

Quarterly Thematic Index Performance Review

Thematic Index Round-Up

MV Index Solutions (MVIS[®]) publishes 59 thematic indices to cover forward-looking investment concepts grouped into meta themes: Clean Energy, Health Care Innovation, Financials 2.0, NextGen Hardware & Communications, NextGen Software, Consumer Trend, Thematic Industrials & Infrastructure, Thematic REITS, Materials, and Disruptive Technology.

In Q4 2021, NextGen Hardware & Communications outperformed, returning 15%, while Health Care Innovation underperformed, returning -11%. Overall for the year, NextGen Hardware & Communications outperformed, returning 33%, while Clean Energy underperformed, returning -15%.

Exhibit 1: Meta Thematic Returns (USD, ending 31 December 2021)

Q1-2019	Q2-2019	Q3-2019	Q4-2019	Q1-2020	Q2-2020	Q3-2020	Q4-2020	Q1-2021	Q2-2021	Q3-2021	Q4-2021
Next Gen Software 25.1%	Clean Energy 5.8%	Thematic REITS 4.7%	Health Care Innovation 20.1%	Health Care Innovation -8.1%	Clean Energy 49.1%	Clean Energy 42.4%	Clean Energy 54.2%	Financials 2.0 38.6%	NextGen Hardware & Communications 8.7%	Materials 3.1%	NextGen Hardware & Communications 14.6%
Health Care Innovation 23.1%	Thematic Industrials & Infrastructure 5.5%	NextGen Hardware & Communications 4.0%	Clean Energy 15.4%	Financials 2.0 -12.1%	Next Gen Software 47.9%	Disruptive Technology 17.9%	Financials 2.0 38.1%	Thematic Industrials & Infrastructure 8.8%	Thematic REITS 8.5%	Thematic Industrials & Infrastructure 1.1%	Materials 8.1%
Thematic Industrials & Infrastructure 18.6%	Health Care Innovation 4.9%	Clean Energy 0.9%	NextGen Hardware & Communications 12.5%	Clean Energy -14.0%	Health Care Innovation 47.3%	Next Gen Software 11.6%	Health Care Innovation 30.9%	NextGen Hardware & Communications 8.0%	Health Care Innovation 8.4%	Thematic REITS -0.8%	Thematic REITS 6.8%
NextGen Hardware & Communications 17.6%	Financials 2.0 3.4%	Thematic Industrials & Infrastructure 0.4%	Consumer Trends 12.0%	Next Gen Software -15.0%	Financials 2.0 33.5%	Materials 11.1%	Materials 30.3%	Consumer Trends 7.0%	Thematic Industrials & Infrastructure 7.8%	NextGen Hardware & Communications -1.3%	Thematic Industrials & Infrastructure 3.2%
Clean Energy 16.3%	Disruptive Technology 2.8%	Consumer Trends -1.5%	Materials 11.4%	NextGen Hardware & Communications -16.6%	Disruptive Technology 29.8%	Consumer Trends 11.0%	Next Gen Software 29.5%	Materials 6.6%	Materials 7.1%	Disruptive Technology -2.0%	Clean Energy 1.0%
Disruptive Technology 15.7%	Thematic REITS 2.6%	Financials 2.0 -1.6%	Next Gen Software 10.4%	Disruptive Technology -17.7%	NextGen Hardware & Communications 29.7%	Thematic Industrials & Infrastructure 10.8%	Disruptive Technology 28.5%	Disruptive Technology 5.6%	Next Gen Software 7.0%	Consumer Trends -6.4%	Consumer Trends -2.0%
Consumer Trends 14.8%	Consumer Trends 2.0%	Next Gen Software -3.9%	Disruptive Technology 10.3%	Thematic Industrials & Infrastructure -20.8%	Materials 29.3%	Health Care Innovation 9.9%	Consumer Trends 22.7%	Thematic REITS 5.0%	Disruptive Technology 5.9%	Health Care Innovation -7.5%	Disruptive Technology -2.2%
Materials 14.3%	Materials 1.9%	Disruptive Technology -5.2%	Financials 2.0 6.1%	Consumer Trends -27.0%	Thematic Industrials & Infrastructure 26.8%	NextGen Hardware & Communications 8.2%	NextGen Hardware & Communications 22.3%	Next Gen Software 3.9%	Consumer Trends 1.3%	Next Gen Software -9.4%	Financials 2.0 -7.3%
Thematic REITS 12.8%	NextGen Hardware & Communications 1.8%	Materials -5.3%	Thematic Industrials & Infrastructure 5.7%	Materials -28.3%	Consumer Trends 25.3%	Financials 2.0 8.1%	Thematic Industrials & Infrastructure 16.8%	Health Care Innovation -2.9%	Clean Energy -1.1%	Clean Energy -10.8%	Next Gen Software -7.6%
Financials 2.0 9.7%	Next Gen Software -1.8%	Health Care Innovation -8.9%	Thematic REITS 3.8%	Thematic REITS -32.4%	Thematic REITS 19.6%	Thematic REITS 2.5%	Thematic REITS 15.1%	Clean Energy -5.0%	Financials 2.0 -2.9%	Financials 2.0 -13.4%	Health Care Innovation -11.3%

