



# Screening public procurement data to detect bid-rigging: the Brazilian experience

ICN Cartel Workshop 2018 – Mini Plenary #2 – Ottawa, Canada

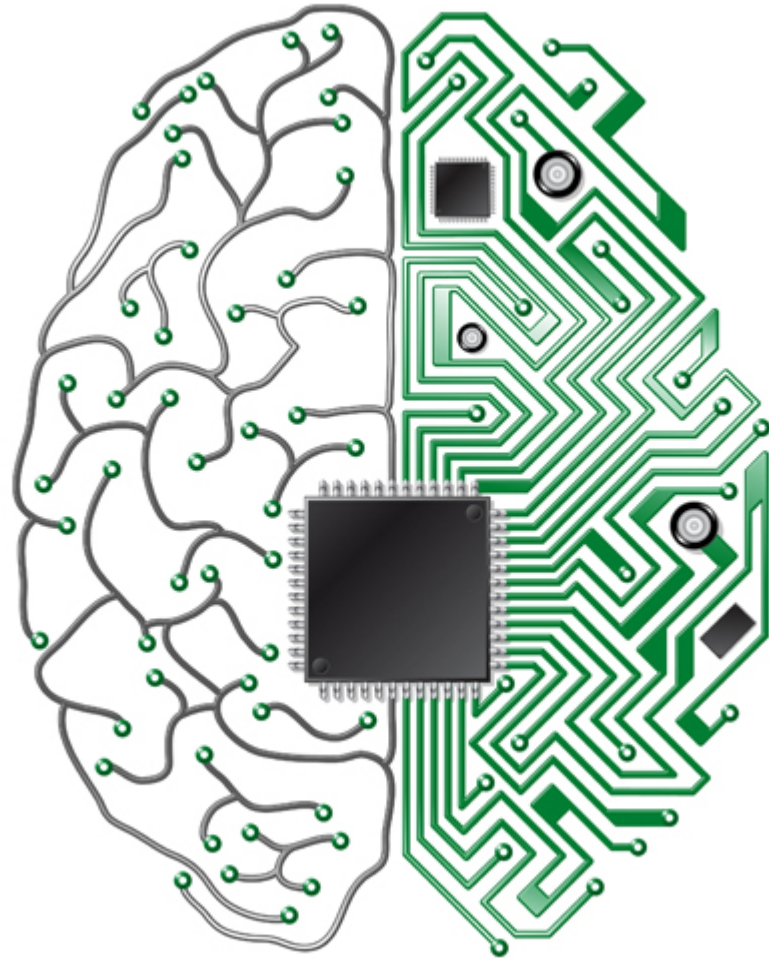
**Diogo Thomson de Andrade**  
*Acting General Superintendent of Cade*



[The views expressed in this presentation does not necessarily represent CADE's opinion]

# AGENDA

1. “The Brain Project” - How did we get there?
2. What are we screening?
3. What is the future of the “Brain Project”?



# “The Brain Project” - 2017

CÉREBRO v3.6

AJUDA

INÍCIO

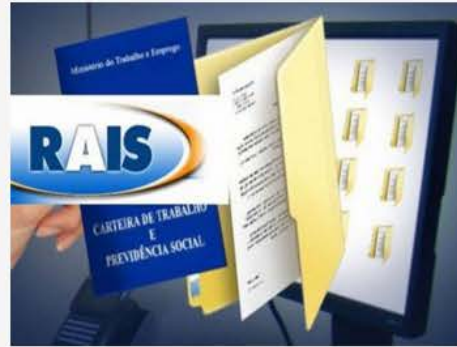
SOBRE

logout

CADASTRAL  
DATABASE



EMPLOYMENT  
RELATIONSHIP



CORPORATE  
NETWORKS



ECONOMIC  
FILTER



DATA  
MINING



# 1. “The Brain Project” – How did we get there?

- 1.1. Team management
- 1.2. Data collection
- 1.3. Database development
- 1.4. Algorithm development



