

Tracking European Large/Mid Cap Equities with Nasdaq Indexes

After starting the year underperforming other equity markets around the globe, a number of European Stock Indexes have rallied to new all-time highs. Continued dovish talk by the ECB as well as hopes for an improving economy has helped provide a tailwind for European stocks. This research piece is going to focus on historic price history of two Nasdaq Indexes which track European equities: The Nasdaq Eurozone Large Mid Cap Index (NQEUEOLM) and the Nasdaq Germany Large Mid Cap TR Index (NQDELMT). We will use the historic performance history to compare each index to some competing indexes: The MSCI Daily Total Return EMU Index (GDDUEMU) and the MSCI Daily Total Return Germany Index (GDDUGR). Furthermore, we will provide a number of statistics that prove how similar both of the Nasdaq Indexes are to both MSCI Indexes. This will include providing examples of historical rolling volatility, correlation, beta, etc.

Eurozone

To begin, we will analyze the NASDAQ Eurozone Large Mid Cap Index, which is designed to track the performance of securities assigned to Eurozone and comprised of the Large Mid Cap segment. The Index is calculated in USD. It currently has 329 components and went live on January 13, 2014, with back-test data available back to March 30, 2001. Evaluations occur on the third Friday after the close of trading each March and September.

Methodology

The Global Index Family provides a transparent, rules-based benchmark for institutional investors. This family is specifically designed to meet the needs of institutions that are facing continued demands to track the global equity market.

The comprehensive Nasdaq Global index Family consists of more than 40,000 indexes broken down by market segment, region, country, size and sector. The Global Index Family includes 45 individual countries designated as Developed and Emerging Markets.

The Nasdaq Global Index (NQGI) provides broad coverage of global equities with approximately 9,000 Index Securities and over 98% of the entire listed market capitalization of the global equity space.

The Nasdaq Developed Market Index (NQDM) is comprised of the indexes of 25 countries which are designated as Developed Markets.

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The Nasdaq Emerging Market Index (NQEM) is comprised of the indexes of 20 countries which are designated as Emerging Markets.

The Nasdaq Developed Market Index (NQDM) and **The Nasdaq Emerging Markets Index (NQEM)** are individually segmented into the Large, Mid, Large Mid and Small Cap indexes. The combination of the Large, mid and Small Cap indexes construct the similar global index.

More detailed information about the Methodology can be found here: <https://indexes.nasdaqomx.com/Index/Overview/NQEUOLM>

In addition, a further breakdown of the Global Index Family is found in Appendix A – Nasdaq Global Index Family Breakdown section.

Eligibility

The basic eligibility requirements for the NASDAQ Eurozone Large Mid Cap Index (NQEUOLM) index are listed below:

- The security must be an eligible security type, as described in section 2.2.2;
- The security must have a minimum worldwide market capitalization of USD 150 million, as described in section 2.2.3;
- The security must have a minimum three-month average daily dollar trading volume of USD 100 thousand, as described in section 2.2.4;
- The security must have a minimum free float of 20% and in some cases a minimum free float of 5%, as described in 2.2.5;
- The security must have "seasoned" for at least three months on an index Eligible Global Stock Exchange, as described in section 2.2.6;
- The security must be within a country classified as Developed or Emerging Markets, as described in section 3.1 and 3.2; and

More detailed information about the Eligibility Requirements can be found here:

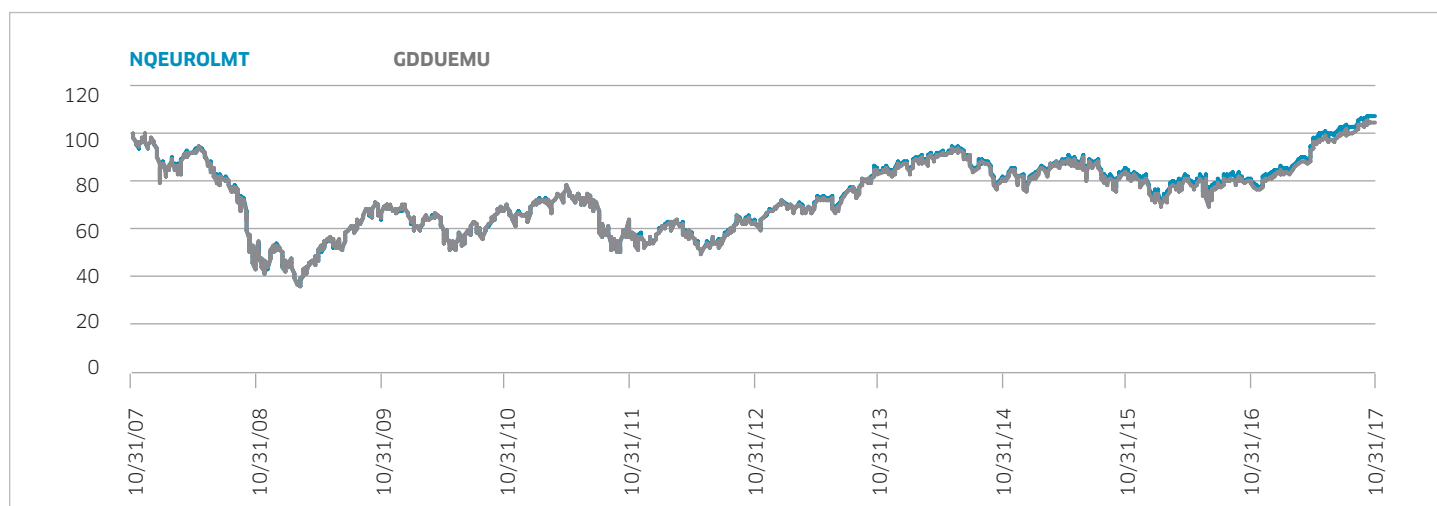
<https://indexes.nasdaqomx.com/Index/Overview/NQEUOLM>

Historic Performance

The table below displays historical performance figures for both the Nasdaq Eurozone Large Mid Cap Index (NQEUOLMT) compared with the MSCI Daily Total Return EMU Index (GDDUEMU) between October 31, 2007 and October 31, 2017. Performance figures for each index are very similar in nature over the allotted time frame. The next graphic provides a visual for how correlated both indexes have been going back ten years.

	NQEUOLMT	GDDUEMU
Cumulative Return	7.46%	5.35%
Annualized Return	0.72%	0.52%
Annualized Volatility	26.95%	26.80%

The historical price history chart below confirms the thesis of how closely correlated each both NQEUOLMT and GDDUEMU. In fact, up until recently there are very times when you can see both indexes performance history, which provides a great visual confirmation and perspective for readers. Similarly, the annualized volatility over the entire timeframe is a shade under 27% for both.



Yearly Comparison: (December 30, 2008 – October 31, 2017)

A year by year summary helps display what time periods have seen differences in performance. For the most part, performance of each index has been extremely similar each year. To confirm this we've added a final column that shows the difference in performance at the end of year calendar year. Notice that between 2008 and thus far into 2017 there isn't a single time frame where the difference has been greater than +/- 1%. The largest difference was in 2015, which saw NQEUOLMT outperform GDDUEMU by 0.93%. The year with the smallest difference in performance was 2008, where NQEUOLMT outperformed by 0.03%. There are also another of number years where performance differences were de minimis. Thus far on a year YTD basis (through October 31, 2017), both indexes have performed very well, notching gains of just over 28.50%.

