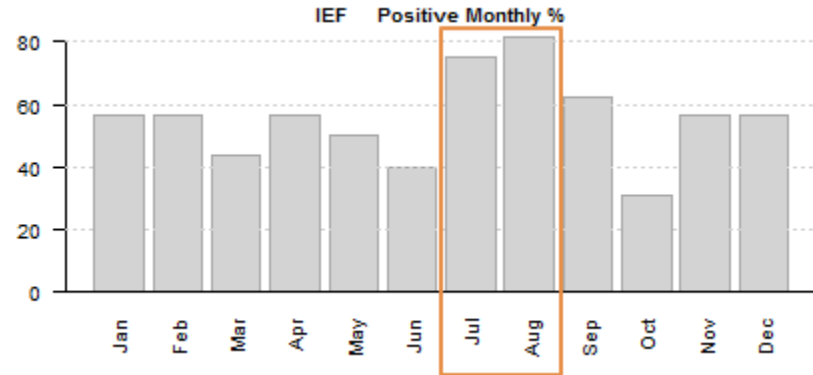
- Seasonality Patterns in Fixed Income¹
- Seasonality Patterns in Google Trend Search Queries²
- Seasonality Patterns in Adaptive Allocation strategy back-test³
- Seasonality Patterns in VIX

[1] Morgan Stanley unveils a detailed strategy that has worked perfectly for 3 decades for trading one of the world's largest markets around US holidays

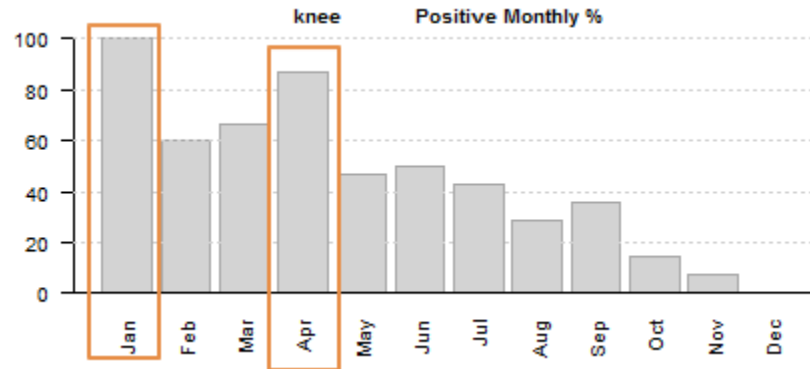
[2] Using google trends to assess for seasonal variation in knee injuries

[3] Market Timing - Adaptive Allocation

Fixed Income

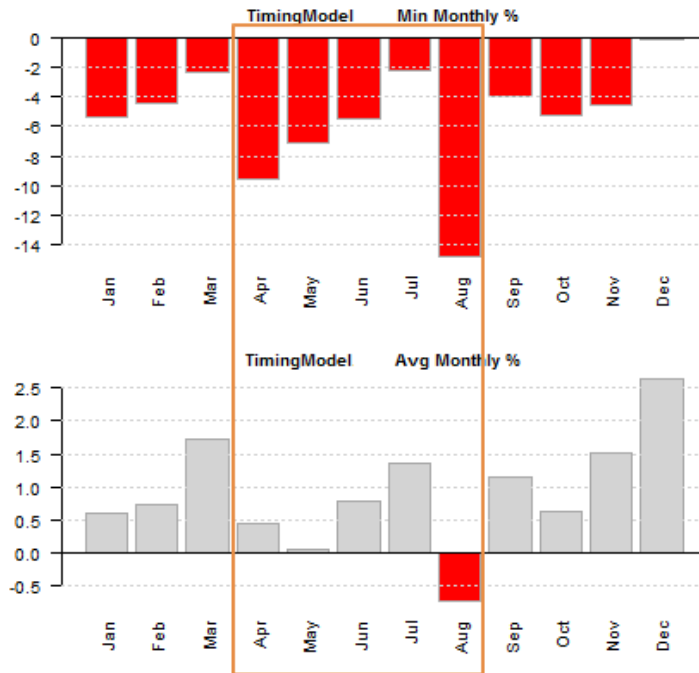
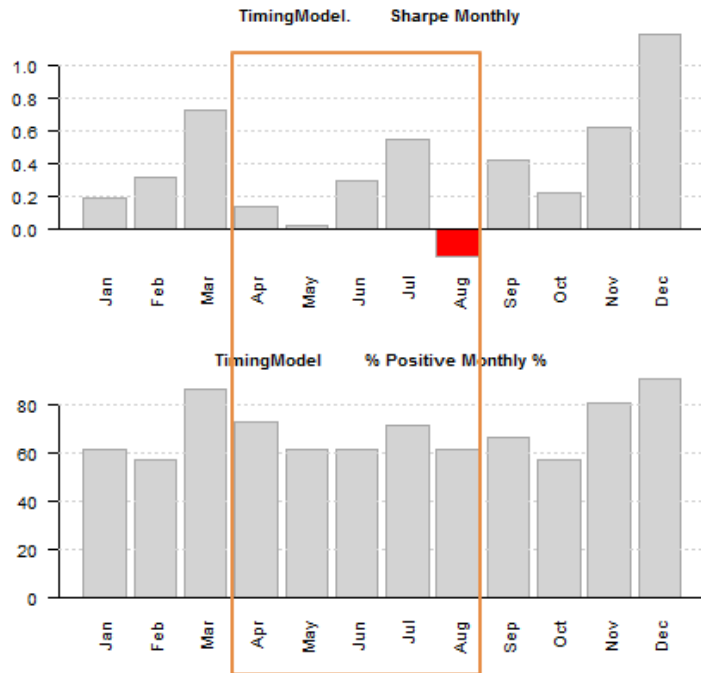


Google Trend Search Queries



Using google trends to assess for seasonal variation in knee injuries.

Adaptive Allocation strategy back-test



Avoid **spring and summer** to reduce **drawdowns**.

Implied Volatility

