Syntax

Know What You Own: Underlying Concentration Risks Embedded in Domestic, International, and Emerging Markets Equity Indices

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Summary

- Geographic diversification across major benchmark indices may be insufficient to ensure that a portfolio is sector-risk averse.

- Following the 2022 tech stock sell-off, the U.S. market, represented by the S&P 1500 Index, still has substantial exposure to the sector. As of 30 June 2023, the Index's total tech exposure, based on Syntax's classification methodology, is 40%, which is significantly higher than the 27% reported by S&P for the Information Technology sector.

- The International Developed ex-U.S. market, represented by the MSCI EAFE Index, has significant allocations to the Industrials (21%) and Financials (19%) sectors. MSCI EAFE also has the largest allocation to the Consumer sector (13%) across the three market categories.

- Emerging markets, represented by the MSCI Emerging Markets Index, is overweight Financials (24%), with Banking (17%) as the largest component. Tech exposure (34%) also poses a potential concentration risk.

- Based on total top 10 holding weights, both the S&P 1500 (29%) and MSCI EM

(23%) indices face potential single stock concentration risk.

Introduction

It is common practice for public equity investors to allocate assets across the U.S., international developed, and emerging markets to pursue geographic diversification. Geopolitical and macroeconomic factors are often considered in determining asset allocation, but what tends to be overlooked is each market's contribution to a portfolio's sector and thematic exposures — an important element for diversification-minded investors. However, even investors who are attuned to these factors face challenges with existing industry classification systems. These systems fail to recognize that most companies today have multiple product lines or individual product lines that span multiple sectors. As a result, the true extent of sector risk concentration in major geographic indices is unclear. For example, well-documented cases of concentration risk, such as tech in the U.S. market, may be more underestimated than predicted.

In this paper, we leverage Syntax's Functional Information System (FIS®), our proprietary industry classification framework, and the Affinity® platform, a web-based user interface for accessing FIS data, to analyze the sector and thematic exposures of three well-known, geographic indices.

- **S&P 1500:** A composite U.S. index comprised of the S&P 500, S&P MidCap 400, and S&P SmallCap 600 indices.
- **MSCI EAFE:** An international index consisting of large and mid-cap stocks in developed markets across Europe, Australasia, and the Far East.
- **MSCI Emerging Markets:** An international index consisting of large and mid-cap stocks across 24 emerging markets countries.

A Deeper Look at Sector Exposures[1]

Exhibit 1: Sector Exposures for S&P 1500, MSCI EAFE, and MSCI EM

Sector	S&P 1500	MSCI EAFE	MSCI EM
Information	23%	11%	18%
Information Tools	21%	7%	17%
Healthcare	13%	13%	4%
Industrials	13%	21%	15%
Financials	9%	19%	24%
Consumer	8%	13%	9%
Energy	7%	7%	8%
Food	6%	8%	6%

Source: Syntax as of 30 June 2023. Totals may not sum to 100% due to rounding or unallocated product line data.

The data in Exhibit 1 provides a high-level view into the sector concentrations of each index:

- **Technology:** The S&P 1500 and MSCI EM indices have significant exposure to the Information sector at 23% and 18%, respectively. Similarly, the S&P 1500 has nearly three times the exposure to Information Tools (21%) as MSCI EAFE (7%), whereas MSCI EM has double the exposure to the sector (17%).

- **Financials:** The concentration of Financials in the international developed and emerging markets is roughly twice that of the U.S. market. MSCI EAFE and MSCI EM's allocation to Financials are 19% and 24%, respectively, versus the S&P 1500 at 9%.

- **Industrials:** All three indices have substantial exposure to Industrials – MSCI EAFE at 21%, MSCI EM at 15% and the S&P 1500 at 13%.

In addition to these observations, we analyzed possible concentration risks within each sector.

Sizing Up the Exposure to the Financials Sector

Both MSCI EAFE (19%) and MSCI EM (24%) have large allocations to the Financials sector, with the latter having the largest percentage exposure to a single sector across the three representative indices. Based on the FIS framework, the three main segments of the Financials sector are Banking, Insurance, and Real Estate. Exhibit 2 highlights the weights of these segments and their respective subgroupings. The values highlighted in green show the industries where the MSCI EAFE and EM weightings are 2% or more than those for the S&P 1500.

