TEACHING ETHICS TO: ECONOMETRICS STUDENTS

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Introduction

In statistical studies there are ethical considerations that must be taken into account in **collecting data**, **displaying** and **reporting findings**.

When conducting research, it is important to remember that any misconduct in the research process violates the **trust that society** places in the research.

Misconduct also **wastes time and resources** in misdirected efforts based on erroneous information.

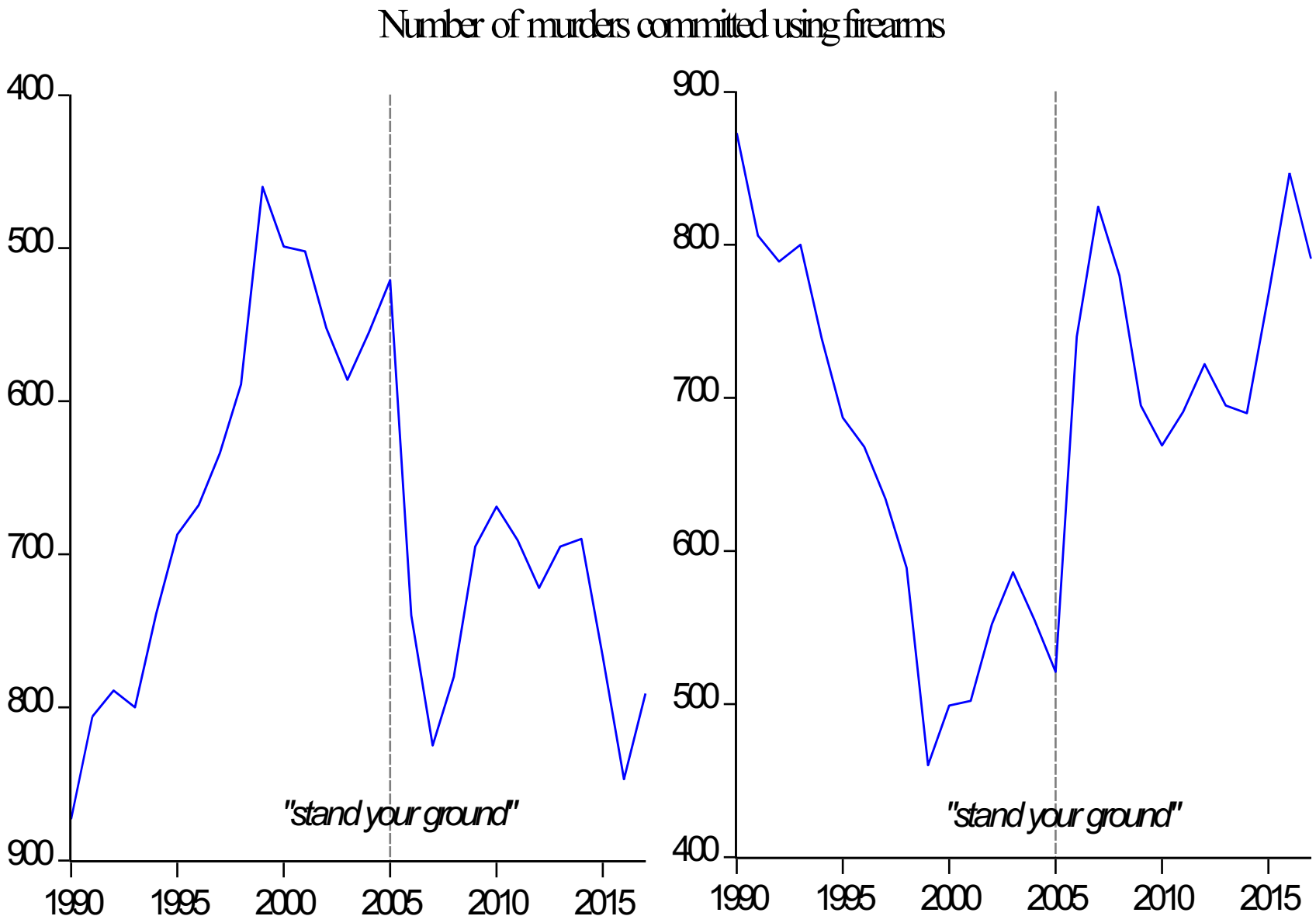
DISTORTING DATA

"Stand Your Ground"

In 2005 the Florida legislature passed the ***"Stand Your Ground"*** law.

It broadened the situations in which citizens can use lethal force to protect themselves against perceived threats.

Some believed that the law would ultimately ***reduce crime*** while others feared an **increase** in the use of lethal force.


