



INFLATION AND INVESTING: IS THE GENIE OUT OF THE BOTTLE?

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Inflation takes center stage?

- Looking at US equities, the S&P 500 is up about 11% and the NASDAQ is up about 5%, from start of the year levels, and that underperformance has led to a wave of stories about whether this is start of the long awaited return of value stocks, after a decade of lagging growth stocks.
- Along the way, it has been a bumpy ride, as the market wrestles with two competing factors,
 - ▣ an economy growing faster than expected, acting as a positive
 - ▣ And worries that this growth will bring with it higher inflation and interest rates, as a negative.

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.

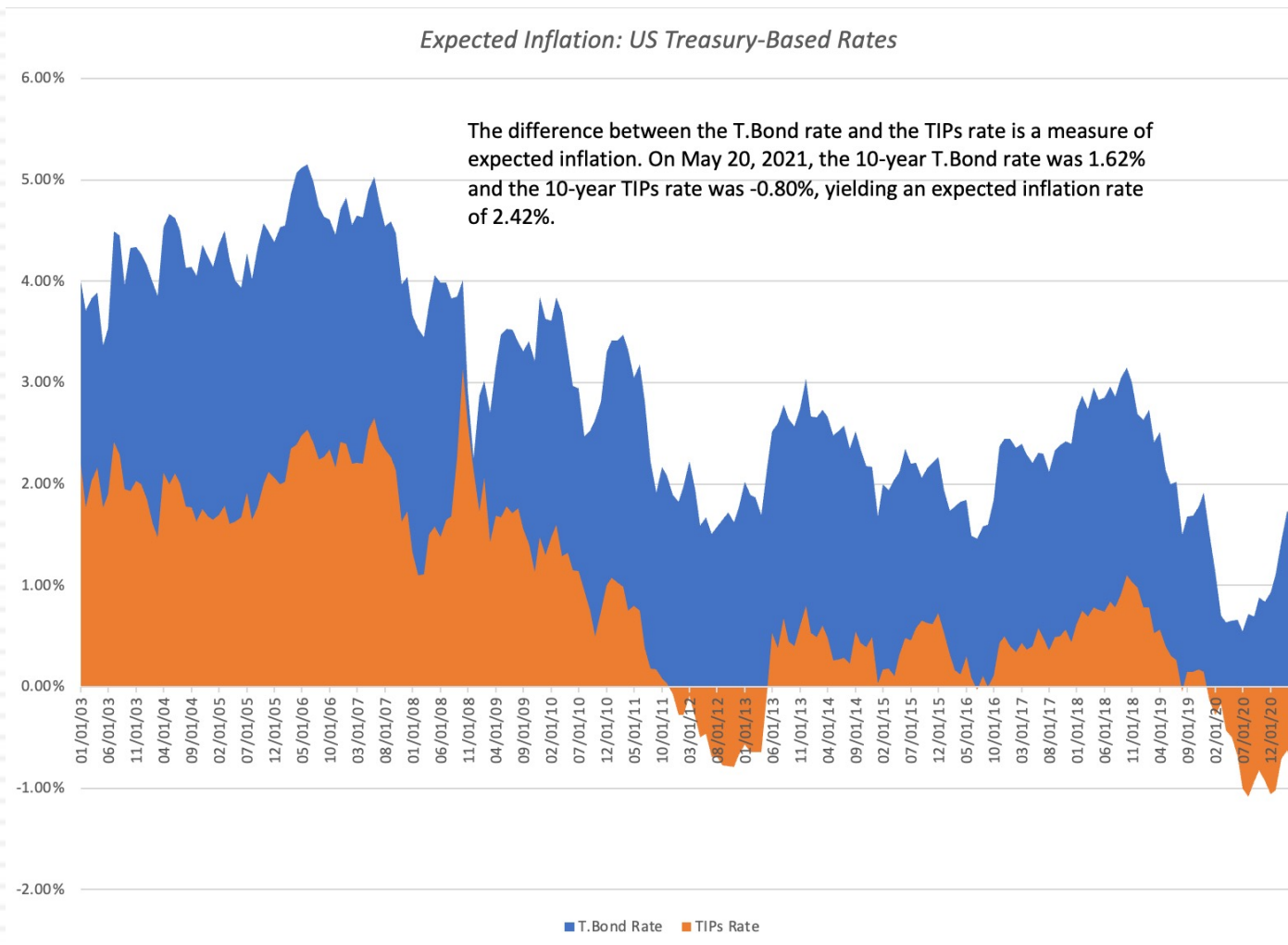
Actual Inflation: Measures

- 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.

