

<https://www.jpmorgan.com/insights/research/macrosynergy-quantamental-system>

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RESEARCH

## J.P. Morgan Macrosynergy Quantamental System

Macro quantamental trading made easy by breaking down the barriers between purely quantitative and fundamental trading styles.

The J.P. Morgan Macrosynergy Quantamental System (JPMaQS) tracks macroeconomic concepts, like growth, inflation and macroeconomic balance sheets, and transforms them into macroeconomic quantamental indicators, making it easy to use quantitative-fundamental information for algorithmic trading and for the development of discretionary trading tools.

Today JPMaQS processes nearly 1 billion raw data points, cleaning and wrangling them into over 300 million high-quality data points, or 10 million data vintages, to produce over 5,000 macro quantamental indicators, the "building blocks" used to create trading signals and macro quantamental systematic strategies. New data and data sets are added to this process every day.

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Macro quantamental indicators are real-time dated “quantitative-fundamental” information on economic financial developments that are relevant for market trends.

Using macro quantamental indicators and strategies provides for an information advantage on macro factors across global fixed income, foreign exchange, equity, credit and commodity markets. It is also a major cost saver, compared to the alternative of building clean real-time macro data series for financial markets on an ad-hoc and single institution basis.

JPMaQS is a premium data offering and a commercial/paid data service - however the license fee is a fraction compared to the significant higher resources/costs necessary to source, clean and condense this type of data in-house. Information and documentation on JPMaQS is available on [J.P. Morgan Markets](#), and the macro quantamental indicators are available via [DataQuery API](#) (simple and fast authentication via OAuth).

## What is macro quantamental data? +

### Key Capabilities

Building strong quantamental indicators requires in-depth economic data knowledge, extensive data wrangling, logical rigor, econometrics/machine learning, careful documentation and consistency across countries.

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By translating fundamental data into a real-time measures of the market's information state, JPMaQS breaks down barriers between purely quantitative and fundamental trading styles.

JPMaQS adds complementary quantamental indicators to standard algorithmic trading features.

JPMaQS delivers four key services:



**Quick and easy access to tradeable data**



**Clear and concise explanations of the themes**



**Curation and common-sense oversight**



**Generic returns - as a service - for quick and easy backtesting**

## Data



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## Data

Quantamental indicators associate the measurement of an event with the time at which markets have access to it - and for as long as this measurement would be the latest relevant instance of information of its kind. This means values are associated with real-time dates, and quantamental indicators always represent information status.

For most types of information the real-time date principle implies that a quantamental indicator is based on a two-dimensional data set:



**The first dimension is the timeline of real-time dates**



**The second dimension is the timeline of observation dates**

Macro quantamental indicators are delivered in the right format for developing and backtesting trading strategies. The system provides clear and concise explanations of its indicators from the perspective of strategy builders.

## Themes

Trends are point-in-time indicators that capture actual fundamental developments. JPMaQS classifies macro quantamental indicators in six broad quantamental themes:



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 <p><b>Economic trends</b> Indicators of changes in economic conditions designed to capture actual fundamental development as opposed to data volatility.</p>	 <p><b>Macroeconomic balance sheets</b> Indicators of the state of the economy in terms of stocks and valuations.</p>	 <p><b>Financial conditions</b> Indicators that track the conditions of the broader financial system and its impact on the economy.</p>
 <p><b>Shocks and risk measures</b></p>	 <p><b>Stylized trading factors</b></p>	 <p><b>Generic return</b></p>




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**Shocks and risk measures**



**Stylized trading factors**



**Generic return**



### Shocks and risk measures

Indicators of changes in expectations, uncertainty and risk aversion.



### Stylized trading factors

Stylized trading factors are generic indicators of basic trading strategy ideas based on macro quantamental indicators and, possibly, conventional trading factors.



### Generic return

Generic returns indicators are: Approximate daily profit and loss series of stylized derivatives positions in % of notional or risk capital. This includes returns on vol-targeted and hedged positions on all major asset classes.

