

# Introduction and first metrics

FINANCIAL ANALYTICS IN SPREADSHEETS



**David Ardia**

Professor in Quantitative Methods for  
Finance

# Market value of a company



# Stock

## Slice



# Stock

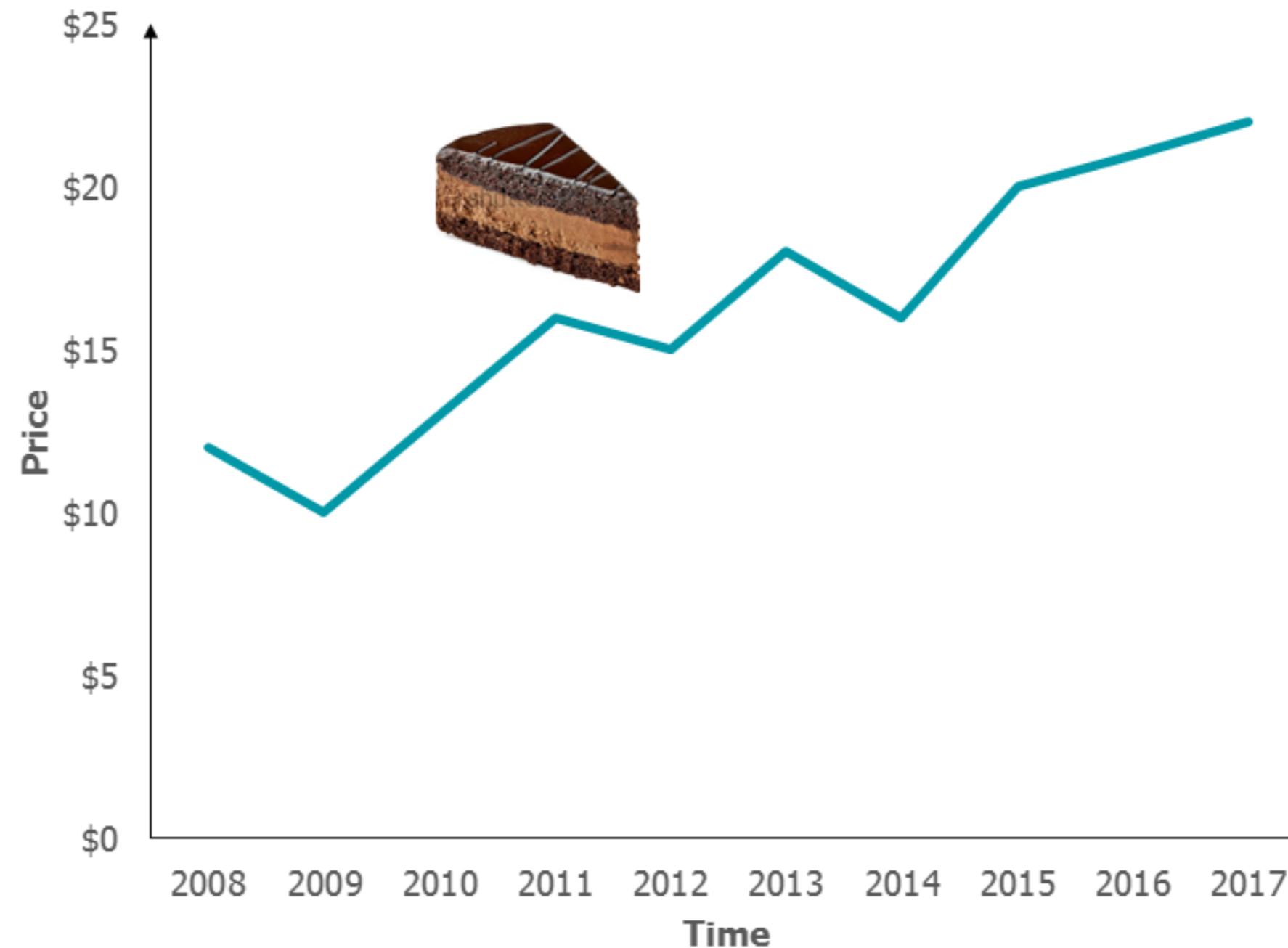
Slice



Stock



# Stock price



# Dividends

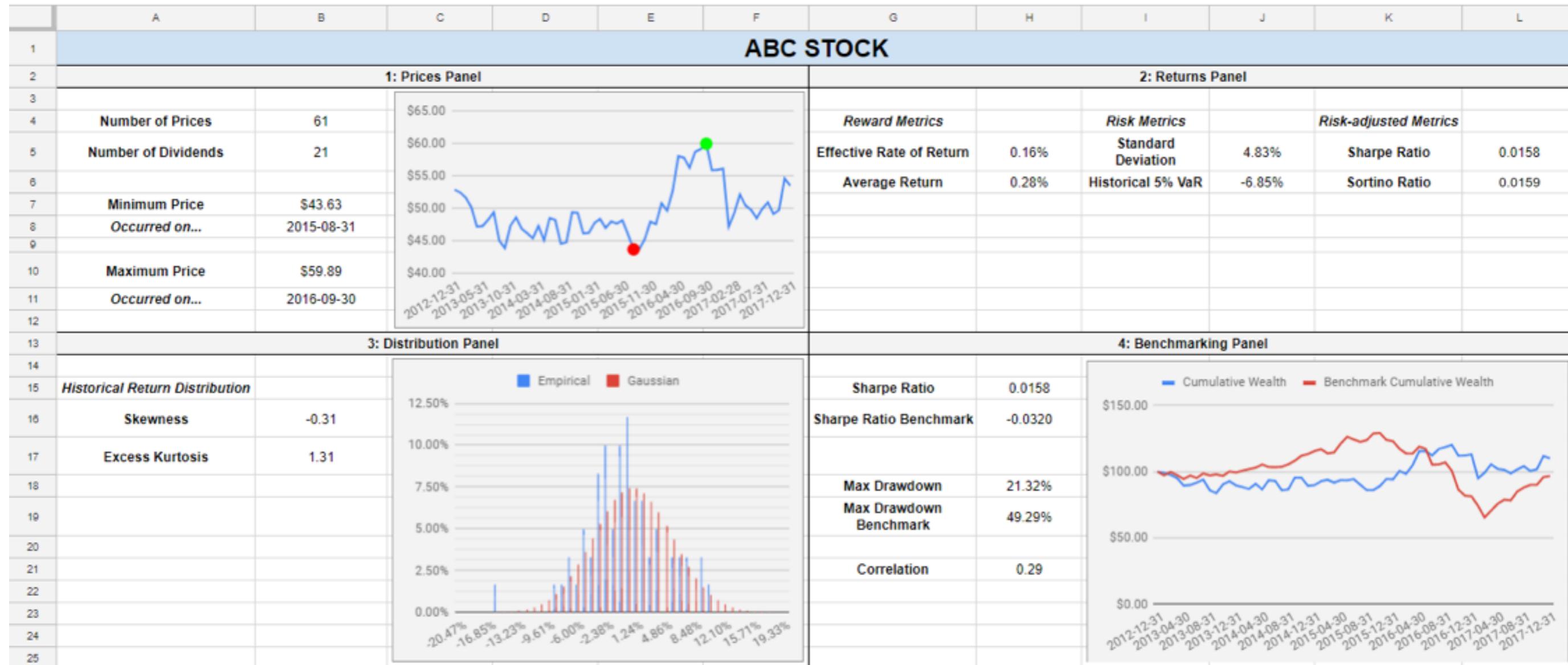
Without dividend



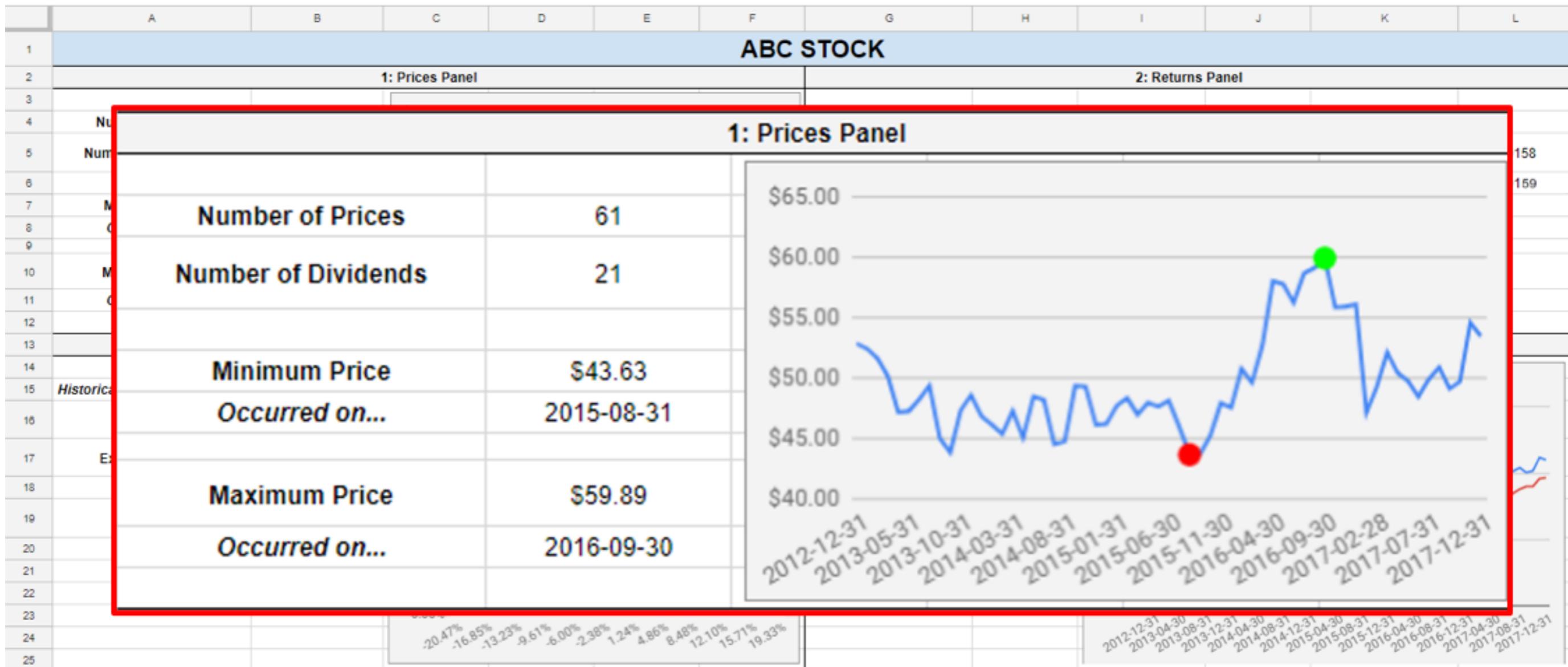
With dividend



# Monitoring dashboard



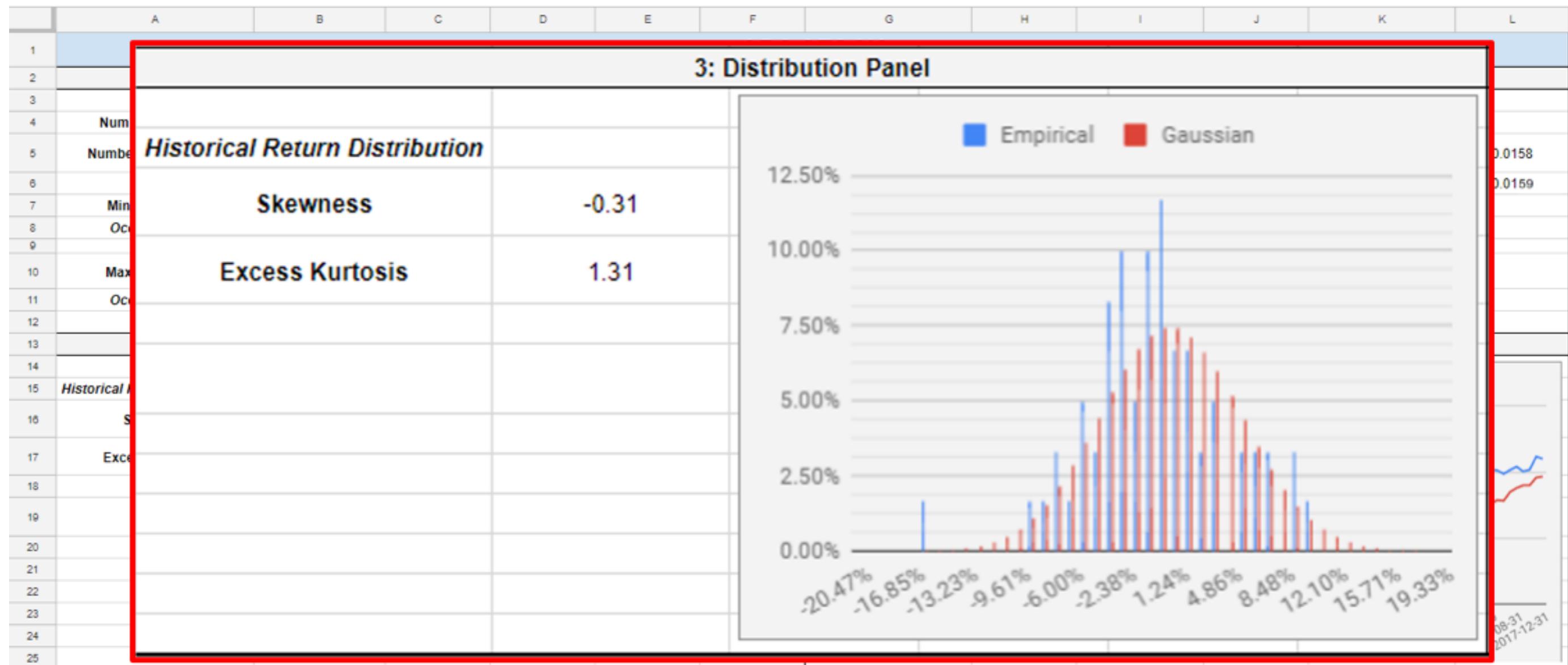
# Prices panel



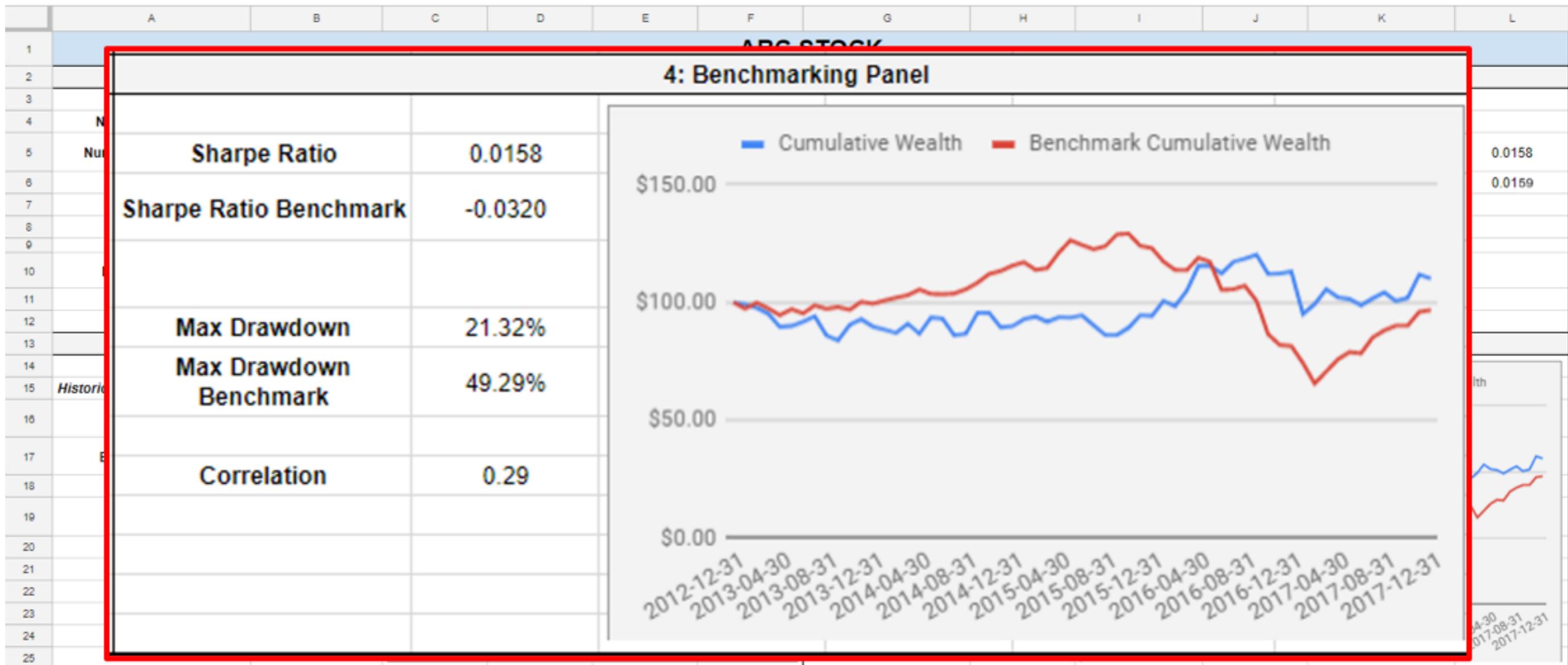
# Returns panel

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3												
4	Nu											
5	Num											
6												
7	M											
8	O											
9												
10	<b>Reward Metrics</b>				<b>Risk Metrics</b>				<b>Risk-adjusted Metrics</b>			
11	<b>Effective Rate of Return</b>	0.16%			<b>Standard Deviation</b>		4.83%		<b>Sharpe Ratio</b>	0.0158		