Number of murders committed using firearms
400
500
600
700
800
900
1990
1995
2000
2005
2010
2015
"stand your ground"
900
800
700
600
500
400
1990
1995
2000
2005
2010
2015
"stand your ground"

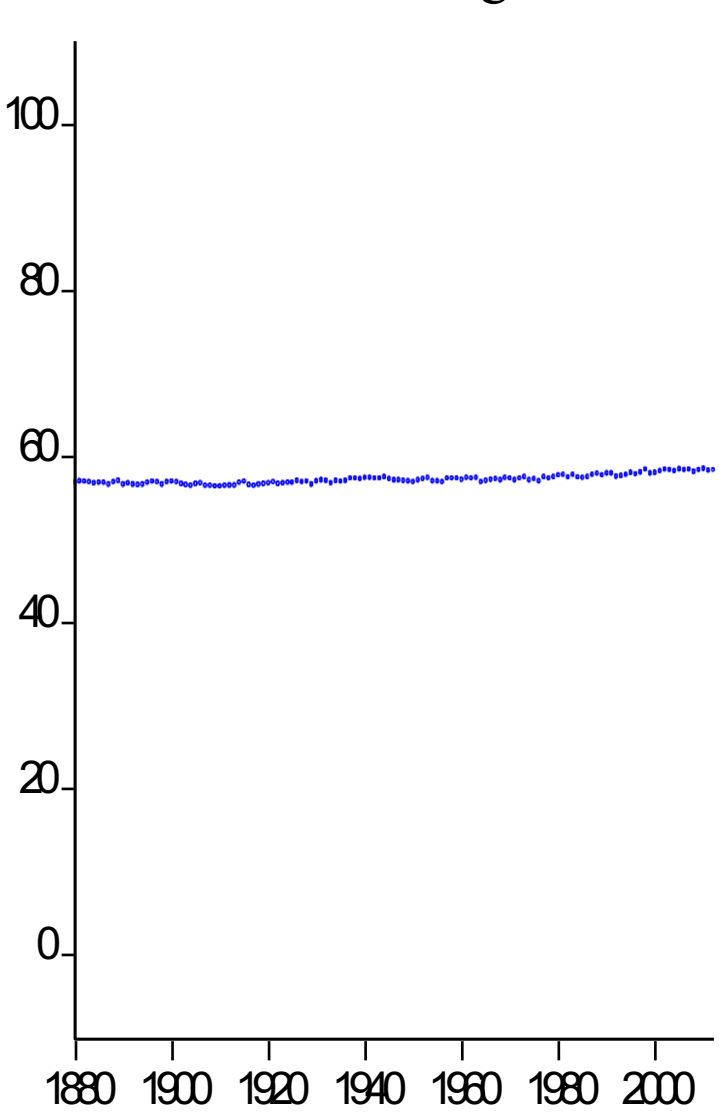
Global Temperature over Time

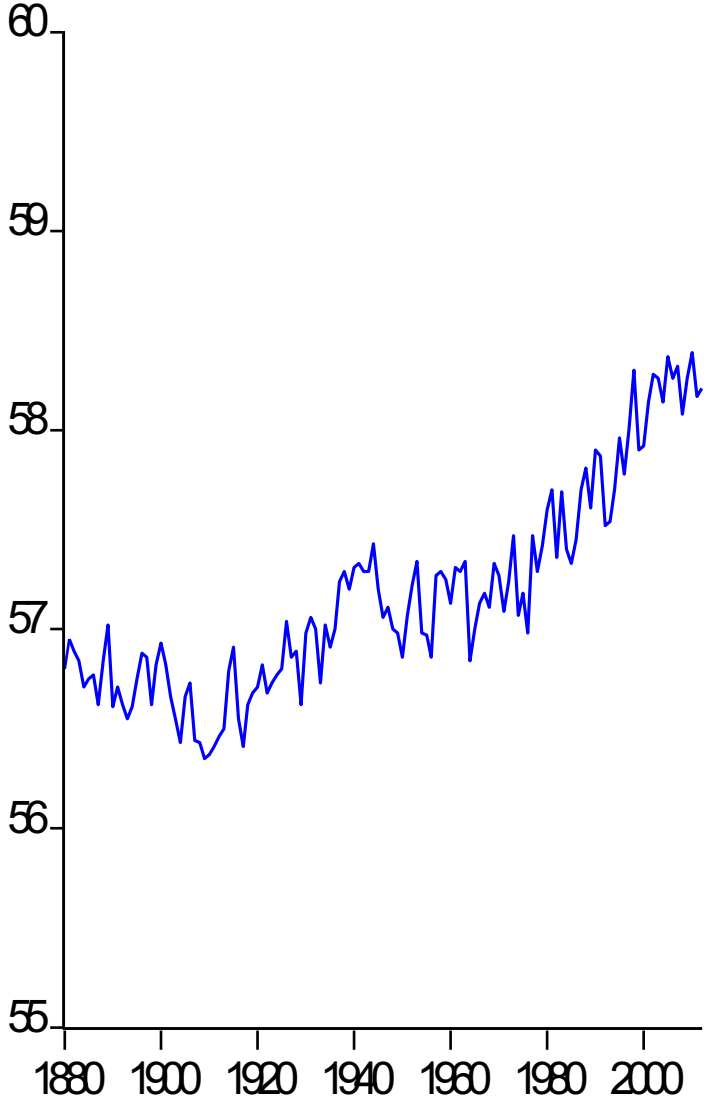
A news magazine tweeted on the subject of **climate change**.