Exhibit 2: Financial Sector Exposures for S&P 1500, MSCI EAFE, and MSCI EM

	Portfolio Weight			Over (Under) S&P 1500	
	S&P 1500	MSCI EAFE	MSCI EM	MSCI EAFE	MSCI EM
Financials	**9.0%**	**19.4%**	**24.2%**	**10.4%**	**15.2%**
Banking	**3.9%**	**9.4%**	**17.7%**	**5.5%**	**13.8%**
Capital Markets	1.9%	5.2%	6.3%	3.3%	4.4%
Non-Real Estate Banking	0.7%	1.6%	5.9%	0.8%	5.1%
Other Financial Services	0.4%	1.4%	2.3%	1.0%	1.9%
Brokers and Dealers	0.3%	0.7%	1.7%	0.4%	1.4%
Real Estate Banking	0.5%	0.6%	1.5%	0.1%	1.0%
Insurance	**2.0%**	**5.4%**	**3.4%**	**3.4%**	1.4%
Consumer	0.9%	3.6%	2.5%	2.7%	1.6%
Commercial	1.1%	1.8%	0.9%	0.7%	-0.2%
Real Estate	**3.1%**	**4.4%**	**2.9%**	**1.3%**	-0.2%
Operators and Developers	1.1%	2.6%	2.1%	1.5%	1.0%
Rental	2.0%	1.8%	0.7%	-0.2%	-1.2%

Source: Syntax as of 30 June 2023. Affinity group weight totals may differ from the sum of lower-level groups due to the elimination of double-counting product lines that provide exposure to more than one lower-level group. Totals may not sum to 100% due to rounding

The analysis reiterates the extent of MSCI EM's concentration risk from the Financials sector:

- MSCI EM's 17.7% weight to Banking companies represents nearly three-quarters of its total exposure to the Financials sector.
- MSCI EM's exposure to Financials is less diversified than that of MSCI EAFE and the S&P 1500. The S&P 1500 and MSCI EAFE's weight to Banking is less than 50% of the two indices' total exposure to Financials.
- MSCI EM's exposure to Banking is 13.8% overweight relative to the S&P 1500, whereas MSCI EAFE is 5.0% overweight.
- Despite MSCI EM's large exposure to Financials, it has the lowest weight to Real Estate out of the three indices – both as a percentage of the total index (2.9%) and as a percentage of its Financials sector exposure (12%).

The argument can be made that the MSCI EM and MSCI EAFE's overall exposure to

Banking and Financials provides diversification benefits that may offset the S&P 1500's relatively smaller exposure. However, the Financials sector, and particularly the Banking segment, can be prone to contagion risk. Investors who take a top-down view of geographic diversification should be aware of inherent risks, including the possibility that nearly 25% of their emerging markets exposure may consist of financial companies with a tilt to banking.

A Closer Look at the Exposure to Technology

According to published reporting standards, the S&P 1500 and MSCI EM, which utilize the GICS industry classification system, both have over 20% exposure to the Information Technology sector.[2] However, when the indices are analyzed through Syntax's Technology Lens[3] in Affinity, their technology exposure is even higher: 40% for the S&P 1500 and 34% for MSCI EM, with large concentrations in hardware and software companies for both indices. Exhibit 3 breaks down the types of tech-focused product lines of the constituents in each index. Shown in the two far-right columns are the weights of these product lines in MSCI EAFE and MSCI EM relative to the S&P 1500. Differences of greater than -2% and 2% are highlighted respectively in red and green.

