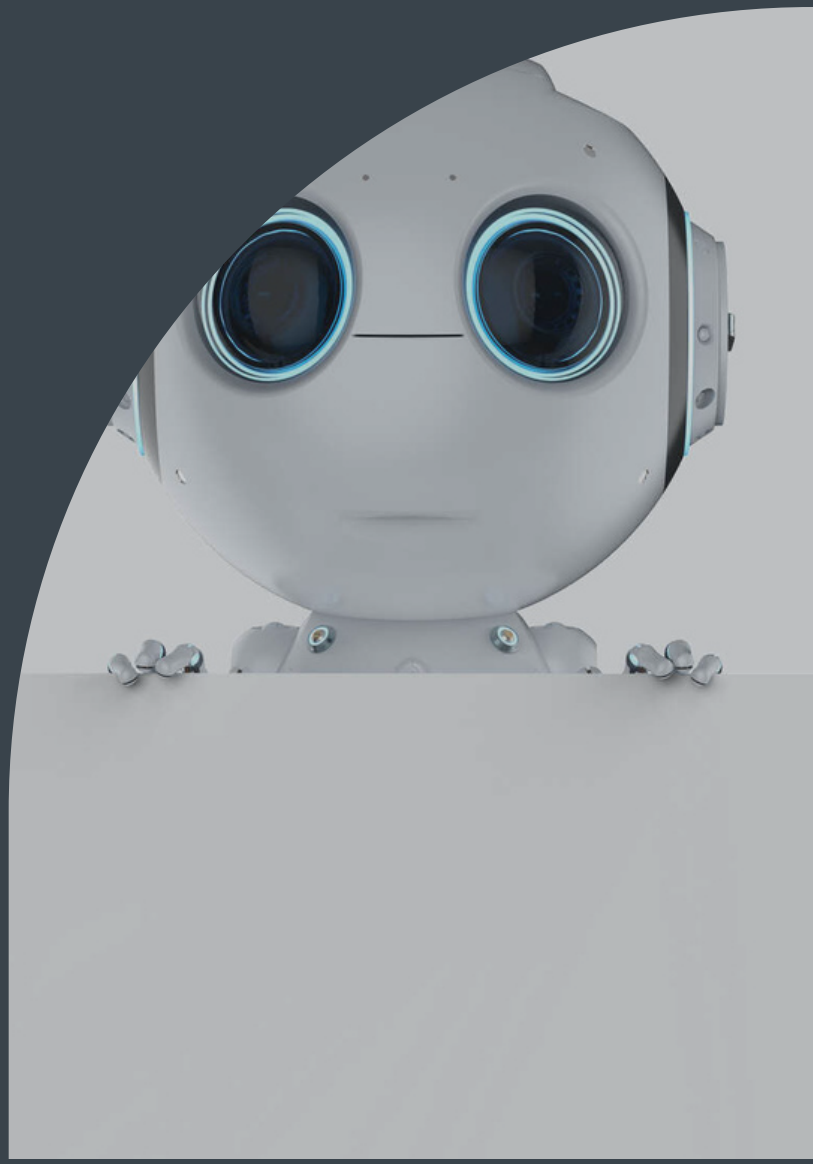
Inflation forecasting is so hard... Can Robots help?

