

XL3A: V0A      Excel2013 Model Toolpak Regress1 Continuous      1

## Toolpak Regress: Excel 2013. One Continuous Predictor

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by  
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US Rep: International Statistical Literacy Project  
Director, W. M. Keck Statistical Literacy Project*

*Materials at: [www.StatLit.org/pdf/Excel2013-Model-Toolpak-Regress1C-Slides.pdf](http://www.StatLit.org/pdf/Excel2013-Model-Toolpak-Regress1C-Slides.pdf)  
[Excel2013-Model-Toolpak-Regress1C-Output.pdf](http://www.StatLit.org/pdf/Excel2013-Model-Toolpak-Regress1C-Output.pdf)*

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## Weight-Height Association

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Required output: Create and upload your worksheet:

1. Calculate mean height and weight: slide 3
2. Model Weight on Height using Regression command in the Data Analysis Toolpak: slide 6.
3. Generate Trendline chart with equation & R<sup>2</sup>. Slide 7

Note: The equation and R<sup>2</sup> in the Regression output is the same as that generated by Trendline. Slide 8.  
Data: [www.StatLit.org/xls/Excel2013-Model-Toolpak-Regress1C-Data.xls](http://www.StatLit.org/xls/Excel2013-Model-Toolpak-Regress1C-Data.xls)  
Subjects are college students.

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### 1) Analyze Data: Enter formula: K4:K6, P4:P5

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Ht	Male	Wt	Row	J	K	L	M	N
67	0	125	2	<b>Generate Summary Statistics</b>				
62	0	120	3	Averages	ALL			
66	0	120	4	Height	68.7	=AVERAGE(C2:C93)		
66	0	120	5	Weight	145.2	=AVERAGE(E2:E93)		
63	0	112	6	Correlate	0.785	=CORREL(C2:C93,E2:E93)		
				N	O	P	Q	R
			3	Std. Dev	ALL			
			4	Height	3.66	=STDEV(C2:C93)		
			5	Weight	23.7	=STDEV(E2:E93)		

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### 2a) Data Toolbar, select Data Analysis. Select Regression

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The screenshot shows the Excel ribbon with the 'DATA' tab selected. The 'Data Analysis' button in the 'Data Tools' group is highlighted. A callout box points to it with the text: "See slides 11-12 if no Data Analysis on your toolbar." Below the toolbar, a portion of the data table from slide 3 is visible.

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### 2b) Regress Weight (E1:E93) on Height (C1:C93)

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Ht	Male	Wt	Row	J	K	L
67	0	125	2	<b>General</b>		
62	0	120	3	Average		
66	0	120	4	Height		
66	0	120	5	Weight		
63	0	112	6	Correlate		
65	0	122	7			
66	0	130	8	J		
66	0	125	9			

**Regression**

Input Y Range: \$E\$1:\$E\$93

Input X Range: \$C\$1:\$C\$93

Labels       Constant is Zero

Confidence Level: 95 %

Output options:  Output Range: \$J\$9

New Worksheet Ply:       New Workbook

Residuals:  Residuals       Residual Plots

Standardized Residuals       Line Fit Plots

Normal Probability

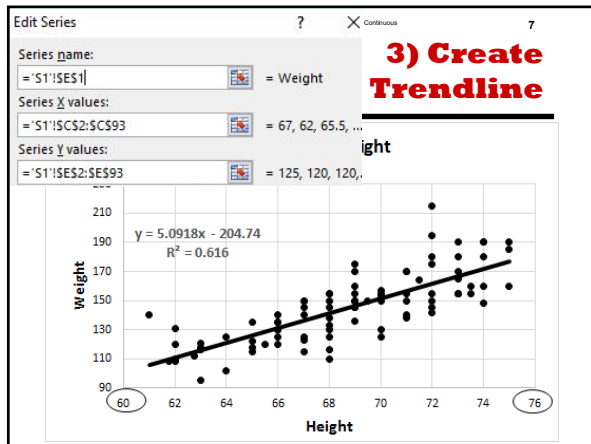
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### 2c) Results: Regress Weight on Height