## 1.1. Team management

2013-2015

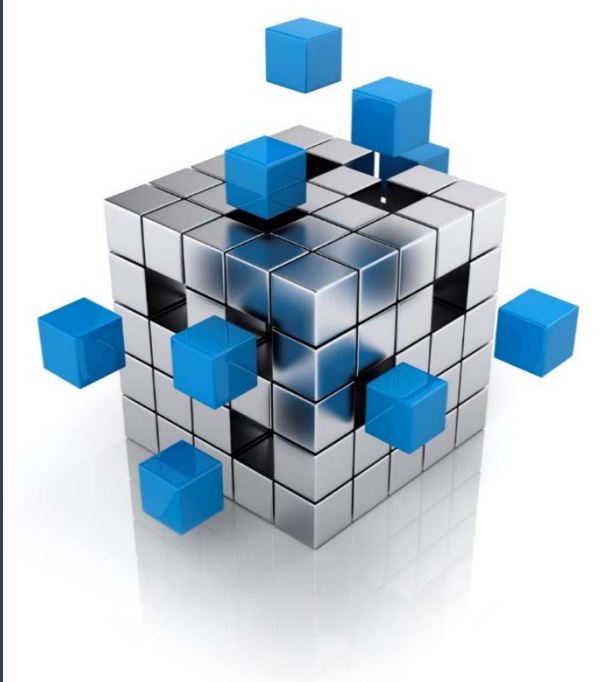
- \* In house team (2)
- \* IT consultant (1)
- \* Statistics consultant (1)

2016-2017

- \* In house team (3)



## 1.2. Data collection



>2TB  
~40 databases

Public bids  
database

- Federal Government, DF, RJ, RS, PB, PI, CE, MG, Petronect, Brasil Bank

Budget  
implementation  
database

- PE, SP, DF, RJ, RS, PB, ES, GO, PI, CE, MG

Others database

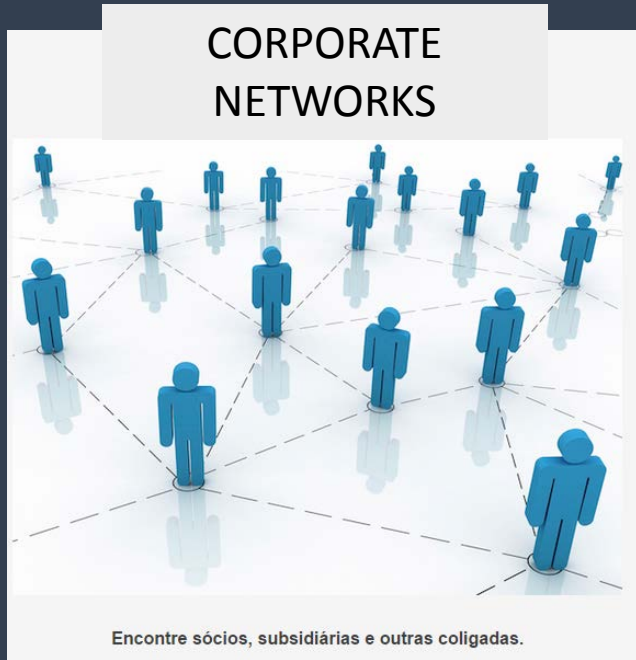
- RAIS, ANVISA, CMED, ANPGeo, Federal Revenue