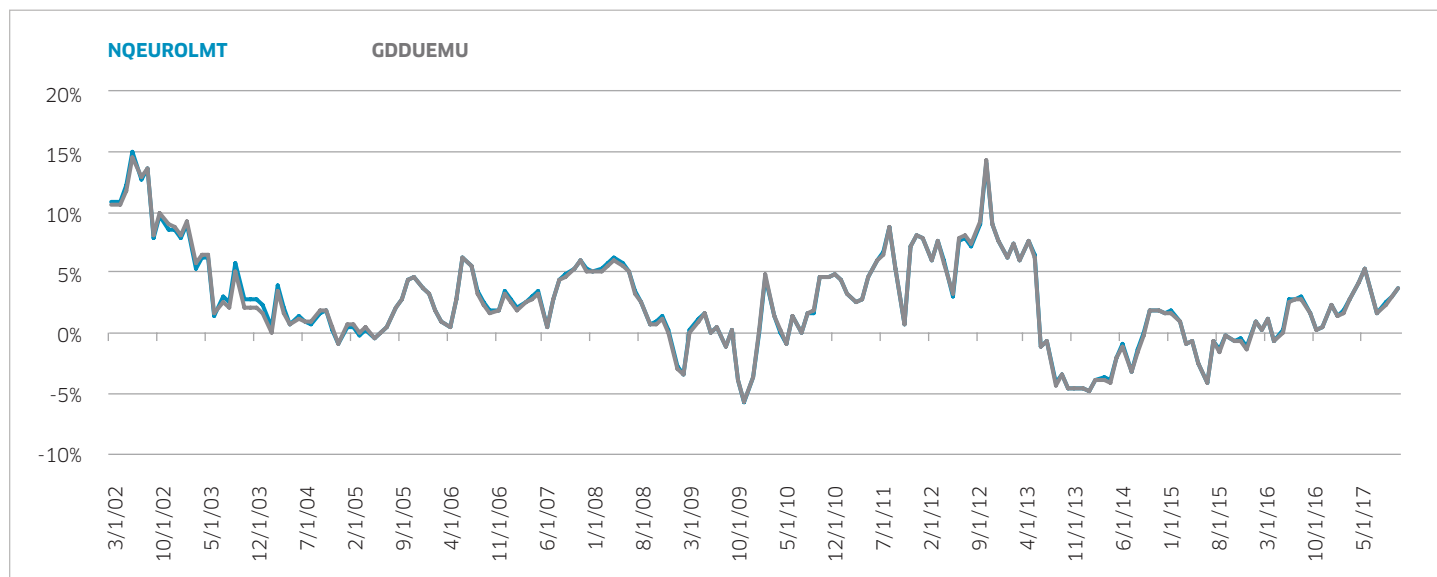
	NQEUOLMT	GDDUEMU	DIFFERENCE
2008	-47.06%	-47.09%	-0.03%
2009	32.18%	32.79%	0.61%
2010	-2.75%	-3.42%	-0.67%
2011	-16.96%	-16.86%	0.10%
2012	23.11%	22.49%	-0.62%
2013	30.49%	30.03%	-0.46%
2014	-7.83%	-7.73%	0.10%
2015	0.17%	-0.76%	-0.93%
2016	2.47%	2.19%	-0.28%
2017 YTD	28.68%	28.82%	0.14%

Additional performance analysis below shows a number of statistics including win rate, and average annual return during our time period studied. NQEUOLMT displayed a slightly stronger average gain at 4.25% vs. 4.05%.

	NQEUOLMT	GDDUEMU
Total Years	10	10
Wins	6	4
Win Rate	60.00%	40.00%
Average Return	4.25%	4.05%