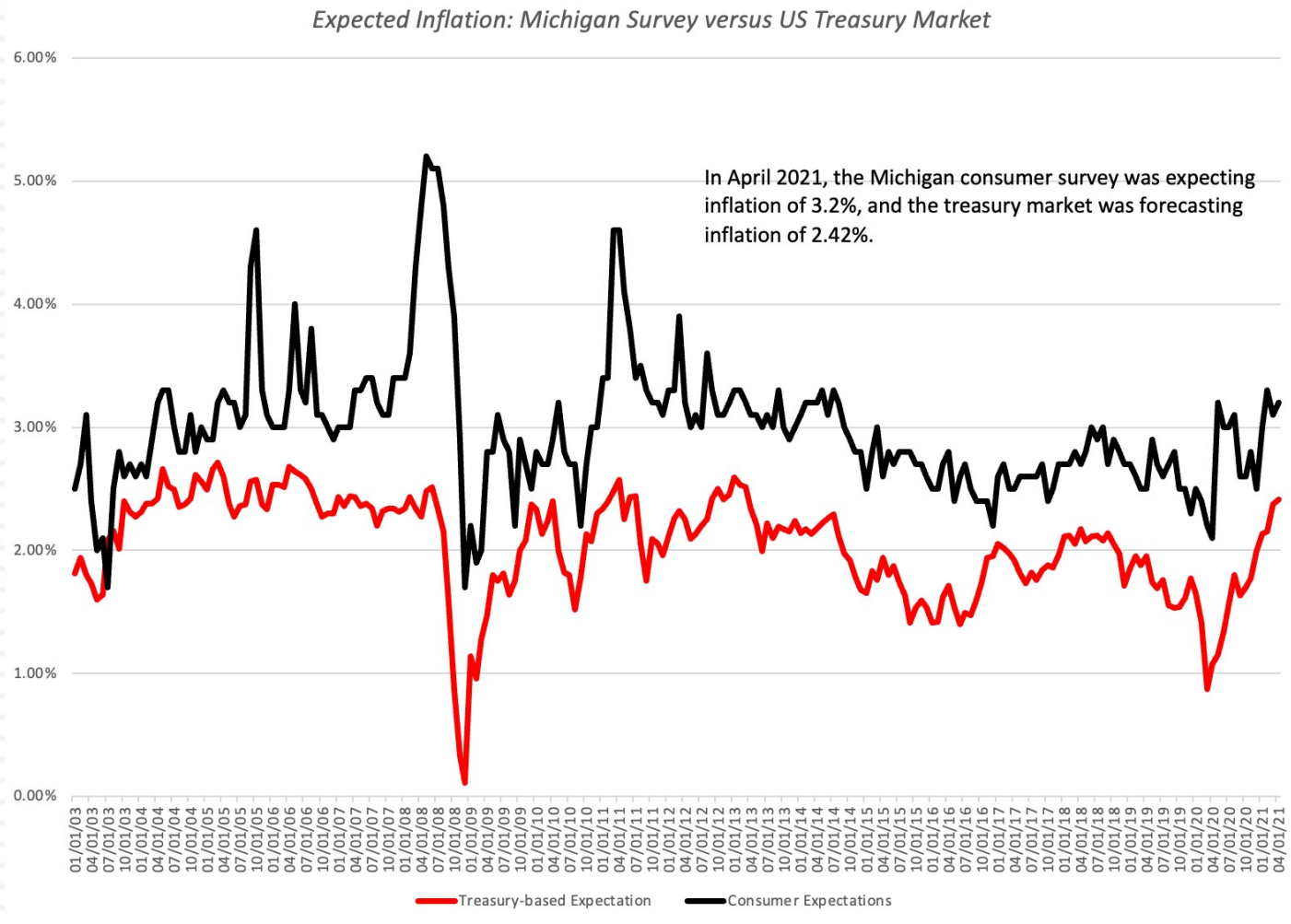
Expected Inflation

- 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.