How do macro quantamental indicators differ from standard economic data? +



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IDMaOS allows research analysts and portfolio managers to obtain the





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## How do macro quantamental indicators differ from standard economic data?

Quantamental indicators often have similar names as standard economic time series, even though their calculation and meaning are different. The main difference is that they measure market information status for any given day, not an ex-post (and often revised) actual state of the economy. Even where differences appear to be small, the distinction between a macro quantamental indicator and a standard economic time series can have a big impact on dynamic investment strategies, particularly during crises when exact real-time data can deviate drastically from simple approximations.

The JPMaQS data can be downloaded through DataQuery, either through its API or its User Interface on J.P. Morgan Markets.

[Access JPMaQS via J.P. Morgan Markets →](#)



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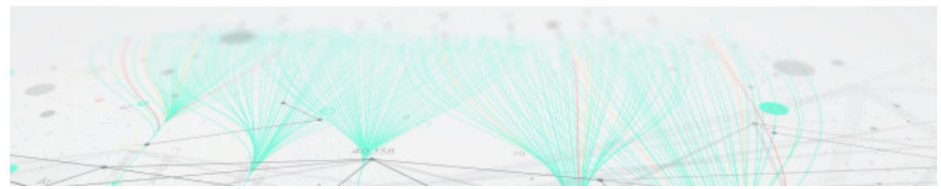


JPMaQS allows research analysts and portfolio managers to obtain the best possible information about the state of an economy at the time at which it was available. This means higher quality backtesting.

**Luis Oganés**  
Head of Global Macro Research  
J.P. Morgan



**An introduction to JPMaQS:  
a video with Ralph Sueppel and Luis Oganés**



## An introduction to JPMaQS: a video with Ralph Sueppel and Luis Oganés



**Would you like more information**



## AN INTRODUCTION TO JPMAQS: a video with Ralph Sueppel and Luis Oganés



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## About JPMAQS

### Basics




- JPMAQS is a service that makes it easy to use quantitative fundamental information for algorithmic trading as well as for discretionary trader support tools.
- The term quantamental refers to data that inform directly on activity, balance sheets, and sentiment of various parts of an economy.

### Feature space




- Practically, JPMAQS greatly enhances the "feature space" that can be applied to machine learning pipelines and significantly reduces development time of fundamental-based strategies.

### Data format




- Quantamental indicators come directly in the right format for developing and backtesting trading strategies.
- The system also provides clear and concise explanations of its indicators from the angle of strategy builders.



JPMAQS  
Macro quantamental trading made easy


## Explore our themes

### Economic trends




- Indicators of changes in economic conditions designed to capture actual fundamental development as opposed to data volatility.
- Examples are economic growth estimates, inflation metrics, changes in external balances, credit

### Macroeconomic Balance Sheets



- Indicators of the state of the economy in terms of stocks and valuations.
- Examples are monetary aggregates, bank credit ratios, public debt ratios and international investment positions.

### Financial Conditions



- Indicators that track the conditions of the broader financial system and its impact on the economy.
- Examples are real interest rates, credit conditions, real effective exchange rates or terms of trade.

## New Content

### Short term external trade balance ratios & trends

These are indicators: "External balance ratio" and "External ratio trend".

In general these category groups contain:

- Real time measures of any external balance of payments flows, as % consumer nominal GDP. They are typically covered in 1 year rolling moving average or as short-term seasonally adjusted averages. These ratios serve as a laboratory of external sustainability and of demand for the local currency.
- Recent trends in external balances ratios, based on consensus strategies.

**Bookend**  
02 Mar 2022

### Intervention liquidity

- This category group contains real time measures of central bank intervention and liquidity expansion.
- The most complete indicator measures the combined growth of the monetary base relative to central bank interventions in US and security markets.
- The time series measure recorded changes not announcements.

**Bookend**  
29 Feb 2022

standard economic time series that bear the same names. The differences reflect different timing, use of vintages and thorough data cleaning. And even where differences appear to be small the distinction between a quantamental indicator and a standard economic time series can have a big impact on dynamic investment strategies, particularly during crises when exact real-time data can deviate drastically from simple approximations.