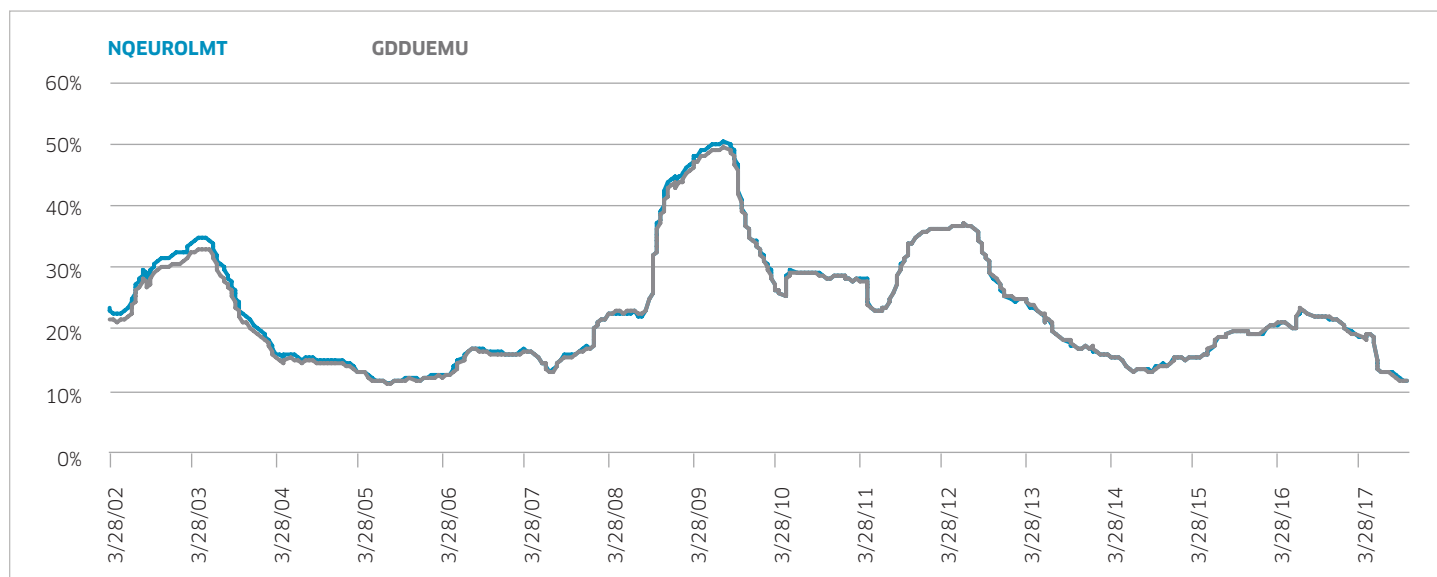
Rolling Returns (1 Year - Monthly)

The 12 month rolling return for each index ranged between -5% to +15% during our time frame studied. The largest return value occurred at the end of October 2012, while the smallest was at the end of November 2009. Perhaps the most interesting thing to consider when looking at the below visual is that there is only a very small time frame which occurred during 2003 and into 2004 when you can even see both Indexes rolling returns, once again confirming how similar each has performed.



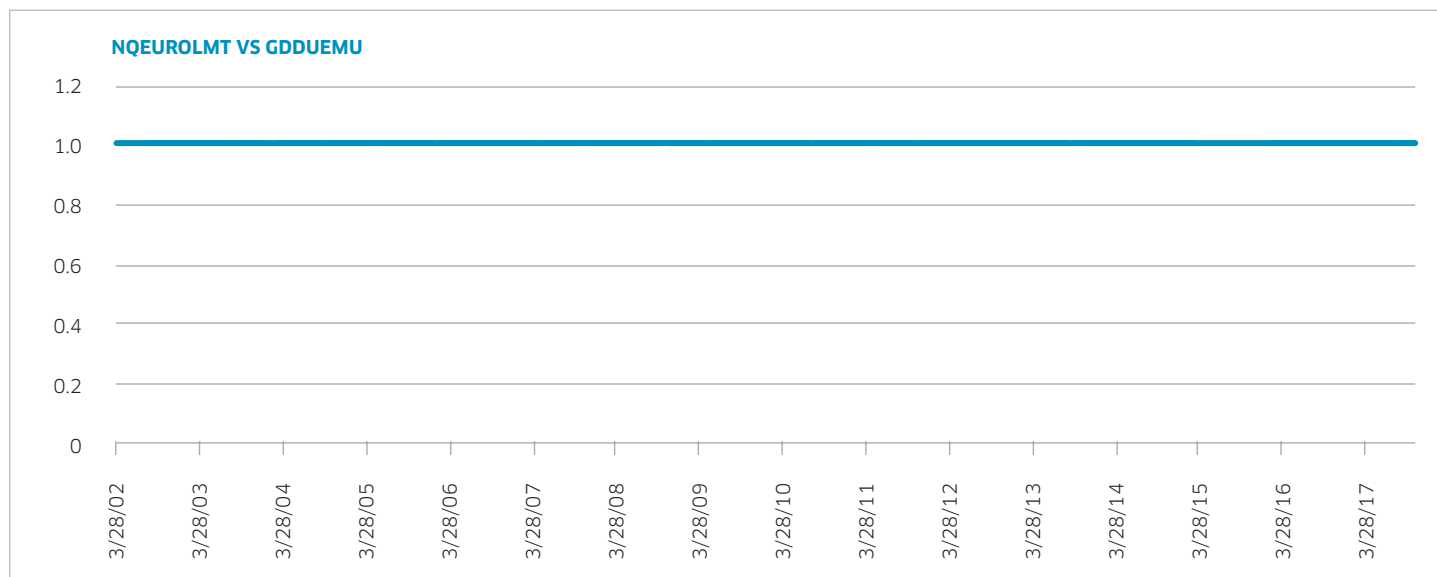
Rolling Volatility (1 Year - Daily)