Source: MV Index Solutions. Meta Thematic index returns are the equal weighted returns of underlying Thematic indices listed in Exhibit 2.

In Q4 2021, the top performing MVIS index was MVIS US Listed Semiconductor (21%) and the bottom performing MVIS index was BlueStar China Internet Software (-18%).

Exhibit 2: Thematic Index Returns (USD, ending 31 December 2021)

Index Ticker	Index Name	Meta Theme	Launch Date	Base Date	Quarterly Returns (USD)				Last3 Years (USD)		
					Q4-2021	Q3-2021	Q2-2021	Q1-2021	Ann Ret	Ann Stdev	Draw-Down
MVSMOGR	MVIS Global Low Carbon Energy	Clean Energy	02/23/21	12/31/15	7.6%	-6.7%	3.8%	-8.1%	41.7%	28.8%	-17.2%
BGTQNR	* BlueStar Global GreenTech	Clean Energy	07/06/20	12/30/16	5.3%	-5.3%	3.6%	0.3%	39.9%	25.8%	-17.9%
MVHTWOTR	MVIS Global Hydrogen Economy ESG	Clean Energy	12/22/20	12/15/20	1.8%	-17.4%	-5.9%	1.1%			
BEVNTR	* BlueStar Electric Vehicle Industry	Clean Energy	01/19/21	12/29/17	1.2%	-20.6%	10.3%	-12.5%	59.8%	59.0%	-19.0%
BWINDNTR	* BlueStar Wind Energy Industry	Clean Energy	03/23/21	12/31/14	-2.2%	0.9%	-5.7%	-5.3%	31.6%	22.6%	-12.3%
BHDROT	BlueStar Hydrogen and NextGen Fuel Cell	Clean Energy	03/09/21	06/30/20	-2.6%	-19.1%	-10.1%	-1.2%			
BSOLRNTR	* BlueStar Solar Energy Industry	Clean Energy	03/09/20	12/31/14	-4.1%	-7.5%	-3.7%	-9.0%	73.4%	41.5%	-28.5%
BAUTNTR	* BlueStar Autonomous Driving	Consumer Trends	05/10/18	12/28/12	8.3%	-5.1%	5.9%	9.5%	29.1%	27.9%	-21.6%
MVESPOTR	MVIS Global Video Gaming & eSports	Consumer Trends	07/16/18	12/31/14	5.3%	-10.1%	7.1%	-2.7%	37.5%	17.8%	-6.7%
BCCONNTR	* BlueStar China Mainland Consumer 50	Consumer Trends	06/24/21	12/31/15	4.9%	-11.2%	4.0%	-8.1%	35.5%	24.6%	-14.8%
BEGAMNTR	* BlueStar E-Games	Consumer Trends	10/05/18	12/29/14	1.9%	-10.3%	5.0%	1.3%	23.9%	17.5%	-7.0%
BATORNTR	* BlueStar Asia Travel and Vacation	Consumer Trends	06/24/21	12/31/15	-1.3%	-9.2%	-5.7%	12.3%	-0.8%	27.4%	-21.2%
BTOURTR	BlueStar Travel and Vacation	Consumer Trends	02/05/21	12/31/15	-2.8%	-2.5%	-4.2%	18.0%	7.0%	40.1%	-38.3%
BCRUZTR	BlueStar Hotels, Airlines, and Cruises	Consumer Trends	06/01/21	12/31/17	-5.8%	-0.6%	-5.1%	17.2%	-0.5%	39.2%	-36.0%
MVBKTR	MVIS Global Gaming	Consumer Trends	05/08/12	12/29/06	-7.6%	-8.5%	-0.3%	14.2%	12.1%	33.7%	-28.5%
BETORNTR	* BlueStar Europe Travel and Vacation	Consumer Trends	05/12/21	12/31/15	-8.0%	1.9%	-5.7%	8.7%	-6.8%	43.5%	-36.3%
MVFOFTR	MVIS Global Future of Food ESG	Consumer Trends	09/09/21	12/31/19	-8.5%	-11.3%	5.0%	4.7%			