12	<b>Average Return</b>	0.28%			<b>Historical 5% VaR</b>		-6.85%		<b>Sortino Ratio</b>	0.0159		
13												
14												
15	<i>Historical Returns</i>											
16												
17	Ex:											
18												
19												
20												
21												
22												
23												
24												
25												

# Distribution panel



# Benchmarking panel



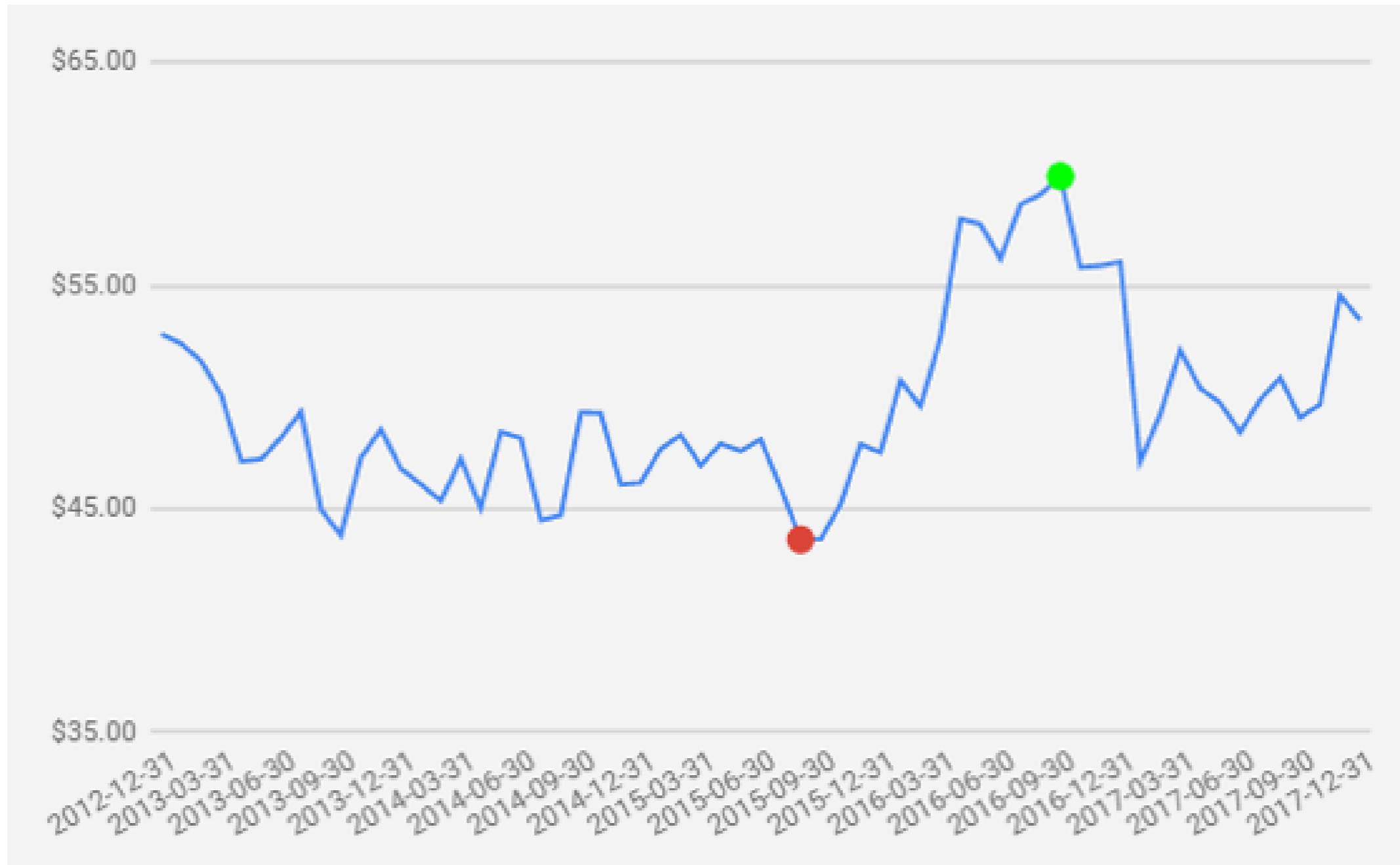
# Historical prices and dividends

	A	B	C
1	Date	ABC Price	ABC Dividend
2	2012-12-31	\$52.82	\$0.13
3	2013-01-31	\$52.40	\$0.00
4	2013-02-28	\$51.61	\$0.00
5	2013-03-31	\$50.11	\$0.15
6	2013-04-30	\$47.14	\$0.00
7	2013-05-31	\$47.23	\$0.15
⋮	⋮	⋮	⋮
58	2017-08-31	\$50.87	\$0.27
59	2017-09-30	\$49.09	\$0.00
60	2017-10-31	\$49.68	\$0.00
61	2017-11-30	\$54.55	\$0.00
62	2017-12-31	\$53.45	\$0.27