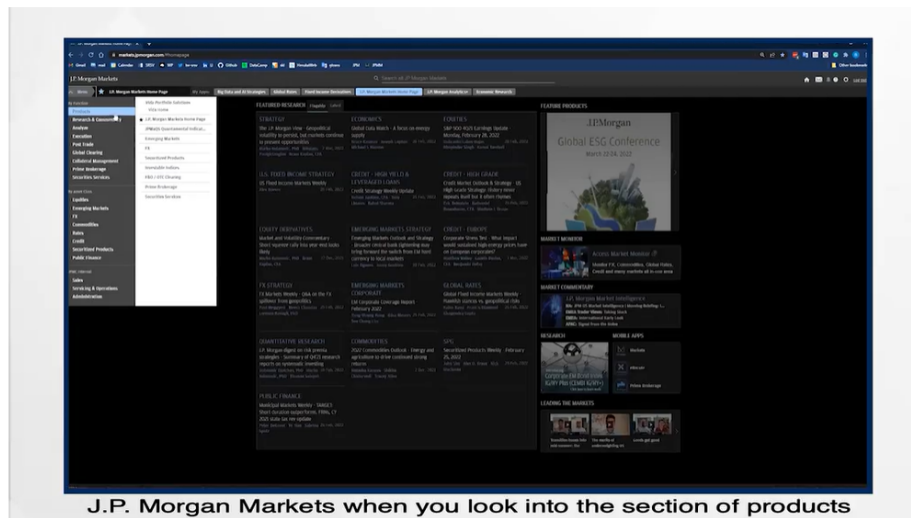
Sweden: industrial production trend



U.S. core PCE inflation: standard versus quantamental time series

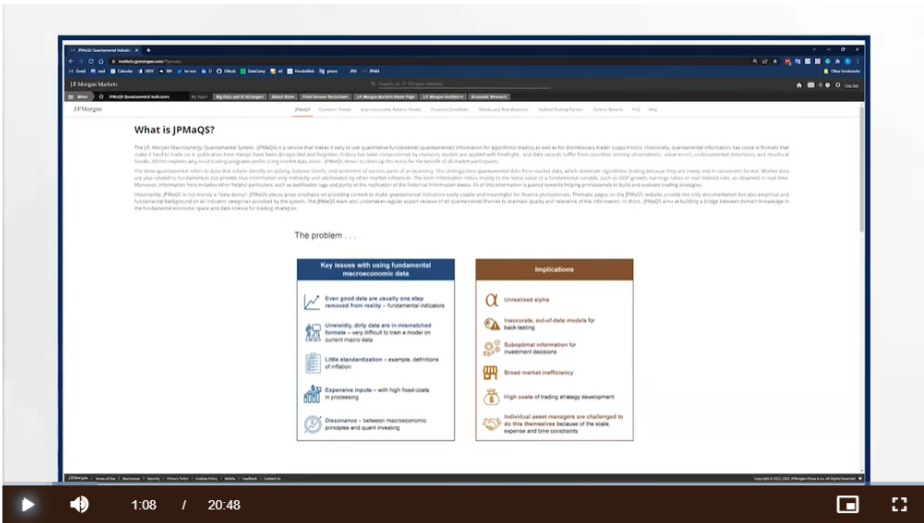


## An introduction to JPMAQS: a video with Ralph Sueppel and Luis Oganes



J.P. Morgan Markets when you look into the section of products





Would you like more information on JPMaQS?  
If so, please provide:



The screenshot displays the JPMaQS website with a navigation bar at the top. The main content area is divided into several sections: 'About JPMaQS' with a brief overview, 'Basics' with three bullet points, 'Feature space' with a bullet point, 'Data format' with a bullet point, 'Explore our themes' with three sub-sections: 'Economic trends', 'Macroeconomic Balance Sheets', and 'Financial Conditions', each with a bullet point. At the bottom, there are three more sections: 'Stocks and Risk Measures', 'Hybrid Trading Factors', and 'Generic Returns'. A 'New Content' section is also visible on the right side of the main content area.