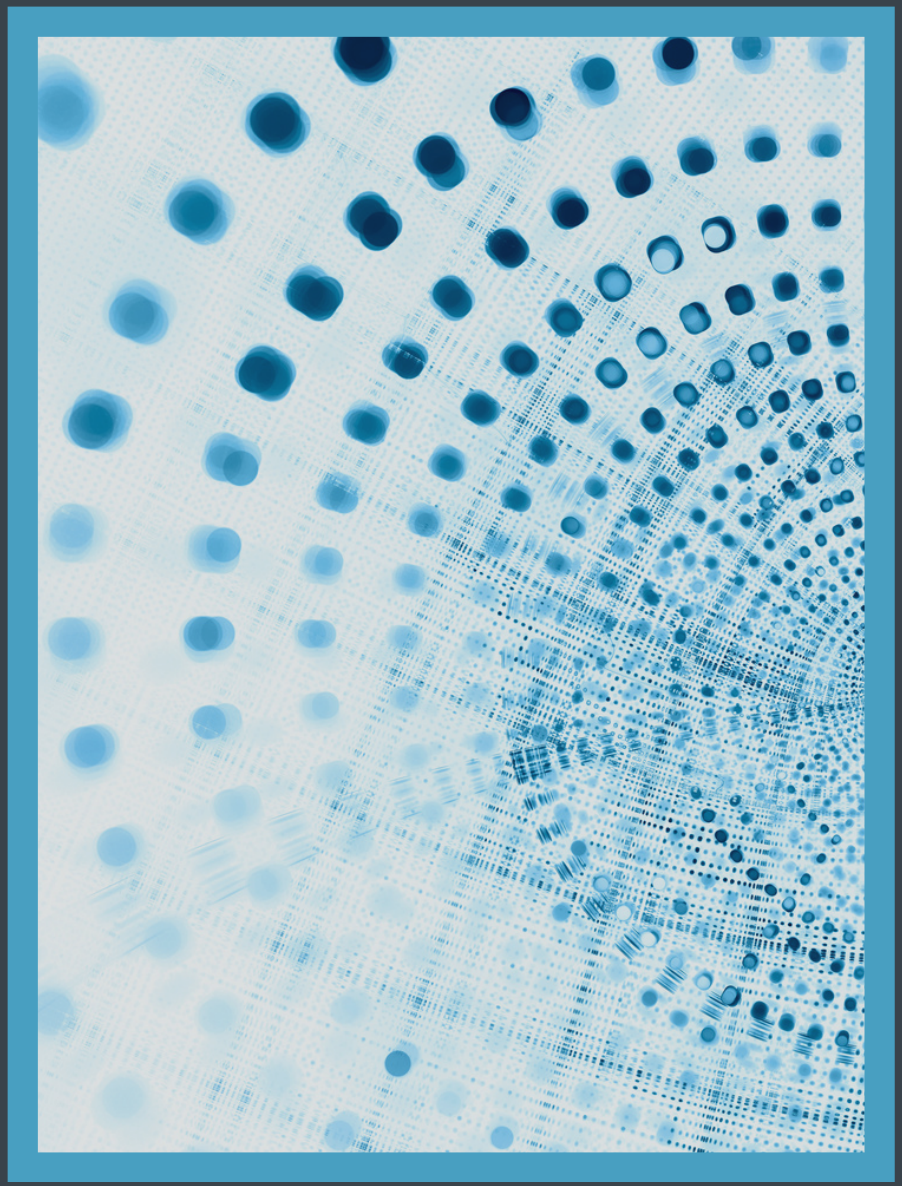


Laurent Bilke

Citi Inflation Conference, London

22 Feb. 2023

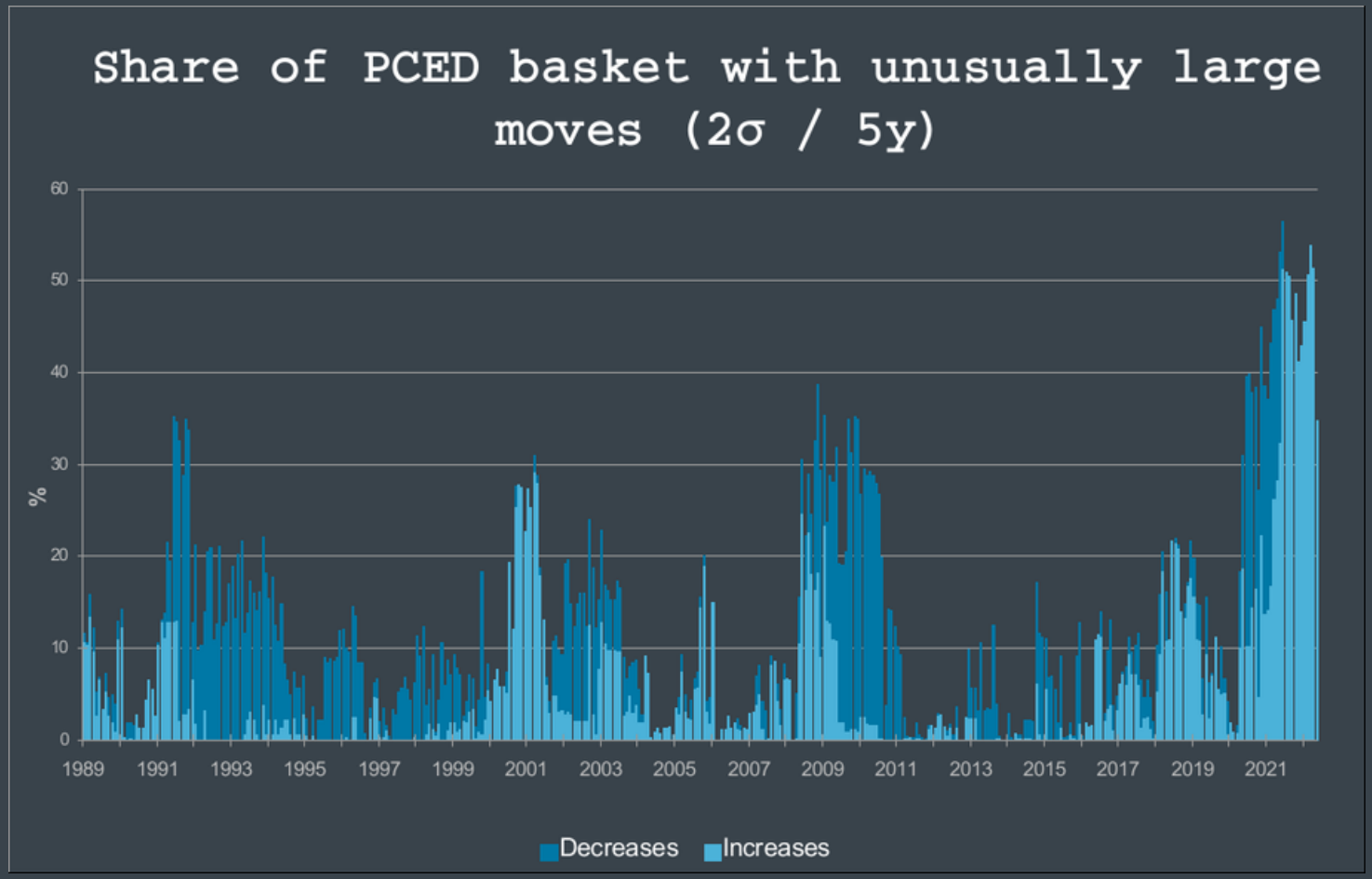
Alternative Macro Signals



Content

- Something wrong with inflation forecasting