Expected Inflation: Treasury Markets



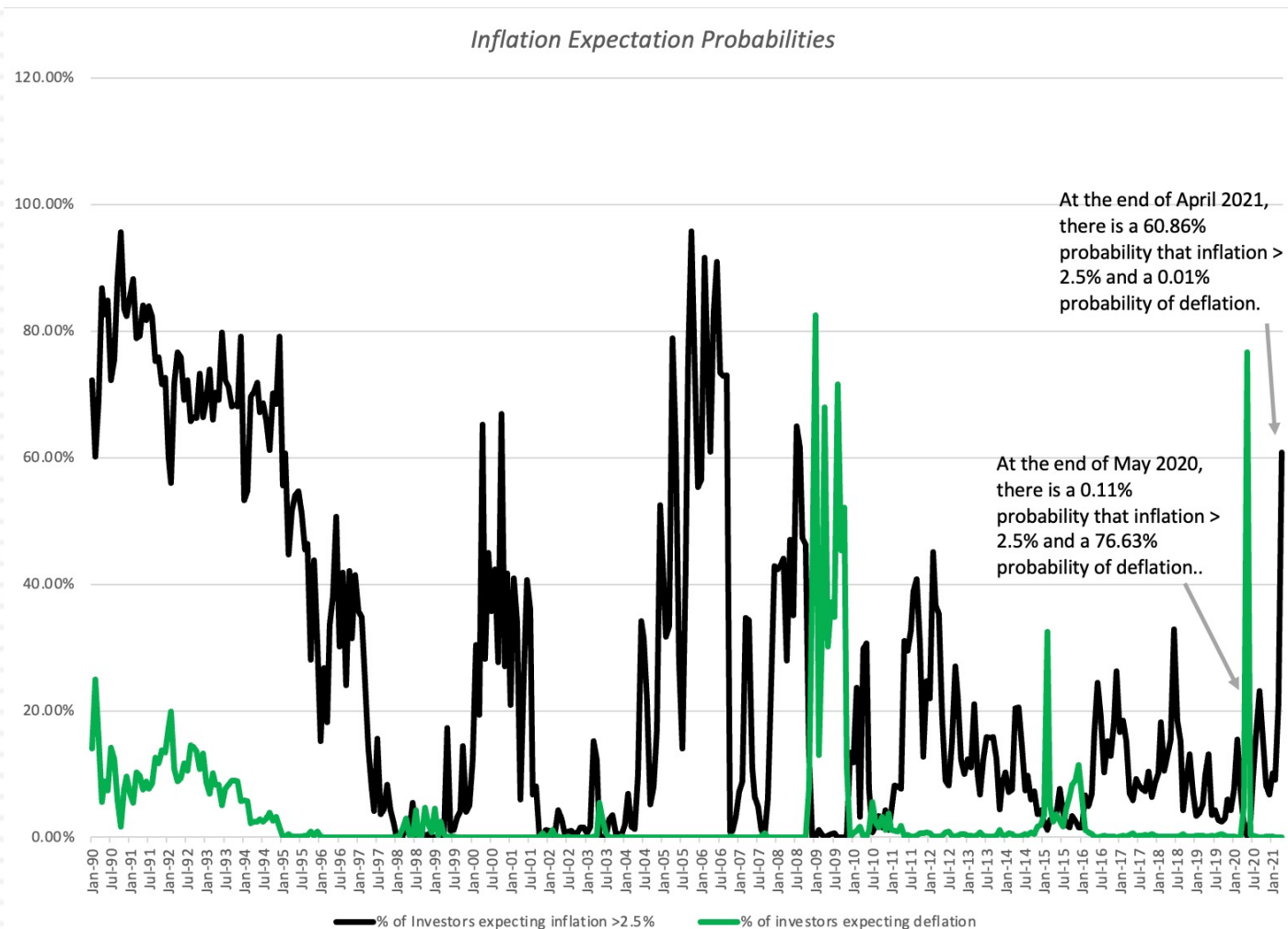
Expected Inflation: Survey versus Treasury



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.

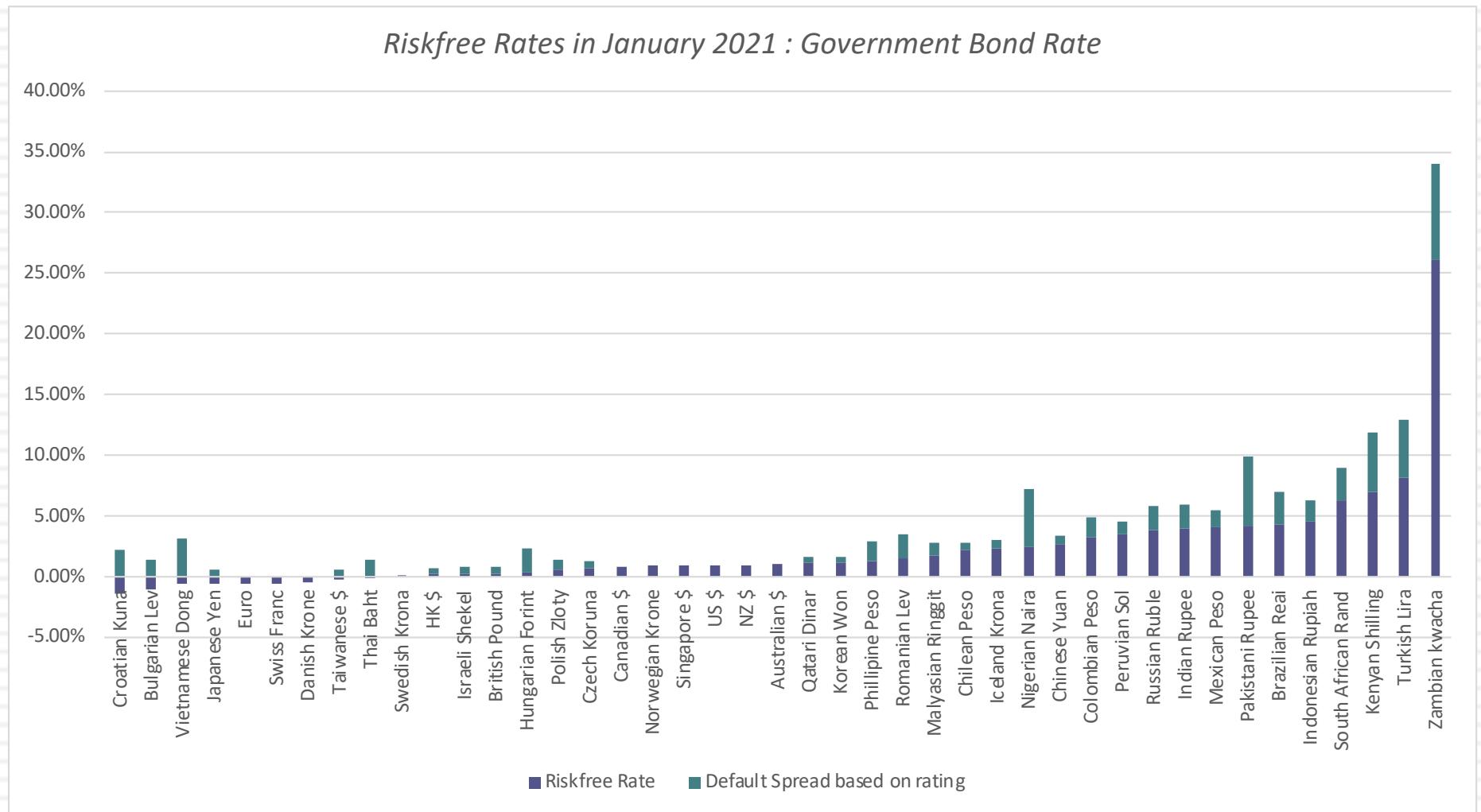
Difference of views?