BECOMNTR	* BlueStar E-Commerce US Leaders	Consumer Trends	09/11/18	12/28/12	-8.9%	-3.3%	8.3%	2.1%	26.7%	23.3%	-12.4%
MVDINDTR	MVIS Digital India	Disruptive Technology	12/28/21	12/31/15	7.0%	24.3%	10.9%	8.8%	33.6%	29.2%	-12.7%
BSEAQNTR	* BlueStar Asia Technology	Disruptive Technology	08/13/18	06/29/13	-2.0%	-12.6%	3.4%	7.4%	29.0%	23.4%	-12.7%
BGTHTR	BlueStar Israel Global Technology	Disruptive Technology	01/31/14	12/31/03	-4.3%	-5.4%	7.4%	-5.4%	27.6%	22.8%	-13.9%
BGTNATR	BlueStar Israel Global Technology North America	Disruptive Technology	04/19/21	12/17/20	-5.5%	-6.2%	11.0%	-5.2%			
B3DPNTR	* BlueStar 3D Printing	Disruptive Technology	05/12/21	12/29/17	-6.1%	-10.2%	-3.3%	22.4%	24.0%	39.6%	-11.4%
MVDAMTR	MVIS Global Digital Assets Mining	Financials 2.0	12/28/21	12/17/21					33.8%	22.8%	-8.1%
BEBKRNTR	* BlueStar E-Brokers and Digital Capital Markets	Financials 2.0	03/31/21	12/29/17	-0.2%	-16.6%	-3.2%	55.8%	33.6%	29.2%	-12.7%
BBIDSTR	BlueStar Global E-Brokers and Digital Capital Markets	Financials 2.0	08/23/21	12/31/19	-2.6%	-15.8%	2.3%	40.9%			
BFNQNR	* BlueStar Fintech	Financials 2.0	11/07/17	06/29/12	-9.8%	-2.5%	5.4%	-2.9%	20.0%	27.3%	-22.5%
BUBIDTR	BlueStar US Listed E-Brokers and Digital Capital Markets	Financials 2.0	11/10/21	12/31/19	-11.2%	-19.9%	3.8%	60.5%	20.0%	27.3%	-22.5%
MVDAPPTR	MVIS Global Digital Assets Equity	Financials 2.0	03/08/21	02/26/21	-12.9%	-12.2%	-23.1%				
BEHCNTR	* BlueStar E-Healthcare	Health Care Innovation	01/22/21	12/31/15	-8.3%	-10.1%	2.7%	-3.3%	33.8%	22.8%	-8.1%
MVFHCTR	MVIS Global Future Healthcare ESG	Health Care Innovation	12/06/21	12/31/20	-9.6%	-1.0%	16.6%	-2.5%	19.6%	18.2%	-13.4%
BDNANTR	* BlueStar Genomic Health Care	Health Care Innovation	05/22/20	12/31/15	-16.2%	-11.5%	5.9%	-2.8%	23.9%	31.5%	-10.2%
MVREMXT	MVIS Global Rare Earth/Strategic Metals	Materials	10/13/10	12/28/07	12.8%	23.2%	15.0%	14.3%	43.1%	38.8%	-15.6%
MVGDXJTR	MVIS Global Junior Gold Miners	Materials	08/31/09	12/31/03	11.5%	-17.7%	4.3%	-17.4%	13.7%	42.3%	-22.4%
MVGMETTR	MVIS Global Clean-Tech Metals	Materials	11/02/21	12/31/15	9.5%	0.4%	6.6%	11.9%	13.7%	42.3%	-22.4%
BMOONTR	* BlueStar Agribusiness 50	Materials	05/03/21	12/31/15	6.2%	0.7%	1.9%	14.0%	19.6%	18.2%	-13.4%
MVMOOTR	MVIS Global Agribusiness	Materials	07/18/12	12/29/06	5.8%	0.4%	4.2%	12.5%	20.3%	18.4%	-14.1%
BACOMNTR	* BlueStar Asia-Pacific Commodities	Materials	06/24/21	12/31/15	3.0%	11.4%	10.5%	4.3%	25.0%	22.7%	-12.6%
BAINTR	* BlueStar Artificial Intelligence	Next Gen Software	03/26/18	12/31/12	-0.8%	-0.1%	10.8%	0.1%	34.2%	22.8%	-12.9%
