M.M.WARBURG & CO
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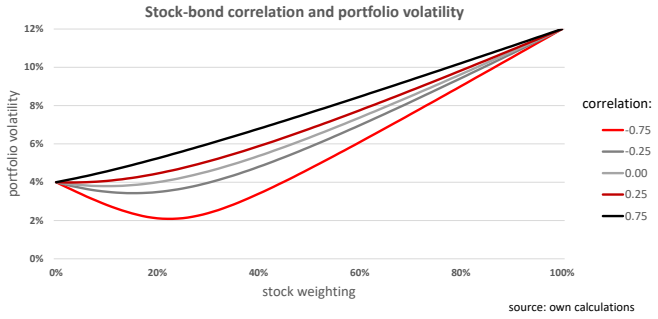
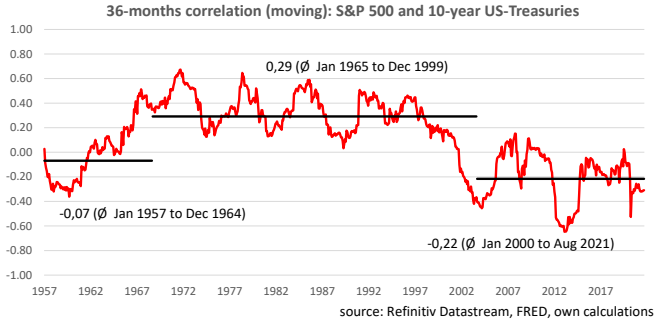
About Face in the Stock/Bond Correlation?

In times of crisis and turmoil, investors gravitate towards safe money havens. To avoid impending losses in high-risk asset classes like stocks, they seek the supposedly safer realm of sovereign investments. The resulting inverse correlation between the two asset classes is good for investors who can use this divergence as a natural hedge in their portfolio structure. It also reduces portfolio volatility. A simple model calculation illustrates this diversification benefit. Volatility in a classic 60/40 portfolio (60% stocks with an expected return on investment of 7% and 12% volatility; 40% bonds with an expected yield of 1% and 4% volatility) would be 8.5% given a 0.75 correlation coefficient between the two asset classes. However, if the two asset classes performed in the opposite directions giving a -0.75 correlation coefficient, portfolio volatility would drop to about 6.1% while the expected return on investment would remain at 4.6% in either case.



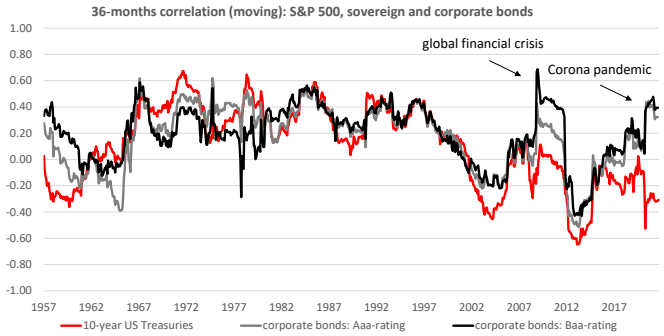
Have investors benefited from such a natural hedging mechanism in the past? An analysis of US bond data and the S&P 500 over the period from January 1954 to September 2021 including both times of positive and negative correlation coefficients indicates that there is no unambiguous answer to this question. The moving 36-month correlation coefficient between total yields on 10-year US treasuries and the S&P 500 shows three phases with qualitatively equivalent results for various lengths of the moving correlation coefficient: From 1957 to the end of 1964 the moving correlation coefficient remained below the naught line (averaging -0.07) promising a small diversification benefit. This was followed by a long stretch of persistently positive correlation coefficients (1965 through 1999 averaging 0.29) that made risk-weighted portfolio construction more difficult. However, the correlation coefficient did come down during the oil crises in 1973 and 1979/1980 reflecting investor flight into safe asset classes.

At the turn of the millennium and the bursting of the dot-com bubble, the sign of the moving correlation coefficient turned negative, falling to -0.53 in the wake of the Corona pandemic in April 2020, for example. The correlation coefficient turned negative in low-interest environments with massive liquidity injections from the Fed that made the stock market rally (the monthly return on investment on the S&P 500 averaged 1.2% in the past ten years exceeding the monthly calculated nominal long-term growth rate at some 0.7%) and made the yields on US treasuries hit record lows. Qualitatively similar developments occurred in the moving correlation coefficients between US treasuries in the maturities range from one to thirty years and the S&P 500.