- Can new language models help (or fool)?
- Implementation

At the item level, large moves are common



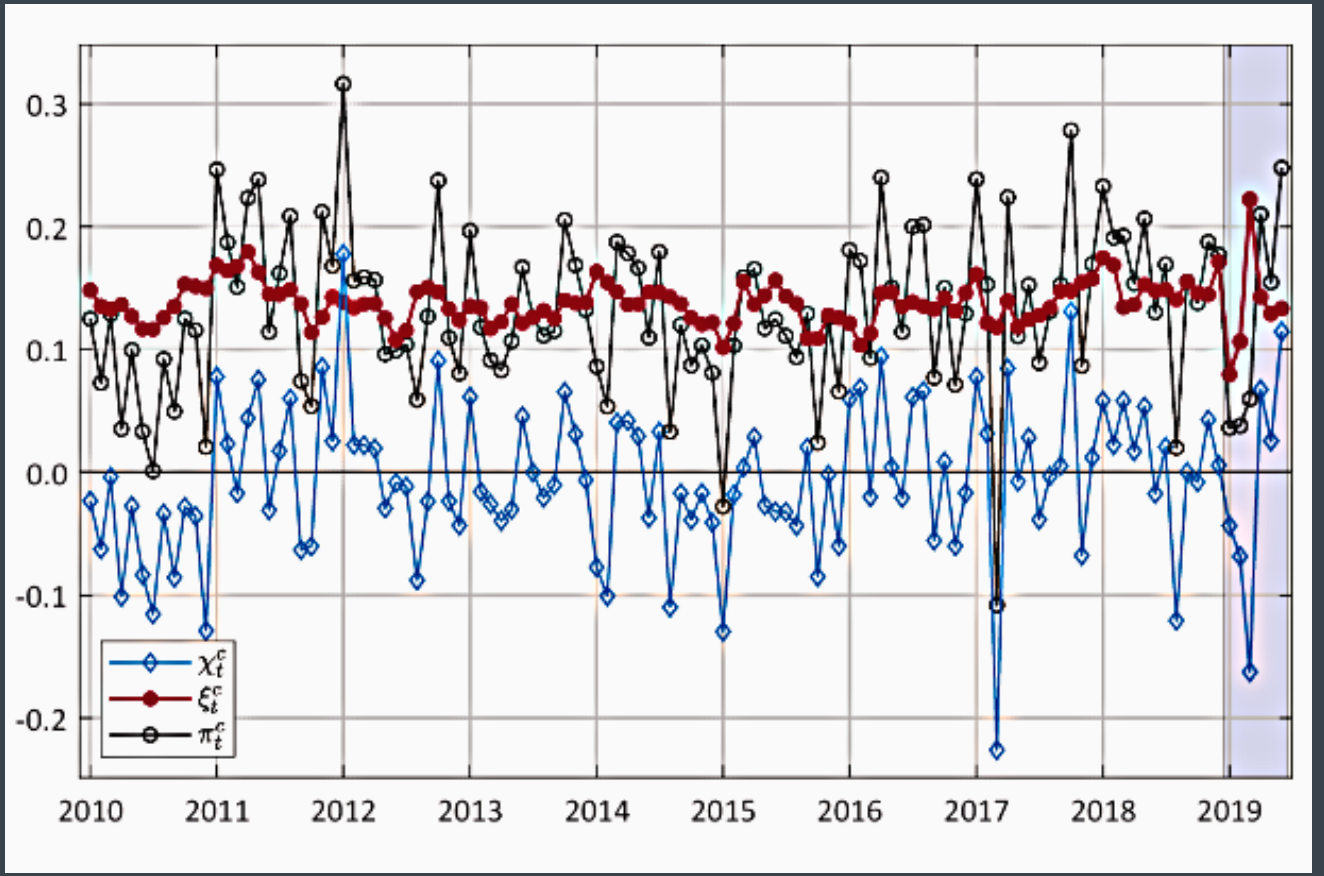
Sources: FRBSF, BEA, Alternative Macro Signals

