Parallax
Financial Research, Inc.

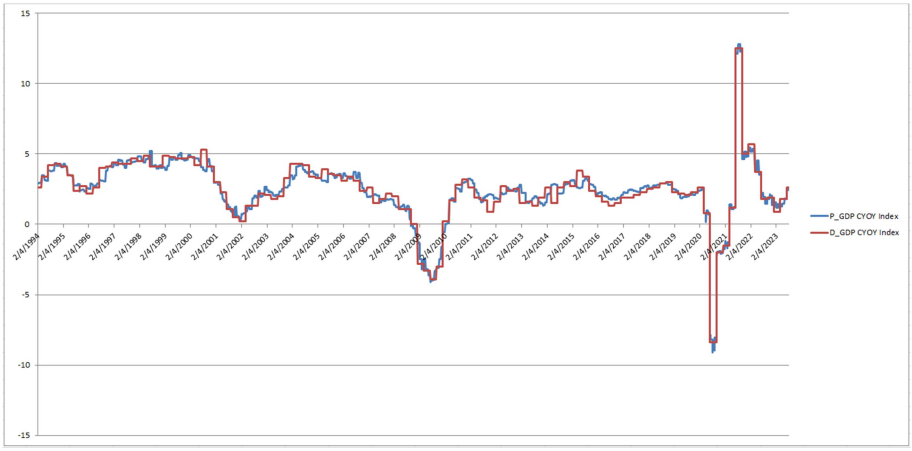
Wednesday, August 23, 2023

Quadrant Analysis Research Update

Two new AI products have been added to our Bloomberg EXCEL addin, SmartGDP to forecast year-over-year US GDP and SmartCPI, to do the same for US inflation. Both products were trained on fundamental data from 1994 to present. Note that they are both "autoregressive", meaning that the prior measured GDP or CPI is one of the inputs. Here are the inputs that were chosen (our NGO tool throws out redundant or useless inputs) by the neural network training tool for GDP YoY forecasting:

RSTAYOY Index	Adjusted Retail & Food Service
INJCJYOY Index	US Initial Jobless Claim YoY SA
NFP TYOY Index	US Employees on Nonfarm Payroll
USTBEXPY Index	US Trade Balance of Exports YoY SA
PIDSCWT% Index	US Disposable Personal Income Chained 2012 Dollars YoY
GDP YoY-1	Prior GDP US Chained 2012 Dollars YoY SA (Did You Mean?)
CNSTRYOY Index	Census Bureau US Construction Residential SA YoY
CPI YOY Index	US CPI Urban Consumers YoY NSA
USTBIMPY Index	US Trade Balance of Imports YoY SA
SAARTOTL Index	US Auto Sales Total Annualized SAAR
IP YOY Index	US Industrial Production YOY SA
PCE CYOY Index	US Personal Consumption Expenditure Core Price Index YoY SA
MWINYOY Index	MERCHANT WHOLESALER INVENTRY YOY %

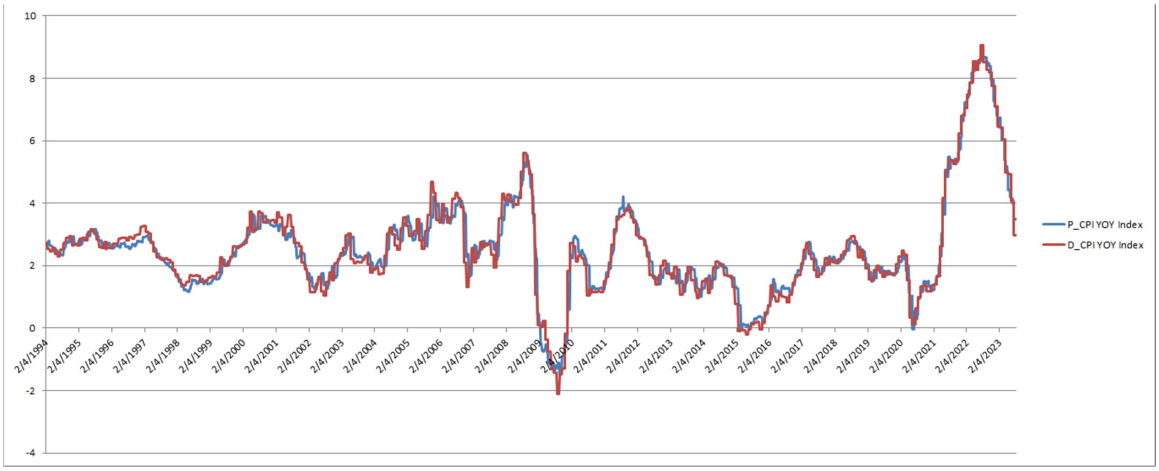
The network was able to learn how to model GDP YoY in the past, and was given an in-sample test set to validate its internal model. The fit was quite good, but I will monitor its forward performance to make sure it isn't "brain-damaged":