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	J	K	L	M	N	O	P
9	SUMMARY OUTPUT						
11	Regression Statistics						
12	Multiple R	0.7849					
13	R Square	0.6161					
14	Adjusted R Sq	0.6117					
15	Standard Error	14.792					
16	Observations	92					
18	ANOVA						
19		df	SS	MS	F	Significance F	
20	Regression	1	3159.6	3159.6	144.384	2.1E-20	
21	Residual	90	218.802	2.4311			
22	Total	91	3378.4				
24		Coefficient	Std Error	t Stat	P-value	Lower 95%	Upper 95%
25	Intercept	-204.74	29.16	-7.0214	4E-10	-262.67	-146.81
26	Ht	5.0918	0.4237	12.016	2.1E-20	4.24992	5.93362

Weight = -204.74 + (5.0918\*Height)



**4. Conclusion**

Trendline and the Data Analysis Regression command both generate the same model:

- Same constant: -204.74
- Same slope: 5.0918
- Same R-squared: 0.616

Trendline is limited to a single predictor.  
 Data analysis Regression can handle multiple predictors.

**Appendix: What to do if .....**

Slide 10: What to do if the plus sign doesn't appear on the upper-right side of the graph

Slides 11 & 12: What to do if the Data Analysis object doesn't appear on the right side of the Data toolbar.

**If + Sign doesn't appear on upper-right side of graph...**

Select the graph. Select the Chart-Tools Design tab.

At the far-left, select "Add Chart Element". Select "Axis Titles" and "Chart Title".

To add a Trendline, either select "Trendline" under "Add Chart Element" or right-mouse on a data point and select Trendline from menu.

**If Data Analysis doesn't appear on Data Toolbar**

1) Select File/Options. 2) Select Add-Ins.

3) In the lower-left corner next to Manage, select Excel Add-Ins. 4) Press GO.

**Add Data Analysis to the Data Toolbar**

1) Checks the boxes involving Analysis ToolPak. 2) Press OK

# **Toolpak Regress: Excel 2013. One Continuous Predictor**

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*Excel2013-Model-Toolpak-Regress1C-Slides.pdf*

*Excel2013-Model-Toolpak-Regress1C-Output.pdf*

# Weight-Height Association

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Required output: Create and upload your worksheet:

1. Calculate mean height and weight: slide 3
  2. Model Weight on Height using Regression command in the Data Analysis Toolbox: slide 6.
  3. Generate Trendline chart with equation &  $R^2$ . Slide 7
- 

Note: The equation and  $R^2$  in the Regression output is the same as that generated by Trendline. Slide 8.

Data: [www.StatLit.org/xls/](http://www.StatLit.org/xls/)

Excel2013-Model-Toolpak-Regress1C-Data.xlsx

Subjects are college students.

# 1) Analyze Data:

## Enter formula: K4:K6, P4:P5

Ht	Male	Wt	Row	J	K	L	M	N
67	0	125	2	<b>Generate Summary Statistics</b>				
62	0	120	3	Averages	ALL			
66	0	120	4	Height	68.7	=AVERAGE(C2:C93)		
66	0	120	5	Weight	145.2	=AVERAGE(E2:E93)		
63	0	112	6	Correlate	0.785	=CORREL(C2:C93,E2:E93)		

	N	O	P	Q	R
3	Std. Dev	ALL			
4	Height	3.66	=STDEV(C2:C93)		
5	Weight	23.7	=STDEV(E2:E93)		

