

## Downside Correlation Convergence

### Do Crisis Correlations Go to One?

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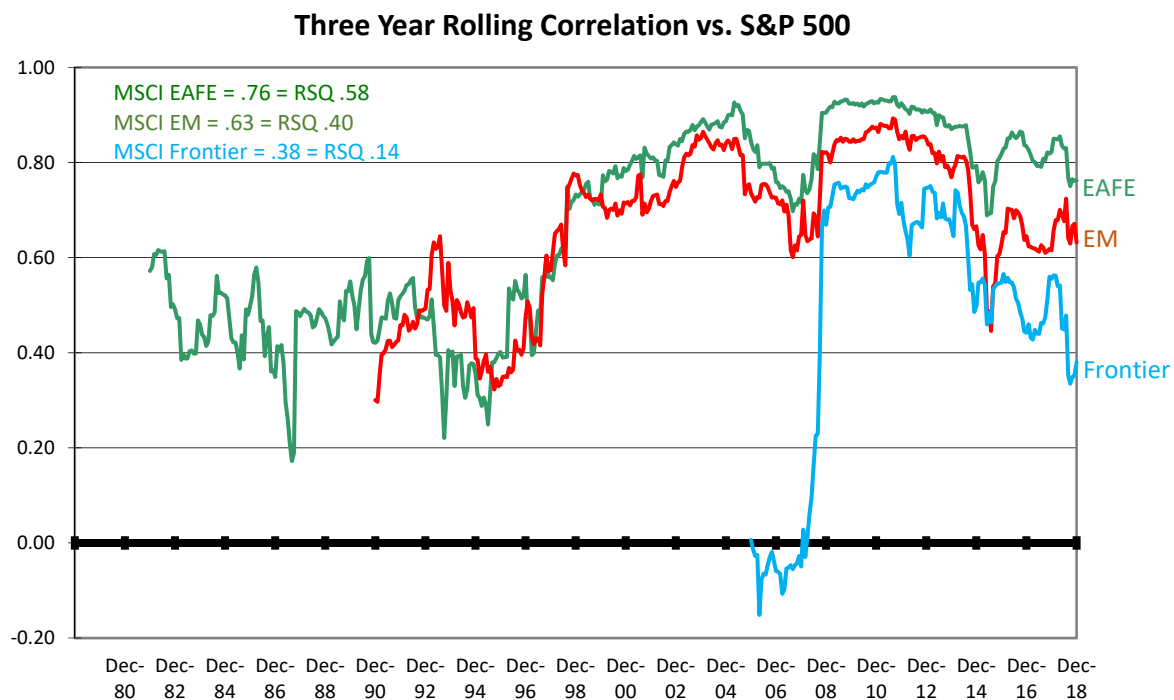
*"Bad news travels at the speed of light, good news travels like molasses."*

– Tracy Morgan, *New York Times Magazine*, April 15, 2014

Low correlation is a key to diversification. The problem is that correlations jump around. Not only that, but they tend to spike up in times of crisis – just when we need diversification the most. This makes building a diversified portfolio like building a doghouse around a moving dog.

The evidence of the variability of correlations is in Exhibit 1 which shows that rolling correlations with the US for the primary global equity indexes spiked up in 2008, and especially for frontier markets. Around that time, frontier markets were being discovered by global investors, so their correlation would probably have been rising anyway, but their spike was a surprise.

Exhibit 1 – Correlation of MSCI EAFE, Emerging Markets and Frontier Markets indexes with MSCI US over rolling 36-month periods



Source: MSCI, S&P Dec 2018

## Up and Down Market Correlations

To get to the bottom of this, I decided to look at correlations in up and down market periods, beginning from our earliest frontier market data in January 1996 and then isolating the period since January 2008. I looked at all months and grouped them into months when the US market was up, months when it was down and months where the gain in the US market was 3% or more and months when the US market was down 3% or more. Then I did the same for the period since the beginning of the 2008 global financial crisis. For all those groups of months, I calculated the correlation of EAFE, Emerging and Frontier returns with the US.

Table 1 – Correlations with MSCI US overall and in up and down months

Correlations	1996-2018					2008-2018				
	96-18 All	96-18 Up	96-18 Up>3%	96-18 Down	96-18 Down<-3	08-18 All	08-18 Up	08-18 Up >3%	08-18 Down	08-18 Down<-3%
EAFE	0.83	0.59	0.50	0.77	0.73	0.88	0.73	0.72	0.82	0.76
EM	0.74	0.44	0.37	0.65	0.65	0.79	0.63	0.73	0.69	0.66
Frontier	0.43	0.20	0.20	0.55	0.61	0.67	0.40	0.38	0.71	0.73
Count	276	180	81	96	45	132	88	37	44	22

Source: FGP, MSCI 2019

The results in Table 1 show that during the total of 276 months, frontier markets had a correlation with MSCI US of 0.43, but over the 132 months since January 2008 it has been 0.67.