BADTQNR	* BlueStar Digital Advertising	Next Gen Software	12/28/21	12/30/16	-2.8%	-9.7%	6.2%	10.2%	25.4%	19.3%	-12.8%
BDATATR	BlueStar Big Data & Analytics	Next Gen Software	03/09/21	12/31/15	-9.3%	1.8%	11.8%	0.3%	36.7%	33.8%	-15.3%
BCHNQNR	* BlueStar China Internet Software	Next Gen Software	08/13/18	06/29/13	-17.8%	-29.5%	-0.6%	5.1%	11.2%	32.0%	-21.7%
MVSMHTR	MVIS US Listed Semiconductor 25	NextGen Hardware & Communications	08/12/11	09/29/00	21.2%	-2.2%	7.7%	11.5%	53.8%	23.1%	-15.5%
MVSMCTR	MVIS US Listed Semiconductor 10% Capped	NextGen Hardware & Communications	08/13/20	12/31/11	20.3%	-1.6%	8.7%	11.9%	53.7%	22.4%	-16.1%
BFIVGTR	BlueStar 5G Communications	NextGen Hardware & Communications	01/10/19	12/30/16	15.5%	-4.2%	8.5%	5.0%	25.4%	19.3%	-12.8%
BUQFCNTR	* BlueStar US Machine Learning and Quantum Computing	NextGen Hardware & Communications	03/08/21	12/18/15	14.8%	-0.2%	7.5%	14.1%	46.1%	21.9%	-13.0%
BGFGNTR	* BlueStar Global 5G Connectivity	NextGen Hardware & Communications	07/26/19	12/15/15	14.0%	-4.2%	7.8%	4.3%	25.8%	19.8%	-11.4%
BIINFNTR	* BlueStar Internet Infrastructure	NextGen Hardware & Communications	12/28/21	12/31/15	4.6%	2.3%	13.8%	-4.4%	42.6%	20.9%	-13.1%
BRBTNTR	* BlueStar Robotics	Thematic Industrials & Infrastructure	01/29/18	06/29/12	7.9%	1.0%	7.4%	4.8%	31.3%	22.8%	-15.1%
BLOGRNTR	* BlueStar Global Logistics	Thematic Industrials & Infrastructure	10/23/20	12/29/06	7.9%	3.7%	7.2%	12.1%	32.2%	15.0%	-7.5%
BLOGTNTR	* BlueStar Global Logistics Benchmark	Thematic Industrials & Infrastructure	10/23/20	12/29/06	7.3%	3.9%	8.1%	11.4%	29.5%	14.6%	-8.4%
BECLGNTR	* BlueStar E-Commerce, Payments, and Logistics	Thematic Industrials & Infrastructure	03/01/21	12/29/06	5.6%	0.3%	7.7%	7.5%	36.5%	19.0%	-9.1%
BTOTNTR	* BlueStar Total Security	Thematic Industrials & Infrastructure	07/08/19	12/31/15	0.6%	-0.9%	7.3%	-0.1%	21.6%	20.8%	-14.2%
MVSPCTR	MVIS Global Space Industry ESG	Thematic Industrials & Infrastructure	08/31/21	12/31/19	-9.9%	-1.2%	9.2%	17.2%			
BDLRTNTR	* BlueStar Data Center and Logistics Real Estate	Thematic REITs	08/05/19	12/31/13	15.7%	-1.4%	11.4%	-0.4%	28.3%	14.5%	-7.5%
MVMVATR	MVIS Australia A-REITs (AUD)	Thematic REITs	12/21/12	12/29/06	7.4%	4.6%	8.7%	-0.9%	11.0%	27.3%	-35.6%
BUORTTR	BlueStar Top 10 US Office REITs	Thematic REITs	08/24/21	12/31/15	5.8%	-3.3%	8.1%	8.6%	6.1%	26.6%	-21.8%
MVMORTTR	MVIS US Mortgage REITs	Thematic REITs	08/04/11	12/30/04	-1.9%	-3.2%	6.0%	12.8%	0.4%	39.8%	-56.2%