# 2a) Data Toolbar, select Data Analysis. Select Regression

The screenshot shows the Microsoft Excel 2013 interface. The 'DATA' tab is selected in the ribbon, and the 'Data Analysis' button is highlighted. A text box with a black border and white background contains the text: "See slides 11-12 if no Data Analysis on your toolbar." The 'Data Analysis' dialog box is open, showing a list of analysis tools. 'Regression' is selected in the list. The spreadsheet data is visible in the background.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Pulse1	Pulse2	Height	Male?	Weight	Activity	Run?	smokes?				
2	58	56	67	0	125	2	0	0				
3	60	66	62	0	120	2						
4	61	70	65.5	0	120	2						
5	62	100	66	0	120	2						
6	62	98	62.75	0	112	2						
7	62	66	65	0	122	3						
8	64	60	66	0	130	3						
9	66	72	66	0	125	2						
10	66	76	65	0	115	2						
11	68	112	70	0	125	2						
12	68	68	69	0	150	2						

**See slides 11-12 if no Data Analysis on your toolbar.**

**Data Analysis**

Analysis Tools

- Histogram
- Moving Average
- Random Number Generation
- Rank and Percentile
- Regression**
- Sampling
- t-Test: Paired Two Sample for Means
- t-Test: Two-Sample Assuming Equal Variances
- t-Test: Two-Sample Assuming Unequal Variances
- z-Test: Two Sample for Means

OK  
Cancel  
Help



## 2b) Regress Weight (E1:E93) on Height (C1:C93)

Ht	Male	Wt	Row	J	K	L
67	0	125	2	General	Regression	
62	0	120	3	Average	Input	
66	0	120	4	Height	Input Y Range:	\$E\$1:\$E\$93
66	0	120	5	Weight	Input X Range:	\$C\$1:\$C\$93
63	0	112	6	Correlat	<input checked="" type="checkbox"/> Labels	<input type="checkbox"/> Constant is Zero
65	0	122	7		<input type="checkbox"/> Confidence Level:	95 %
66	0	130	8	J	Output options	
66	0	125	9		<input checked="" type="radio"/> Output Range:	\$J\$9
					<input type="radio"/> New Worksheet Ply:	
					<input type="radio"/> New Workbook	
					Residuals	
					<input type="checkbox"/> Residuals	<input type="checkbox"/> Residual Plots
					<input type="checkbox"/> Standardized Residuals	<input type="checkbox"/> Line Fit Plots
					Normal Probability	

# 2c) Results: Regress Weight on Height

8	J	K	L	M	N	O	P		
9	SUMMARY OUTPUT								
10									
11	<i>Regression Statistics</i>								
12	Multiple R	0.7849							
13	R Square	0.616							
14	Adjusted R Sq	0.6117							
15	Standard Error	14.792							
16	Observations	92							
17									
18	ANOVA								
19		<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
20	Regression	1	31592	31591.6	144.384	2.1E-20			
21	Residual	90	19692	218.802					
22	Total	91	51284						
23									
24		<i>Coefficient</i>	<i>Std Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
25	Intercept	-204.74	29.16	-7.0214	4E-10	-262.67	-146.81	-262.67	-147
26	Ht	5.0918	0.4237	12.016	2.1E-20	4.24992	5.93362	4.24992	5.93

Obtain R-sq here

Formatting and formula are optional

Obtain best-fit coefficients here

$$\text{Weight} = -204.74 + (5.0918 * \text{Height})$$



Series name:

= 'S1'!\$E\$1

= Weight

Series X values:

