IN SEARCH OF A STEADY STATE: INFLATION, INTEREST RATES AND VALUE

The (inflation) genie escapes the bottle!

A Market in search of a Steady State…

- The nature of markets is that they are never quite settled, as investors recalibrate expectations constantly and reset prices.
  - In most time periods, those recalibrations and resets tend to be small and in both directions, resulting in the ups and downs that pass for normal volatility.
  - WE are not in one of those time periods, as markets approach bipolar territory, with big moves up and down.
- The good news is that the culprit behind the volatility, inflation, is easy to identify, but the bad news is that inflation remains the most unpredictable of all macroeconomic factors to factor into stock prices and value.
- In this session, I will look at where we stand on inflation expectations, and the different paths we can be end up on, ranging from potentially catastrophic to mostly benign.

Inflation: Measurement and History

What is inflation?

- Put simply, inflation is a measure of the change in purchasing power in a given currency over time. Implicit in this definition are two key components of inflation.
  - The first is that to define purchasing power, you have to start with a definition of what you are purchasing, and this detail, as we will see, can lead to differences in inflation measured over a given period, across measures/services.
  - The second is that inflation is tied to currencies, and different currencies can be exposed to different levels of inflation over the same period. Understanding these differences is key to understanding why interest rates can vary across currencies and the changes in exchange rates over time.

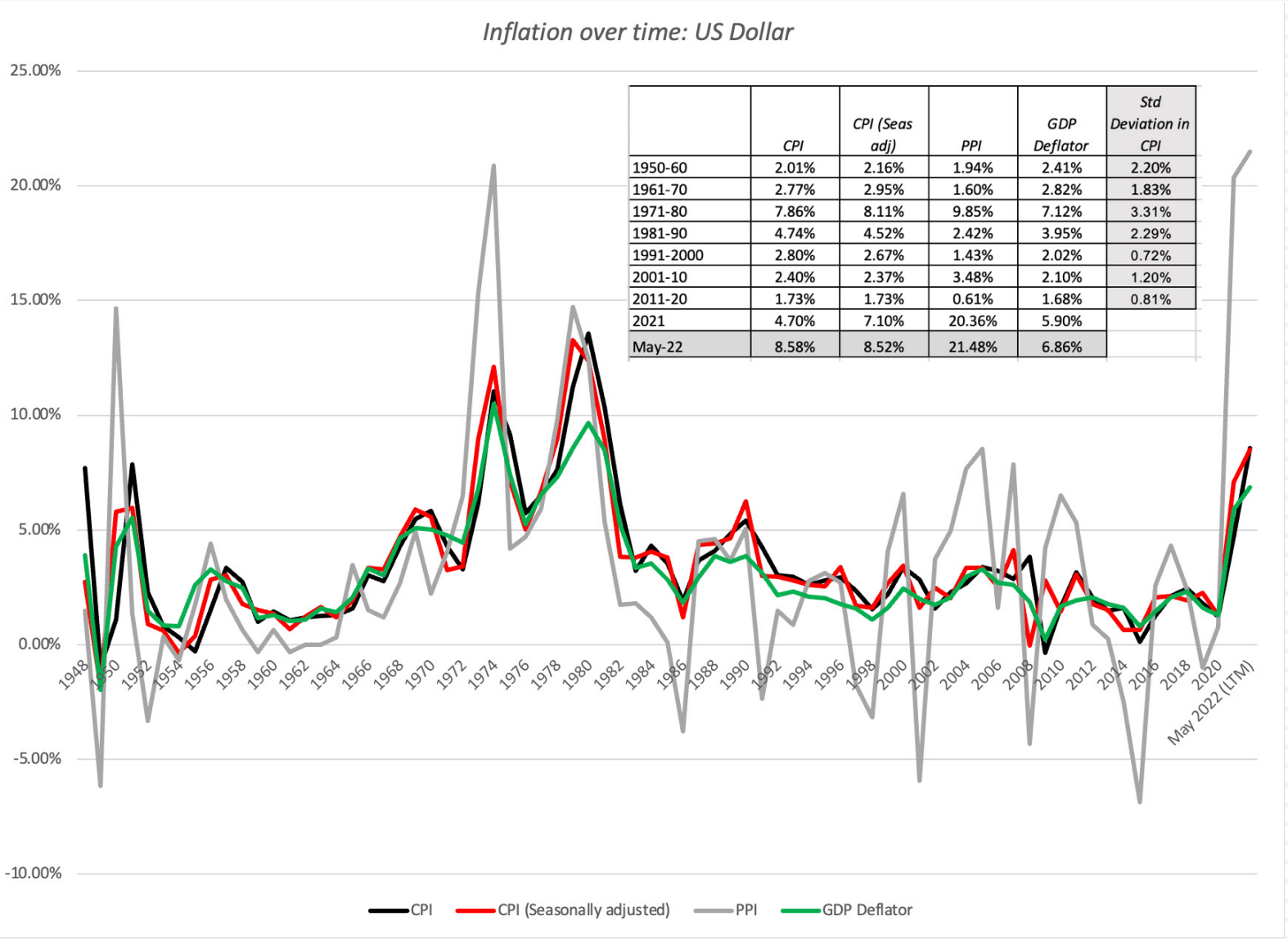
What causes inflation?

- Inflation, at its core, is a monetary phenomenon, created by too much money chasing too few goods. That said, it is true that in the near term (which can extend to years), inflation is affected by other forces as well.
  - Economic slack: When an economy has employment and production slack, as is the case after recessions or economic crises, you could see inflation stay subdued, even in the presence of fiscal and monetary stimuli, as it grows to fill in capacity.
  - Structural Changes: There are times when structural changes in the economy, arising as you transition from a manufacturing to a service economy, or from one that is domestically focused to one that is export-oriented, can create periods where inflation stays subdued in the face of monetary expansion.
  - Consumer/investor behavior: Consumers are the final wild card in this process, as changes in demographics and behavior can have consequences for inflation.
  - Size of the economy: It is not fair, but larger economies with currencies that are used more globally, also have the capacity to absorb shocks that would put a lesser economy into an inflationary spiral.

Actual Inflation: Measures

- Consumption basket is misspecified: While the services try their best to get the basket of goods and services right, there are two fundamental problems. The first is that within a country, the basket varies widely across consumers and identifying the representative consumer is inherently subjective. The second is that the basket is not stable over time, as consumers adjust to changing tastes and prices to alter what and how much they consume of different goods and services.
- Prices of goods and services are wrong/biased: Even if you had consensus on the consumption basket, the prices for goods and services have to be estimated. While services use sampling techniques to obtain prices of goods and service from sellers, and double check them against consumer expenditures, there is no practical way that you can survey every store and consumer.
- Prices of goods and services have seasonal patterns and/or volatility: There are some goods and service, where there can be seasonal patterns in prices, and services sometimes try to control for the seasonality, when measuring changes in pricing power. With items, where prices can be volatile over short period, like gasoline, services will measure inflation with and without these items to highlight the effect of volatility.

Inflation: History and Perspective



	CPI	CPI (Seas adj)	PPI	GDP Deflator	Std Deviation in CPI
1950-60	2.01%	2.16%	1.94%	2.41%	2.20%
1961-70	2.77%	2.95%	1.60%	2.82%	1.83%
1971-80	7.86%	8.11%	9.85%	7.12%	3.31%
1981-90	4.74%	4.52%	2.42%	3.95%	2.29%
1991-2000	2.80%	2.67%	1.43%	2.02%	0.72%
2001-10	2.40%	2.37%	3.48%	2.10%	1.20%
2011-20	1.73%	1.73%	0.61%	1.68%	0.81%
2021	4.70%	7.10%	20.36%	5.90%	
May-22	8.58%	8.52%	21.48%	6.86%	

Expected Inflation

- Inflation surveys: There are services that report measures of expected inflation, obtained by surveying economic experts or consumers.
- Interest rates: To understand the link between expected inflation and interest rates, consider the Fisher equation, where a nominal riskfree interest rate (which is what treasury bond rates) can be broken down into expected inflation and expected real interest rate components. Put simply, if you expect the annual inflation rate to be 2% in the future, you would need to set the interest rate on a bond above 2% to earn a real return.
- Exchange rates: The third approach to estimating inflation rates is to use forward exchange rate, in conjunction with spot rates, to back out expected inflation in a currency. To use this approach, you need to have a base currency, where you can estimate expected inflation, say the US dollar and forward exchange rates in the currency in which you want to estimate inflation.