Similarly, one year rolling volatility (on a daily basis) was closely correlated as evidenced by the ability to only see both lines below very few times. The range of rolling volatility during our time frame studied was between roughly 10% and 50%. The peak on our graphic occurred during the financial crisis or shortly after due to the nature of the way rolling volatility is calculated. Currently, it's back near the lowest levels seen since 2005 just above 10%.



Rolling Correlation (1 Year - Daily)

A rolling correlation calculation tracks the consistency in returns between two indexes and continues to look back over the same time frame throughout the time period studied. The below chart is a rolling correlation (1 Year on a daily basis) between the NQEUROLMT and GDDUEMU. The rolling correlation chart between the two indexes helps confirm the stability and robust methodology of each index during our time frame studied and has historically remained right near 1.00 since 2002.



Daily Correlation & Beta

The Beta (defined as measure of systematic risk) of NQEUROLMT compared to GDDUEMU was 1.01, while the correlation figure was 1.00. This helps confirm a few of our previous charts above that gave us the same visual.

INDEX COMPARISON	BETA
NQEUROLMT vs GDDUEMU	1.01

INDEX COMPARISON	CORRELATION
NQEUROLMT vs GDDUEMU	1.00

Germany

The Nasdaq Germany Large Mid Cap Index is designed to track the performance of securities assigned to Germany and comprised of the Large Mid Cap segment. The Index is calculated in USD. It was launched on January 13, 2014, with back-test data available back to March 30, 2001, and currently has 80 components. Evaluations occur on the third Friday after the close of trading each March and September.

Methodology

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The comprehensive Nasdaq Global index Family consists of more than 40,000 indexes broken down by market segment, region, country, size and sector. The Global Index Family includes 45 individual countries designated as Developed and Emerging Markets.

The Nasdaq Global Index (NQGI) provides broad coverage of global equities with approximately 9,000 Index Securities and over 98% of the entire listed market capitalization of the global equity space.

The Nasdaq Developed Market Index (NQDM) is comprised of the indexes of 25 countries which are designated as Developed Markets.

The Nasdaq Emerging Market Index (NQEM) is comprised of the indexes of 20 countries which are designated as Emerging Markets.

The Nasdaq Developed Market Index (NQDM) and The Nasdaq Emerging Markets Index (NQEM) are individually segmented into the Large, Mid, Large Mid and Small Cap indexes. The combination of the Large, mid and Small Cap indexes construct the similar global index.

In addition, a further breakdown of the Global Index Family is found in Appendix A – Nasdaq Global Index Family Breakdown section.

More detailed information about the Index Methodology can be found at the following:

<https://indexes.nasdaqomx.com/Index/Overview/NQDELM>

Eligibility

The basic eligibility requirements for the NASDAQ Germany Large Mid Cap Index NQDELM index are listed below:

- The security must be an eligible security type, as described in section 2.2.2;
- The security must have a minimum worldwide market capitalization of USD 150 million, as described in section 2.2.3;
- The security must have a minimum three-month average daily dollar trading volume of USD 100 thousand, as described in section 2.2.4;
- The security must have a minimum free float of 20% and in some cases a minimum free float of 5%, as described in 2.2.5;
- The security must have "seasoned" for at least three months on an index Eligible Global Stock Exchange, as described in section 2.2.6;
- The security must be within a country classified as Developed or Emerging Markets, as described in section 3.1 and 3.2; and

More detailed information about the Eligibility Requirements can be found at the following:

<https://indexes.nasdaqomx.com/Index/Overview/NQDELM>

Historic Performance

The table below displays historical performance figures for both the NASDAQ Germany Large Mid Cap Index (NQDELMT) compared with the MSCI Daily Total Return German Index (GDDUGR) between October 31, 2007 and October 31, 2017. Performance figures for each index are once again similar in nature over the allotted time frame. The next graphic provides a visual for how correlated both indexes have been over this time frame. Similarly, the annualized volatility for both indexes is right around 27%.