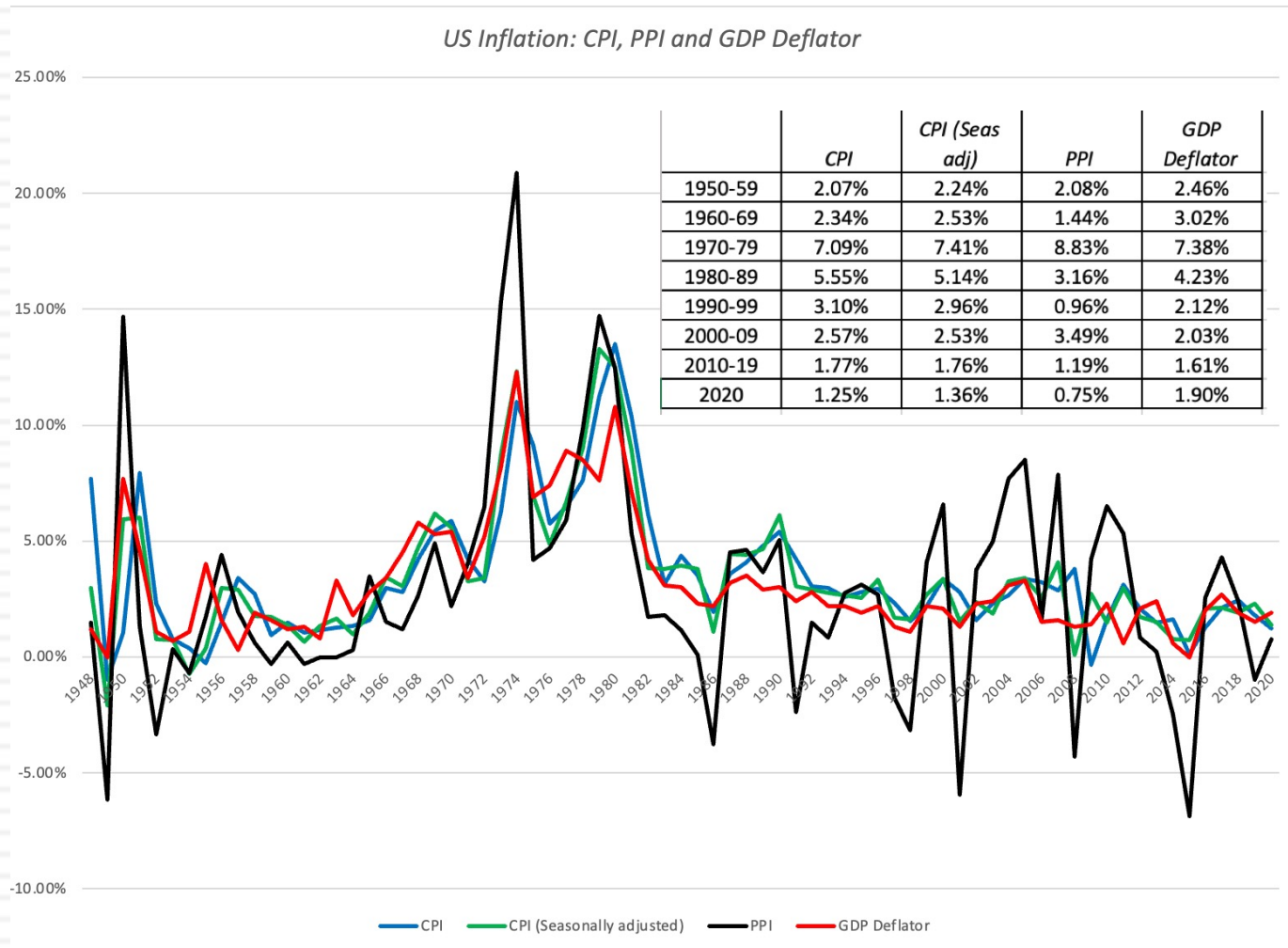
Response	Percentage
Doing a good job	68%
Not doing a good job	32%

10

Leading to interest rate differences..