Measures of Expected Inflation

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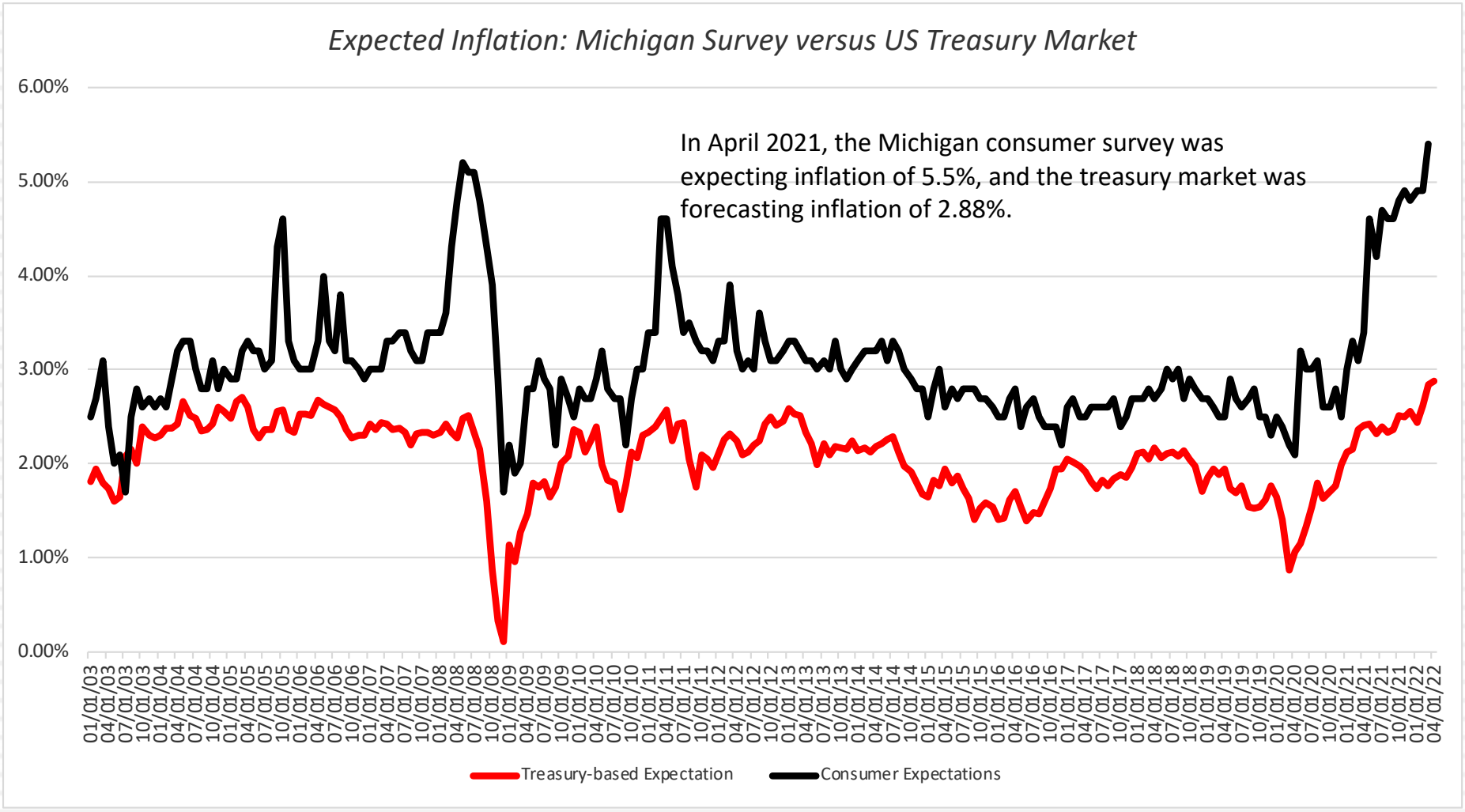
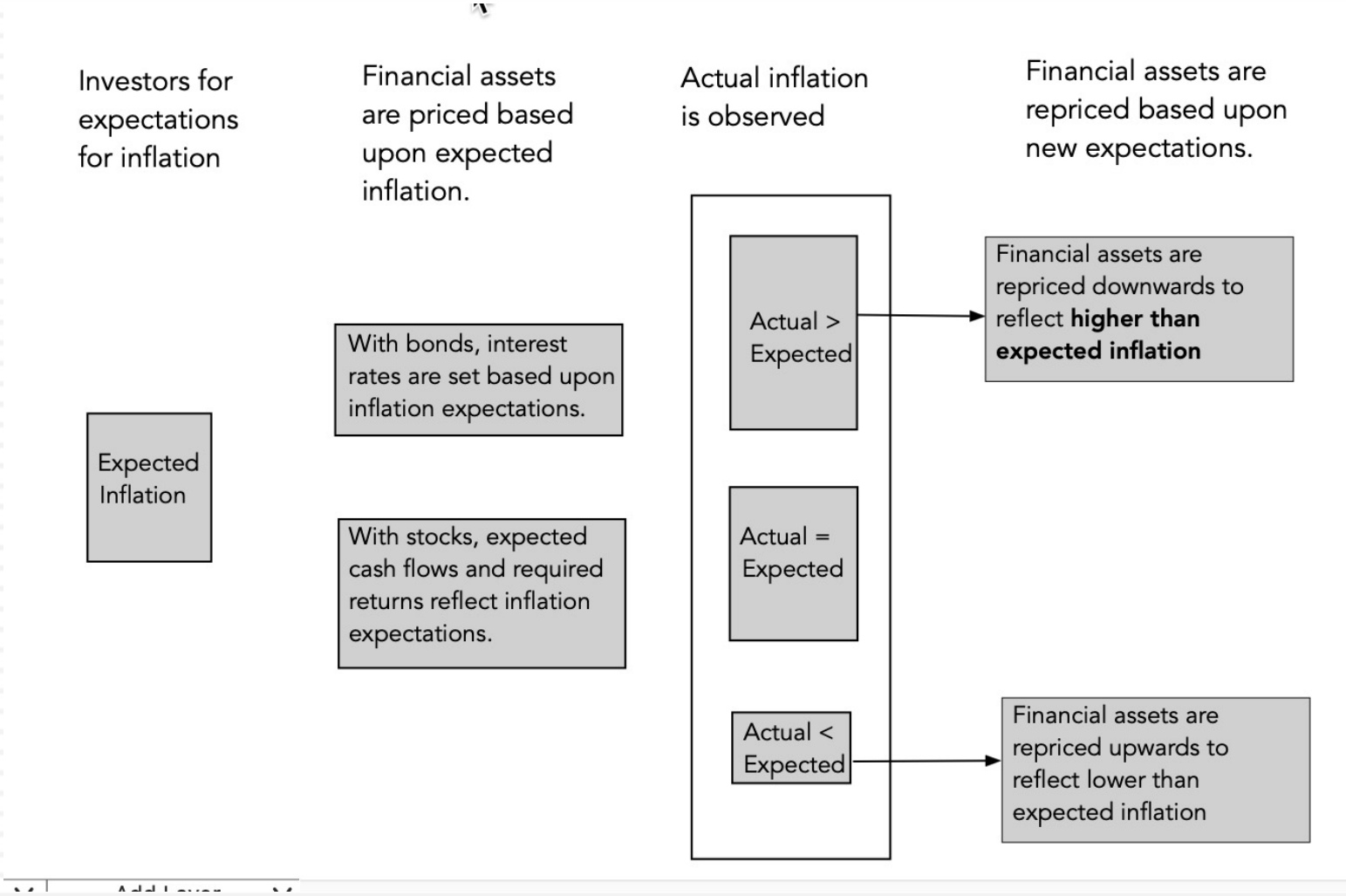


Explaining the divergence…

- Short term versus Long term: The consumer survey extracts an expectation of inflation in the near term, whereas the treasury markets are providing a longer term perspective, since I am using ten-year rates to derive the market-implied inflation.
- Consumers are over adjusting: The big inflation surges have happened in gasoline, food and housing, all items that consumers come into contact with on a continuous basis, and it is possible that they are over reaction and adjusting expected inflation up too much, as a consequence.
- Markets are under adjusting: Alternatively, it is possible that it is consumers who are being realistic and it is that the market which is under adjusting to higher inflation, partly because many investors have operated only in a low and steady inflation environment and partly because many of these investors have a belief that the Fed has super powers and "determines" what interest rates and inflation will be in the future.

And Unexpected Inflation..

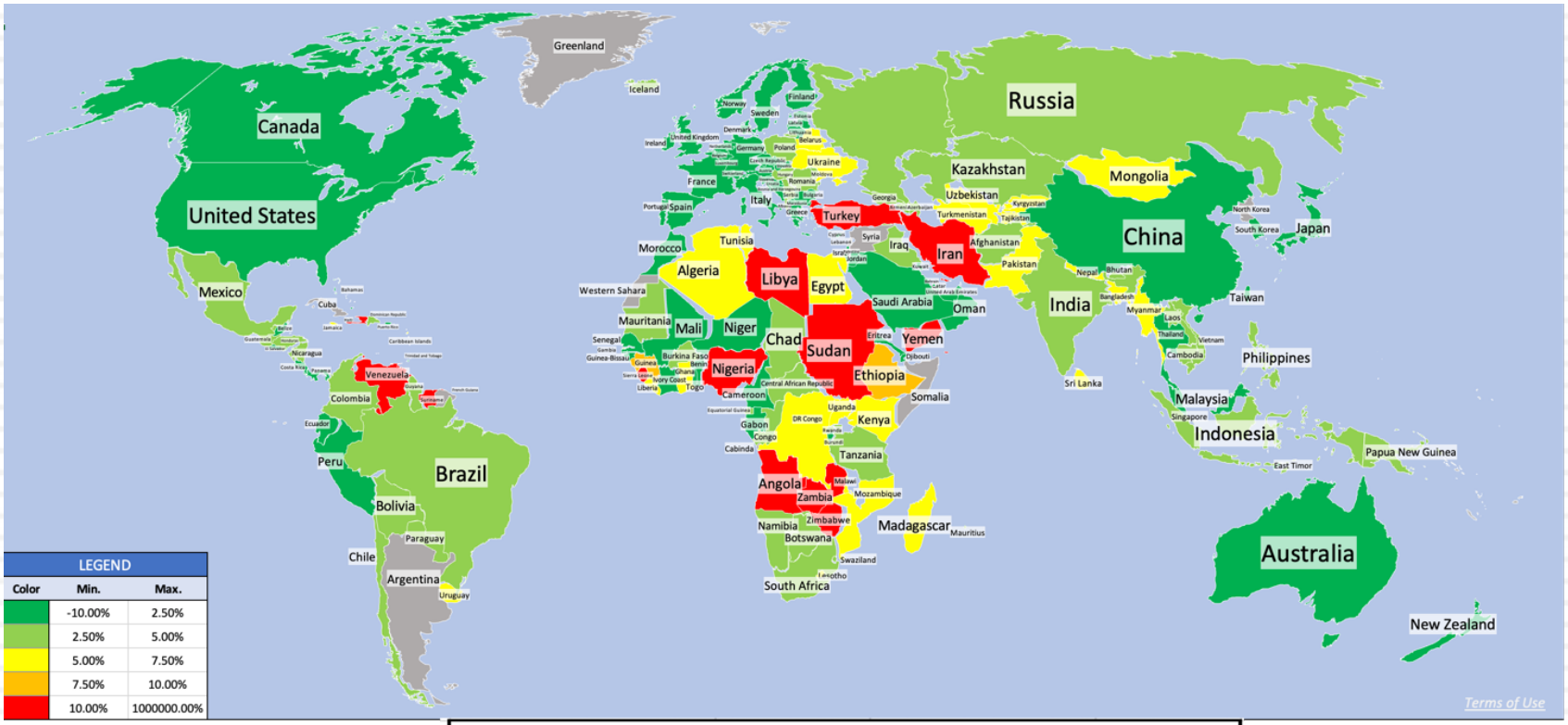


The Inflation Decade: 1971-1980 & Inflation in 2021

- Investors who are old enough to remember the 1970s point to it as a decade of high inflation, but that is only with the benefit of hindsight.
  - At the start of that decade, investors had no reason to believe that they were heading into a decade of higher inflation, and initial signs of price increases were attributed to temporary factors (with OPEC being a convenient target).
  - In fact, expected inflation lagged actual inflation through much of the decade, and the damage done to financial asset returns that decade came as much from actual inflation being higher than expected inflation, period after period, as from higher inflation.
- It is precisely because we have been spoiled by a decade of low and stable inflation that the inflation numbers in 2021 and 2022 have comes as such a surprise to economists, investors and even the Fed.
  - Early on, the inflation surge was explained away by the reopening of the economy, after the COVID shutdown, and then by stressed supply chains, and expected inflation remained low.
  - However, as inflation has remained stubbornly high, and neither COVID nor supply chains provide a sufficient rationale, market expectations of inflation have started to creep up.