	NQDELMT	GDDUGR
Cumulative Return	27.12%	27.95%
Annualized Return	2.43%	2.49%
Annualized Volatility	27.13%	26.98%

The historical price history chart below confirms the thesis of how closely correlated each both NQDELMT and GDDUGR. During no point of the course of time period studied can you see both Index historical returns on this graphic, confirming a very tight correlation between both indexes.



Yearly Comparison (12/30/08 – 10/31/17)

A year by year summary helps display what time periods have seen differences in performance. For the most part, performance of each index has been extremely similar each year. To confirm this we've added a final column that shows the difference in performance. Notice that between 2008 and thus far into 2017 there is only one year (2009) where the difference was greater than 1%. Thus far on a year YTD basis (through October 31, 2017), both indexes have performed very well, notching gains of close to 27%. The difference between the YTD stats for each is a meager 0.14%.

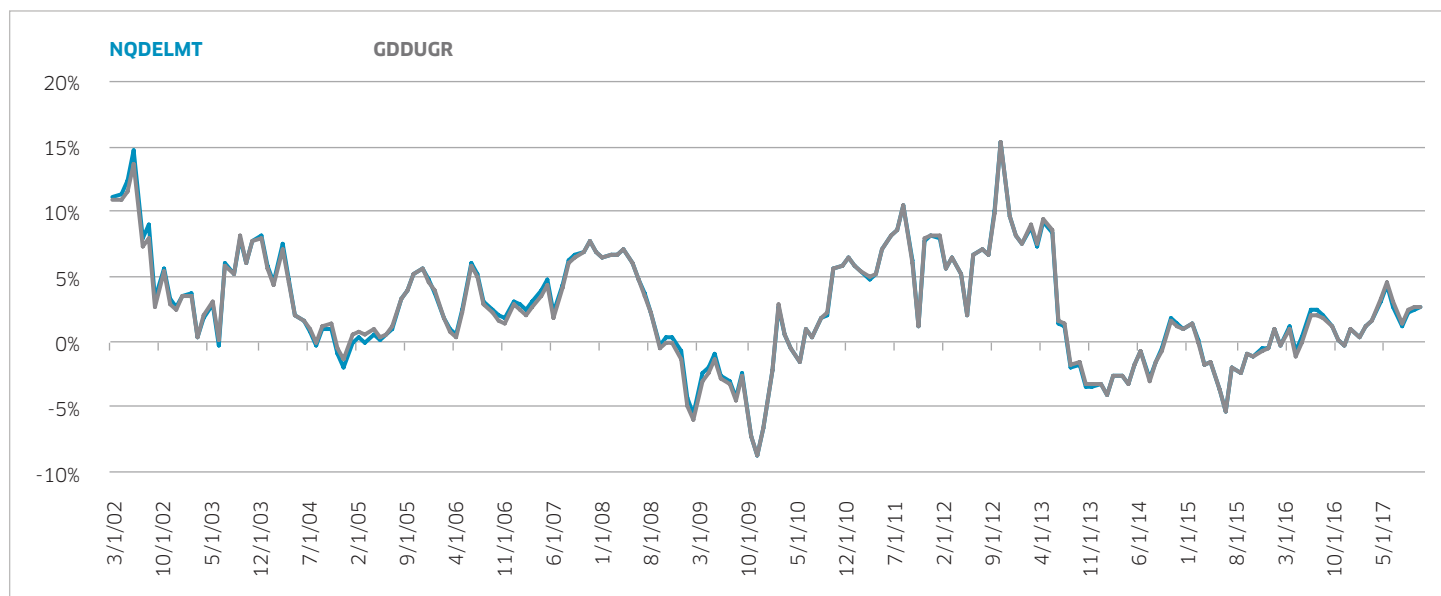
	NQDELMT	GDDUGR	DIFFERENCE
2008	-46.14%	-45.50%	0.64%
2009	27.60%	26.56%	-1.04%
2010	9.63%	9.32%	-0.31%
2011	-18.07%	-17.45%	0.62%
2012	31.65%	32.10%	0.44%
2013	31.76%	32.40%	0.64%
2014	-9.42%	-9.76%	-0.34%
2015	-0.58%	-1.27%	-0.69%
2016	2.98%	3.50%	0.51%
2017	26.80%	26.94%	0.14%

Additional analysis below shows a number of statistics including win rate, average gain, and average loss during our time period studied. Both the average gain and average loss stats are only separated by .06% and .05%, respectively. The largest gain and largest loss stats are both separated by less than 1%.

