

Project: Estimation of Inflation by components

Abstract

“It is not the strongest of the species that survives, but rather, that which is most adaptable to change”, Darwin.

The recent digital revolution reformed our societies’ economic models as well as our access to information, which availability broadens exponentially.

Nevertheless, the main barrier to exploit this massive amount of unstructured information is still the adapted technology and required experience for it.

Into this turning point, whereas large institutions struggle to improve their economic predictive models with traditional sources of information, QuantCube Technology offers for more than 2 years now its expertise in Big Data analytics through economic and financial applications.

Indeed, we cover a wide range of data sources including social and professional networks, online retailers, blogs, auction markets, meteorological data, etc.

Among many applications, from creating sentiment indexes on US and Chinese equity markets to a real-time weather monitoring of agricultural harvest’s fields, we now focus on predicting global-macro trends using Big Data analytics, more precisely the real-time tracking of Eurozone inflation as a start.

Big Data analytics will be used to break down inflation’s main components and particularly to track in real-time the most difficult-to-estimate ones, among each of the main Eurozone countries.

Identification of project

Name and contact information of head scientist:

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Project description

Project Outline:

1. Understanding the macroeconomic theory on inflation
2. Understanding each micro-factors’ impacts among the inflation’s basket of goods and services
3. Determining a relevant scope of micro-factors which erratic behaviors affects short-term Inflation trends
4. Structuring and Automating the real-time Data-Mining and aggregation of these micro-factors
5. Modelling the inflation index short-term dynamics based on these micro-factors’ dynamics
6. Conducting and adapting the studies 2. 3. 4. 5. for the main Eurozone countries:
 - a. Germany
 - b. France
 - c. Italy
 - d. Spain
7. Aggregating the 4 inflation indexes on different countries into 1 global Eurozone inflation index

Methods:

Traditionally, inflation rate forecasts are based on scenarios involving macro-economic and market data such as Crude Oil futures term-structure, EUR/USD exchange rate, Risk-aversion, financial institution flows (Bonds emission, Bonds purchasing during quantitative easing).

However, history showed that these kinds of macro forecasts and official numbers generally differ, sometimes by far.

A complementary method of forecasting inflation is getting back to its basic definition: originally, a good proxy of inflation is computed as the weighted average of prices of a consumer goods and services basket (Consumer Price Index).

By breaking down this basket at the micro-level, we can identify which groups of goods and services have the most erratic behaviors, making inflation hard to forecast in a classical way.

This is where employing Big Data analytics makes sense: tracking such erratic data (through retailer prices on the web for example) and understanding their impacts on inflation dynamics brings us high value-added information in real-time.

To correctly track the Eurozone inflation, the project plans in a first step to conduct separately this study on the main Eurozone countries including Germany, France, Italy and Spain.

In a second step, these country-based inflation proxies will be aggregated to provide a global Eurozone Inflation proxy.

This Big Data tracking can then:

1. Provide a real-time less-biased proxy of inflation
2. Help economic and financial institutions (Central Banks, Investment Banks, Statistic Institutes) adjusting their forecasts in real-time:
 - a. On inflation
 - b. But also on macroeconomic forecasts depending on inflation (GDP for example)
3. Provide smart exposure advices on financial markets (through inflation derivatives for example)

This project gathers at the same time Statistical and Mathematical researchers, Inflation specialists, and Big Data professionals.

The combination of these three complementary expertises ensures that:

1. The data are the relevant ones to look at (a relevant picking of micro-factors impacting the global inflation trend)
2. The data-mining process is well-structured, with a real-time feed
3. The subsequent models are stable and adapted to practical constraints