Idiosyncratic shocks dominate short term vol

Core PCE m-o-m breakdown:

common

idiosyncratic



Sources: Fed Board, BEA

No timely time series to monitor those items

- Services: insurance premium, bank fees, hairdressers, telephone services, train fares...
- Indirect tax changes
- Sales dates
- Administered prices
- Supply disruptions
- Regulation, market structures
- ...

Hard truths about infation forecasting

- Clean, item-level input time series cover a small part of the basket

- No way around using a lot of unformatted sources of info for near-term inflation forecasting

Text is data

Can AI help structure it?

AI in Finance: How projects fail

1. Nice model, but no use case

2. Ask the machine way more than it can solve

Simple, narrow use case

1. Timely detect events potentially relevant to near-term inflation forecasting

2. Bonus: a turning point indicator

How do we get it done?

"I'm cutting articles out of the newspaper while we still can."

1. Scrap news articles

2. Trained language models recognize "relevant" news

3. Present / Aggregate those news

Large scale web-scraping

Unique news sources regularly scraped, per language:

ZH	EN	FR	DE	IT	JA	PL	ES	SW
2847	41067	6689	4890	9769	4457	1477	9111	864

Language Models

- 2018 Google's BERT breakthrough
- Transformers: neural network, with encoder-decoder architecture
- Context aware: learn words meaning from their context
- Fine-tuned for a specific task (e.g. classification)

Not a generic "sentiment" model

- Supervised learning
- Tens of thousands of examples, given by economists so the Language Model can learn
- (not all LM can do this)

Inflation NewsBot Examples

US ★★ ★★ - Electric and gas rates will continue to rise in New York: ConEd calls for staggered annual increases for (...) - El Diario NY - 18 Feb 00:27

US ★★★★ - Are egg prices dropping? Where to find eggs for USD2 - Biztoc.com - 17 Feb 19:44

US ★★ - Midwest ethanol push seen to lift pump prices by 12 cents a gallon - Lincoln Journal Star - 19 Feb 01:56

UK ★★★★ - Morrisons cuts prices on more than 60 products - Mirror Online - 20 Feb 10:13