Inflation and Currencies

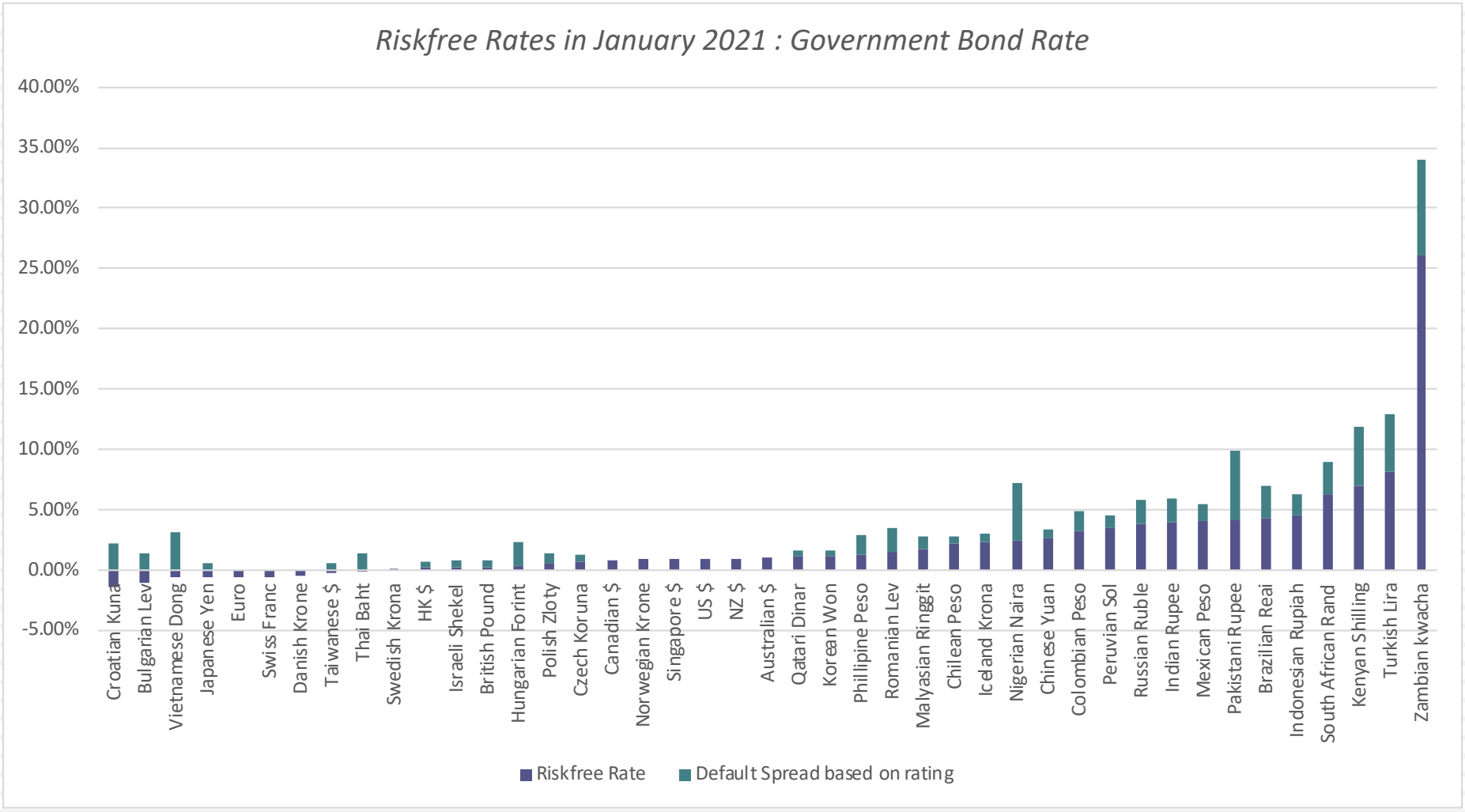
Currency and Inflation: Variations



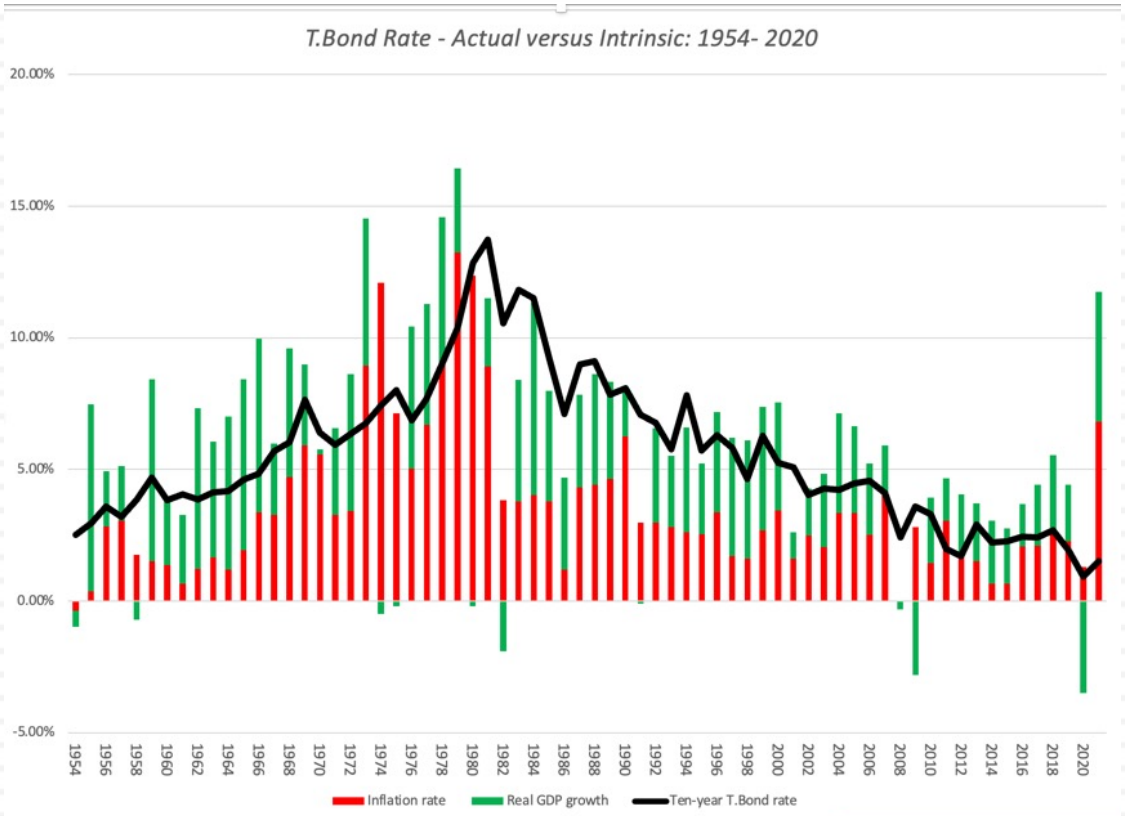
LEGEND		
Color	Min.	Max.
	-10.00%	2.50%
	2.50%	5.00%
	5.00%	7.50%
	7.50%	10.00%
	10.00%	1000000.00%

Expected Inflation: 2021-26			
Highest Expected Inflation		*Lowest Expected Inflation*	
Country	*Expected Inflation*	*Country*	*Expected Inflation*
Venezuela	5500.00%	Switzerland	0.68%
Sudan	38.86%	Israel	0.72%
Iran	27.65%	Japan	0.73%
Suriname	22.58%	Brunei Darussalam	0.80%
Zimbabwe	22.16%	Saint Kitts and Nevis	0.88%
South Sudan, Republic of	21.24%	San Marino	1.00%
Haiti	15.92%	Singapore	1.07%
Yemen	14.74%	West Bank and Gaza	1.08%
Nigeria	12.45%	Italy	1.08%
Turkey	11.56%	El Salvador	1.12%

Leading to interest rate differences..



The Real Reason for Low Rates (Psst: It's not the Fed's doing…)



	Ten-year T.Bond rate	*Inflation rate*	*Real GDP growth*	*Intrinsic riskfree rate*
1954-2021	5.59%	3.55%	2.94%	6.50%
1954-1980	5.83%	4.49%	3.50%	7.98%
1981-2008	6.88%	3.26%	3.04%	6.30%
2011-2021	2.25%	1.76%	1.70%	3.46%

The Interest Rate Divergence

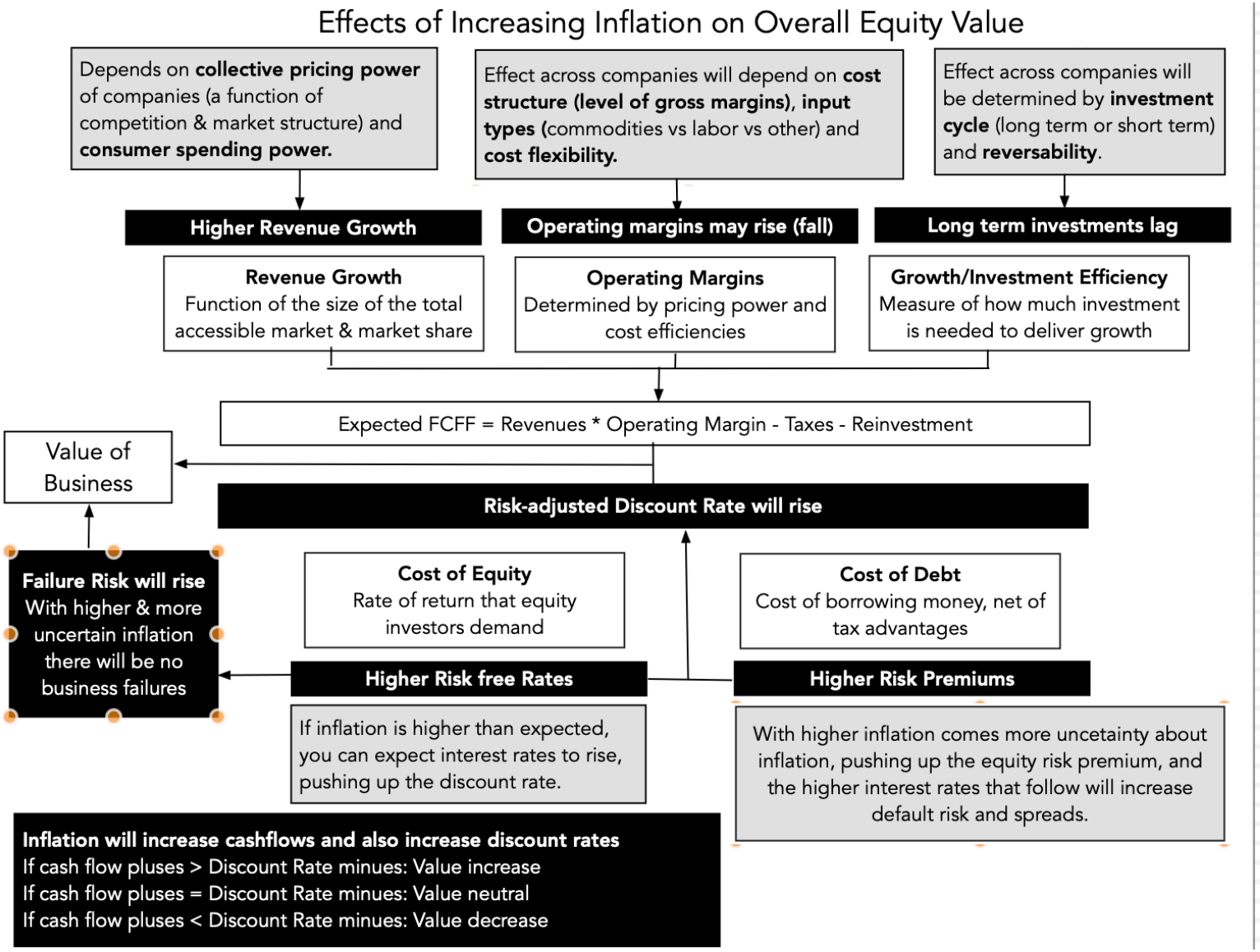
- The 10-year treasury bond rate on July 21, 2022, stood at 3.30%, the highest level in almost a decade.
- The actual inflation rate, though, was 8.6% (if you use the CPI, or higher if you use the PPI) and real GPD grew 4.5% in 2021 (though that rate did drop back in the first quarter of 2022). Put simply, the intrinsic risk free rate looks much higher than the current T.Bond rate.
- That divergence will continue to put pressure on markets, and it will be resolved in one of three ways:
  - The T.Bond rate continues to rise, perhaps even precipitously, to reach levels not seen in this century.
  - The inflation rate subsides quickly, as the temporary factors resolve, to much lower levels.
  - The economy slows down (maybe into a recession), and real GDP growth becomes much lower or negative.

