Making Your Excel Graphs Better

Jonathan Schwabish
@jschwabish

policyviz

FEDERAL RESERVE BANK OF RICHMOND®
Richmond • Baltimore • Charlotte

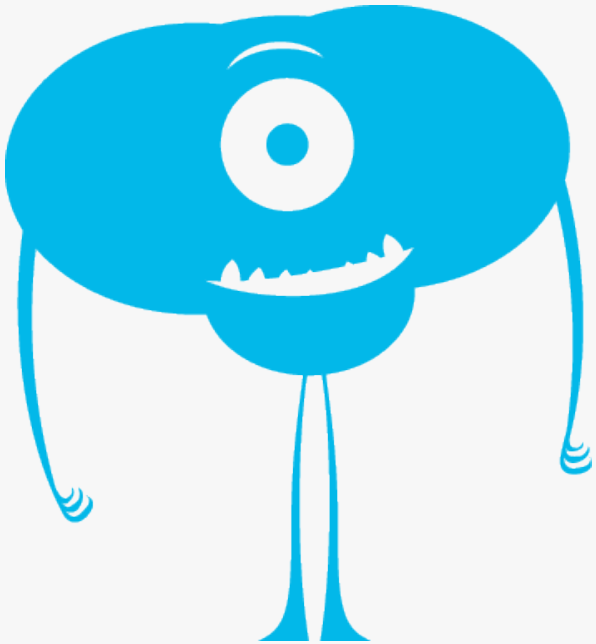
ABOUT ME

Social Security
Retirement Policy
Immigration
Food Stamps
Disability Insurance
Inequality
Labor Market

URBAN INSTITUTE

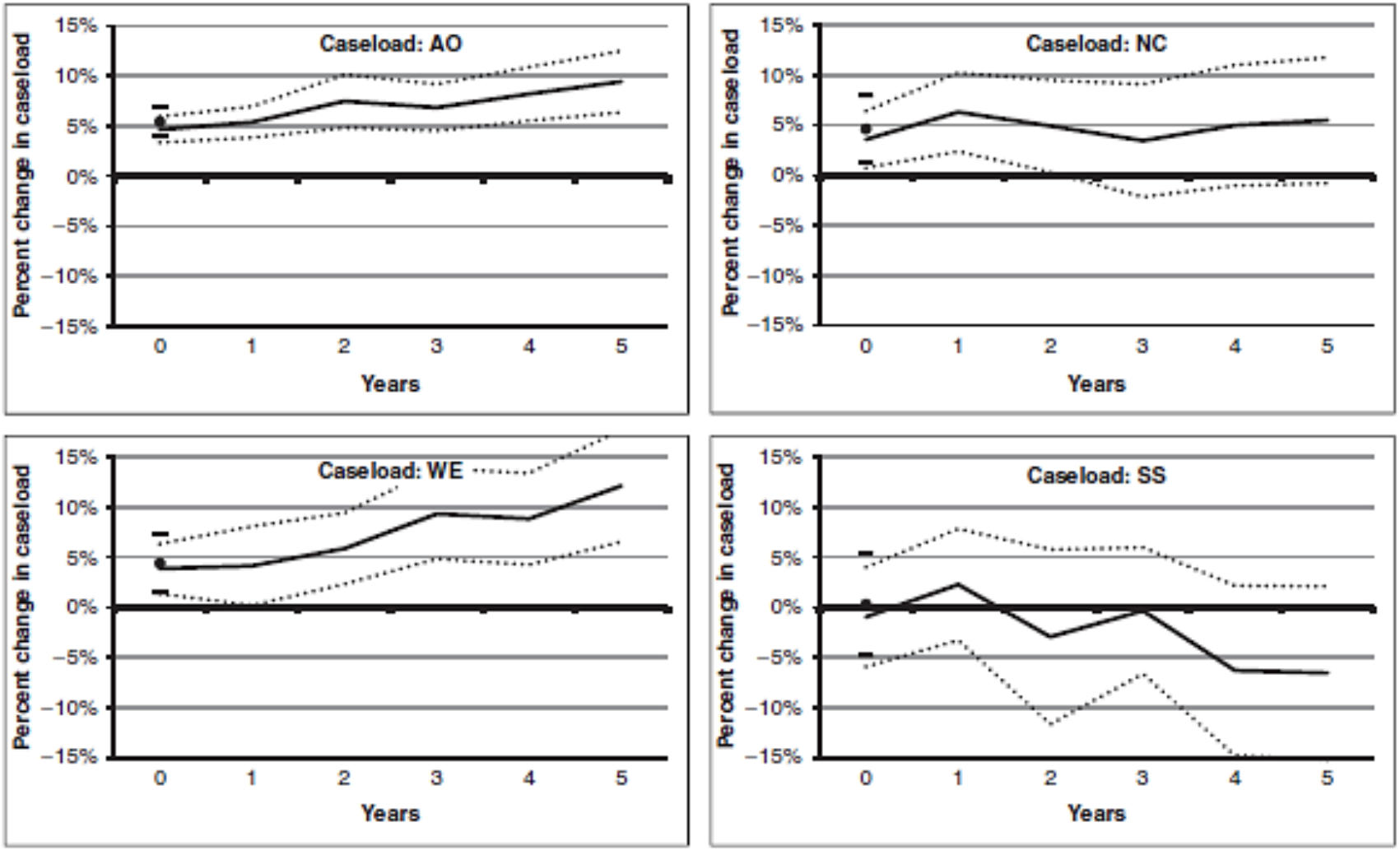
ABOUT ME

policyviz

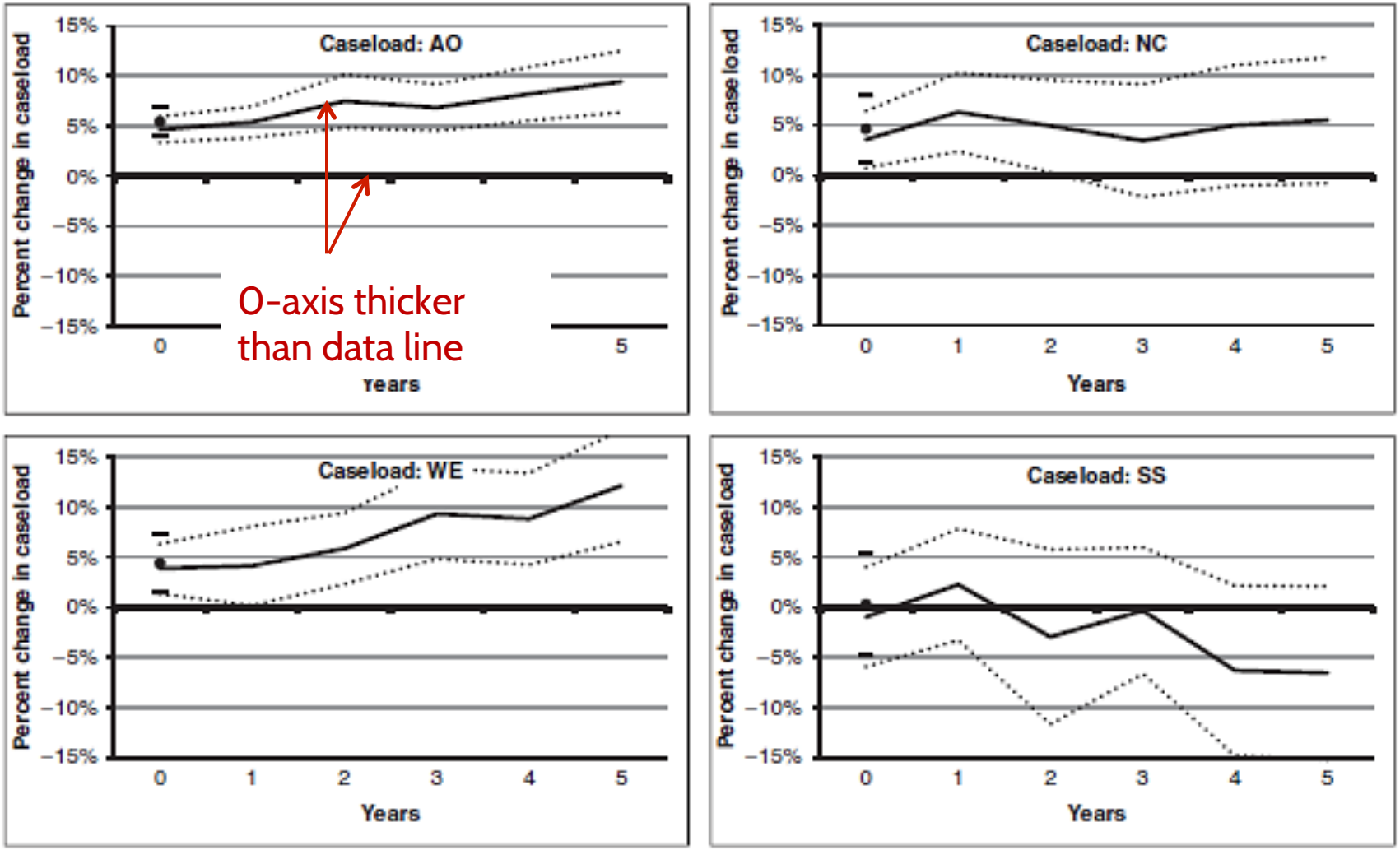


HelpMeViz

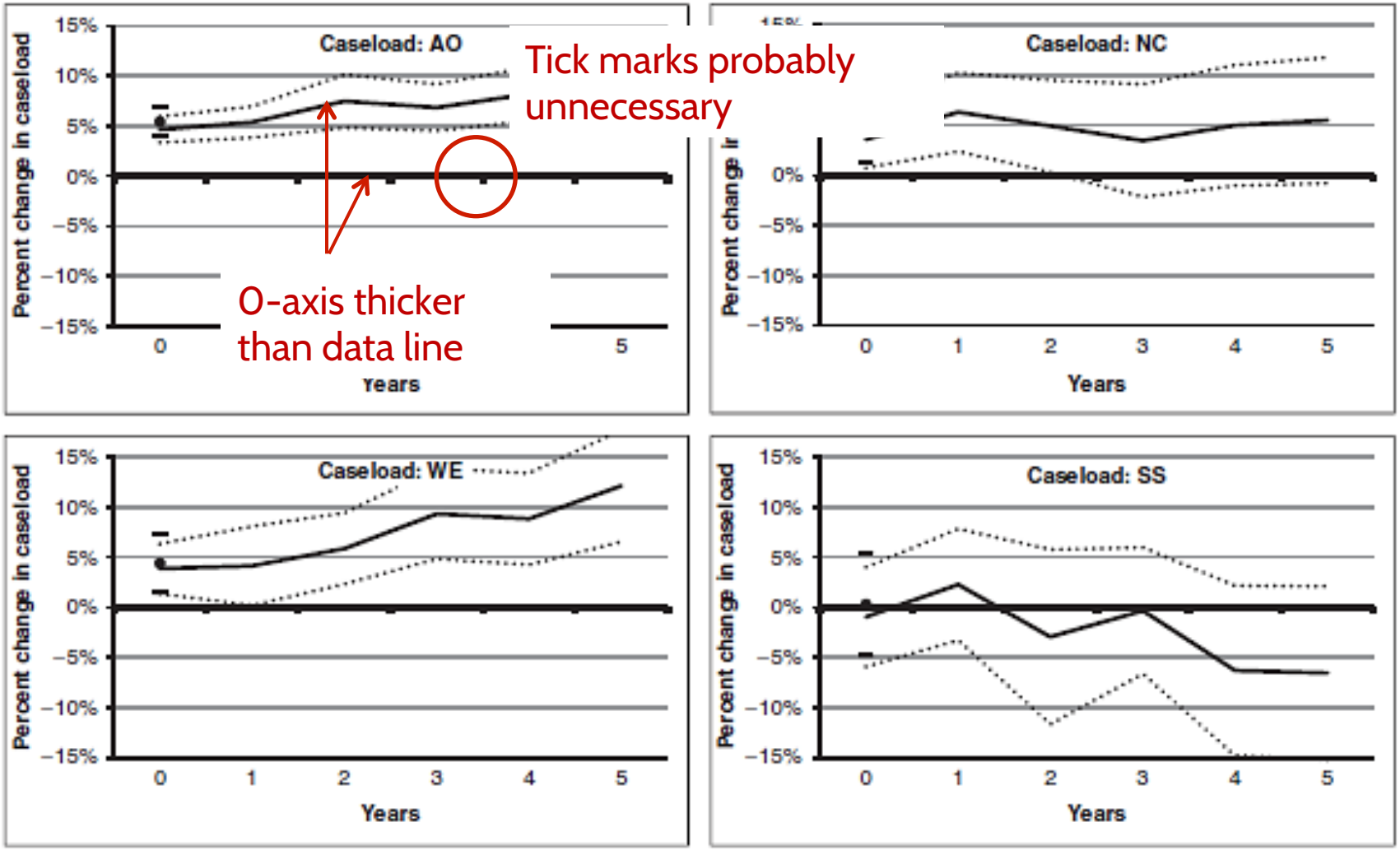
From Cluttered to Uncluttered



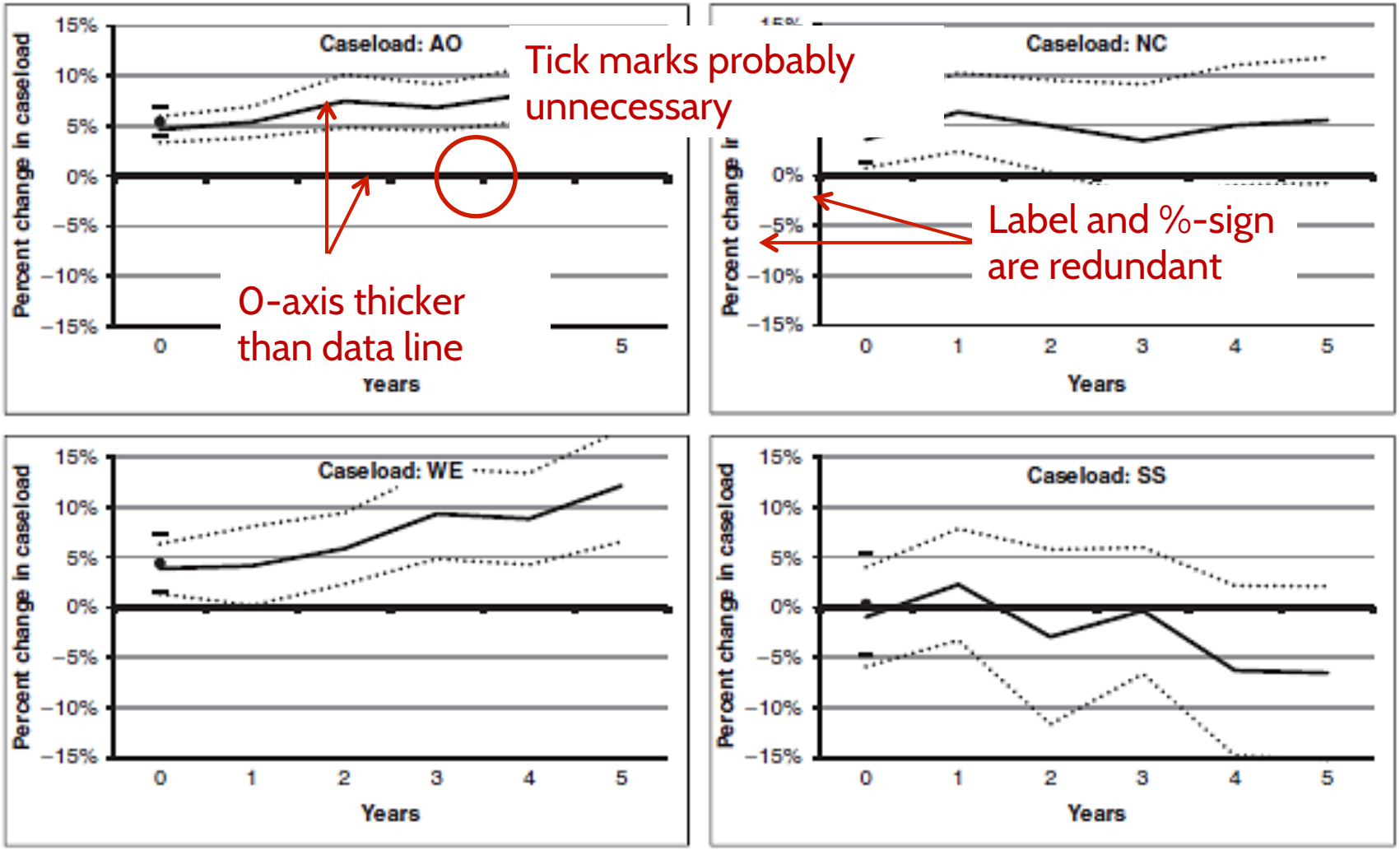
Klerman and Danielson, *The Transformation of the Supplemental Nutrition Assistance Program*, 2011.



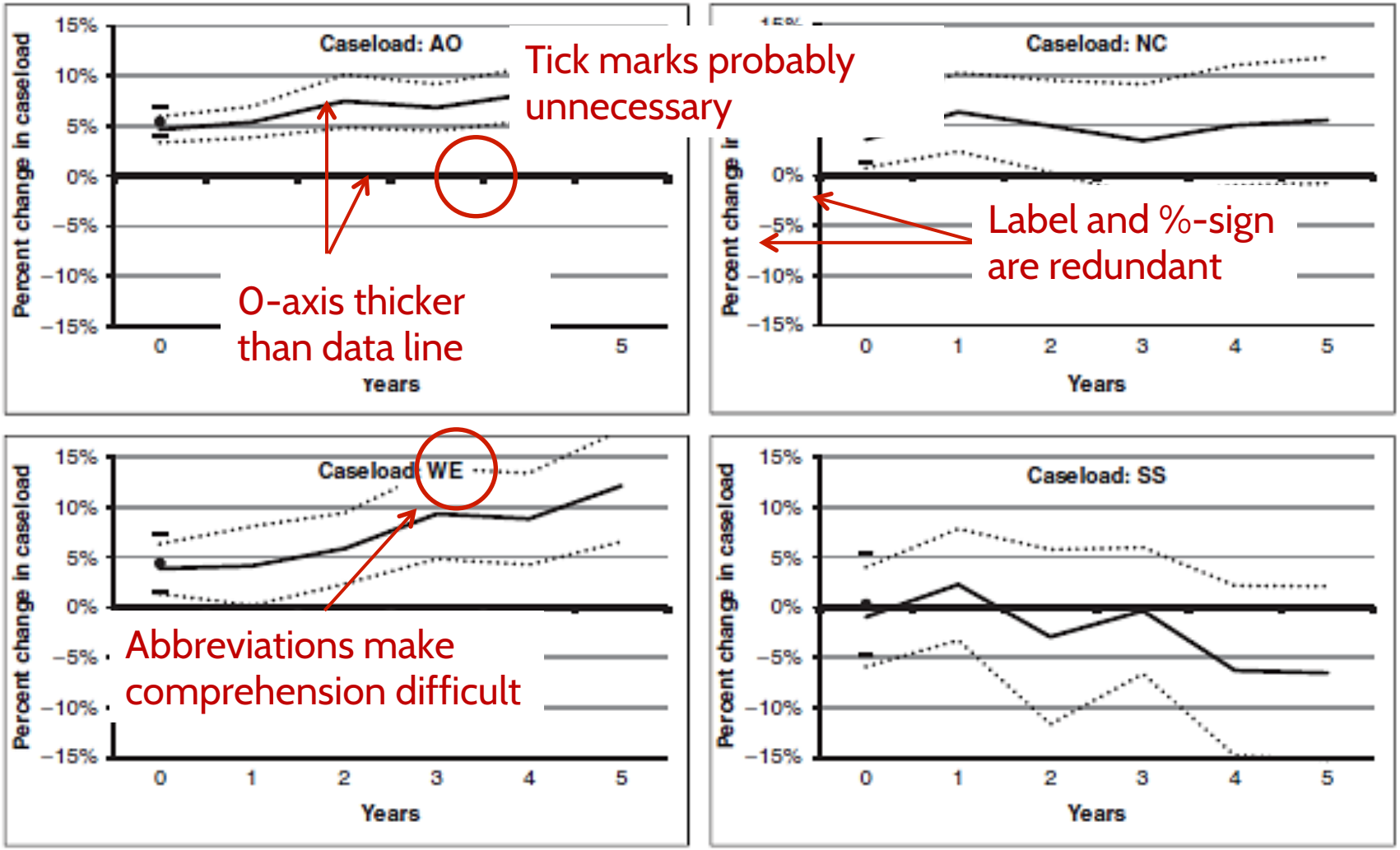
Klerman and Danielson, *The Transformation of the Supplemental Nutrition Assistance Program*, 2011.



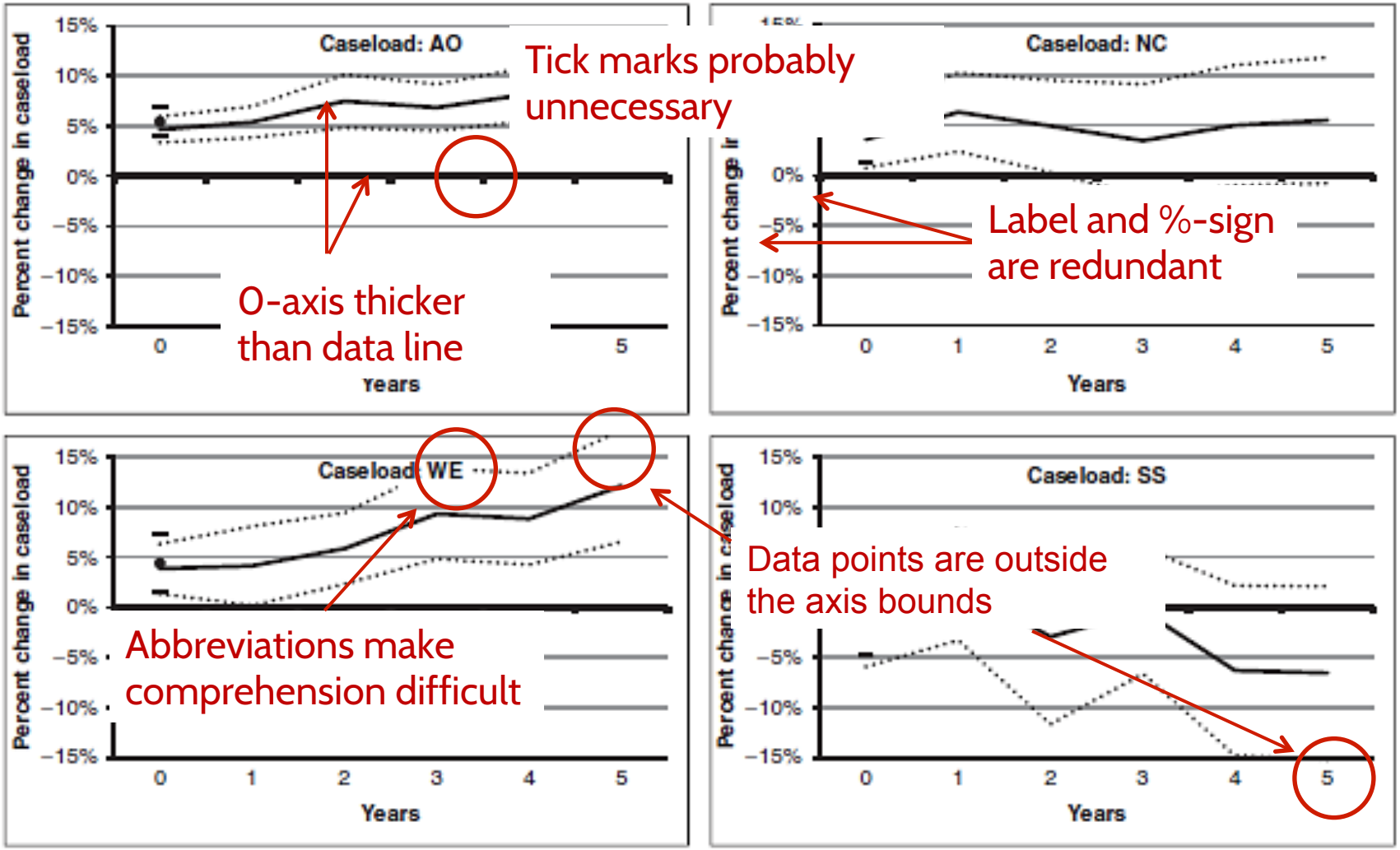
Klerman and Danielson, *The Transformation of the Supplemental Nutrition Assistance Program*, 2011.



Klerman and Danielson, *The Transformation of the Supplemental Nutrition Assistance Program*, 2011.

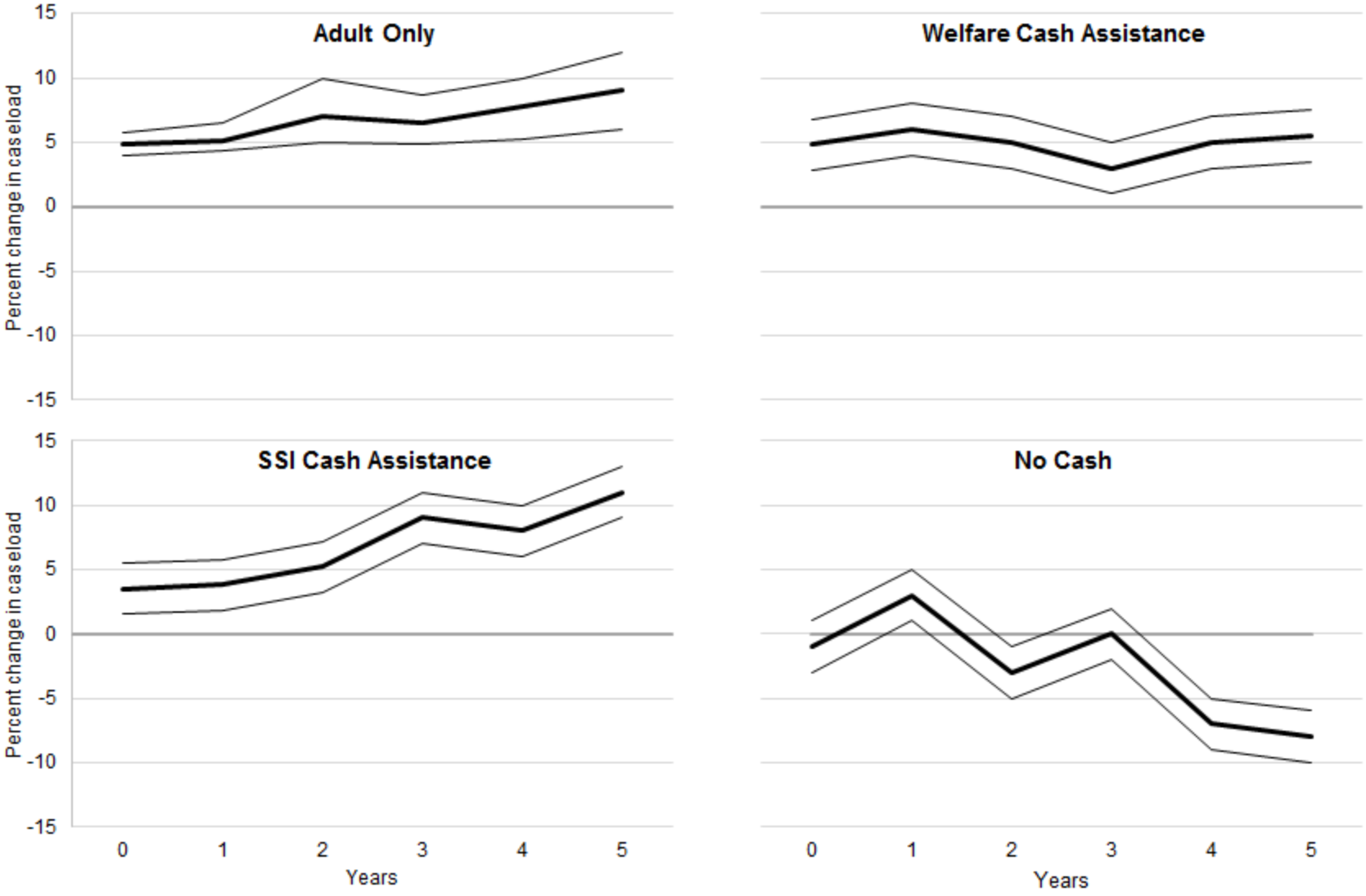


Klerman and Danielson, *The Transformation of the Supplemental Nutrition Assistance Program*, 2011.



Klerman and Danielson, *The Transformation of the Supplemental Nutrition Assistance Program*, 2011.

Implied Impulse Response Functions for Different Caseloads



General Tips & Tricks

Online Excel Tutorials

Peltier
Technical Services, Inc.

Chandoo.org
BECOME AWESOME IN EXCEL

Also see

- ozgrid.com
- mrexcel.com
- processtrends.com
- Microsoft Forums (office.microsoft.com)
- ...or just search the web

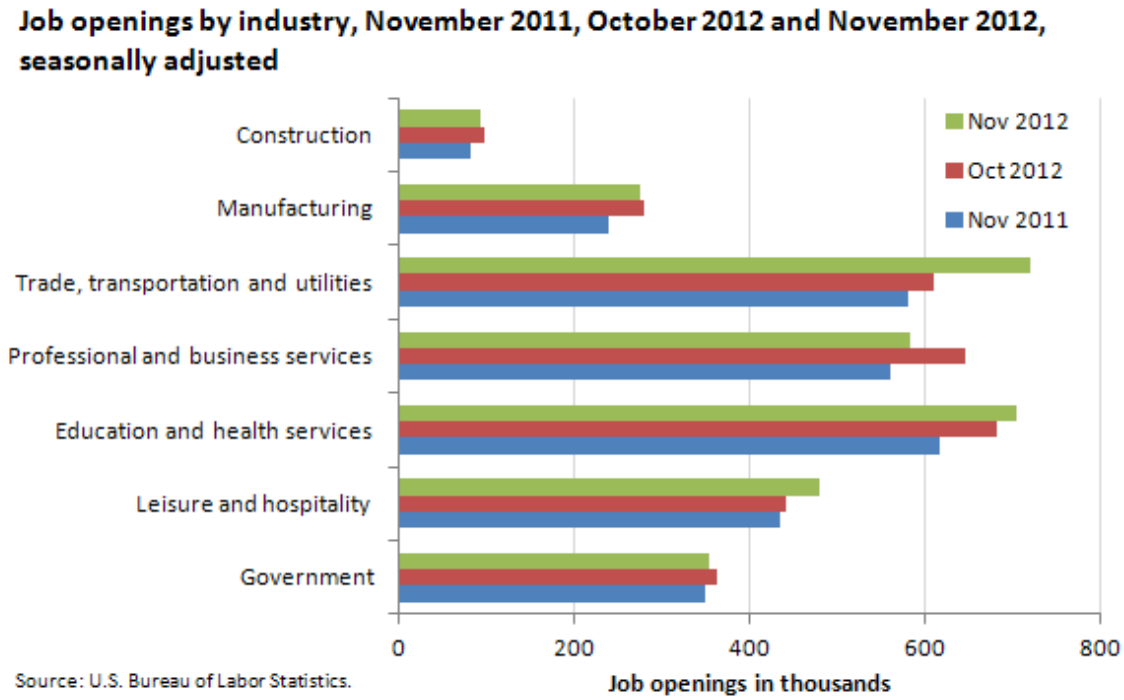
Encode Your Data!

Job openings in November 2012

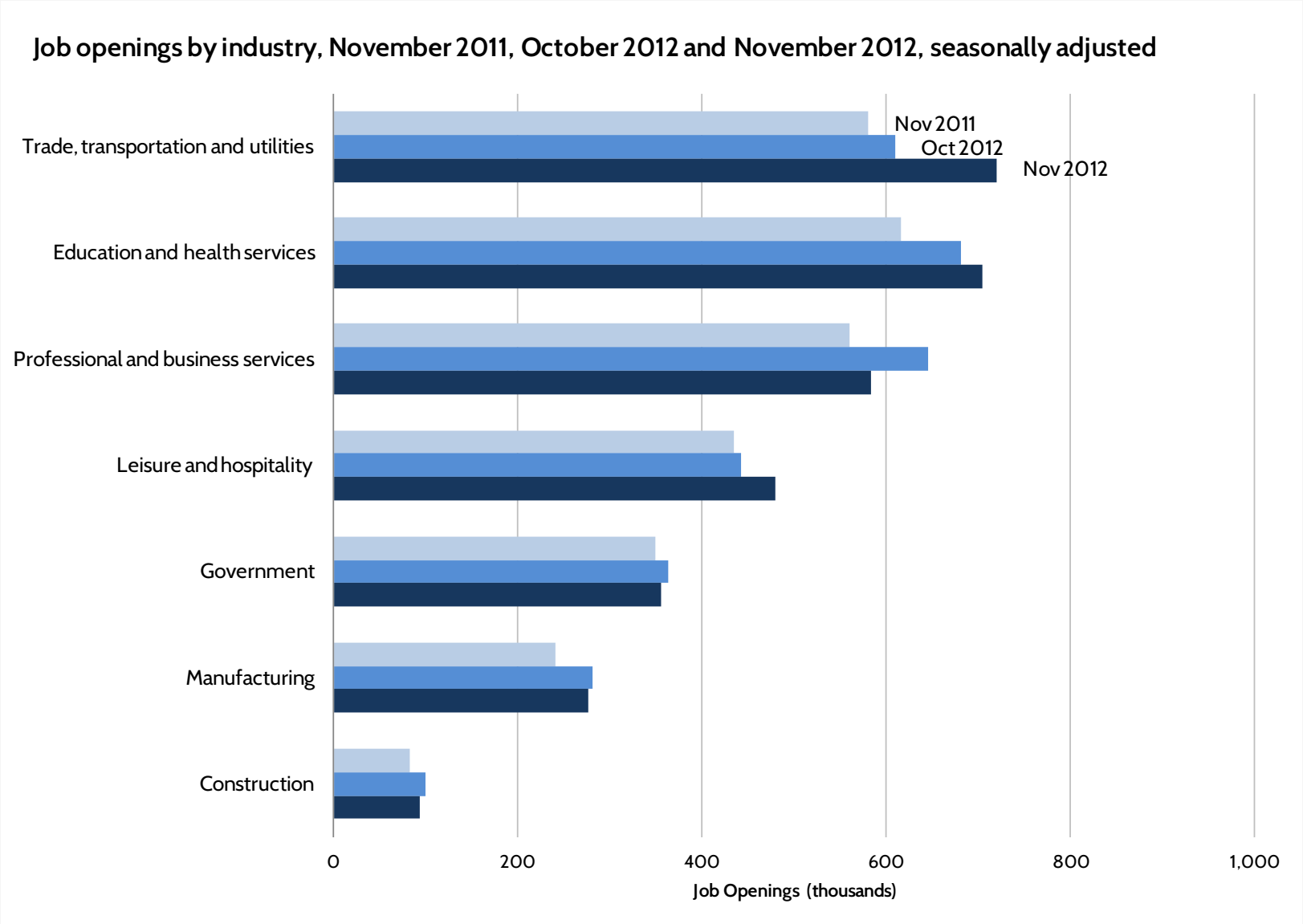
JANUARY 11, 2013

There were 3.7 million job openings on the last business day of November 2012, unchanged from October 2012. In November 2011 there were 3.3 million job openings.