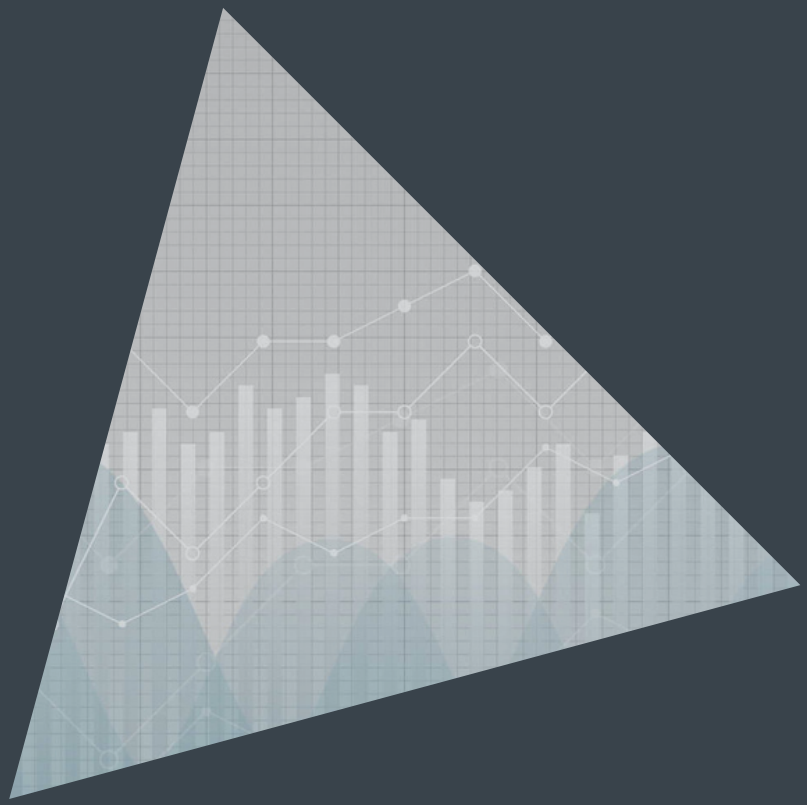
Germany ★★ - Volkswagen Is Raising Combustion-Engined Model Prices In Germany - CarBuzz - 19 Feb 23:13

France ★★★ - Orange: mobile plan prices will increase - Capital.fr - 17 Feb 18:38

Spain ★★ - The Spanish Minister of Agriculture will analyze the rise in prices with producers, distributors - EITB - 19 Feb 17:31

Japan ★★★★ - Toyo Suisan raises prices of about 200 items such as cup noodles and bag noodles from June-Food newspaper...-Food newspaper company - 食品新聞社 - 20 Feb 02:35