= 'S1'!\$C\$2:\$C\$93

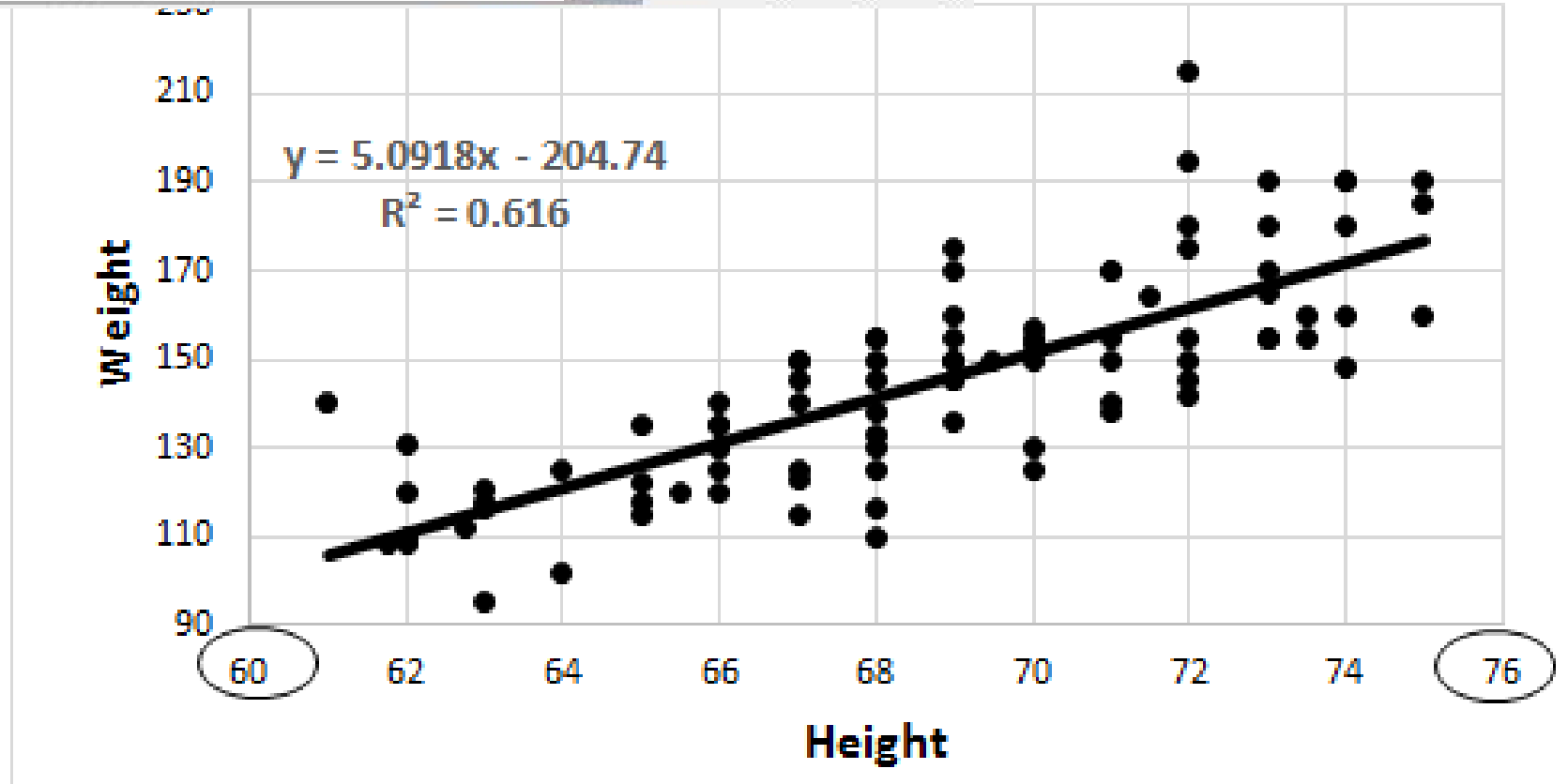
= 67, 62, 65.5, ...

Series Y values:

= 'S1'!\$E\$2:\$E\$93

= 125, 120, 120, ...

# 3) Create Trendline



## 4. Conclusion

---

Trendline and the Data Analysis Regression command both generate the same model:

- Same constant: -204.74
- Same slope: 5.0918
- Same R-squared: 0.616

Trendline is limited to a single predictor.

Data analysis Regression can handle multiple predictors.