Exhibit 3: Technology Lens Exposures for S&P 1500, MSCI EAFE, and MSCI EM

	Portfolio Weight			Over (Under) S&P 1500	
	S&P 1500	MSCI EAFE	MSCI EM	MSCI EAFE	MSCI EM
Technology Lens	**40.3%**	**14.7%**	**33.6%**	**-25.6%**	**-6.8%**
Software	**16.7%**	**4.1%**	**11.4%**	**-12.6%**	**-5.3%**
Enterprise and Application Software	6.2%	1.8%	0.6%	-4.4%	-5.6%
Web-Based Retailing and Distribution Platforms	5.9%	1.3%	5.6%	-4.6%	-0.3%
Gaming, Social & Search Networks	4.7%	0.9%	5.2%	-3.8%	0.5%
Hardware	**16.1%**	**8.3%**	**18.1%**	**-7.9%**	**2.0%**
Computers, Phones, and Consumer Electronics	6.5%	0.6%	4.7%	-5.9%	-1.9%
Electronic Components	7.0%	4.0%	11.7%	-3.0%	4.7%
Network Equipment and Servers	0.6%	0.2%	0.4%	-0.4%	-0.3%
Automation, Robotics, and Industrial Hardware	1.0%	2.2%	0.3%	1.2%	-0.7%
Electronic Systems for Transportation	0.5%	0.5%	0.7%	-0.1%	0.2%
Defense and Surveillance Tech	0.3%	0.1%	0.2%	-0.2%	-0.1%
Commercial and Office Hardware	0.1%	0.5%	0.2%	0.4%	0.1%
Financial Technology and Payments	**3.0%**	**1.2%**	**1.6%**	**-1.9%**	**-1.4%**
Internet Infrastructure	**3.6%**	**0.2%**	**0.5%**	**-3.4%**	**-3.1%**
IT Services	**0.9%**	**1.0%**	**2.3%**	**0.1%**	**1.3%**

Source: Syntax as of 30 June 2023. Affinity group weight totals may differ from the sum of lower-level groups due to elimination of double-counting product lines that provide exposure to more than one lower-level group. Totals may not add due to rounding.

The difference in the technology exposure between the S&P 1500 (40.3%), MSCI EAFE (14.7%), and MSCI EM (33.6%) is striking, particularly in the Software category.

- Software represents 16.7% of the S&P 1500's overall weight versus merely 4.1% for MSCI EAFE.

- The S&P 1500's substantial weight to Software is linked to its sizeable exposure to all three underlying software-related product lines: Enterprise and Application Software (6.2%), Web-Based Retailing and Distribution Platforms (5.9%), and Gaming, Social & Search Networks (4.7%).

- In comparison, MSCI EM's 11.4% weight to Software reflects similar exposure to two of the three software-related product lines, Gaming, Social and Search Networks (5.2%) and Web-Based Retailing and Distribution Platforms (5.6%). However, its allocation to Enterprise and Application Software is only 0.6%, well below the 6.2% exposure for the S&P 1500 and 1.8% for MSCI EAFE.

Like Software, the three indices have a high concentration of companies with Hardware product lines: 16.1% for the S&P 1500, 18.1% for MSCI EM, and 8.3% for MSCI EAFE. Notable observations about the indices' exposure to Hardware include:

- MSCI EM's Hardware exposure is predominantly driven by its 11.7% weight to Electronic Components, specifically the chip manufacturer, Taiwan Semiconductor Manufacturing Co., which makes up 6.8% of the index. The S&P 1500's modest 7.0% allocation to Electronic Components is derived from exposure to chip-related companies, including NVIDIA, Broadcom, and Intel.

- The S&P 1500's 6.5% exposure to Computers, Phones and Consumer Electronics results from its allocation to Apple, which is 7.1% of the entire index (when including all of the company's product lines). Meanwhile, MSCI's EM's 4.7% weight in this subcategory is largely driven by its 3.1% exposure to Samsung Electronics.

- MSCI EAFE outranks the two other indices in Automation, Robotics, and Industrial Hardware (2.2%) and Commercial and Office Hardware (0.5%). Major holdings in Automation, Robotics, and Industrial Hardware, such as Keyence and Siemens, are not among its top ten holdings.

Based on the examples and observations above, it is evident that investors who rely on broad market indices like the three highlighted for geographic diversification could still encounter material concentration risks within the tech sector. In particular, they should consider how certain tech companies outweigh entire sectors. For example, Apple accounts for 7.1% of the S&P 1500, exceeding the 6% total weight of the Food sector. Taiwan Semiconductor Manufacturing comprises 6.8% of MSCI EM, which is larger than the Index's 4% exposure to the Healthcare sector.

Analyzing Allocations to Industrials

Besides Financials and Technology, the three indices also have substantial exposure to the Industrials sector, which is also MSCI EAFE's largest primary sector (20.6%). Investors are likely to be particularly interested in the Materials category, which includes Chemicals, Metals, and Other Natural Resources—a product line that is often considered an inflation hedge. While MSCI EAFE's total allocation to Industrials is higher than MSCI EM's (15.4%), the latter has a larger allocation to Materials at 8.3% versus 7.5% for MSCI EAFE.