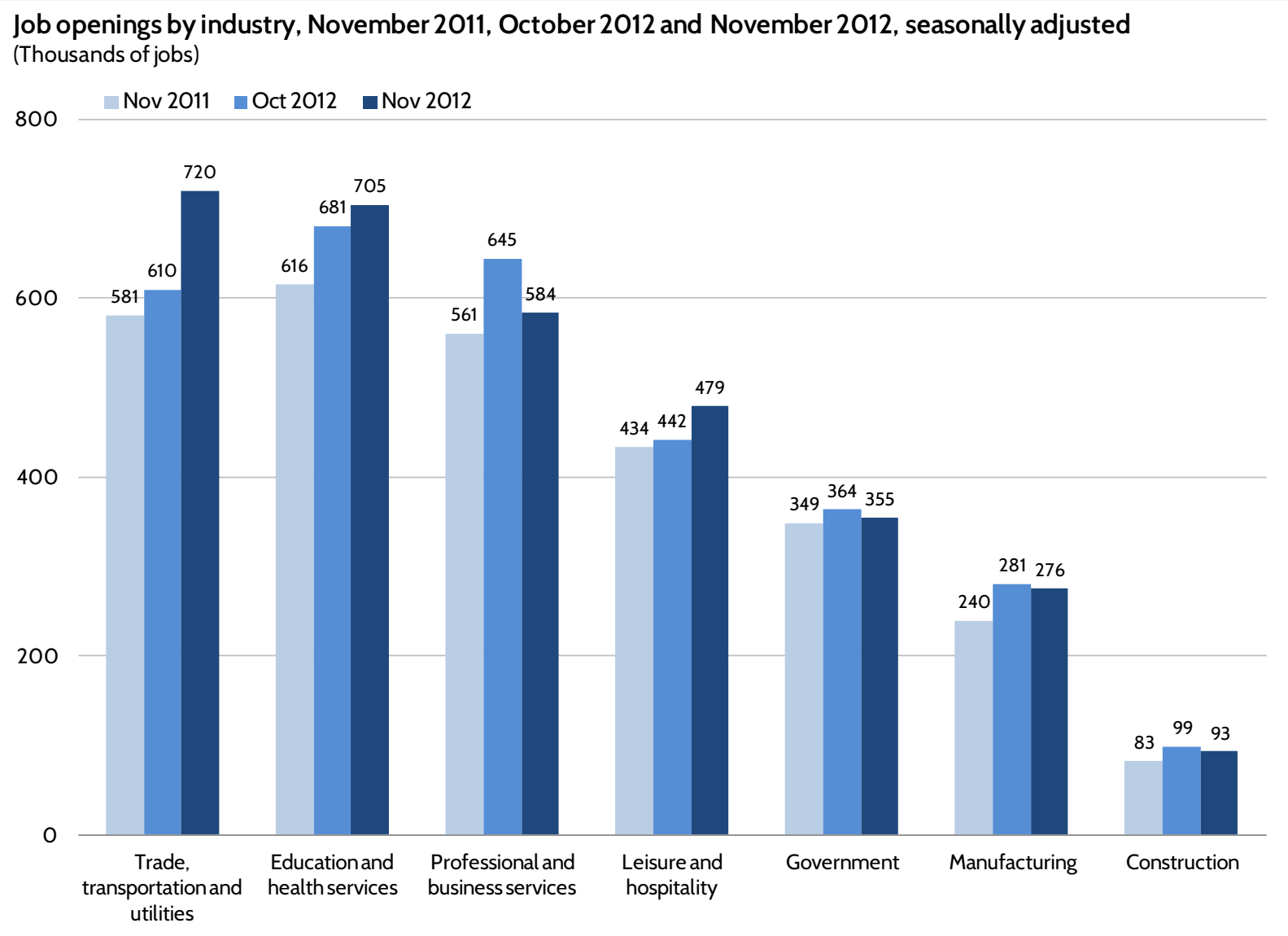
CHART IMAGE | CHART DATA



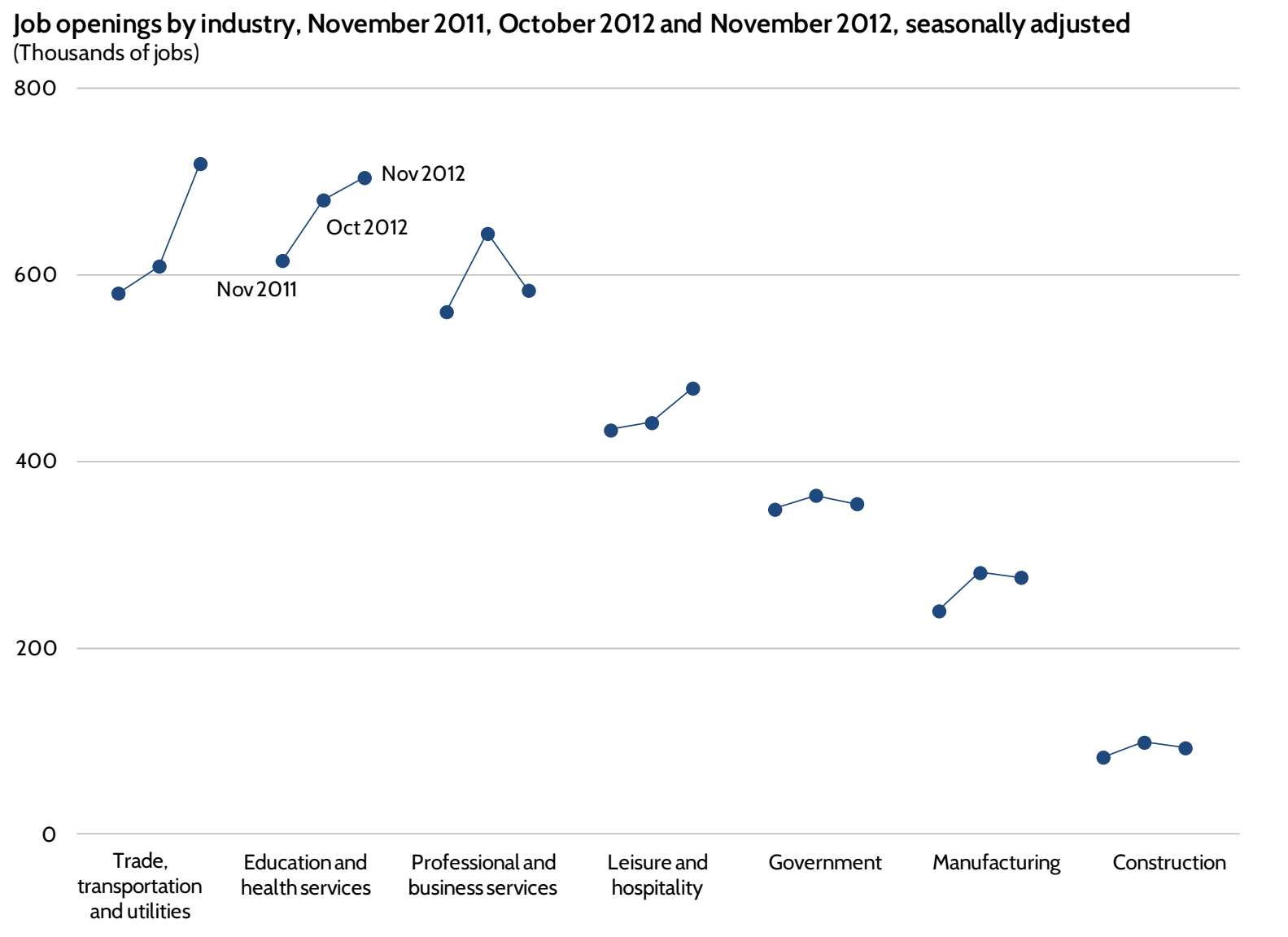
Step 1. Redesign as a bar chart, sorted by November 2012 value.



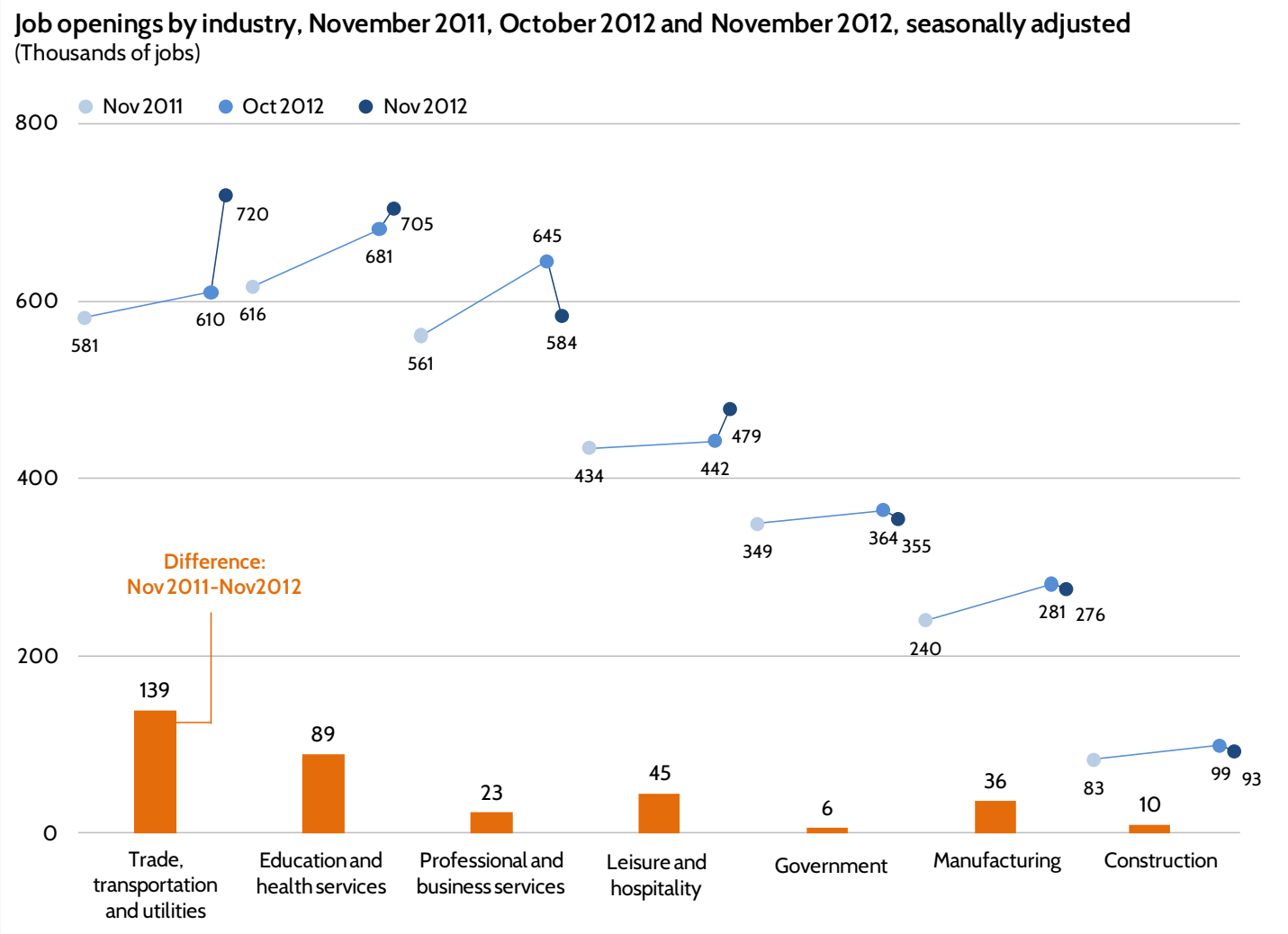
Step 2. Column chart is more intuitive



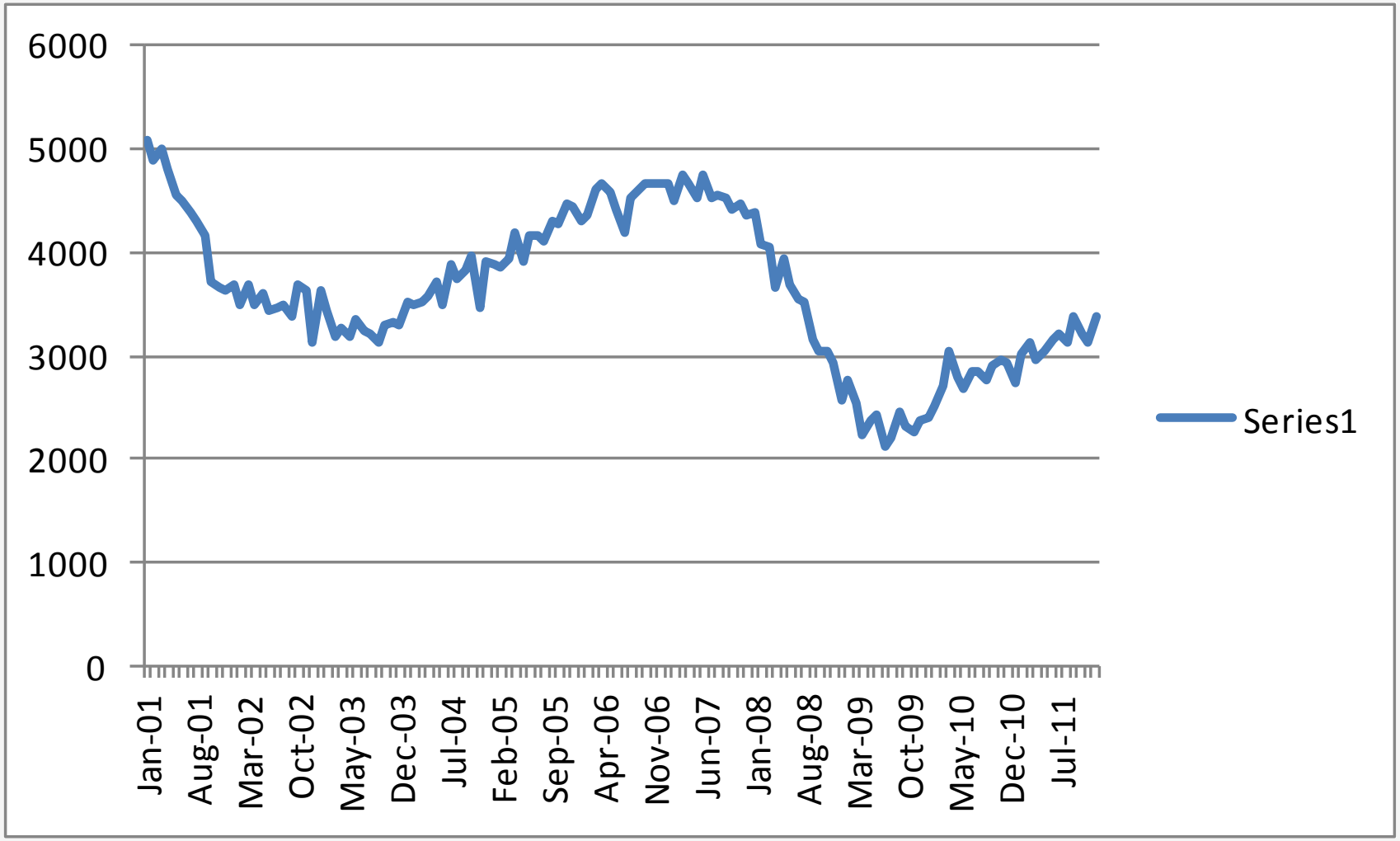
Step 3. Redesign as separate line charts. This requires using separate scatterplots for each industry.



Step 4. Extend scatterplots to more accurately represent time and add orange bars to represent difference between November 2011 and November 2012.



Change the Defaults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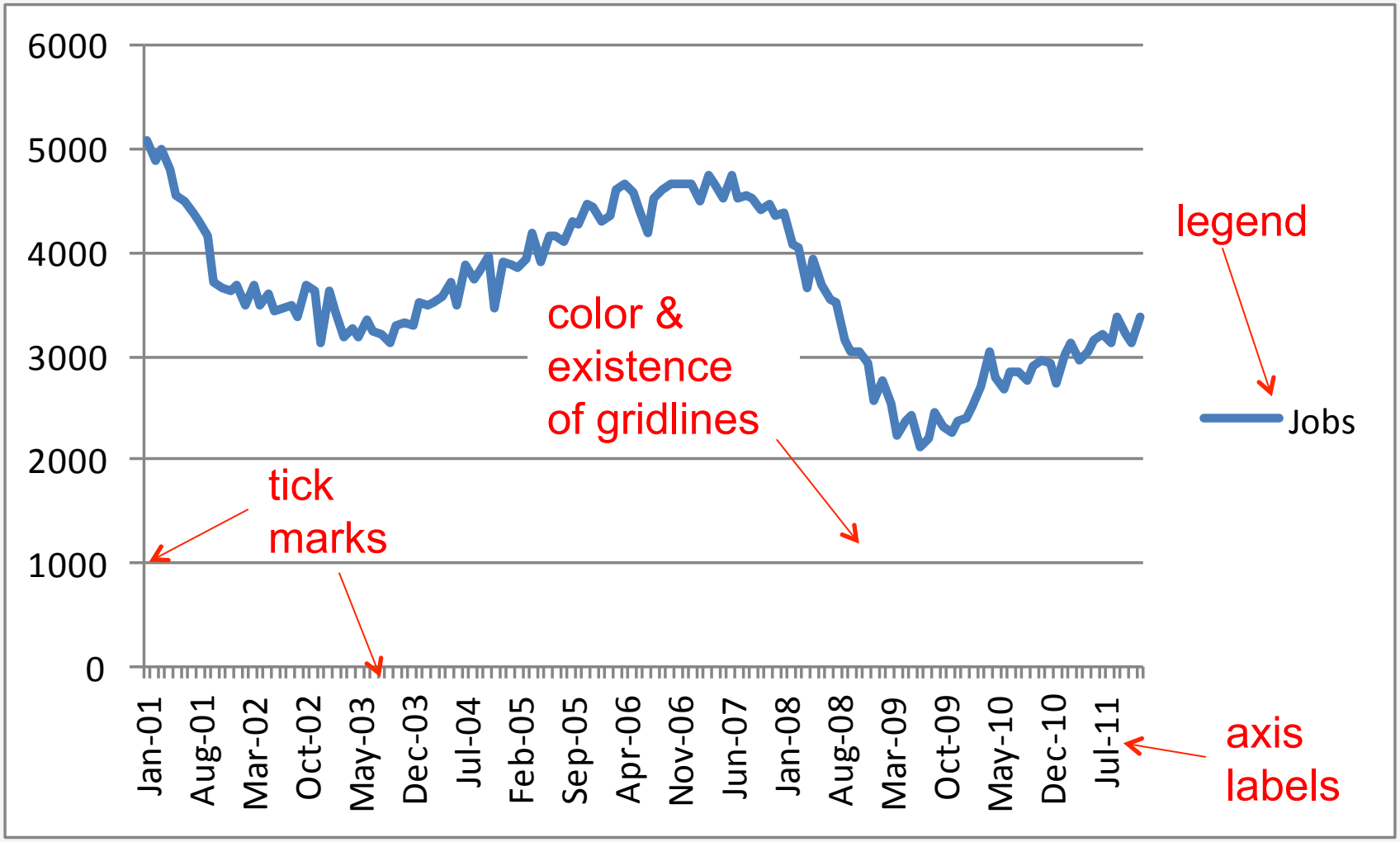
Jul-11
Series1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May-10
Dec-10
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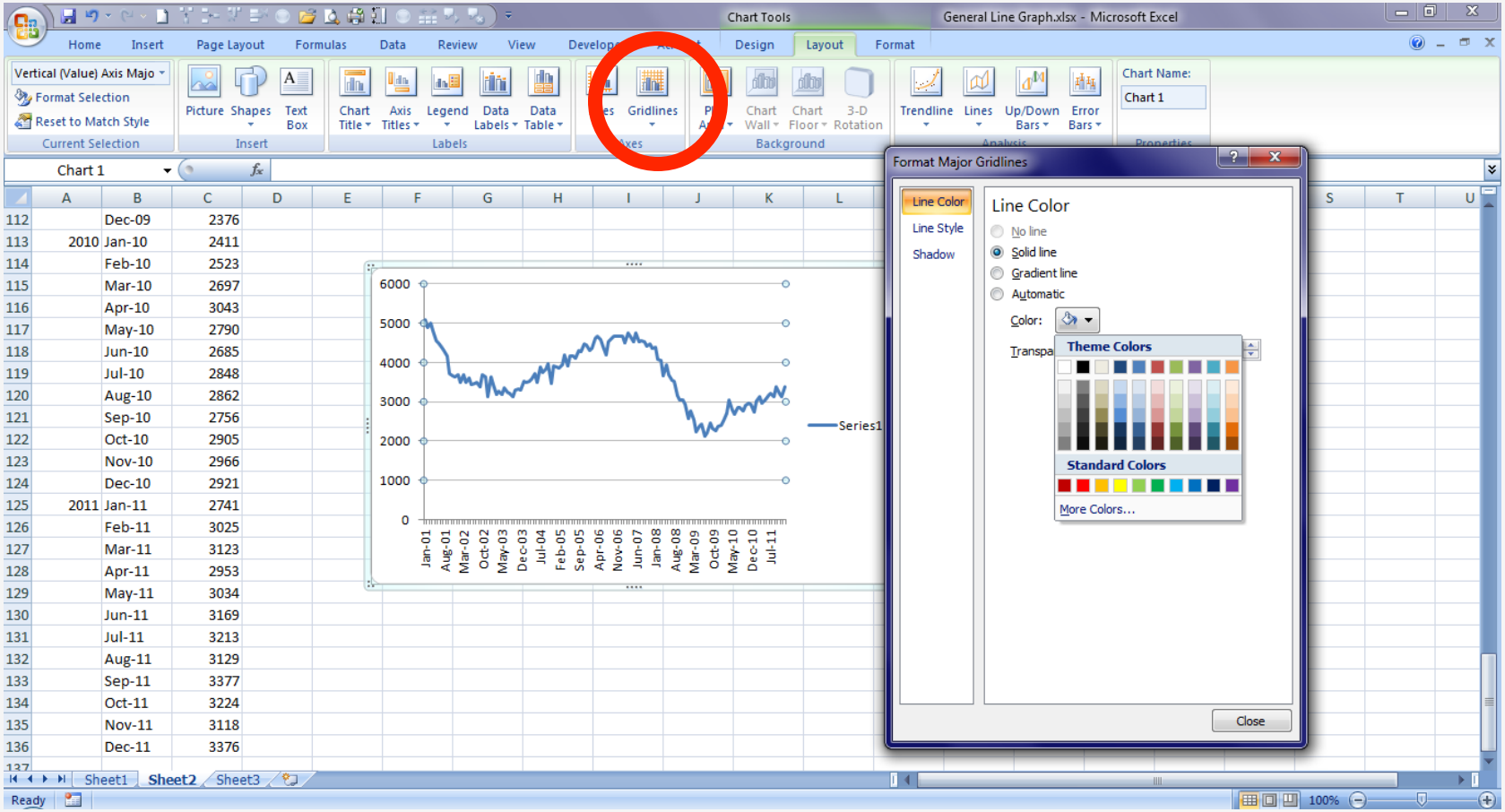
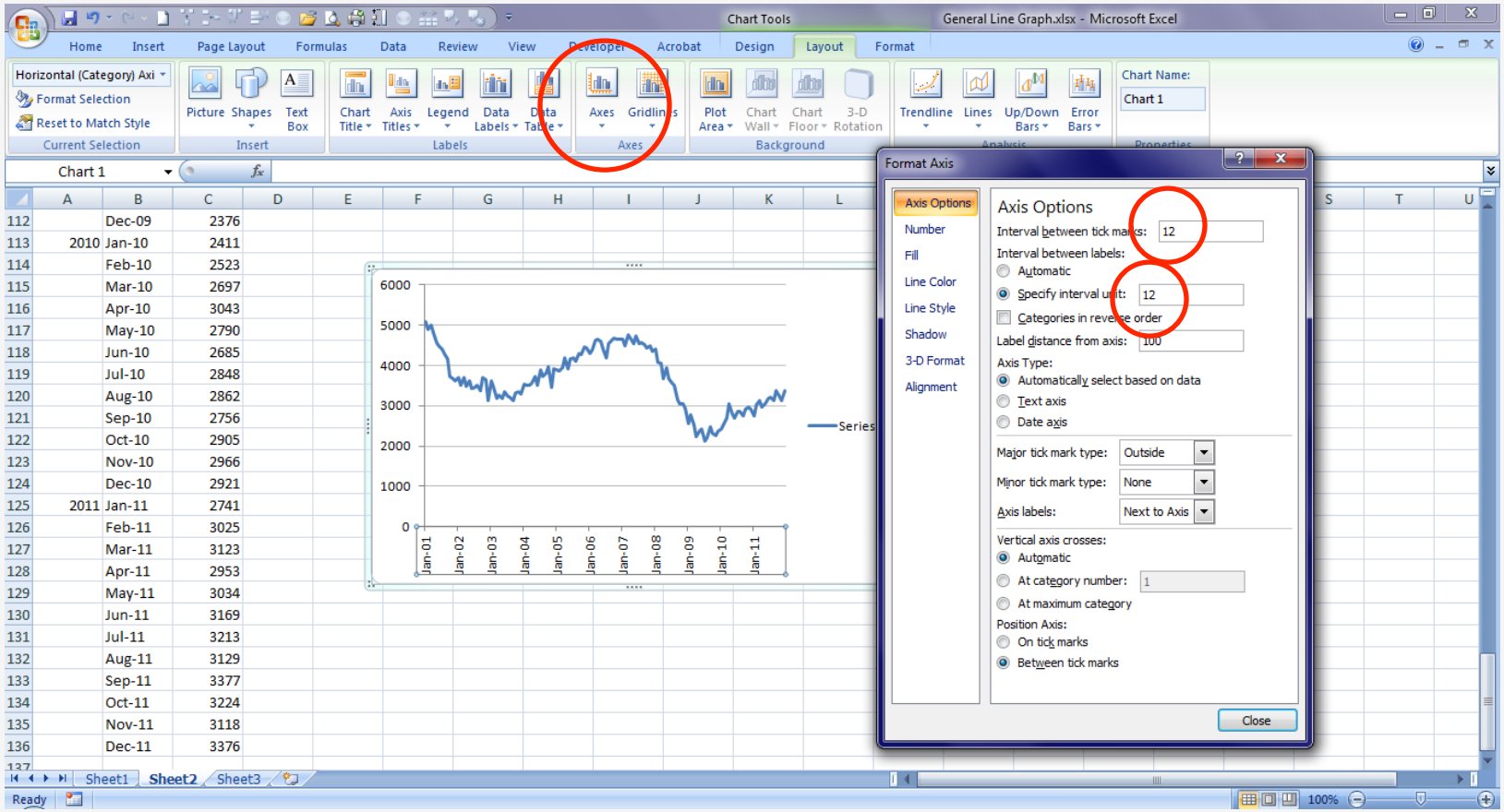
Jobs
legend
color &
existence
of gridlines
tick
marks
axis
labels

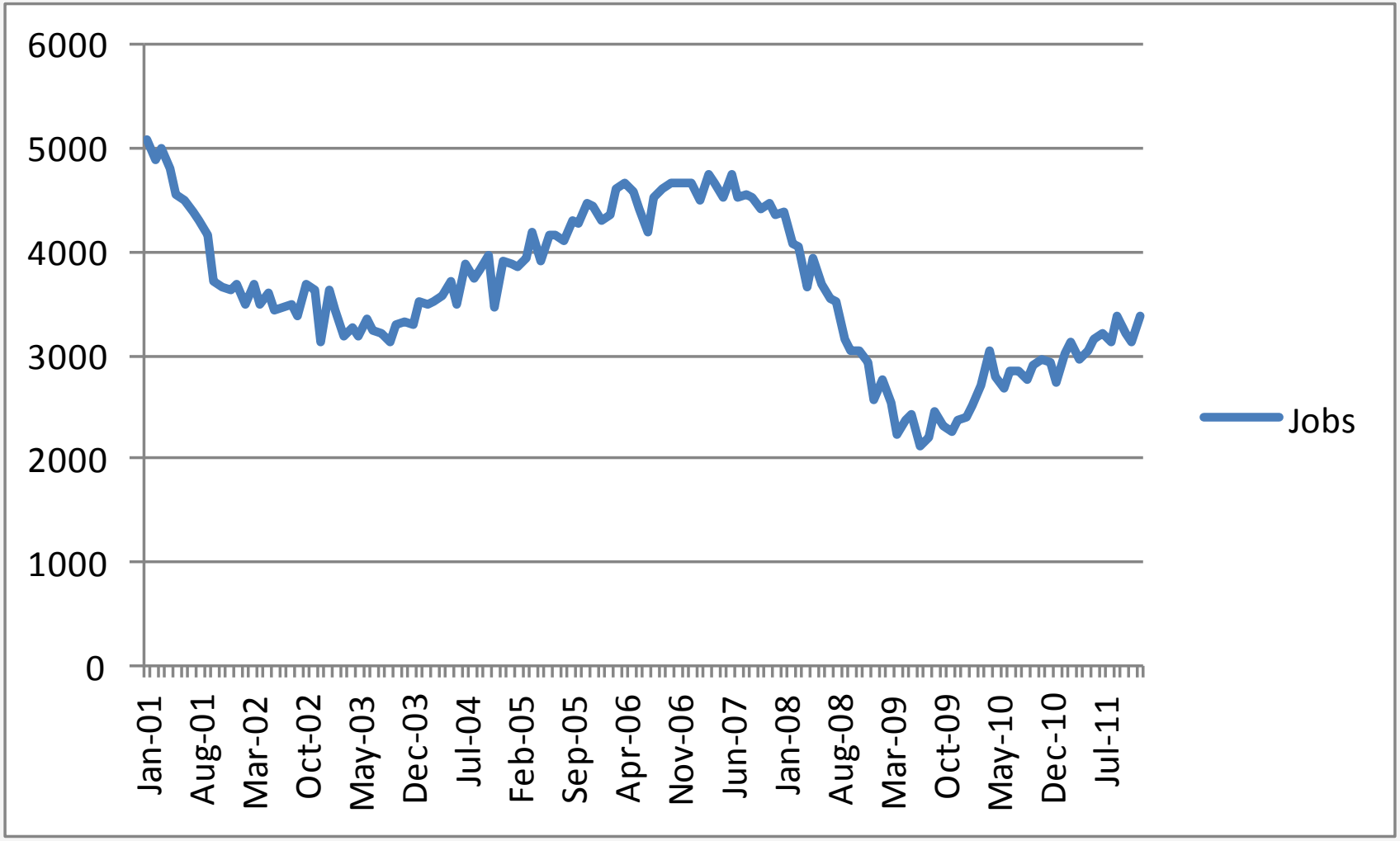
Changing or Removing Gridlines



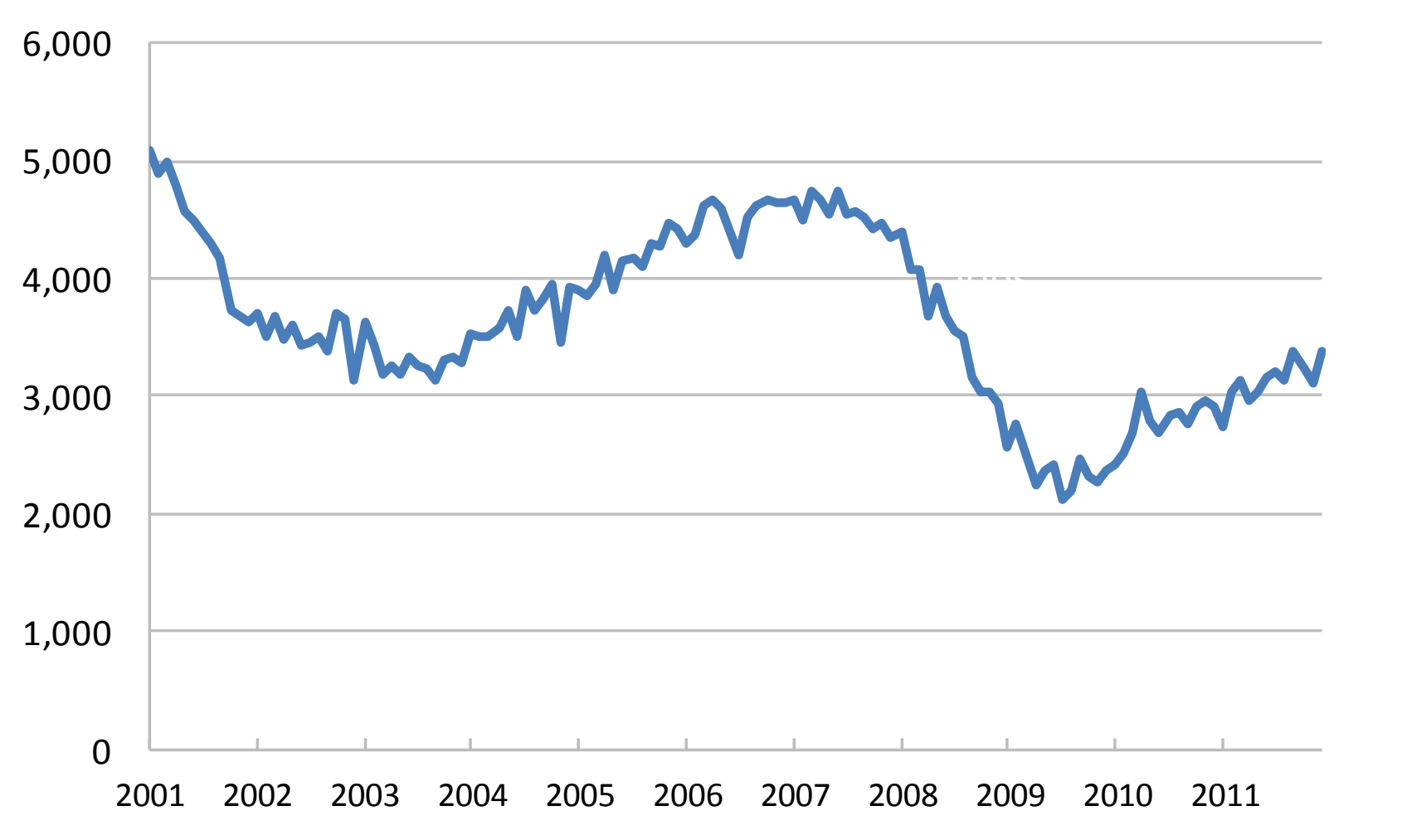
Changing tick mark and axis label appearance and frequency