Inflation in the US

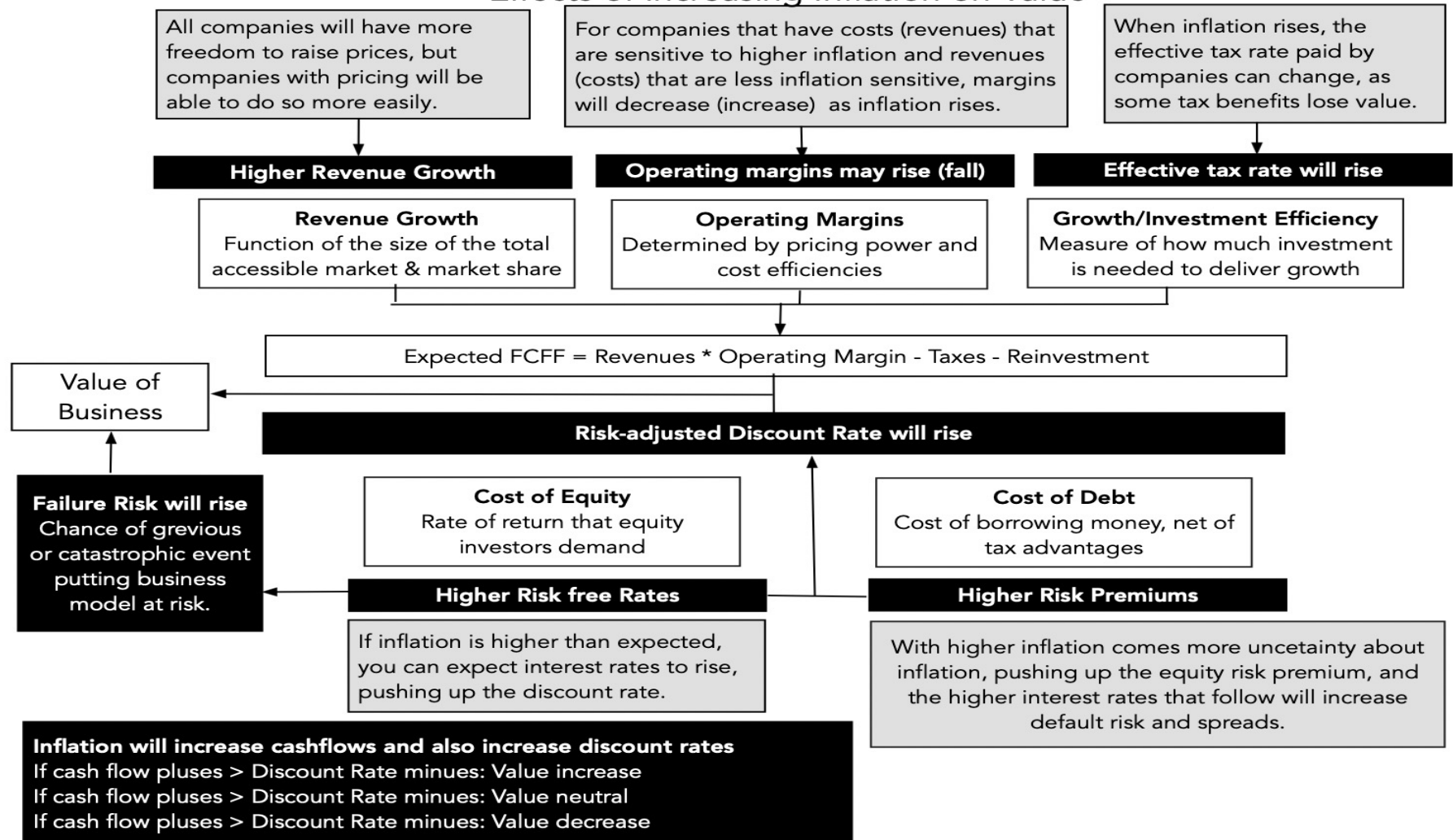


Inflation and Value: Fixed Income

- 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 Stocks

Effects of Increasing Inflation on Value

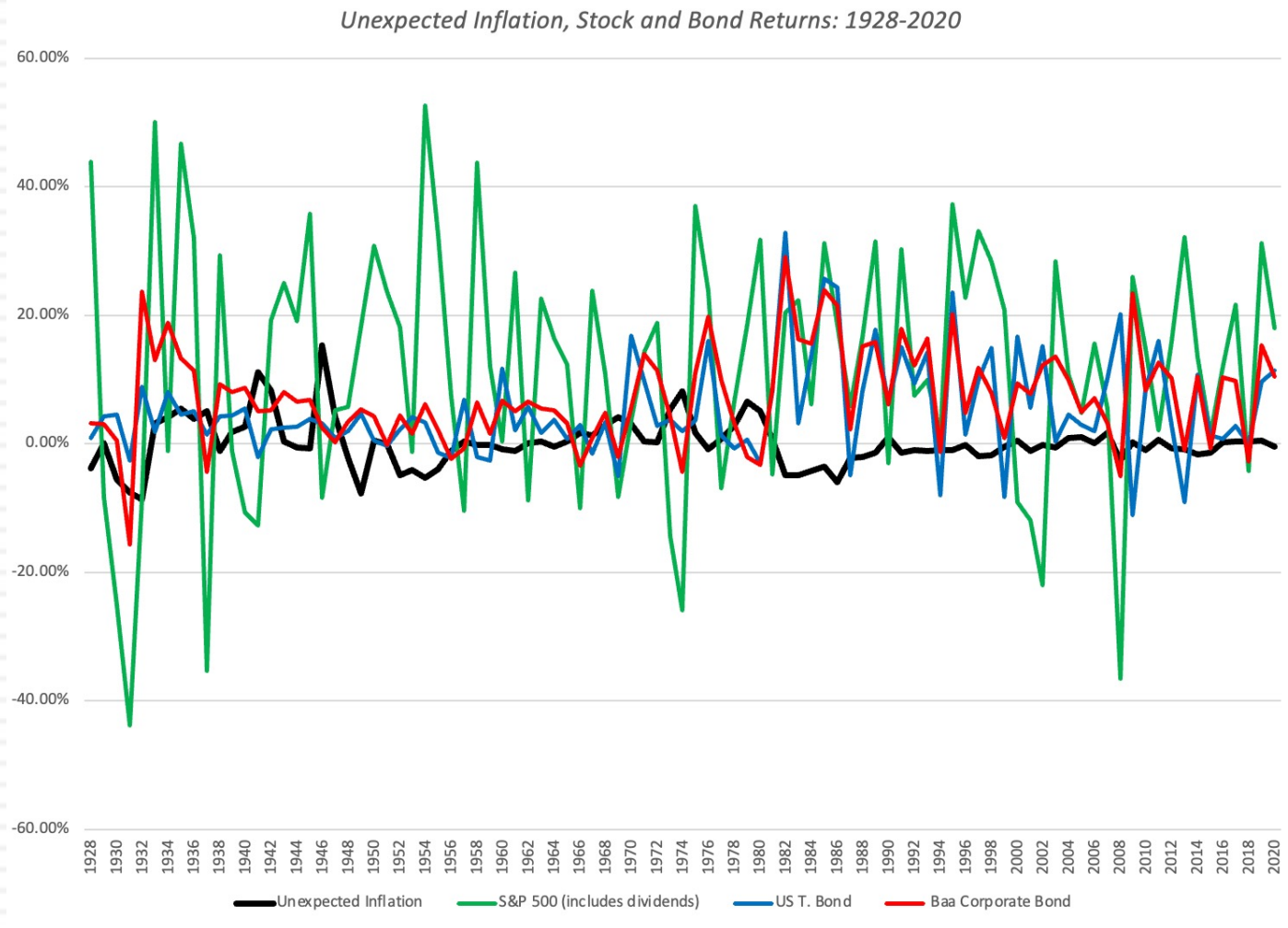


Inflation: Value Effects

- As you work through these competing effects, you can see why you see competing claims about how equities will be affected by inflation. I have heard, from market experts, that inflation is good for stocks, that it is a neutral and that it is a bad, and I think that all three statements can be true, but not at the same company.
- **Inflation value proposition 3:** *In periods when inflation is higher (lower) than expected, individual companies can benefit, be left unaffected or be hurt by inflation, depending on whether the benefits of inflation (higher revenue growth and margins) are greater than, equal to or less than the costs of unexpected inflation (higher risk free rates, higher risk premiums, higher default spreads and higher taxes).*
- **Inflation value proposition 3:** *Extending this discussion from individual stocks to the entire equity market, it is difficult to visualize a scenario where unexpectedly high inflation is not a net minus for markets, at least until expectations are reset, as investors struggle to reassess risk premiums and companies try to adjust their product pricing and cost structures to deal with the higher inflation.*

