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The Taylor Rule and Sector Views

Given the current macroeconomic environment, where the most significant topics include discussions on inflation, policy rates, real GDP (rGDP), and the Fed Funds Rate, we thought it would be valuable to visit the relationship that connects all these variables together. The Taylor Rule is a way to utilize associations based on both historical data and economic expectations to estimate what the policy rate should be given the levels of these specific variables.

The Taylor Rule says the target nominal policy rate (i) should be dependent on the level of real neutral rates (r_n), expected inflation (π_e), half of the difference between expected real GDP growth (Y_e) and trend real GDP growth (Y_t), and half the difference between expected inflation (π_e) and target inflation (π_t). If expected inflation is above target inflation, then the rule says that The Federal Reserve (The Fed) should raise rates. If expected rGDP growth is above trend rGDP growth, then Fed Policy Rates should also rise as well. This way the economy can be cooled with higher rates when it's running too hot and heated with lower rates when running cold. The full formula is below.

$$i = r_n + \pi_e + 0.5\,(Y_e - Y_t) + 0.5\,(\pi_e - \pi_t)$$

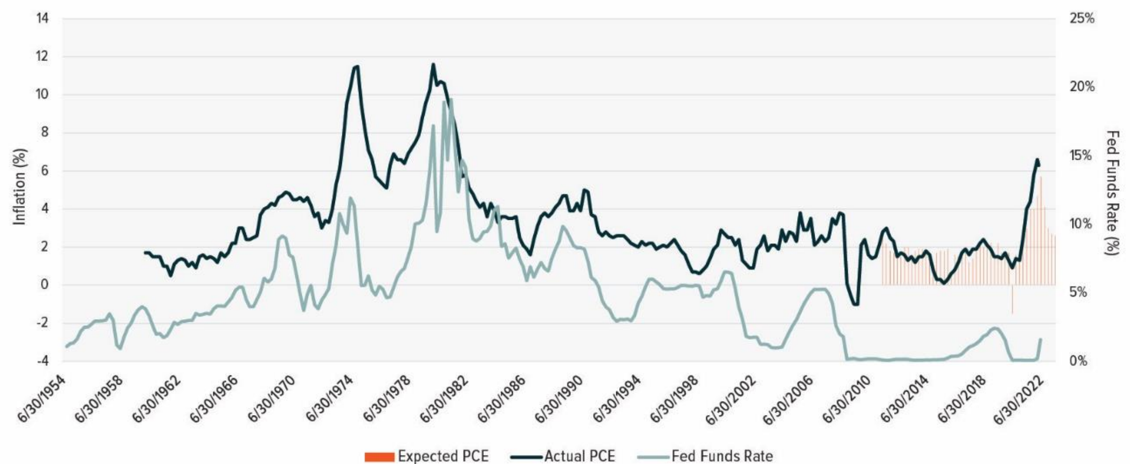
i = Fed Funds Policy Rate
r_n = Real Neutral Rates
π_e = Exptected Inflation
Y_e = Expected rGDP
Y_t = Trend rGDP
π_t = Target Inflation

Inflation

Inflation, in this case, would be best measured through Personal Consumption Expenditure (PCE) Index, since this is the same figure that The Fed uses. The main difference between PCE and Consumer Price Index (CPI) is that CPI data is sourced from consumers, while PCE data is sourced from businesses.[1] And that PCE measures goods and services bought by all households and non-profits, while CPI only accounts for urban households. CPI can also be victim to wide price volatility, while PCE has a smoothing effect which lowers volatility. Given the positive relationship between inflation and the policy rate, if expected inflation rises, then the rule dictates that Fed Policy Rates should rise as well.

PCE & THE FED FUNDS RATE

Source: Bloomberg data as of June 17, 2022



The Fed has indicated that the target inflation rate for the economy should be around 2%[2]. So, this could fit with the target inflation variable (π_t). For expectations, they're subjective, if basing off The Fed forecast then it would be 5.2% for 2022, 2.6% for 2023, and 2.2% for 2024.[3] If basing off private institutions, then this variable can vary as seen below.