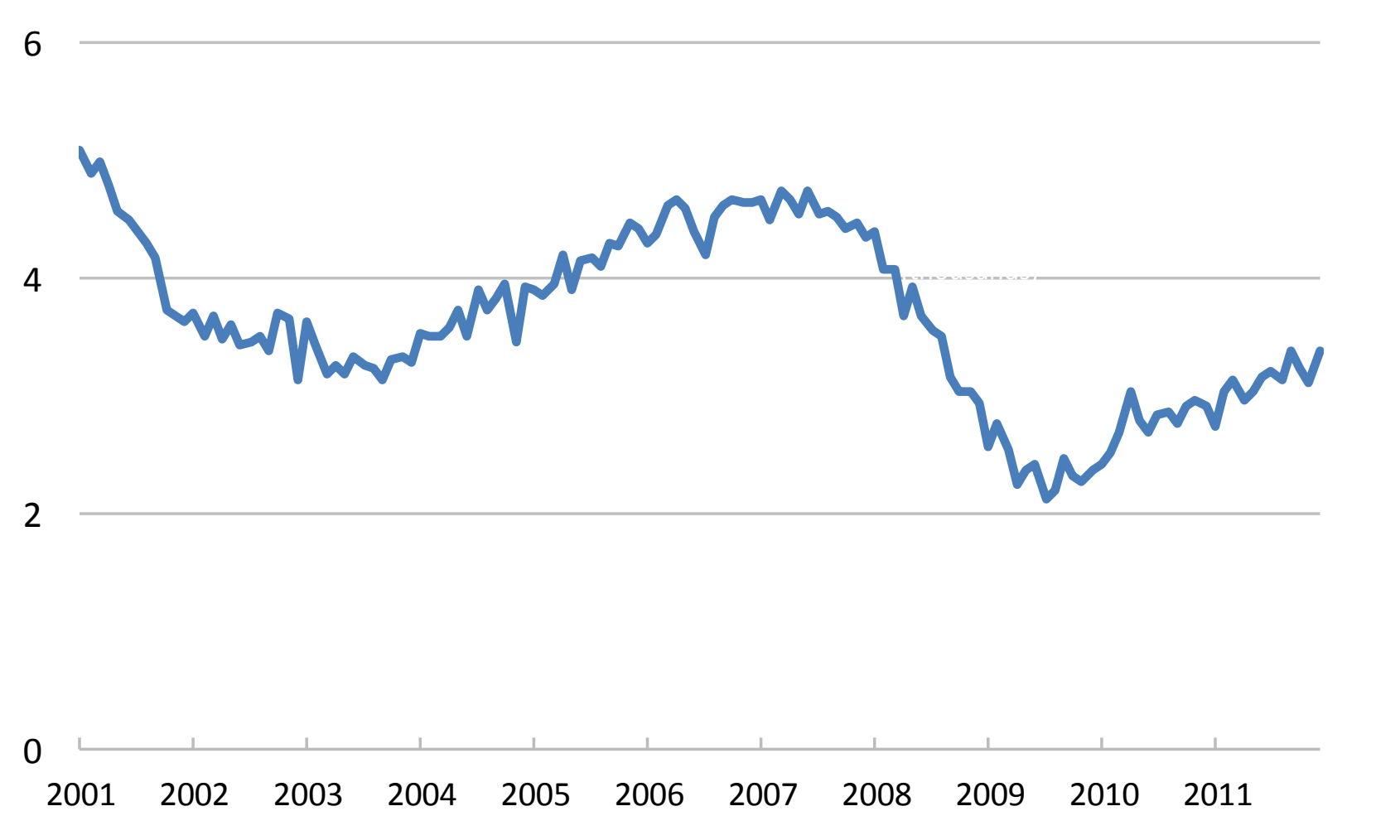
Revising the Basic Chart



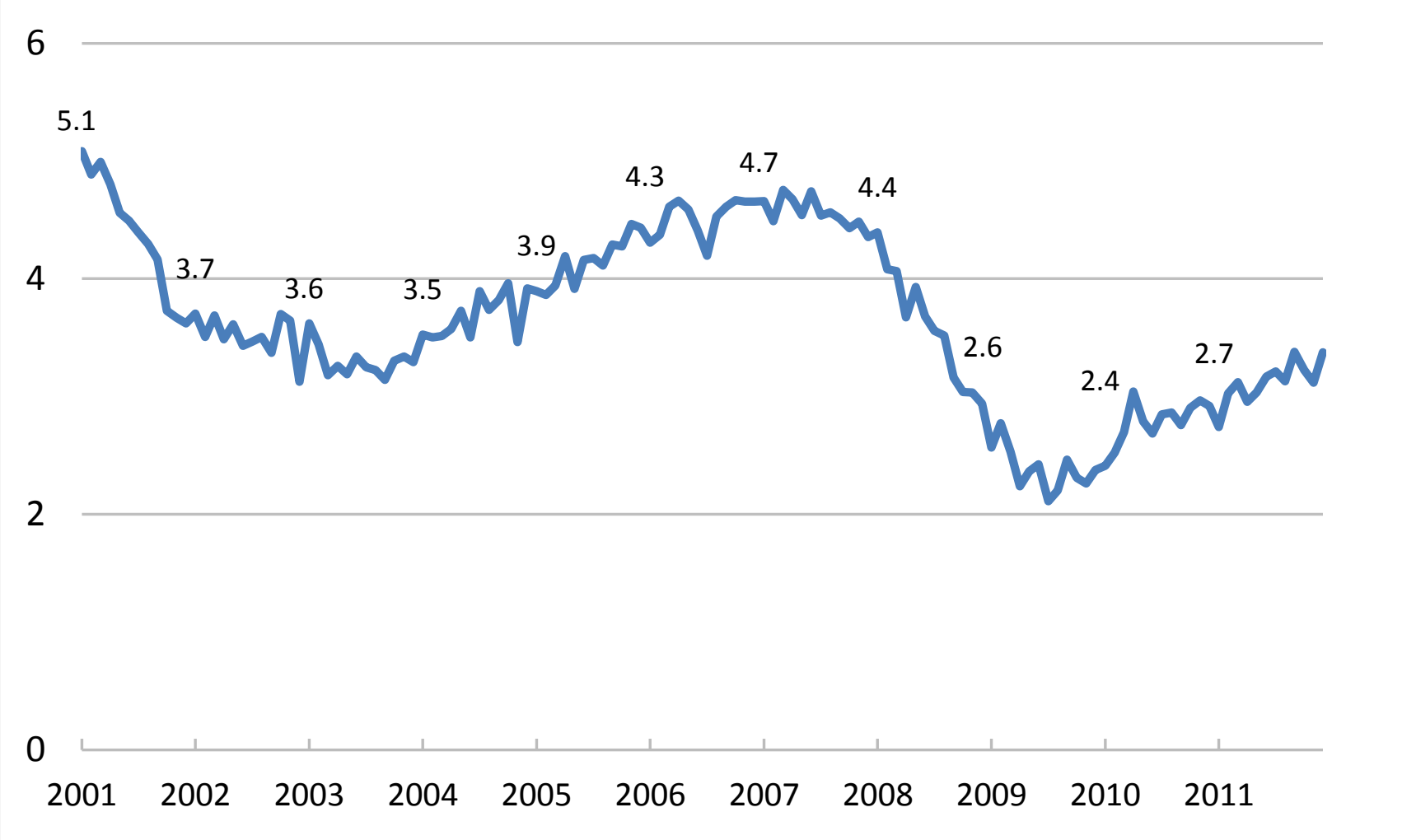
Remove legend, change axis labels



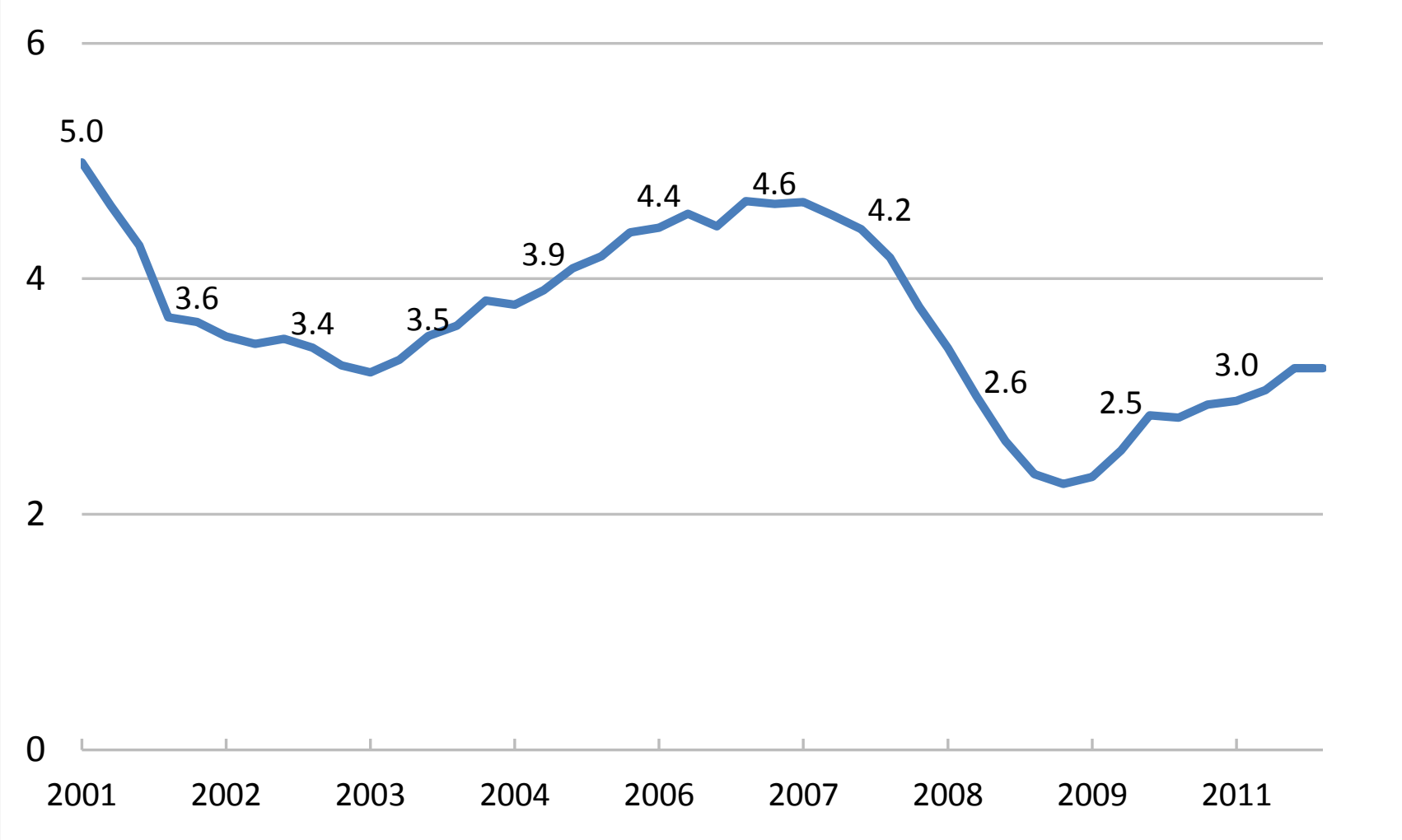
Simplify units



Add data labels….by using another series



Reduce frequency



Other Tips & Shortcuts

Use the ‘Quick Access Toolbar’

Other Tips & Shortcuts

Use the ‘Quick Access Toolbar’

Use the *Layout* tab in ‘Chart Tools’

Other Tips & Shortcuts

Use the ‘Quick Access Toolbar’

Use the *Layout* tab in ‘Chart Tools’

Use VBA code, if possible

Other Tips & Shortcuts

Use the ‘Quick Access Toolbar’

Use the *Layout* tab in ‘Chart Tools’

Use VBA code, if possible

Combine chart types

Other Tips & Shortcuts

Use the ‘Quick Access Toolbar’

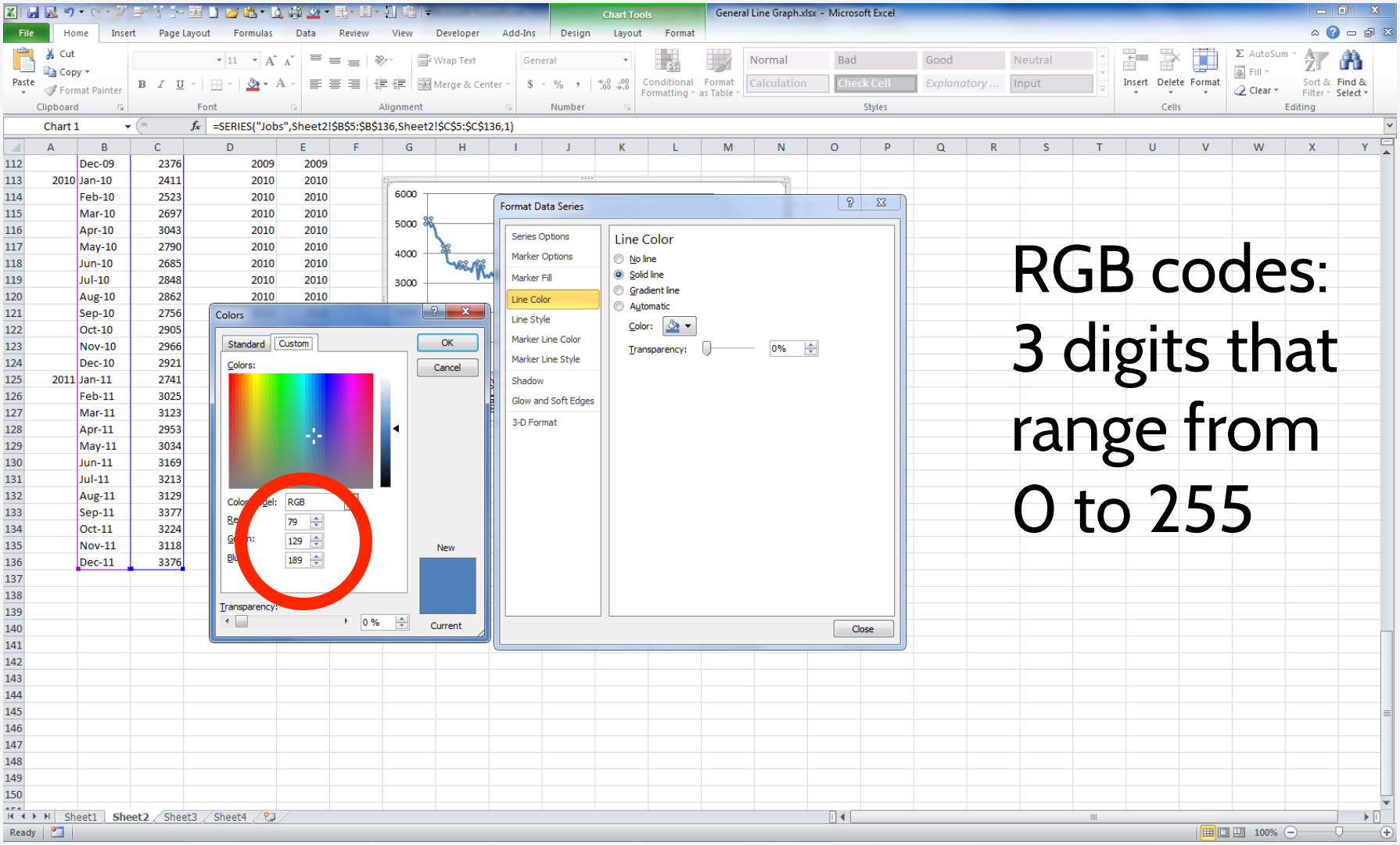
Use the *Layout* tab in ‘Chart Tools’

Use VBA code, if possible

Combine chart types

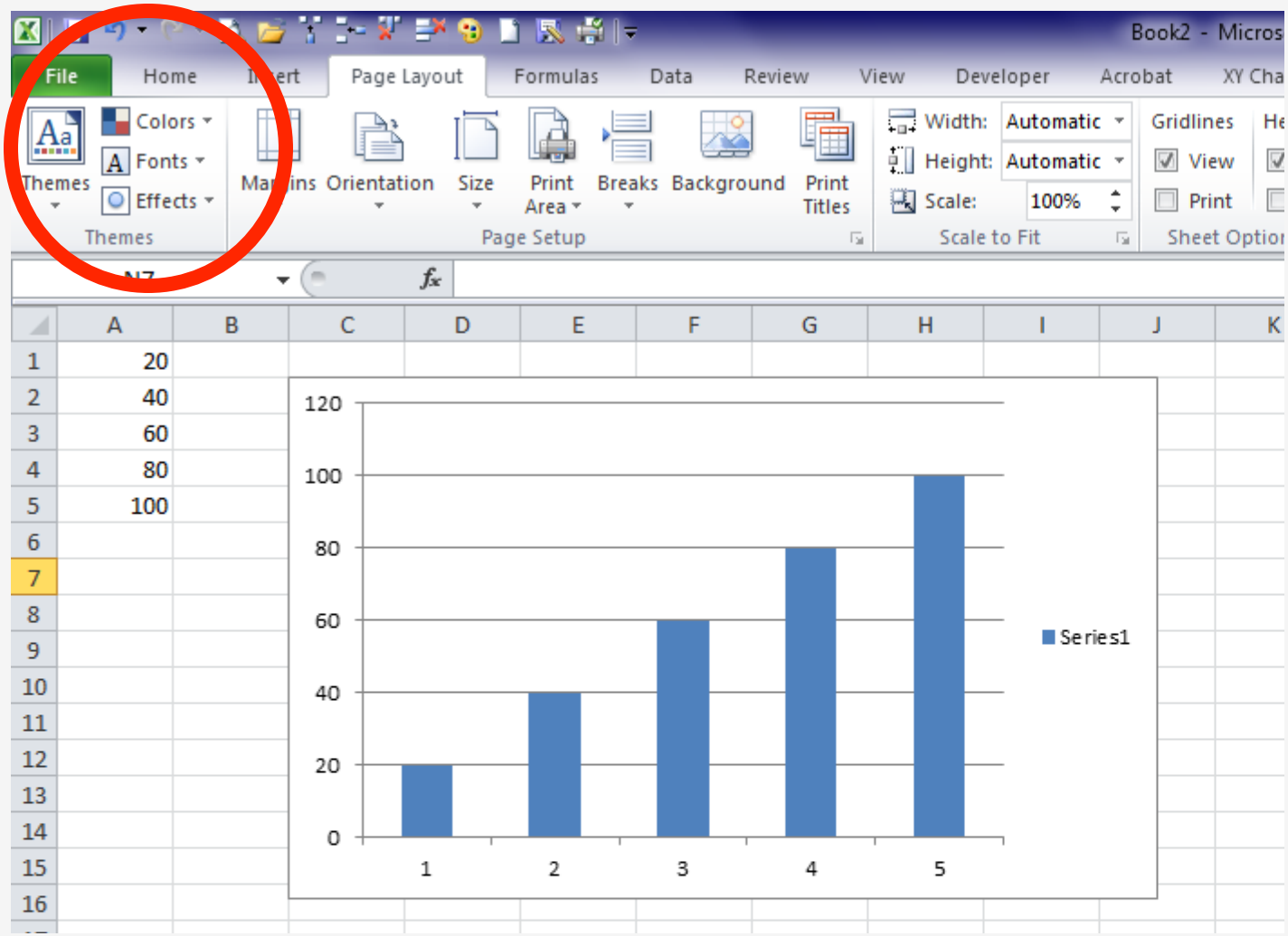
Change default colors & fonts

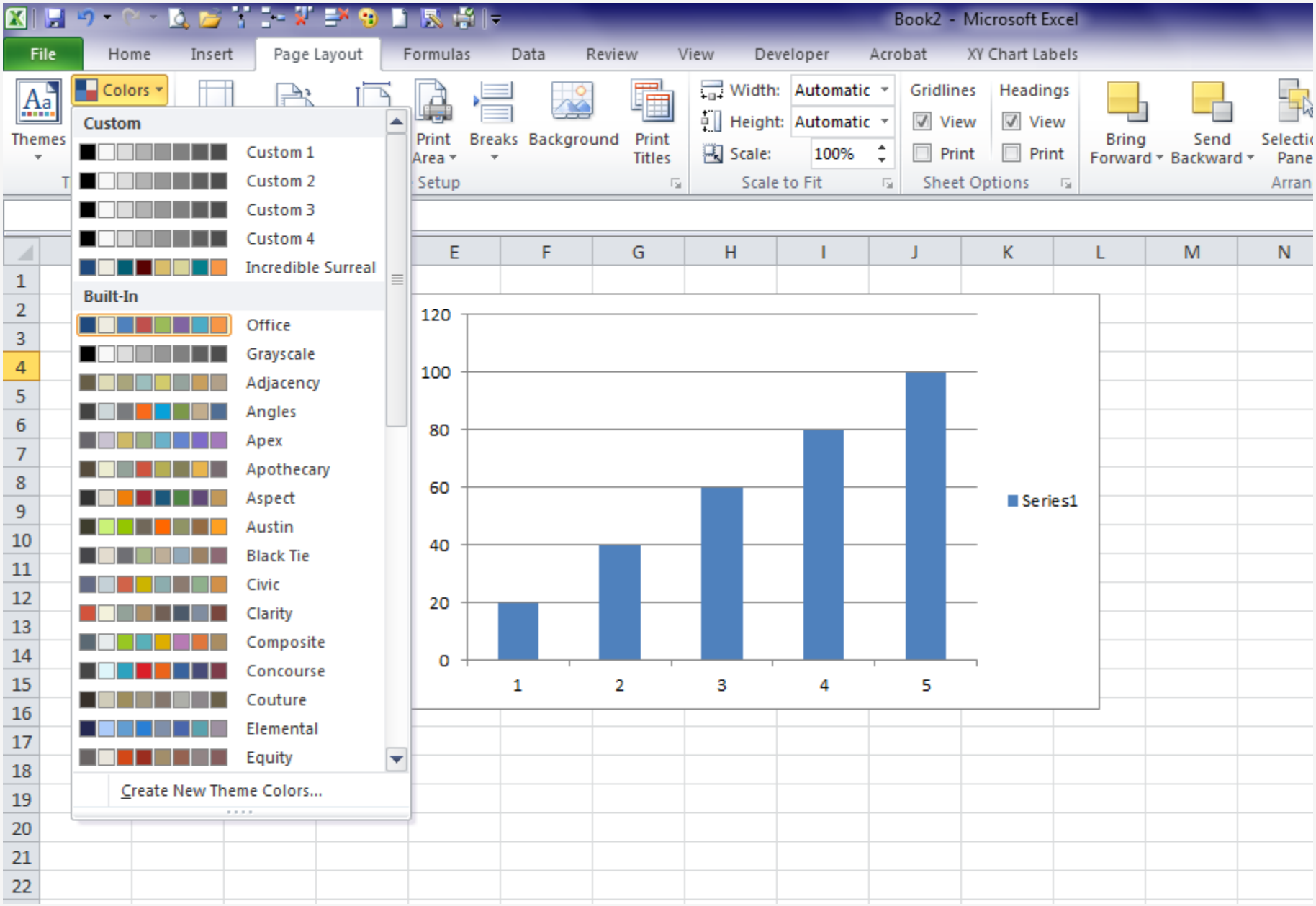
Changing color



RGB codes:
3 digits that range from 0 to 255

Custom Color Palette




Book2 - Microsoft Excel
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Formulas
Data
Review
View
Developer
Acrobat
XY Chart Labels
Themes
Colors
Custom
Custom 1
Custom 2
Custom 3
Custom 4
Incredible Surreal
Built-In
Office
Grayscale
Adjacency
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Series1

kuler

Register Sign In

Create
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Please sign in to save your theme.

Base Color

HSV	191	98	45	
RGB	2	94	115	
CMYK	98	18	0	55
LAB	36	-15	-19	

HSV	186	98	55	
RGB	3	127	140	
CMYK	98	9	0	45
LAB	48	-24	-15	

HSV	56	29	85	
RGB	217	213	154	
CMYK	0	2	29	15
LAB	84	-8	30	

HSV	45	51	85	
RGB	217	189	106	
CMYK	0	13	51	15
LAB	77	-1	45	

HSV	0	98	35	
RGB	89	2	2	
CMYK	0	98	98	65
LAB	16	37	25	

Book1 - Microsoft Excel

Picture Tools

File | Home | Insert | Page Layout | Formulas | Data | Review | View | Developer | Acrobat | XY Chart Labels | Format

Themes: Colors, Fonts, Effects

Page Setup: Margins, Orientation, Size, Print Area, Breaks, Background, Print Titles

Width: Automatic
Height: Automatic
Scale: 100%

Gridlines: View, Print
Headings: View, Print

Bring Forward, Send Backward, Selection Pane

Picture 2

kuler

Colors

Standard | Custom

Colors:

Color model: RGB
Red: 2
Green: 94
Blue: 115

OK
Cancel

New
Current

Create New Theme Colors

Theme colors

Text/Background - Dark 1
Text/Background - Light 1
Text/Background - Dark 2
Text/Background - Light 2
Accent 1
Accent 2
Accent 3
Accent 4
Accent 5
Accent 6
Hyperlink
Followed Hyperlink

Sample

Text
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Hyperlink

Text
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Name: Incredible Surreal

Reset
Save
Cancel

	HSV	RGB	CMYK
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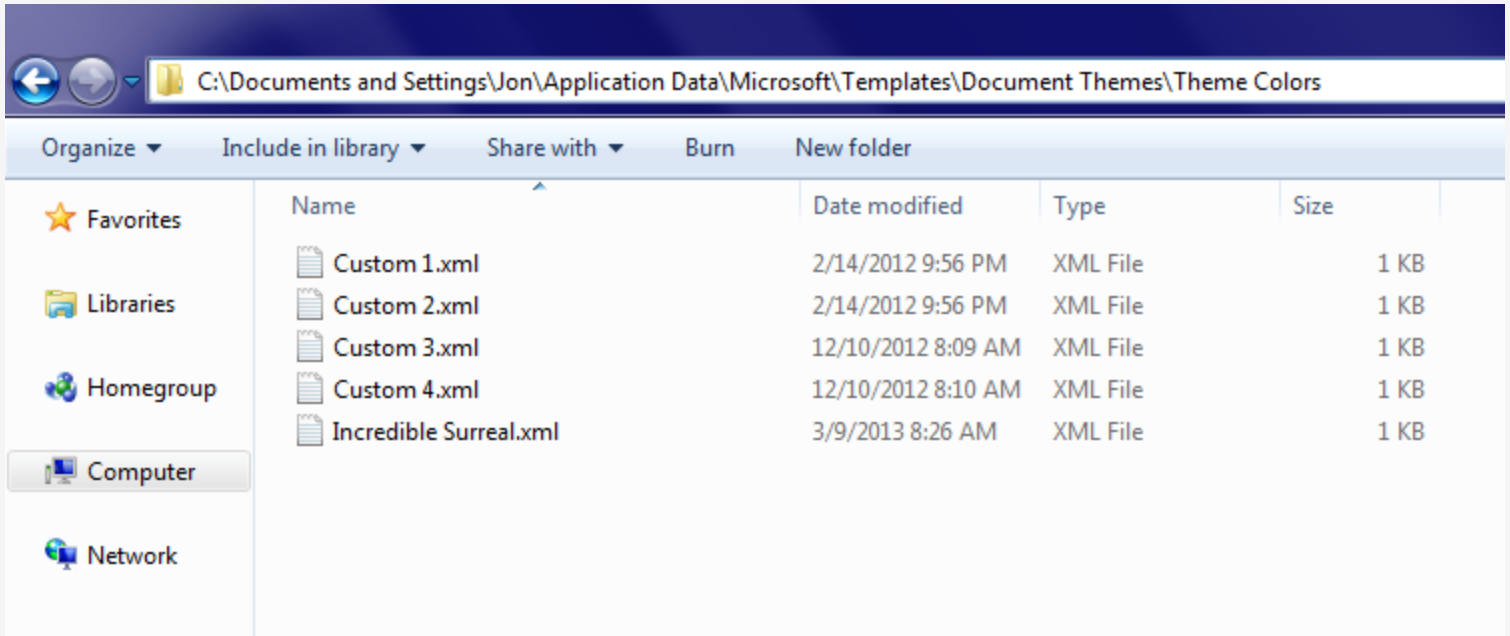
	186 98 55	3 127 140	98 9 0 45
	56 29 85	217 213 154	0 2 29 15
	45 51 85	217 189 106	0 13 51 15
	0 98 35	89 2 2	0 98 98 65

Sheet1 | Sheet2 | Sheet3

Share the custom palette



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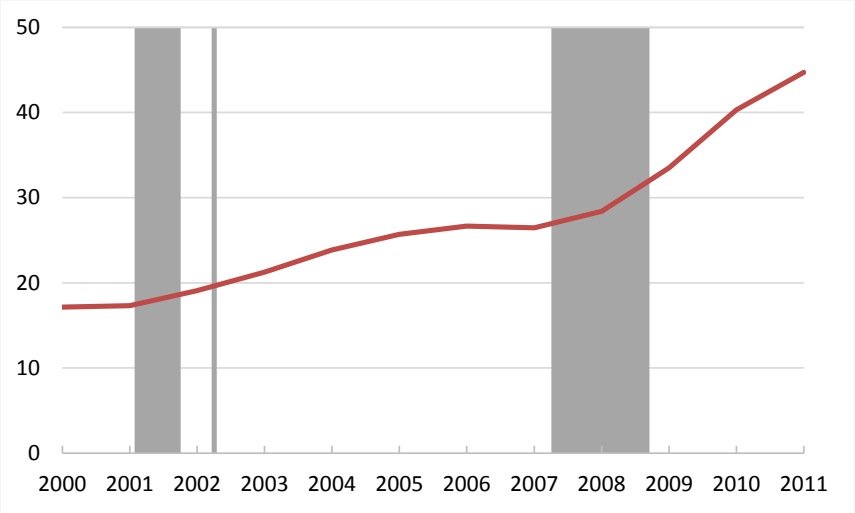
Data Visualization in Excel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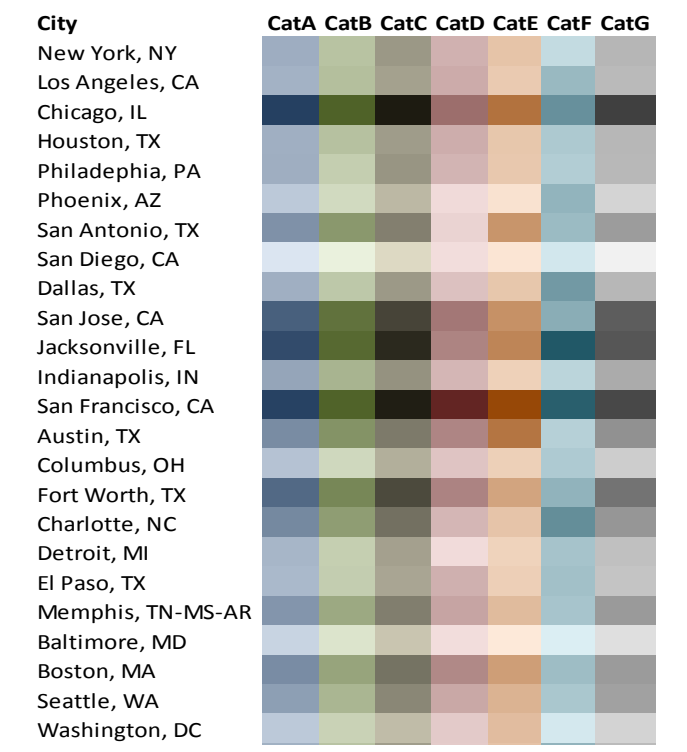
City
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CatC
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CatE
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CatG
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Los Angeles, CA
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Houston, TX
Philadephia, PA
Phoenix, AZ
San Antonio, TX
San Diego, CA
Dallas, TX
San Jose, CA
Jacksonville, FL
Indianapolis, IN
San Francisco, CA
Austin, TX
Columbus, OH
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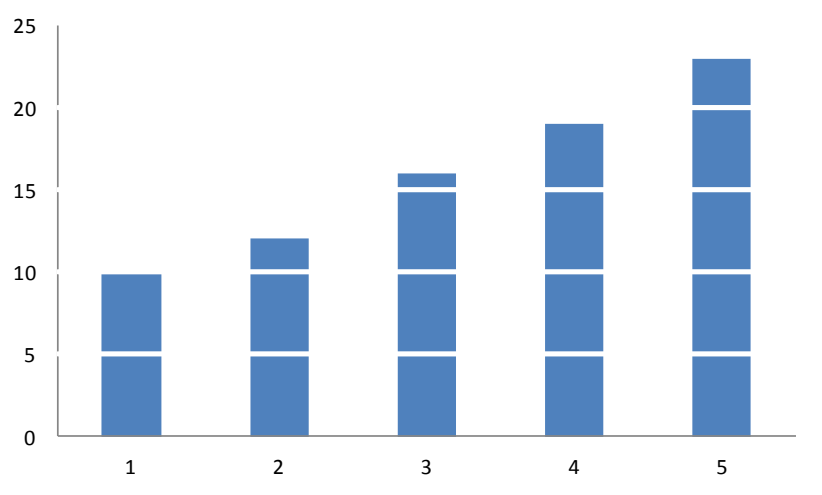
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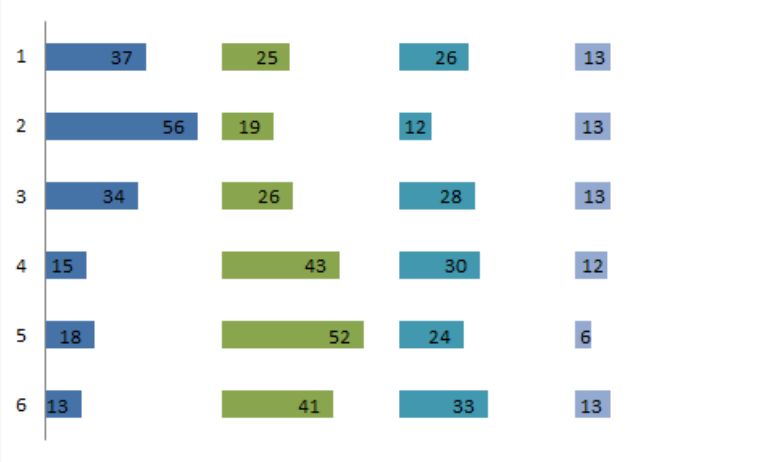
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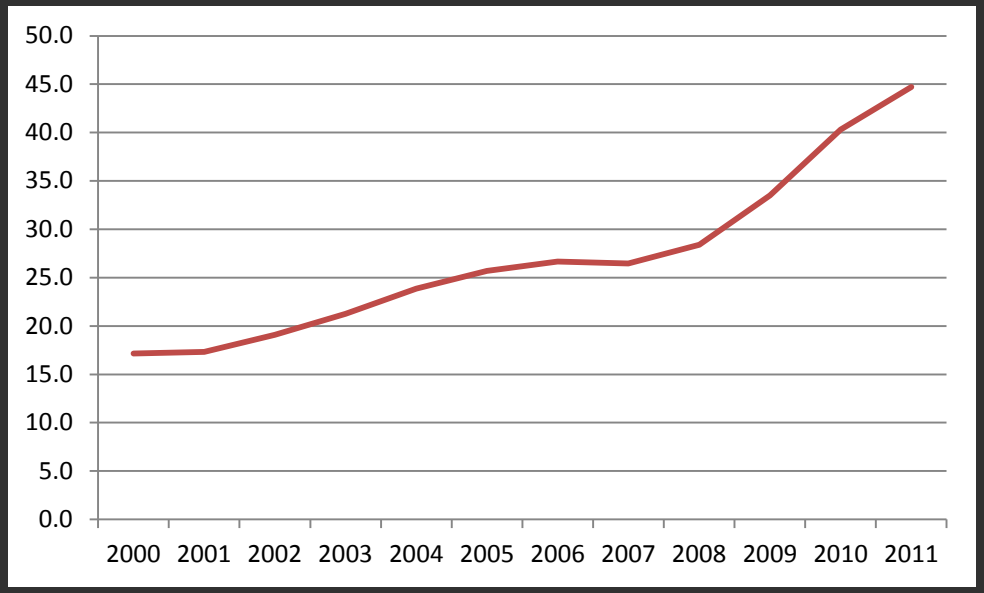
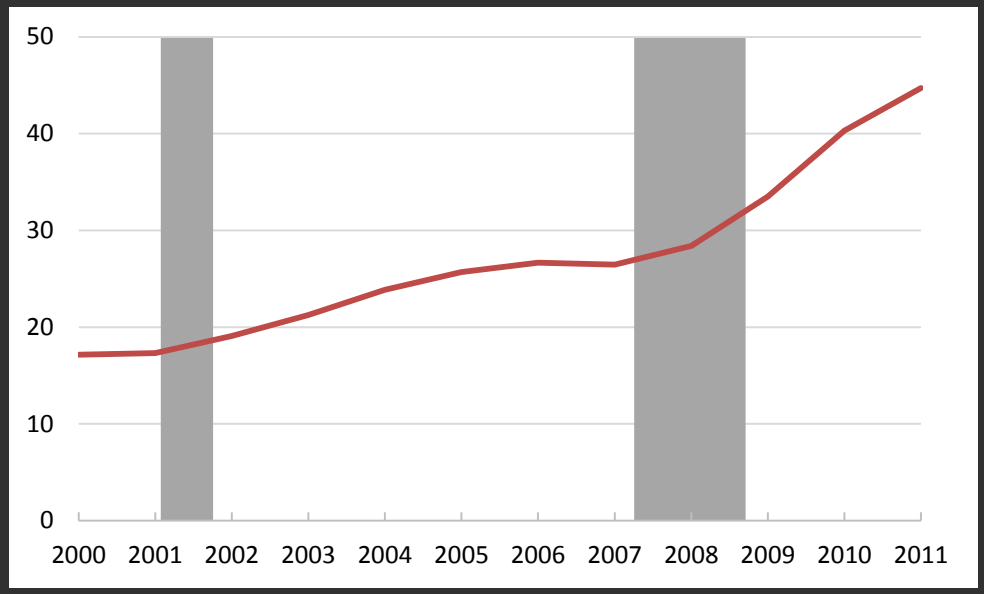
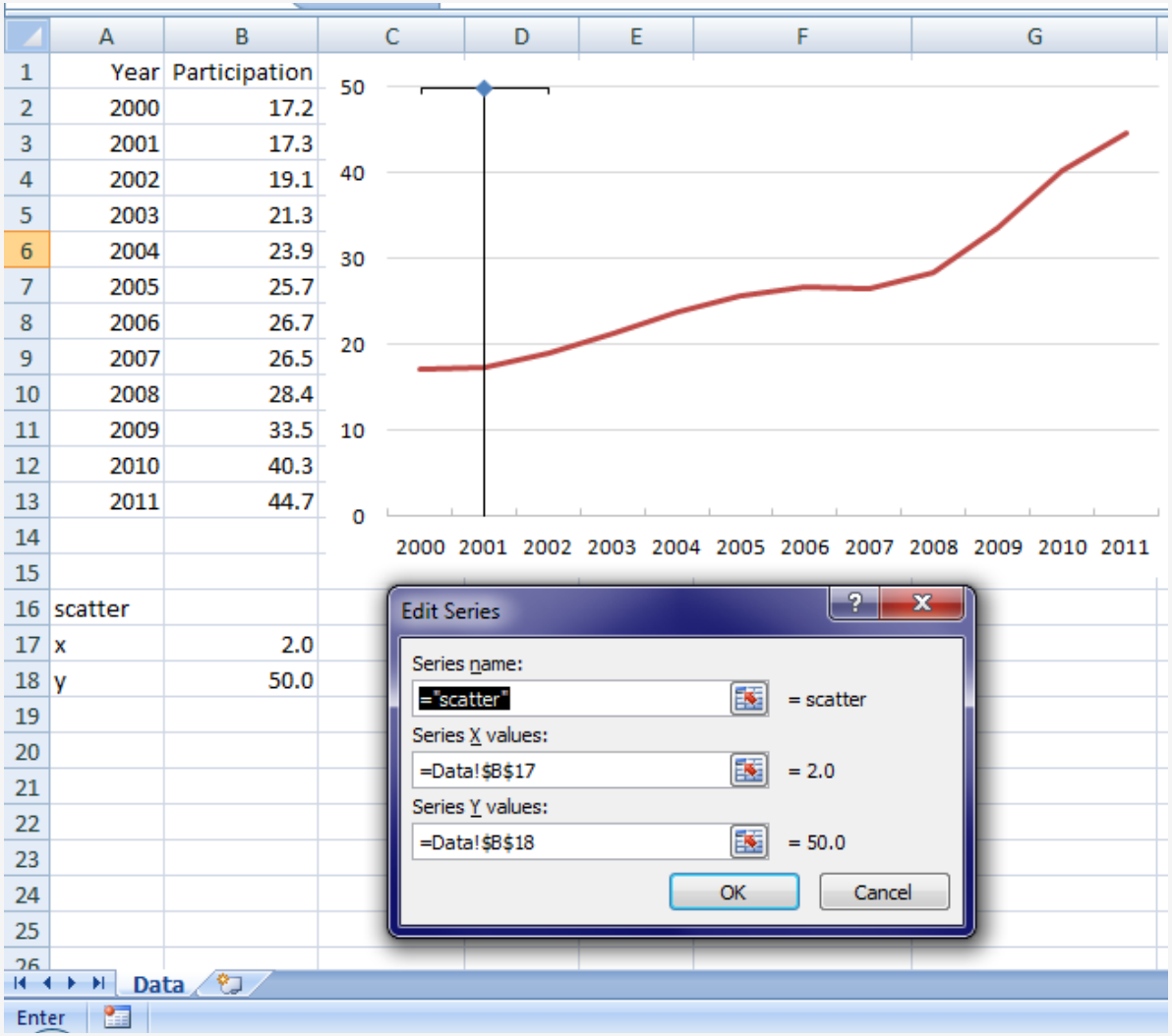
Line Chart with Recession Bars