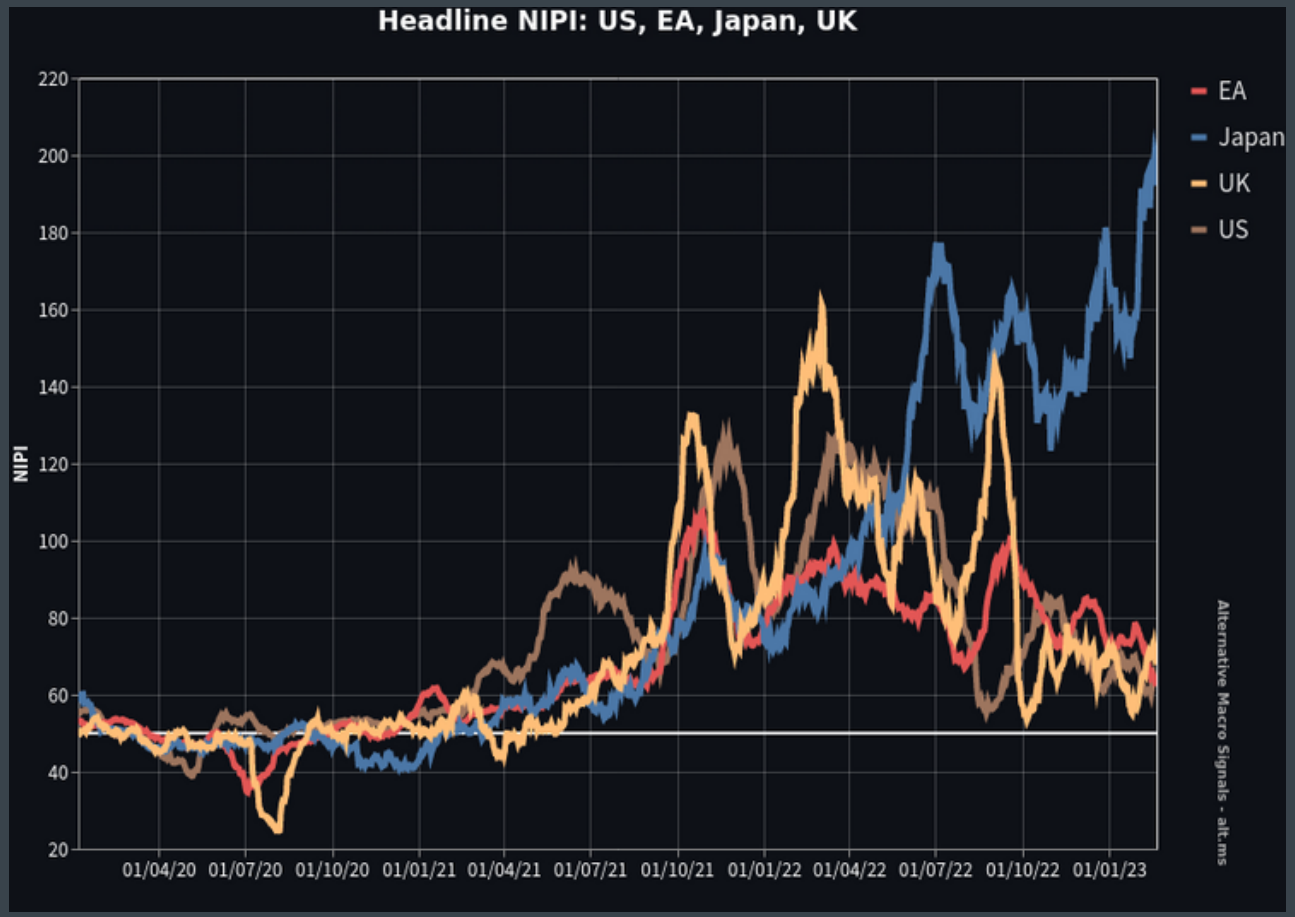
From text to numbers



- Price pressures diffusion index: NIPI
- News Volume Index (NVI)
- Daily frequency
- 15 countries
- 6 sectors