The next point you should know is what JPMaQS means for



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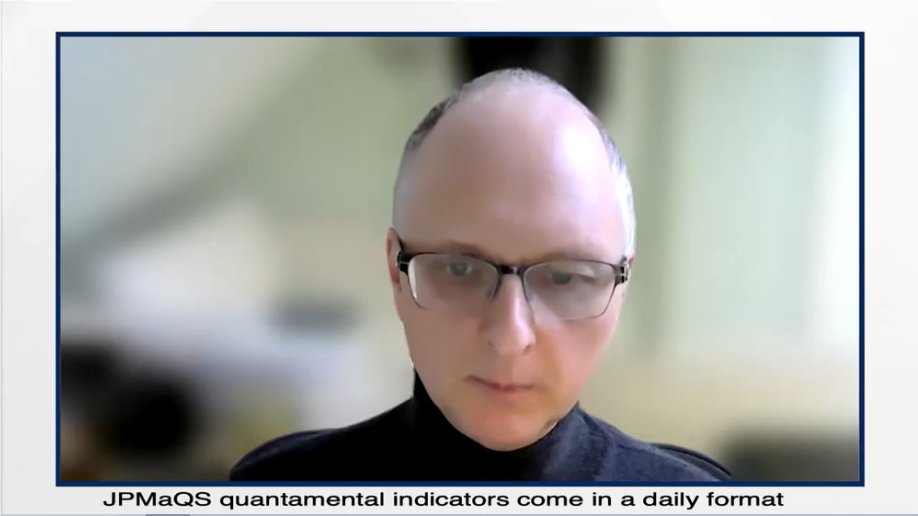




**Would you like more information  
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**What is a quantamental category?**

Without any of the broad-brush of (P)RO, indicators are divided into various groups, but within each category group one can find more specific categories. For example, the broad theme could be macroeconomic balance sheets. A category group within that theme could be external balance of payments. And within that category group, a number of categories would be available external trade balance (to GDP) and foreign direct investment (to GDP).

The range of the **quantamental category** is very important. It denotes a type of indicator that can be applied through different markets or countries. Quantamental themes are typically organized as panels. A panel contains a single category for various time series. For example, a specific type of growth indicator may be available for a range of 20 countries. (P)RO group groups together similar indicators. The focus on categories and panels allows trading the cross-time series and therefore mitigates the further problem of limited data points. The quantamental system, J.P. Morgan (P)RO, particularly suitable for various time series and strategies for trading macroeconomic.

Quantamental information can be traded periodically by following through four levels: (1) broad macroeconomic themes, (2) quantamental category groups, (3) specific quantamental categories, and (4) individual quantamental indicators, which are instances of a category for specific countries or markets.

**How do quantamental indicators differ from standard economic data?**

Quantamental indicators have often similar nature as standard economic time series, even though their calculation and meaning is very different. The main difference is that they measure market information status for any given day, not an ex post based often revised actual state of the economy. Some indicators look very different from standard economic time series that have the same nature. The difference reflects different timing, use of ratings and through data sharing. But even when differences appear to be small the distinction between a quantamental indicator and a standard economic time series can have a big impact on dynamic investment strategies, particularly during crises when asset real-time data can deviate drastically from simple approximations.