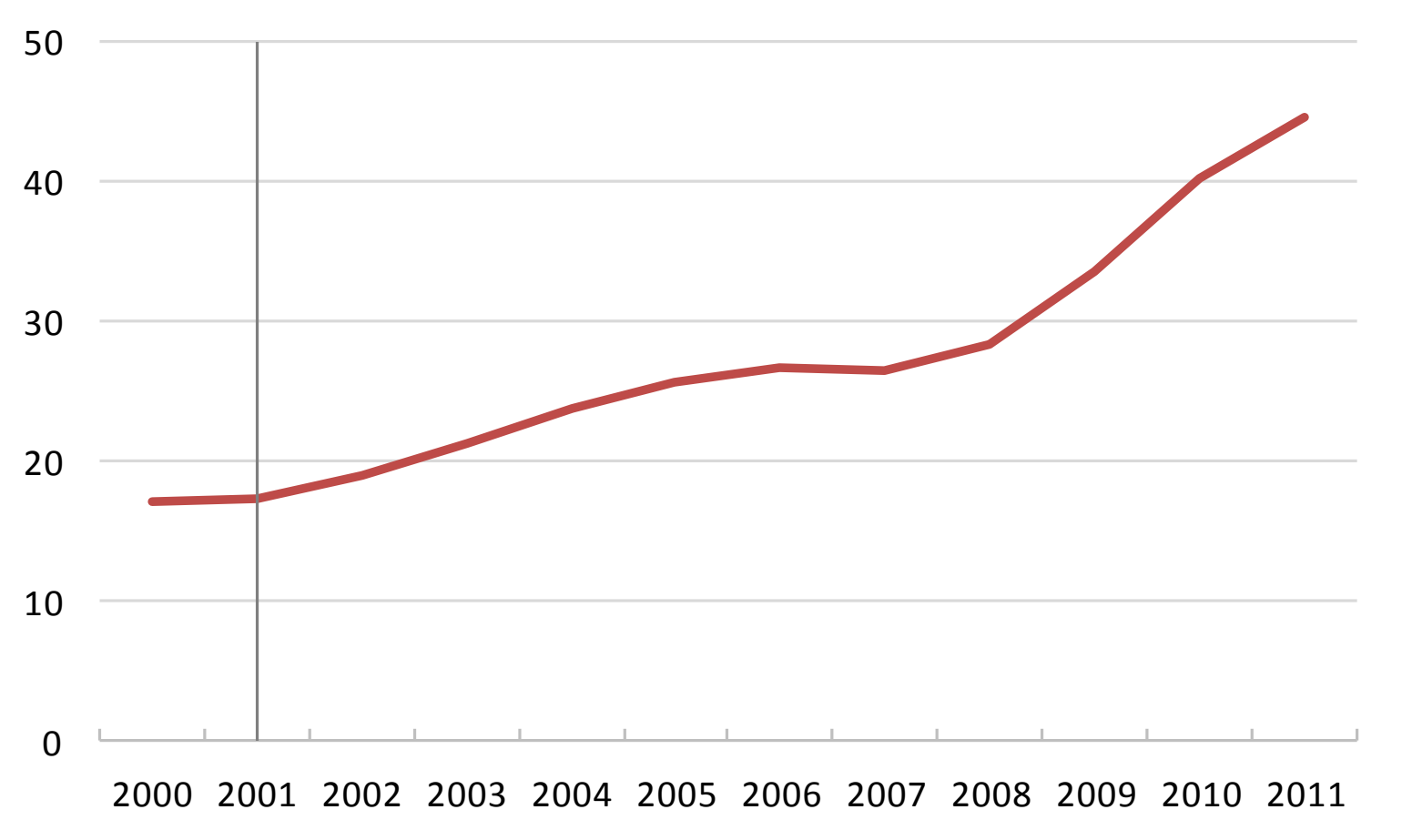


**Add a vertical line by using a scatterplot. Add the additional series as a scatterplot with maximum y-axis value.



Line Chart with Recession Bars

**Delete horizontal error bar, lighten vertical error bar, and remove marker.

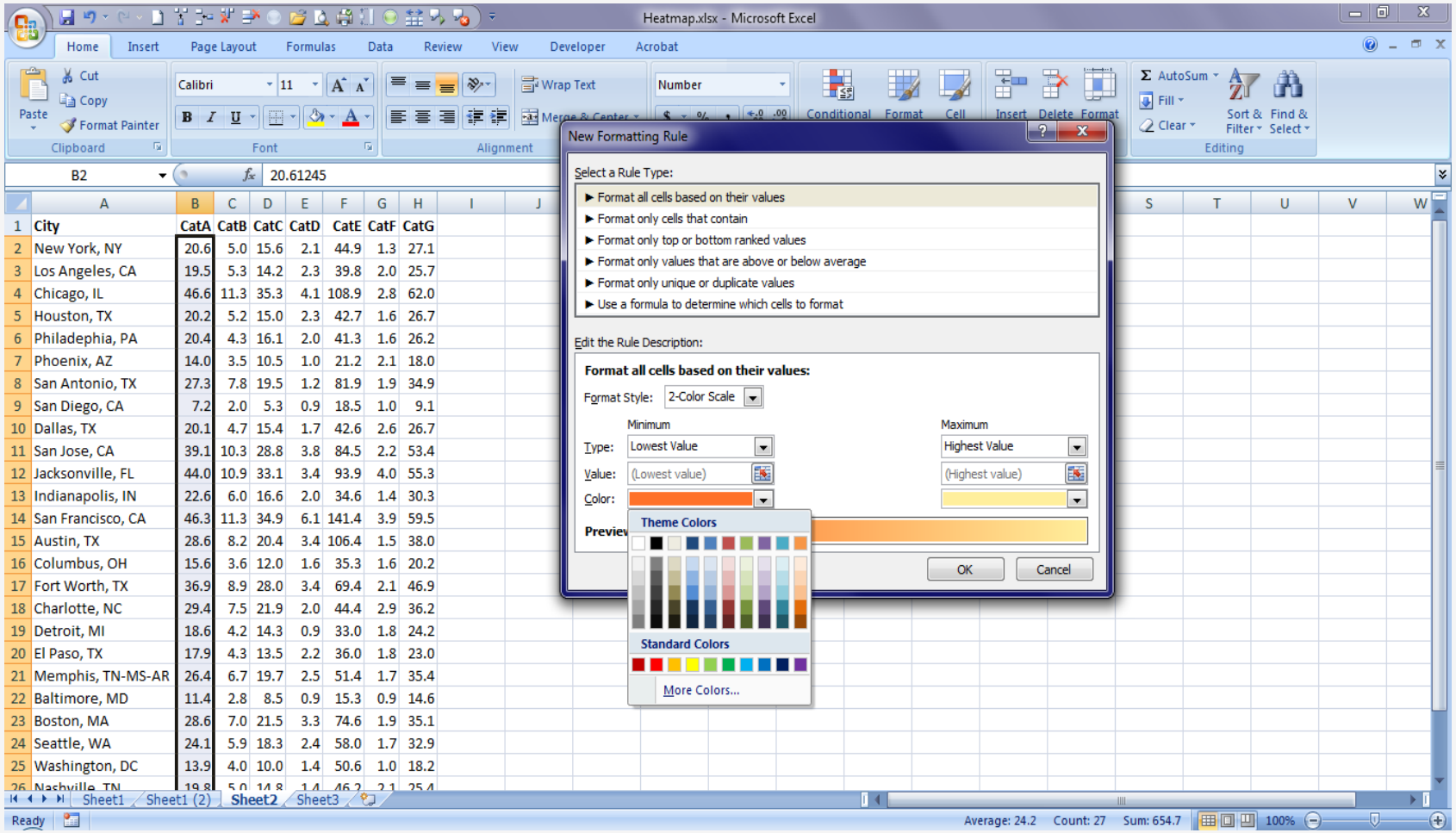


Line Chart with Recession Bars

Heatmap

City	CatA	CatB	CatC	CatD	CatE	CatF	CatG
New York, NY	20.6	5.0	15.6	2.1	44.9	1.3	27.1
Los Angeles, CA	19.5	5.3	14.2	2.3	39.8	2.0	25.7
Chicago, IL	46.6	11.3	35.3	4.1	108.9	2.8	62.0
Houston, TX	20.2	5.2	15.0	2.3	42.7	1.6	26.7
Philadephia, PA	20.4	4.3	16.1	2.0	41.3	1.6	26.2
Phoenix, AZ	14.0	3.5	10.5	1.0	21.2	2.1	18.0
San Antonio, TX	27.3	7.8	19.5	1.2	81.9	1.9	34.9
San Diego, CA	7.2	2.0	5.3	0.9	18.5	1.0	9.1
Dallas, TX	20.1	4.7	15.4	1.7	42.6	2.6	26.7
San Jose, CA	39.1	10.3	28.8	3.8	84.5	2.2	53.4
Jacksonville, FL	44.0	10.9	33.1	3.4	93.9	4.0	55.3
Indianapolis, IN	22.6	6.0	16.6	2.0	34.6	1.4	30.3
San Francisco, CA	46.3	11.3	34.9	6.1	141.4	3.9	59.5
Austin, TX	28.6	8.2	20.4	3.4	106.4	1.5	38.0
Columbus, OH	15.6	3.6	12.0	1.6	35.3	1.6	20.2
Fort Worth, TX	36.9	8.9	28.0	3.4	69.4	2.1	46.9
Charlotte, NC	29.4	7.5	21.9	2.0	44.4	2.9	36.2
Detroit, MI	18.6	4.2	14.3	0.9	33.0	1.8	24.2
El Paso, TX	17.9	4.3	13.5	2.2	36.0	1.8	23.0
Memphis, TN-MS-AR	26.4	6.7	19.7	2.5	51.4	1.7	35.4
Baltimore, MD	11.4	2.8	8.5	0.9	15.3	0.9	14.6
Boston, MA	28.6	7.0	21.5	3.3	74.6	1.9	35.1
Seattle, WA	24.1	5.9	18.3	2.4	58.0	1.7	32.9
Washington, DC	13.9	4.0	10.0	1.4	50.6	1.0	18.2

Step 1. For each column, highlight the column of numbers and, under *Conditional Formatting*, choose 'Color Scales'.



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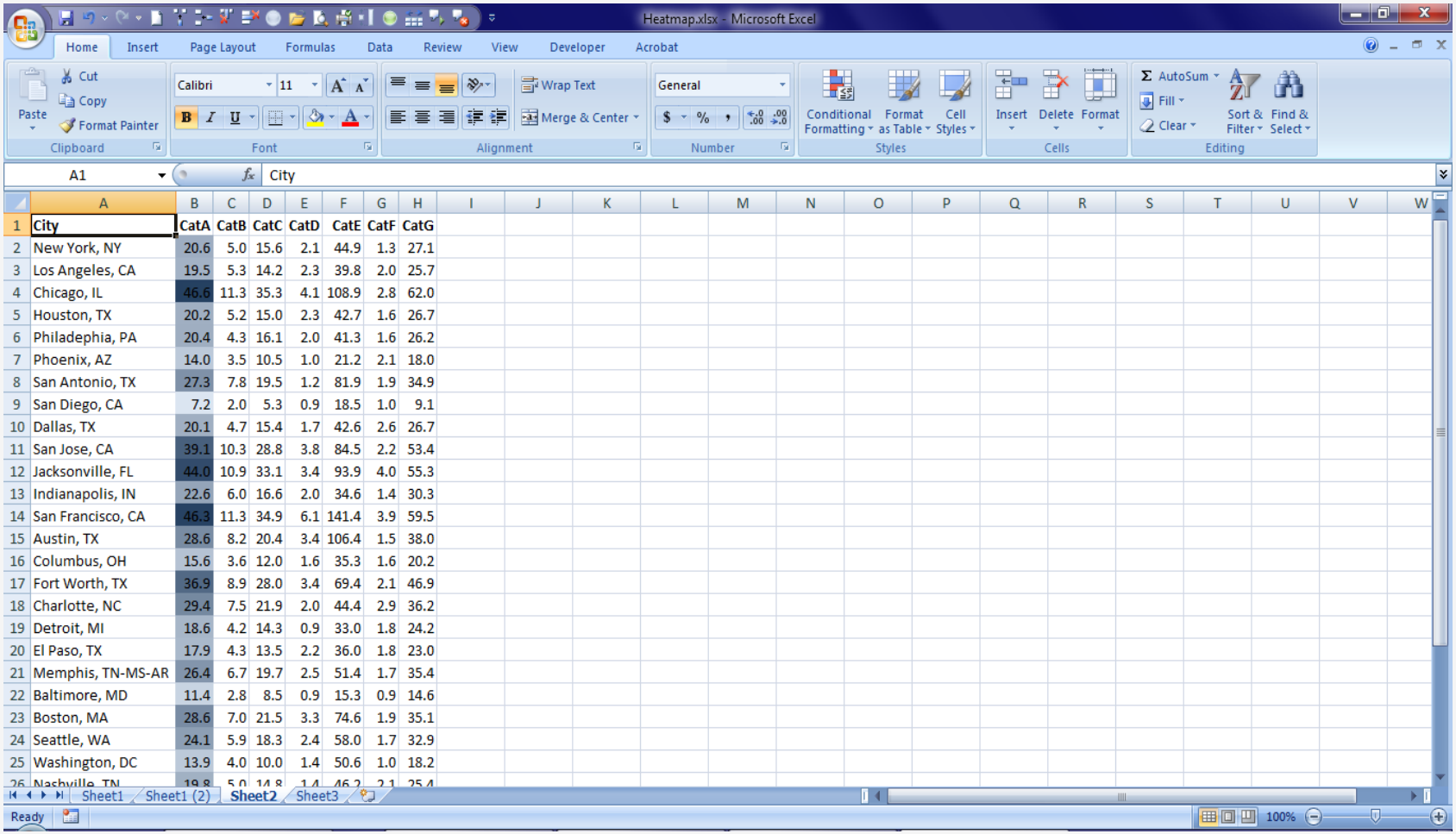
Chicago, IL	46.6	11.3	35.3	4.1	108.9	2.8	62.0
Houston, TX	20.2	5.2	15.0	2.3	42.7	1.6	26.7
Philadephia, PA	20.4	4.3	16.1	2.0	41.3	1.6	26.2
Phoenix, AZ	14.0	3.5	10.5	1.0	21.2	2.1	18.0
San Antonio, TX	27.3	7.8	19.5	1.2	81.9	1.9	34.9
San Diego, CA	7.2	2.0	5.3	0.9	18.5	1.0	9.1
Dallas, TX	20.1	4.7	15.4	1.7	42.6	2.6	26.7
San Jose, CA	39.1	10.3	28.8	3.8	84.5	2.2	53.4
Jacksonville, FL	44.0	10.9	33.1	3.4	93.9	4.0	55.3
Indianapolis, IN	22.6	6.0	16.6	2.0	34.6	1.4	30.3
San Francisco, CA	46.3	11.3	34.9	6.1	141.4	3.9	59.5
Austin, TX	28.6	8.2	20.4	3.4	106.4	1.5	38.0
Columbus, OH	15.6	3.6	12.0	1.6	35.3	1.6	20.2
Fort Worth, TX	36.9	8.9	28.0	3.4	69.4	2.1	46.9
Charlotte, NC	29.4	7.5	21.9	2.0	44.4	2.9	36.2
Detroit, MI	18.6	4.2	14.3	0.9	33.0	1.8	24.2
El Paso, TX	17.9	4.3	13.5	2.2	36.0	1.8	23.0
Memphis, TN-MS-AR	26.4	6.7	19.7	2.5	51.4	1.7	35.4
Baltimore, MD	11.4	2.8	8.5	0.9	15.3	0.9	14.6
Boston, MA	28.6	7.0	21.5	3.3	74.6	1.9	35.1
Seattle, WA	24.1	5.9	18.3	2.4	58.0	1.7	32.9
Washington, DC	13.9	4.0	10.0	1.4	50.6	1.0	18.2
Nashville, TN	19.8	5.0	14.8	1.4	46.2	2.1	25.4

Step 2. The image below shows the results for the first column in which a blue color scheme was implemented.

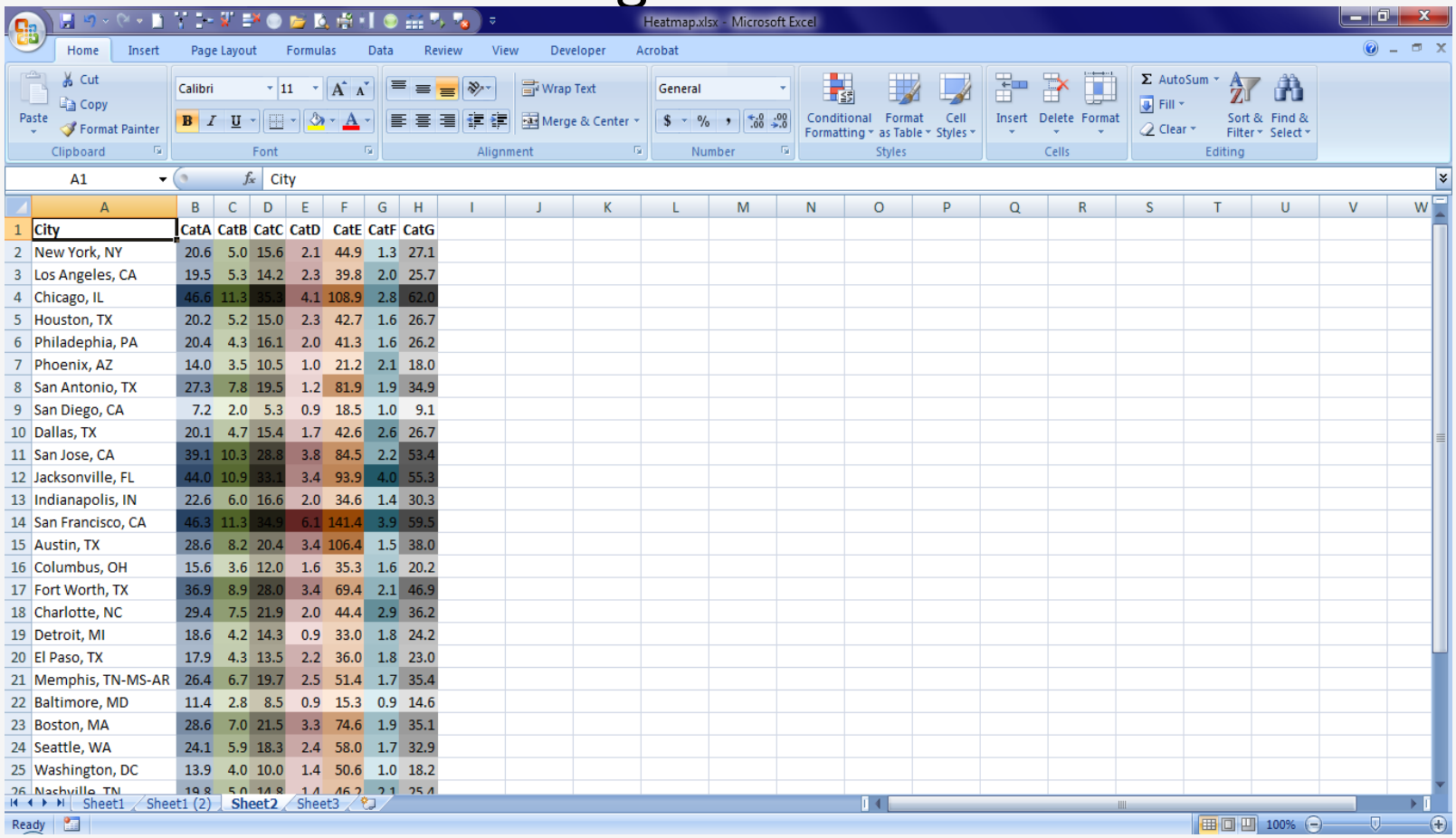


City	CatA	CatB	CatC	CatD	CatE	CatF	CatG
New York, NY	20.6	5.0	15.6	2.1	44.9	1.3	27.1
Los Angeles, CA	19.5	5.3	14.2	2.3	39.8	2.0	25.7
Chicago, IL	46.6	11.3	35.3	4.1	108.9	2.8	62.0
Houston, TX	20.2	5.2	15.0	2.3	42.7	1.6	26.7
Philadephia, PA	20.4	4.3	16.1	2.0	41.3	1.6	26.2
Phoenix, AZ	14.0	3.5	10.5	1.0	21.2	2.1	18.0
San Antonio, TX	27.3	7.8	19.5	1.2	81.9	1.9	34.9
San Diego, CA	7.2	2.0	5.3	0.9	18.5	1.0	9.1
Dallas, TX	20.1	4.7	15.4	1.7	42.6	2.6	26.7
San Jose, CA	39.1	10.3	28.8	3.8	84.5	2.2	53.4
Jacksonville, FL	44.0	10.9	33.1	3.4	93.9	4.0	55.3
Indianapolis, IN	22.6	6.0	16.6	2.0	34.6	1.4	30.3
San Francisco, CA	46.3	11.3	34.9	6.1	141.4	3.9	59.5
Austin, TX	28.6	8.2	20.4	3.4	106.4	1.5	38.0
Columbus, OH	15.6	3.6	12.0	1.6	35.3	1.6	20.2
Fort Worth, TX	36.9	8.9	28.0	3.4	69.4	2.1	46.9
Charlotte, NC	29.4	7.5	21.9	2.0	44.4	2.9	36.2
Detroit, MI	18.6	4.2	14.3	0.9	33.0	1.8	24.2
El Paso, TX	17.9	4.3	13.5	2.2	36.0	1.8	23.0
Memphis, TN-MS-AR	26.4	6.7	19.7	2.5	51.4	1.7	35.4
Baltimore, MD	11.4	2.8	8.5	0.9	15.3	0.9	14.6
Boston, MA	28.6	7.0	21.5	3.3	74.6	1.9	35.1
Seattle, WA	24.1	5.9	18.3	2.4	58.0	1.7	32.9
Washington, DC	13.9	4.0	10.0	1.4	50.6	1.0	18.2
Nashville, TN	19.8	5.0	14.8	1.4	46.2	2.1	25.4

Step 3. You have to do each column separately to

a. choose the separate colors, and

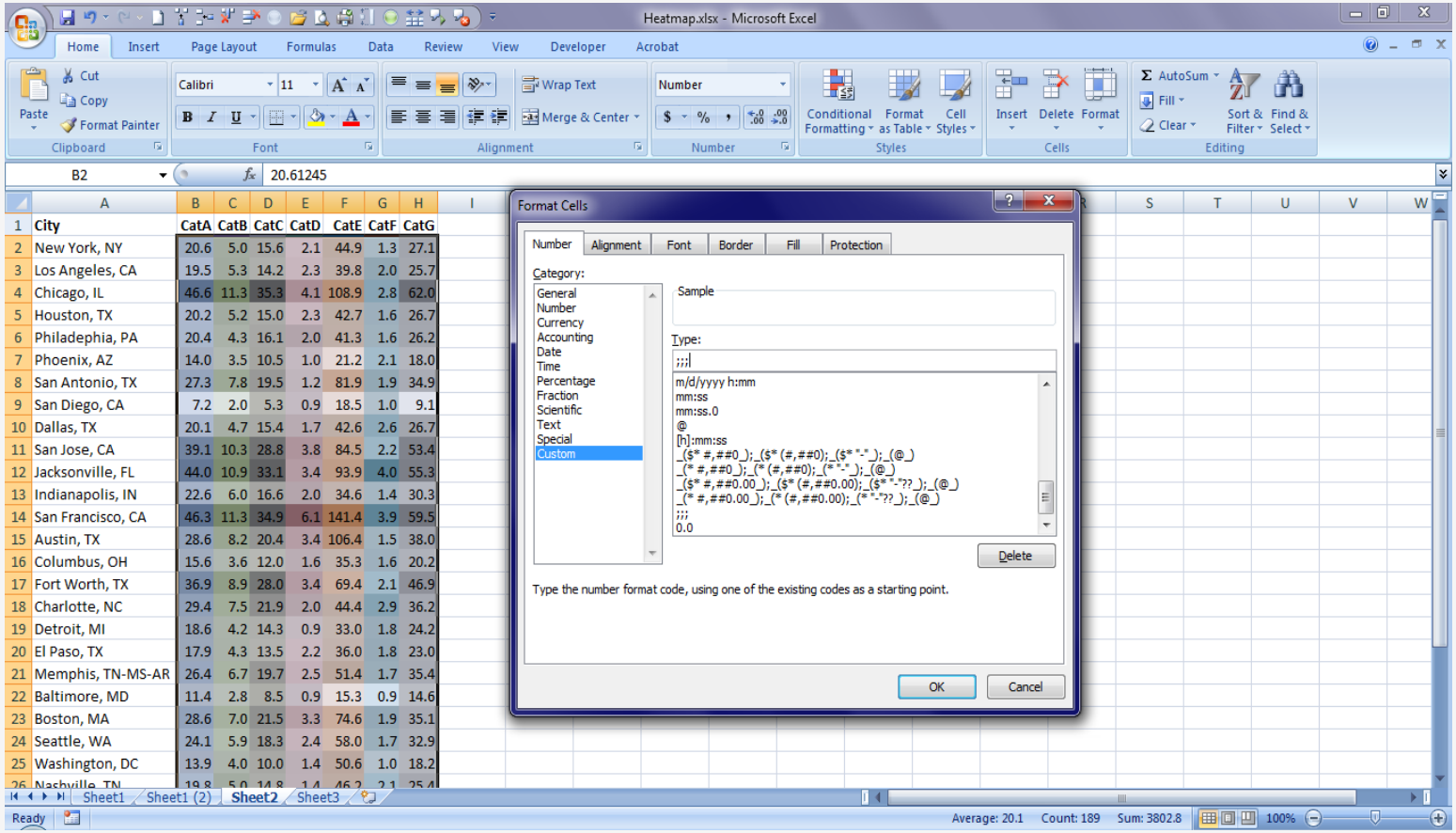
b. so that the estimates are not assumed to be from the distribution of a single estimate.



City	CatA	CatB	CatC	CatD	CatE	CatF	CatG
New York, NY	20.6	5.0	15.6	2.1	44.9	1.3	27.1
Los Angeles, CA	19.5	5.3	14.2	2.3	39.8	2.0	25.7
Chicago, IL	46.6	11.3	35.3	4.1	108.9	2.8	62.0
Houston, TX	20.2	5.2	15.0	2.3	42.7	1.6	26.7
Philadephia, PA	20.4	4.3	16.1	2.0	41.3	1.6	26.2
Phoenix, AZ	14.0	3.5	10.5	1.0	21.2	2.1	18.0
San Antonio, TX	27.3	7.8	19.5	1.2	81.9	1.9	34.9
San Diego, CA	7.2	2.0	5.3	0.9	18.5	1.0	9.1
Dallas, TX	20.1	4.7	15.4	1.7	42.6	2.6	26.7
San Jose, CA	39.1	10.3	28.8	3.8	84.5	2.2	53.4
Jacksonville, FL	44.0	10.9	33.1	3.4	93.9	4.0	55.3
Indianapolis, IN	22.6	6.0	16.6	2.0	34.6	1.4	30.3
San Francisco, CA	46.3	11.3	34.9	6.1	141.4	3.9	59.5
Austin, TX	28.6	8.2	20.4	3.4	106.4	1.5	38.0
Columbus, OH	15.6	3.6	12.0	1.6	35.3	1.6	20.2
Fort Worth, TX	36.9	8.9	28.0	3.4	69.4	2.1	46.9
Charlotte, NC	29.4	7.5	21.9	2.0	44.4	2.9	36.2
Detroit, MI	18.6	4.2	14.3	0.9	33.0	1.8	24.2
El Paso, TX	17.9	4.3	13.5	2.2	36.0	1.8	23.0
Memphis, TN-MS-AR	26.4	6.7	19.7	2.5	51.4	1.7	35.4
Baltimore, MD	11.4	2.8	8.5	0.9	15.3	0.9	14.6
Boston, MA	28.6	7.0	21.5	3.3	74.6	1.9	35.1
Seattle, WA	24.1	5.9	18.3	2.4	58.0	1.7	32.9
Washington, DC	13.9	4.0	10.0	1.4	50.6	1.0	18.2
Nashville, TN	19.8	5.0	14.8	1.4	46.2	2.1	25.4

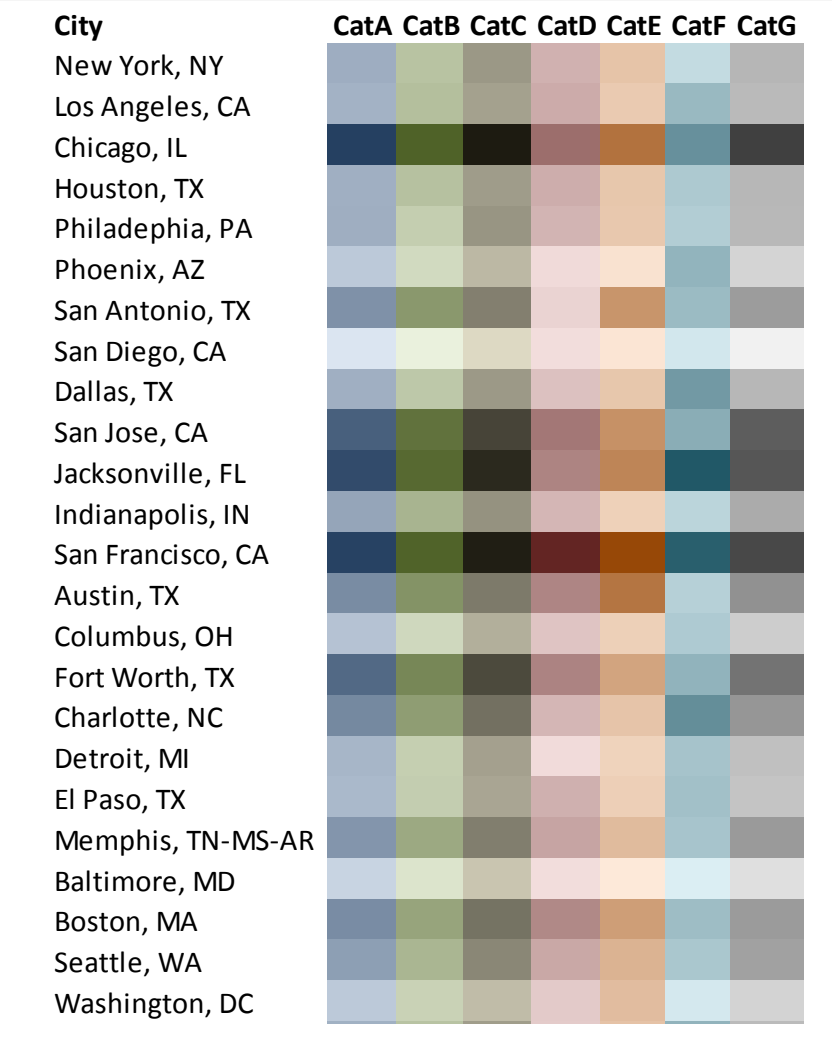
Heatmap

Step 4. Hide the numbers: Highlight all of the numbers, right-click, and in the *Format Cells* menu, choose *Custom* formatting. In the box below 'Type' insert 3 semi-colons ("";;;"). This will hide the numbers, not delete them.



	City	CatA	CatB	CatC	CatD	CatE	CatF	CatG
2	New York, NY	20.6	5.0	15.6	2.1	44.9	1.3	27.1
3	Los Angeles, CA	19.5	5.3	14.2	2.3	39.8	2.0	25.7
4	Chicago, IL	46.6	11.3	35.3	4.1	108.9	2.8	62.0
5	Houston, TX	20.2	5.2	15.0	2.3	42.7	1.6	26.7
6	Philadephia, PA	20.4	4.3	16.1	2.0	41.3	1.6	26.2
7	Phoenix, AZ	14.0	3.5	10.5	1.0	21.2	2.1	18.0
8	San Antonio, TX	27.3	7.8	19.5	1.2	81.9	1.9	34.9
9	San Diego, CA	7.2	2.0	5.3	0.9	18.5	1.0	9.1
10	Dallas, TX	20.1	4.7	15.4	1.7	42.6	2.6	26.7
11	San Jose, CA	39.1	10.3	28.8	3.8	84.5	2.2	53.4
12	Jacksonville, FL	44.0	10.9	33.1	3.4	93.9	4.0	55.3
13	Indianapolis, IN	22.6	6.0	16.6	2.0	34.6	1.4	30.3
14	San Francisco, CA	46.3	11.3	34.9	6.1	141.4	3.9	59.5
15	Austin, TX	28.6	8.2	20.4	3.4	106.4	1.5	38.0
16	Columbus, OH	15.6	3.6	12.0	1.6	35.3	1.6	20.2
17	Fort Worth, TX	36.9	8.9	28.0	3.4	69.4	2.1	46.9
18	Charlotte, NC	29.4	7.5	21.9	2.0	44.4	2.9	36.2
19	Detroit, MI	18.6	4.2	14.3	0.9	33.0	1.8	24.2
20	El Paso, TX	17.9	4.3	13.5	2.2	36.0	1.8	23.0
21	Memphis, TN-MS-AR	26.4	6.7	19.7	2.5	51.4	1.7	35.4
22	Baltimore, MD	11.4	2.8	8.5	0.9	15.3	0.9	14.6
23	Boston, MA	28.6	7.0	21.5	3.3	74.6	1.9	35.1
24	Seattle, WA	24.1	5.9	18.3	2.4	58.0	1.7	32.9
25	Washington, DC	13.9	4.0	10.0	1.4	50.6	1.0	18.2
26	Nashville, TN	19.8	5.0	14.8	1.4	46.2	2.1	25.4

Step 5. Erase gridlines and clean-up as necessary.