# **Appendix:**

## **What to do if .....**

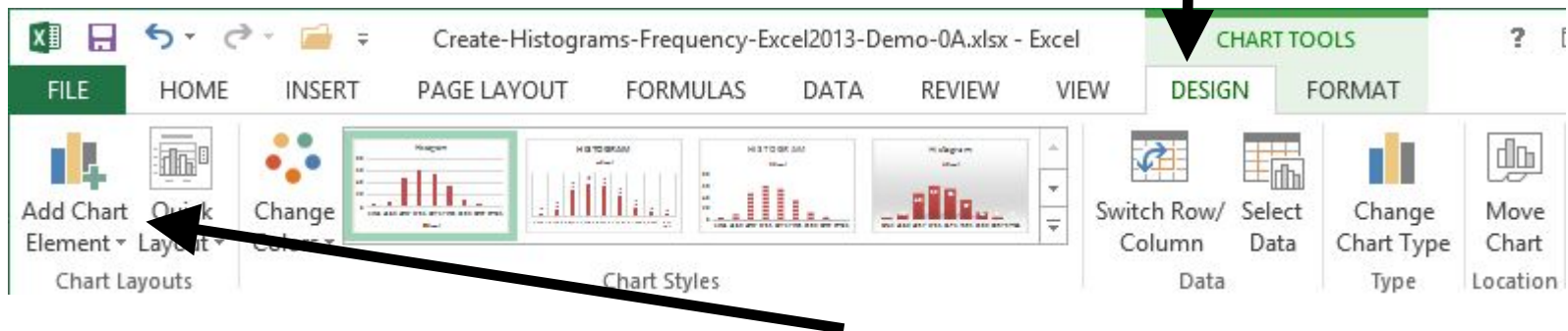
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Slide 10: What to do if the plus sign doesn't appear on the upper-right side of the graph

Slides 11 & 12: What to do if the Data Analysis object doesn't appear on the right side of the Data toolbar.

# If + Sign doesn't appear on upper-right side of graph...

Select the graph. Select the Chart-Tools Design tab.