Inflation and Asset Class Returns

Inflation and Bonds

- Expected inflation and unexpected inflation play out in very different ways on bond value:
  - At the time that the contract is specified, the buyer of a bond takes into account the expected inflation, at that time, when deciding the coupon rate for the bond.
  - Subsequent to the contract being settled and the bond being issued, both the bond buyer and seller are exposed to actual inflation, which can be higher or lower than the inflation that was expected at the time the bond was issued. The return that the bond buyer will earn on the bond has two components, a coupon portion that will increase with expected inflation and a price appreciation portion that will move inversely with unexpected inflation.
- **Inflation value proposition 1:** ***In periods when inflation is lower than expected, treasury bond returns will be boosted by price appreciation and in periods when inflation is higher than expected, treasury bond returns will be dragged down by price depreciation***.
- **Inflation value proposition 2:** ***In periods when inflation is higher (lower) than expected, corporate default risk can increase (decrease), leading to corporate bond returns lagging (leading) treasury bond returns.***

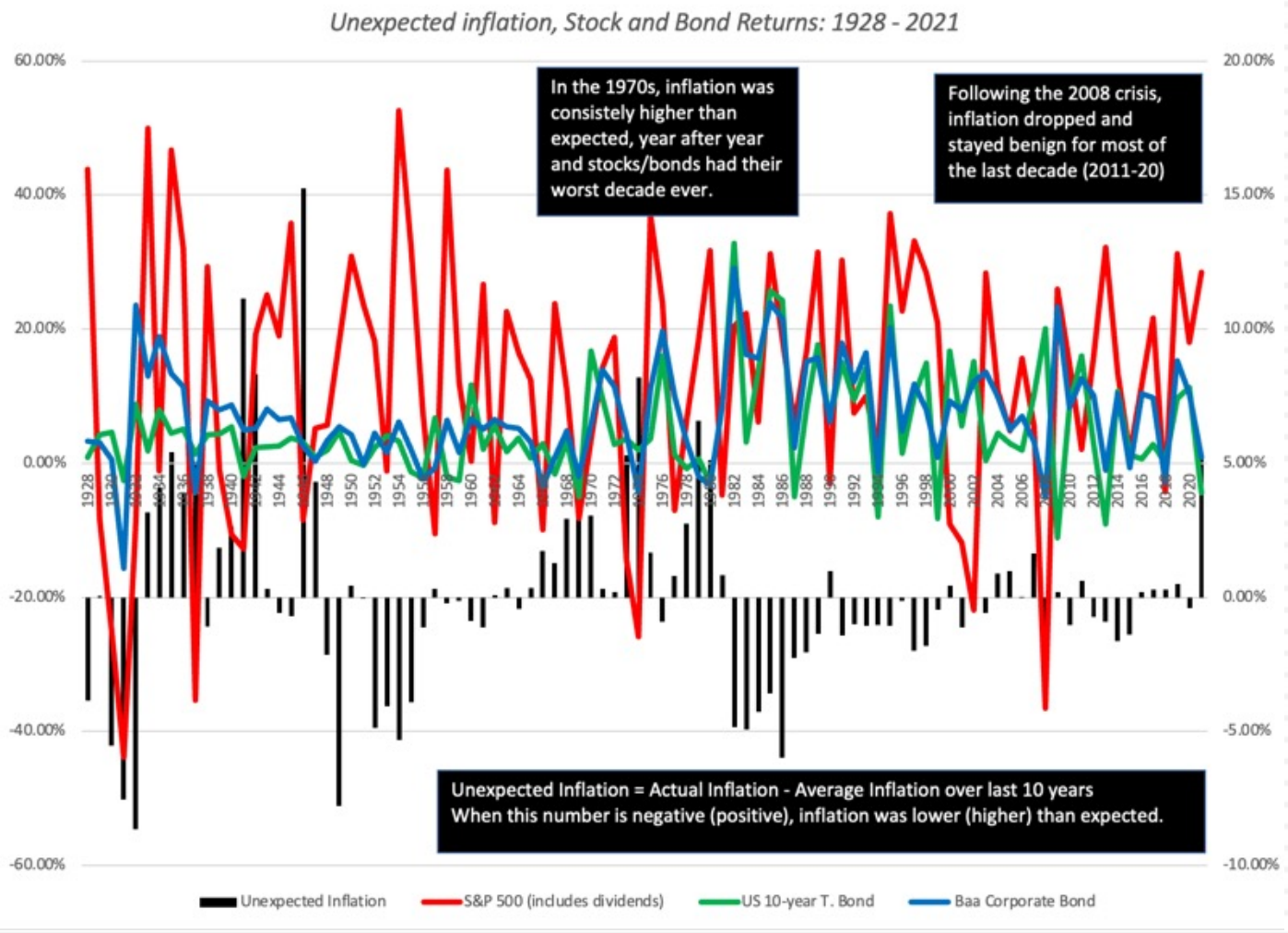
Inflation and Overall Equity Value



Financial Asset Returns: By Decade

			Average Annual Nominal Return				Average Annual Real Return			
Decade	*Expected Inflation*	*Unexpected Inflation*	*Stocks*	*T. Bills*	*T. Bonds*	*Baa Corp Bonds*	*Stocks*	*T. Bills*	*T. Bonds*	*Baa Corp Bonds*
1930-39	-1.92%	0.07%	4.27%	0.99%	4.01%	7.77%	6.19%	2.91%	5.93%	9.69%
1940-49	5.51%	3.08%	9.64%	0.48%	2.52%	5.18%	4.14%	-5.03%	-2.99%	-0.32%
1950-59	2.24%	-1.89%	20.93%	2.00%	0.83%	2.32%	18.69%	-0.24%	-1.41%	0.08%
1960-69	2.53%	0.84%	8.60%	3.98%	2.51%	3.23%	6.07%	1.45%	-0.02%	0.70%
1970-79	7.41%	2.80%	7.52%	6.29%	5.58%	7.29%	0.11%	-1.12%	-1.83%	-0.12%
1980-89	5.14%	-2.33%	17.95%	8.82%	12.59%	14.46%	12.81%	3.68%	7.45%	9.31%
1990-99	2.94%	-0.90%	18.82%	4.85%	7.83%	9.69%	15.88%	1.92%	4.89%	6.75%
2000-09	2.53%	-0.02%	1.16%	2.69%	6.62%	8.61%	-1.37%	0.16%	4.09%	6.08%
2010-19	1.76%	-0.38%	14.02%	0.52%	4.35%	7.23%	12.27%	-1.24%	2.59%	5.48%
2020	1.36%	-0.39%	18.01%	0.09%	11.33%	10.41%	16.65%	-1.27%	9.97%	9.05%

Unexpected Inflation and Financial Assets…



With a follow up…

Annual Returns on Stocks, Bills and Bonds: 1928 -2021

Stocks do best when inflation is close to expected and worst when inflation is far higher than expected.

Treasury and corporate bonds generally deliver worse returns when inflation is greater than expected.

Inflation less than expected.

Inflation greater than expected.

	S&P 500 (Stocks)		*3-month T.Bill*		*10-year T.Bond*		*Baa Corporate Bond*	
Qunitile	*Nominal*	*Real*	*Nominal*	*Real*	*Nominal*	*Real*	*Nominal*	*Real*
Bottom quintile	9.82%	9.80%	4.19%	4.17%	8.32%	8.30%	8.52%	8.50%
2nd quintile	17.50%	15.57%	2.96%	1.02%	7.80%	5.86%	9.17%	7.23%
3rd quintile	15.32%	13.04%	2.18%	-0.10%	1.69%	-0.59%	7.20%	4.92%
4th quintile	9.21%	5.36%	3.91%	0.06%	5.62%	1.77%	6.87%	3.02%
Top quintile	7.15%	0.01%	3.44%	-3.70%	2.29%	-4.84%	4.25%	-2.88%

Other investment classes: Real Estate and Gold

- One of the costs that come with the last scenario is that inflation eats away at trust in not just currencies, but in all financial assets, and that investors will turn away from stocks and bonds.
- In the 1970s, the asset classes that benefited the most from this flight were gold and real estate, and the question is which asset classes will best play this role now, if inflation is here to stay.
  - I do think that securitizing real estate has made it behave more like financial assets and removed some of its power to hedge against inflation, but there may be segments (such as rental properties, where rent can be raised to match inflation) that retain their inflation fighting magic.
  - Gold's history as a collectible with standing will continue, but the truth is that it is not big enough as an asset class for us to all hold it.

And by decade…

			Annual Nominal Return		*Annual Real Return*	
Decade	*Expected Inflation*	*Unexpected Inflation*	*Gold*	*Real Estate*	*Gold*	*Real Estate*
1930-39	-1.92%	0.07%	NA	-1.05%	NA	0.87%
1940-49	5.51%	3.08%	NA	8.56%	NA	3.05%
1950-59	2.24%	-1.89%	NA	3.09%	NA	0.85%
1960-69	2.53%	0.84%	NA	2.18%	NA	-0.35%
1970-79	7.41%	2.80%	37.46%	8.80%	30.05%	1.39%
1980-89	5.14%	-2.33%	-0.96%	5.90%	-6.10%	0.76%
1990-99	2.94%	-0.90%	-2.72%	2.70%	-5.65%	-0.24%
2000-09	2.53%	-0.02%	14.95%	4.30%	12.42%	1.77%
2010-19	1.76%	-0.38%	4.43%	3.86%	2.68%	2.11%
2020	1.36%	-0.39%	24.17%	10.35%	22.81%	8.98%

Unexpected Inflation and Real Asset Returns..

Annual Returns on Gold (1970-2021) and Real Estate (1928 -2021)

Returns on gold, nominal and real, are significantly higher when inflation is greater than expected, and lower when it is lower than expected.

While nominal returns on real estate increase, as unexpected inflation gets higher, real returns show litle or no pattern.

Inflation less than expected.

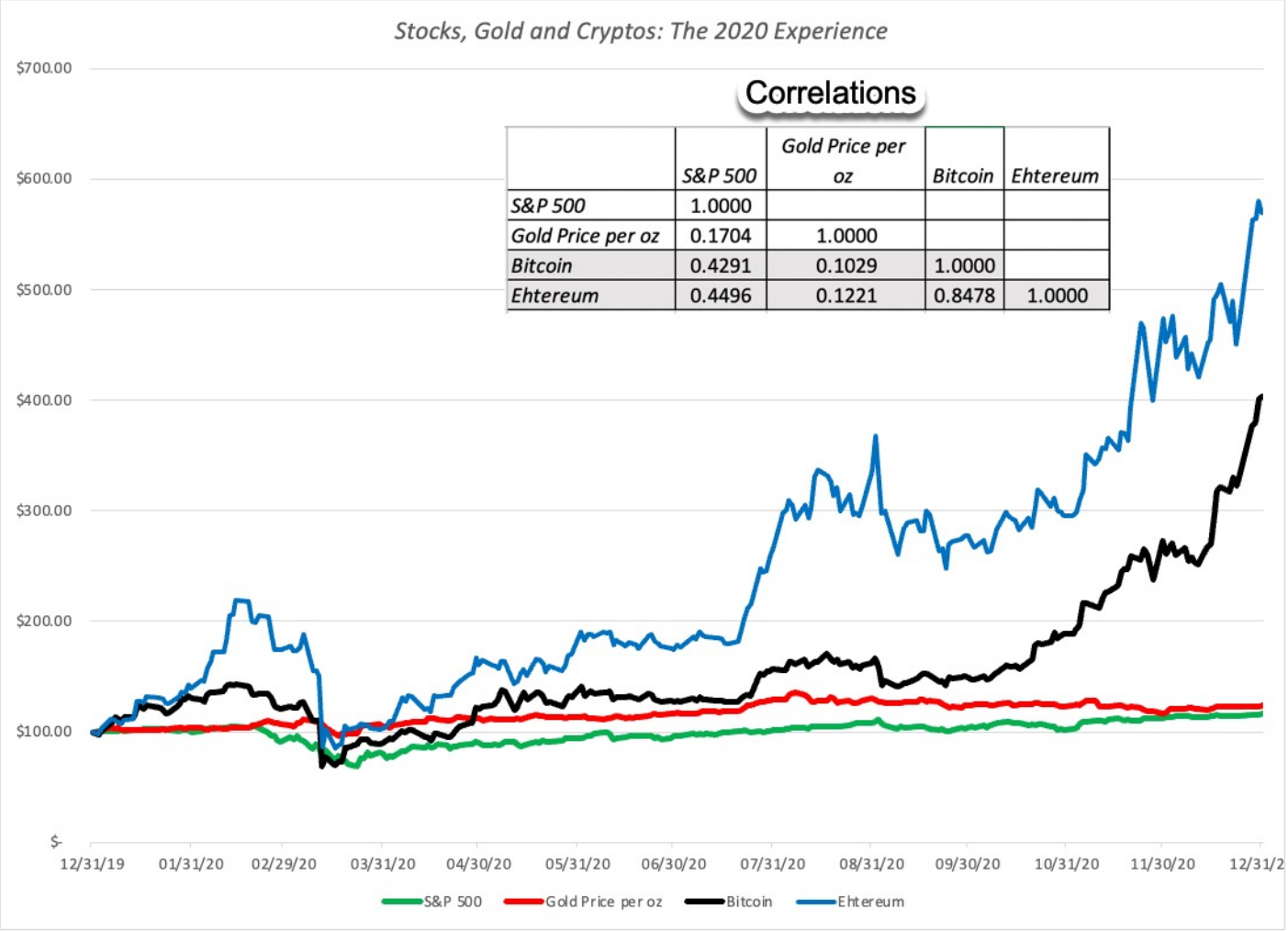
Inflation greater than expected.