# Number of prices

	A	B	C
1	Date	ABC Price	ABC Dividend
2	2012-12-31	\$52.82 #1	\$0.13
3	2013-01-31	\$52.40 #2	\$0.00
4	2013-02-28	\$51.61	\$0.00
5	2013-03-31	\$50.11	\$0.15
6	2013-04-30	\$47.14	\$0.00
7	2013-05-31	\$47.23	\$0.15
⋮	⋮	⋮	⋮
58	2017-08-31	\$50.87	\$0.27
59	2017-09-30	\$49.09	\$0.00
60	2017-10-31	\$49.68	\$0.00
61	2017-11-30	\$54.55	\$0.00
62	2017-12-31	\$53.45 #61	\$0.27

# Minimum and maximum prices



# Functions COUNT(), MIN() and MAX()

Goal	Function	Output
<i>Number of prices</i>	=COUNT(B2:B10)	9

	A	B
1	Date	ABC Price
2	2012-12-31	\$52.82
3	2013-01-31	\$52.40
4	2013-02-28	\$51.61
5	2013-03-31	\$50.11
6	2013-04-30	\$47.14
7	2013-05-31	\$47.23
8	2013-06-30	\$48.20
9	2013-07-31	\$49.35
10	2013-08-31	\$44.96

# Functions COUNT(), MIN() and MAX()

Goal	Function	Output
<i>Number of prices</i>	=COUNT(B2:B10)	9
<i>Minimum price</i>	=MIN(B2:B10)	\$44.96
<i>Maximum price</i>	=MAX(B2:B10)	\$52.82

	A	B
1	Date	ABC Price
2	2012-12-31	\$52.82
3	2013-01-31	\$52.40
4	2013-02-28	\$51.61
5	2013-03-31	\$50.11
6	2013-04-30	\$47.14
7	2013-05-31	\$47.23
8	2013-06-30	\$48.20
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<i>Number of prices</i>	=COUNT(B2:B10)	9
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<i>Maximum price</i>	=MAX(B2:B10)	\$52.82

	A	B
1	Date	ABC Price
2	2012-12-31	\$52.82
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Goal	Function	Output
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	A	B
1	Date	ABC Price
2	2012-12-31	\$52.82
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7	2013-05-31	\$47.23
8	2013-06-30	\$48.20
9	2013-07-31	\$49.35
10	2013-08-31	\$44.96

# Functions COUNTIFS(), MINIFS(), and MAXIFS()

Goal	Function	Output
<i>Counting under conditions</i>	=COUNTIFS(B2:B10,>48")	6

	A	B
1	Date	ABC Price
2	2012-12-31	\$52.82
3	2013-01-31	\$52.40
4	2013-02-28	\$51.61
5	2013-03-31	\$50.11
6	2013-04-30	\$47.14
7	2013-05-31	\$47.23
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# Functions COUNTIFS(), MINIFS(), and MAXIFS()

Goal	Function	Output
<i>Counting under conditions</i>	=COUNTIFS(B2:B10, ">48")	6

	A	B
1	Date	ABC Price
2	2012-12-31	\$52.82 #1
3	2013-01-31	\$52.40 #2
4	2013-02-28	\$51.61 #3
5	2013-03-31	\$50.11 #4
6	2013-04-30	\$47.14
7	2013-05-31	\$47.23
8	2013-06-30	\$48.20 #5
9	2013-07-31	\$49.35 #6
10	2013-08-31	\$44.96

# Functions COUNTIFS(), MINIFS(), and MAXIFS()

Goal	Function	Output
<i>Counting under conditions</i>	=COUNTIFS(B2:B10,>48")	6
<i>Minimum under conditions</i>	=MINIFS(B2:B10,B2:B10,>48")	\$48.20
<i>Maximum under conditions</i>	=MAXIFS(B2:B10,B2:B10,<50")	\$49.35

	A	B
1	Date	ABC Price
2	2012-12-31	\$52.82
3	2013-01-31	\$52.40
4	2013-02-28	\$51.61
5	2013-03-31	\$50.11
6	2013-04-30	\$47.14
7	2013-05-31	\$47.23
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# Functions COUNTIFS(), MINIFS(), and MAXIFS()

Goal	Function	Output
<i>Counting under conditions</i>	=COUNTIFS(B2:B10,>48")	6
<i>Minimum under conditions</i>	=MINIFS(B2:B10,B2:B10,>48")	\$48.20
<i>Maximum under conditions</i>	=MAXIFS(B2:B10,B2:B10,<50")	\$49.35

	A	B
1	Date	ABC Price
2	2012-12-31	\$52.82
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5	2013-03-31	\$50.11
6	2013-04-30	\$47.14
7	2013-05-31	\$47.23
8	2013-06-30	\$48.20
9	2013-07-31	\$49.35
10	2013-08-31	\$44.96

# **It's time to practice!**

**FINANCIAL ANALYTICS IN SPREADSHEETS**

# Identifying dates with unusual prices

FINANCIAL ANALYTICS IN SPREADSHEETS



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# Context affects prices

Was the minimum price a consequence of an economic downturn...?



# Context affects prices

Was the minimum price a consequence of an economic downturn...?



*... or the consequence of a company-specific event?*



# Function VLOOKUP()

VLOOKUP(*search\_key*, *range*, *index*, [*is\_sorted*])

# Function VLOOKUP()

VLOOKUP(search\_key, range, index, [is\_sorted])

Goal	Function	Output
Vertical lookup	=VLOOKUP(44.96,A2:B10,2, FALSE)	2013-08-31

	A	B
1	ABC Price	Date
2	\$52.82	2012-12-31
3	\$52.40	2013-01-31
4	\$51.61	2013-02-28
5	\$50.11	2013-03-31
6	\$47.14	2013-04-30
7	\$47.23	2013-05-31
8	\$48.20	2013-06-30
9	\$49.35	2013-07-31
10	\$44.96	2013-08-31

# Function VLOOKUP()

VLOOKUP(*search\_key*, **range**, *index*, [*is\_sorted*])

Goal	Function	Output
<i>Vertical lookup</i>	=VLOOKUP(44.96, A2:B10, 2, FALSE)	2013-08-31

	A	B
1	ABC Price	Date
2	\$52.82	2012-12-31
3	\$52.40	2013-01-31
4	\$51.61	2013-02-28
5	\$50.11	2013-03-31
6	\$47.14	2013-04-30
7	\$47.23	2013-05-31
8	\$48.20	2013-06-30
9	\$49.35	2013-07-31
10	\$44.96	2013-08-31

# Function VLOOKUP()

VLOOKUP(*search\_key*, *range*, ***index***, [*is\_sorted*])

Goal	Function	Output
<i>Vertical lookup</i>	=VLOOKUP(44.96,A2:B10 <b>2</b> FALSE)	2013-08-31

	A	B
1	<b>ABC Price</b>	<b>Date</b>
2	\$52.82	2012-12-31
3	\$52.40	2013-01-31
4	\$51.61	2013-02-28
5	\$50.11	2013-03-31
6	\$47.14	2013-04-30
7	\$47.23	2013-05-31
8	\$48.20	2013-06-30
9	\$49.35	2013-07-31
10	\$44.96	2013-08-31

# Function VLOOKUP()

VLOOKUP(*search\_key*, *range*, *index*, [*is\_sorted*])

Goal	Function	Output
<i>Vertical lookup</i>	=VLOOKUP(44.96,A2:B10,2 FALSE)	2013-08-31

	A	B
1	<b>ABC Price</b>	<b>Date</b>
2	\$52.82	2012-12-31
3	\$52.40	2013-01-31
4	\$51.61	2013-02-28
5	\$50.11	2013-03-31
6	\$47.14	2013-04-30
7	\$47.23	2013-05-31
8	\$48.20	2013-06-30
9	\$49.35	2013-07-31
10	\$44.96	2013-08-31

# Function VLOOKUP()

VLOOKUP(*search\_key*, *range*, *index*, [*is\_sorted*])

Goal	Function	Output
<i>Vertical lookup</i>	=VLOOKUP(44.96,A2:B10,2, FALSE)	2013-08-31

	A	B
1	ABC Price	Date
2	\$52.82	2012-12-31
3	\$52.40	2013-01-31
4	\$51.61	2013-02-28
5	\$50.11	2013-03-31
6	\$47.14	2013-04-30
7	\$47.23	2013-05-31
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10	\$44.96	2013-08-31