The dominant visual impression of the graph is that global temperature has **hardly changed** at all.

Is this the **correct conclusion**?

Average Annual Global Temperatures in Fahrenheit 1880-2012





Questions you should ask yourself when constructing a graph:

(i) Does the message of interest stand out clearly?

(ii) Is the title of the graph evident?

(iii) Is everything clearly labelled leaving no ambiguity?

(iv) Do the axes maintain a constant scale?

(v) Are there any breaks in the numbers on the axes that may be easy to miss?

(vi) Is there information cluttering the graph or misleading the eye?

RESEARCH MISTAKES

All research is susceptible to error.

Researchers have an obligation to be as accurate and as careful as possible.

Results need to be written up carefully and clearly.

When writing up research avoid making value judgments and rely instead on economic facts and analyses.

Limitations of research should be highlighted.

Reinhart and Rogoff (2010) - Replication

Reinhart and Rogoff (2010) present a set of '***stylised facts***' concerning the relationship between public debt and GDP growth.

This research provided a major empirical foundation in support of ***austerity policies*** aimed at reducing the high public debt levels that emerged after the Global Financial Crisis.

Herndon et al. (2014) undertook a replication of this work and identify three problems:
(i) selective data exclusions, (ii) coding errors and (iii) an inappropriate weighting methodology used.

Reinhart and Rogoff (2010) key results on mean GDP growth in advanced economies between 1946 and 2009

Public debt/GDP ratios	GDP growth rates
<= 30%	4.1%
30-60%	2.8%
60-90%	2.8%
>90%	**-0.1%**

The focus of the Herndon et al. (2014) replication is the result that average real GDP growth rate over 1946-2009 for countries carrying a public debt/GDP ratio greater than 90% is -0.1 (see cells highlighted).

(i) ***Data exclusions –***

Reinhart and Rogoff (2010) exclude data on three countries which significantly affect their overall conclusion: **Australia (1946-50)**, **New Zealand (1946-49)** and **Canada (1946-50)**.

The reason behind these exclusions appear to be justified by the fact that these data are clustered in the years following WW2 when economic growth was high.

However, all data for the **USA** which was also in the >90% public debt/GDP category was included.

(ii) ***Spreadsheet errors*** –

There was a coding error in the spreadsheet which resulted in the data for 5 countries being excluded entirely (**Australia, Austria, Belgium, Canada and Denmark**). This has subsequently being acknowledged by Reinhart and Rogoff (2010) as an error.

Countries in which public debt/GDP >90% over 1946-2009	Years in which public debt/GDP >90%	Correct Total	Reinhart and Rogoff (2010) count through chosen exclusions	Reinhart and Rogoff (2010) count through chosen exclusions** plus spreadsheet errors
Australia	1946-50	5	**0**	**0**
Belgium	1947, 1984-2005, 2008-09	25	25	**0**
Canada	1946-50	5	**0**	**0**
Greece	1991-2009	19	19	19
Ireland	1983-89	7	7	7
Italy	1993-2001,2009	10	10	10
Japan	1999-2009	11	11	11
New Zealand	1946-49, 1951	5	1	1
UK	1946-64	19	19	19
USA	1946-1949	4	4	4
Totals		**110**	**96**	**71**

(iii)Inappropriate weighting in calculating summary statistics

Reinhart and Rogoff (2010) generate mean values for GDP growth through averaging by country.

Each country counting as a single observation no matter how many years it appears in any given public debt/GDP category: 19 years for the UK or 1 year only for New Zealand.