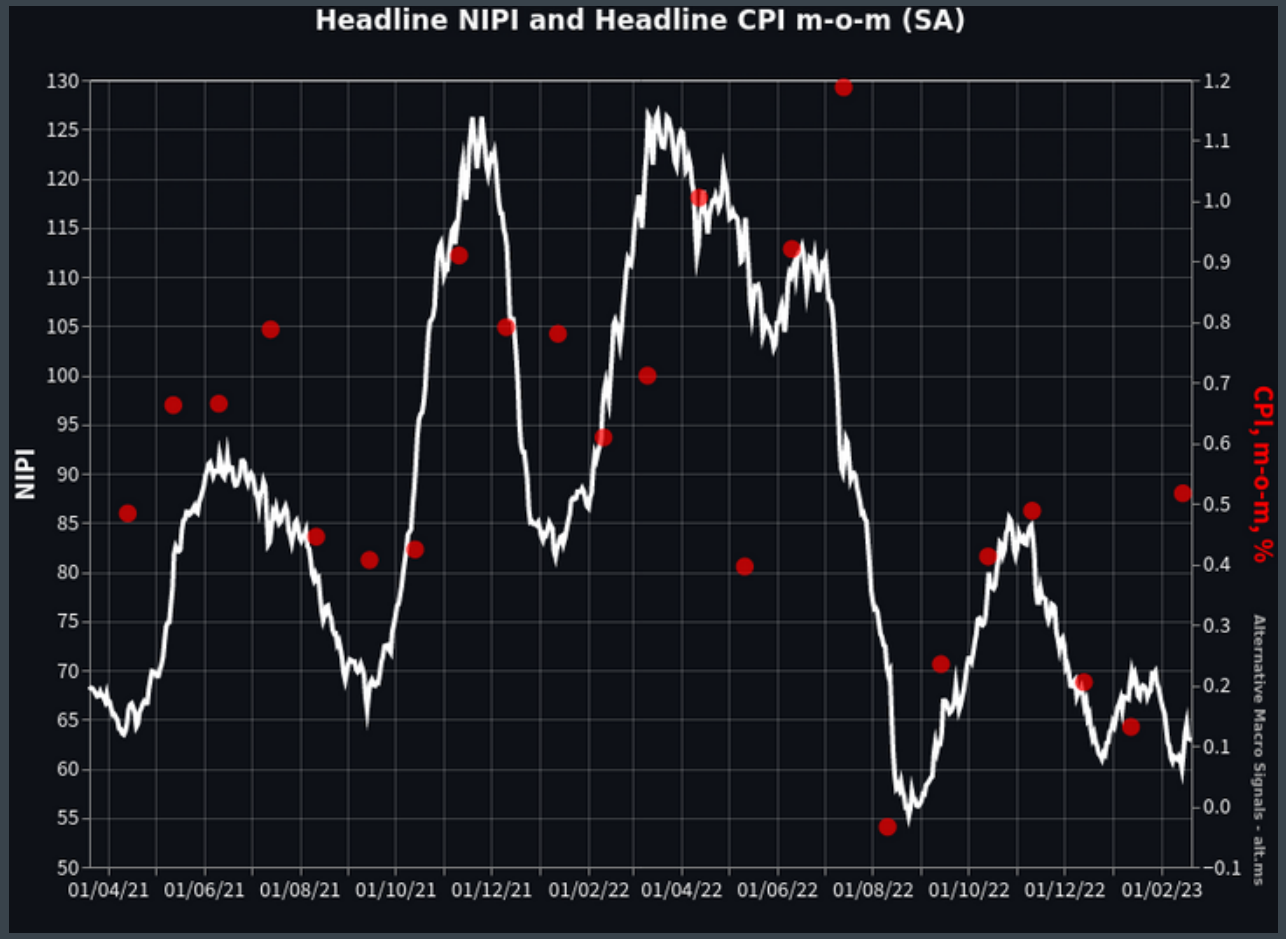
Headline pressures

50 = neutral



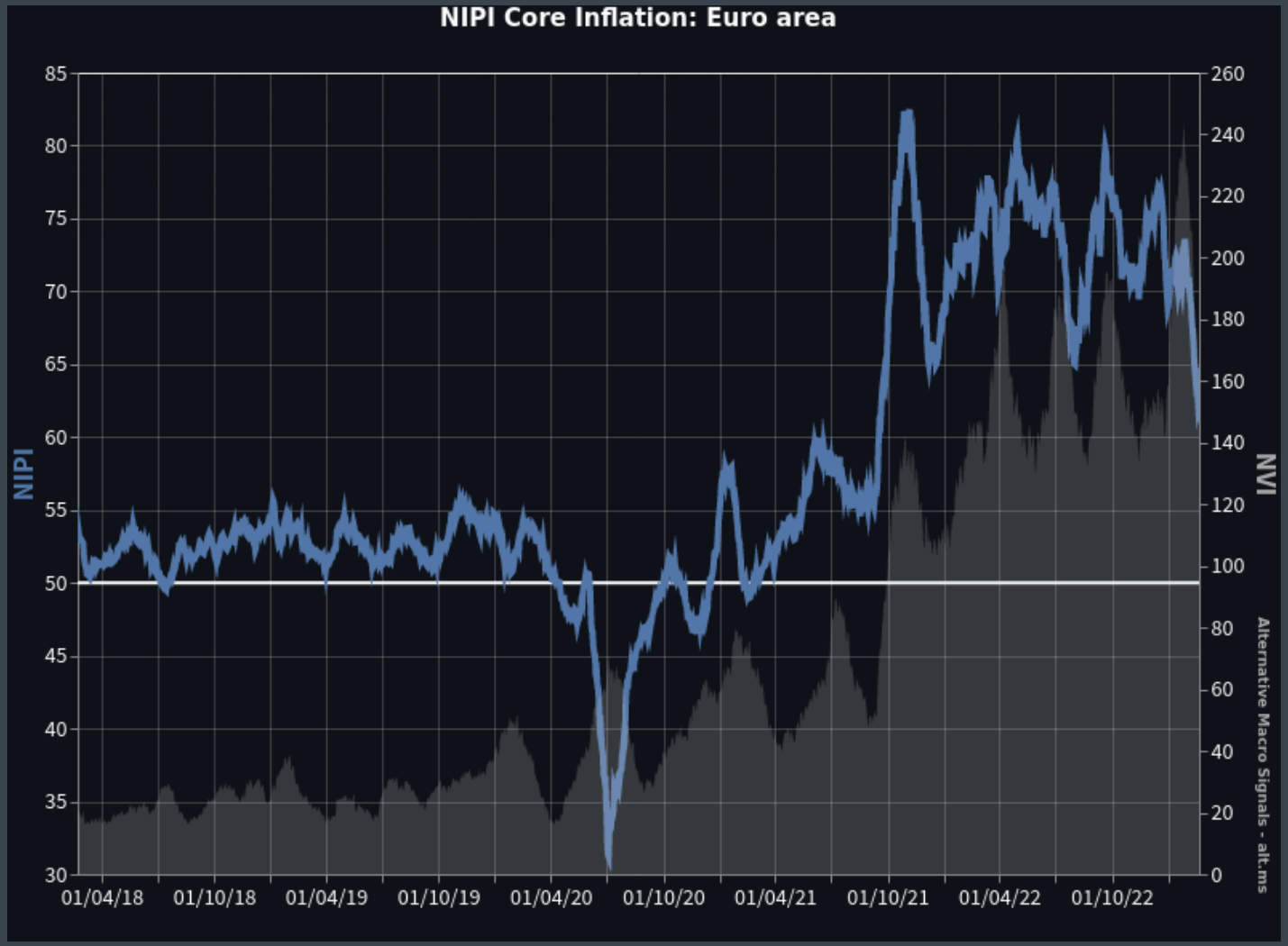
NOT an inflation forecast, but...