Source: MV Index Solutions. Total Return Indices, *Net Total Return Indices

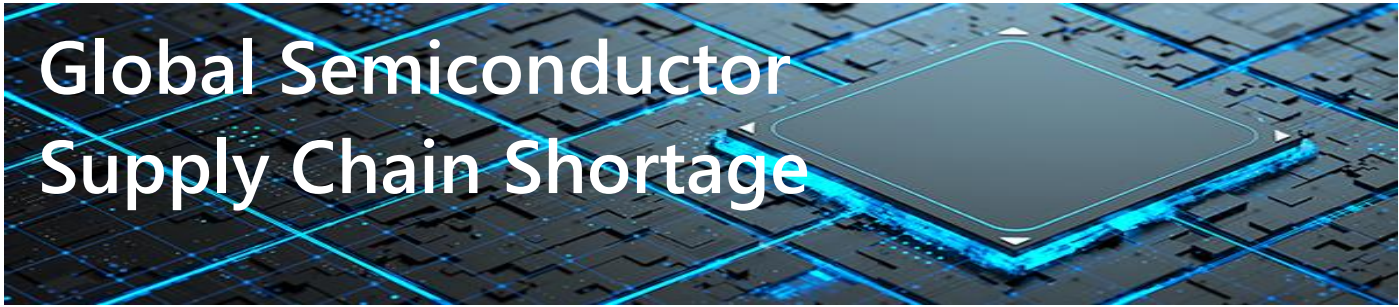
New Index Launches

BADTQNTR	BlueStar Digital Advertising	Next Gen Software	The Index tracks the performance of the largest and most liquid companies involved in the digital advertising services and software segment that generate at least 50% of their revenue from (1) digital advertising-focused data services, (2) digital advertising services, platforms and market places, (3) digital advertisement video production and delivery solutions, and (4) digital marketing software and services including rewards programs.
BIINFNTR	BlueStar Internet Infrastructure	Next Gen Hardware & Communications	The Index tracks the performance of the largest and most liquid companies involved in a range of activities constituting the infrastructure of the internet including application and network services, data center operations, and edge computing solutions.
MVDAMTR	MVIS Global Digital Assets Mining	Financials 2.0	The index tracks the performance of the largest and most liquid companies that generate at least 50% of their revenue from digital assets mining activities or mining related hardware, software or services, or projects that have the potential to generate at least 50% of their revenues from digital assets mining when developed.
MVFNCTR	MVIS Global Future Healthcare ESG	Health Care Innovation	The index tracks the performance of the largest and most liquid companies that are involved in the genomic health care and electronic healthcare industries.
MVDINDTR	MVIS Digital India	Disruptive Technology	The index tracks the performance of the largest and most liquid digital companies in India with pure-play exposure in the fields of technology, telecommunications, and internet applications.
BUBIDTR	BlueStar US Listed E-Brokers and Digital Capital Markets	Financials 2.0	The index tracks the performance of the largest and most liquid US exchange-listed companies in the online brokerage industry. This is an equally-weighted index, and only includes companies that generate at least 50% of their revenue from the online brokerage industry.
MVGMETTR	MVIS Global Clean-Tech Metals	Materials	The index tracks the performance of global metals and rare earth element miners, refiners, and recyclers focused on metals and elements that are used in technologies contributing to the proliferation of clean energy as defined by MVIS.