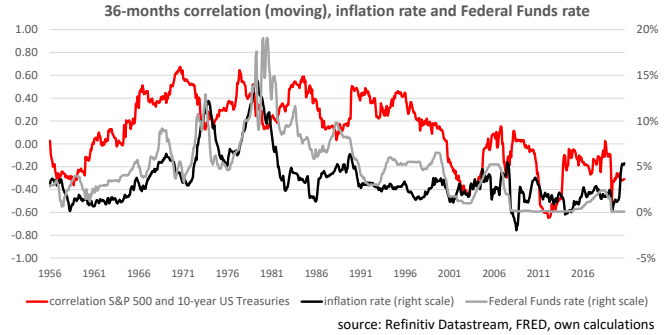
source: Refinitiv Datastream, FRED, own calculations

While the low-interest environment of the past few years made safe sovereigns look unattractive from a yield perspective, corporate bonds still offered comparatively attractive yields. However, the 'excess' yield came at the price of diversification benefits. For instance, the moving correlation coefficient between the S&P 500 and the total yield on US corporate bonds with Moody's ratings from Aaa to Baa skyrocketed when the Covid pandemic first hit in March 2020. By contrast, the correlation coefficient between S&P 500 and 10-year US treasuries markedly dropped at the same time. Due to the higher default risk on corporate bonds compared to sovereigns, investors demanded – analogously to equities – higher risk premiums and sold off higher-risk corporate bonds.



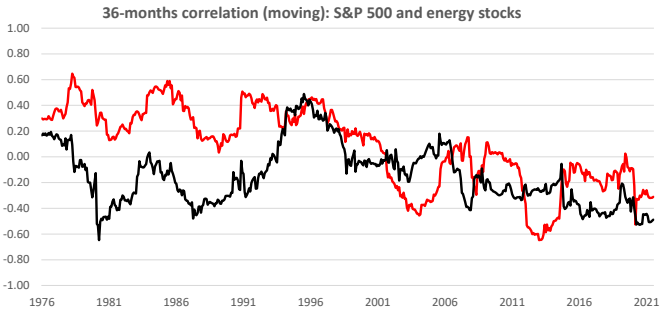
source: Refinitiv Datastream, FRED, own calculations

Are the negative correlation coefficients between stocks and bonds here to stay or will the pendulum swing back to positive coefficients reigning supreme again? A brief look at the macroeconomic environment is very enlightening. It appears that in the past high inflation and high interest rates coincided with both asset classes moving in lockstep (see development between 1965 and 1999).



source: Refinitiv Datastream, FRED, own calculations

Rising prices and higher interest rates were negative for sovereigns as the fixed interest on their coupons makes them less attractive and higher discount rates lower the net asset value of future coupon payments. Stock prices also tend to be weak on a short-term horizon in such macroeconomic environment. For instance, rising interested rates worsen refinancing terms and make entrepreneurial investment projects more difficult. Moreover, rising energy prices raise corporate costs and lower profit margins in the short-term which puts pressure on stock prices. Energy companies, however, see the opposite effect as rising energy prices boost their margins and are therefore good for their stock prices. We see a prime example of this effect in the strongly negative correlation coefficient between American energy companies and 10-year treasuries at the end of the 1970s.



source: Refinitiv Datastream, FRED, own calculations

A multiple regression model illustrates the empirical impact of various macroeconomic indicators on the moving correlation coefficient. The graph already indicates that the estimated coefficients for the real interest rate and inflation rate are positive. That means rising prices and interest rates raise the correlation coefficient between US treasuries and the S&P 500. Rising unemployment – indicating lower economic growth – however, lowers the moving correlation coefficient and is indicative of capital moving into lower-risk asset classes.

variable	*coefficient*	*P-value*
intersection	-0.1249	0.0000
dummy: period 1953 to 1964	0.0417	0.0391
dummy: period 1965 to 1999	0.4735	0.0000
real interest rate	1.5469	0.0000
inflation rate (yoy)	0.5449	0.0794
recession dummy	-0.0215	0.2566
unemployment rate	-0.9089	0.0126
adjusted coefficient of determination		0.70

source: Refinitiv Datastream, FRED, own calculations

Of course, in addition to the macroeconomic indicators discussed above, behavioral economic phenomena also factor into the correlation calculation. From an econometric perspective, we see two plausible scenarios:

1. If the economy continues to improve, prices persistently rise in a price-wage spiral, and the central bank initiates a lasting interest rate turnaround, it becomes empirically highly likely that the correlation coefficient turns positive again.
2. If the economy keeps temporarily faltering, for instance, due to supply chain bottlenecks, the currently high inflation returns to pre-pandemic levels, and interest rate hikes remain moderate, the most likely scenario is a correlation coefficient near zero.

Investors focusing on the US market should know how a rising correlation coefficient would impact their portfolios. The more total returns on stocks and sovereigns move in lockstep, the higher the portfolio risk. That means investors should give restructuring their portfolios a serious thought. There are some tradeoffs to consider, though. Either investors accept the higher risk and leave the stock-to-bond ratio in their portfolios unchanged, or they increase the share of lower-risk government bonds. Increasing the bond weighting in their portfolios, however, is not really an alternative considering the quite low coupon interest and generally low yield. Even corporate bonds with presumably higher yields than sovereigns are not a good choice owing to their already positive correlation to stock markets. If the correlation coefficient really were to turn around, it may make more sense to build up cash positions as a risk hedge. Alternatively, investors may give their portfolios a broader geographic diversification or add less strongly positive-correlated asset classes like gold.