	Gold		*Real Estate*	
Qunitile	*Nominal*	*Real*	*Nominal*	*Real*
Bottom quintile	1.96%	-1.22%	1.54%	1.52%
2nd quintile	-2.15%	-4.45%	3.23%	1.29%
3rd quintile	16.97%	14.58%	4.81%	2.53%
4th quintile	5.23%	0.56%	4.46%	0.61%
Top quintile	46.34%	36.57%	7.62%	0.49%

Cryptos, NFTS and other Collectibles

- That, of course, brings us to cryptos, NFTs and other, more recent, entrants into the investment choice list. In theory, you could make the argument that these new investment choices will operate like gold, but you have two serious barriers to overcome.
  - The first is that they have not been along for long, and history is full of collectibles, from Beanie Babies to Pokemon cards, that people paid high prices for, but failed to hold their value.
  - The second is that in the limited history that we have for cryptos and NFTs, they have behaved less like collectibles (holding or increasing in value, as stocks and bonds collapse) and more like very risk stock.
- In fact, higher and sustained inflation may be the ultimate test of whether there is any substance to the bitcoin as millennial gold story, and the results may make or break those holding cryptos for the financial apocalypse that they see coming.

Inflation and Cryptos?



Correlations

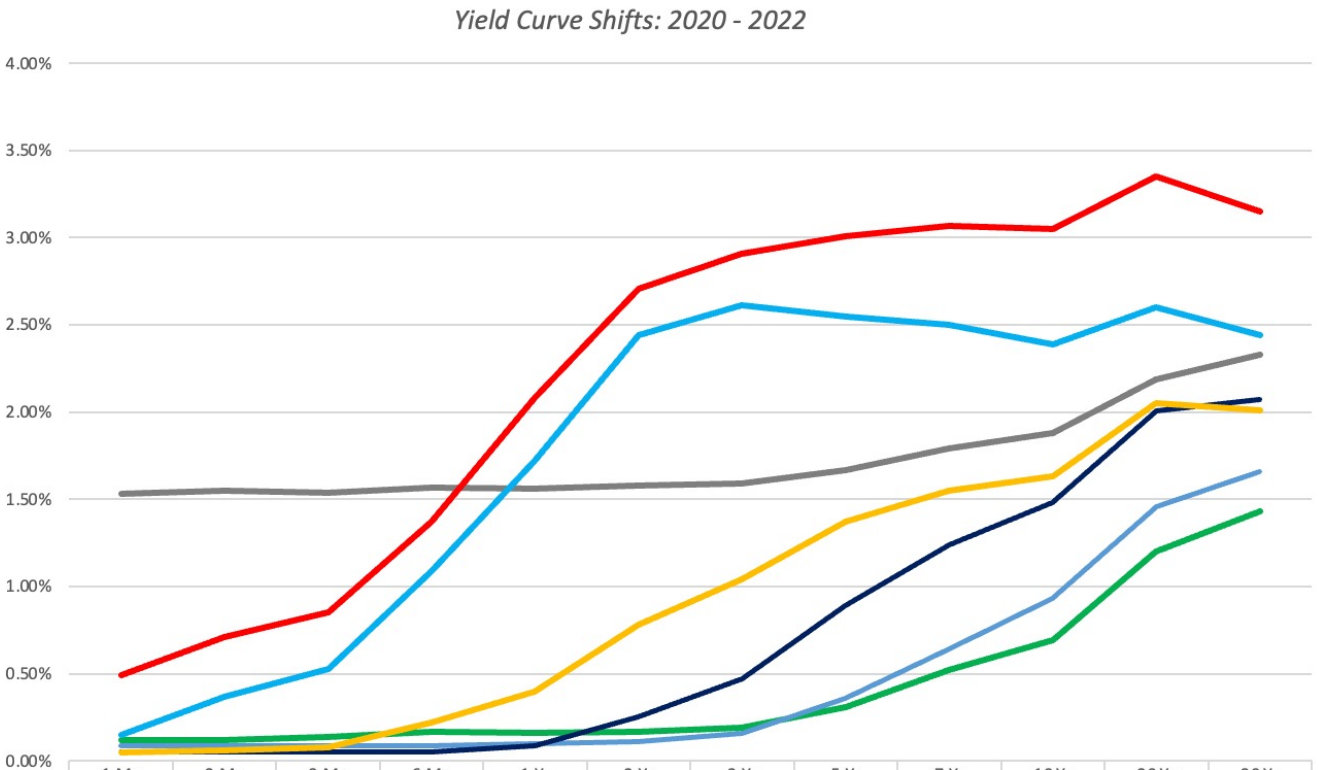
	S&P 500	Gold Price per oz	Bitcoin	Ehtereum
S&P 500	1.0000			
Gold Price per oz	0.1704	1.0000		
Bitcoin	0.4291	0.1029	1.0000	
Ehtereum	0.4496	0.1221	0.8478	1.0000

Inflation Hedges?

	Actual Inflation Rate	Unexpected Inflation	S&P 500 (includes dividends)	3-month T.Bill	US T. Bond	Baa Corporate Bond	Gold	Real Estate
Actual Inflation Rate	1.0000							
t								
Unexpected Inflation	**0.7624**	1.0000						
t	11.2383							
S&P 500 (includes dividends	0.0131	-0.1326	1.0000					
t	0.1245	-1.2766						
3-month T.Bill	**0.4000**	-0.0362	-0.0347	1.0000				
t	4.1629	-0.3460	-0.3311					
US T. Bond	-0.0740	**-0.2442**	-0.0119	**0.2625**	1.0000			
t	-0.7078	-2.4021	-0.1134	2.5954				
Baa Corporate Bond	-0.0988	**-0.2219**	**0.4062**	0.0876	**0.5921**	1.0000		
t	-0.9471	-2.1712	4.2408	0.8388	7.0091			
Gold	**0.4787**	**0.5861**	-0.2011	0.0629	-0.1417	-0.2161	1.0000	
t	3.8169	5.0637	-1.4372	0.4412	-1.0020	-1.5493		
Real Estate	**0.5427**	**0.3329**	0.1382	0.1116	-0.0782	-0.0168	0.1636	1.0000
t	6.1633	3.3678	1.3312	1.0715	-0.7484	-0.1603	1.1609	

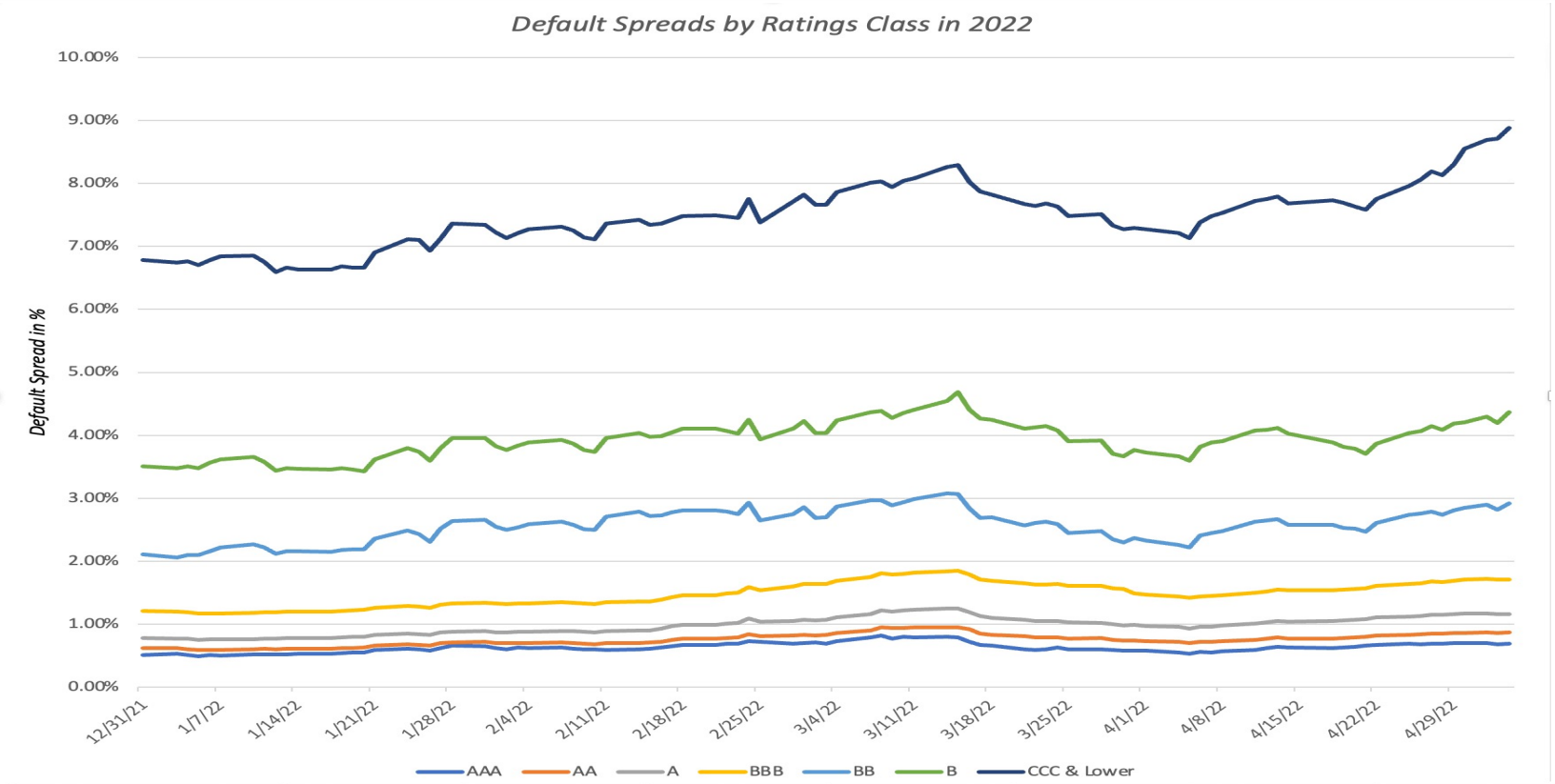
Inflation: Economic and Value Consequences