**Source: Industrial production trend**

**U.S. core PCE inflation, standard versus quantamental time series**

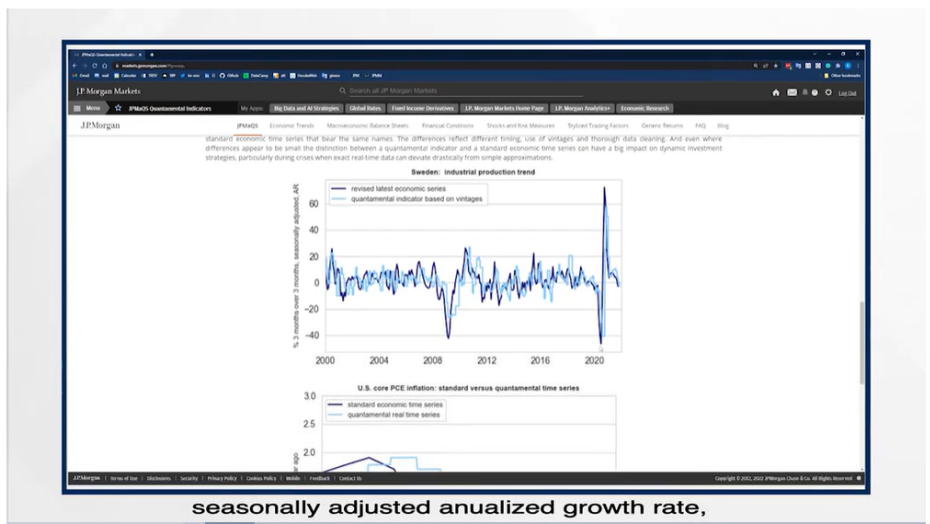
between a quantamental macro indicator



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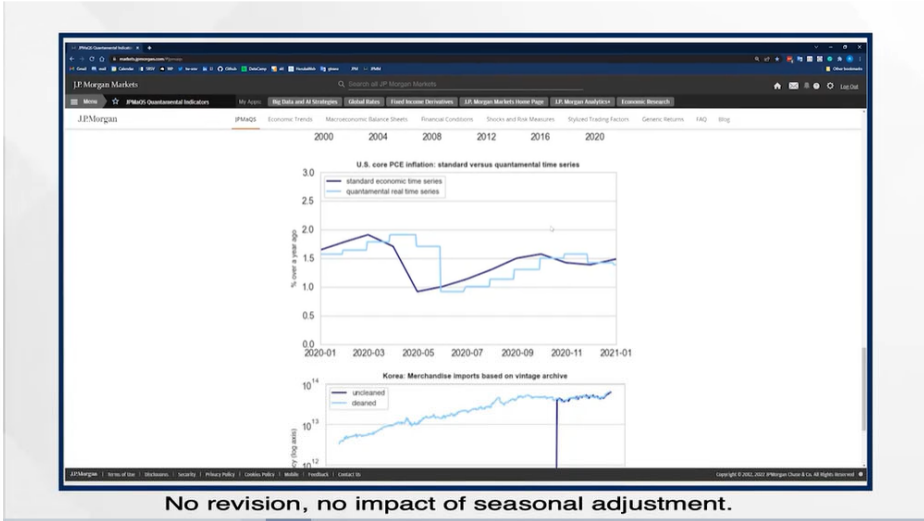
seasonally adjusted annualized growth rate,



Would you like more information on JPMaQS?

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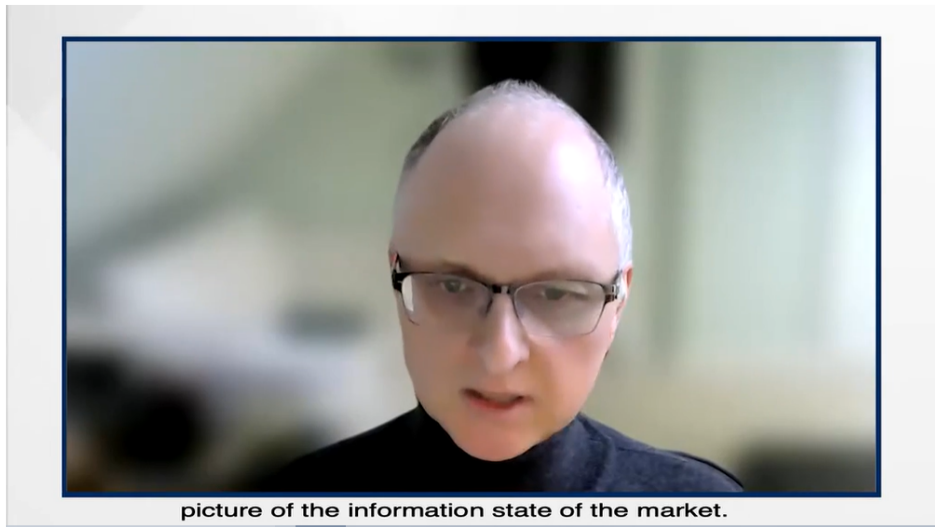