Licensed Product News

As of Q4 2021, total thematic products licensed stands at \$22bn USD. We are excited to welcome our newest products licensed in Q4 2021.

MVGMETTR	MVIS Global Clean-Tech Metals	11 November 2021
BECLG	BlueStar E-Commerce, Payments, and Logistics Index	12 October 2021
BEBKR	BlueStar E-Brokers and Digital Capital Markets Index	5 October 2021



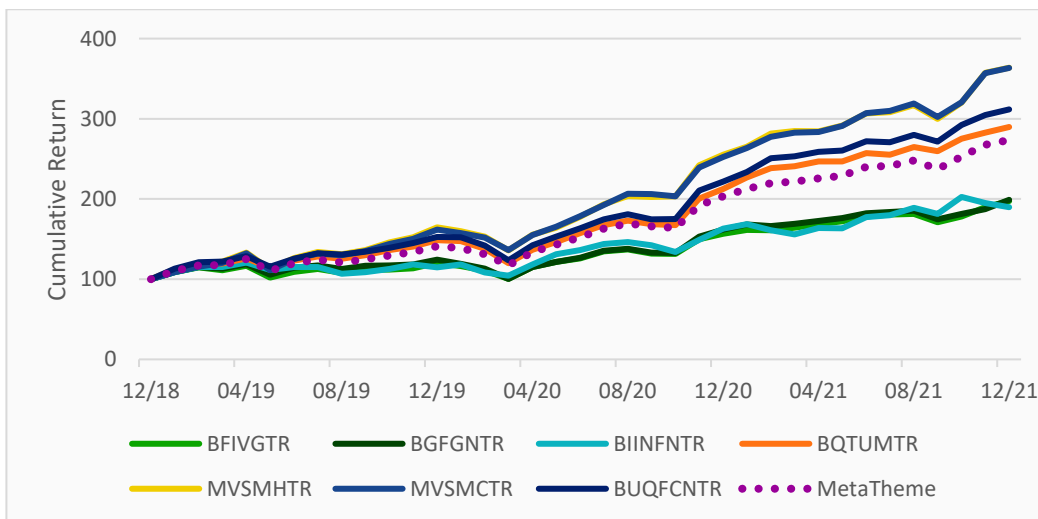
Global Semiconductor Supply Chain Shortage

Thematic Spotlight

The semiconductor or 'chip' shortage of 2021 in the wake of the Covid pandemic was the biggest theme of the year. Semiconductor companies, both that produce chips or produce equipment aiding in the production of chips benefitted enormously in the stock market. In a bizarre market twist automobile makers bore the biggest brunt, with used cars achieving price parity with new cars. Computer and household appliances makers were equally badly hit and deliveries of basic household appliances like refrigerators could be six months out. With increased digitization post the pandemic, the rollout of 5G networks in the communication services, as well as the increase in the importance of machine learning, AI and cloud-based products and services, the importance of semiconductor companies is only going to grow and will not reduce even when the shortage eases potentially by mid-2022.