Economic Consequences: Interest Rates



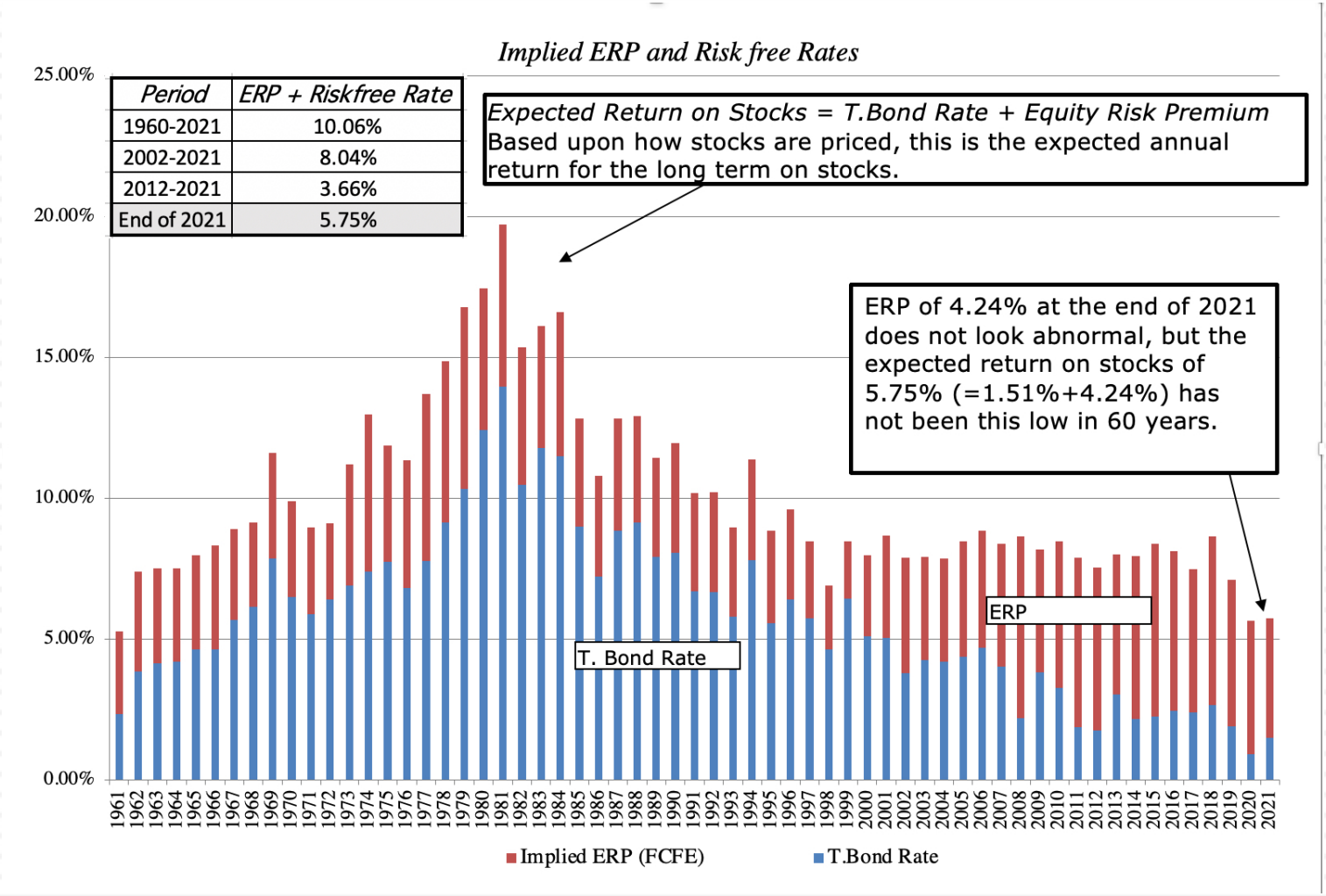
	1 Mo	2 Mo	3 Mo	6 Mo	1 Yr	2 Yr	3 Yr	5 Yr	7 Yr	10 Yr	20 Yr	30 Yr
1/1/20	1.53%	1.55%	1.54%	1.57%	1.56%	1.58%	1.59%	1.67%	1.79%	1.88%	2.19%	2.33%
7/1/20	0.12%	0.12%	0.14%	0.17%	0.16%	0.17%	0.19%	0.31%	0.52%	0.69%	1.20%	1.43%
1/1/21	0.09%	0.09%	0.09%	0.09%	0.10%	0.11%	0.16%	0.36%	0.64%	0.93%	1.46%	1.66%
7/1/21	0.05%	0.05%	0.05%	0.05%	0.09%	0.25%	0.47%	0.89%	1.24%	1.48%	2.01%	2.07%
1/1/22	0.05%	0.06%	0.08%	0.22%	0.40%	0.78%	1.04%	1.37%	1.55%	1.63%	2.05%	2.01%
4/1/22	0.15%	0.37%	0.53%	1.09%	1.72%	2.44%	2.61%	2.55%	2.50%	2.39%	2.60%	2.44%
5/5/22	0.49%	0.71%	0.85%	1.37%	2.08%	2.71%	2.91%	3.01%	3.07%	3.05%	3.35%	3.15%

Default Spreads…

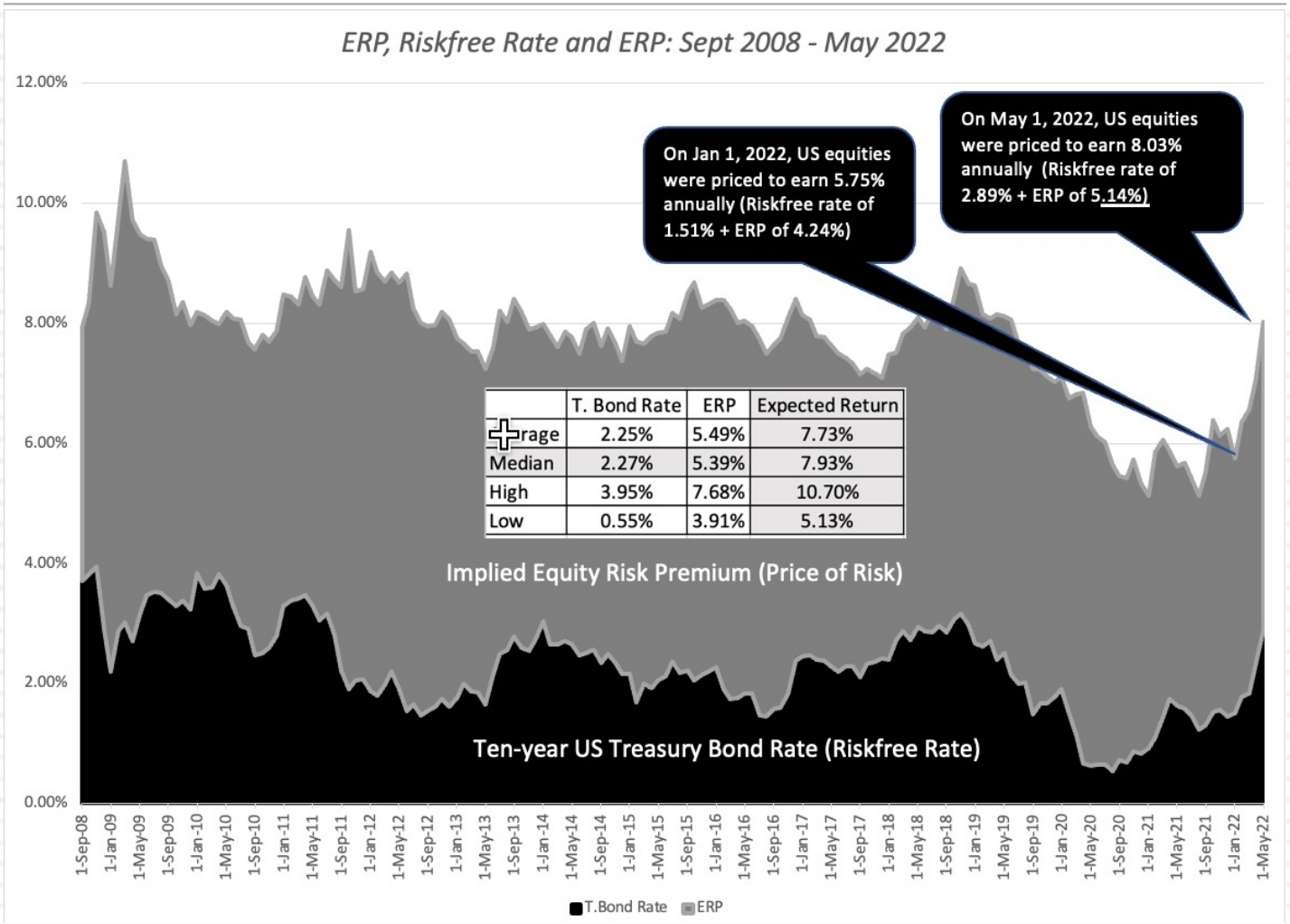


Date	AAA	AA	A	BBB	BB	B	0
12/31/21	0.51%	0.62%	0.78%	1.21%	2.11%	3.51%	6.78%
2/1/22	0.62%	0.70%	0.87%	1.33%	2.55%	3.83%	7.22%
3/1/22	0.70%	0.83%	1.07%	1.64%	2.86%	4.23%	7.82%
4/1/22	0.58%	0.73%	0.97%	1.47%	2.33%	3.73%	7.27%
5/4/22	0.69%	0.87%	1.16%	1.71%	2.92%	4.37%	8.88%
Change in 2022	0.18%	0.25%	0.38%	0.50%	0.81%	0.86%	2.10%

Equity Risk Premiums



And expected returns on stocks…



	T. Bond Rate	ERP	Expected Return
rage	2.25%	5.49%	7.73%
Median	2.27%	5.39%	7.93%
High	3.95%	7.68%	10.70%
Low	0.55%	3.91%	5.13%

With worries about economic growth…

- Almost every economic forecasting service has increased their assessed probabilities for a recession, with variations on how deep and long a recession has to be to break inflation's back.
- In a note published in mid-April, Larry Summers and Alex Domash go as far as to put the likelihood of a recession at 100%, based upon a joint indicator, i.e., that a combination of inflation > 5% and unemployment<4% has always led to a recession within 12 to 24 months, using quarterly data from the 1950s to today.
- While I remain a skeptic about historic rules of thumb (downward sloping yield curve, for example) to make categorical statements about future economic growth, I think that we can state categorically that there is a greater chance of an economic slowdown now than just a few months ago.

Investment Consequences

- As the storm clouds of higher inflation and interest rates, in conjunction with slower or even negative economic growth, gather, it should come as no surprise that equity markets are struggling to find their footing.
  - At the close of trading on May 5, 2022, the S&P 500 stood at 4147, down 13.3% from the start of the year value, accompanied by increased volatility.
  - You are hearing from ”experts” offering divergent advice from sell and flee to buy into weakness.
- Investors are looking for safe havens, in case inflation is back, and they are being offered alternative ”asset” classes.

Determinants of Value

- Steady State Interest Rate: There are three possibilities for the future.
  - Bulk of the move is behind us. This is steady state.
  - A Seventies rerun, with expectations lagging inflation
  - Inflation is transient and returns to last decade levels
- Equity Risk Premium Path: The equity risk premium of 5.24%, estimated at the start of May 2022, is at the high end of historical equity risk premiums. That rate could
  - Continue to rise with high and volatile inflation
  - Stay steady at current levels
  - Drop, as inflation fears pass
- Earnings Estimates: The strength of the economy has been a big contributor to boosting actual and expected earnings on companies in the last two years, and these higher earnings have translated into more cash returned in dividends and buybacks. If recession fears play out, those earnings may be under stress.

S&P Valuation: Status Quo

Valuing the S&P 500 on May 5, 2022

Risk free Rate
Assume that the treasury bond rate will stay at or around 3% long term.

Expected Earnings in 2022 & 2023
Used analyst forecasts for earnings in 2022 and 2023

Growth rates in 2024-26
Growth rate decreases from 2023 level to stable growth in linear increments.

