CPI – Food At Home Index

August 1 2024

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Happy Birthday

Background

- Doug Edmonds, Chief Data Officer at DecaData. An ‘alternative’ data firm we set up 6 years ago.
- We license data products to the academic research community and Financial Services sector.
- While our customers want raw data, we have built some aggregated / forecast data products.
- One of which is a forecast of the BLS CPI Index Food-at-home Component.

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Say Data Is The New Oil, One More Time

OUR CORE DATA SET

- Data set covering consumer supermarket transactions at an *item * customer * day* level.
- Starting data Jan 1 2007
- Fluctuating panel size from 700 - 1300 Roof Tops
- ~12 million annual unique customers
- ~35 million life time unique customers
- ~15 States (Midwest, SouthWest, South and South East)

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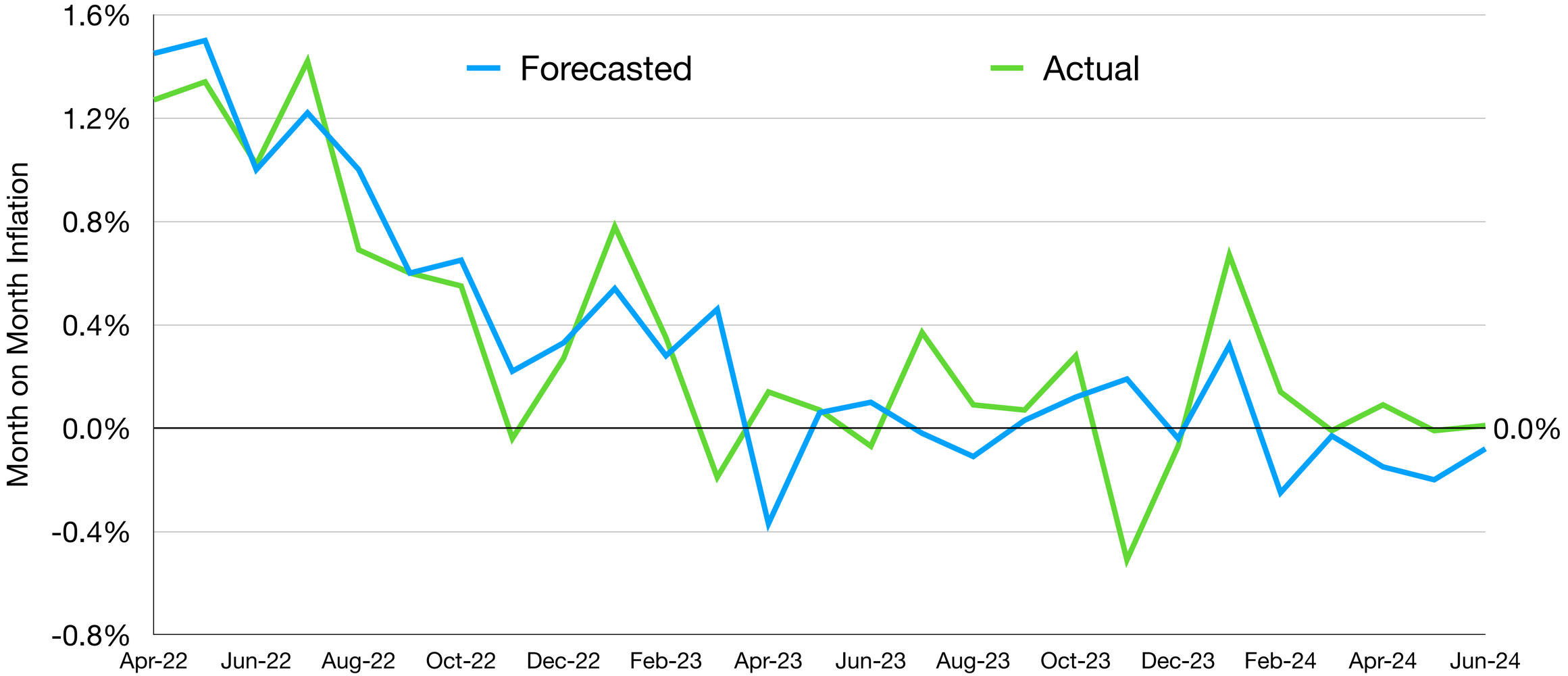
CPI Food-At-Home Estimate

Example Output

Monthly Inflation (Data as of 2024-05-31)	Apr 2024 Actual Reported	May 2024 ODY (MoM)			
		Lower	Midpoint	Upper	Direction
Cereals and bakery products	0.33%	(0.40%)	(0.20%)	(0.00%)	Decel
Dairy and related products	0.45%	(0.46%)	(0.26%)	(0.06%)	Decel
Fruits and vegetables	(0.16%)	(0.54%)	(0.34%)	(0.14%)	Decel
Meats poultry fish and eggs	(0.08%)	(0.53%)	(0.33%)	(0.13%)	Decel
Food at home	**0.09%**	**(0.40%)**	**(0.20%)**	**(0.00%)**	Decel