# **It's time to practice!**

**FINANCIAL ANALYTICS IN SPREADSHEETS**

# Visualizing the price evolution

FINANCIAL ANALYTICS IN SPREADSHEETS

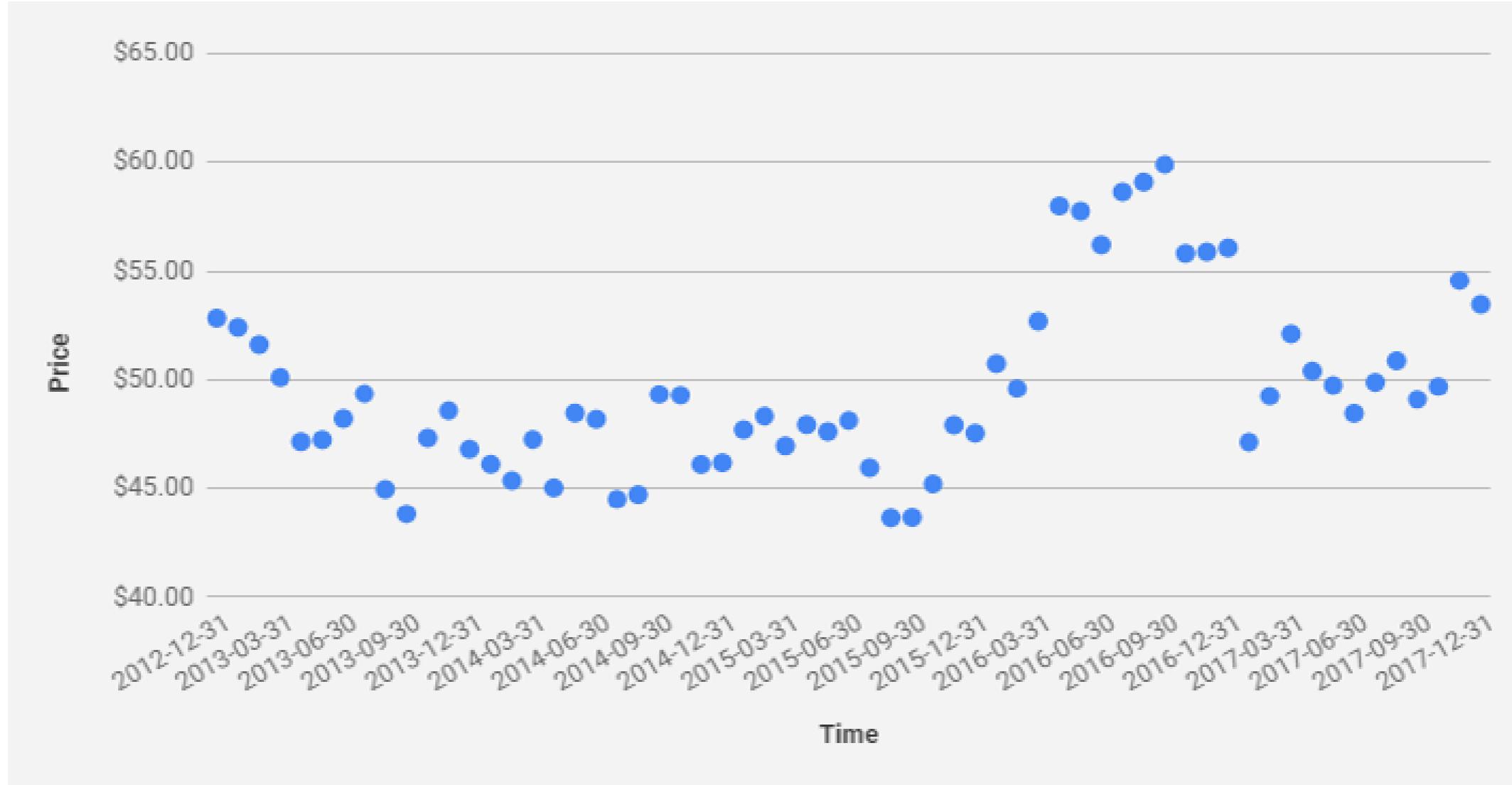


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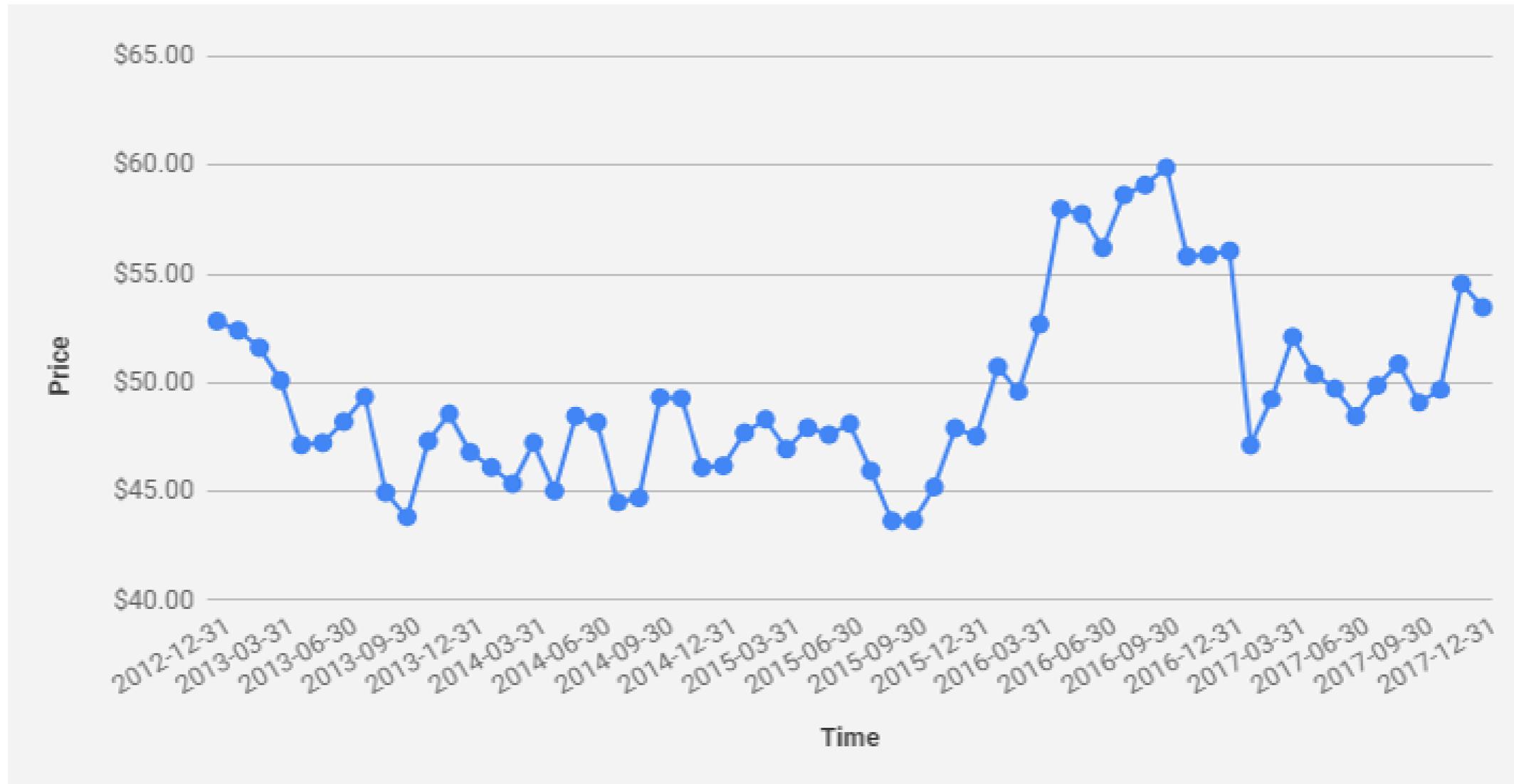
# Line chart

Historical prices are points



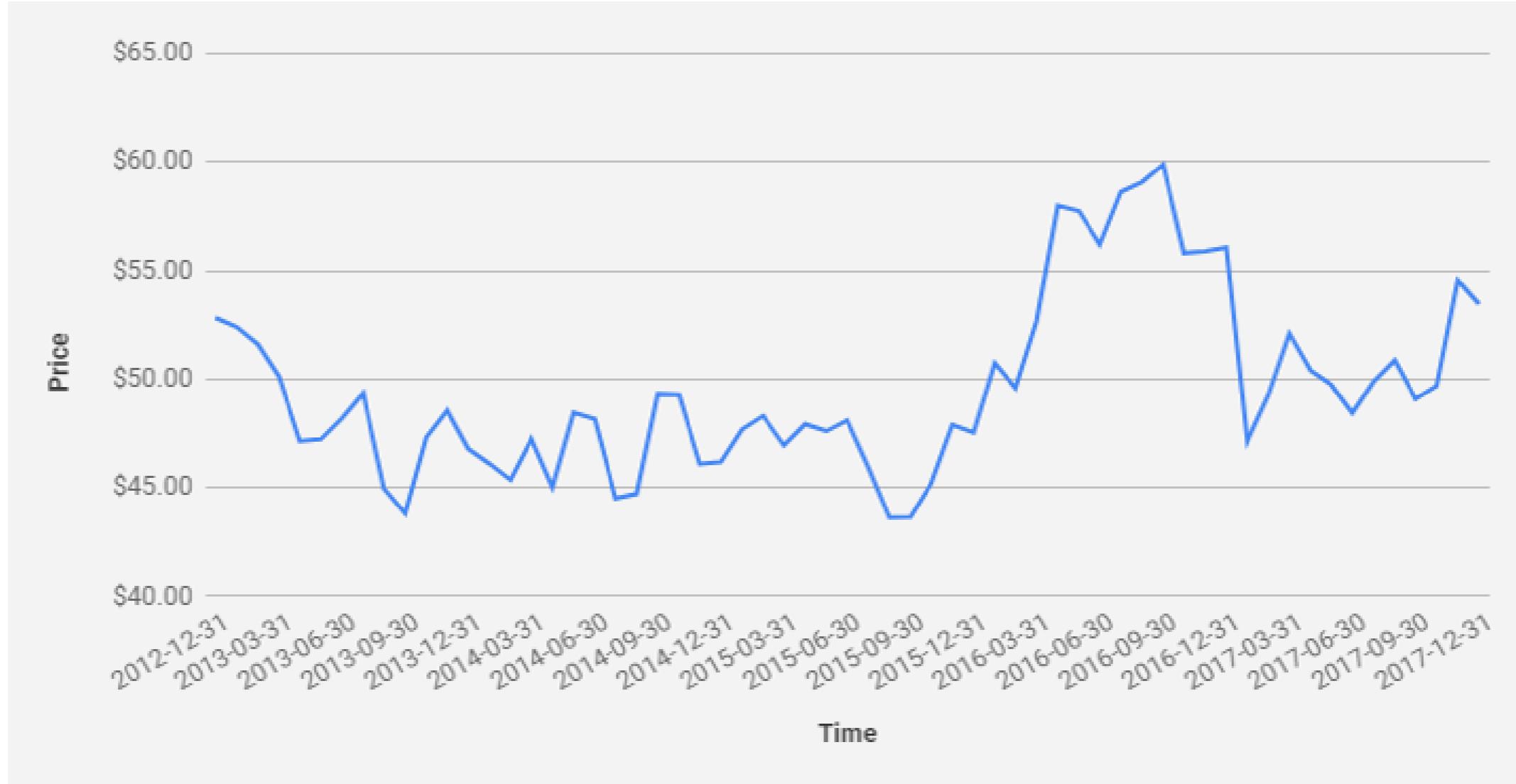
# Line chart

Connecting the points...



# Line chart

...leads to a line chart.