MVIS indices in the Next Gen Hardware and Communications meta theme family capture the value of this rapidly growing investment theme. The meta theme has three main sub themes -- Semiconductors, 5G communications and Machine Learning and AI. The [MVIS US Listed Semiconductor 25 Index \(MVSMHTR\)](#) includes companies like Taiwan SemiConductor and Nvidia and captures 25 of the largest companies that generate 50% or more of their revenue from semiconductors or semiconductor equipment. This index has returned over 41% in 2021. The [BlueStar 5G Communications Index \(BFIVGTR\)](#) tracks the largest and most liquid companies in the US 5G communications industry and includes companies like Qualcomm and Advanced Micro Devices and has grown over 26% in 2021. Finally, the [BlueStar Machine Learning and Quantum Computing Index \(BQTUMTR\)](#) tracks companies generating revenues from global quantum computing and machine learning industries. This index includes companies like IBM and Micron and grew over 36% in 2021. With the increasing innovation and industry demand happening in this space, we see the potential for a huge growth in the coming years.

Exhibit 1: Cumulative return (Last 3 years, ending 12/31/2021)



Source: MV Index Solutions, 12/31/2021

To learn more about MVIS's extended family of innovative indices, please visit www.mvis-indices.com and sign up to join the conversation.

IMPORTANT DEFINITIONS AND DISCLOSURES

Copyright © 2022 by MV Index Solutions GmbH (“MVIS”). All rights reserved. MVIS is a registered trademark of Van Eck Associates Corporation that has been licensed to MV Index Solutions GmbH and BlueStar and BlueStar Indexes are registered trademarks of MV Index Solutions GmbH. Redistribution, reproduction and/or photocopying in whole or in part are prohibited without written permission. All information provided by MVIS is impersonal and not tailored to the needs of any person, entity or group of persons. MVIS receives compensation in connection with licensing its indices to third parties. You require a license from MVIS to launch any product that is linked to an MVIS index to use the index data for any business purpose and for all use of the MVIS name or name of the MVIS index. Past performance of an index is not a guarantee of future results.

It is not possible to invest directly in an index. Exposure to an asset class represented by an index is available through investable instruments based on that index. MVIS does not sponsor, endorse, sell, promote or manage any investment fund or other investment vehicle that is offered by third parties and that seeks to provide an investment return based on the performance of any index. MVIS makes no assurance that investment products based on the index will accurately track index performance or provide positive investment returns. MVIS is not an investment advisor, and it makes no representation regarding the advisability of investing in any such investment fund or other investment vehicle. A decision to invest in any such investment fund or other investment vehicle should not be made in reliance on any of the statements set forth in this document.

Prospective investors are advised to make an investment in any such fund or other vehicle only after carefully considering the risks associated with investing in such funds, as detailed in an offering memorandum or similar document that is prepared by or on behalf of the issuer of the investment fund or other vehicle. Inclusion of a security within an index is not a recommendation by MVIS to buy, sell, or hold such security, nor is it considered to be investment advice.

These materials have been prepared solely for informational purposes based upon information generally available to the public from sources believed to be reliable. No content contained in these materials (including index data, ratings, credit-related analyses and data, model, software or other application or output therefrom) or any part thereof (Content) may be modified, reverse-engineered, reproduced or distributed in any form by any means, or stored in a database or retrieval system, without the prior written permission of MVIS. The Content shall not be used for any unlawful or unauthorized purposes. MVIS and its third-party data providers and licensors (collectively “MVIS Indices Parties”) do not guarantee the accuracy, completeness, timeliness or availability of the Content. MVIS Indices Parties are not responsible for any errors or omissions, regardless of the cause, for the results obtained from the use of the Content. THE CONTENT IS PROVIDED ON AN “AS IS” BASIS. MVIS INDICES PARTIES DISCLAIM ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT'S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE CONTENT WILL OPERATE WITH ANY SOFTWARE OR HARDWARE CONFIGURATION. In no event shall MVIS Indices Parties be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs) in connection with any use of the Content even if advised of the possibility of such damages.

MV Index Solutions GmbH

Frankfurt Office
Kreuznacher Str. 301350
DE-60486 Frankfurt am Main
+49 (69) 4056 695 55

New York Office
Avenue of the Americas, Fl 4
New York, NY 10019
(646) 380 2500