Heatmap

EDUCATION and the ECONOMY

An estimated 1.3 million students across all 50 states and the District of Columbia dropped out of high school in 2010. Cutting in half the number of high school dropouts for this single high school class could result in tremendous economic benefits. The Alliance for Excellent Education estimated the potential impact these 650,000 "new graduates" would have on national, state, and local economies, and how those benefits might differ across different race and ethnic groups.

EARNINGS
$7.6 billion
Total estimated increase in average earnings graduates would receive with a high school degree.

INVESTMENTS
$2.0 billion
Total estimated amount of new investment new graduates would make in an average year.

SPENDING
$5.6 billion
Additional estimated spending new graduates would spend with a high school degree.

REVENUES
$713 million
Estimated increase in state tax revenues originating from higher wages and increased spending from the class of new graduates.

HOMES
$19 billion
Total amount of home purchases new graduates would likely make by the midpoint of their careers.

VEHICLES
$741 million
Estimated amount of total vehicle purchases in an average year by new graduates.

JOBS
54,000
Number of new jobs resulting from increases in savings and investment by new graduates.

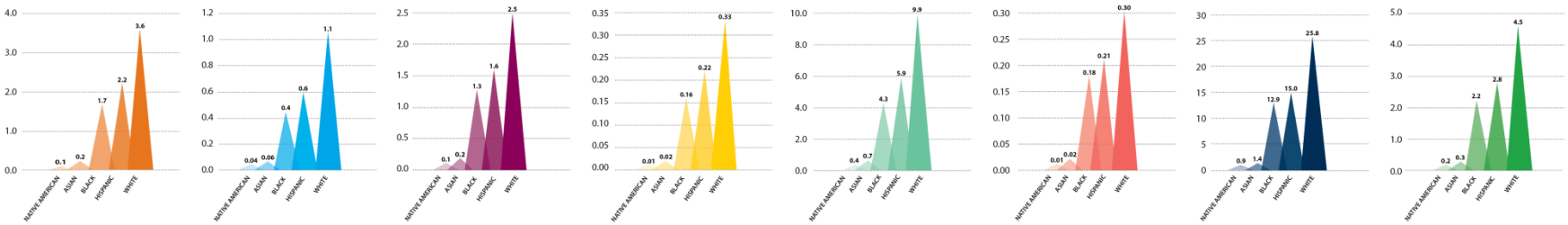
GDP
$9.6 billion
Increase in Gross Domestic Product owing to increases in spending, investment, and jobs from these new graduates.

RESULTS by RACE

Improving the educational outcomes of all students—particularly members of racial and ethnic minorities—can significantly boost the national economy and economies of the communities in which they live. For example, if just half of the over 333,000 black students who dropped out of the Class of 2010 had graduated, these new graduates would likely earn an additional $1.7 billion each year compared with what they would earn without a high school diploma.

(Billions of dollars; jobs in thousands)

Number of Dropouts In the Class of 2010:	Total: 1.3 million	White: 543,700	Hispanic: 363,900	Black: 333,200	Asian: 34,500	Native American: 24,700

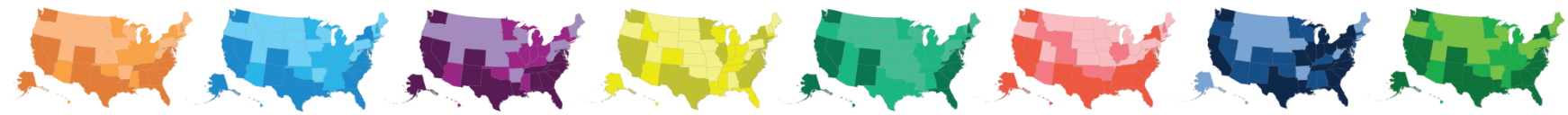


RESULTS by STATE

Education reform can be a key strategy for strengthening state economies, but benefits from higher high school graduation rates vary across the 50 states and the District of Columbia. In per capita terms, California and Texas are estimated to experience the highest economic growth across the 8 measures. However, other states with smaller populations—such as Alaska, Georgia, Nevada, North Carolina, and South Carolina—are also estimated to experience faster economic growth.

(Thousands of per capita dollars; jobs in numbers)

Lowest — Highest

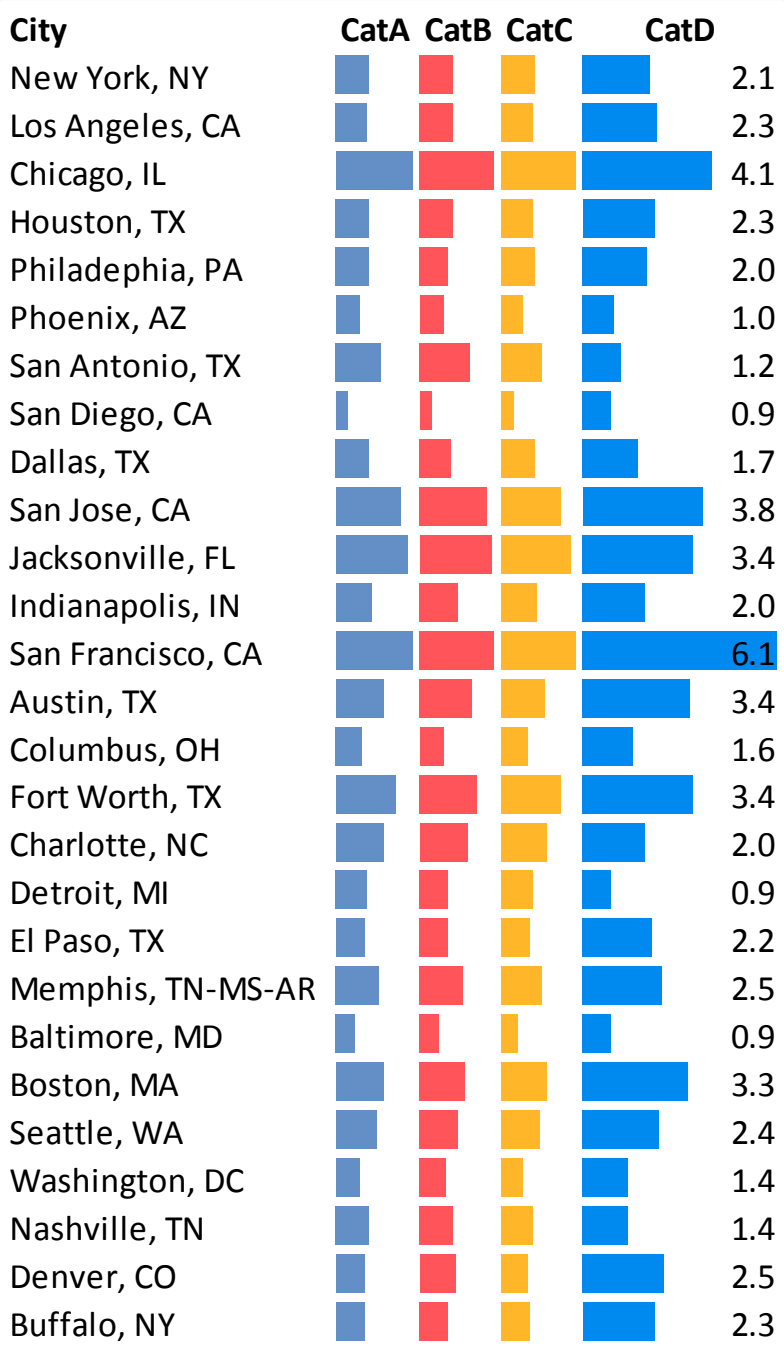


RESULTS at the LOCAL LEVEL

Higher high school graduation rates can yield different benefits to different localities. The Alliance for Excellent Education estimated the economic benefits that would accrue to more than 200 localities if high school dropout rates were reduced. Below are the estimated economic benefits that would result from reducing the dropout rate by half for 52 localities that have at least 1 million people.

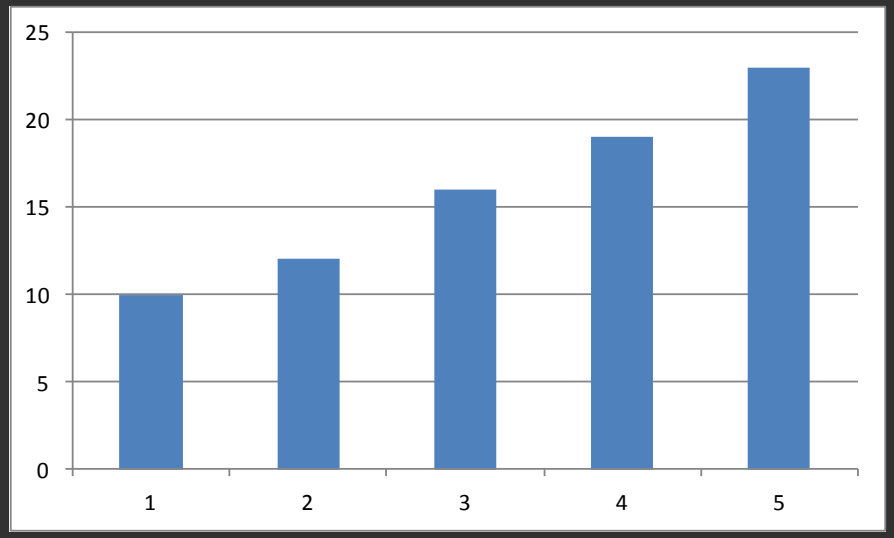
(Thousands of per capita dollars; jobs in numbers)

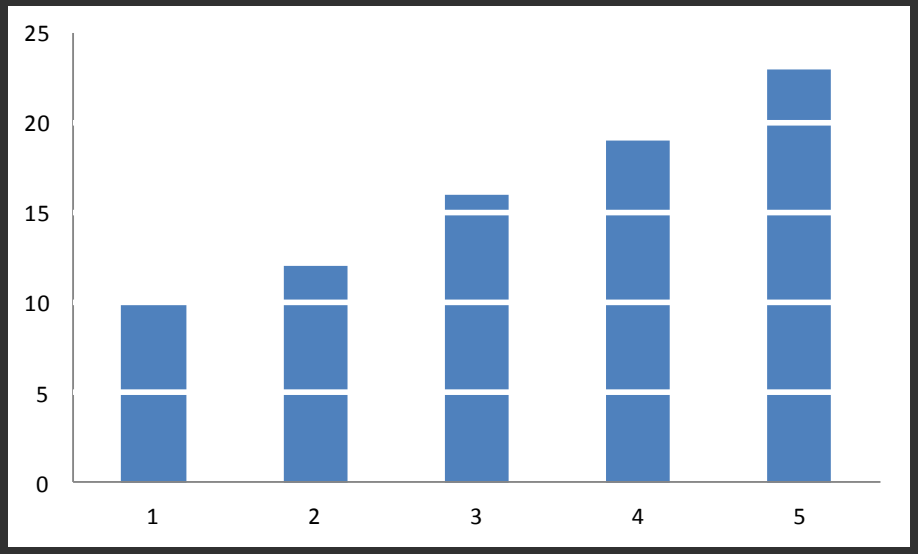
	New York, NY	Los Angeles, CA	Chicago, IL	Dallas, TX	Philadelphia, PA	Houston, TX	Miami, FL	Washington, DC	Atlanta, GA	Boston, MA	Detroit, MI	Phoenix, AZ	San Francisco, CA	Riverside, CA	Seattle, WA	Minneapolis, MN	San Diego, CA	St. Louis, MO	Tampa Bay, FL	Baltimore, MD	Denver, CO	Pittsburgh, PA	Portland, OR	Cincinnati, OH	Sacramento, CA	Cleveland, OH	Orlando, FL	San Antonio, TX	Kansas City, KS	Las Vegas, NV	San Jose, CA	Columbus, OH	Charlotte, NC	Indianapolis, IN	Austin, TX	Virginia Beach, VA	Providence, RI	Nashville, TN	Milwaukee, WI	Jacksonville, FL	Memphis, TN	Louisville, KY	Richmond, VA	Oklahoma City, OK	Hartford, CT	New Orleans, LA	Birmingham, AL	Salt Lake City, UT	Raleigh-Cary, NC	Buffalo, NY	Rochester, NY	Tucson, AZ
	24	46	24	37	22	38	30	28	39	14	30	22	34	45	32	25	32	20	29	29	25	14	18	20	34	26	26	32	20	48	33	22	36	23	23	30	16	23	22	31	32	25	27	16	23	17	26	21	34	18	19	26
	7	12	7	10	6	10	8	9	10	4	8	6	10	12	9	7	9	5	8	8	7	3	5	5	10	6	7	8	5	13	10	6	9	6	6	8	4	6	6	8	8	6	7	4	7	4	7	6	9	4	5	6
	17	34	17	27	16	28	23	19	29	10	22	16	24	32	23	18	23	15	22	20	19	11	13	15	25	19	19	25	15	35	23	17	26	17	17	22	12	17	16	23	24	19	20	12	17	13	20	16	25	13	14	20
	3	5	3	3	3	3	3	2	4	1	3	2	4	5	3	3	4	2	2	3	3	2	2	2	4	3	2	3	2	4	4	2	4	2	2	3	2	2	3	2	3	2	3	2	4	2	2	2	3	2	3	3
	52	142	65	56	54	57	68	49	85	51	85	57	124	141	111	76	102	38	67	106	91	31	53	45	108	59	60	47	39	131	113	49	85	50	35	89	40	43	55	71	61	49	76	25	90	31	51	78	77	35	38	68
	3	3	2	2	1	2	2	1	2	1	2	1	2	4	2	1	2	1	2	1	1	1	1	1	2	2	3	2	1	5	2	1	3	1	1	2	1	1	1	2	2	1	2	1	2	1	2	2	2	2	1	2
	2717	5109	1837	1829	943	1542	1372	770	1785	339	899	894	781	1628	707	655	666	490	766	556	473	305	350	386+	532	478	473	658	374	595	271	363	509	341	310	372	213	297	277	358	338	289	260	185	178	136	244	215	301	188	169	236
	31	66	33	51	29	51	41	35	53	18	39	32	44	61	42	34	42	27	41	38	34	20	24	27	46	35	36	44	28	63	42	31	48	31	30	39	22	32	30	42	43	34	36	22	30	22	35	29	45	24	25	35


City
CatA
CatB
CatC
CatD
New York, NY 2.1
Los Angeles, CA 2.3
Chicago, IL 4.1
Houston, TX 2.3
Philadephia, PA 2.0
Phoenix, AZ 1.0
San Antonio, TX 1.2
San Diego, CA 0.9
Dallas, TX 1.7
San Jose, CA 3.8
Jacksonville, FL 3.4
Indianapolis, IN 2.0
San Francisco, CA 6.1
Austin, TX 3.4
Columbus, OH 1.6
Fort Worth, TX 3.4
Charlotte, NC 2.0
Detroit, MI 0.9
El Paso, TX 2.2
Memphis, TN-MS-AR 2.5
Baltimore, MD 0.9
Boston, MA 3.3
Seattle, WA 2.4
Washington, DC 1.4
Nashville, TN 1.4
Denver, CO 2.5
Buffalo, NY 2.3

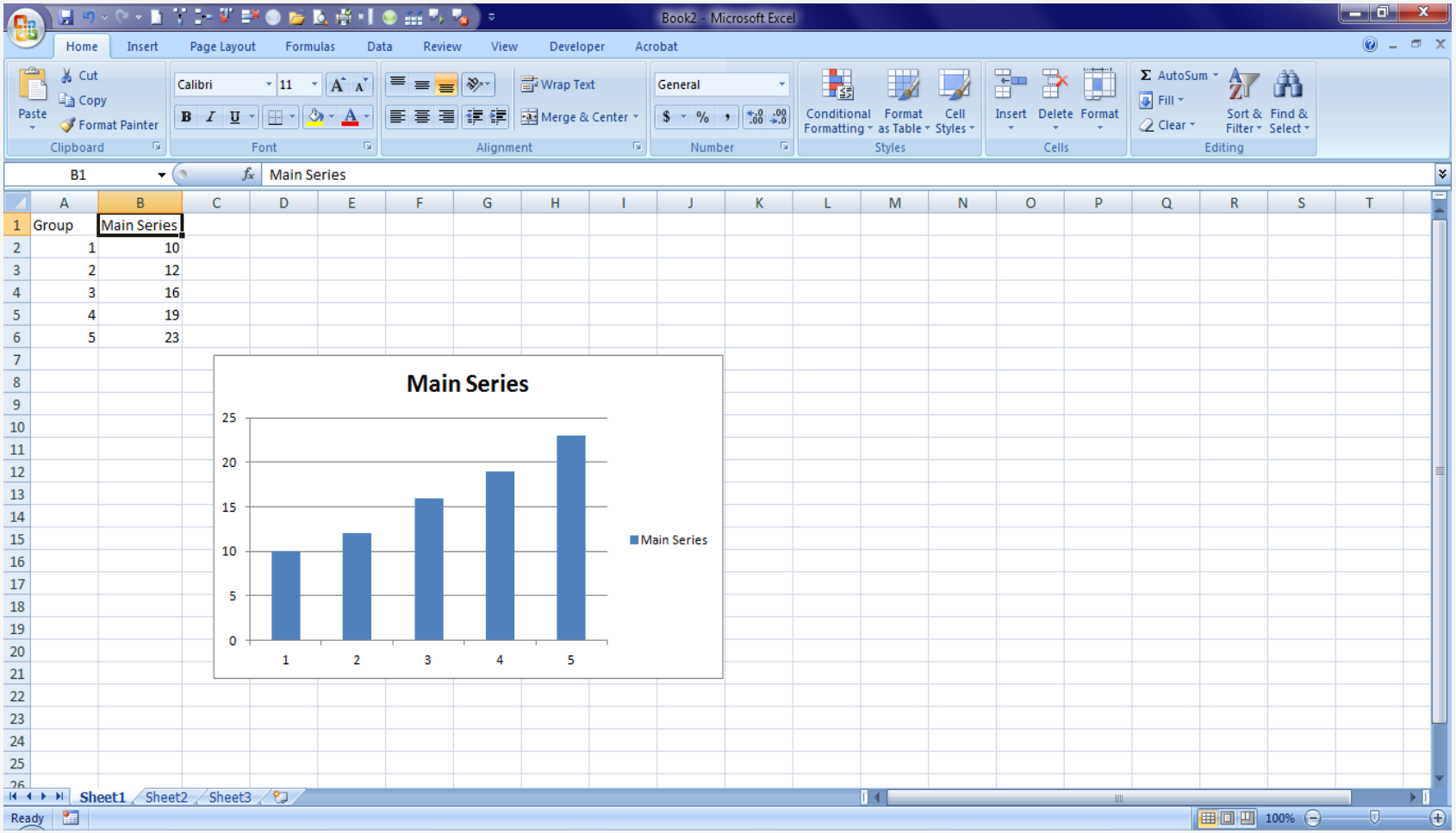
Heatmap

Column Chart with Overlaid Gridlines



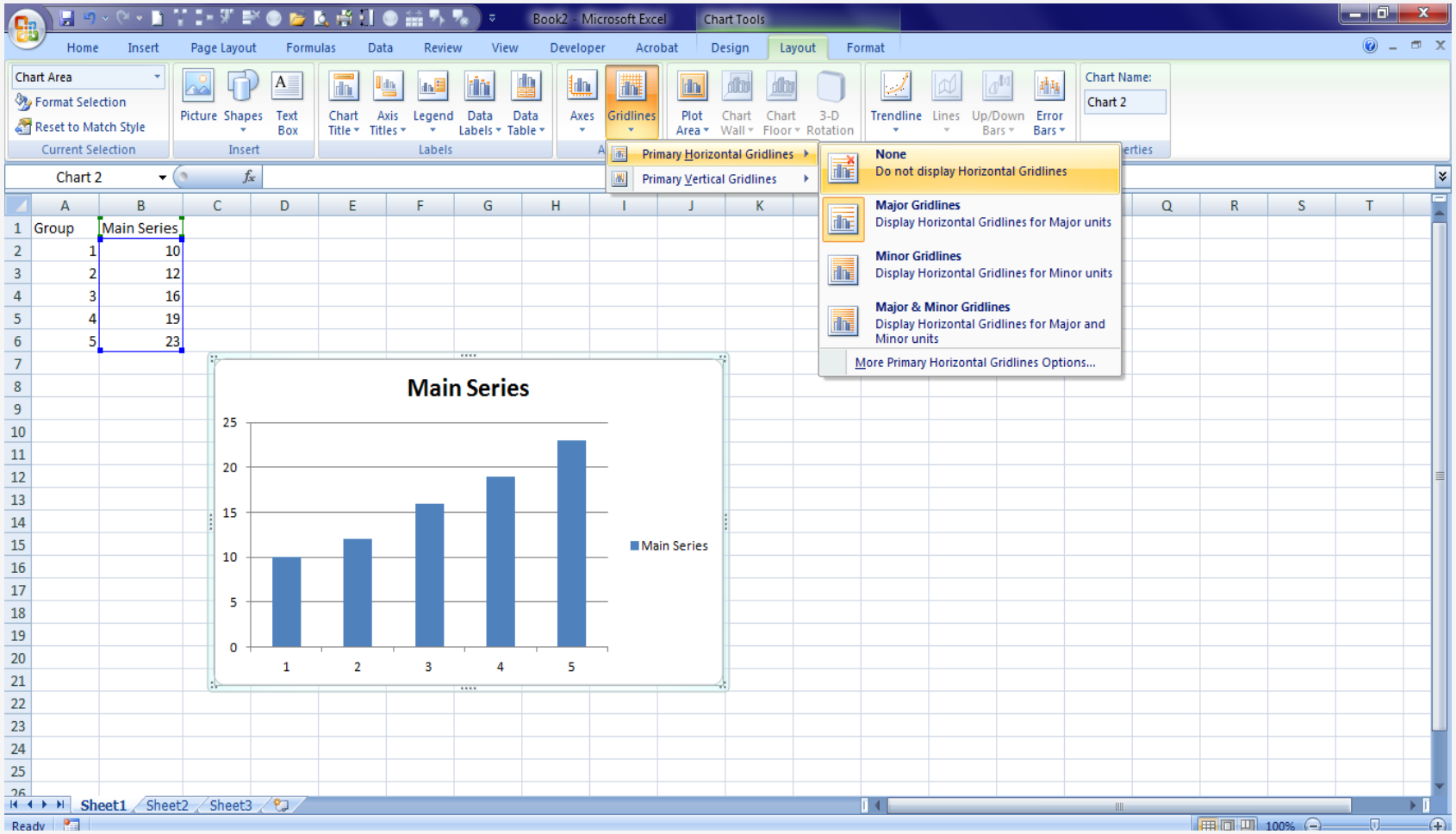


Step 1. Create a standard column chart



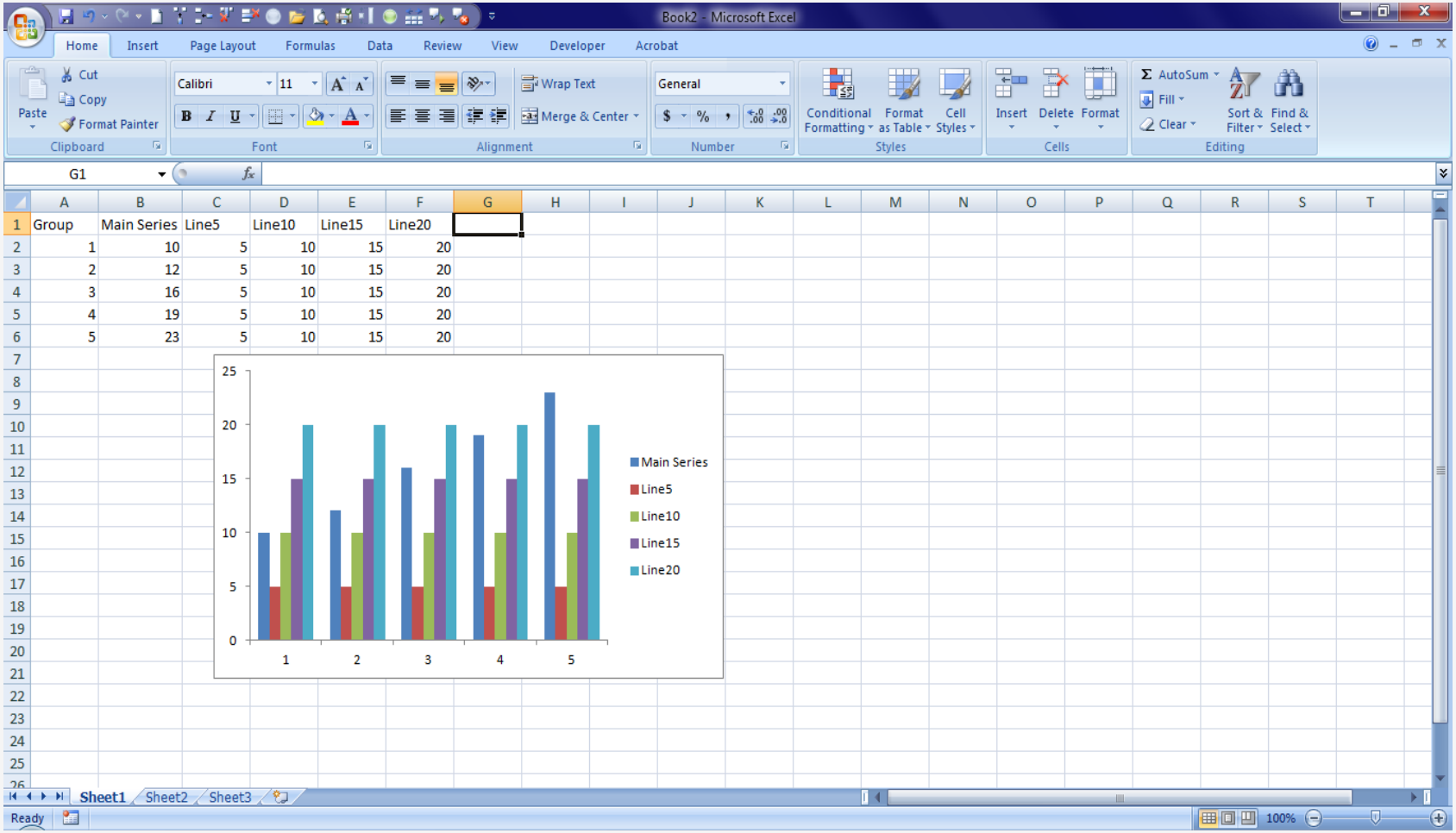
Column chart with overlaid gridlines

Step 2. Turn off the existing gridlines.



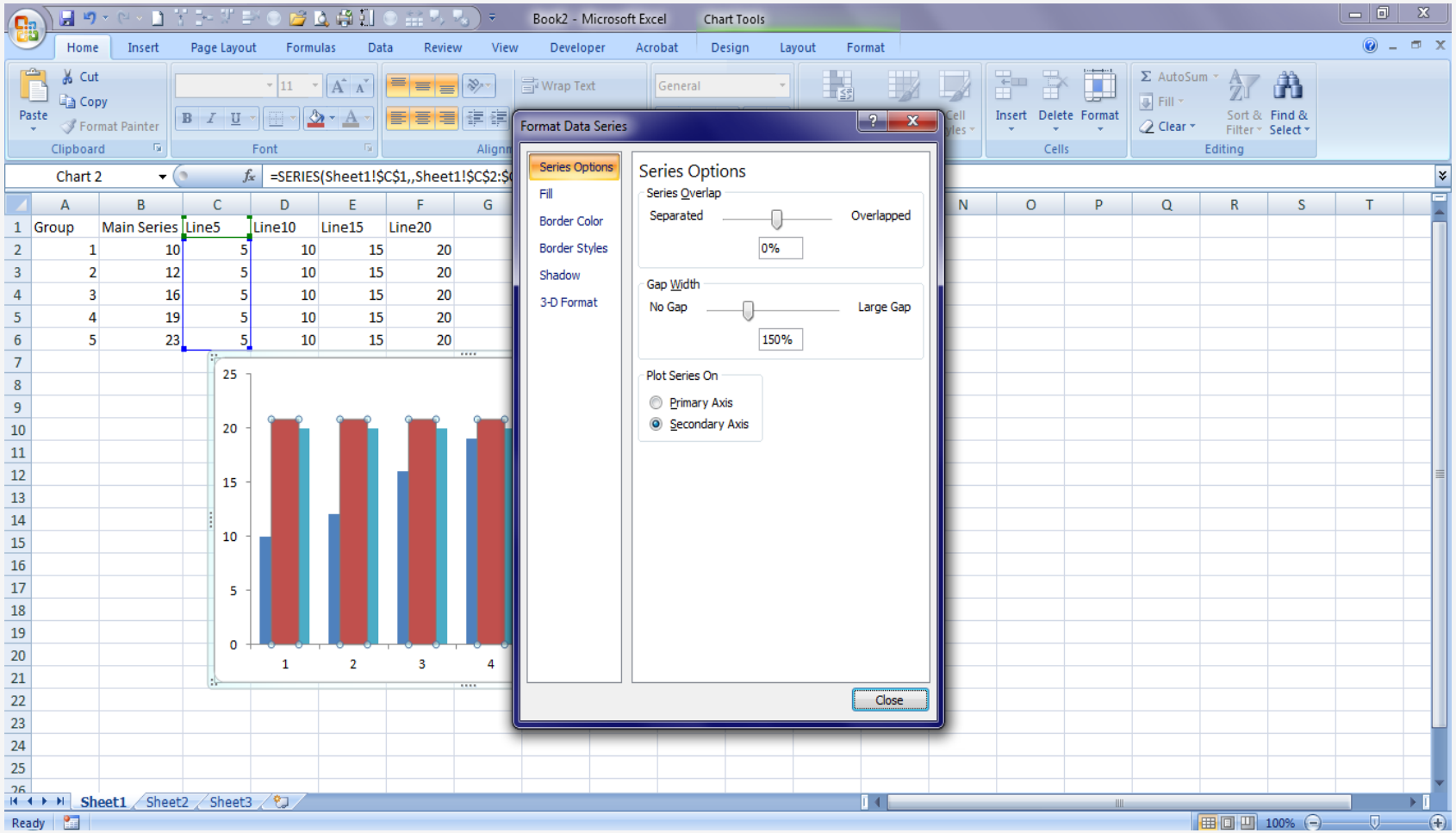
Column chart with overlaid gridlines

Step 3. New gridlines will be generated by creating lines linked to secondary x- and y-axes. Add the new series to your chart.



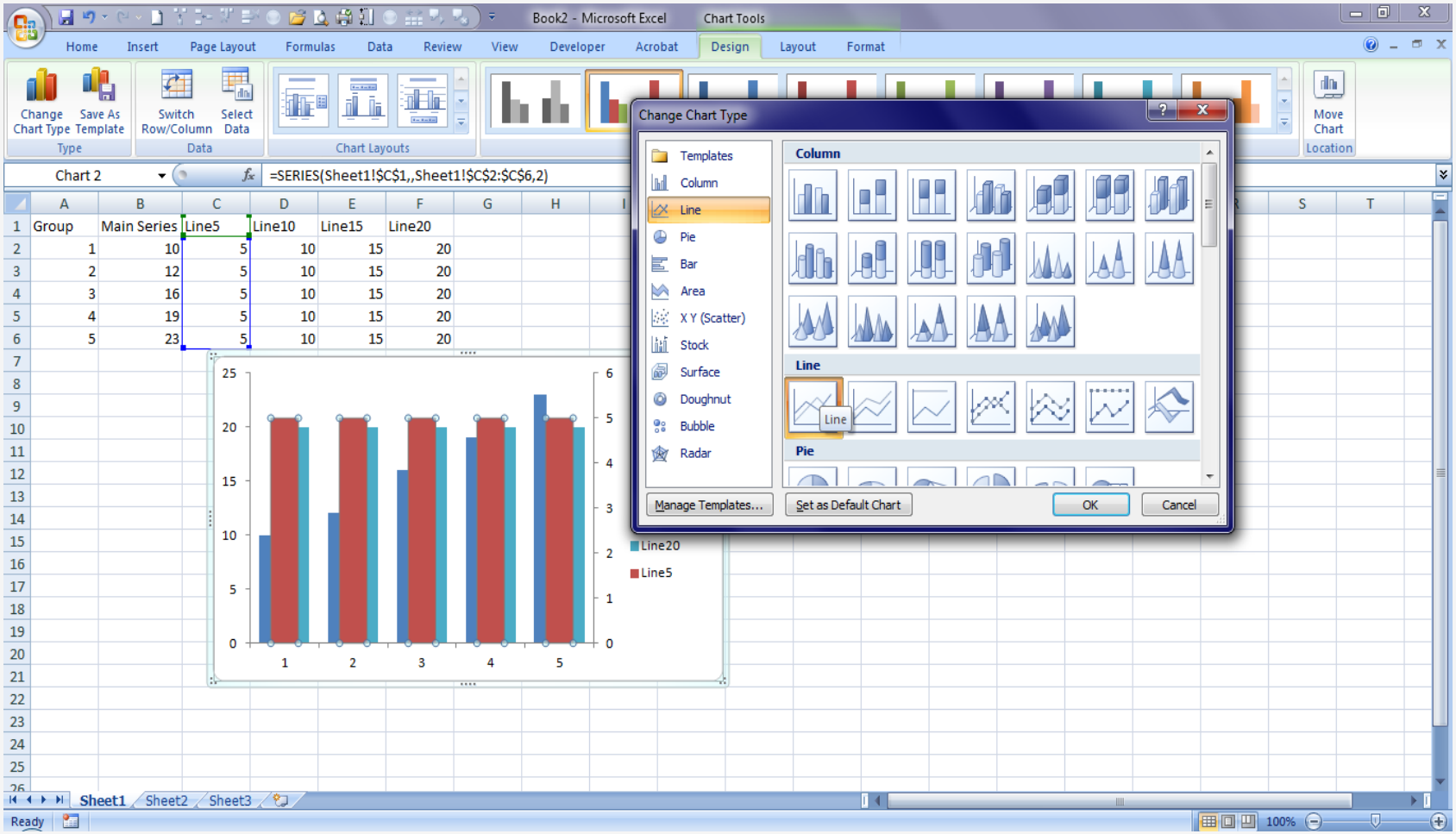
Column chart with overlaid gridlines

Step 4. Assign each ‘Line’ series to the ‘Secondary Axis’.