US CPI m-o-m, as of release date, vs NIPI



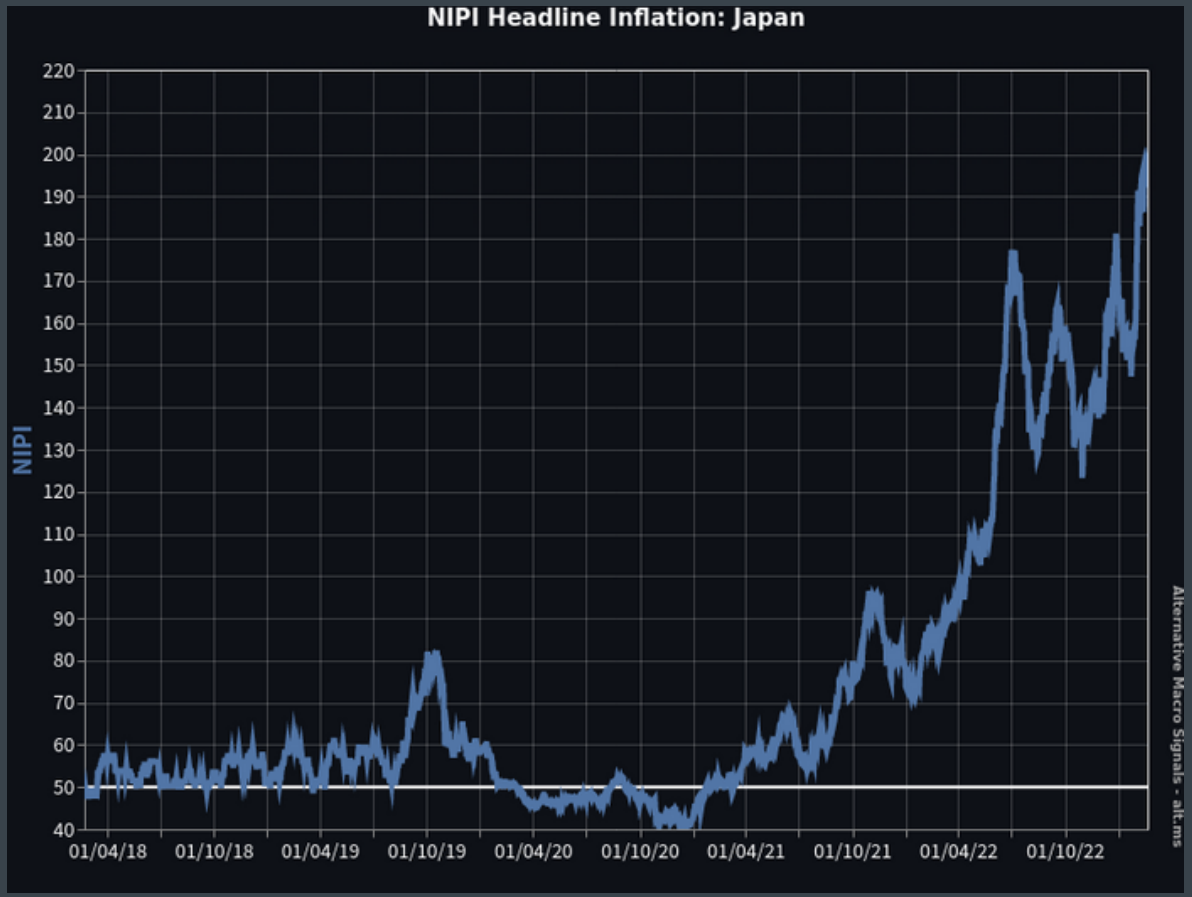
Euro area core NIPI

50 = neutral



Japan Headline NIPI

50 = neutral



In short

- Transfer learning to large Language Models works...
- ... if specific
- A lot more can be done: monitor wages, rents, carbon market regulation, etc

Thank you

Presentation material and references:

https://alt.ms