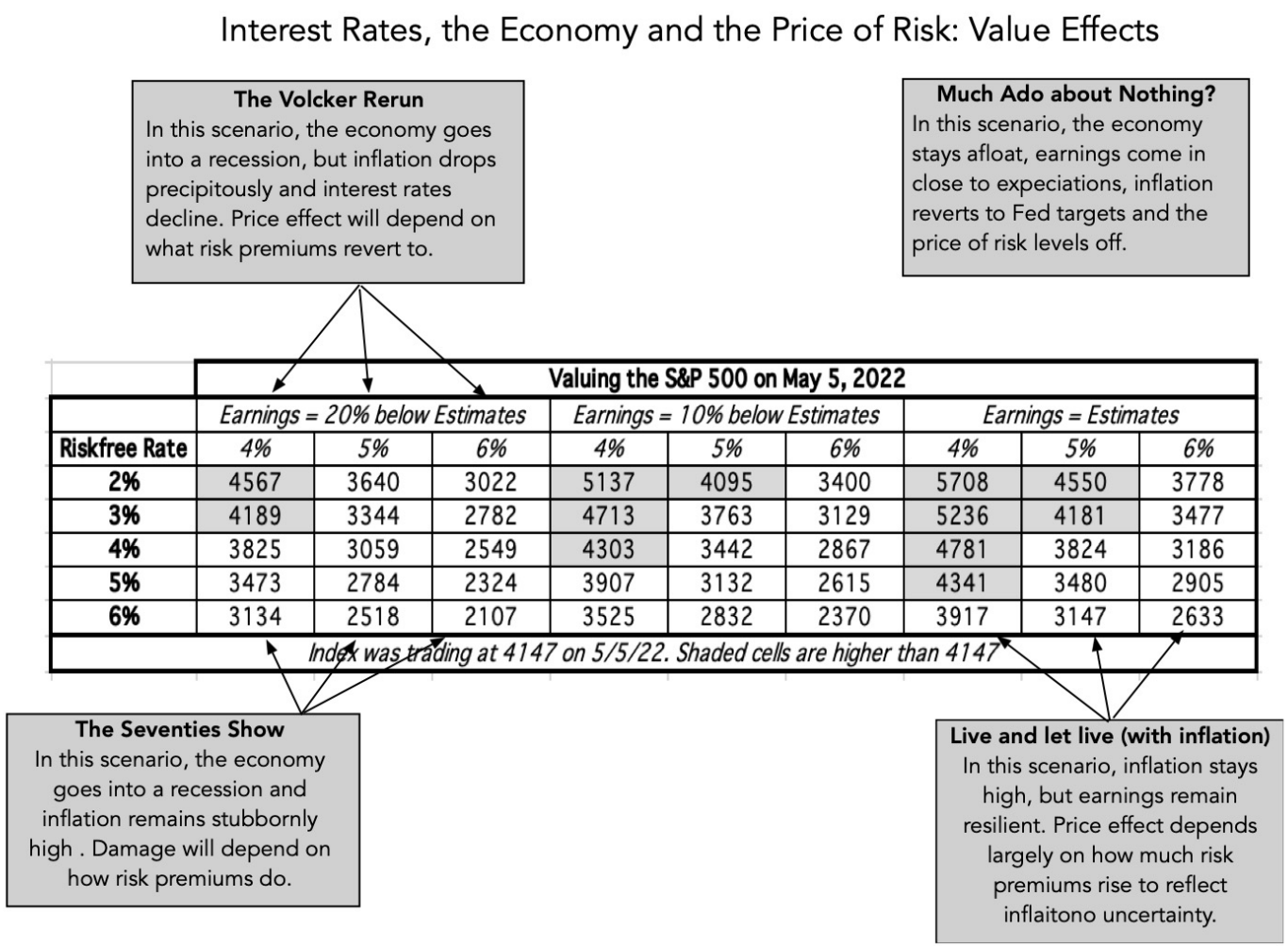
Growth rate beyond 2026
Expected growth rate is 3% in perpetuity (= Risk free rate in 2026)

	2021	2022	2023	2024	2025	2026	*Terminal Year*
Earnings	$208.49	227.29	250.11	269.35	283.75	292.27	301.03
Expected growth		9.02%	10.04%	7.69%	5.35%	3.00%	3.00%
Cash Payout Ratio	80.48%	80.48%	80.70%	80.92%	81.14%	81.37%	81.37%
Dividends + Buybacks =	$167.79	$182.92	$201.84	$217.96	$230.25	$237.81	244.94
Terminal Value =						$4,898.81	
Riskfree Rate	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Required Return	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
Present Value =		$169.37	$173.04	$173.03	$169.24	$3,495.90	
Intrinsic Value of Index =	4180.57						
Actual Index level =	4146.87						
% Under or Over Valuation =	-0.81%						

Intrinsic Value of Index
PV of expected cash flows for next 5 years + PV of terminal value

Terminal Value
= 244.94/ (.08 - .03) = 4898.81

Value Dynamics

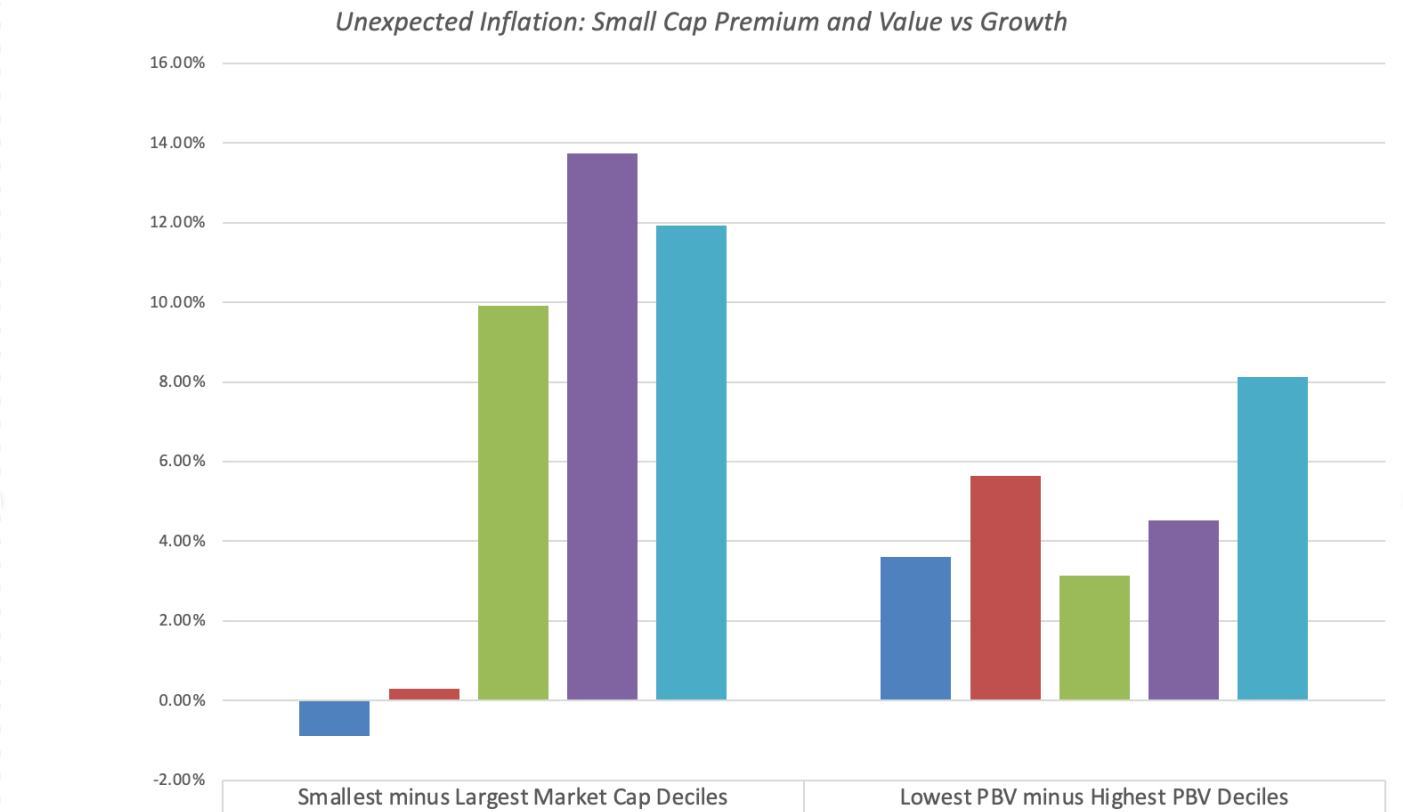


Inflation and Company Value

The Disparate Effects of Inflation

- While higher than expected inflation, in general, is bad for stocks, not all companies are equally hurt by it.
  - There are a few companies that may benefit from the unexpectedly high inflation.
  - There are some companies that may find their value close to unaffected by inflation
  - There are other companies that are negatively affected by inflation, to varying degrees
- When investors get worried about inflation, the search for companies that are less affected by inflation, or unaffected by it, picks up. To find these companies, investors often look at history to see which classes of stock or sectors have performed best during inflationary periods.

Unexpected Inflation and Stock Groupings..



	Smallest minus Largest Market Cap Deciles	Lowest PBV minus Highest PBV Deciles
Bottom quintile	-0.89%	3.61%
2nd quintile	0.29%	5.64%
3rd quintile	9.92%	3.13%
4th quintile	13.74%	4.52%
Top quintile	11.94%	8.12%

The Return of Value (and Small Cap) Investing?

- For value investors, who have spent a decade wandering in the wilderness, the return of inflation may seem like a chance at redemption, but there are two caveats:
  - While the table shows that low PE and low PBV ratio stocks did better than high PE and high PBV stocks during inflationary periods, they still delivered sub-standard returns, just less sub-standard than other groupings.
  - There is little evidence that active value investing derived any benefits from high inflation. In short, as in almost every other time period in the last century, a value index fund would have beaten most active value investors.
- With small cap investing, which has not delivered a premium since 1981, the circumstances (market structure, trading costs/difficulty, information access) have changed enough that they may be no repeat of the 1970s.

Inflation and Value: Just the facts!

Inflation effect: Depends on Pricing power
Divergence: Companies with pricing power should be able to pass through inflation into their product/service prices, allowing revenues to grow with inflation.

Inflation effect: Cost components & structure
Divergence: Companies with significant costs (low gross margins) and inputs that are more exposed to inflation (commodities) will see margins decrease, relative to other companies.

Inflation effect: Uncertainty about future inflation
Divergence: Companies with longer term investments will invest less, as uncertainty about future inflation makes it more difficult to justify large up front investments.

Revenue Growth
Function of the size of the total accessible market & market share

Operating Margins
Determined by pricing power and cost efficiencies

Growth/Investment Efficiency
Measure of how much investment is needed to deliver growth

Value of Business

Expected FCFF = Revenues * Operating Margin - Taxes - Reinvestment

Risk-adjusted Discount Rate

Failure Risk
Chance of grevious or catastrophic event putting business model at risk.

Cost of Equity
Rate of return that equity investors demand

Cost of Debt
Cost of borrowing money, net of tax advantages

Inflation effect: Increase failure risk
Divergence: Failure risk will rise at cash flow negative companies (both very young & old).

Inflation effect: Increase cost of equity
Divergence: Inflation will increase the risk free rate, and uncertainty about inflation will increase teh equity risk premium, with costs of equity rising more for riskier firms.

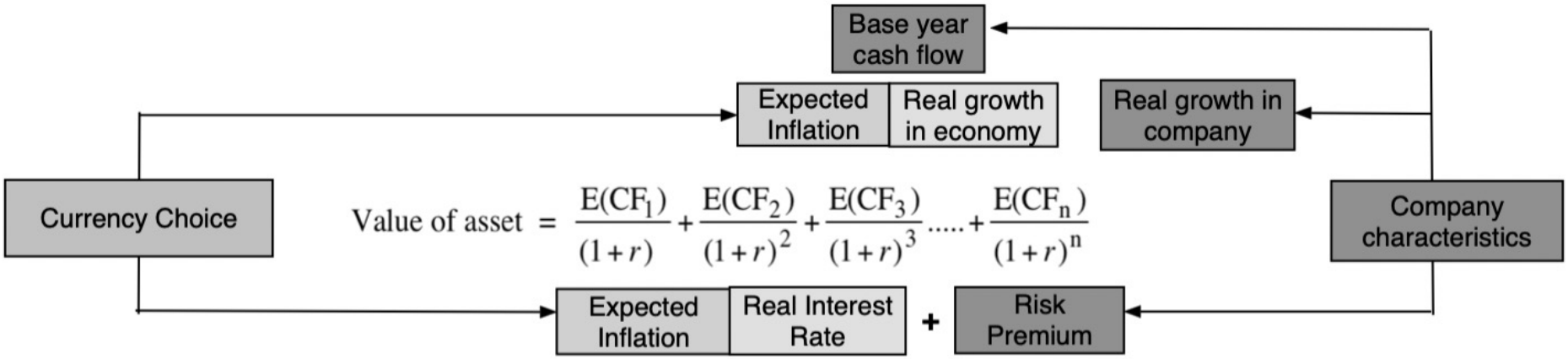
Inflation effect: Increase cost of debt
Evidence: The cost of debt will rise as expected iinflation rises, pushing up the risk free rate and default spreads. If inflation is higher than expected, there is a benefit.