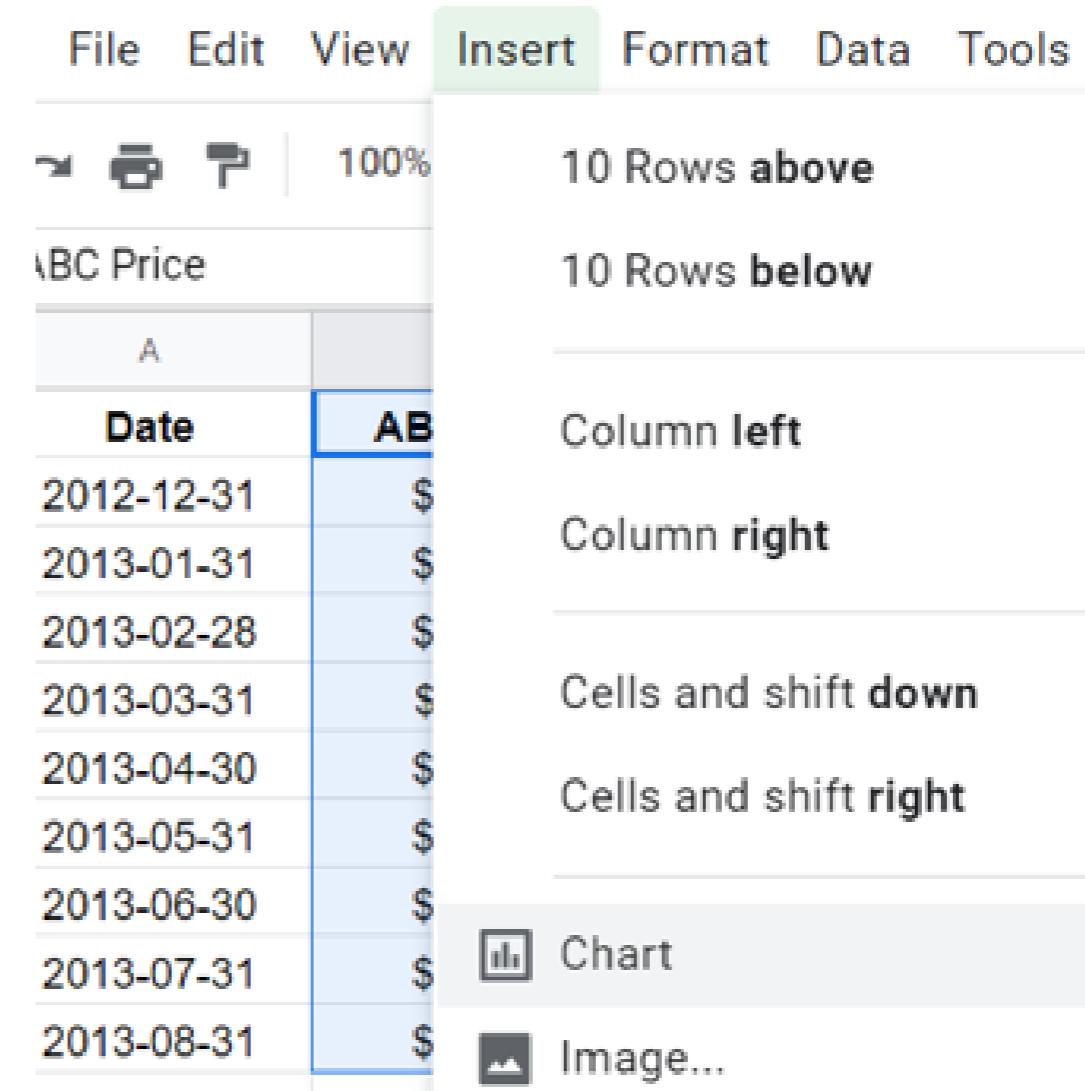


# Building a line chart

Step 1: Select range of past prices

	A	B
1	Date	ABC Price
2	2012-12-31	\$52.82
3	2013-01-31	\$52.40
4	2013-02-28	\$51.61
5	2013-03-31	\$50.11
6	2013-04-30	\$47.14
7	2013-05-31	\$47.23
8	2013-06-30	\$48.20
9	2013-07-31	\$49.35
10	2013-08-31	\$44.96

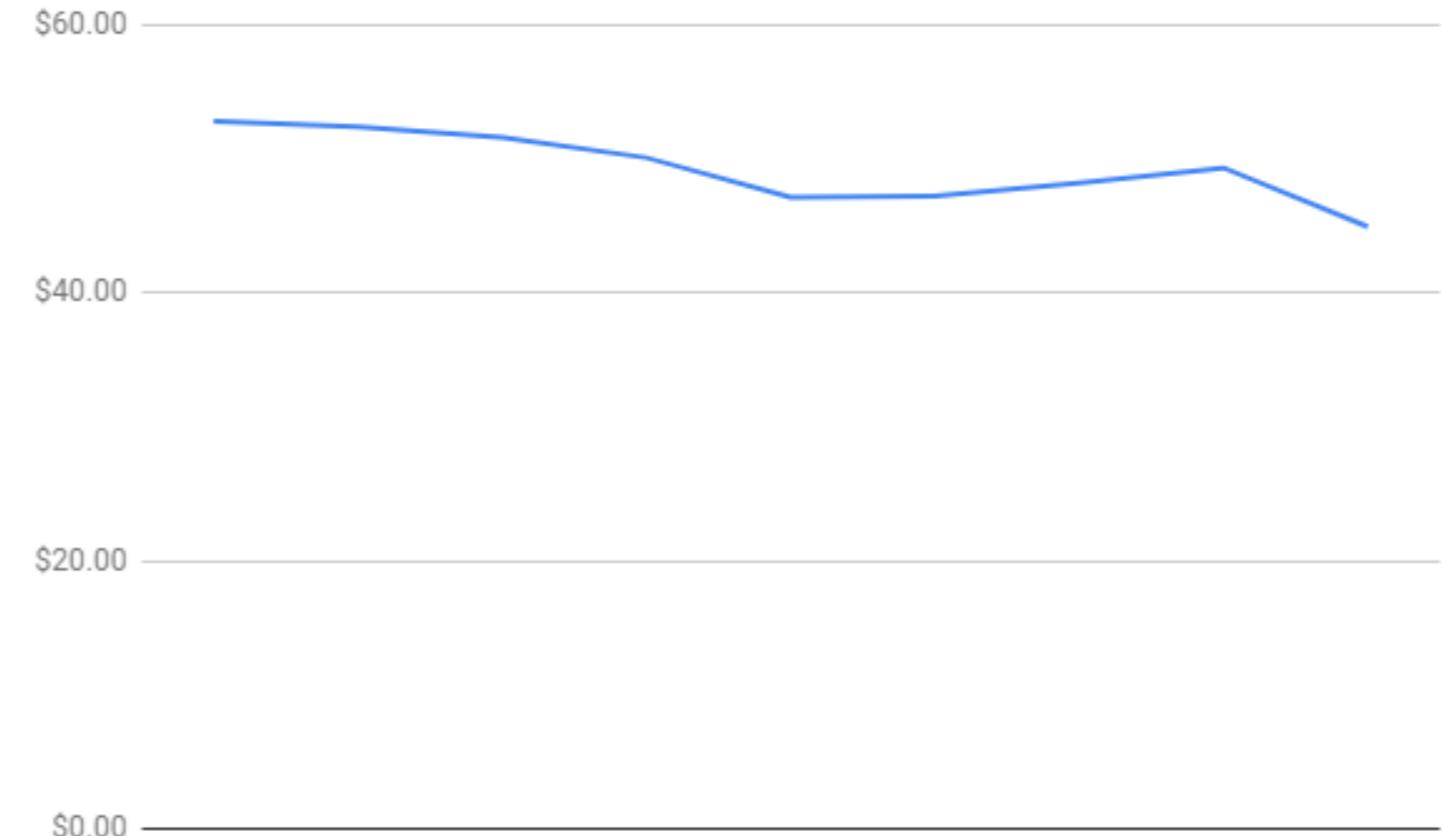
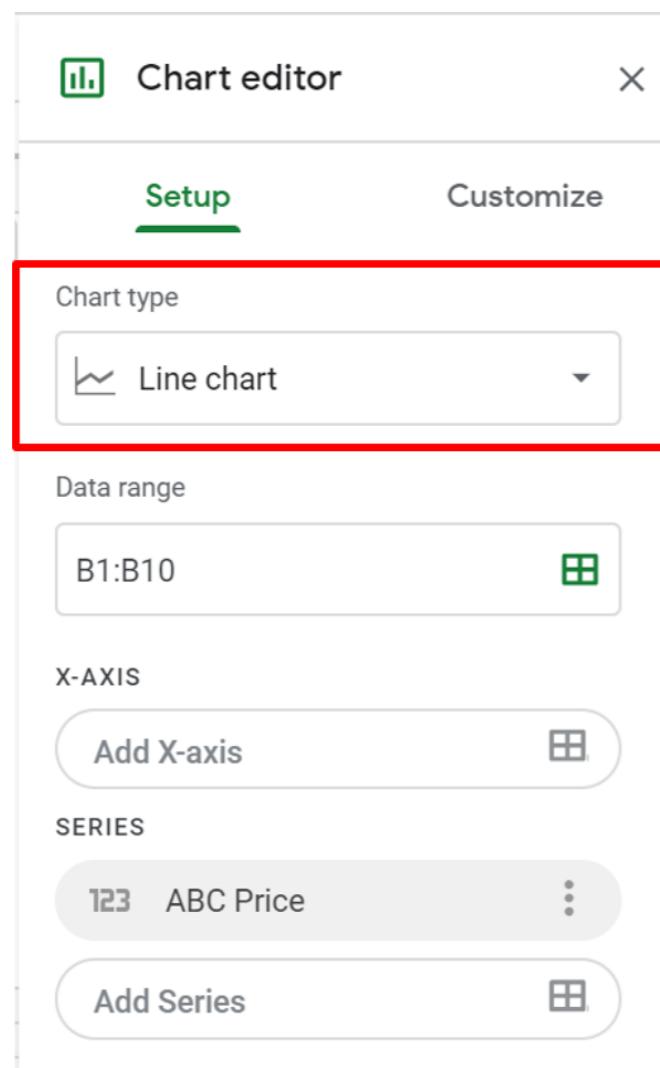
Step 2: Click on Insert >> Chart



# Building a line chart

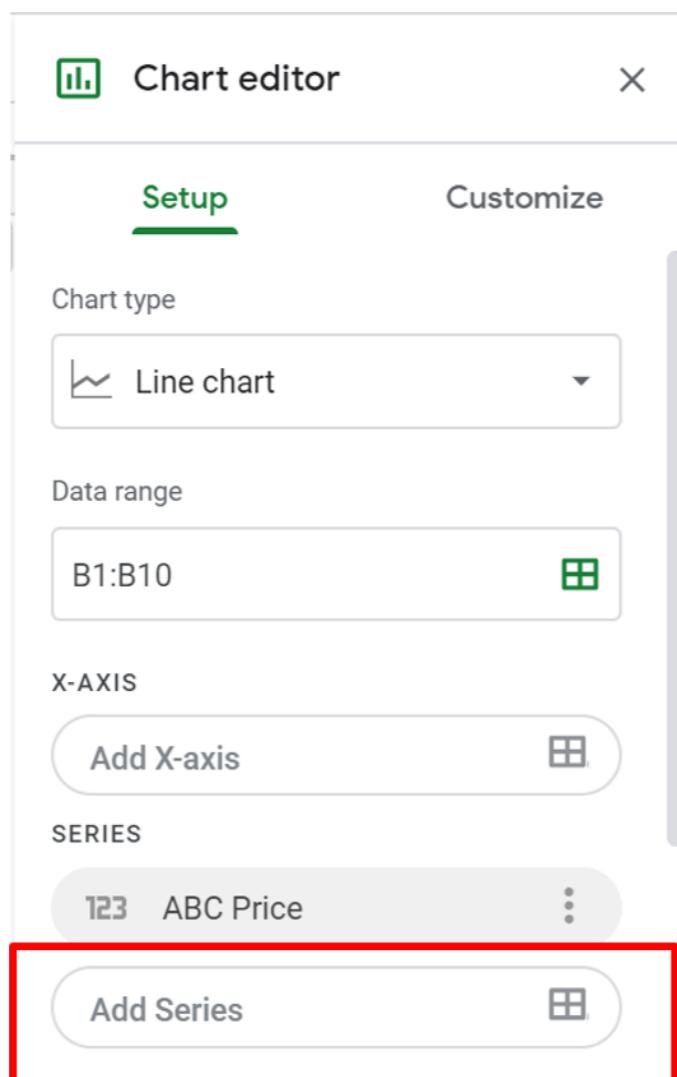
Step 3: Select Line chart

And you're done!