Exhibit 4: Industrials Sector Exposures for S&P 1500, MSCI EAFE, and MSCI EM

		Portfolio Weight			Over (Under) S&P 1500	
		S&P 1500	MSCI EAFE	MSCI EM	MSCI EAFE	MSCI EM
Industrials		**12.9%**	**20.6%**	**15.4%**	**7.6%**	**2.5%**
Materials		**3.2%**	**7.5%**	**8.3%**	**4.3%**	**5.1%**
	Chemicals	2.1%	3.5%	3.3%	1.4%	1.2%
	Metals	0.5%	3.0%	3.8%	2.5%	3.3%
	Other Natural Resources	0.6%	1.1%	1.2%	0.5%	0.6%
Components		**3.0%**	**4.5%**	**3.9%**	**1.5%**	**0.9%**
	Information and Electrical	1.2%	1.8%	3.2%	0.6%	2.1%
	Mechanical	1.9%	2.7%	0.7%	0.9%	-1.2%
Services		**3.5%**	**3.9%**	**2.5%**	**0.5%**	**-1.0%**
	Distribution	2.6%	2.7%	1.6%	0.1%	-1.0%
	Speciality	0.9%	1.2%	0.9%	0.4%	0.0%
Equipment		**3.3%**	**4.7%**	**0.8%**	**1.4%**	**-2.5%**
	Production	1.7%	3.1%	0.4%	1.4%	-1.3%
	Transport, Aerospace and Defense	1.2%	1.3%	0.3%	0.1%	-0.8%
	Conglomerates	0.5%	0.3%	0.1%	-0.2%	-0.4%

Source: Syntax as of 30 June 2023. Affinity group weight totals may differ from the sum of lower-level groups due to elimination of double-counting product lines that provide exposure to more than one lower-level group. Totals may not add due to rounding.

In Exhibit 5, we analyzed the exposure to the Materials sub-sector, applying the Affinity Commodities Lens to each index's holdings. Similar to the Technology Lens, the Commodities Lens looks across sectors, identifying pure commodity exposure as well as companies that are part of the commodity supply chain. For example, the Lens pinpoints crude oil producers in the Energy sector alongside conglomerates in Industrials that manufacture drilling equipment –companies that are categorized into different sectors by traditional classification systems but that are similarly exposed to commodity price volatility.

Exhibit 5: Commodity Lens Exposures for S&P 1500, MSCI EAFE and MSCI EM

		Portfolio Weight			Over (Under) S&P 1500	
		S&P 1500	MSCI EAFE	MSCI EM	MSCI EAFE	MSCI EM
Commodities Lens		**9.0%**	**11.7%**	**14.2%**	**2.8%**	**5.3%**
Energy		**4.6%**	**4.7%**	**5.5%**	**0.0%**	**0.9%**
	Upstream Oil & Gas	3.2%	2.4%	1.2%	-0.8%	-2.0%
	Refined Petroleum Products	0.9%	0.7%	3.3%	-0.2%	2.4%
	Coal and Uranium	0.1%	0.6%	0.5%	0.5%	0.4%
	Midstream Energy	0.6%	1.1%	0.5%	0.5%	-0.1%
Metal		**1.0%**	**3.5%**	**4.0%**	**2.5%**	**3.0%**
	Metal Mining and Refining	0.3%	2.5%	2.6%	2.2%	2.3%
	Metal Alloys and Fabricated Metals	0.4%	0.4%	1.3%	0.0%	0.9%
	Mining Capital Equipment	0.5%	0.6%	0.2%	0.1%	-0.3%
Chemical		**1.2%**	**2.0%**	**2.7%**	**0.8%**	**1.5%**
Agricultural		**1.0%**	**1.5%**	**1.7%**	**0.5%**	**0.7%**
	Producers and Processors	0.4%	1.0%	0.9%	0.6%	0.6%
	Equipment and Supply	0.7%	0.6%	0.8%	-0.2%	0.1%
Rail Transport		**0.8%**	**0.0%**	**0.2%**	**-0.7%**	**-0.5%**
Lumber		**0.2%**	**0.1%**	**0.2%**	**-0.1%**	**0.0%**

Source: Syntax as of 30 June 2023. Affinity group weight totals may differ from the sum of lower-level groups due to elimination of double-counting product lines that provide exposure to more than one lower-level group. Totals may not add due to rounding.