The Factors that determine Inflation Sensitivity

Variable	*Why it matters*	*Factors determining variable*
Pricing Power	Companies that can pass inflation through to customers are more protected from inflation.	1. Discretionary/Non-discretionary: If the product or service you offer is one that your customers need, and cannot delay purchase, you will have more pricing power. 2. Competition: Companies in competitive businesses will have less pricing power than otherwise similar companies with less competition. 3. Regulation: Companies that face price regulation, from governments or regulatory authorities, will be at the mercy of regulatory pricing decisions.
Cost Structure	Companies that have costs that are substantial and inflation-sensitive will be more negatively exposed to inflation.	1. Cost of Goods Sold: Companies that have higher direct costs of production are more negatively affected by inflation than companies with lower costs of production. 2. Input composition: Companies with inputs that are more exposed to inflation (commodities, skilled labor) will be more negatively affected by inflation.
Investment Efficiency	Companies with longer term & less flexible investment choices will be more negatively affected by inflation.	1. Type of Business: Infrastructure and manufacturing companies generally have to invest larger amounts for longer periods than service or technology companies. 2. Flexibility: Companies that have more flexibility (to withdraw or stagger spending) on their investments are better positioned to weather inflation than companies that don't have that flexibility.
Cost of equity	Riskier companies will be more negatively affected by inflation	1. Sector Risk: Companies in riskier sectors, i.e., sectors more exposed to market/economic up and down turns will see costs of equity go up more than companies in safer sectors. 2. Country Risk: Companies that operate in riskier countries will see bigger surges in equity risk premiums than companies that operate in stable markets.
Cost of debt	Companies that have more default risk (lower bond ratings) will be hurt more by higher inflation.	1. Stability/Level of Earnings: Companies with higher and more stable earnings will see costs of debt go up less than companies with lower/negative earnings. 2. Debt level: Companies that have borrowed more will see a bigger increase in their costs of debt than otherwise similar companies that have borrowed less.
Failure risk	Companies with a higher risk of failure will be hurt more by inflation.	1. Stage in Life Cycle: Young companies with unformed business models have a greater chance of failure than older companies with more established business models. 2. Debt level: Companies that have borrowed more are more likely to fail than otherwise similar companies that have borrowed less.

Inflation Consistency in Valuation

- In a scenario where inflation is volatile and you are trying to estimate its level and effects on the value of a company, trying to get it right is an impossible task. You should however always maintain internal consistency in your valuation.
- Put simply, if you expect inflation to be low (high), your discount rate and expected growth rate should both incorporate that low (high) inflation.



Heineken: September 2019 (in Euros)

Cash flows from existing assets

	LTM	2013-2018
Revenues	€ 23,119	Growth rate = 3.22%
Operating Margin	14.86%	14.44%
Sales/Invested Capital	0.71	0.79
ROIC	7.46%	8.32%
Effective Tax Rate	29.70%	27.00%

The Payoff from growth

Revenues will grow 3.22% a year for next 5 years, tapering down to -0.5% growth in year 10

Operatng margin (per-tax) will drop to 14.00%

Sales/Invested Capital will stay at five-year average of 0.79.

Maturty and Closure

Stable Growth
g = -0.5%;
Cost of capital = 5%
ROC= 5%;
Reinvestment Rate=-.5%/5% = -10%

Terminal Value = 2972/(.05-..-(.005)) = 54,034

Euro Cashflows

	1	2	3	4	5	6	7	8	9	10	Terminal year
Revenue growth rate	3.22%	3.22%	3.22%	3.22%	3.22%	2.48%	1.73%	0.99%	0.24%	-0.50%	-0.50%
Revenues	€ 23,863	€ 24,632	€ 25,425	€ 26,244	€ 27,089	€ 27,759	€ 28,240	€ 28,519	€ 28,589	€ 28,446	€ 28,304
EBIT (Operating) margin	14.38%	14.34%	14.30%	14.26%	14.21%	14.17%	14.13%	14.09%	14.04%	14.00%	14.00%
EBIT (Operating income)	€ 3,432	€ 3,532	€ 3,635	€ 3,741	€ 3,850	€ 3,934	€ 3,990	€ 4,017	€ 4,015	€ 3,982	$ 3,963
Tax rate	29.70%	29.70%	29.70%	29.70%	29.70%	28.76%	27.82%	26.88%	25.94%	25.00%	$ 0
EBIT(1-t)	€ 2,413	€ 2,483	€ 2,556	€ 2,630	€ 2,707	€ 2,802	€ 2,880	€ 2,937	€ 2,973	€ 2,987	$ 2,972
- Reinvestment	€ 942	€ 973	€ 1,004	€ 1,036	€ 1,070	€ 849	€ 609	€ 353	€ 88	€ (181)	$ (297)
FCFF	€ 1,471	€ 1,511	€ 1,552	€ 1,594	€ 1,637	€ 1,953	€ 2,271	€ 2,584	€ 2,885	€ 3,168	$ 3,269

PV(Terminal value)	€ 36,390.85
PV (CF over next 10 years)	€ 15,300.34
Value of operating assets =	€ 51,691.19
- Debt	€ 19,709.52
- Minority interests	€ 1,069.00
+ Cash	€ 1,751.60
+ Non-operating assets	€ 1,401.00
Value of equity	€ 34,065.26
Number of shares	571.10
Estimated value /share	€ 59.65
Price	€ 93.25
Price as % of value	56.33%

Discount at Euro Cost of Capital (WACC) = 7.66% (.599) + 1.13% (0.401) = 5.04%

The Risk in the Cash flows

On September 1, 2019, Heineken was trading at 93.25 Euros/share

Cost of Equity 7.66%

Cost of Debt (-0.5%+2%)(1-.25) = 1.13%

Weights E = 59.9% D = 40.1%

Riskfree Rate: Euro Risk free rate = -0.50%

\+

Beta = 1.20

X

Firm's D/E Ratio: 66.98%

Unlevered beta of alcoholic beverage business = 0.80

ERP = 6.83%			
Region	*Revenues*	*Weight*	*ERP*
Europe	10348	50.24%	6.90%
North America	5920	28.74%	5.75%
Asia	2919	14.17%	7.22%
Latin America & Caribbean	781	3.79%	10.53%
Africa & Mid East	631	3.06%	9.30%
Total	**20599**	**100.00%**	**6.83%**

Arcelik's revenue growth has been solid and its margins have been high, but return on capital has been less that the cost of capital

	LTM	2014-2019	Industry Average
Revenue Growth	37.03%	20.14%	7.83%
Pre-tax Operating Margin	7.82%	7.70%	7.93%
ROIC	11.70%	12.74%	18.68%
Sales/Capital	1.70	1.77	2.73

Arcelik: My valuation (October 2019)

Between 2014 and 2019, Arcelik reported a growth rate of 20.14% in revenues, an average operating margin of 7.70% and an average sales to capital ratio of 1.77.

Stable Growth
g = 10%
Cost of capital = 15%
ROC= 15%;
Reinvestment Rate= 10%/15% = 66.67%

Revenue growth of 20% a year for 5 years, tapering down to 10% in year 10

Pre-tax operating margin increases to 8.00% over time.

Sales to capital ratio of 2.73, matching global average

Terminal Value= 3,332/(.15-.10) = TL 66,633

PV(Terminal value)	$11,766.68
PV (CF over next 10 years)	$ 3,603.22
Value of operating assets =	$15,369.90
- Debt	$14,305.92
- Minority interests	$ 114.60
+ Cash	$ 6,026.00
+ Non-operating assets	$ 481.10
Value of equity	$ 7,456.48
Number of shares	675.70
Estimated value /share	$ 11.04

	Base year	1	2	3	4	5	6	7	8	9	10	Terminal year
Revenue growth rate		20.00%	20.00%	20.00%	20.00%	20.00%	18.00%	16.00%	14.00%	12.00%	10.00%	10.00%
Revenues	30,440 ₺	36,528 ₺	43,834 ₺	52,600 ₺	63,120 ₺	75,744 ₺	89,378 ₺	103,679 ₺	118,194 ₺	132,377 ₺	145,615 ₺	160,177 ₺
EBIT (Operating) margin	7.82%	7.84%	7.86%	7.88%	7.89%	7.91%	7.93%	7.95%	7.96%	7.98%	8.00%	8.00%
EBIT (Operating income)	2,381 ₺	2,864 ₺	3,444 ₺	4,143 ₺	4,982 ₺	5,992 ₺	7,087 ₺	8,239 ₺	9,413 ₺	10,567 ₺	11,649 ₺	12,814 ₺
Tax rate	14.80%	14.80%	14.80%	14.80%	14.80%	14.80%	16.24%	17.68%	19.12%	20.56%	22.00%	22.00%
EBIT(1-t)	2,029 ₺	2,440 ₺	2,935 ₺	3,529 ₺	4,245 ₺	5,105 ₺	5,936 ₺	6,782 ₺	7,614 ₺	8,394 ₺	9,086 ₺	9,995 ₺
- Reinvestment		2,226 ₺	2,672 ₺	3,206 ₺	3,847 ₺	4,616 ₺	4,986 ₺	5,230 ₺	5,308 ₺	5,187 ₺	4,841 ₺	6,663 ₺
FCFF		214 ₺	263 ₺	324 ₺	398 ₺	489 ₺	950 ₺	1,553 ₺	2,306 ₺	3,208 ₺	4,246 ₺	3,332 ₺

Cost of capital = 24.73% (.522) + 16.01% (.478) = 20.64%

Cost of capital decreases to 15% from years 6-10

On October 14, 2019, the shares were trading at 18 TL/share.

Cost of equity = 24.73%

Cost of Debt *Rated B*
(11.06%+4.06%+5.40%)(1-.25) = 16.01%

Weights
E = 52.2% D = 47.8%

Riskfree Rate:
Riskfree rate = 11.06%

+

Beta
1.69

x

Risk Premium
8.11%

D/E = 89.04%

Business	Revenues	EV/Sales	Estimated Value	Unlevered Beta
Furn/Home Furnishings	$ 20,657	0.9785	$ 20,213	0.97
Electronics (Consumer & Office)	$ 2,807	0.5769	$ 1,619	1.30
Arcelik	$ 23,464		$ 21,833	0.99

Region	Revenues	ERP	Weight
Europe	13,272 ₺	6.68%	49.37%
Turkey	8,425 ₺	10.53%	31.34%
Asia	2,299 ₺	7.00%	8.55%
Africa & Mid East	1,926 ₺	9.08%	7.16%
Rest of the World	963 ₺	7.39%	3.58%
Total	26,885 ₺	8.11%	100.00%

In Conclusion…

- The inflation genie is out of the bottle, and if history is any guide, getting it back in is going to take more time and create more pain than we realize.
  - It is the lesson that the US learned in the 1970s, and that other countries have learned or chosen to not learn from their own encounters with inflation.
  - It is the reason that when inflation made itself visible in the early part of 2021, I argued that the Fed should take it seriously, and respond quickly, even if there existed the possibility that it was transient.
- The Fed and the administration chose a different path, one that can be described as whistling in the graveyard, not just ignoring the danger with happy talk, but also actively taking decisions that only exacerbated the danger.
  - They find themselves between a rock (more inflation) and a hard place (a recession), and while you may be tempted to say "I told you so", the truth is that we will all feel the pain.
  - If central banking good sense prevails, we are faced with a recession of uncertain length and depth. If political expediency leads to accepting inflation, a generation of businesspeople, investors and public policy makers will have to learn to live with higher and more volatile inflation.