	NQDELMT	GDDUGR
Total Years	10	10
Wins	4	6
Win Rate	40.00%	60.00%
Average Gain	21.74%	21.80%
Average Loss	-18.55%	-18.50%
Largest Gain	31.76%	32.40%
Largest Loss	-46.14%	-45.50%

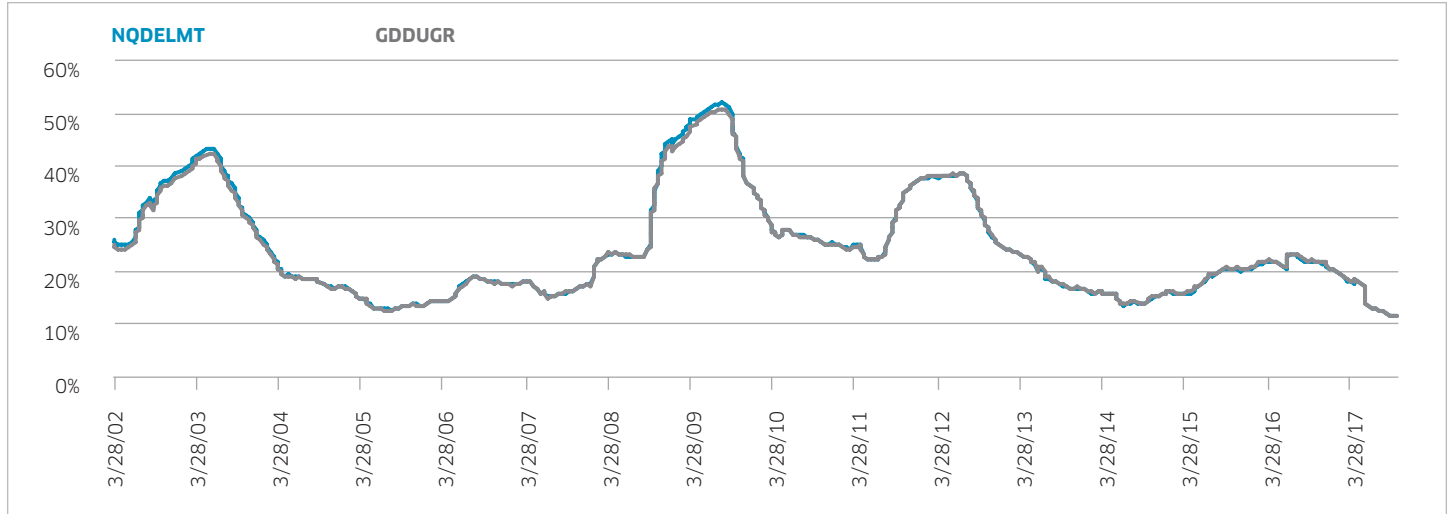
Rolling Returns (1 Year - Monthly)

The 12 month rolling return for each index ranged between -9% to +16% during our time frame studied. The largest value occurred at the end of October 2012, while the smallest was at the end of November 2009. Perhaps the most interesting thing to consider when looking at the below visual is that there are very few occasions when both index lines are visible and each is for a minimal period of time, which points to the similarity and consistency of returns generated by both indexes.