PCE FORECAST

Source: Bloomberg data as of June 23, 2022

2022				2023				2024			
High	Mean	Median	Low	High	Mean	Median	Low	High	Mean	Median	Low
7.5%	5.8%	5.8%	4.5%	7.5%	5.8%	5.8%	4.5%	7.5%	5.8%	5.8%	4.5%

GDP

Real GDP is measured by removing the effects of inflation from nominal GDP. The relationship between rGDP and Fed Policy Rates is positive as well. If expected growth rises above trend growth, then the Taylor rule says that rates should rise as well. Higher rates tend to cool demand, and through this equilibrium process higher policy rates are used so the economy doesn't overheat. Historically, average rGDP growth since 1973 has been about 2.7%[4], greater than The Fed's projections of 1.7% for 2022, 1.7% for 2023, and 1.9% for 2024. The Fed projects that long run change in real GDP is expected to be about 1.8%.[5]

For the Taylor Rule, inputs for both expected rGDP and trend rGDP can vary. Potential substitutes for the long term Y_t could be the long run rGDP estimate from The Fed of 1.8%, which would maintain consistency since the Fed Funds Rate is a product of Federal Reserve expectations. Another option would be the empirical figure of 2.7% from 30 years of historical data. The drawback would be that tomorrow's economy is different than yesterdays and the

past doesn't dictate the future. While the much more subjective shorter term Y_e, could either be based on The Fed's near-term projections or current private institution expectations of what rGDP could be. Similar to expected PCE, this number also varies depending on institution.

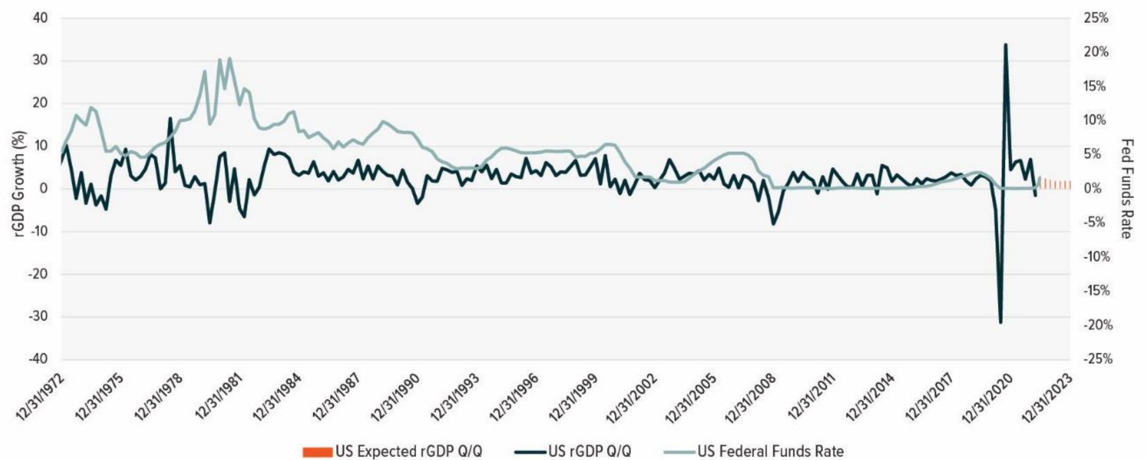
rGDP FORECAST

Source: Bloomberg data as of June 23, 2022

2022				2023				2024			
High	Mean	Median	Low	High	Mean	Median	Low	High	Mean	Median	Low
3.8%	2.6%	2.6%	-0.6%	3.4%	1.9%	1.9%	0.0%	3.2%	1.8%	1.9%	-1.0%

rGDP & THE FED FUNDS RATE

Source: Bloomberg data as of June 22, 2022



The real neutral rate (r_n) is what the assumed short-term rate should be if inflation and output influences were removed from the economy.[6] This rate can be determined by looking at the longer run nominal Federal Funds Rate projections. From the June FOMC meeting, the median for this is set at 2.5%, up 10bps from the March meeting. If backing out long term inflation, which is set at 2.0%, the real neutral rate can be deduced to be 0.5%.