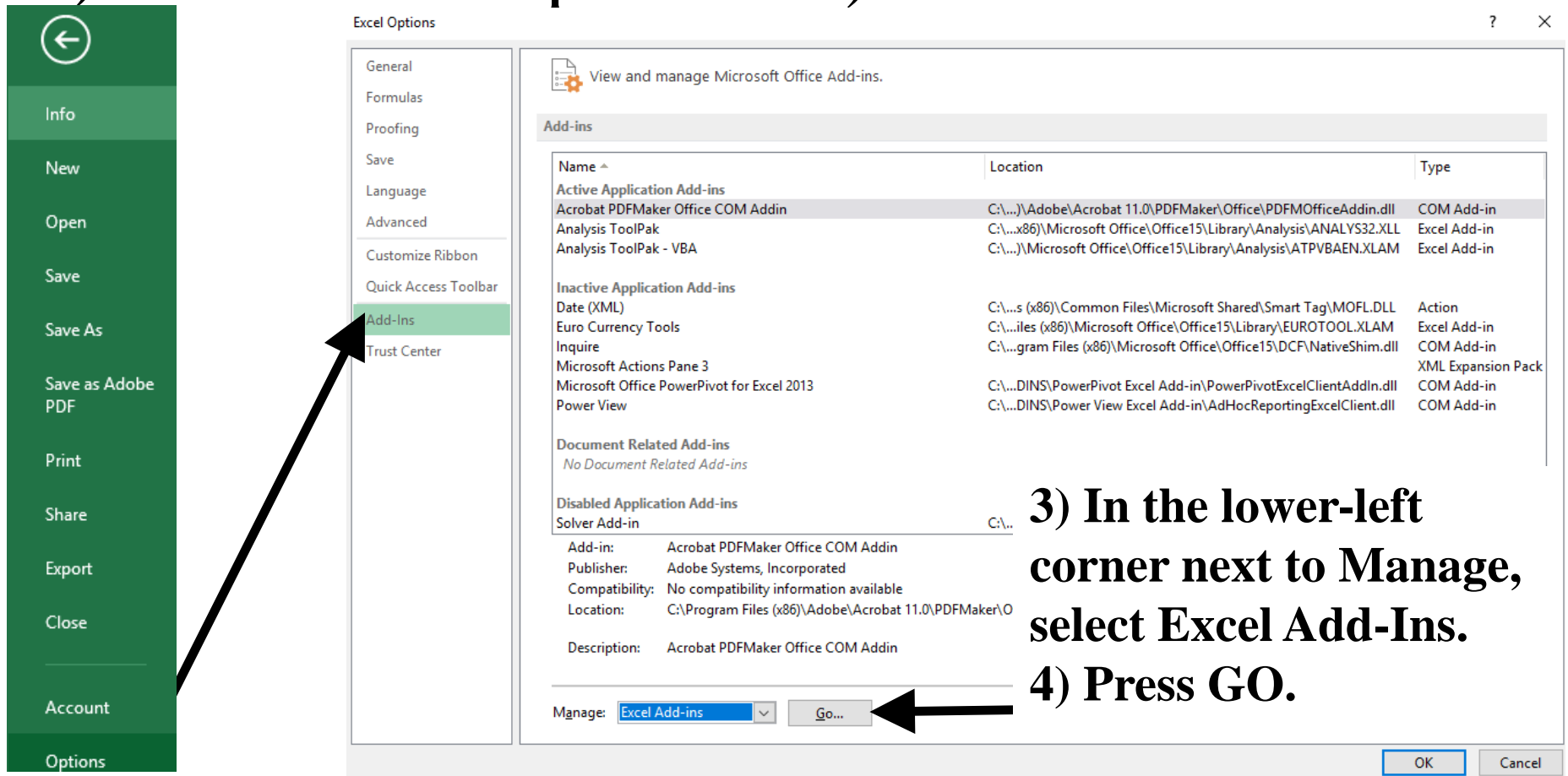


At the far-left, select “Add Chart Element”.  
Select “Axis Titles” and “Chart Title”.

To add a Trendline, either select “Trendline” under  
“Add Chart Element” or right-mouse on a data point  
and select Trendline from menu.

# If Data Analysis doesn't appear on Data Toolbar

1) Select File/Options. 2) Select Add-Ins.



Excel Options

View and manage Microsoft Office Add-ins.

Add-ins

Name ^	Location	Type
<b>Active Application Add-ins</b>		
Acrobat PDFMaker Office COM Addin	C:\...\Adobe\Acrobat 11.0\PDFMaker\Office\PDFMOfficeAddin.dll	COM Add-in
Analysis ToolPak	C:\...x86\Microsoft Office\Office15\Library\Analysis\ANALYS32.XLL	Excel Add-in
Analysis ToolPak - VBA	C:\...\Microsoft Office\Office15\Library\Analysis\ATPVBAEN.XLAM	Excel Add-in
<b>Inactive Application Add-ins</b>		
Date (XML)	C:\...s (x86)\Common Files\Microsoft Shared\Smart Tag\MOFL.DLL	Action
Euro Currency Tools	C:\...iles (x86)\Microsoft Office\Office15\Library\EUROTOOL.XLAM	Excel Add-in
Inquire	C:\...gram Files (x86)\Microsoft Office\Office15\DCF\NativeShim.dll	COM Add-in
Microsoft Actions Pane 3		XML Expansion Pack
Microsoft Office PowerPivot for Excel 2013	C:\...DINS\PowerPivot Excel Add-in\PowerPivotExcelClientAddIn.dll	COM Add-in
Power View	C:\...DINS\Power View Excel Add-in\AdHocReportingExcelClient.dll	COM Add-in
<b>Document Related Add-ins</b>		
No Document Related Add-ins		
<b>Disabled Application Add-ins</b>		
Solver Add-in		
C:\...		
Add-in:	Acrobat PDFMaker Office COM Addin	
Publisher:	Adobe Systems, Incorporated	
Compatibility:	No compatibility information available	
Location:	C:\Program Files (x86)\Adobe\Acrobat 11.0\PDFMaker\O	
Description:	Acrobat PDFMaker Office COM Addin	

Manage: Excel Add-ins Go...

3) In the lower-left corner next to Manage, select Excel Add-Ins.

4) Press GO.

# Add Data Analysis to the Data Toolbar

- 1) Checks the boxes involving Analysis ToolPak.
- 2) Press OK