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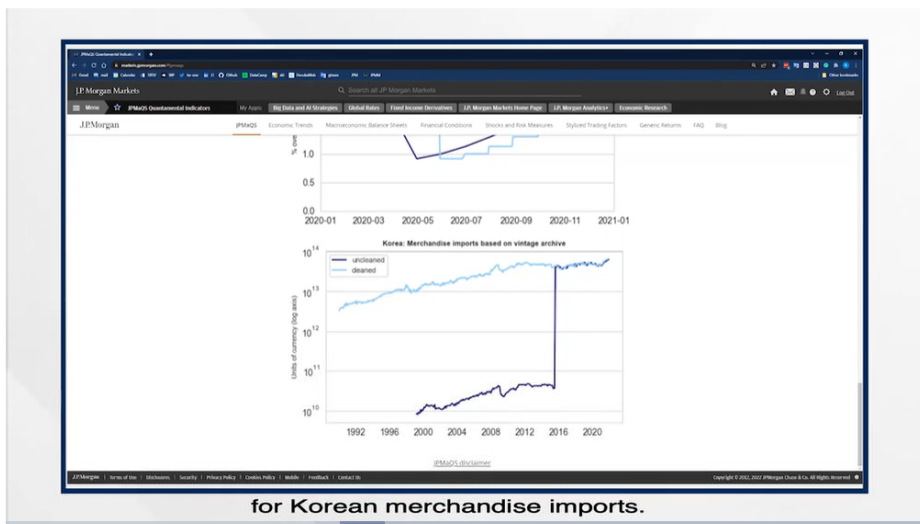




**Would you like more information  
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for Korean merchandise imports.

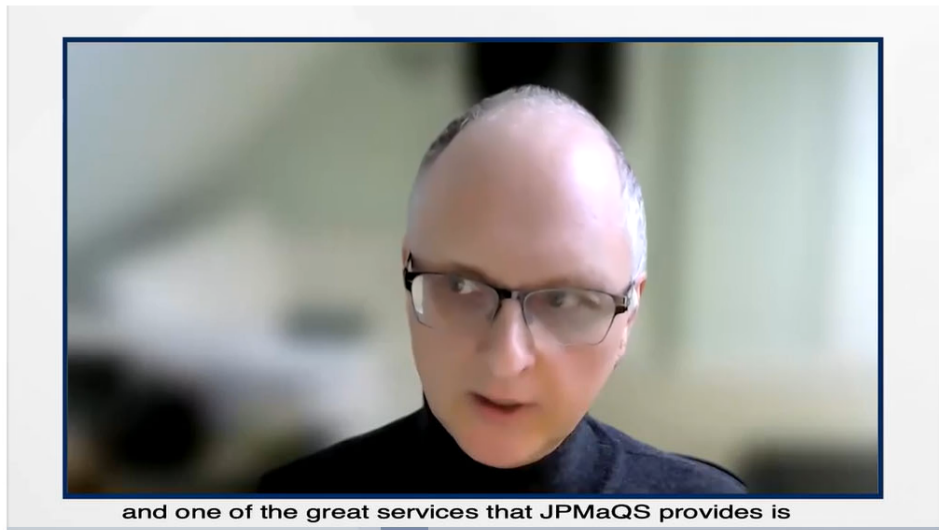


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  - Macroeconomic Balance Sheets**
  - Financial Conditions**
- New Content**
  - Short-term external trade balance ratios & trends

Quantamental indicators come directly in a format which is



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**J.P. Morgan Macrostrategy Quanti**