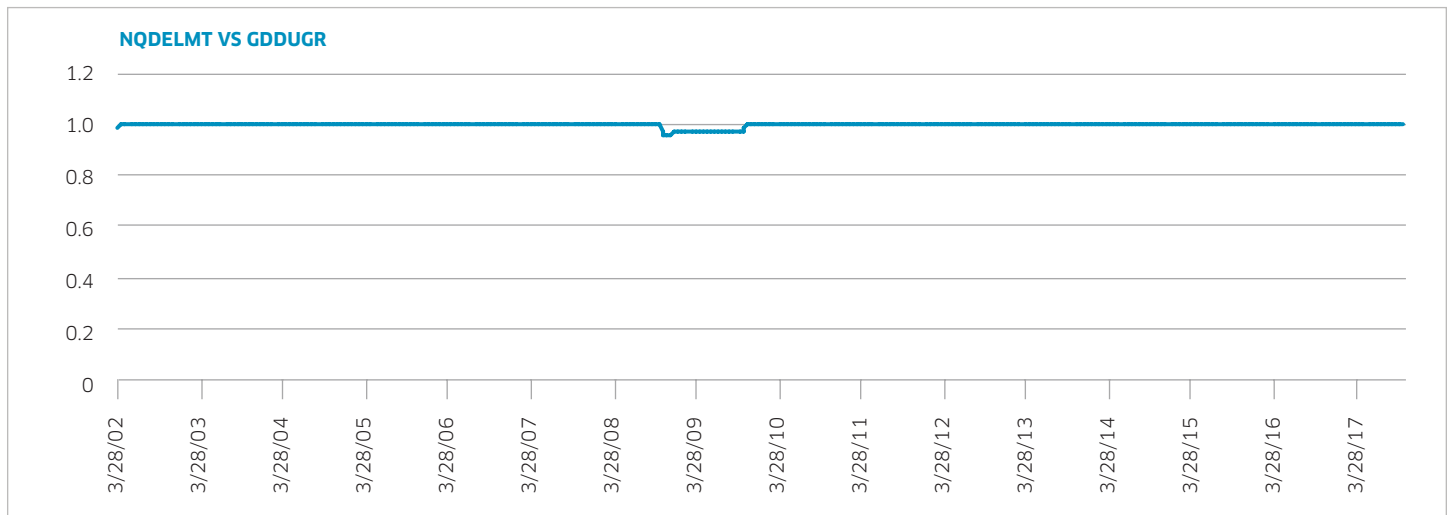
Rolling Volatility (1 Year - Daily)

Similarly, one year rolling volatility (on a daily basis) was closely correlated. The range our time frame studied was between 10% and just over 50%. The peak on our graphic occurred during the financial crisis or shortly after due to the nature of the way rolling volatility is calculated. Currently, it's back near the lowest levels seen since 2005 just above 10%.



Rolling Correlation (1 Year - Daily)

A rolling correlation calculation tracks the consistency in returns between two indexes and continues to look back over the same time frame through the time period studied. The below chart is a rolling correlation (1 Year- Daily) between the NQDELMT and GDDUGR. The rolling correlation chart between the two indexes helps confirm the stability and robust methodology of each index during our time frame studied and has historically remained right near 1.00 since 2002.



Daily Correlation & Beta

The Beta of NQDELMT compared to GDDUGR was 1.00, while the correlation figure was 0.99. This helps confirm a few of our previous charts above that gave us the same visual.

INDEX COMPARISON	BETA
NQDELMT vs GDDUGR	1.00

INDEX COMPARISON	CORRELATION
NQDELMT vs GDDUGR	0.99

Conclusion

After underperforming most other stock indexes around the globe to begin the year, European equities have staged a solid rally and are have established impressive gains on the year. In this research piece we focused on two Nasdaq Indexes which each track a basket of European equities. The first was the Nasdaq Eurozone Large Mid Cap Index (NQEUEOLM), followed by the Nasdaq Germany Large Mid Cap TR Index (NQDELMT). We provided some historic performance figures for each, and compared performance history and statistics with the MSCI Daily Total Return EMU Index (GDDUEMU) and the MSCI Daily Total Return Germany Index (GDDUGR). All of these statistics (correlation, volatility, beta, performance history) confirm how similar both the Nasdaq Indexes are compared to their peer MSCI Indexes. Investors can diversify a portfolio by gaining exposure to equities from different parts of the globe and those looking to add an allocation to these Nasdaq indexes can do so through the corresponding ETFs: Nasdaq-listed EURZ for Eurozone and Nasdaq-listed GRMY for Germany.

More Information

For more information, please visit business.nasdaq.com/indexes.

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