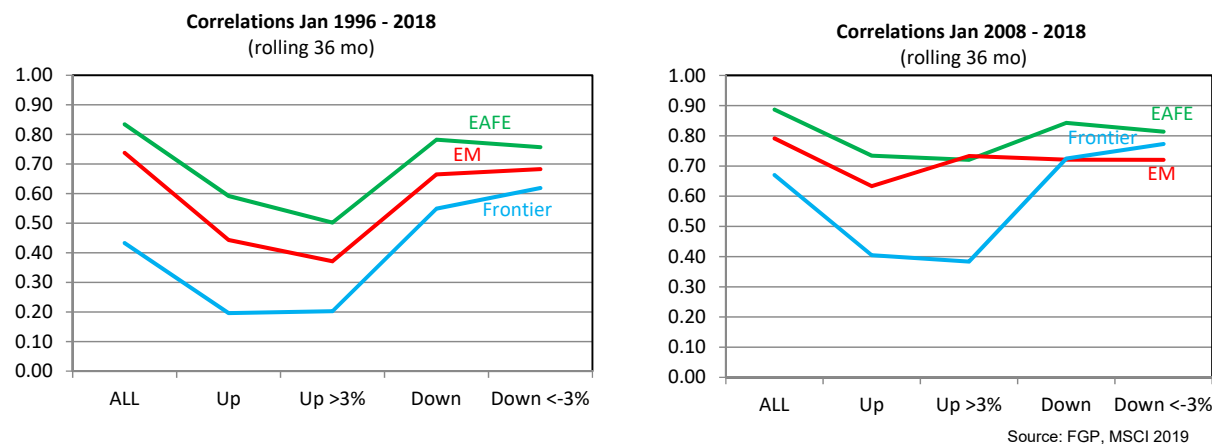
Looking at just the 180 positive months since 1996, the frontier correlation was 0.20; and in 88 positive months since 2008, it has been 0.40.

Next, I looked at the big positive months, when the US went up by more than 3%. During 81 months since 1996 when the US was up 3% or more, the frontier correlation with the US was again 0.20, and for the 37 big up months in the last ten years, the frontier correlation was 0.38.

Bad news travels fast, however, and down months are another story. The down month correlations with the US for EAFE, emerging and frontier are all higher than the up month correlations over both 23 and 11 years. Over the 45 months since 1996 when MSCI US declined by more than 3%, the frontier correlation was 0.61 and over the 22 months since 2008, it was 0.73. This is higher than the 0.66 correlation of emerging markets but less than that of EAFE.

It may be easier to see what is going on in the graphs below in Exhibit 2.

Exhibit 2 - Correlations with MSCI US overall and in up and down months



Source: FGP, MSCI 2019

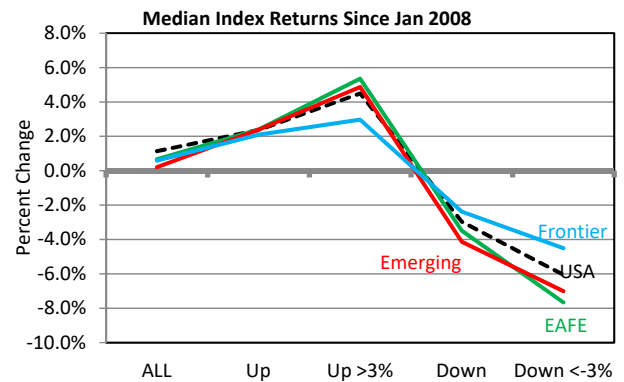
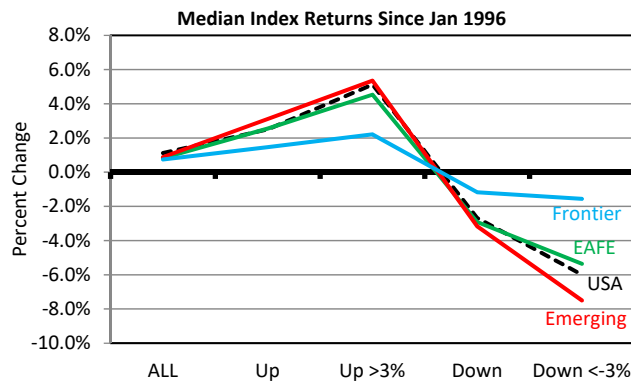
## Up and Down Market Returns

While correlation changes are interesting, it is actual returns that matter most. Exhibit 3 shows the median monthly percent changes for the same periods as in Table 1.