We thank our colleague Simon Landt for his constructive contribution to this article.

Market data

Stock marktes	As of 15.10.2021 09:20	Change versus 30.09.2021 -1 week	06.09.2021 -1 month	06.07.2021 -3 months	06.10.2020 -1 year	31.12.2020 YTD
Dow Jones	34913	3,2%	-1,3%	1,0%	25,7%	14,1%
S&P 500	4438	3,0%	-2,1%	2,2%	32,1%	18,2%
Nasdaq	14823	2,6%	-3,5%	1,1%	32,9%	15,0%
DAX	15486	1,5%	-2,8%	-0,2%	20,0%	12,9%
MDAX	34294	-0,2%	-5,3%	-0,7%	23,9%	11,4%
TecDAX	3717	-0,7%	-6,3%	3,2%	19,5%	15,7%
EuroStoxx 50	4168	3,0%	-1,8%	2,8%	28,9%	17,3%
Stoxx 50	3616	3,3%	-0,8%	2,7%	23,8%	16,3%
SMI (Swiss Market Index)	11912	2,3%	-4,2%	-0,4%	16,4%	11,3%
Nikkei 225	29069	-1,3%	-2,0%	1,5%	24,0%	5,9%
Brasilien BOVESPA	113185	2,0%	-4,0%	-9,5%	18,4%	-4,9%
Russland RTS	1888	6,2%	8,7%	14,8%	61,6%	36,1%
Indien BSE 30	61306	3,7%	5,2%	16,0%	54,9%	28,4%
China CSI 300	4932	1,4%	0,0%	-3,0%	7,5%	-5,4%
MSCI Welt (in €)	3085	2,3%	-0,6%	3,3%	31,5%	21,2%
MSCI Emerging Markets (in €)	1267	0,8%	-2,3%	-4,1%	16,7%	3,7%
Bond markets						
Bund-Future	169,65	-17	-560	-395	-462	-799
Bobl-Future	134,70	-23	-23	32	-44	-48
Schatz-Future	112,19	-2	-6	1	-9	-9
3 Monats Euribor	-0,55	3	2	2	-4	3
3M Euribor Future, Dec 2017	-0,55	0	0	-1	0	0
3 Monats $ Libor	0,12	-1	1	-1	-11	-11
Fed Funds Future, Dec 2017	0,08	0	0	-2	3	0
10 year US Treasuries	1,54	1	22	17	80	63
10 year Bunds	-0,16	3	21	15	35	41
10 year JGB	0,08	1	4	5	6	6
10 year Swiss Government	-0,15	3	17	12	35	35
US Treas 10Y Performance	692,88	0,1%	-1,6%	-0,8%	-4,5%	-3,2%
Bund 10Y Performance	662,94	-0,1%	-1,8%	-1,0%	-2,6%	-3,2%
REX Performance Index	490,05	-0,4%	-1,1%	-0,8%	-1,7%	-1,8%
US mortgage rate	0,00	0	0	0	0	0
IBOXX AA, €	0,34	1	14	11	19	32
IBOXX BBB, €	0,72	4	15	10	-17	16
ML US High Yield	4,76	8	17	20	-116	-22
Convertible Bonds, Exane 25	8153	0,0%	-2,4%	-2,8%	3,8%	-2,1%
Commodities						
MG Base Metal Index	435,13	0,7%	-1,3%	0,4%	41,9%	22,7%
Crude oil Brent	84,84	8,0%	17,7%	13,6%	98,4%	63,5%
Gold	1790,72	1,7%	-1,7%	-0,7%	-6,4%	-5,6%
Silver	22,54	2,1%	-8,9%	-13,8%	-5,4%	-14,6%
Aluminium	2883,75	1,5%	4,6%	15,0%	65,8%	46,1%
Copper	9052,60	1,2%	-4,1%	-2,5%	39,0%	16,8%
Iron ore	122,83	2,7%	-15,2%	-43,5%	0,8%	-21,2%
Freight rates Baltic Dry Index	5062	-2,0%	32,4%	59,2%	141,4%	270,6%
Currencies						
EUR/ USD	1,1613	0,3%	-2,1%	-1,9%	-1,5%	-5,4%
EUR/ GBP	0,8467	-1,5%	-1,3%	-1,2%	-6,9%	-5,4%
EUR/ JPY	132,40	2,1%	1,6%	1,1%	6,3%	4,7%
EUR/ CHF	1,0712	-1,1%	-1,4%	-2,0%	-0,6%	-0,8%
USD/ CNY	6,4270	-0,3%	-0,5%	-0,8%	-5,4%	-1,6%
USD/ JPY	111,43	0,1%	1,4%	0,7%	5,5%	7,9%
USD/ GBP	0,73	-1,7%	0,8%	0,7%	-5,4%	-0,3%

Source: Refinitiv Datastream

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