■ For a given time series, vintage is defined as a set of data that represented the last value available for each reference point in the time series at a particular moment in time

■ Revisions could be defined as a change in values for any reference point in the time series

■ Vintage matrix

Reference Period	8/1/2017	8/1/2017	11/1/2017	11/1/2017	2/1/2018	2/1/2018	5/1/2018	5/1/2018	8/1/2018	8/1/2018	11/1/2018	11/1/2018	2/1/2019	2/1/2019	5/1/2019	5/1/2019	8/1/2019	8/1/2019
Jan-17	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Feb-17	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Mar-17	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Apr-17	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
May-17	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Jun-17	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Jul-17	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Aug-17	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Sep-17	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Oct-17	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Nov-17	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Dec-17	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08

Reference periods for the time series are identified in the rows and vintage release dates are identified in the columns.

Quantamental indicator of each vintage series (year date)

From vintage matrix to quantamental indicator: simple latest value example

Full time series or vintages are changing across real-time dates. The changes arise from new data becoming available or old data being revised. Importantly, new information and revisions of raw data series have knock-on effects on related estimates, such as principal components, calendar adjustments and seasonal adjustment factors. Therefore, even if revisions look small or seem to affect only older history, the release of new information often entails significant changes of full time series. The more a time series depends on estimation, the more such changes can propagate.

A vintage is an instance of full time series information associated with a real-time period. Conceptually, vintages are complete past states of information allowing replicating what markets could have known at any day in recent history, which is important for back testing algorithmic strategies, ignoring changing states of information leads to shortcomings and look-ahead biases in the evaluation of trading ideas.

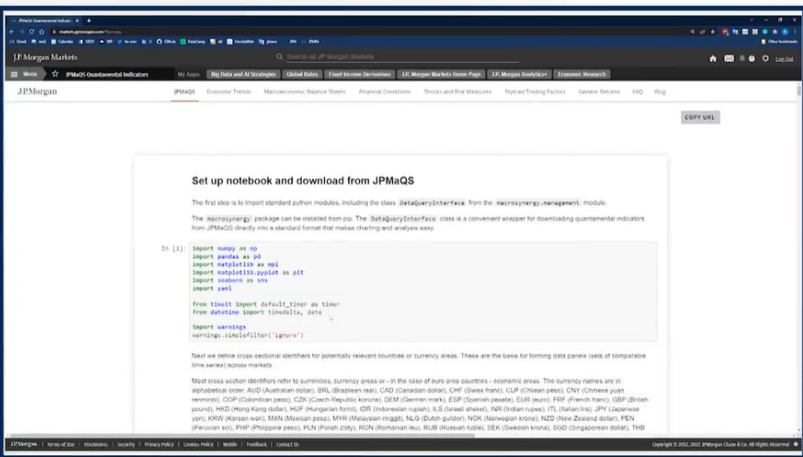
for example, in respect to a growth rate into



Would you like more information on JPMaQS?

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**Set up notebook and download from JPMAQS**

The first step is to import standard python modules, including the class `DataSetInterface` from the `macrostrategy.management` module. The `macrostrategy` package can be installed from pip. The `DataSetInterface` class is a convenient wrapper for downloading quantamental indicators from JPMAQS directly into a standard format that makes charting and analysis easy.

```
In [1]: import numpy as np
import pandas as pd
import matplotlib as mpl
import matplotlib.pyplot as plt
import seaborn as sns
import re

from timeit import default_timer as timer
from statistics import mean

import warnings
warnings.simplefilter('ignore')
```

Next we define cross-sectional identifiers for potentially relevant countries or currency areas. These are the base for forming data panels (sets of comparative time series) across markets.

