## Economic Intelligence Factory



## About QuantCube Technology



## QUANTCUBE TECHNOLOGY

Data science driven real-time macroeconomic analysis



## **BIG DATA ANALYTICS FOR MACROECONOMICS**

### **Unique Datalake**

Satellite Data

# Zerom on the major Industrial zone in China 2020 04 01 : 2020 04 15 2019 04 01 : 2019 04 15 2020 04 01 : 2020 04 15

### Maritime, Air & Road Traffic



### Multi-lingual Social Media

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	2028 66 67 02 18 36	MapultureEconvar د (اغل طر مناسس (الارسان ٢٠ طر، وطر وما ليو اسطي ، لولو زا ستر العدود (التر ستر	344	0.972
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	3020-06-08 21:32:00	ANDERECONDER AND	prs.	0.021
х	2020-06-08-12 10:29	ting (CoopGARBA) ، عدد في تبة جمع تان (بله + علي عبد الدار بعض الع المانية (دانه الاسترسم	204	0.998

### Many other data sources...



### Provides unique real-time macro data USA, Eurozone, China

### GDP Nowcast – US, Eurozone, China



### International Trade, Employment, Industrial Production, Consumer Spendings, ...

Country



15.04

-10.0

07.01 15.0

07.02 13.02 01.03 15.03

		10033303
United States	67.9	-30.39
France	61.4	-37.39
China	113.9	-10.5%
Japan	83.3	-18.9%
United Kingdom	73.0	-23.89
Canada	93.2	-14.6%
Italy	58.0	-38.3%

57.7

INTERNATIONAL TRADE INDEX BY COUNTRY

Current

Situation (NSA)

Change over

QuantCube GDP Nowcest Index - China

Updated on Jun 09 02:00 CEST

### Use cases

### See what Wall Street does not see (feedback) May 7, 2020



### **Investment Strategies**

4 Strategies - NowCast US + Nowcast EUR + US Employment + International Trade US S&P500 and STOXX50 Index - Sharpe : 1.36



Russia

## THE REFERENCE IN REAL-TIME MACROECONOMICS

### "Data Science for Economics and Finance: Methodologies and Applications" – Springer Edition



Massive data analytics for macroeconomic nowcasting

Peng CHENG and Laurent FERRARA and Alice FROIDEVAUX and Thanh-Long HUYNH

Abstract Nowcasting macroeconomic aggregates has proved extremely useful for policy-makers or financial investors, in order to get a real-time reliable information to monitor a given economy or sector. Recently, we witnessed the arrival of new large databases of alternative data, stemming from Internet, social media, satellites, fixed sensors, texts ... By correctly accounting for those data, especially by using appropriate statistical and econometric approaches, the empirical literature has shown evidence of some gain in nowcasting ability. In this chapter, we propose to review recent advances of the literature on the topic and we put forward innovative alternative indicators to monitor the Chinese and the U.S. economy.



Insee, QuantCube, PSE, CANDRIAM and Société Générale create a new research Chair :

« Measurement in Economics, Nowcasting – Beyond GDP »



A new Chair gathering five partners is created at PSE. It aims to contribute to the progress of economic statistics methods, by promoting the mobilization of new sources and the development of very short-term forecasting tools (Nowcasting), and by continuing the reflections initiated from the Stiglitz Commission on a deepening of the statistical measurement of economic performance and well-being (Beyond GDP). On these two components, the objective of the Chair is to better meet the expectations of private and public decision-makers, and more broadly of the social demand on these subjects.

#### AN EXCEPTIONAL PARTNERSHIP



SOCIETE GENERALE

Corporate & Investment Banking

This Chair is the result of an exceptional and original partnership, thanks to the diversity and the complementarity of the entities who are committed to sharing and carrying out their ambitions in these fields of research. It brings together the French National Institute of Statistics and Economic Studies (INSEE), whose work in this field is authoritative, a start-up offering macroeconomic forecasts based on Big Data and Artificial Intelligence (QuantCube Technology), an international asset management company (CANDRIAM) and a major French bank (Société Générale), that together intend to develop their methods of economic measurement and analysis, and a research and teaching center (Paris School of Economics) that has always been committed to a quantified and statistical approach in economics. The Chair will be able to develop scientific collaborations and mobilize diverse expertise. For example, it will collaborate with the OECD in the framework of its WISE (Wellbeing, Inclusion, Sustainability and Equal Opportunity) program.

### **Prediction of US Elections - Twitter Analytics** Publication with JP Morgan Global Macro Quant Team



· As an example, Figure 1 below shows the difference in Biden - Trump support in some swing state counties (AZ, FL, GA, MI, NC, OH) with sufficient Twitter user data. These counties are sorted into quartiles by Hispanic population % when combined with county demographic information. As we can see, in counties with the highest Hispanic % (yellow line = 4), Trump has made the most significant gains since late September. This could be useful in informing us the voter support in states such as FL and AZ.