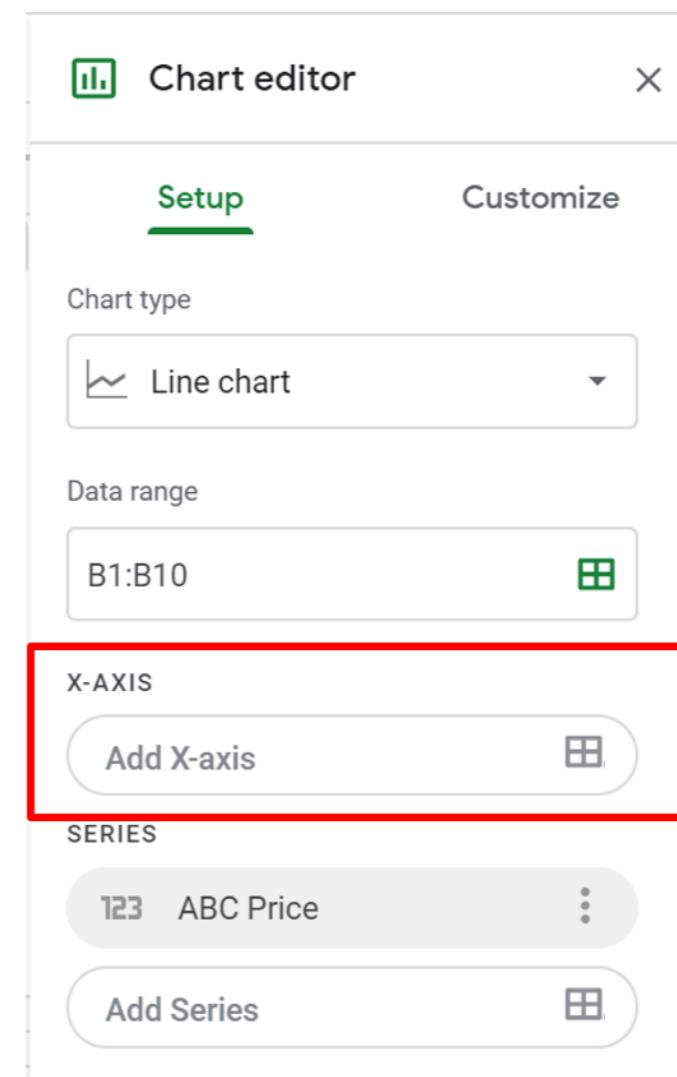


# Chart editor

Add series to the chart

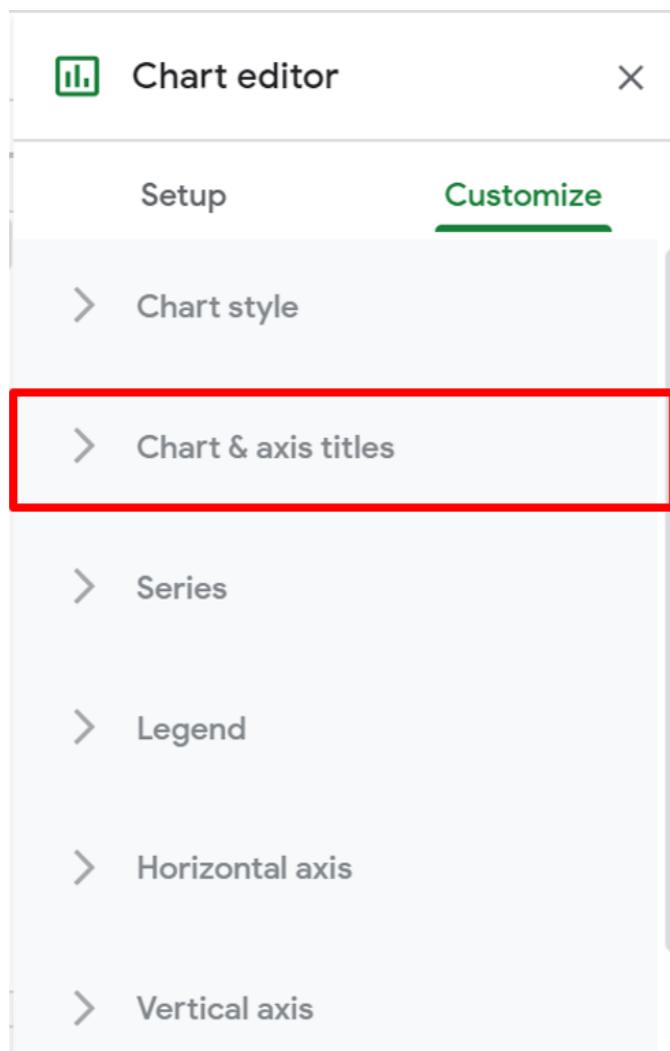


Add the horizontal axis

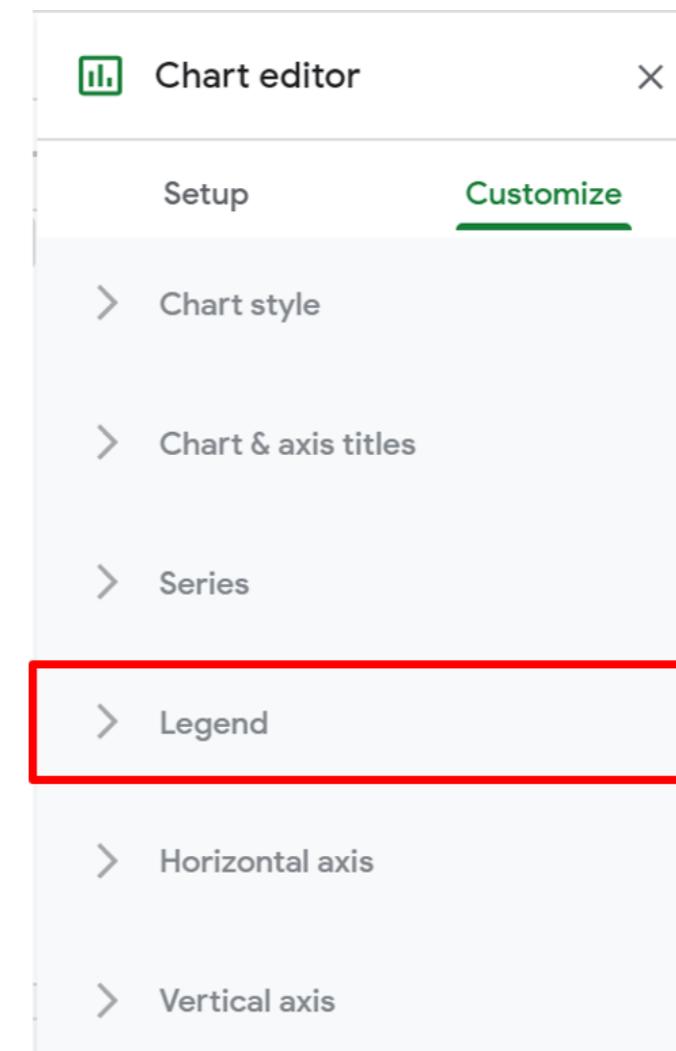


# Chart editor

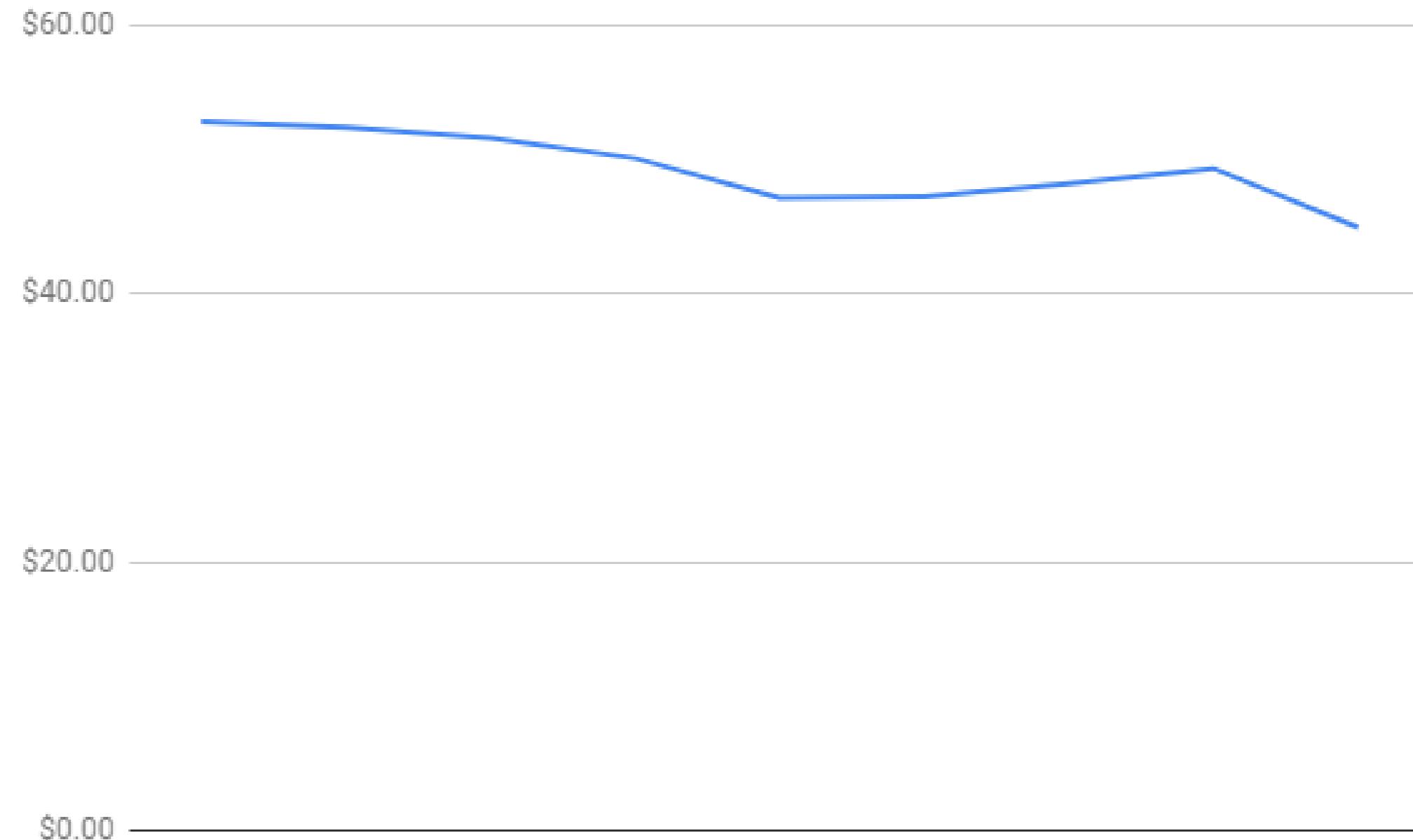
Modify the titles



Modify the legend



# Improving a line chart



# Adding dates on the horizontal axis

Chart editor

Setup      Customize

Chart type

Line chart

Data range

B1:B10

X-AXIS

Add X-axis

SERIES

ABC Price

Add Series

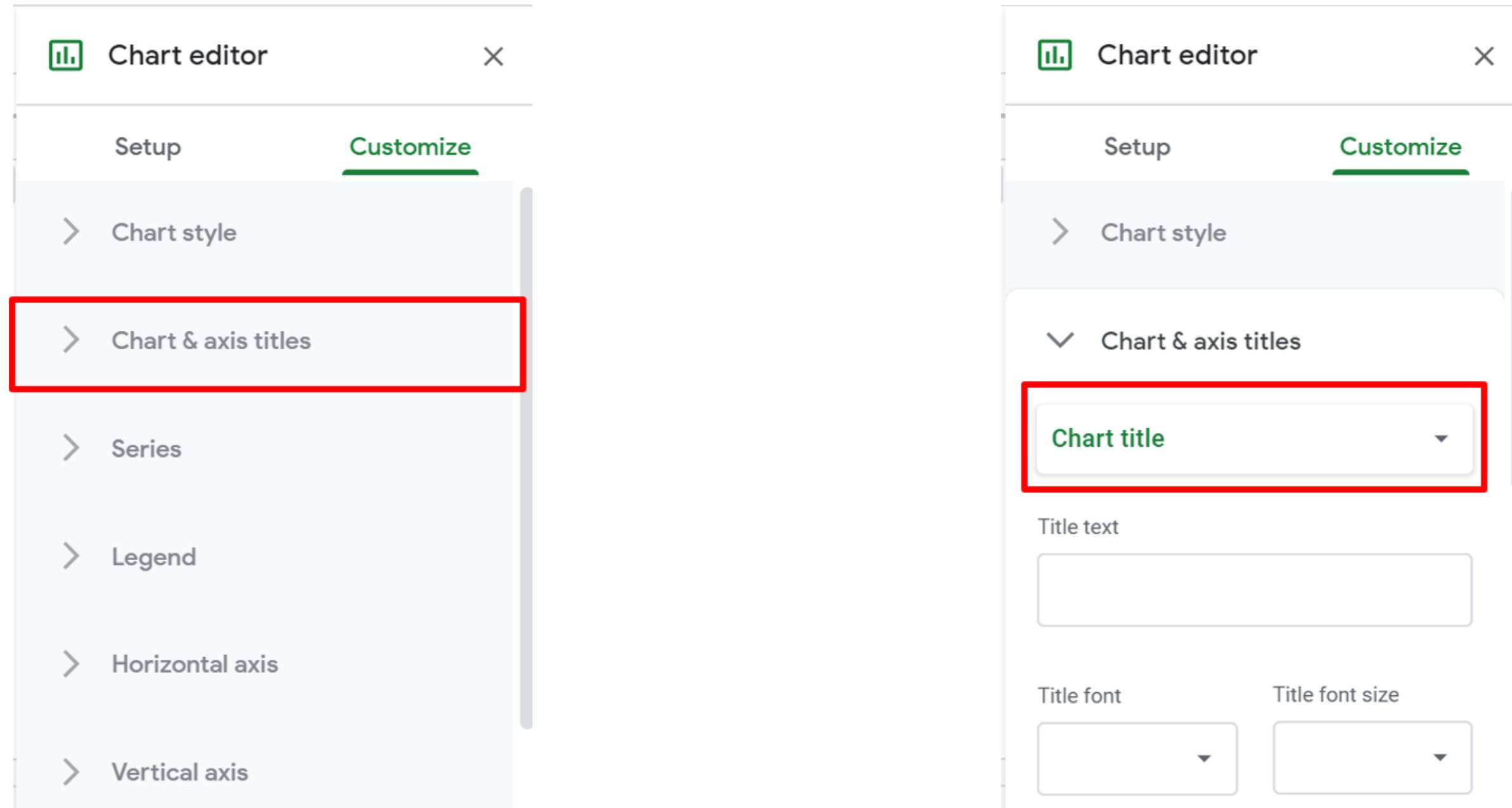
	A	B
1	Date	ABC Price
2	2012-12-31	\$52.82
3	2013-01-31	\$52.40
4	2013-02-28	\$51.61
5	2013-03-31	\$50.11
6	2013-04-30	\$47.14
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Select a data range