Bringing It Together

Bringing together all the above, we now have variables to estimate what the Fed Policy Rate could be in 2022, 2023, and 2024. Variables for the real neutral rate, target inflation, and trend rGDP growth can remain static when forecasting Fed Funds rates since these are long term estimates provided by The Fed. This leaves expected rGDP growth and expected inflation as the dynamic variables where investors and institutions can apply their individual outlooks on the market.

$$i = r_n + \pi_e + 0.5\,(Y_e - Y_t) + 0.5\,(\pi_e - \pi_t)$$

The scenarios below outline what the Taylor Rule says the Fed Policy Rate should be under certain rGDP and Inflation Expectations.

POLICY RATE SCENARIO ANALYSIS BASED ON THE TAYLOR RULE

Expected Real GDP Growth (%)	Expected Inflation (%)						
	2	3	4	5	6	7	8
-2	0.6	2.1	3.6	5.1	6.6	8.1	9.6
-1	1.1	2.6	4.1	5.6	7.1	8.6	10.1
0	1.6	3.1	4.6	6.1	7.6	9.1	10.6
1	2.1	3.6	5.1	6.6	8.1	9.6	11.1
2	2.6	4.1	5.6	7.1	8.6	10.1	11.6
3	3.1	4.6	6.1	7.6	9.1	10.6	12.1

Although the Taylor Rule is a widely used metric to assess the potential level of Fed Policy Rates, it doesn't account for other factors. One of which is the unemployment rate, which plays a large role in The Fed's decision on how to position their rates. By using this framework investors can also back into what The Fed could be assigning as their expected inflation and expected GDP for each year given their trajectory of terminal rates for that given year. With higher policy rates, equity valuations are discounted at a higher premium, causing a revaluation that affects growthier sectors more than value.

Our sector views table provides more detail on sector positioning and the current tailwinds and headwinds for each sector.

CURRENT VIEWS ON U.S. SECTORS

	Positive Factors	Negative Factors	Overall View
Communication Services	The sector is a potential future beneficiary of the development of augmented reality and metaverse.	Higher interest rates adversely impact the discount rate negatively impacting future earnings and cash flows.	**Underweight**
Consumer Discretionary	Consumers adapted to the pandemic by increasing	Consumer Discretionary is a labor-intensive sector.	**Underweight**

	their use of online ordering and delivery and in-store pickup.	Wage pressure combined with higher input costs in materials and shipping is a risk to margins if companies are not able to pass inflation pressures to the end consumer. Spending on discretionary items will likely continue to face headwinds from high commodity prices and a slowdown in housing activity.[7]	
Consumer Staples	High inflation and slower real economic growth may force consumers to prioritize staples over discretionary purchases.	Higher transport costs by air and sea may negatively impact company margins.[8] Risks remain that consumers will begin to trade down to less expensive generic products and companies will have a more difficult time raising prices in order to offset cost inflation.[9]	**Overweight**
Energy	Escalated tensions with Russia, a large natural gas exporter to Europe, could lead to elevated energy prices globally for an extended period. Hurricane season and concerns about low storage levels may provide near-term support for the Energy sector.	Sector is sensitive to Chinese demand for oil. Stringent Zero Covid policy can cause abrupt lockdowns which could weigh on prices and demand. The Energy sector is sensitive to the economic cycle. Should elevated energy and food prices detract from real economic growth, reduced demand pressures may shorten the commodity cycle.	**Overweight**
Financials	The Financial sector could benefit from higher interest rates with the Fed starting their interest rate rising cycle.	Russia's invasion of Ukraine increased inflation expectations while reducing expectations for real economic growth and raising the probability of a recession. Flatter yield curve and elevated inflation weighs on sector.	**Market Weight**