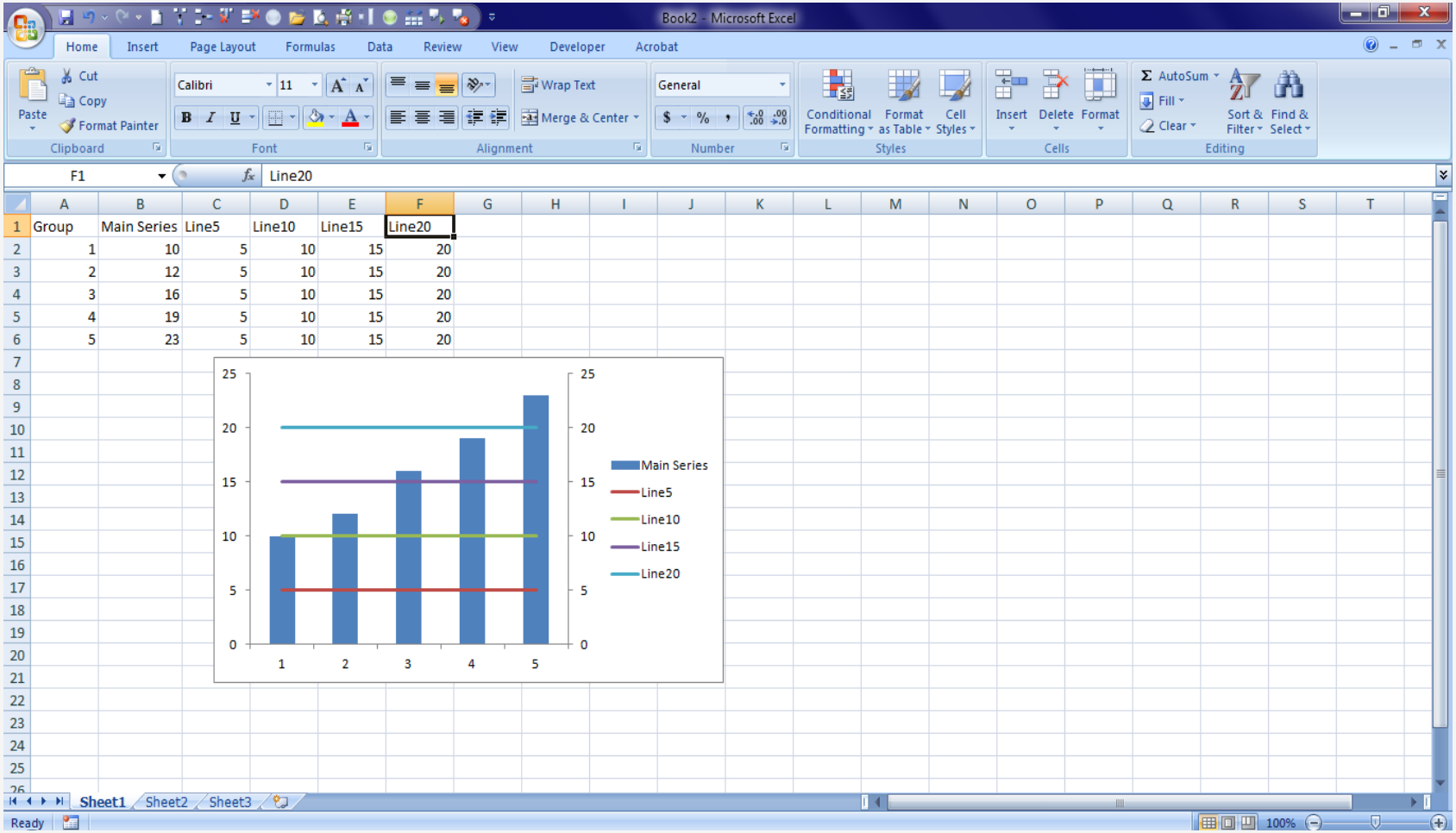
Column chart with overlaid gridlines

Step 5. Choose each 'Line' series and change each to a Line graph by selecting the series and going to the *Design* menu.



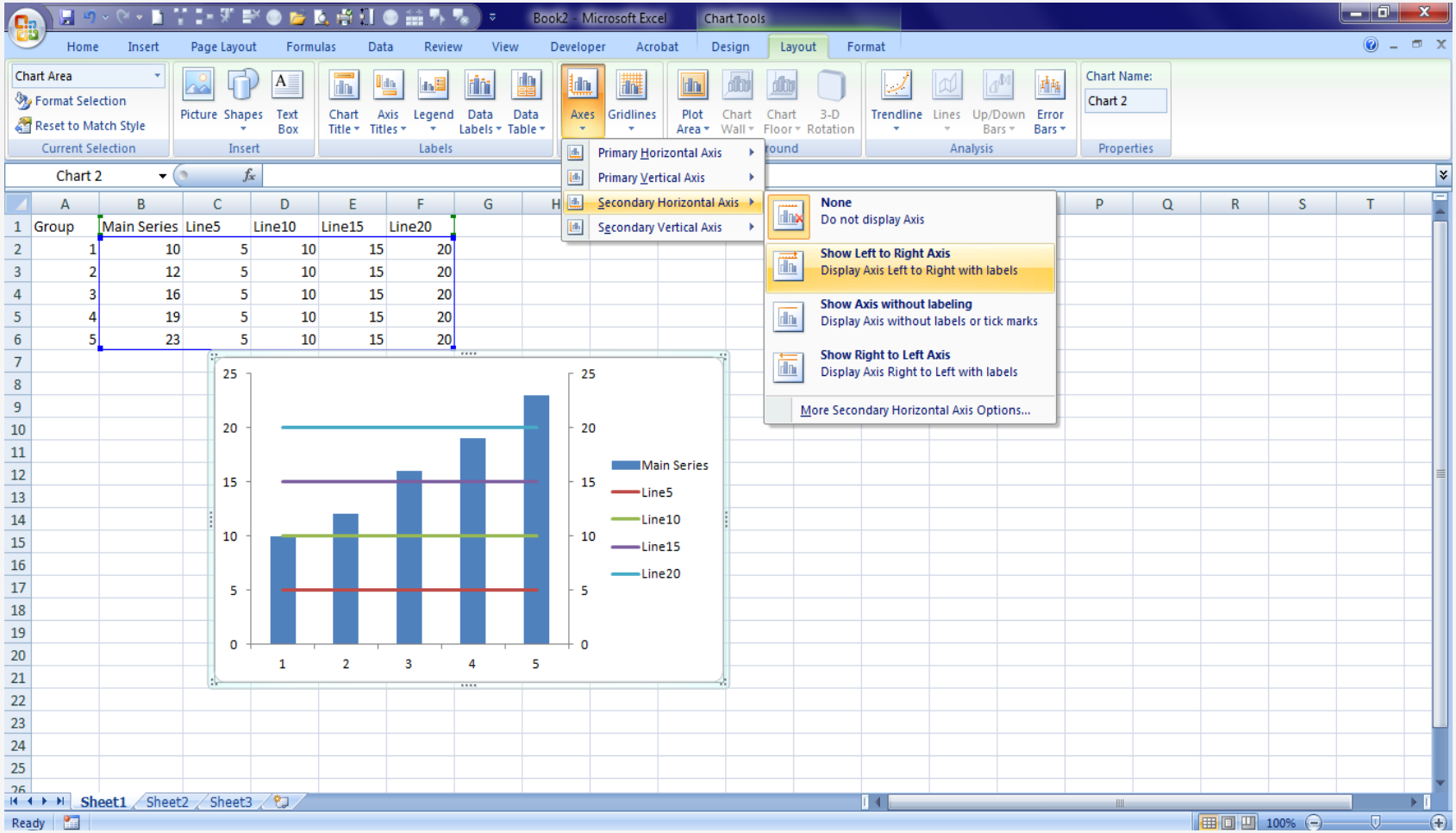
Column chart with overlaid gridlines

Step 6. Once you've linked all four 'Line' series to the secondary axis and changed them to line graphs, you will have this chart.



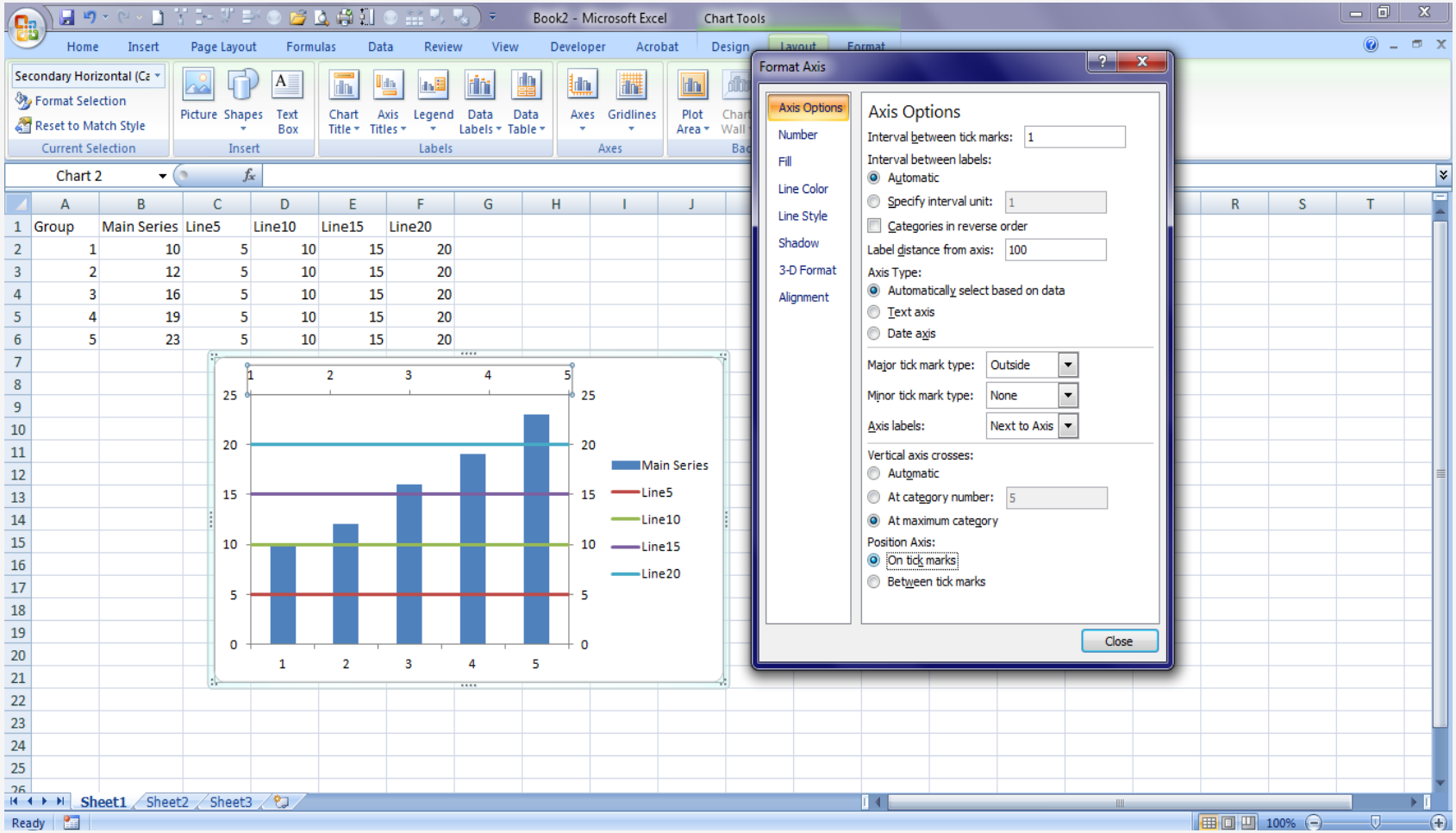
Column chart with overlaid gridlines

Step 7. To force the line to go all the way to the y-axes, show the 'Secondary Horizontal Axis' (*Layout → Axes → Secondary Horizontal Axis*).



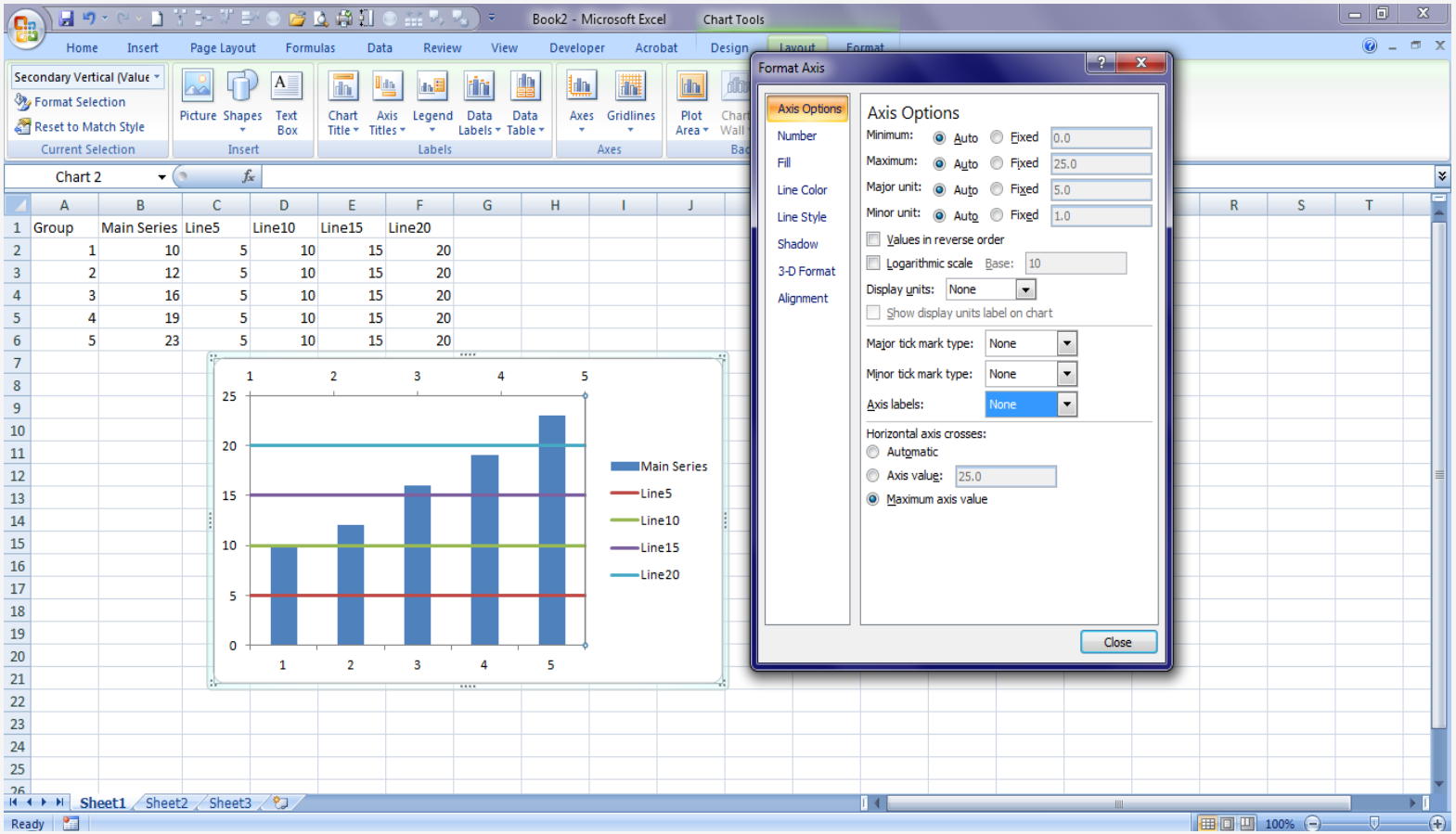
Column chart with overlaid gridlines

Step 8. Right-click on the secondary horizontal axis and in the format menu, under 'Position Axis', choose 'On tick marks'.



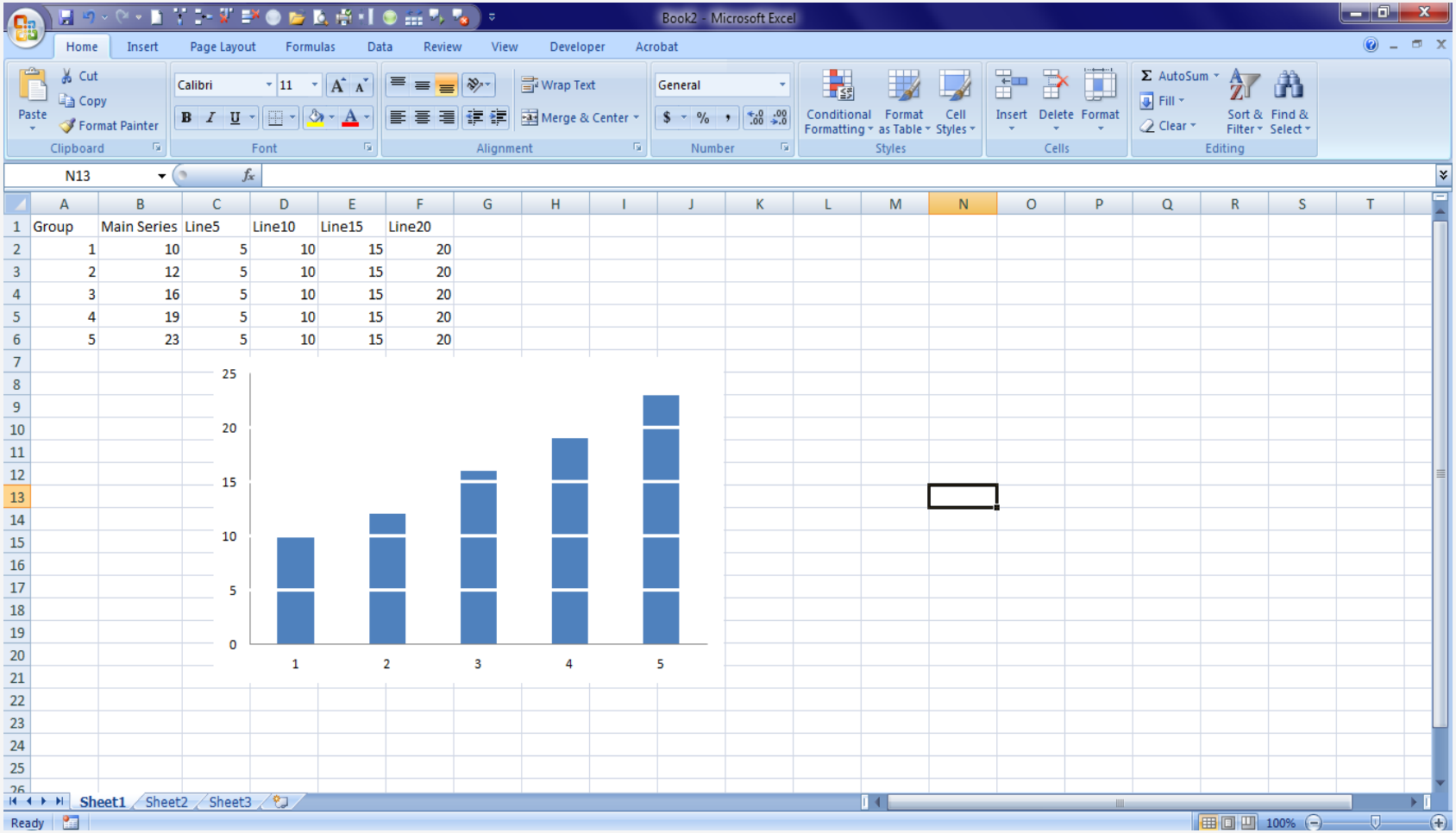
Column chart with overlaid gridlines

Step 9. You can now clean up (remove) the secondary axes by turning off the tick mark, axis, labels, and line color. (Note: do not simply delete the secondary y-axis as this will undo all of your changes).



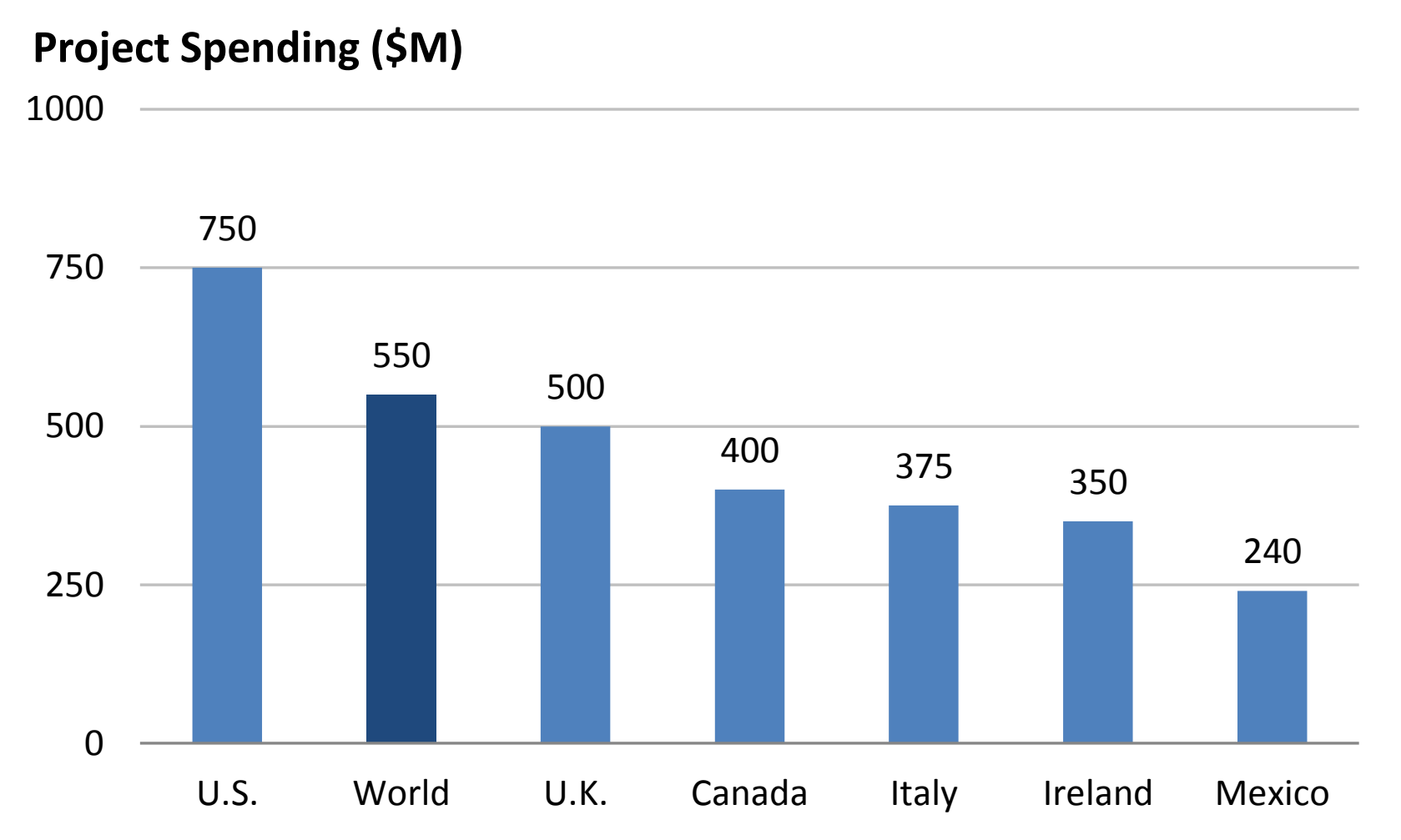
Column chart with overlaid gridlines

Step 10. For each 'Line' series, change the outline to white (or whichever color you are using for your background).



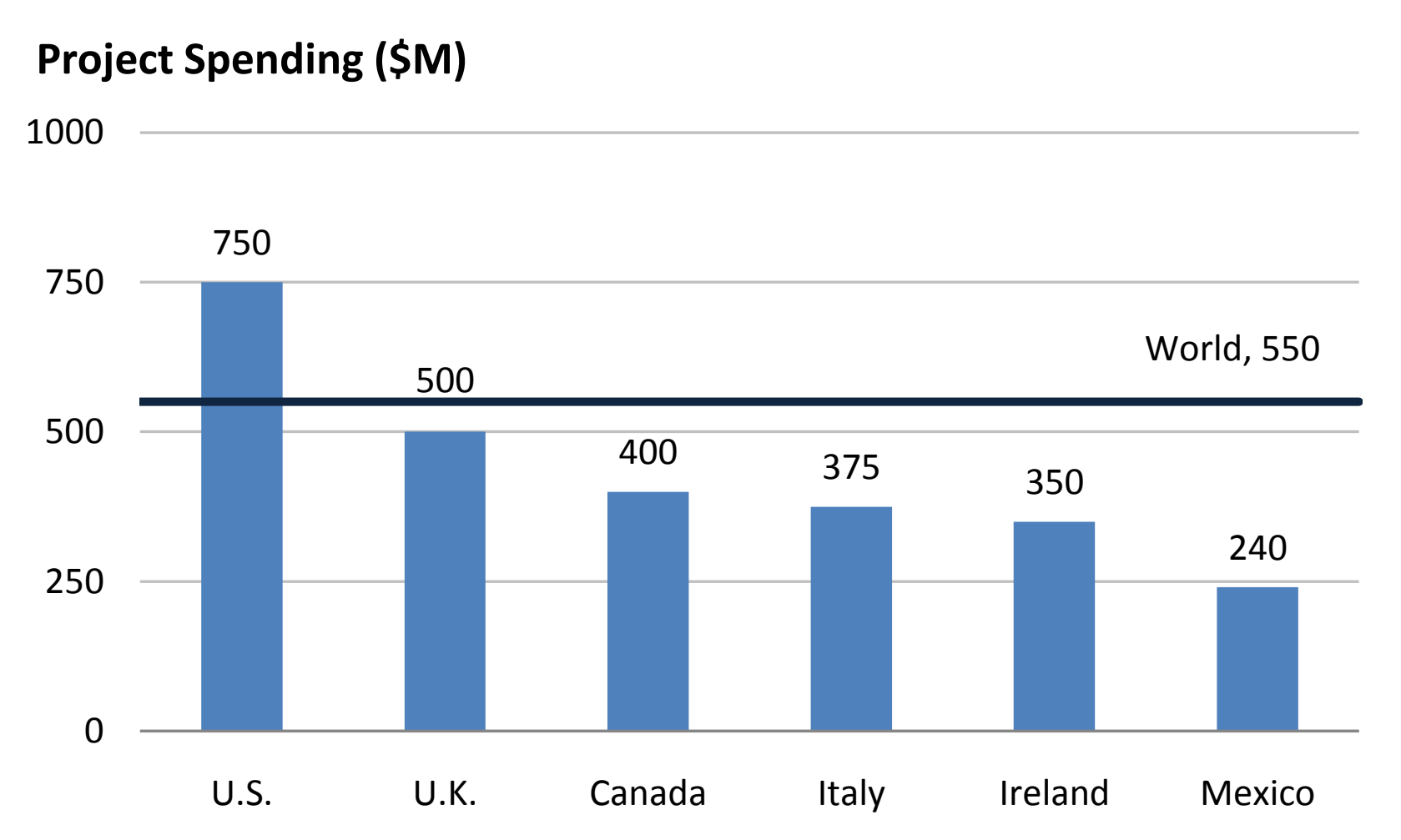
Column chart with overlaid gridlines

Alternative use of this strategy



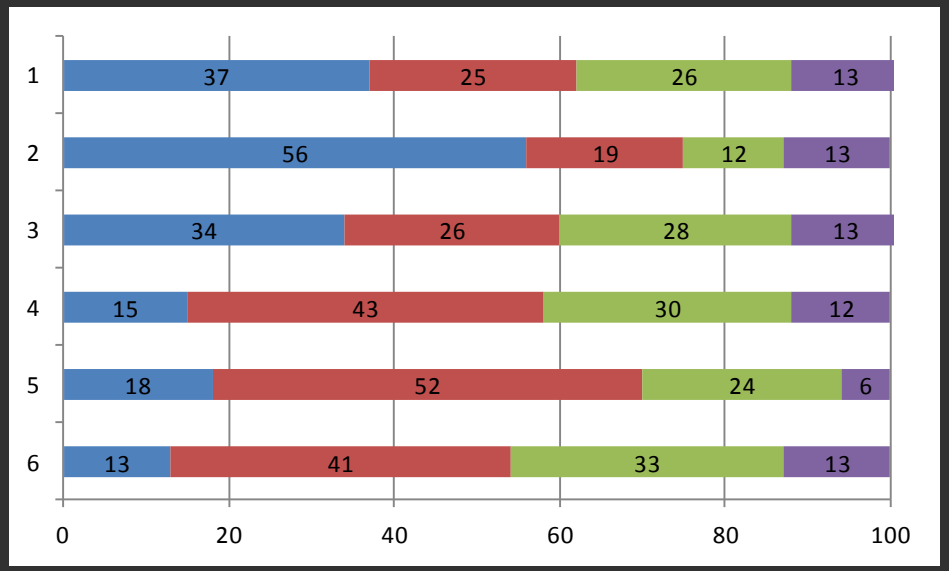
Column chart with overlaid gridlines

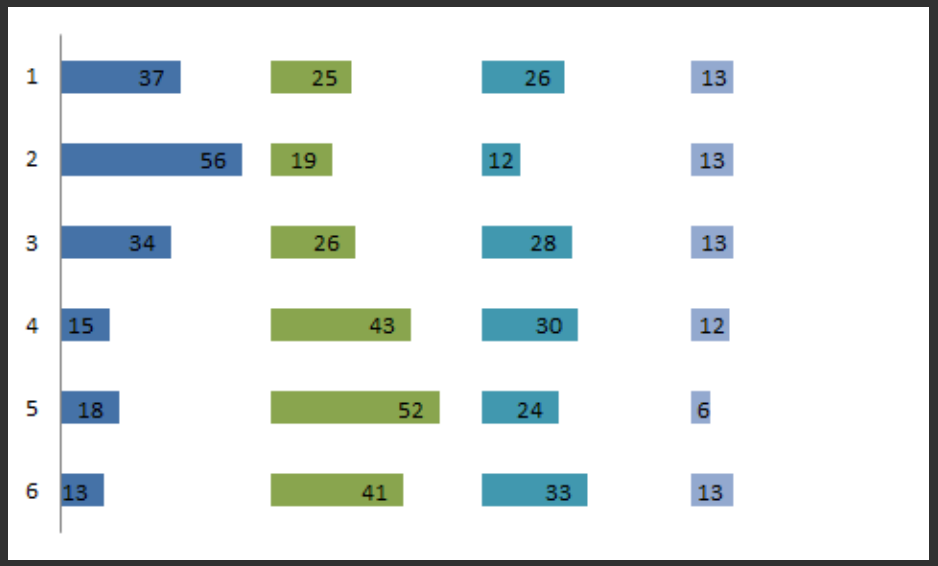
Alternative use of this strategy



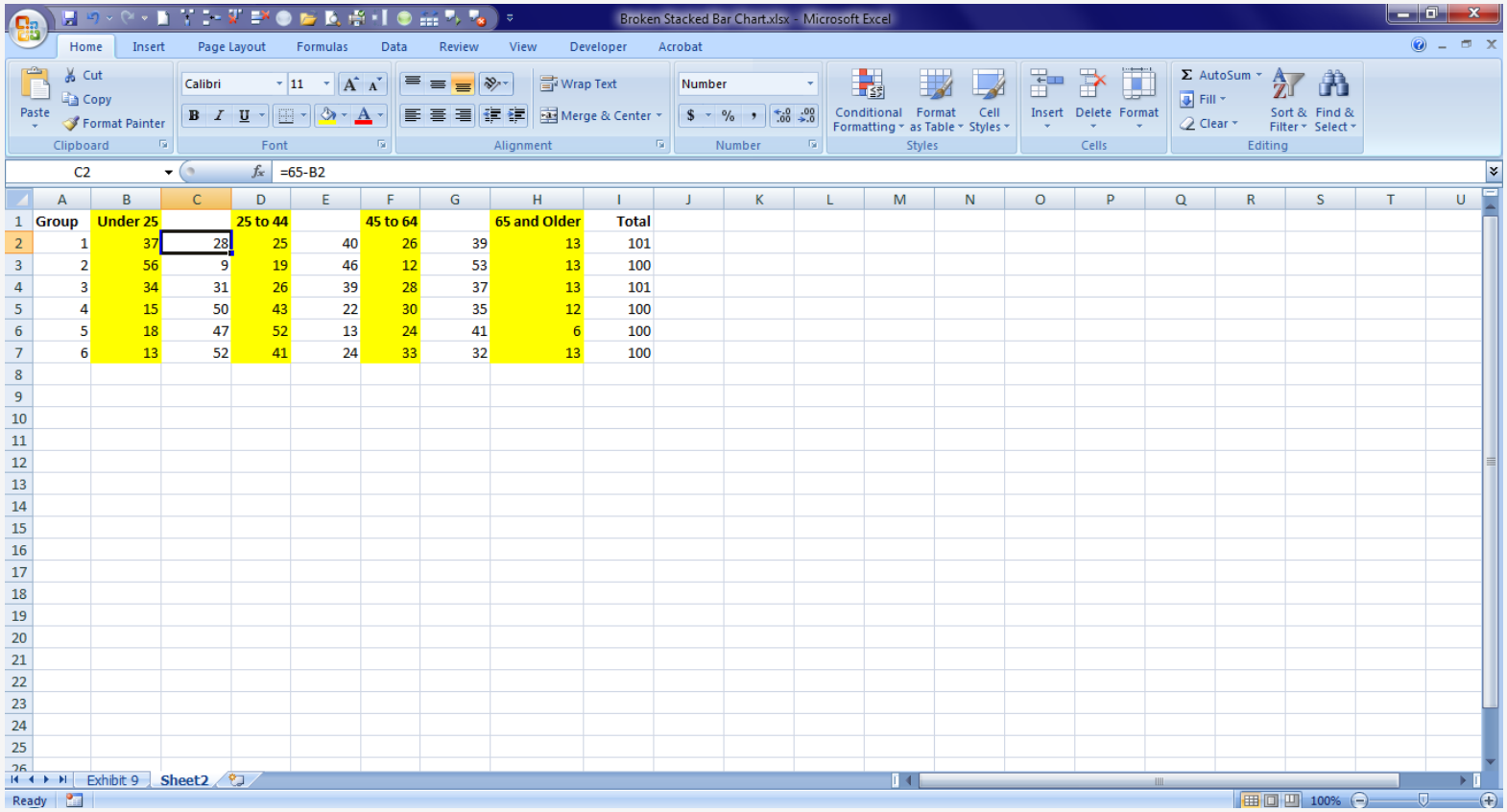
Column chart with overlaid gridlines

Broken Stacked Column Chart



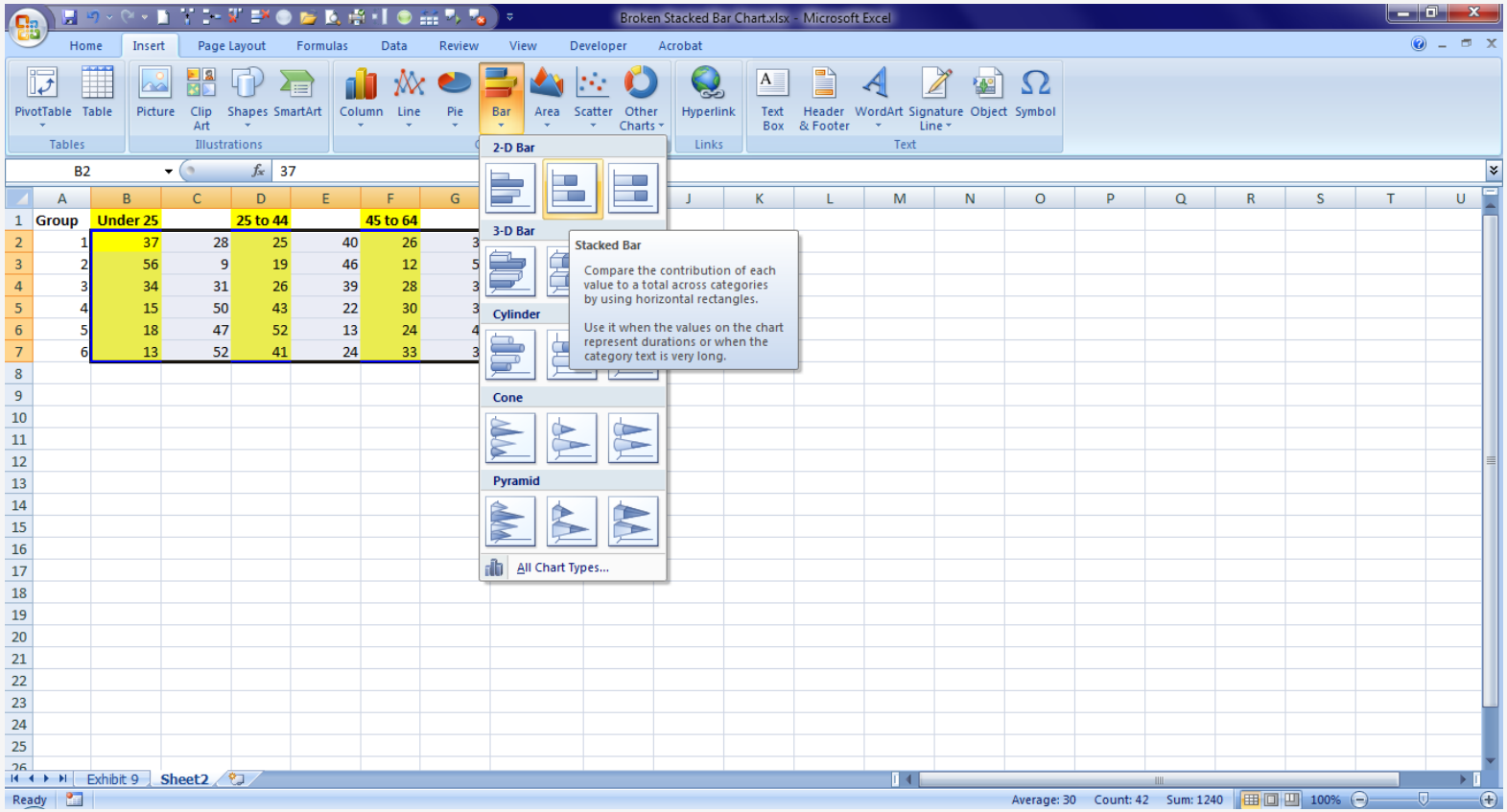


Step 1. The data in this example show percentages of some metric for 6 groups and 4 age categories. The data are highlighted in yellow. The intervening columns are built to fill the space between the different categories in the chart.