CPI Food-At-Home Index Forecast, Performance



Source: BLS.gov Food-At-Home Component / DecaData

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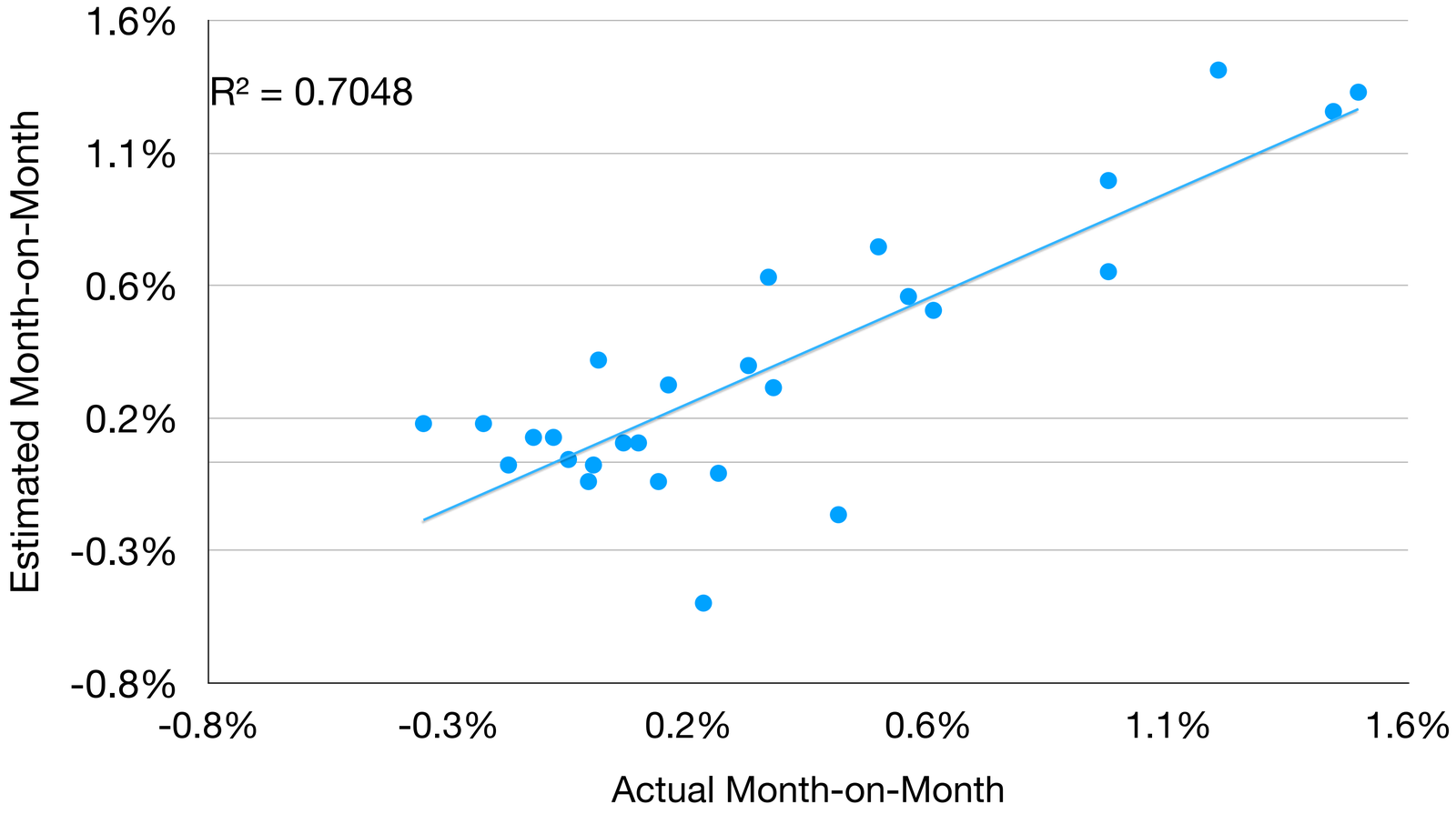
CPI Food-At-Home Index Forecast, Correlation



Source: BLS.gov Food-At-Home Component / DecaData

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Methodology

- Retailer data provides gross unit price (before promotion) and net unit price (after promotion)
- Find MoM gross/net price delta for each item at each store location
    - 20,000 items * 700 Locations * ~30 Days = 420 million data points/month
- Assign panel weight to each item based on trailing 12-month sales
- Map each item to a category of Food at home
    - Cereals_Bakery_Products
    - Dairy_Related_Products
    - Fruit_And_Vegetables
    - Meat_Poultry_Fish

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Create CPI Food At Home Components

- Find weighted average price delta for the category based on each item's price delta and relative weight, for gross and net price
- Use category's weighted average price delta for gross and net price as features of a Non-negative Least Square model.
- Non-negative LS regression avoids over-fitting - using price decreases to fit data to a CPI increase.
- The regression model estimates actual BLS-reported category's MoM price change.