The year-over-year CPI forecast tool has these inputs:

CPI YOY Index-1	Prior months CPI YoY
RSTAYOY Index	Adjusted Retail & Food Service
INJCJYOY Index	US Initial Jobless Claim YoY S
IP YOY Index	US Industrial Production YOY S
PCE CYOY Index	US Personal Consumption Expend
USTBEXPY Index	US Trade Balance of Exports YO
USTBIMPY Index	US Trade Balance of Imports Yo
NFP TYOY Index	US Employees on Nonfarm Payrol
MWINYOY Index	MERCHANT WHOLESALER INVENTRY Y
GDP CYOY Index	GDP US Chained 2012 Dollars Yo
CRB RIND Index YoY	CRB Index YoY
CNSTRYOY Index	Census Bureau US Construction
PIDSCWT% Index	US Disposable Personal Income
CSXHPPY Index	US Bloomberg BEA PCE Core Serv

This training session also resulted in an excellent fit to the data, but again, models need supervision both during training and after being put into production.



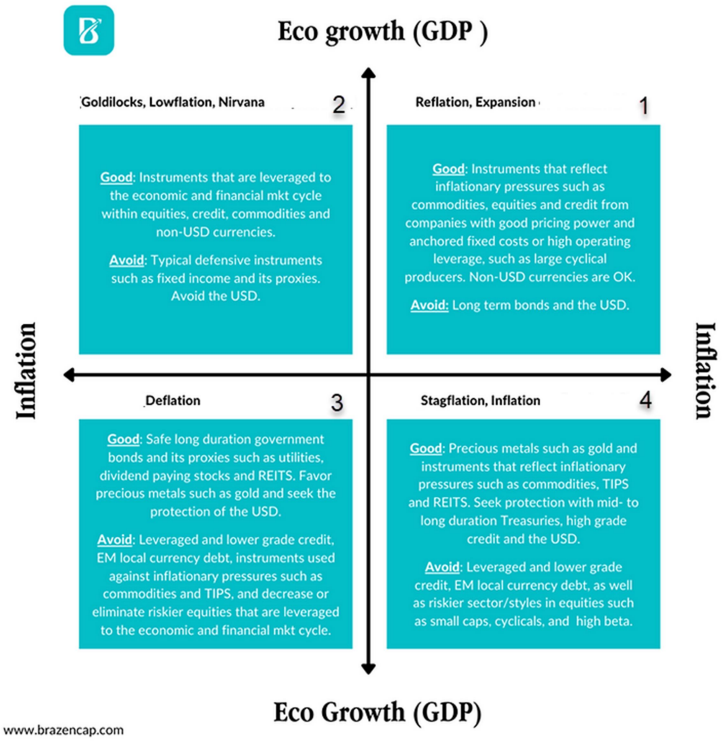
Using these two tools, it's possible now to perform a quadrant analysis. I found a great description of the "GI" quadrant analysis on Brazen Capital's website https://www.brazencap.com/post/the-economic-growth-and-inflation-matrix

The Economic Growth and Inflation Matrix (from brazen)

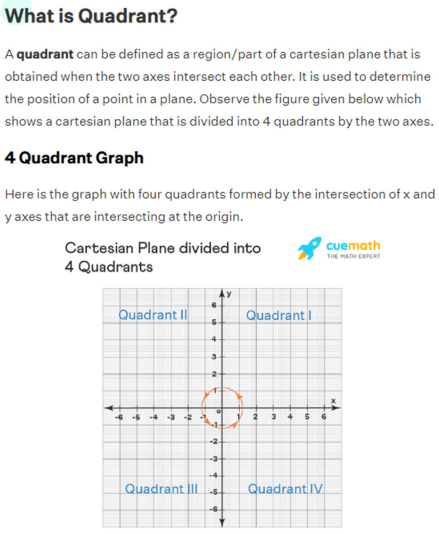
Notwithstanding the complexity of an economic system and the phases of cycles, a simple yet powerful framework involving only the GDP and inflation indicators, emerged as a viable option to assess the stages of the economic cycle, also known as the "Economic Growth and Inflation Matrix" or simply, the **GI matrix**.

Popularized by Ray Dalio from Bridgewater Capital, but first found in books written by Harry Browne and Jay Schabacker, or on research papers from Geoffrey Moore of the National Bureau of Economics Research and Sam Stovall from Standard and Poor's, the basic idea is that as the stages of the business cycle phase evolves, different asset classes should do better and worse.