29 October 2020





#### The state of tourism in Africa during Covid-19 and beyond: Evidence from big data<sup>1</sup>

Rabah Arezki,<sup>a,b,c</sup> Alice Froidevaux,<sup>d</sup> Thanh-Long Huynh,<sup>d</sup> Ha Minh Nguyen<sup>b</sup> and Nicolas Salez<sup>d</sup>

"African Development Bank; "World Bank; "Harvard Kennedy School; <sup>4</sup>QuantCube Technology

#### INTRODUCTION

For many African countries, tourism provides a substantial share of jobs and foreign receipts. As of 2018, tourism receipts represented about 40% of exports over GDP for the Seychelles and Mauritius and were as high as 70% for Sao Tome and Principe (see Figure 1). For the continent as a whole, tourism contributed US\$168.5 billion, accounting for 7% of Africa's GDP in 2019 (World Travel and Tourism Council 2020). The Covid-19 pandemic has brought tourism to a sudden standstill. In this chapter we use big data analysis to explore the effect of the pandemic on tourism in Africa and discuss how to shape recovery for the sector.



## **Sector Intelligence**

## With Satellite Image Analysis



## COMPUTER VISION ANALYTICS

Data science driven real-time macroeconomic analysis

Satellite imagery strengthens our multisourcing datalake for our Economic Intelligence Factory

Satellite images benefits:

- Quantitative and qualitative indicators that can be **compared** across countries (including countries where little official data is disclosed)
- **Granular** information available at the asset, regional or country level
- **Transparent** information that is not dependent on government-reported data
- Access to historical data to build time series

Based on a very fundamental approach, we identify the sectors that drive the economy of countries and cities. Then we select the data sources that allow us to track these sectors in real time





## COMPUTER VISION ANALYTICS

Data science driven real-time macroeconomic analysis

Using **satellite data analytics**, QuantCube Technology added to the existing product 'Global Macro Smart Data' a significant added value layer, allowing to provide a granular vision of the activity of each sector of the economy.

QuantCube Technology has developed a new methodology of creating high frequency industrial macro-indicators based on **satellite images**.

- Urban Growth Index
- Pollution Monitoring
- > Agriculture Yield Index
- Water Stress Monitoring
- Deforestation Monitoring
- ➤ Etc..



## Real Estate Intelligence



## QUANTCUBE REAL ESTATE INTELLIGENCE



With low-resolution & high-resolution satellite images

Using low- and high-resolution satellite images to track new construction



With low-resolution & high-resolution satellite images

Identify new constructions in an area of interest, whether in Europe, America or Asia





Detection of areas that have become generally urbanized



With low-resolution & high-resolution satellite images

S2B

Bandwidth

(nm)

45

98

46

39

20

18

28

133

32

27

76

141

238

Central

(nm)

442.3

492.1

559

665

703.8

739.1

779.7

833

864

943.2

1376.9

1610.4

2185.7

Spatial

resolution

(m)

60

10

10

10

20

20

20

10

20

60

60

20

20



City La Plata in Argentina, August 2018:



Multispectral image



With low-resolution & high-resolution satellite images

## Identify new constructions in an area of interest, whether in Europe, America or Asia.



### TRACKING REAL ESTATE ACTIVITY With Telecom Data and Satellite Images

Using Telecom data and satellite images on specific ROI to estimate commercial & logistics real estate activity





QuantCube Activity Level Indicator led to a joint paper with the CNES
<u>Scientific article titled 'Vehicle detection and counting from VHR Satellites images' published with CNES (French Space Agency) & IRISA – Oct 2019</u>



## TRACKING REAL ESTATE ACTIVITY

### With Satellite Images

 Get the number of vehicles per ROI
 Aggregation per sector (Macro Smart Data) or company (Equity Smart Data)



Scientific article titled 'Vehicle detection and counting from VHR Satellites images' published with CNES (French Space Agency) & IRISA – Oct 2019



### TRACKING REAL ESTATE ACTIVITY With Satellite Images

Pléiades images (70 cm of resolution)

### Challenging: cars are composed of

few pixels!

We implemented a detection model (YOLO) and a segmentation model (Tiramisu)

→ A mixed model based on both predictions increases the number of detected vehicles.

### Mixed model :

- Recall = 80.3%
- Precision = 81.8%



Tiramisu



### Mixed model



## Satellite Image Analysis

A multitude of applications



## COMPUTER VISION ANALYTICS

### Satellites & Applications

- **Earth Observation satellites** : Sentinel 2 & Landsat 7&8
- **High Resolution satellites** : Pléiades (50cm resolution)
- Atmospheric satellites : Sentinel5P & OCO-2
- Radar satellites : Sentinel 1

- Thermal images : Landsat 8 & Sentinel 3







## COMPUTER VISION ANALYTICS

### Satellites & Applications





etc...



### **CONTACTEZ-NOUS POUR EN SAVOIR PLUS SUR NOS SOLUTIONS!**

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