Inflation and Financial Asset Returns

16

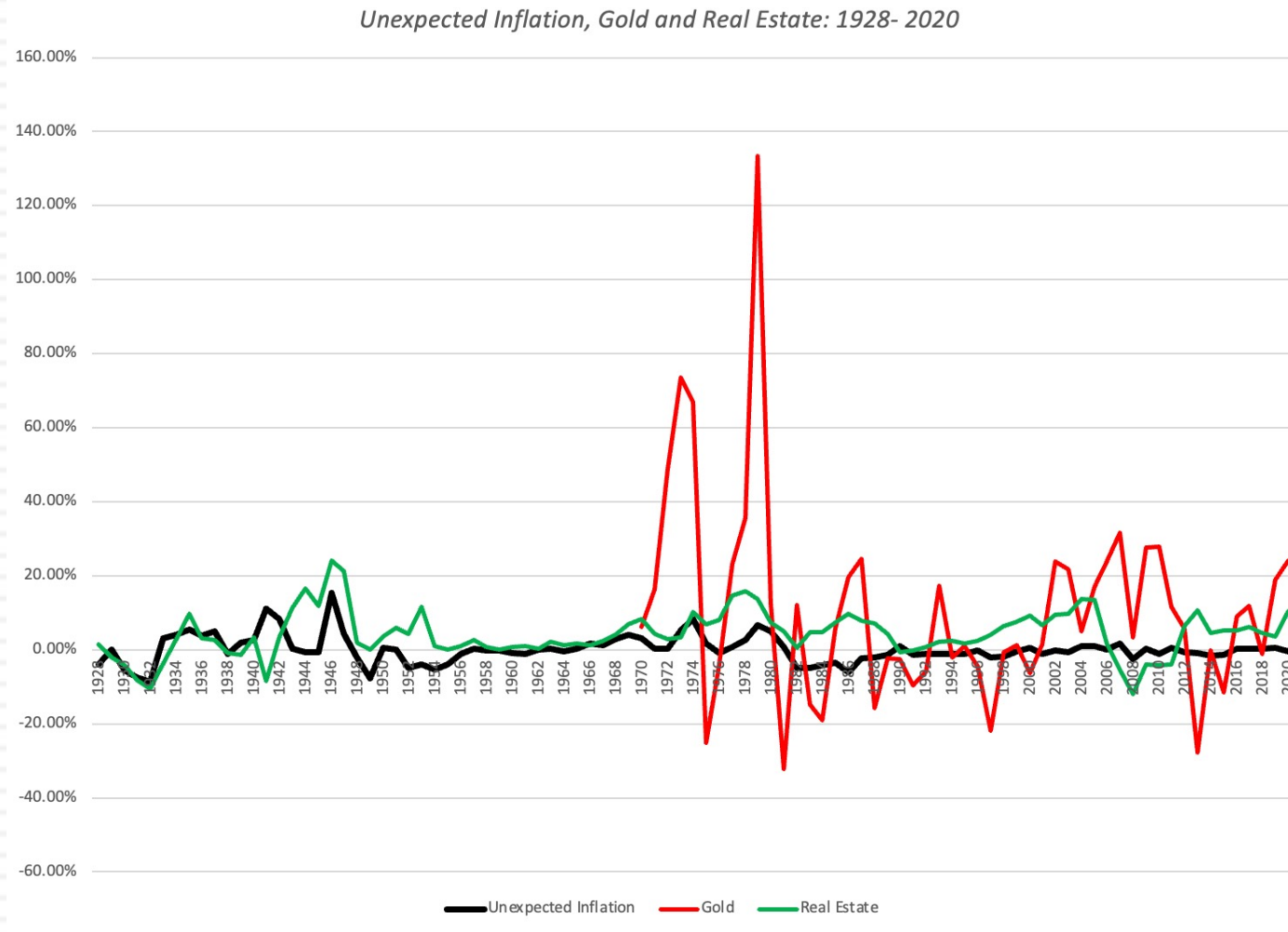


Financial Asset Returns: By Decade

17

Decade	Expected Inflation	Unexpected Inflation	Average Annual Nominal Return				Average Annual Real Return			
			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%