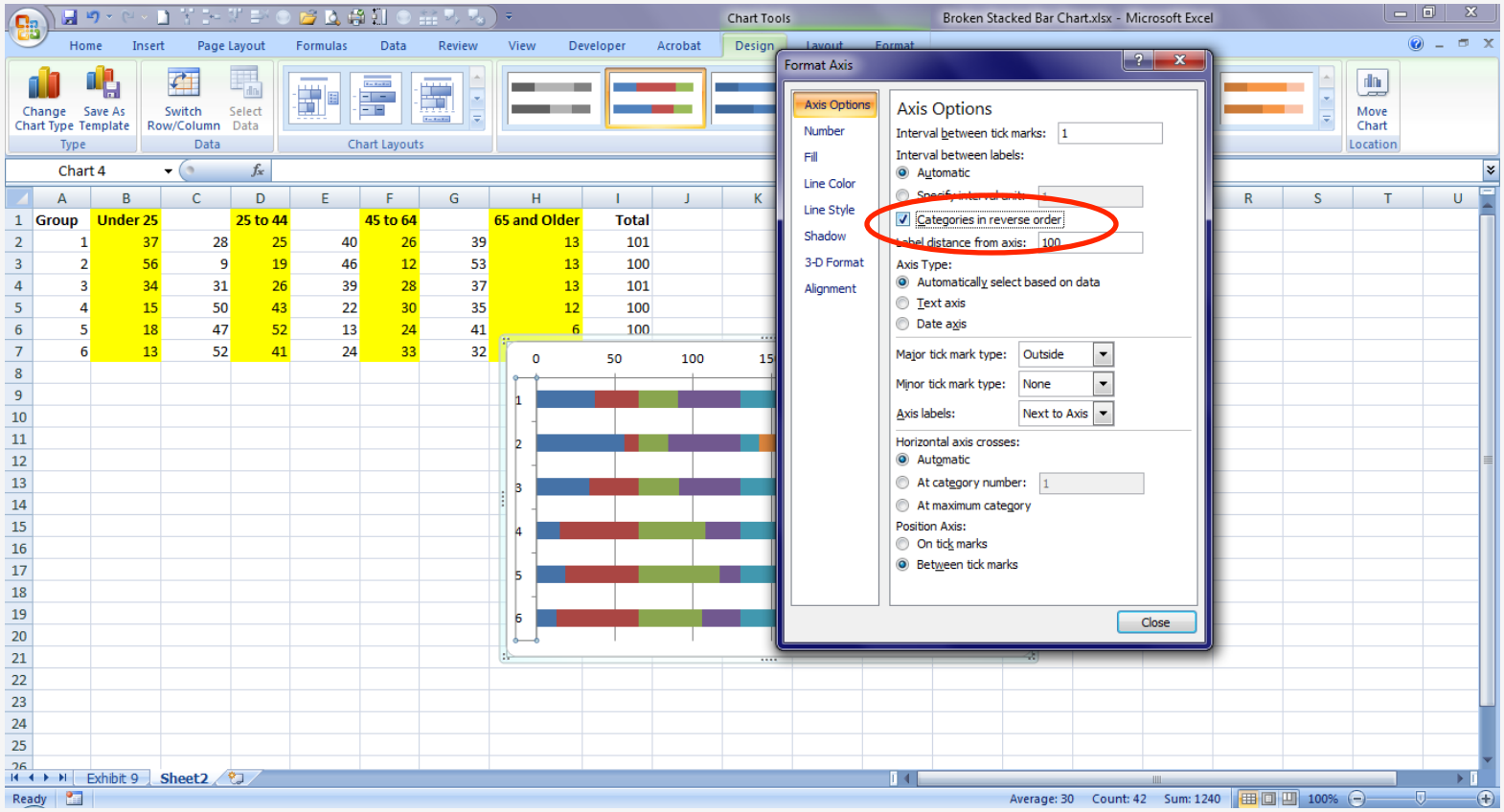


Group	Under 25		25 to 44		45 to 64		65 and Older	Total
1	37	28	25	40	26	39	13	101
2	56	9	19	46	12	53	13	100
3	34	31	26	39	28	37	13	101
4	15	50	43	22	30	35	12	100
5	18	47	52	13	24	41	6	100
6	13	52	41	24	33	32	13	100

Step 2. Create a stacked bar chart from the *Chart* menu.

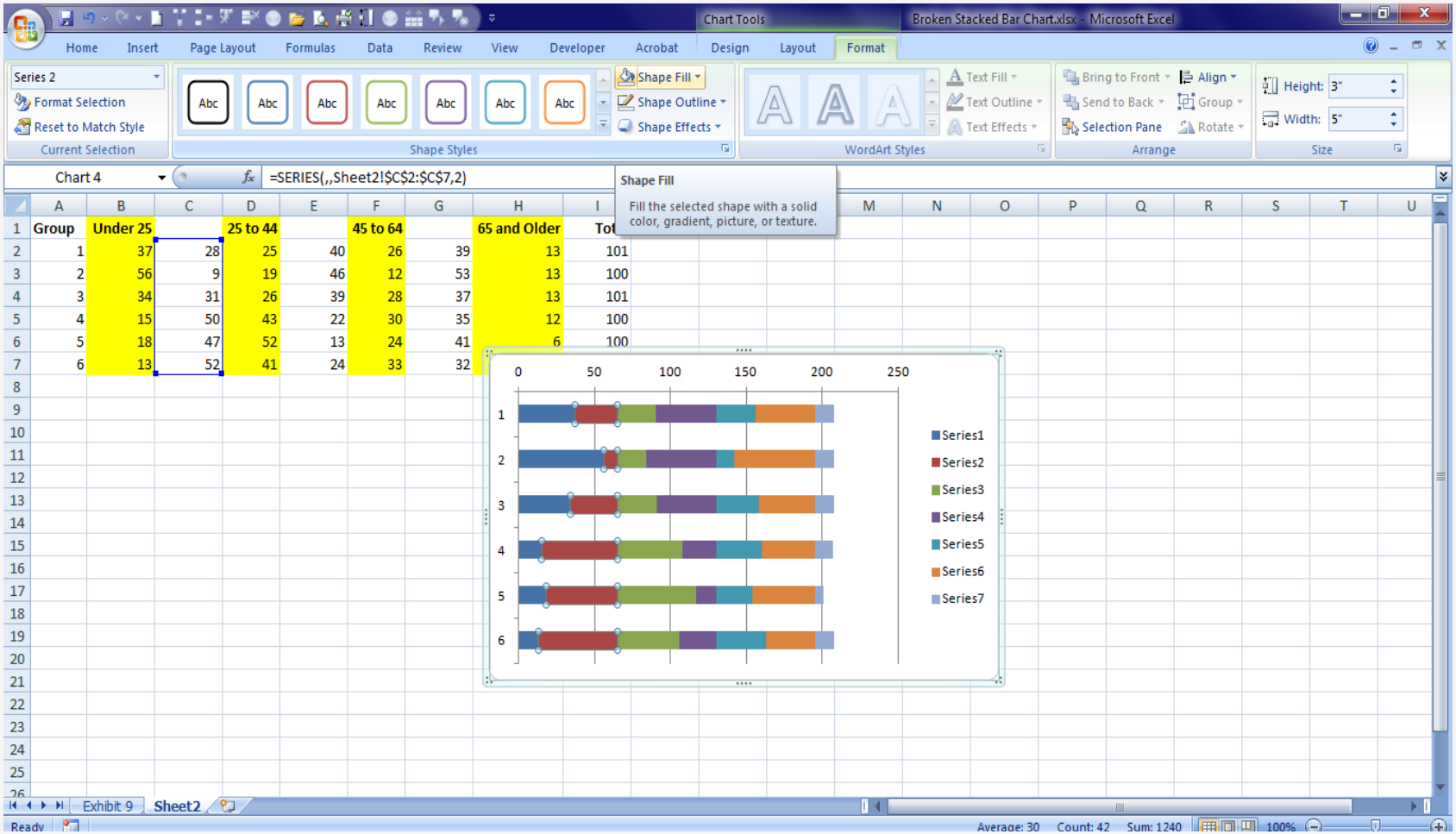


Step 3. If desired, change the order of the categories by choosing the y-axis (either by right-clicking or choosing the *Axis* menu in the *Layout* tab). You can then click the 'Categories in reverse order box'.



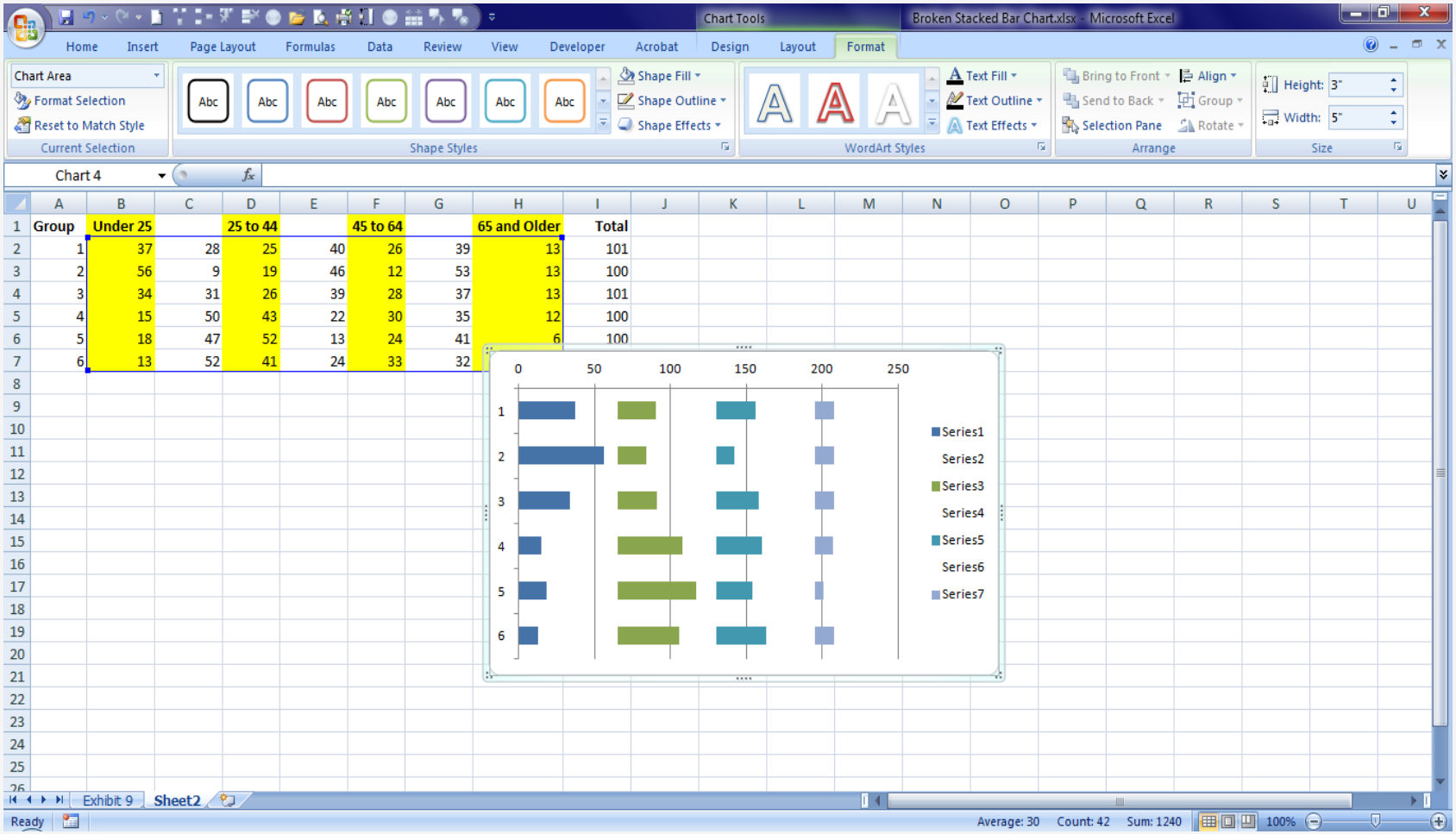
Broken Stacked Bar Chart

Step 4. Choose each intervening 'space-holder' series and set the fill and outline to empty.



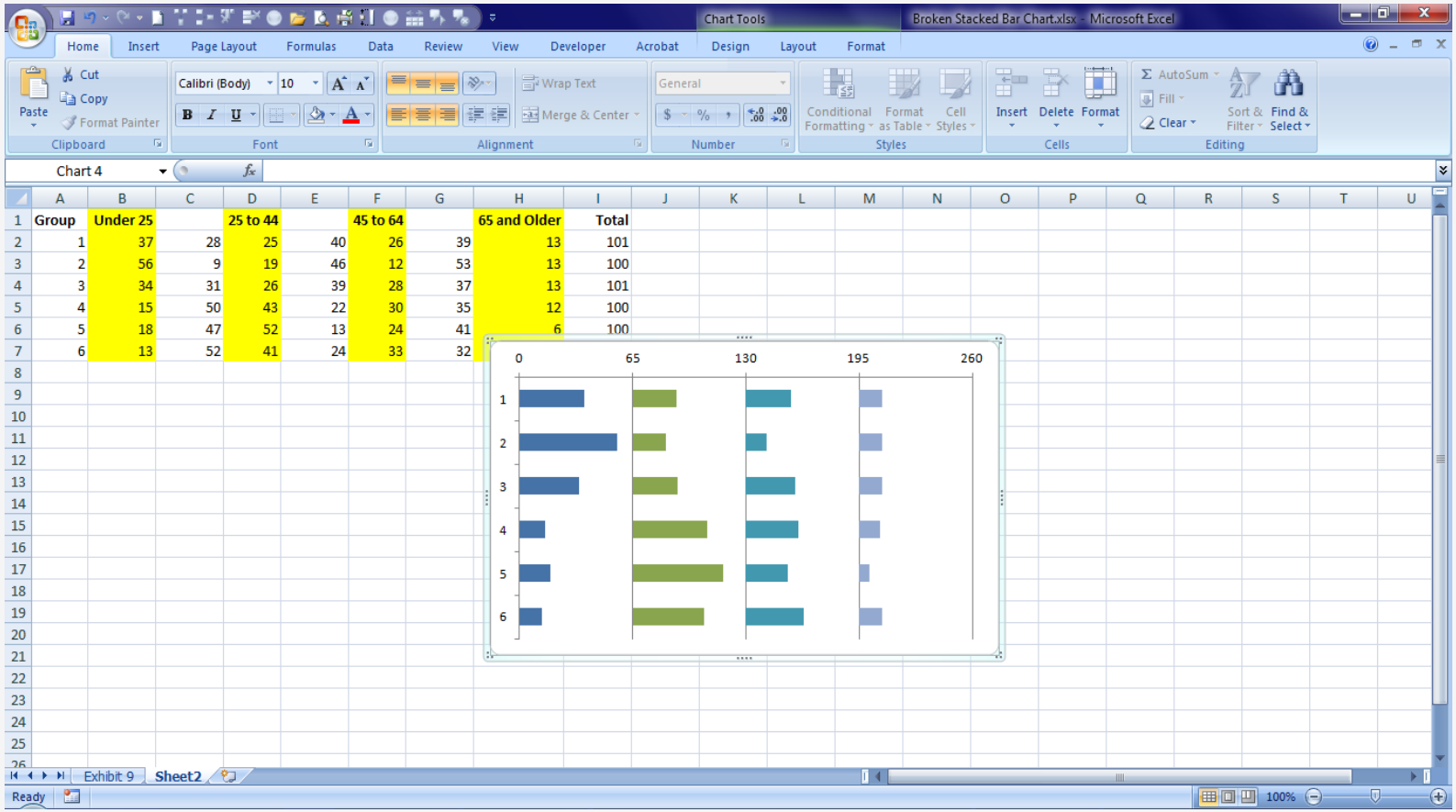
Broken Stacked Bar Chart

Step 5. The image shows the chart after the intervening series are set to empty and the bars are re-colored.



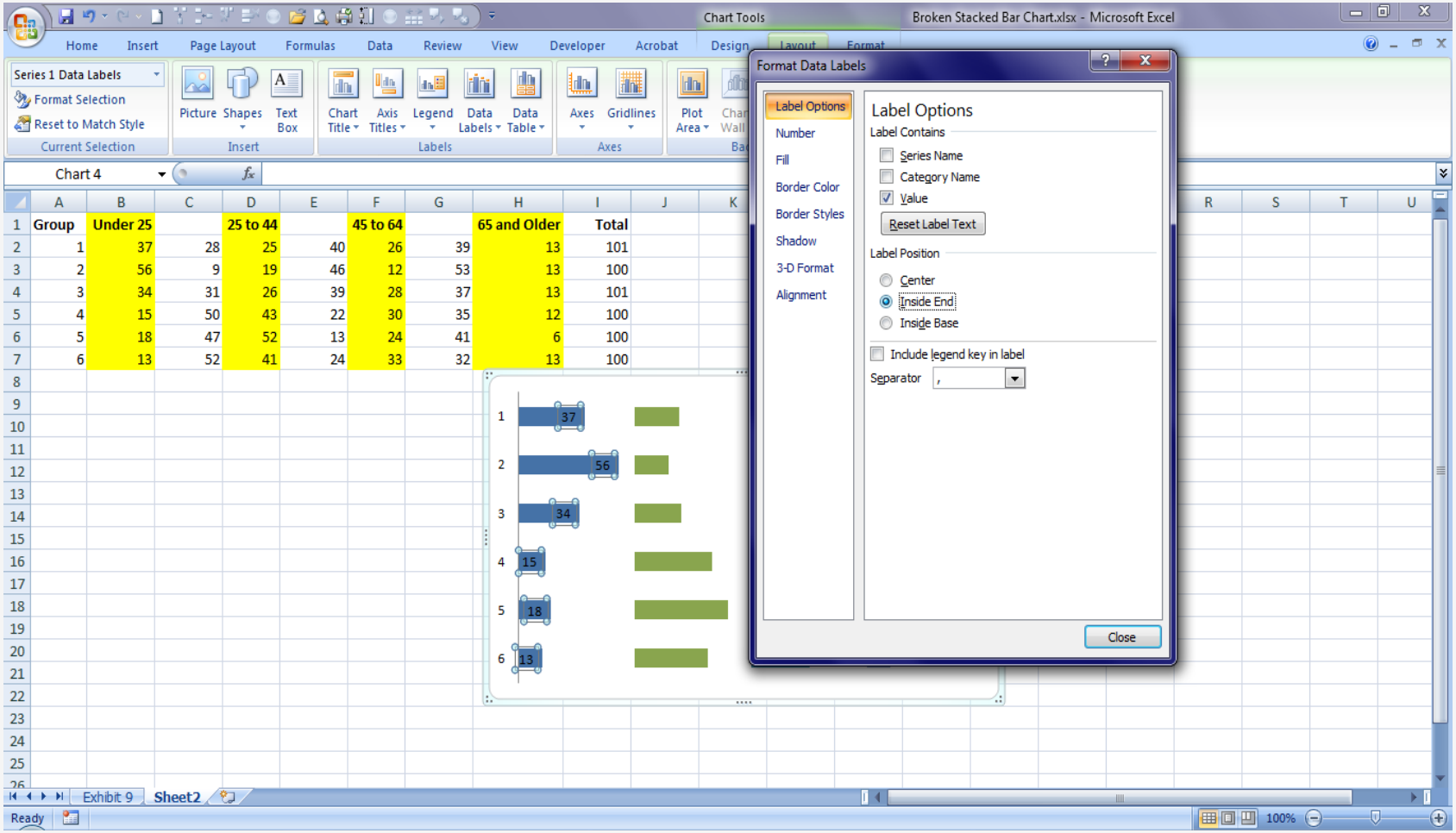
Broken Stacked Bar Chart

Step 6. To illustrate, the image shows the chart when the 'Major Unit' on the x-axis is changed to 65 (to do so, click on the axis, choose *Format Axis* and then change the 'Major Unit').



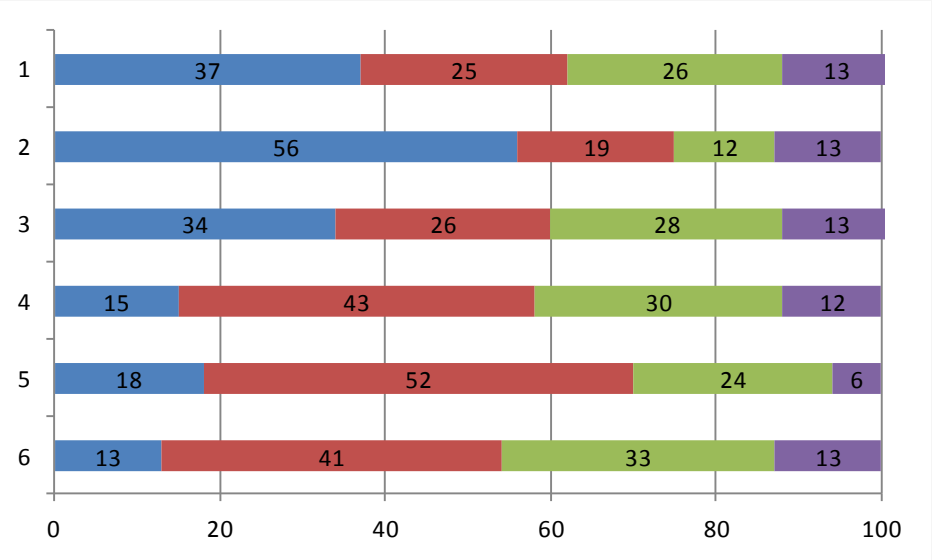
Broken Stacked Bar Chart

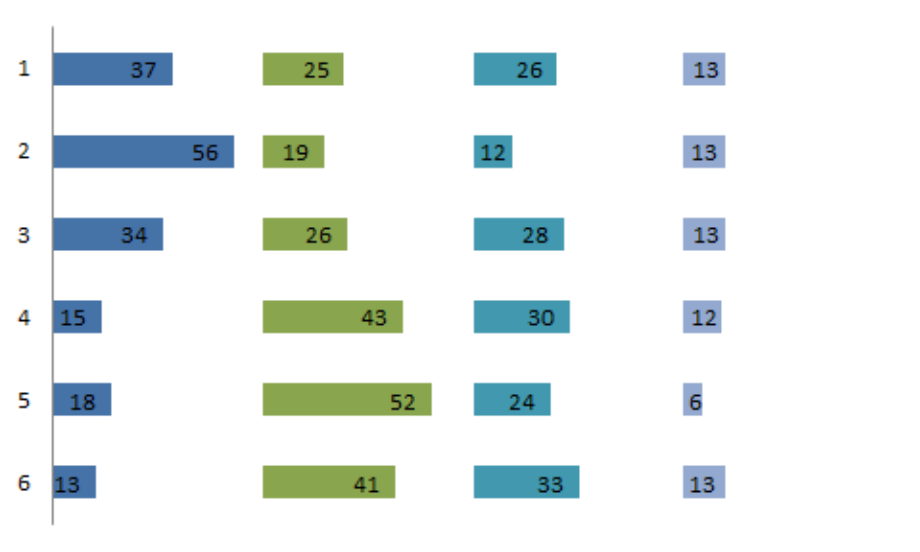
Step 7. If you want to label the bars, right-click each series and 'Add Data Labels'; to format, choose the label, and choose *Format Data Labels.*



Broken Stacked Bar Chart

Step 8. Add titles and labels as needed.





Wrapping Up

Excel can be a starting point

Wrapping Up

Excel can be a starting point

Excel defaults are not great

Wrapping Up

Excel can be a starting point

Excel defaults are not great

Multiple chart types in a single chart

Wrapping Up

Excel can be a starting point

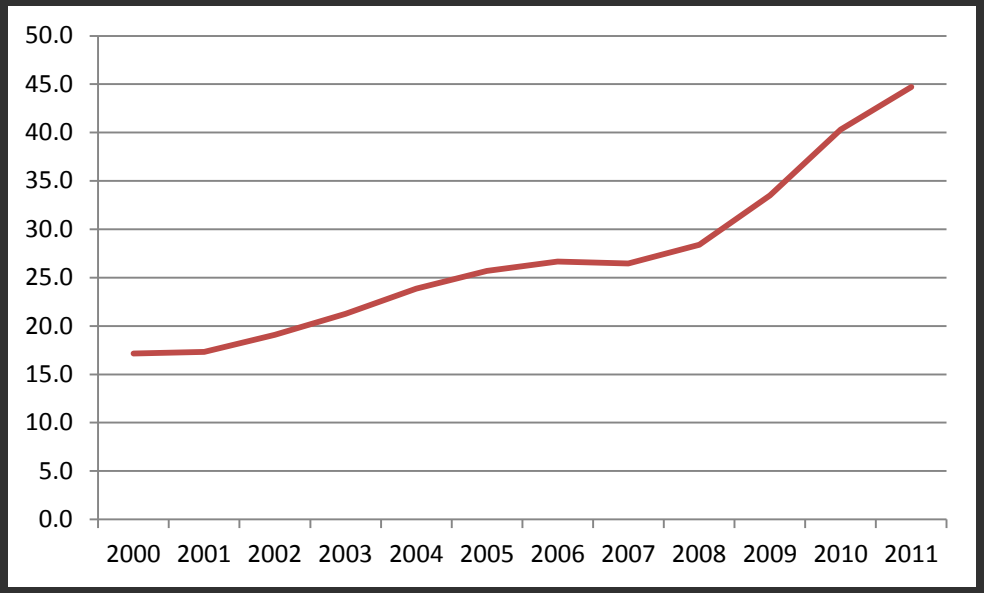
Excel defaults are not great

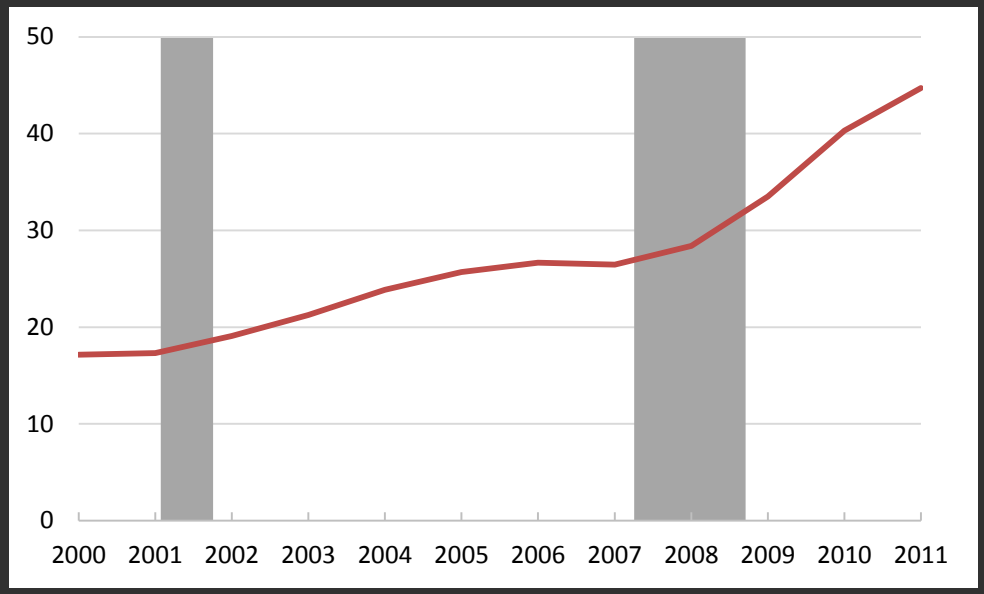
Multiple chart types in a single chart

Softer colors for tick marks, axis lines, etc.

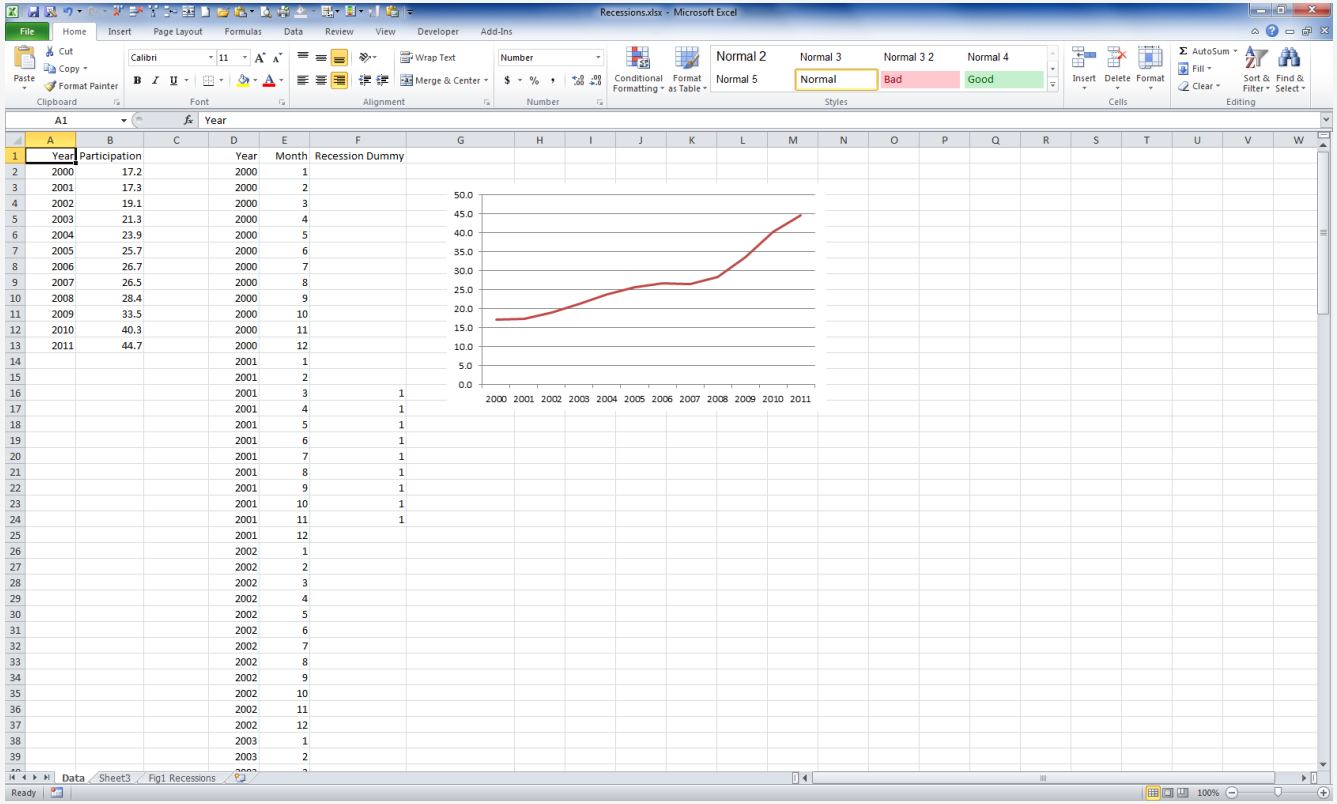
Appendix

Line Chart with Recession Bars



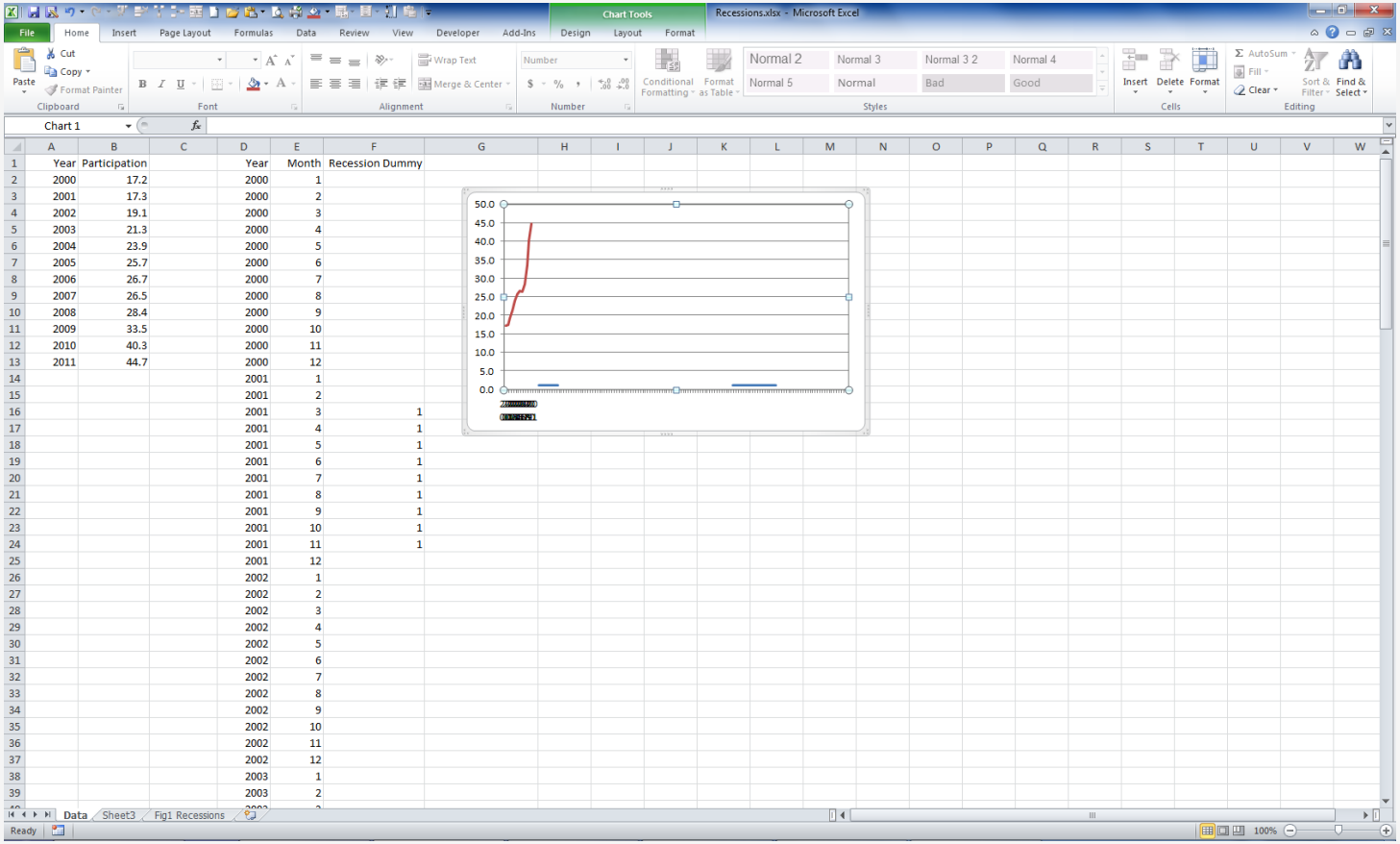


Step 1. Create your standard line graph. Data consists of annual (participation) data from 2000-2011. Monthly recession data for that period are shown in columns D-F and are denoted by the ones for recession months and are missing in other months.