Health Care	Demographics favor the Health Care sector due to the aging global population and the growing middle class in emerging markets. Sector is showing strong fundamentals, quality, and record discounts vs. the S&P 500 on a forward P/E basis.[10]	Drug pricing pressure remains a risk, though the legislative process is slow, and no meaningful legislation is currently expected to be passed. Certain industries within the sector, like Genomics and Biotechnology, have a large amount of non-profitable, high cash burn companies which are not well suited to the current higher rate environment.	**Overweight**
Industrials	The Industrials sector is a beneficiary of rising GDP, interest rates, inflation, and possible infrastructure spending. Re-shoring and a shift towards automation infrastructure spending will be a long-term benefit for Robotics & AI.	Elevated leverage, increasingly expensive valuations, and rising earnings volatility may detract from performance.[11] Supply chain issues could be a major headwind.	**Market Weight**
Information Technology	Software names should benefit from higher CAPEX as firms look to boost productivity amid rising wage inflation.[12] The increased adoption of key disruptive technologies like cloud computing, cybersecurity, and cleantech are likely to continue after the pandemic.	Increased regulatory scrutiny is a risk, and there is bipartisan support for increased regulation. Rising interest rates negatively impact long-duration growth sectors like Technology.	**Market Weight**
Materials	Increased focus on electric vehicle adoption, alternative energy sources, and energy storage should be beneficial to lithium and battery technology. The Materials sector is a beneficiary of inflation, higher raw materials prices and increase capex and infrastructure spending.	Chinese lockdowns may weigh on global demand. Earnings growth likely to be weighed down by the strong dollar.[13]	**Market Weight**
Real Estate	The Real Estate sector has the potential to be a	Uncertainty about a full return to the office and flex	**Market Weight**

	source of inflation-protected yield. The focus on real assets and locking in mortgages before yields rise provided a short-term increase in property pricing with inflation pressures building on rents. Strong demand for residential REITs is translating into higher single family and multi-family rents.	working situations may reduce demand for office space. A fast rise in interest rates, which increases the cost of financing, is a risk if costs cannot be passed along to tenants.	
Utilities	Benefits from resilient fundamentals and is a defensive hedge.[14] The preferred sector in recessionary environments due to the inelasticity of goods & services.	The potential for increased climate-related regulations over time may detract from the sector's appeal. Companies may not be able to pass through higher inflation-related costs due to government regulations.	**Overweight**

Footnotes

[1] US Bureau of Labor Statistics, Comparison of PCE and CPI, 2017
[2] Federal Reserve, Summary of Economic Projections, June, 15, 2022
[3] Federal Reserve, Summary of Economic Projections, June 15, 2022
[4] Bloomberg, US real GDP Data, June 21, 2022
[5] Federal Reserve, Summary of Economic Projections, June 15, 2022
[6] Cleveland Fed, Natural Rate of Interest in Taylor Rules, March 22, 2016
[7] UBS, House View, June 2022
[8] FactSet, Earnings Insight, 22 October 2021
[9] UBS, House View, June, 2022
[10] BofA Securities, The RIC Report: Resources for Realists, 12 April 2022
[11] BofA Securities, The RIC Report: Resources for Realists, 12 April 2022
[12] BofA, The RIC Report: Get paid to wait, 11 January 2022
[13] BofA, The RIC Report: Peace Through Strength, 8 March 2022
[14] BofA, The RIC Report: Bullish Stock Splits, Bearish Rate Hits, 8 February 2022

Definitions

Basis point (bps): A basis point is a hundredth of one percent. It is predominantly used to express differences in interest rates.

Consumer price inflation (CPI): CPI measures the average change in prices that consumers pay for a defined basket of goods and services.

Capital Expenditures (Capex): Funds used by a company to acquire, update, and maintain physical assets such as buildings, technology, and equipment; often used to undertake new investments/projects.

Core PCE inflation: Core inflation is measured by both the CPI and the Core Personal Consumption Expenditures Index (PCE) which represents the price of goods and services purchased by consumers in the U.S.

FOMC: Federal Open Market Committee

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