# 1.3. Database development



# 1.3. Database development



VM 10.1.30.41

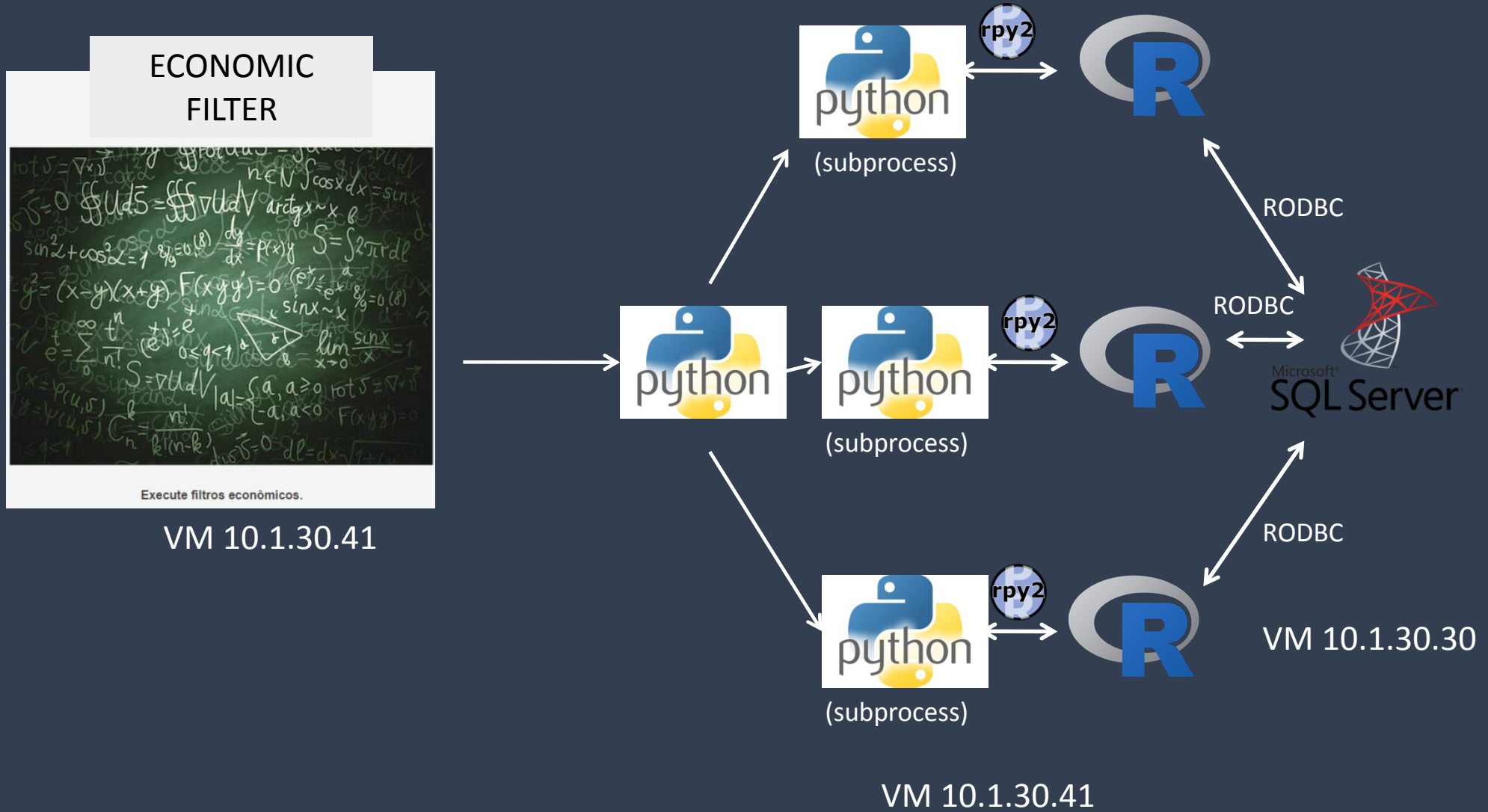


VM 10.1.30.41

# 1.3. Database development



# 1.4. Algorithm development



## 2. What are we screening?

Possible techniques:

2.1. Ranking

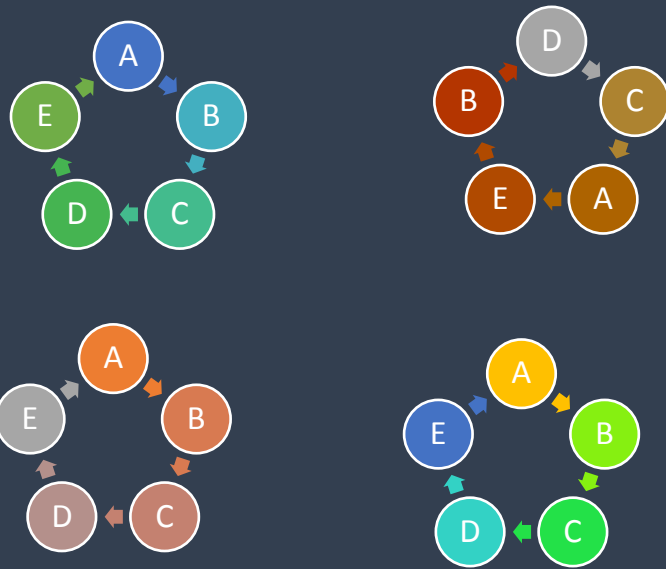
2.2. Benford

2.3. Abrantes-Metz and “similar”

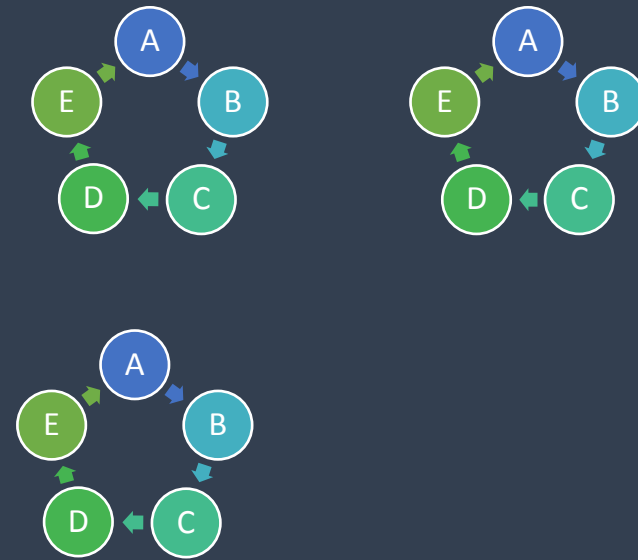
# 2.1. Ranking

## Expected variation

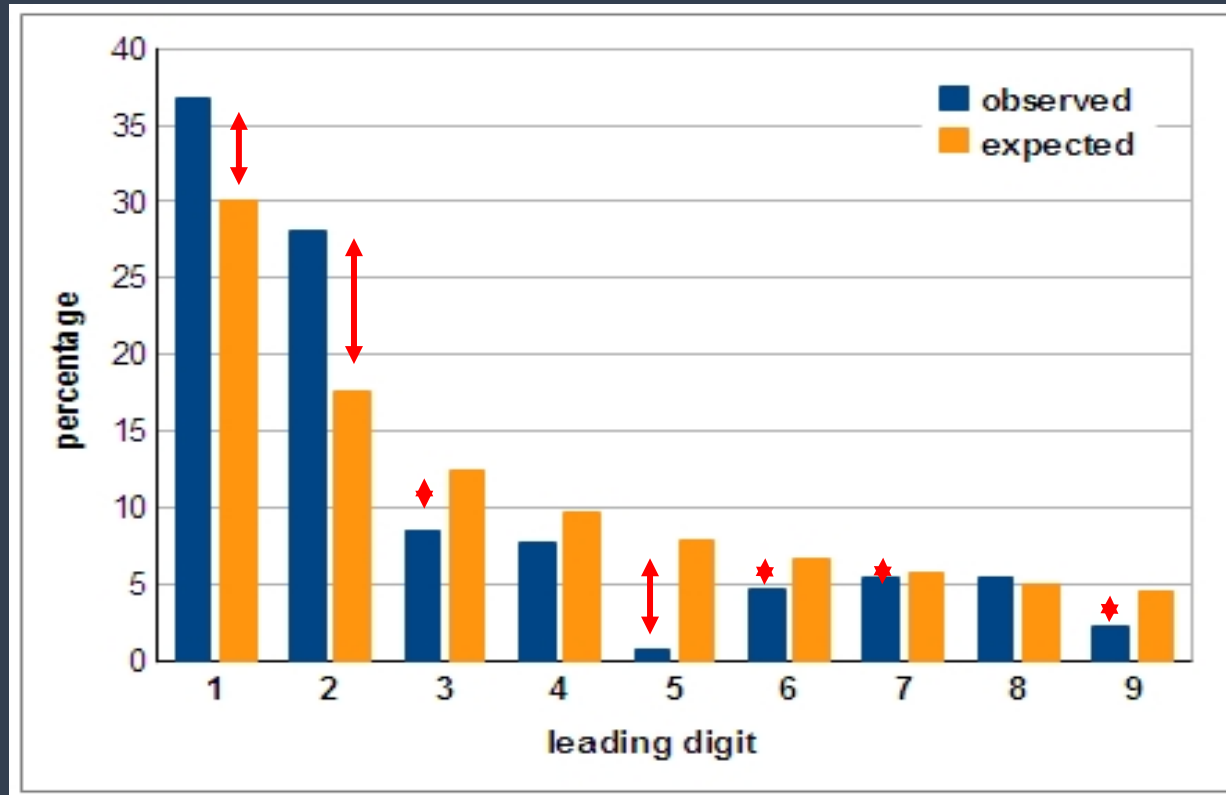
Bayes-Nash Equilibrium



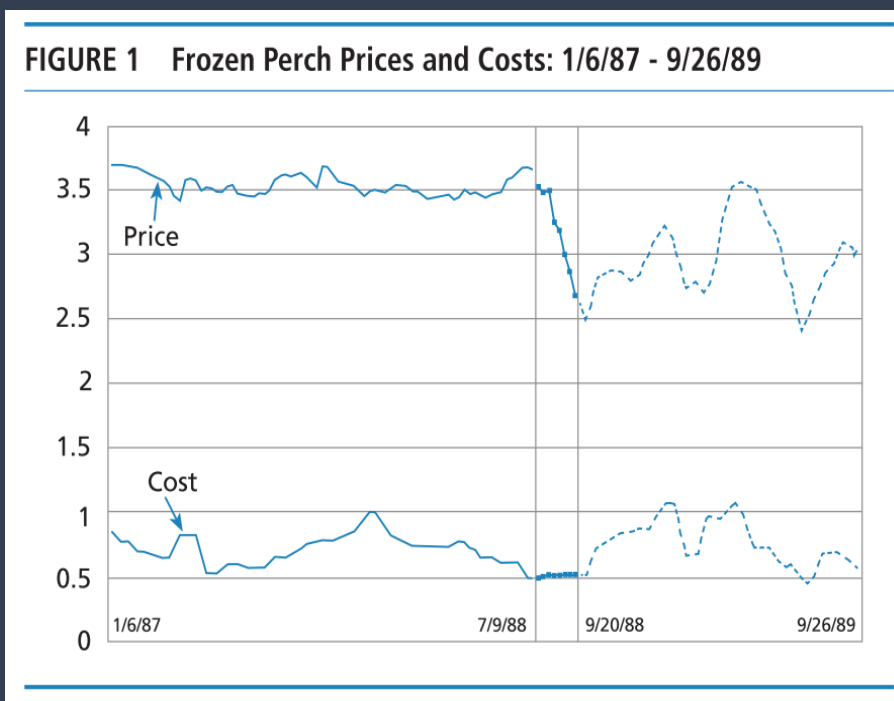
## Actual variation



## 2.2. Benford

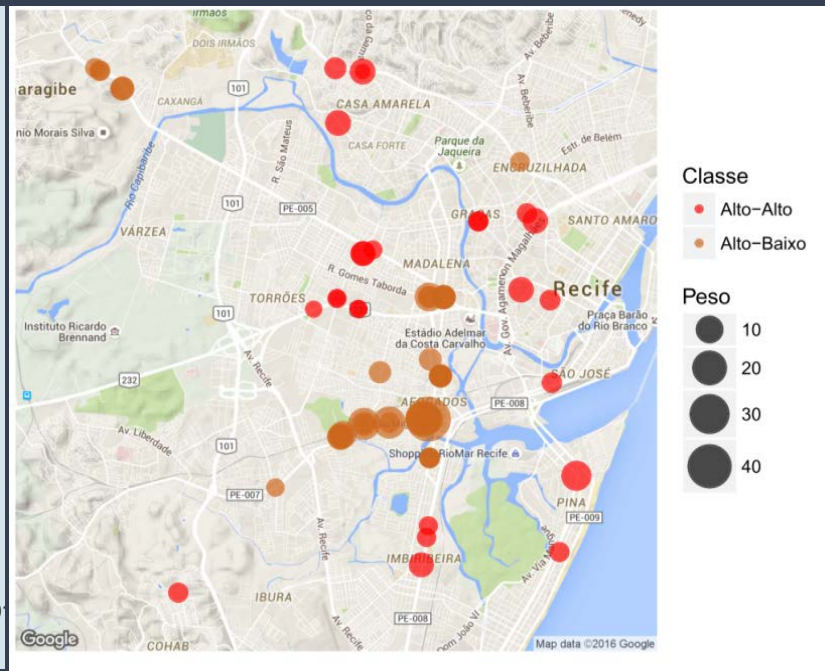
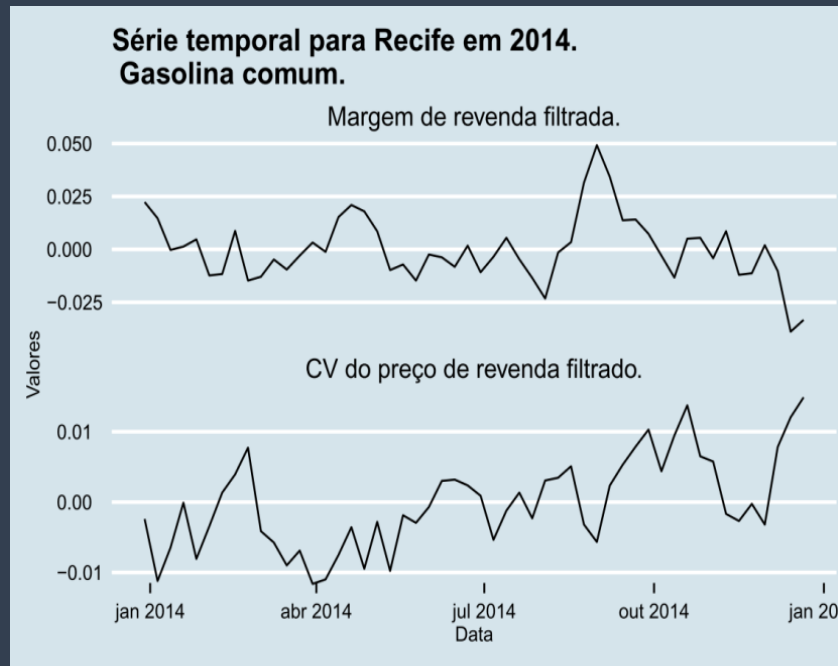


## 2.3. Abrantes-Metz and “similar”





# Abrantes-Metz and “similar” National Petroleum Agency Brazil (ANP)



## 3. What is the future of the “Brain Project”?

- 3.1. Enhancement of preexisting cases
- 3.2. Screening and detection of new cases

# 1. Enhancement of preexisting cases

## NOTÍCIAS

### **CADE's General Superintendence initiates administrative proceeding to investigate a cartel in the market of orthoses, prostheses and special medical supplies**

Cartel

The defendants will be notified to present their cases

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After gathering initial evidence, CADE's General Superintendence, supported by the Federal Police, unleashed the Operation "Mercador de Veneza", with dawn raids that collected evidence, which is being used in the current investigation. In addition to traditional methods of evidence gathering, new methods were also used to analyze evidence by utilizing algorithms of behavioral patterns to detect collusive characteristics in bids.

The use of algorithms as an investigation device forms part of the system known as "Cérebro", developed by the General Superintendence in 2015. Besides the initiation of the two administrative proceedings, the inquiry will remain open for additional investigation regarding other companies.

## 2. Screening and detection of new cases





Thank you! Merci!

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