Exhibit 3 – Median monthly percent changes overall and in up and down months

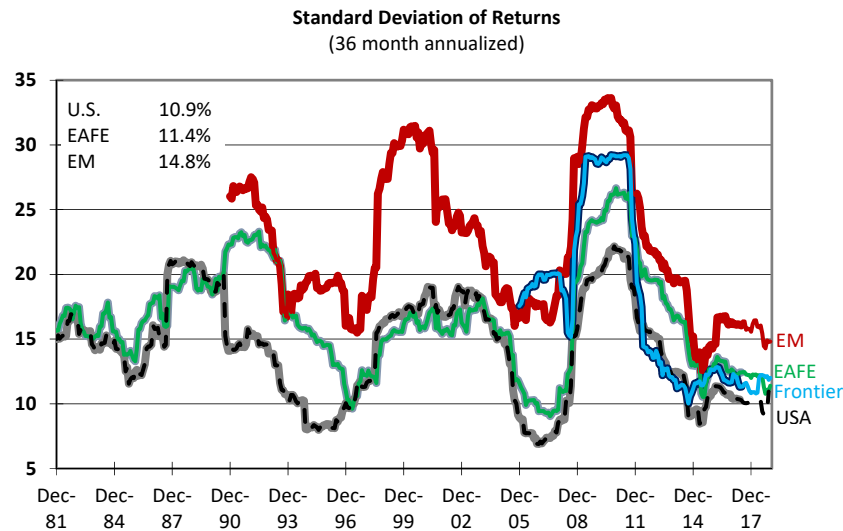
Median Returns	1996-2018					2008-2018				
	96-18 All	96-18 Up	96-18 Up>3%	96-18 Down	96-18 Down<-3%	08-18 All	08-18 Up	08-18 Up >3%	08-18 Down	08-18 Down<-3%
USA	1.1%	2.5%	5.1%	-2.7%	-6.0%	1.1%	2.4%	4.5%	-3.0%	-6.1%
EAFE	0.8%	2.6%	4.5%	-2.9%	-5.4%	0.7%	2.4%	5.4%	-3.5%	-7.7%
EM	0.9%	3.1%	5.4%	-3.2%	-7.5%	0.2%	2.4%	4.9%	-4.1%	-7.0%
Frontier	0.7%	1.5%	2.2%	-1.2%	-1.6%	0.6%	2.1%	3.0%	-2.4%	-4.5%

Source: FGP, MSCI 2019



Source: FGP, MSCI 2019

Exhibit 4 – Standard Deviation of Returns



Source: MSCI, S&P Dec 2018

For all down periods, frontier markets declined less than the other markets.

One reason for this is illustrated in exhibit 4, which shows the index standard deviations over rolling 36-month periods. The frontier index has a current standard deviation of 12.0%, closer to those of the MSCI US at 10.9% and EAFE at 11.4% than emerging markets at 14.9%.

## Conclusion

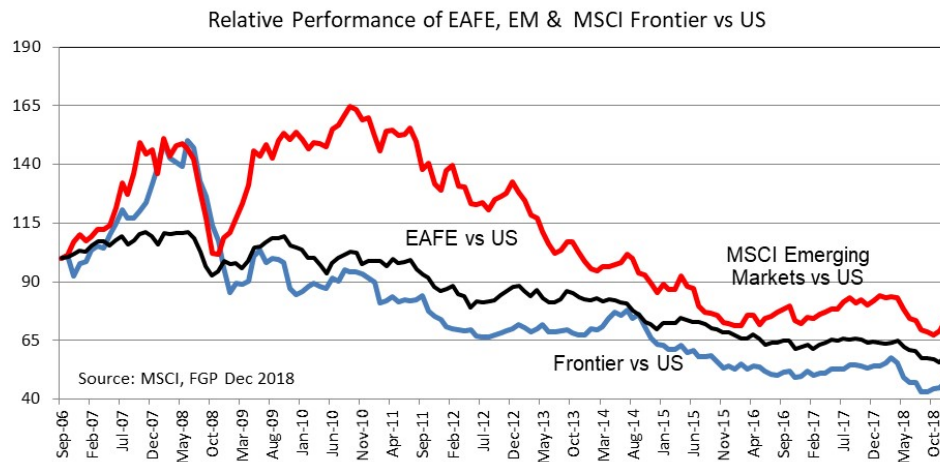
The evidence we have examined over more than two decades shows that frontier markets continue to provide diversification during down market periods, even though correlations do generally increase.

Frontier markets have yet to fully recover from the 2008 global financial crisis, but there have been periods of strong performance (2009, 2010, 2012, 2013, and 2017). More recently, frontier markets, like emerging markets and most developed markets, have been battling headwinds of caution over global growth, politics and trade, so returns have been lower than we had hoped.

It is hard to say whether we are seeing the end of the relative underperformance of foreign markets versus the US, shown in Exhibit 5, but after 10 years, we may be entering a new and different time.

We believe that frontier markets will continue to provide good downside protection and excellent diversification. Combined with attractive valuations, we believe there is the potential for strong returns.

Exhibit 5 - Relative returns versus MSCI US



*"All models are wrong; some models are useful."*

– George Box, *Robustness in the strategy of scientific model building*, *Robustness in Statistics*, R.L. Launer and G.N. Wilkinson, Editors. 1979, Academic Press: New York

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