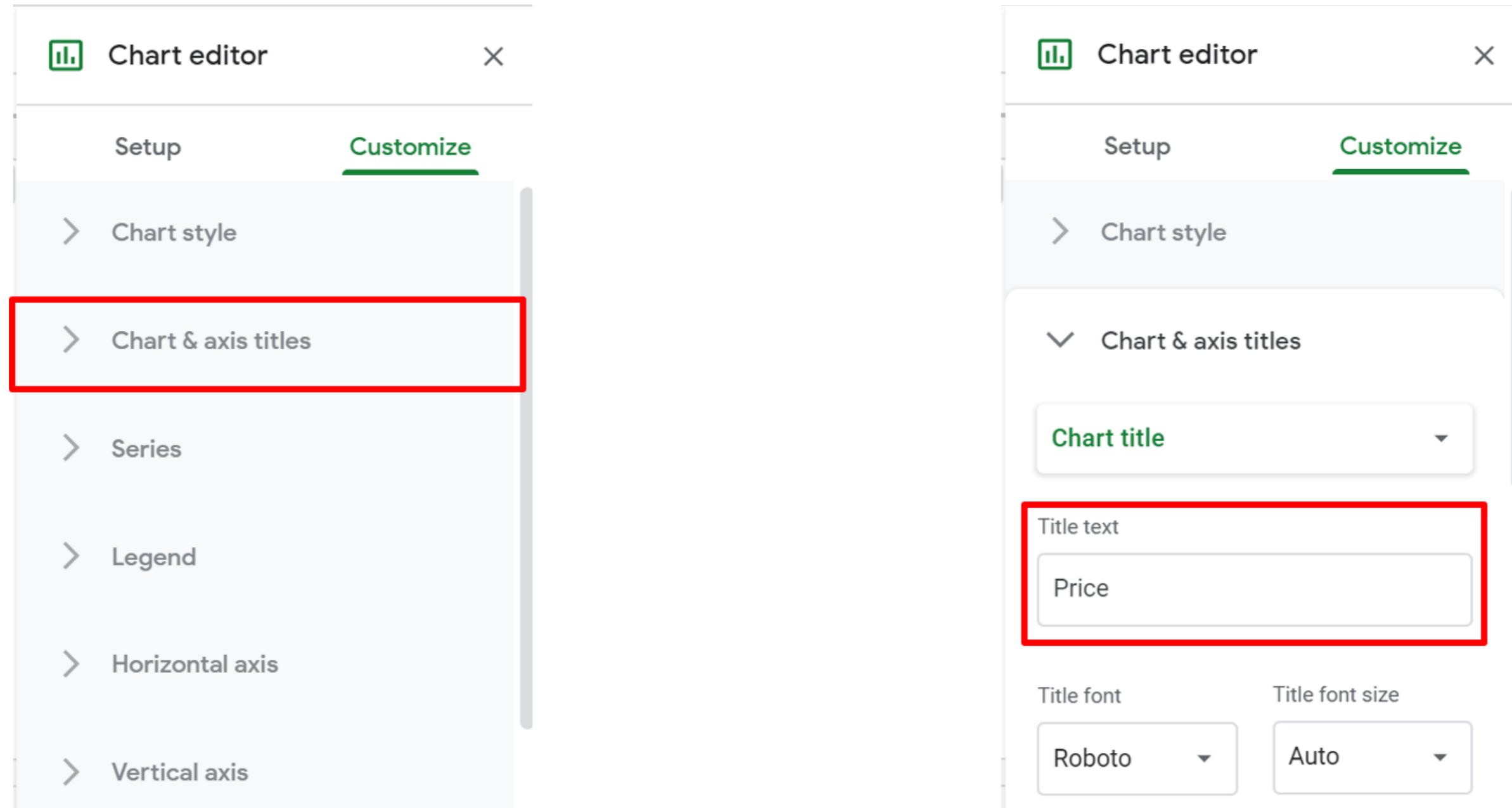
A1:A10

Cancel      OK

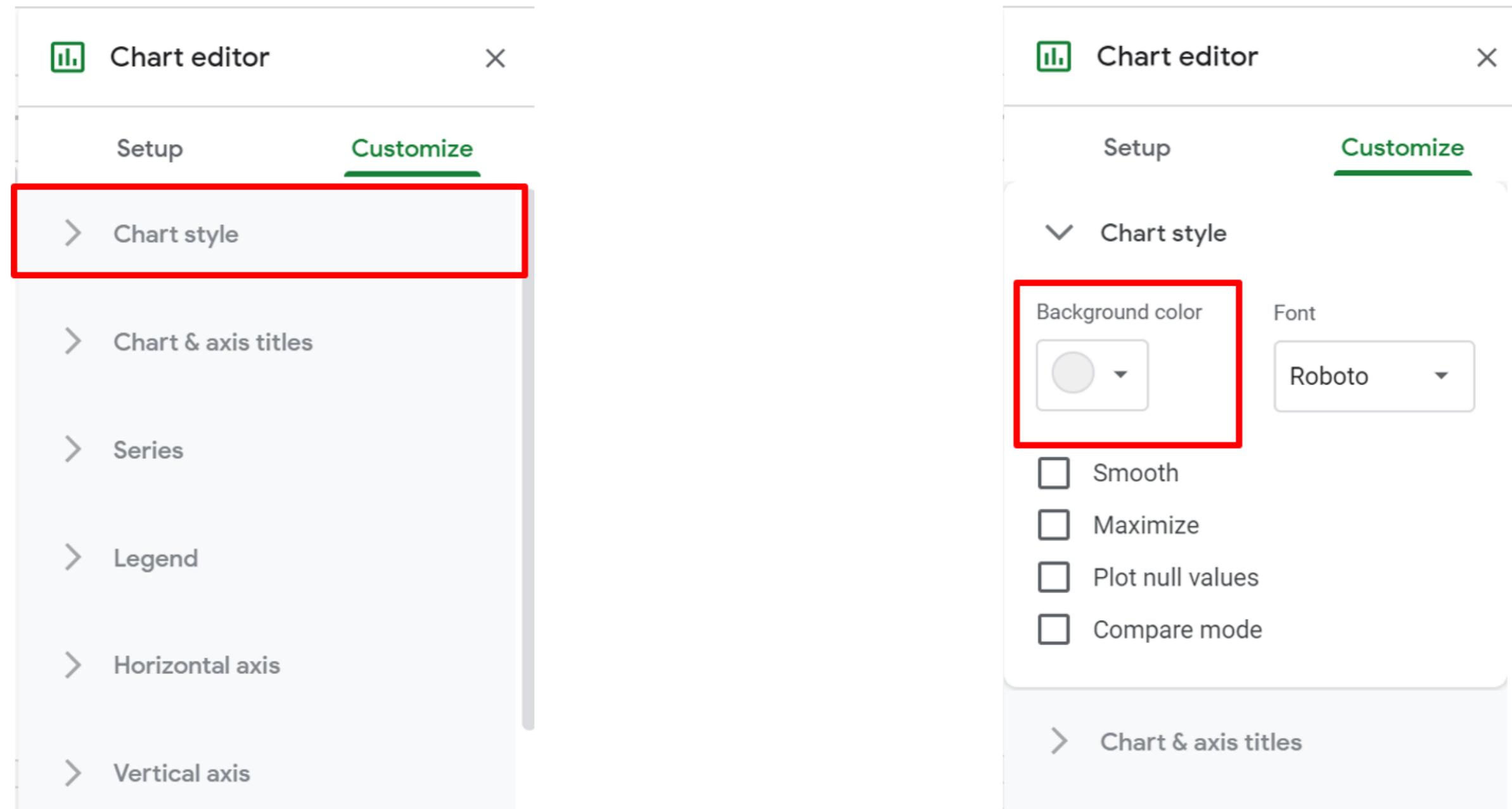
# Modifying the title



# Modifying the title



# Changing the background color



# Modifying the axes

The image shows the 'Chart editor' interface in Google Sheets. The 'Customize' tab is selected. The 'Vertical axis' section is expanded, displaying settings for label font (Roboto), label font size (Auto), label format (B I), text color (Auto), and a checked 'Treat labels as text' option. The 'Min' value is set to 40 and the 'Max' value is set to 55, both of which are highlighted with a red box.

Chart editor

Setup      Customize

> Chart style

> Chart & axis titles

> Series

> Legend

> Horizontal axis

> Vertical axis

Vertical axis

Label font: Roboto

Label font size: Auto

Label format: **I**

Text color: Auto

Treat labels as text

Min: 40

Max: 55

# Modifying the axes

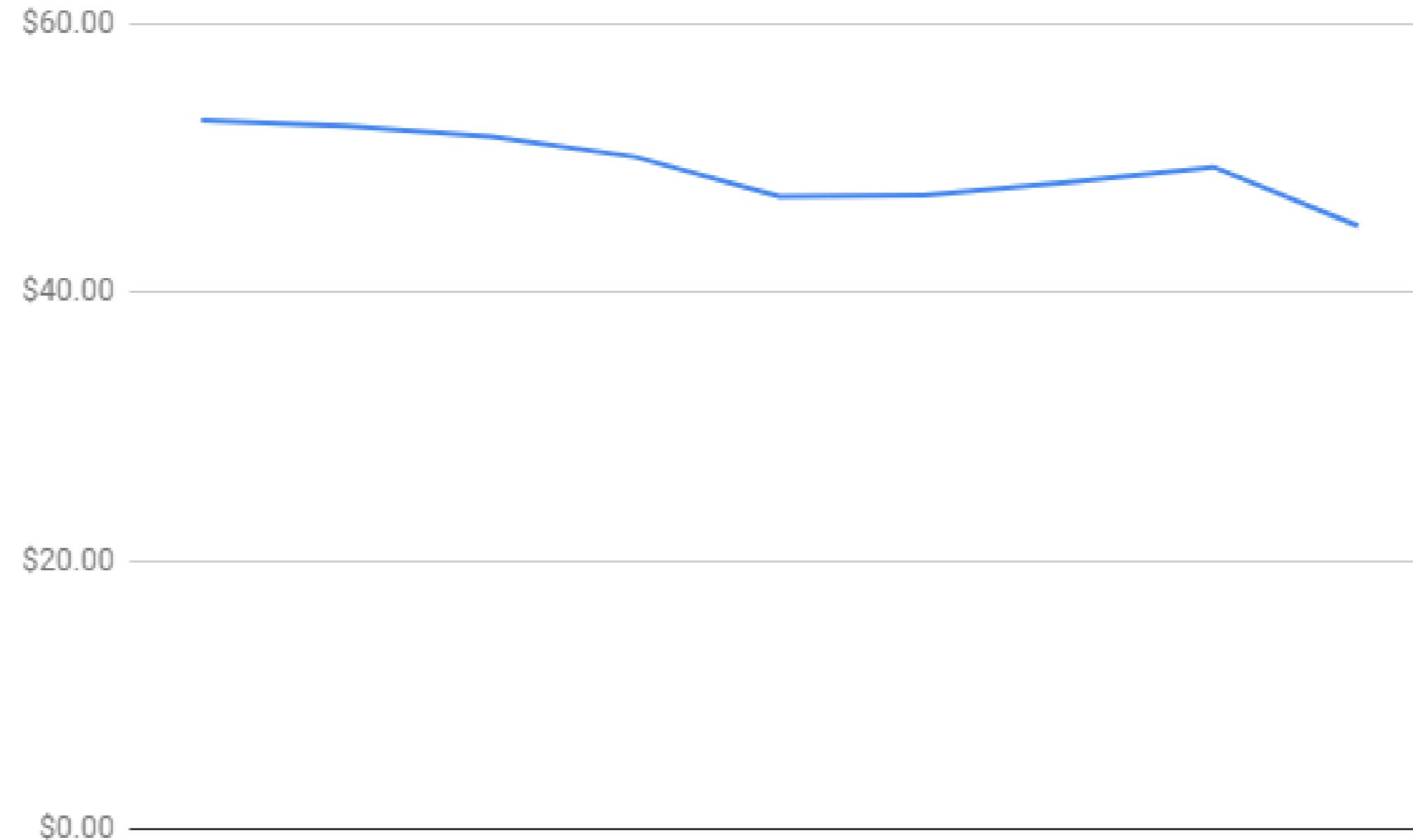
The screenshot shows the 'Chart editor' interface with the 'Customize' tab selected. The left sidebar lists several customization options: 'Chart style', 'Chart & axis titles', 'Series', 'Legend', 'Horizontal axis' (which is highlighted with a red box), and 'Vertical axis'. The 'Horizontal axis' section is expanded, displaying various settings:

- Label font: Roboto
- Label font size: Auto
- Label format: **B** *I*
- Text color: Auto
- Treat labels as text:
- Reverse axis order:
- Slant labels: 30°

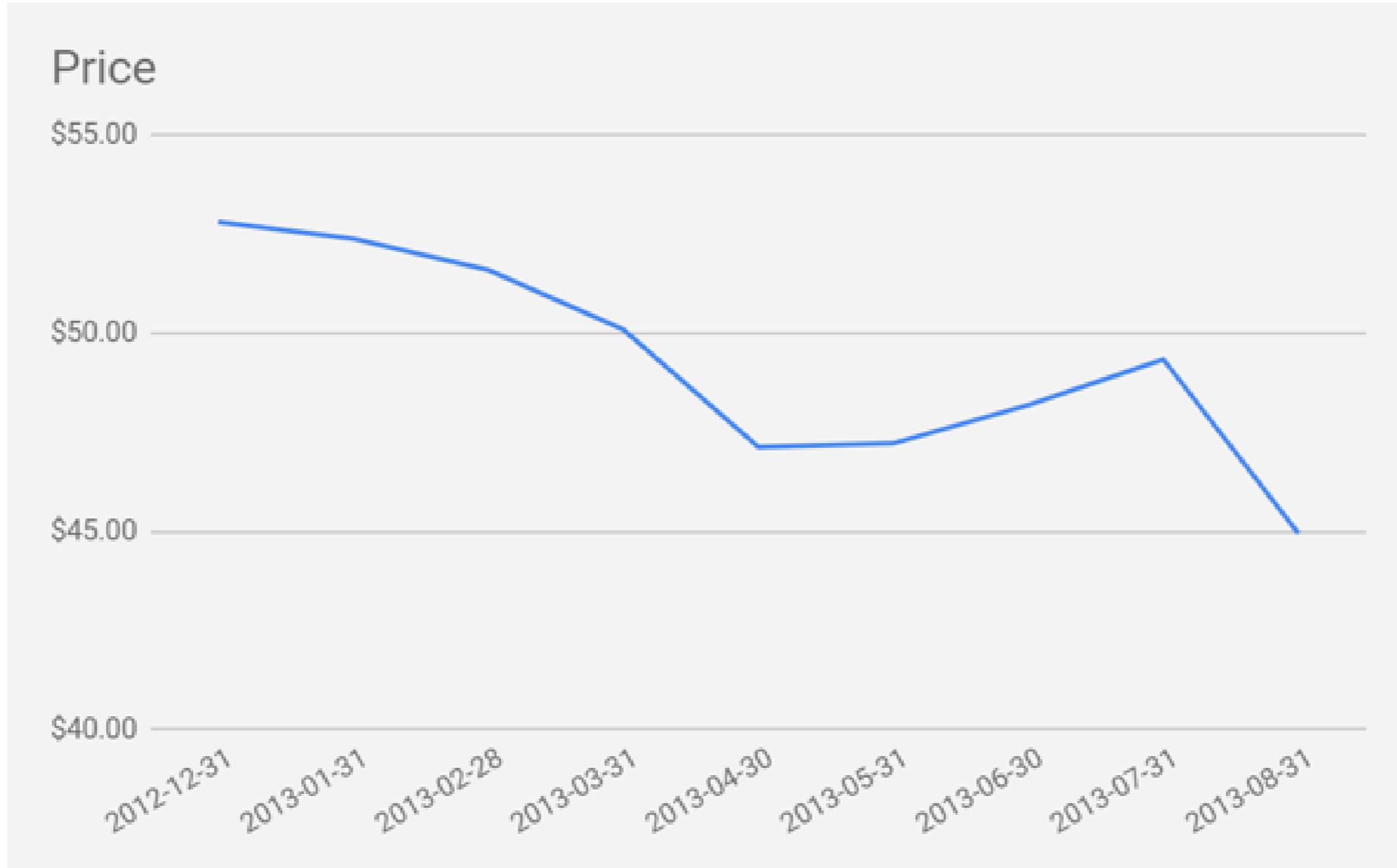
# Modifying the axes

The screenshot shows the 'Chart editor' interface with the 'Customize' tab selected. On the left, a sidebar lists options: 'Setup', 'Chart style', 'Chart & axis titles', 'Series', 'Legend', 'Horizontal axis' (which is highlighted with a red box), and 'Vertical axis'. The main area displays settings for the 'Horizontal axis': 'Label font' set to 'Roboto', 'Label font size' set to 'Auto', 'Label format' showing bold and italic options, 'Text color' set to 'Auto', a checked checkbox for 'Treat labels as text', an unchecked checkbox for 'Reverse axis order', and a dropdown for 'Slant labels' currently set to '30°' (also highlighted with a red box).

# Before...



# ...After



# **It's time to practice!**

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