Line Chart with Recession Bars

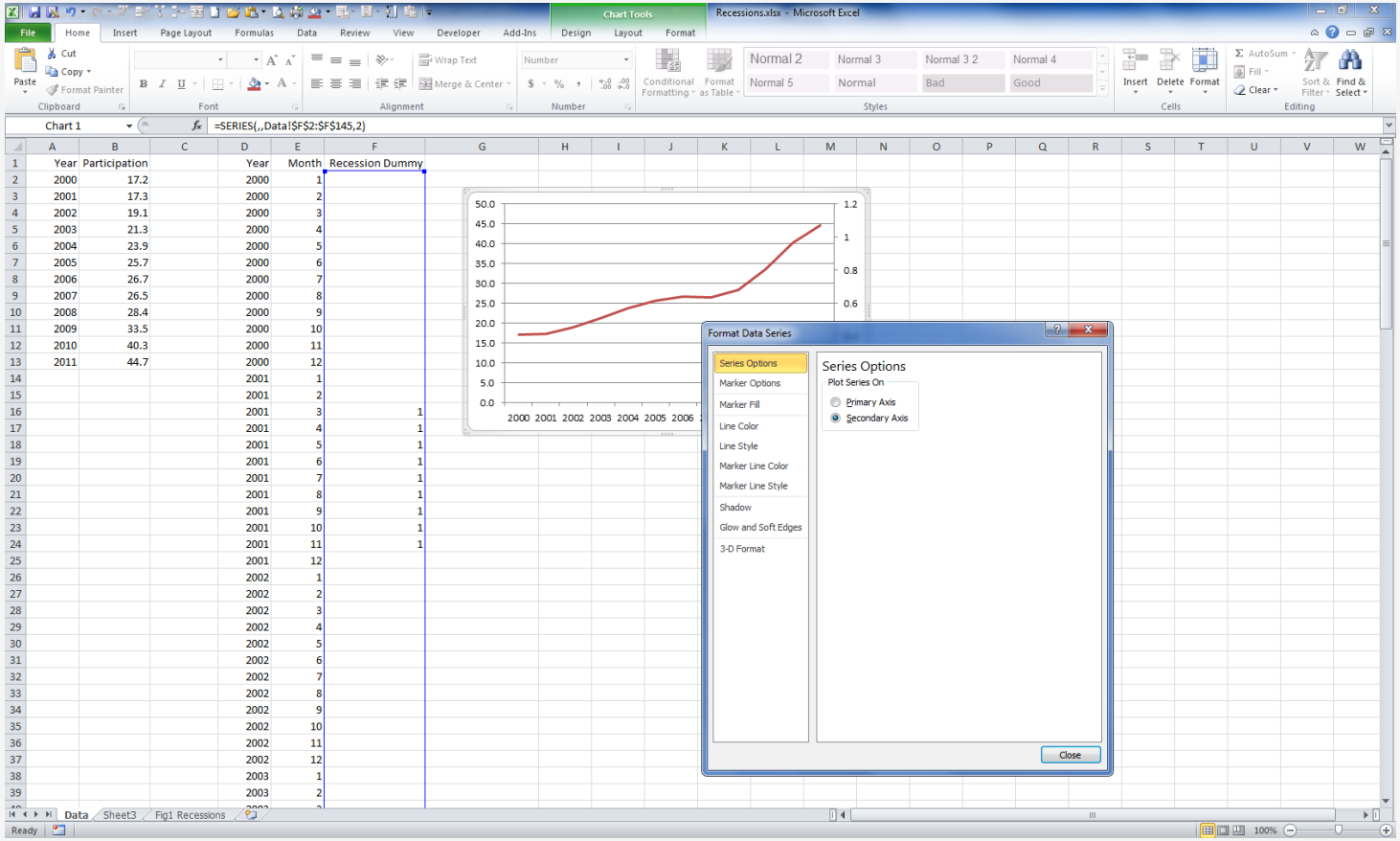
Step 2. Add the recession data as a second series, going from January 2000 to December 2011.



Year	Participation	Year	Month	Recession Dummy
2000	17.2	2000	1	
2001	17.3	2000	2	
2002	19.1	2000	3	
2003	21.3	2000	4	
2004	23.9	2000	5	
2005	25.7	2000	6	
2006	26.7	2000	7	
2007	26.5	2000	8	
2008	28.4	2000	9	
2009	33.5	2000	10	
2010	40.3	2000	11	
2011	44.7	2000	12	
		2001	1	
		2001	2	
		2001	3	1
		2001	4	1
		2001	5	1
		2001	6	1
		2001	7	1
		2001	8	1
		2001	9	1
		2001	10	1
		2001	11	1
		2001	12	
		2002	1	
		2002	2	
		2002	3	
		2002	4	
		2002	5	
		2002	6	
		2002	7	
		2002	8	
		2002	9	
		2002	10	
		2002	11	
		2002	12	
		2003	1	
		2003	2	

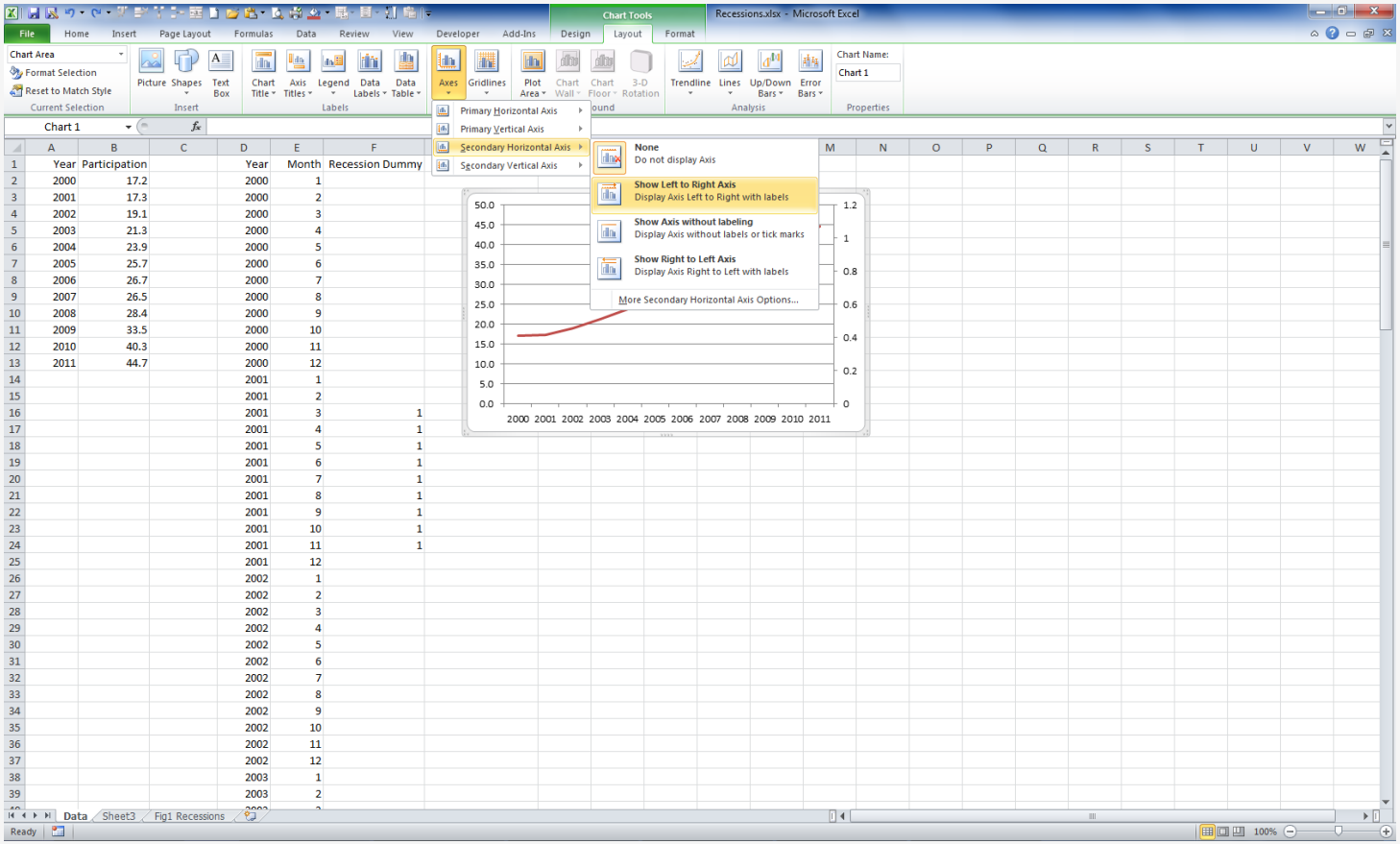
Line Chart with Recession Bars

Step 3. Put the recession series on the 'Secondary Axis' (by either the right-clicking or using the *Layout* menu).



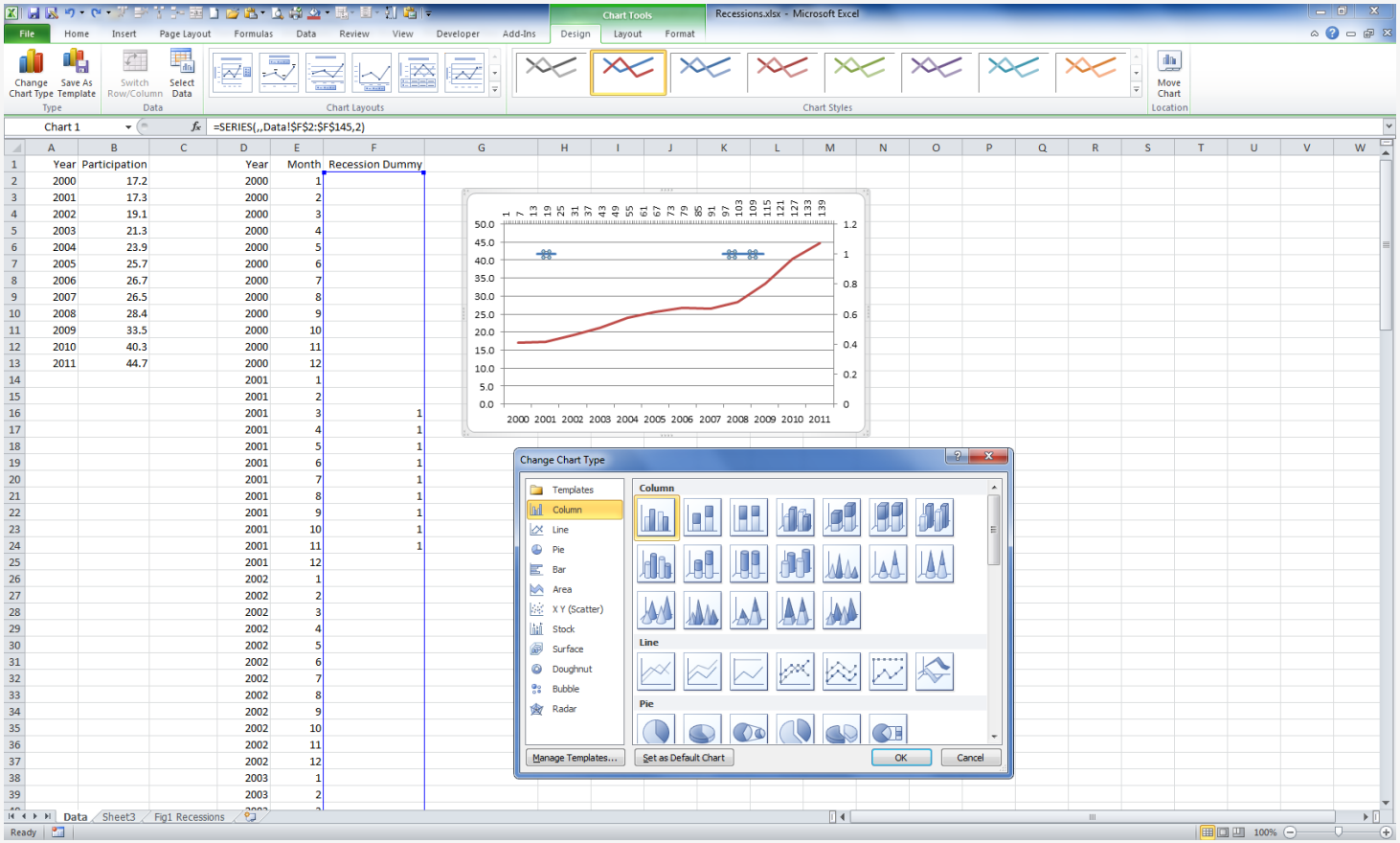
Line Chart with Recession Bars

Step 4. Use the 'Axis' menu to show the 'Secondary Horizontal Axis'. If you don't do this, you won't see the series plotted in the figure.



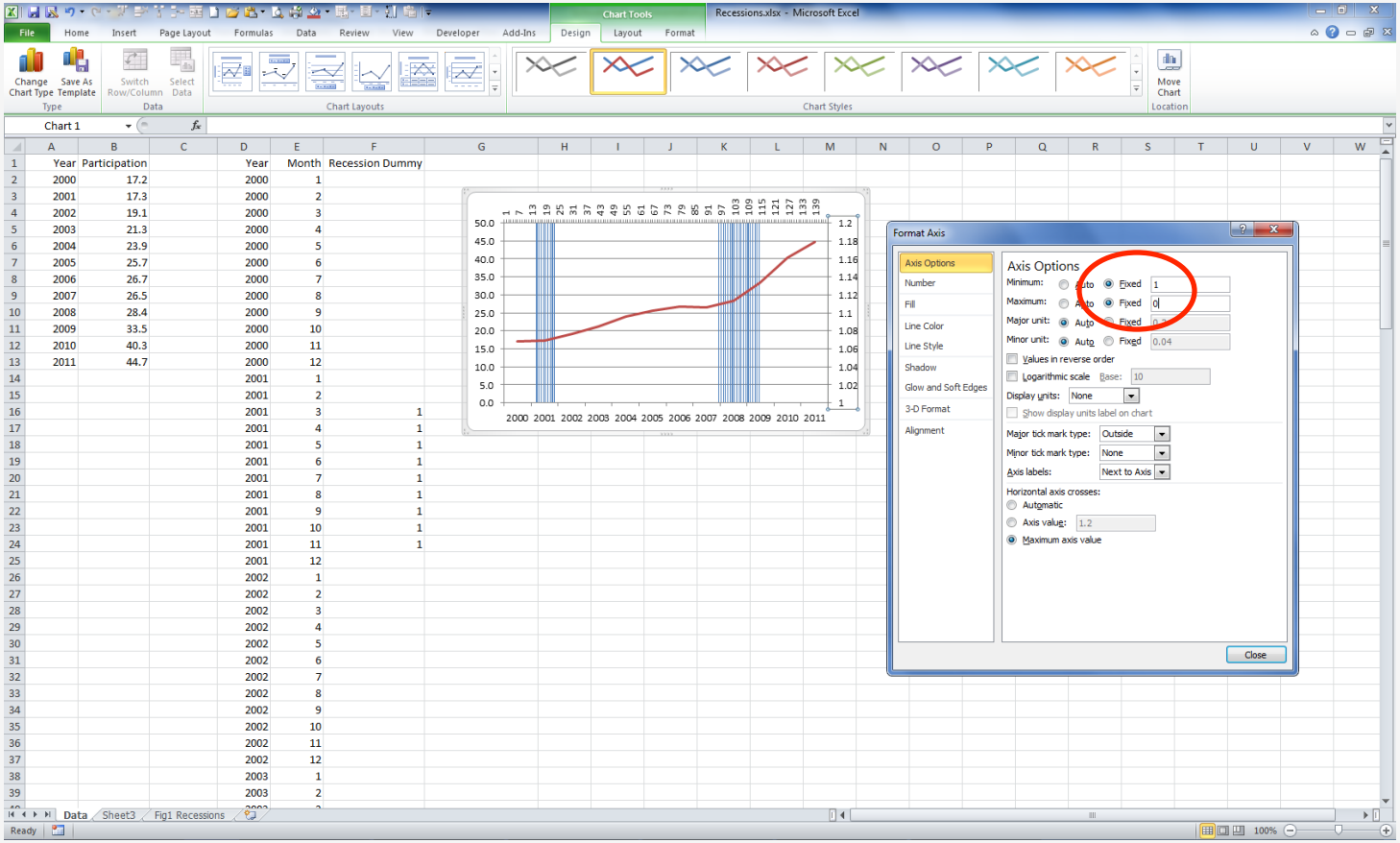
Line Chart with Recession Bars

Step 5. Change the recession series to a Column chart (again, either by right-clicking or using the *Layout* menu).



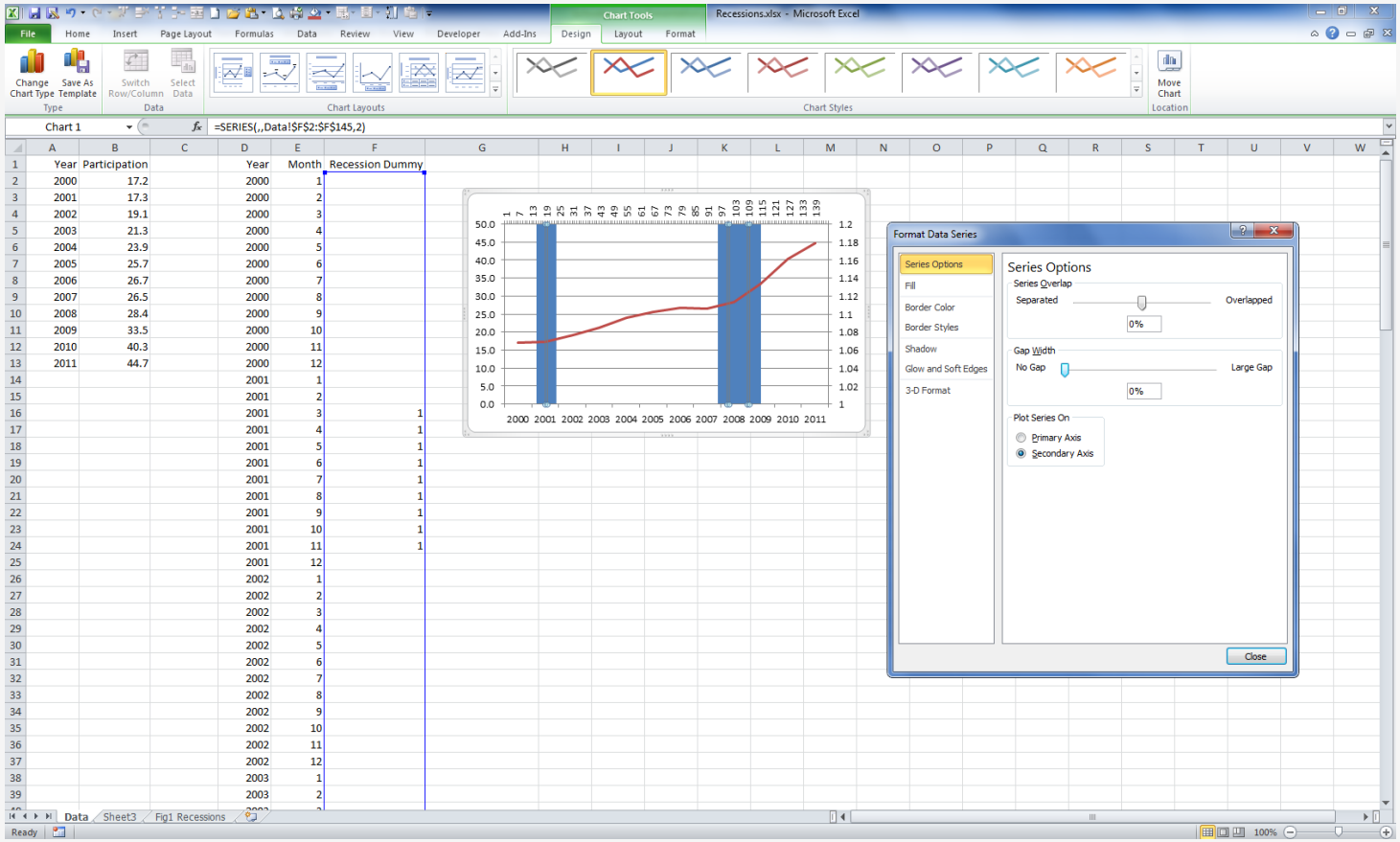
Line Chart with Recession Bars

Step 6. Modify the 'Secondary Primary Axis' to go from 0 (maximum) to 1 (minimum); in this way, your columns will cover the entire vertical distance.



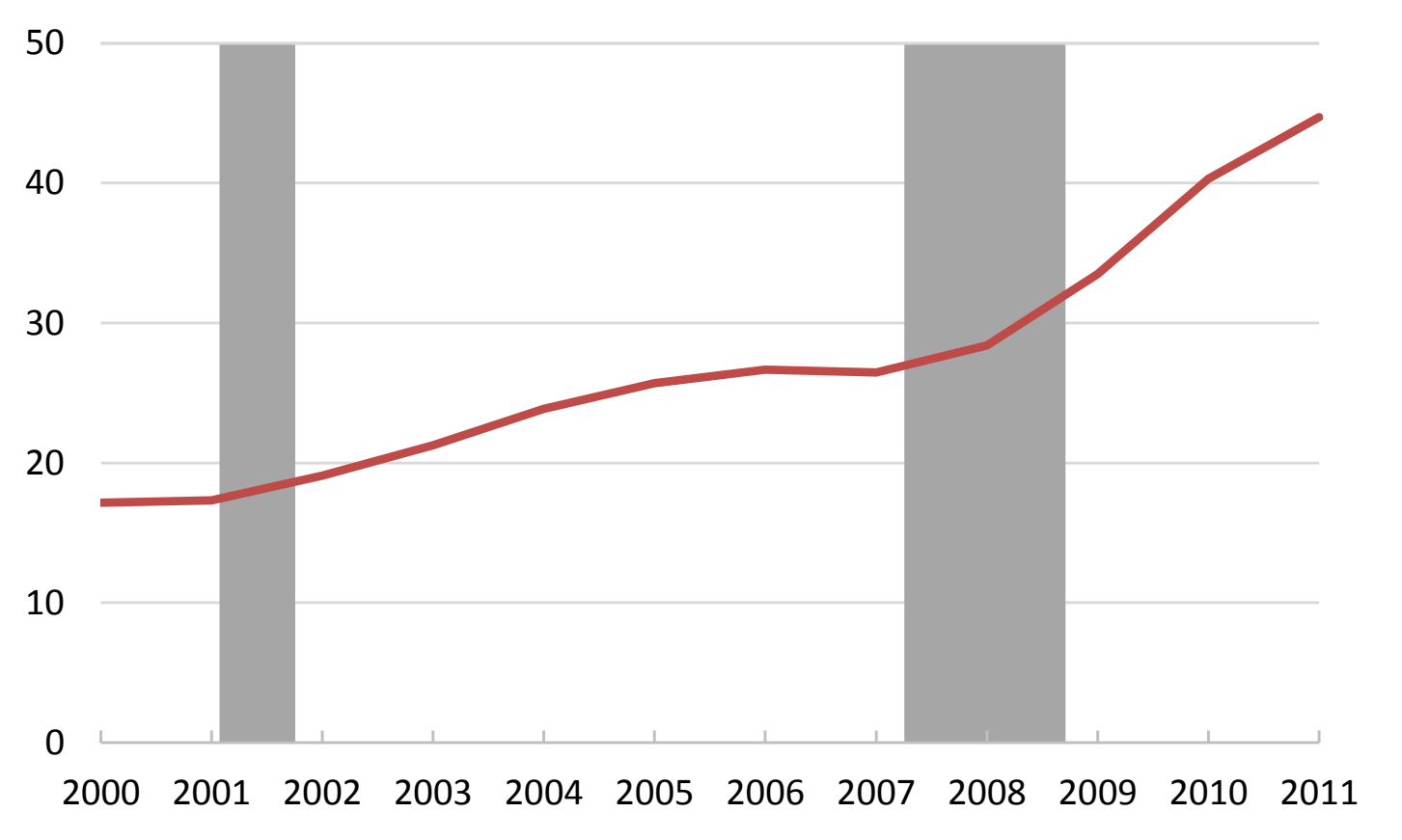
Line Chart with Recession Bars

Step 7. Change the 'Gap Width' on the recession series to 0% (in the 'Format Data Series' menu).



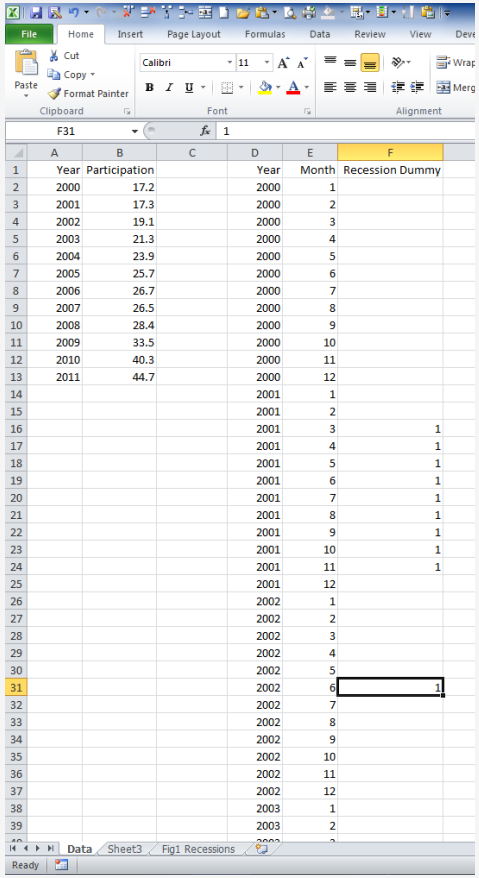
Line Chart with Recession Bars

Step 8. Change colors of the series, remove tick marks, lighten axes and gridlines, as needed.

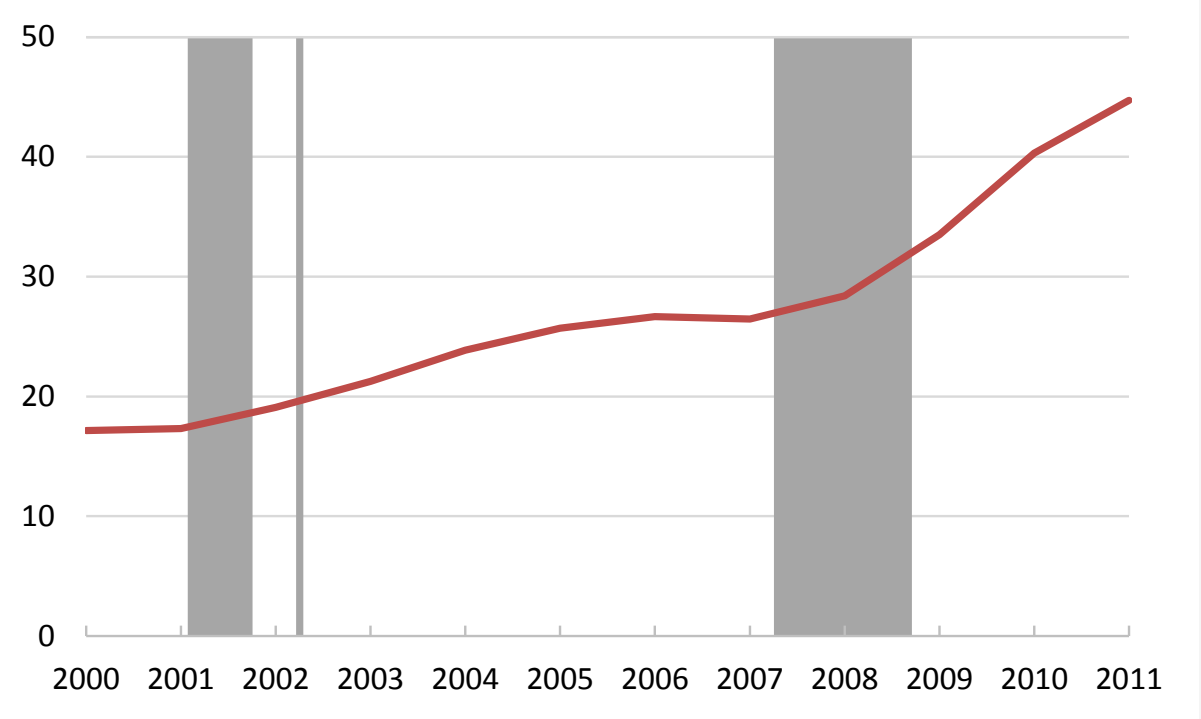


Line Chart with Recession Bars

Step 9a. You can also add single lines–say to denote a policy change or some other event–by inserting the number one in a single cell in the column of your recession data.

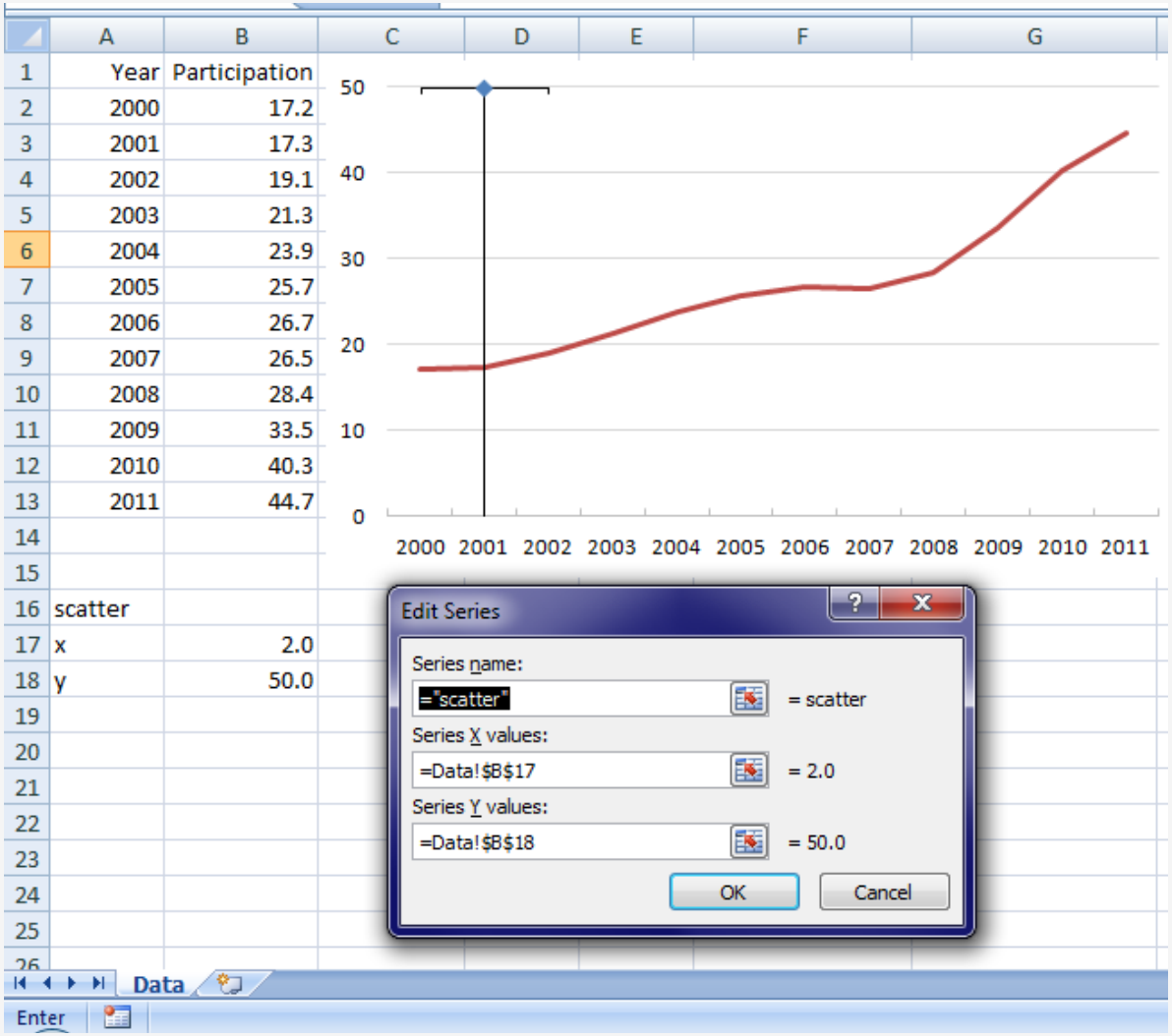


	A	B	C	D	E	F
1	Year	Participation		Year	Month	Recession Dummy
2	2000	17.2		2000	1	
3	2001	17.3		2000	2	
4	2002	19.1		2000	3	
5	2003	21.3		2000	4	
6	2004	23.9		2000	5	
7	2005	25.7		2000	6	
8	2006	26.7		2000	7	
9	2007	26.5		2000	8	
10	2008	28.4		2000	9	
11	2009	33.5		2000	10	
12	2010	40.3		2000	11	
13	2011	44.7		2000	12	
14				2001	1	
15				2001	2	
16				2001	3	1
17				2001	4	1
18				2001	5	1
19				2001	6	1
20				2001	7	1
21				2001	8	1
22				2001	9	1
23				2001	10	1
24				2001	11	1
25				2001	12	
26				2002	1	
27				2002	2	
28				2002	3	
29				2002	4	
30				2002	5	
31				2002	6	1
32				2002	7	
33				2002	8	
34				2002	9	
35				2002	10	
36				2002	11	
37				2002	12	
38				2003	1	
39				2003	2	



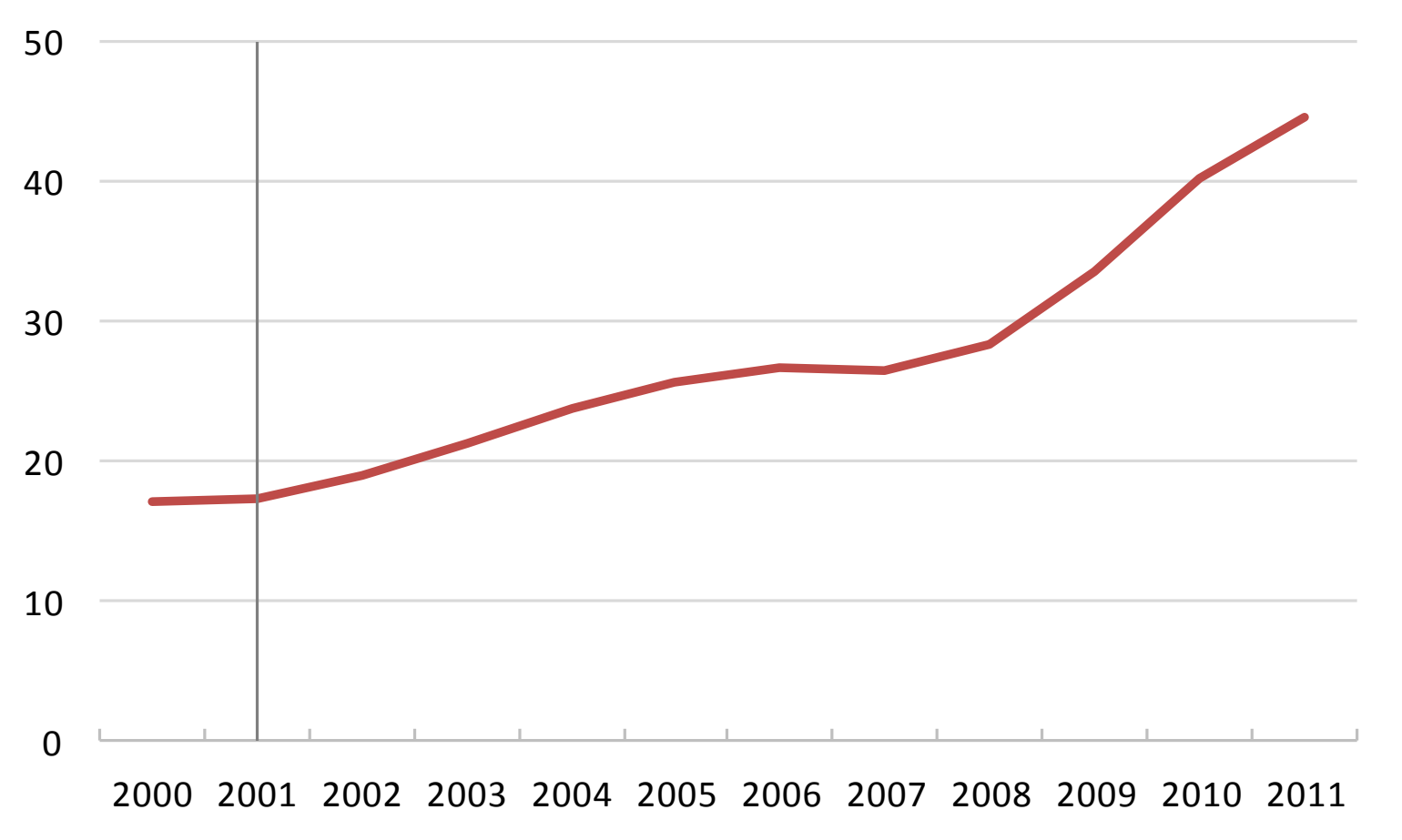
Line Chart with Recession Bars

Step 9b. Alternative way to add a single line: add a point as a scatterplot with a single vertical error bar.



Line Chart with Recession Bars

Step 9c. Delete horizontal error bar, lighten vertical error bar, and remove marker.



Line Chart with Recession Bars