Countries in which public debt/GDP >90%	**Reinhart and Rogoff (2010)**	Alternative country-year weighting
Australia:1946-50	No years in sample	3.8%: (weight 5/110)
Belgium:1947,1984-2005,2008-09	No years in sample	2.6%: (weight 25/110)
Canada: 1946-50	No years in sample	3.0%: (weight 5/110)
Greece: 1991-2009	2.9%: (weight 1/7)	2.9%: (weight 19/110)
Ireland: 1983-89	2.4%: (weight 1/7)	2.4%: (weight 7/110)
Italy: 1993-2001,2009	1.0%: (weight 1/7)	1.0%: (weight 10/110)
Japan: 1999-2009	0.7%: (weight 1/7)	0.7%: (weight 11/110)
New Zealand: 1946-49, 1951	-7.9%: (weight 1/7)	2.6%: (weight 5/110)
UK: 1946-64	2.4%: (weight 1/7)	2.4%: (weight 19/110)
USA: 1946-49	-2.0%: (weight 1/7)	-2.0%: (weight 4/110)
Average GDP growth for all countries in >90% public debt/GDP category	**-0.1%**	**2.2%**

Standard errors on the two averages:

For column 1:

Coefficient	Std. Error	t-Statistic	Prob.
-0.0714	1.14458	-0.049404	0.9622

For column 2:

Coefficient	Std. Error	t-Statistic	Prob.
2.174545	0.377109	5.766365	0.0003

Opinion

The Excel Depression

By Paul Krugman

April 18, 2013

470

In this age of information, math errors can lead to disaster. NASA's Mars Orbiter crashed because engineers forgot to convert to metric measurements; JPMorgan Chase's "London Whale" venture went bad in part because modelers divided by a sum instead of an average. So, did an Excel coding error destroy the economies of the Western world?

The story so far: At the beginning of 2010, two Harvard economists, Carmen Reinhart and Kenneth Rogoff, circulated a paper, "Growth in a Time of Debt," that purported to identify a critical "threshold," a tipping point, for government indebtedness. Once debt exceeds 90 percent of gross domestic product, they claimed, economic growth drops off sharply.

Ms. Reinhart and Mr. Rogoff had credibility thanks to a widely admired earlier book on the history of financial crises, and their timing was impeccable. The paper came out just after Greece went into crisis and played right into the desire of many officials to "pivot" from stimulus to austerity. As a result, the paper instantly became famous; it was, and is, surely the most influential economic analysis of recent years.

What do we learn?

Mistakes in research do occur and can be found even among published journal articles.

Research misconduct does not include honest error.

It is important to carefully document every step of your research.

Also check and double-check your results.

Remember though that this replication possible due to the data being made available by the original author.

FRAUD AND RETRACTIONS

Research misconduct includes:

Fabrication - eg. *making up data or results*

Falsification - eg. *omitting data so the research isn't accurately represented*

Plagiarism - eg. *appropriating another person's ideas without giving appropriate credit*

More Evidence That Nutrition Studies Don't Always Add Up

By Anahad O'Connor - The New York Times Sept. 29, 2018

Not too long ago, Brian Wansink was ***one of the most respected food researchers*** in America.

He founded the Food and Brand Lab at Cornell University, where he won attention for studies that ***showed that small behavioural changes could influence eating patterns***.

He found ***that large plates lead people to eat more food because they make portions look smaller*** and that ***children eat more vegetables when they have colourful names like "power peas"***.

His research led the government to spend almost $20 million redesigning school cafeterias - the Smarter Lunchrooms Movement.

His ***career at Cornell came to an unceremonious end***.

The university announced after a year-long investigation he had committed *"academic misconduct in his research and scholarship, including misreporting of research data"*

The announcement came one day after ***JAMA retracted six of his studies*** because of questions about their *"scientific validity"*.

His lab was known for ***data dredging, or p-hacking, the process of running exhaustive analyses on data sets to tease out subtle signals that might otherwise be unremarkable***.

Emails also showed that he ***prodded researchers in his lab to mine their data sets for results that would "go virally big time"***.

This behaviour ***would not even make Retraction Watch's list of the top 30 scientists with the most retracted papers. One person on the list, has had 183 retracted papers***.

What about economics?