MSCI EM has the largest weight to the Commodities Lens at 14.2%, followed by MSCI EAFE at 11.7% and the S&P 1500 at 9.0%.

- The total exposure to the Energy subgroup, which is driven primarily by the Oil & Gas category, is similar across all three benchmarks, ranging from 4.6% to 5.5%. MSCI EM's exposure results from lower upstream exposure but greater exposure to refined petroleum.

- MSCI EM (4.0%) has the largest weight to Metals, compared to MSCI EAFE (3.5%) and the S&P 1500 (1.0%). MSCI EM's weighting stems from meaningful exposures to both Mining and Refining and Alloys and Fabricated Metals.

- MSCI EM also has the largest weight to Chemicals at 2.7%. Overall, MSCI EM leads in every commodities category except Rail Transport and Lumber, a category to which all three indices have minimal exposure.

With its overall larger exposure to commodities, including non-energy commodities such as chemicals and metals, MSCI EM may serve as a better option for hedging inflation risk than the other two developed market indices.

Single Stock Concentration Risks

The S&P 1500 and MSCI EM indices have a relatively high concentration risk with their top ten holdings accounting for 29.1% and 23.3% of their total weights, respectively. In contrast, the top ten holdings of the MSCI EAFE make up only 14.9% of the Index.

The concentration risk to large tech companies is well documented in the U.S. For instance, Apple represents 7.1% of the S&P 1500 while Microsoft is 6.3%. The third and fourth largest index holdings are also tech names – Alphabet at 3.3% and Amazon at 2.9%. The MSCI EM index also faces identical concentration risk. Tech names dominate the list of top 10 holdings: Taiwan Semiconductor Manufacturing is the largest constituent at 6.8%, followed by Tencent at 3.7% and Samsung at 3.1%. In contrast, MSCI EAFE does not face the same concentration risk as the other two indices, with Nestle at 2.1% as its top holding.

Exhibit 6: Top 10 Holdings for S&P 1500, MSCI EAFE, and MSCI EM

S&P 1500 10 Largest Stocks				MSCI EAFE 10 Largest Stocks				MSCI EM 10 Largest Stocks		
1	Apple	7.1%		1	Nestle	2.1%		1	Taiwan Semiconductor	6.8%
2	Microsoft	6.3%		2	ASML Holdings	1.9%		2	Tencent	3.7%
3	Alphabet	3.3%		3	Novo Nordisk	1.7%		3	Samsung	3.1%
4	Amazon	2.9%		4	LVMH	1.7%		4	Alibaba	2.6%
5	NVIDIA	2.6%		5	Astrazeneca	1.4%		5	Reliance Industries	1.6%
6	Tesla	1.7%		6	Roche	1.4%		6	Meituan	1.6%
7	Meta	1.6%		7	Novartis	1.3%		7	China Construction BK	1.0%
8	Berkshire Hathaway	1.5%		8	Shell	1.3%		8	HDFC	1.0%
9	UnitedHealth Group	1.1%		9	Toyota	1.1%		9	ICICI Bank	1.0%
10	ExxonMobil	1.1%		10	HSBC	1.0%		10	Infosys	1.0%
	Total	29.1%			Total	14.9%			Total	23.3%

Source: S&P, MSCI, Syntax as of 30 June 2023.

Conclusion

Public equity indices are useful resources for investors when developing asset allocation targets and benchmarking performance. Frequently, however, they are considered as a default way to gain access to particular equity markets. In this paper, we have highlighted that all market-capitalization indices exhibit inherent biases that influence their respective performance in certain market environments. Recognizing and understanding these biases will enable investors to:

- Invest better
- Understand the business risks your public equity portfolio is exposed to;
- Assist in developing asset allocation targets and;
- Select active and passive managers that are complementary and aligned with

your objectives.

At Syntax, our mission is to power economic analysis and enable investors to make better decisions. We are committed to helping investors better understand what they own by relying upon granular and precise data powered by our proprietary FIS framework and technology. For more information, visit **www.syntaxdata.com**.