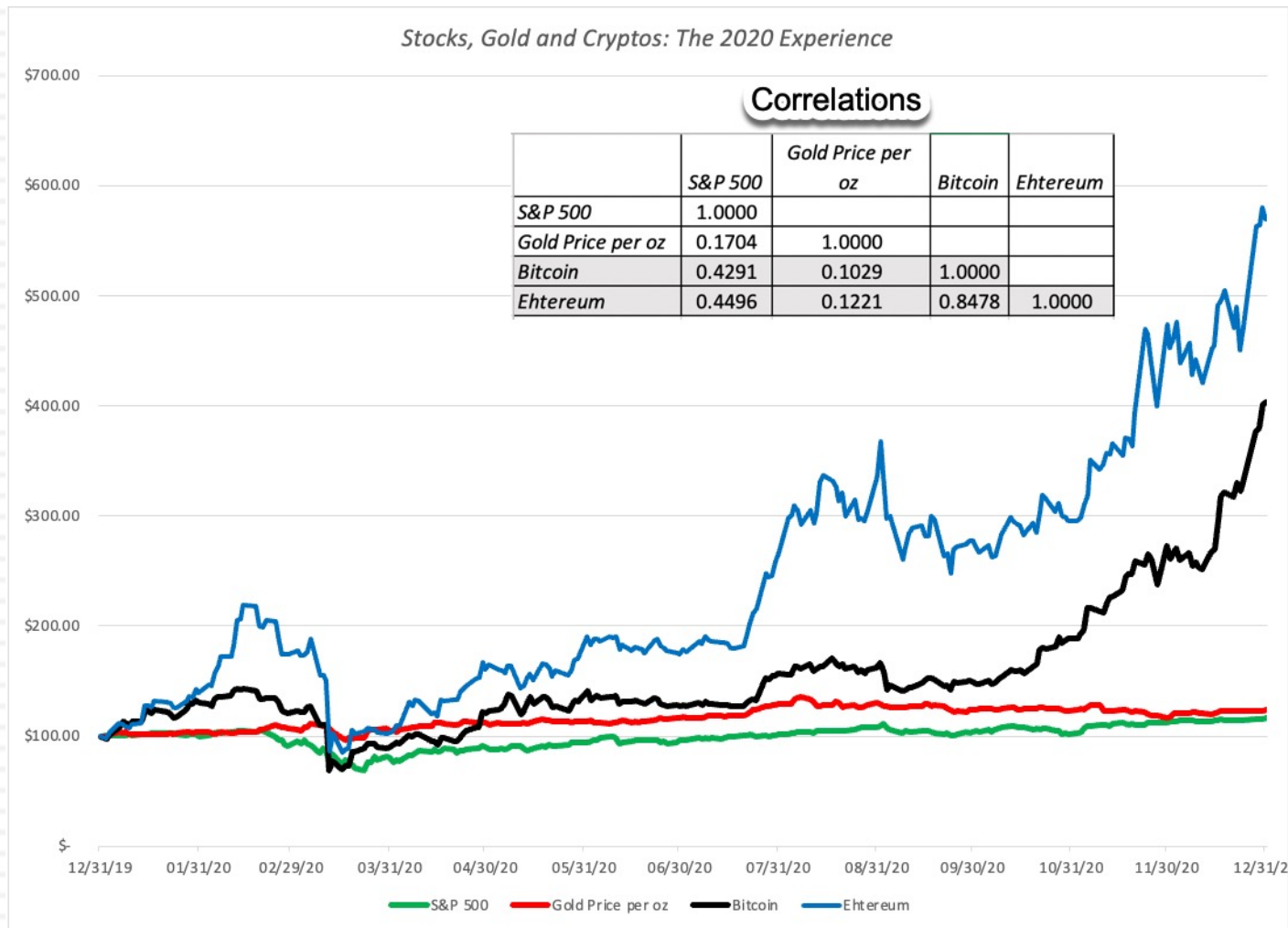
Real Asset Returns and Inflation



And by decade...

			<i>Annual Nominal Return</i>		<i>Annual Real Return</i>	
<i>Decade</i>	<i>Expected Inflation</i>	<i>Unexpected Inflation</i>	<i>Gold</i>	<i>Real Estate</i>	<i>Gold</i>	<i>Real Estate</i>
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%

Inflation and Cryptos?



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							
<i>t</i>								
Unexpected Inflation	0.7624	1.0000						
<i>t</i>	11.2383							
S&P 500 (includes dividends)	0.0131	-0.1326	1.0000					
<i>t</i>	0.1245	-1.2766						
3-month T.Bill	0.4000	-0.0362	-0.0347	1.0000				
<i>t</i>	4.1629	-0.3460	-0.3311					
US T. Bond	-0.0740	-0.2442	-0.0119	0.2625	1.0000			
<i>t</i>	-0.7078	-2.4021	-0.1134	2.5954				
Baa Corporate Bond	-0.0988	-0.2219	0.4062	0.0876	0.5921	1.0000		
<i>t</i>	-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	
<i>t</i>	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
<i>t</i>	6.1633	3.3678	1.3312	1.0715	-0.7484	-0.1603	1.1609	

What now?

- **Inflation is back:** There is no question that we are seeing higher inflation now than we have seen in a decade, in reported numbers (CPI, PPI and GDP deflators), in expectations (from the treasury markets and surveys) and in commodity markets.
- **Transitory or Permanent?** The debate, both among investors and at central banks, is whether this surge in inflation reflects a return from an economic shutdown, which will burn out once things settle down, or a sign of a permanent increase from the abnormally low inflation that we witnessed all of the last decade.
- **Return to Normal:** If some or all of the inflation increase is permanent, and we are reverting back to more normal inflation levels (2-3%), there will be an adjustment, perhaps even painful, as interest rates rise and stock prices recalibrate.
- **With a non-trivial chance of a breakout:** If it is permanent, and we see inflation rise to levels not seen since the 1970s and 1980s (>5%), stocks and bonds will have to be repriced significantly. Not only will investors need to move money out of financial into real assets and collectibles, but companies and individuals that have chosen to borrow to capacity, based upon current low rates, will face a default risk reckoning.
- **Fed Follies?** It behooves the Fed to get ahead of the inflation game. Since the probability of inflation rising to dangerous levels is non-trivial, the Fed should stop its happy talk about inflation being under control and interest rates staying low, no matter what.