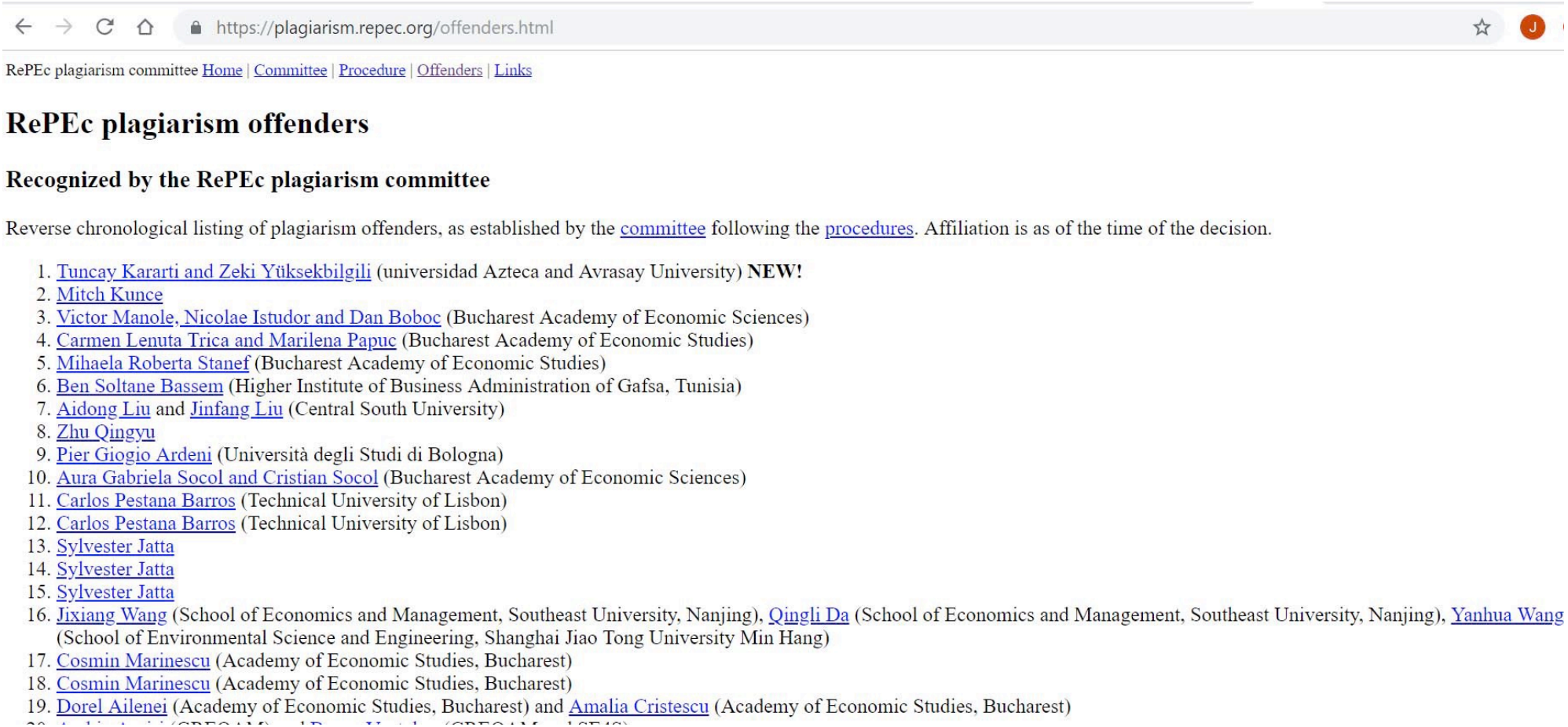
Nector (2014) surveyed economists and found that **1-3.5%** admitted to the **correction**, **fabrication** or **partial exclusion of data** or the **copying** of another person's work.

The use of **tricks** to increase *t*-values, R^2 is reported by **7%**.

Around **20%** admitted to **not citing others' work** that **contradicted** their own analysis.

39% reported questionable practices of data analysis such as the "***selective presentation of findings so that they confirm one's argument***".

RePec website that highlight cases of plagiarism in Economics where all cases documented have been evaluated by a committee



SUMMARY

Good statistical practice is fundamentally based on **transparent assumptions**, **reproducible results**, and **valid interpretations**.

When conducting research, a set of **ethical guidelines** would include:

1. Using **software systems** that have been vetted by the community.

2. Check that your **data** are what you believe them to be. Acknowledge data editing procedures.

3. Be aware of the **limitations, defects, or biases** in your data that may affect the integrity or reliability of the statistical analysis.

4. Manipulating **images** for improved clarity is accepted, but manipulation for other purposes is scientific ethical abuse.

5. Clearly **acknowledge** the work of others.

6. Use **appropriate analytical methods** and report the limitations of statistical inference and possible sources of error.

7. Convey the **findings** in ways that are both honest and meaningful to the reader. Check the **robustness** of your results.

8. Discuss both the **statistical significance** and the **economic significance** of the estimated coefficients of interest.

9. Are your **results reproducible**?

10. Promptly correct any **errors** discovered.