

# Spreadsheets

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## 1 Spreadsheets

The first spreadsheet, Visicalc, was developed for Apple computers in the early 1980's. A prime reason for the popularity of the original IBM PC, was Lotus 123, the most popular spreadsheet at the time.

The starting point for the development of the spreadsheet was financial modelling of cash flows, one wanted a tool that could easily modify accounting relationships when budgeting.

The spreadsheet was however used for many things the initial developers never thought of, and is now a “Jack of all trades,” but the original heritage still influences what a spreadsheet is suited for.

### **Suited for**

Designed for accounting statements, simulating cashflows, etc,

Basic finance calculations, such as present values

Basic Statistics

### **Not suited for**

Complex calculations (derivatives pricing)

Complex statistics (econometrics)

### 1.1 Warning: The NPV function

is error prone

- The first cash flow is assumed to happen at time 1
- A blank cell is not the same as a cell with a zero in it.

See example spreadsheet

## 2 The Reinhart-Rogoff error

is an (in)famous example of how easy it is to make Excel errors which are very hard to detect, Carmen Reinhart and Kenneth Rogoff 2010 make such a common mistake, clicking on a “wrong range.”

In this paper it particularly unfortunate, since it had policy implications, which were used heavily in the post-financial crisis political debates.

Jonathan Borwein and David Bailey, in an article at [theconversation.com](http://theconversation.com), summarizes the mistake as follows:

### **The Reinhart-Rogoff error – or how not to Excel at economics**

... The most serious was that, in their Excel spreadsheet, Reinhart and Rogoff had not selected the entire row when averaging growth figures: they omitted data from Australia, Austria, Belgium, Canada and Denmark.

In other words, they had accidentally only included 15 of the 20 countries under analysis in their key calculation.

When that error was corrected, the “0.1% decline” data became a 2.2% average increase in economic growth.

Source: <http://theconversation.com/the-reinhart-rogooff-error-or-how-not-to-excel-at-economics-13646>

The problem is that when you are sitting in front of the spreadsheet, you will only see the end result, to actually look at the formula specifying the range of the mean calculation one need to “look behind” the spreadsheet.

See the following picture that illustrates the issue

	B	C	I	J	K	L	M
2			Real GDP growth				
3			Debt/GDP				
4	Country	Coverage	30 or less	30 to 60	60 to 90	90 or above	30 or less
26			3.7	3.0	3.5	1.7	5.5
27	Minimum		1.6	0.3	1.3	-1.8	0.8
28	Maximum		5.4	4.9	10.2	3.6	13.3
29							
30	US	1946-2009	n.a.	3.4	3.3	-2.0	n.a.
31	UK	1946-2009	n.a.	2.4	2.5	2.4	n.a.
32	Sweden	1946-2009	3.6	2.9	2.7	n.a.	6.3
33	Spain	1946-2009	1.5	3.4	4.2	n.a.	9.9
34	Portugal	1952-2009	4.8	2.5	0.3	n.a.	7.9
35	New Zealand	1948-2009	2.5	2.9	3.9	-7.9	2.6
36	Netherlands	1956-2009	4.1	2.7	1.1	n.a.	6.4
37	Norway	1947-2009	3.4	5.1	n.a.	n.a.	5.4
38	Japan	1946-2009	7.0	4.0	1.0	0.7	7.0
39	Italy	1951-2009	5.4	2.1	1.8	1.0	5.6
40	Ireland	1948-2009	4.4	4.5	4.0	2.4	2.9
41	Greece	1970-2009	4.0	0.3	2.7	2.9	13.3
42	Germany	1946-2009	3.9	0.9	n.a.	n.a.	3.2
43	France	1949-2009	4.9	2.7	3.0	n.a.	5.2
44	Finland	1946-2009	3.8	2.4	5.5	n.a.	7.0
45	Denmark	1950-2009	3.5	1.7	2.4	n.a.	5.6
46	Canada	1951-2009	1.9	3.6	4.1	n.a.	2.2
47	Belgium	1947-2009	n.a.	4.2	3.1	2.6	n.a.
48	Austria	1948-2009	5.2	3.3	-3.8	n.a.	5.7
49	Australia	1951-2009	3.2	4.9	4.0	n.a.	5.9
50							
51			4.1	2.8	2.8	=AVERAGE(L30:L44)	

Source: <http://www.marketplace.org/topics/economy/excel-mistake-heard-round-world>

## References

Kenneth S. Rogoff Carmen M. Reinhart. Growth in a time of debt. NBER Working Paper, 2010.