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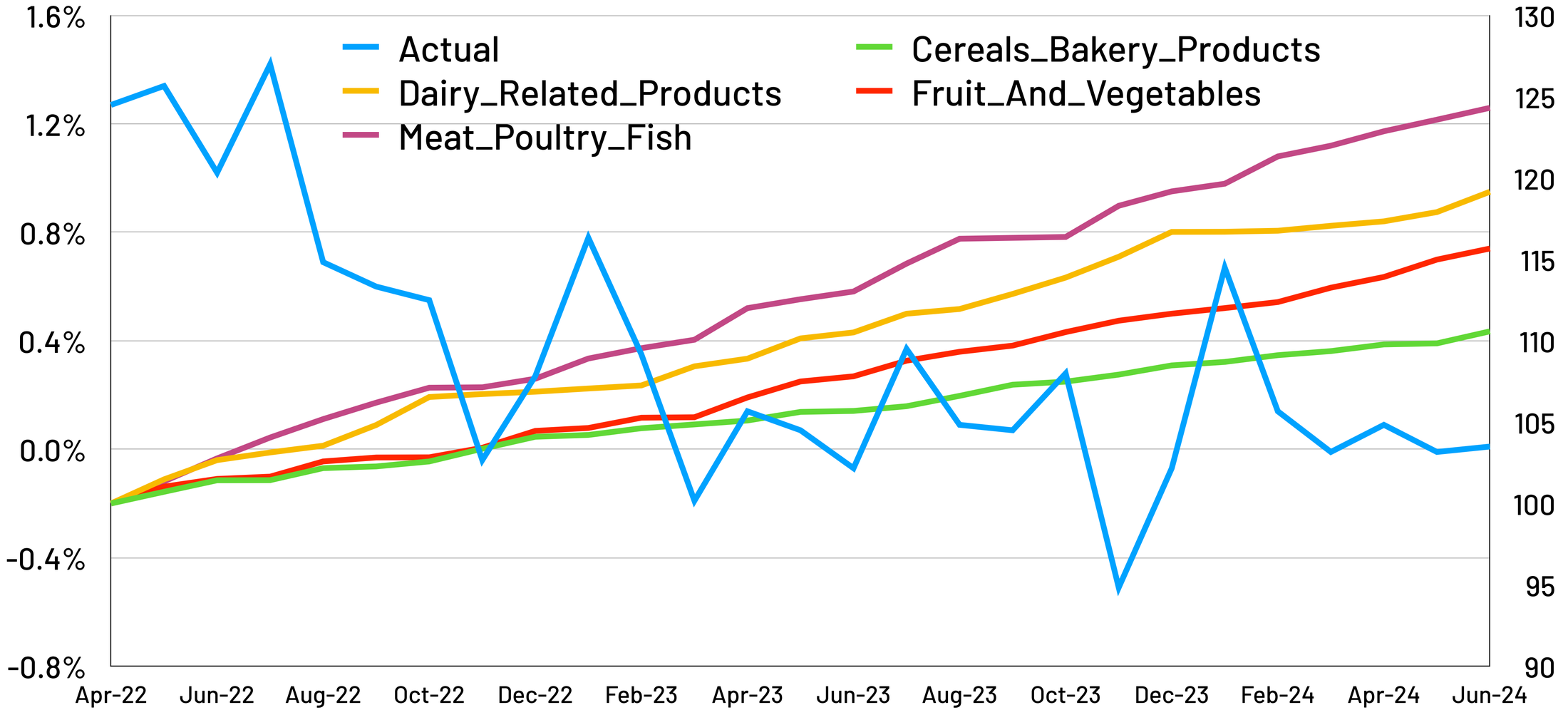
DecaData Components (Example Data)



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Making The Prediction

- At month-end we have a new set of components from the full month of sales.
- We apply our model to estimate the BLS CPI Food-at-Home index 11-13 days before the government reports the actual data.
- This is then emailed to our customers who then update their own models as to how the markets will react to this macro data
- Error (MAPE = 5.7%) is better than the leading sell-side (bank) estimate.

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Learn More Here:

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