Here is the best quadrant description I could find online (also from brazen).



Note that the quadrant numbers in the graph above have been changed … in high school algebra, traditional X-Y graph quadrants are numbered like this:



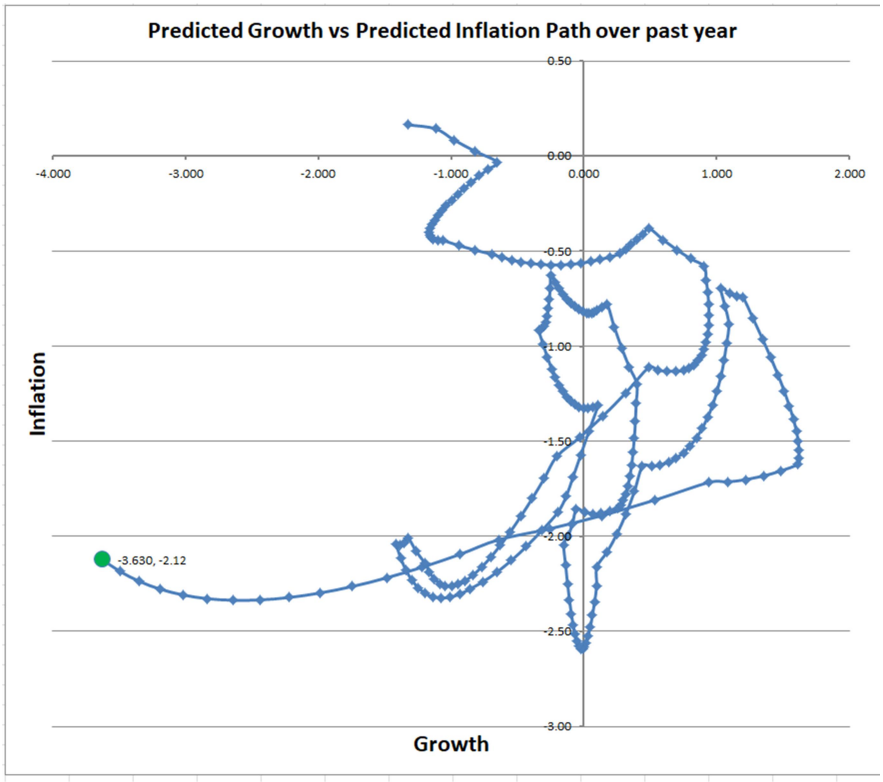
In our EXCEL templates you'll find our quadrant analysis tab in the fundamental examples:

Quadrant Analysis

Run Now= FALSE <--- Type TRUE to run

Date	Predicted GDP YoY	Predicted GDP LinReg%Chg	Implied GDP QoQ	Reported GDP YoY	Reported GDP LinReg%Chg	Reported GDP QoQ	Date	Predicted YoY CPI	Predicted CPI LinReg%Chg	Reported CPI Yoy	Reported CPI LinReg%Chg	Predicted Quadrant	Reported Quadrant
8/23/2023	0.311	-3.630	-6.857	2.5	1.544	2.8	8/23/2023	2.84	-2.12	3.20	-0.78949121	Disinflationary Bust	Disinflationary Boom
8/22/2023	0.334	-3.593	-6.864	2.5	1.541	2.8	8/22/2023	2.84	-2.18	3.20	-0.9107123	Disinflationary Bust	Disinflationary Boom
8/21/2023	0.334	-3.548	-6.864	2.5	1.532	2.8	8/21/2023	2.84	-2.24	3.20	-1.02571693	Disinflationary Bust	Disinflationary Boom
8/18/2023	0.334	-3.491	-6.864	2.5	1.516	2.8	8/18/2023	2.84	-2.28	3.20	-1.13450509	Disinflationary Bust	Disinflationary Boom
8/17/2023	0.334	-3.421	-6.864	2.5	1.595	2.8	8/17/2023	2.84	-2.31	3.20	-1.23707678	Disinflationary Bust	Disinflationary Boom
8/16/2023	0.334	-2.439	-6.864	2.5	1.567	2.8	8/16/2023	2.84	-2.33	3.20	-1.33343201	Disinflationary Bust	Disinflationary Boom
8/15/2023	0.334	-2.444	-6.864	2.5	1.532	2.8	8/15/2023	2.84	-2.34	3.20	-1.42357077	Disinflationary Bust	Disinflationary Boom
8/14/2023	0.334	-2.437	-6.864	2.5	1.492	2.8	8/14/2023	2.84	-2.33	3.20	-1.50749306	Disinflationary Bust	Disinflationary Boom
8/11/2023	0.334	-2.218	-6.864	2.5	1.445	2.8	8/11/2023	2.84	-2.32	3.20	-1.58519889	Disinflationary Bust	Disinflationary Boom
8/10/2023	0.334	-1.986	-6.864	2.5	1.392	2.8	8/10/2023	2.84	-2.30	3.20	-1.65668825	Disinflationary Bust	Disinflationary Boom
8/9/2023	0.334	-1.742	-6.864	2.5	1.333	2.8	8/9/2023	2.84	-2.26	3.20	-1.72196115	Disinflationary Bust	Disinflationary Boom
8/8/2023	0.334	-1.485	-6.864	2.5	1.268	2.8	8/8/2023	2.84	-2.22	3.20	-1.78101758	Disinflationary Bust	Disinflationary Boom
8/7/2023	0.334	-1.216	-6.864	2.5	1.197	2.8	8/7/2023	2.84	-2.16	3.20	-1.83385754	Disinflationary Bust	Disinflationary Boom
8/4/2023	0.334	-0.935	-6.864	2.5	1.119	2.8	8/4/2023	2.84	-2.10	3.20	-1.88048104	Disinflationary Bust	Disinflationary Boom
8/3/2023	0.334	-0.641	-6.864	2.5	1.035	2.8	8/3/2023	2.84	-2.02	3.20	-1.92088807	Disinflationary Bust	Disinflationary Boom
8/2/2023	0.334	-0.258	-6.864	2.5	0.945	2.8	8/2/2023	2.84	-1.96	3.20	-1.9551243293	Disinflationary Bust	Disinflationary Boom
8/1/2023	0.334	0.133	-6.864	2.5	0.849	2.8	8/1/2023	2.84	-1.89	3.20	-1.98379076781	Disinflationary Boom	Disinflationary Boom
7/31/2023	0.334	0.584	-6.864	2.5	0.746	2.8	7/31/2023	2.84	-1.81	3.20	-2.00945589269	Disinflationary Boom	Disinflationary Boom
7/28/2023	1.873	0.984	-0.307	2.5	0.637	2.8	7/28/2023	3.40	-1.72	3.00	-2.03080780759	Disinflationary Boom	Disinflationary Boom
7/27/2023	1.873	1.081	-0.307	2.5	0.522	2.8	7/27/2023	3.40	-1.71	3.00	-2.04870999075	Disinflationary Boom	Disinflationary Boom
7/26/2023	1.873	1.218	-0.307	2.5	0.401	2.8	7/26/2023	3.40	-1.70	3.00	-2.06329740981	Disinflationary Boom	Disinflationary Boom
7/25/2023	1.873	1.362	-0.307	2.5	0.274	2.8	7/25/2023	3.40	-1.68	3.00	-2.07457006475	Disinflationary Boom	Disinflationary Boom
7/24/2023	1.873	1.483	-0.307	2.5	0.140	2.8	7/24/2023	3.40	-1.66	3.00	-2.08279556	Disinflationary Boom	Disinflationary Boom
7/21/2023	2.506	1.631	4.823	1.8	0.000	2	7/21/2023	3.46	-1.62	3.00	-2.08798233	Disinflationary Boom	Disinflationary Bust
7/20/2023	2.506	1.620	4.823	1.8	0.000	2	7/20/2023	3.46	-1.59	3.00	-2.09019496	Disinflationary Boom	Disinflationary Bust
7/19/2023	2.506	1.622	4.823	1.8	0.000	2	7/19/2023	3.46	-1.55	3.00	-2.08941304348	Disinflationary Boom	Disinflationary Bust
7/18/2023	2.506	1.615	4.823	1.8	0.000	2	7/18/2023	3.46	-1.50	3.00	-2.08561187789	Disinflationary Boom	Disinflationary Bust
7/17/2023	2.506	1.600	4.823	1.8	0.000	2	7/17/2023	3.46	-1.44	3.00	-2.07879959482	Disinflationary Boom	Disinflationary Bust
7/14/2023	2.506	1.578	4.823	1.8	0.000	2	7/14/2023	3.46	-1.38	3.00	-2.06896525439	Disinflationary Boom	Disinflationary Bust
7/13/2023	2.506	1.547	4.823	1.8	0.000	2	7/13/2023	3.46	-1.31	3.00	-2.05611979648	Disinflationary Boom	Disinflationary Bust
7/12/2023	2.506	1.509	4.823	1.8	0.000	2	7/12/2023	3.46	-1.24	3.00	-2.04025957447	Disinflationary Boom	Disinflationary Bust
7/11/2023	2.506	1.462	4.823	1.8	0.000	2	7/11/2023	3.46	-1.15	3.00	-2.02138458834	Disinflationary Boom	Disinflationary Bust

In the next release we will add a graph of the past year's quadrant data in a graph like this:



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