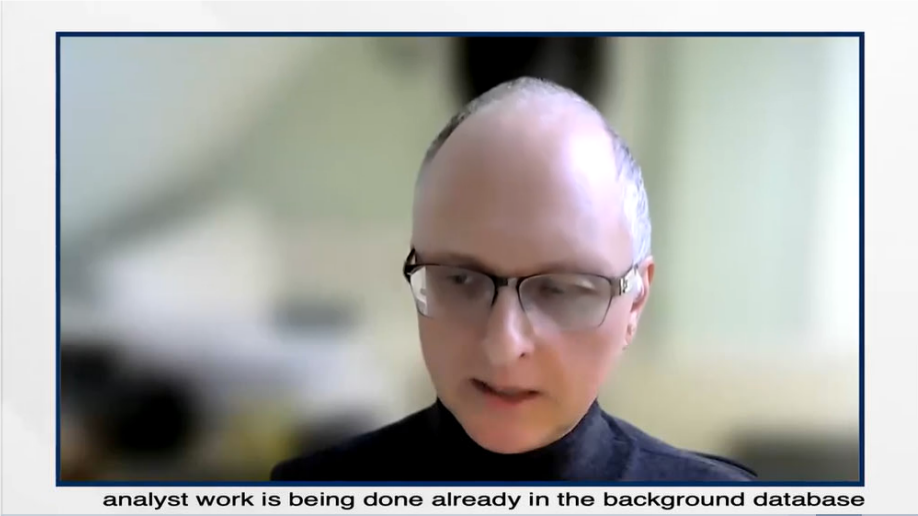
Most cross-section identifiers refer to countries, currency areas or - in the case of euro area countries - economic areas. The currency names are in alphabetical order: AUD (Australian dollar), BRL (Brazilian real), CAD (Canadian dollar), CHF (Swiss franc), CLP (Chilean peso), CNY (Chinese yuan renminbi), COP (Colombian peso), CZK (Czech Republic koruna), DKK (Danish krone), EUR (Euro), FKP (Falkland Islands), GBP (British pound), HKD (Hong Kong dollar), HUF (Hungarian forint), IDR (Indonesian rupiah), ILS (Israeli shekel), INR (Indian rupee), ITL (Italian lira), JPY (Japanese yen), KRW (Korean won), MXN (Mexican peso), MYR (Malaysian ringgit), NZD (South island), NOK (Norwegian krone), NZD (New Zealand dollar), PEN (Peruvian sol), PHP (Philippine peso), PLN (Polish zloty), RON (Romanian lei), RUB (Russian ruble), SEK (Swedish krona), SGD (Singaporean dollar), THB (Thai baht).

can be used in the usual standard Python/Pemdas environment



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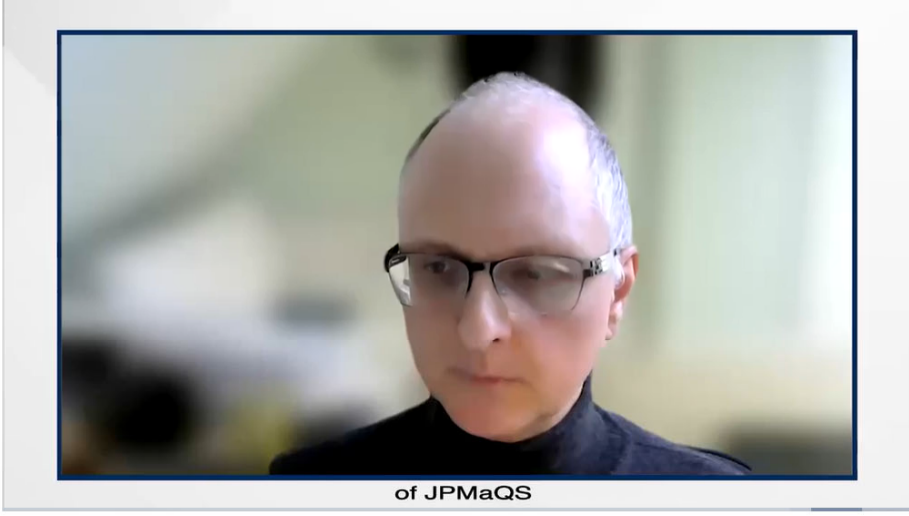




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