THEMATIC UNIVERSE

How to harness the power of megatrends in your portfolio?

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Executive Summary

Thematic investments promise to harness long-term growth by turning structural, world-changing shifts into potentially compelling investment ideas. They enable investors to link their vision of the world and its evolution directly to their investment strategies. They provide an innovative investment approach, breaking from traditional silos like countries, sectors, factors, or regions. However, this evolution in asset management also creates risks for investors as they force us to rethink how we evaluate these tools in the context of fund selection as well as asset allocation.

The first challenge is the complete absence of a recognised nomenclature to organise thematic investments. Traditional benchmarks or peer groups are not helpful to investors in this task. To help fill that gap, we have developed the *WisdomTree Thematic Classification* that splits the universe into 35 investment themes across four main clusters:

+ **Social & Demographic Shifts**
+ **Technological Shifts**
+ **Geopolitical Shifts**
+ **Environmental Pressures**

The classification helps to make better sense of the space allowing us to track performance and flows across regions, wrappers, and themes, identifying trends quicker and more accurately, as illustrated in chapter one. By grouping different funds in investment themes, it also creates a de-facto peer group that can be used to compare funds with each other. **Figure 10 and Figure 11, respectively, demonstrate that such comparison is sorely needed as the dispersion in performance between funds claiming to harness the same theme can be incredibly wide.**

The second challenge is that without a standard selection toolkit, for which benchmarks, peer groups and track records are paramount, selecting funds is significantly more challenging, while the performance dispersion between funds can be larger than for traditional groupings. Hence the second chapter focuses on a holistic framework for selecting thematic funds based on five building blocks. We believe that this tool can provide guidelines to consider funds likely to be successful in the long run:

1. **Clarity of theme**
2. **Expertise**
3. **Purity of exposure**
4. **Differentiation**
5. **Portfolio construction**

Chapter two provides clear steps for evaluating thematic funds as illustrated by qualitative and quantitative analyses. We demonstrate, for example, that:

+ a basket of focused strategies has tended to do better than strategies that attempt to 'do it all' in a single fund (Figure 12);
+ in 2020, 'expert-driven' funds have performed better by picking high performing stocks that non 'expert-driven' funds did not invest in (Figure 16);

+ while the intuition and the expectation is that the revenue growth for companies in a particular theme should be higher than that of the broad market, some strategies do focus on such companies with high revenue growth, placing a large amount of weight in a smaller number of firms but also some do not (Figure 20).

Finally, the third challenge is to fit thematic investments in existing strategic and tactical asset allocations. In chapter three, we propose three possible approaches to fit both tactical and strategic investments in thematic funds:

1. **The Core Satellite Approach**
2. **The Global Equity Approach**
3. **The Long-Term Approach**

We demonstrate that:

+ diversification between themes is typically key to minimising the risk of worst-case scenarios when investing strategically in thematic funds (Figure 25);
+ combining innovative strategies (thematic investments) with established principles (momentum) can lead to better potential overall (Figure 27);
+ a strategic allocation to a diversified sub-portfolio of thematic funds can improve the risk-adjusted returns of a classic strategic asset allocation (Figure 29).

Introduction

Thematic investments aim to turn structural, world-changing shifts into compelling investment ideas. They promise to harness long-term and global growth, but in doing so, they defy traditional portfolio classifications like countries sectors or regions. Investment themes provide new ways to categorise companies, aligning their activities with extensive, potentially world-changing initiatives that are often referred to as megatrends. Proper realisation of the full potential offered by thematic investments requires new tools. Throwing out existing selection and asset allocation principles is not ideal, but forcing a 'square peg into a round hole' will not work either. This paper aims to look at the investment process in its entirety and propose adjustments that would allow investors to harness the power of megatrends through thematic investments.

To do so, we try to answer some of the main questions raised when investing in thematic funds. These include:

+ **How to organise the thematic universe in a way that facilitates portfolio construction?** It is challenging to keep track of the ever-increasing number of investment solutions in the thematics space, particularly when there is no recognised classification. By introducing the WisdomTree Thematic Classification in the first chapter, our objective is to offer investors a roadmap for understanding the thematic universe. This roadmap allows us to understand the space better, but also to benchmark funds' performance and to create peer groups.
+ **Selecting thematic funds: How to separate the wheat from the chaff?** The lack of benchmarks and clear peer groups creates considerable hurdles in identifying successful thematic managers. Therefore, it is paramount to develop clear fund selection guidelines based on the drivers of long-term success. The second chapter will highlight the main characteristics that can drive long-term success for thematic investments, from expert stock selection to best-in-class portfolio construction.
+ **Where do thematic investments fit in a portfolio?** Whether thematic investments are used tactically or strategically, investors should be able to fit them in their existing, portfolio allocation. A clear portfolio allocation strategy is necessary to leverage their full potential in terms of performance and diversification. The third chapter will focus on three interesting approaches to incorporate thematic funds more efficiently.

1. Understanding the thematic universe: The WisdomTree Thematic Classification

An introduction to megatrends and thematic investments

• Megatrends or investment themes

Megatrends are powerful, long-term, transformative changes shaping the world that we live in. They represent tectonic shifts with wide-ranging effects on our societies and way of life. They can include everything from technological advancements, social-demographic transformations, or the effects of climate change. The proliferation of access to high-speed internet was one example of a historical megatrend that has had a transformative impact on our way of living and our consumption habits. The personal computer, the car, the steam engine and even the industrial revolution are other examples—the key is that the word 'megatrend' might be new, but the concept is not.

Thematic investments aim to turn megatrends into compelling investment opportunities. Such investment opportunities, often called investment themes, are linked to one or multiple megatrends. In broad terms, we think about megatrends as those current or upcoming transformative shifts globally, while investment themes are a group of companies that could respond to one or more megatrends positively. Megatrends can, therefore, impact many investment themes.

Multiple investment themes flow, for example, from the globalisation of high-speed internet megatrend:

+ **Entertainment and Gaming:** With higher bandwidth and broader access to online content, streaming services or online gaming services have become more appealing and are changing the world of entertainment.
+ **Cloud Computing:** If one can always access the internet, there is less and less need for data or software to be stored or run locally.
+ **Cybersecurity:** With an increasing volume of information stored and available online, the temptation and opportunities for cybercriminals are increasing as well. This has created a need for a full range of digital tools aimed at protecting our digital lives.

• Thematic investments' coming of age

Viewing stocks through a thematic lens instead of a more classic sectoral or regional lens has the undeniable advantage to tap into human's innate need for stories. Whilst it can be challenging for human beings to connect purely with numbers, we are culturally programmed to react and bond with stories and narratives. **Thematic investments enable investors to link their vision of the world and its evolution directly to their investment strategies.** Thus, active managers have been tapping into this human's need for stories for decades, making it harder to pinpoint the actual period when thematic investments, as we now know them, have been introduced:

+ investors in the late 1930s might have been investing based on which companies were poised as critical suppliers to the military getting ready for World War II;
+ investors in the 1950s might have been investing based on the 'baby boom' and companies supplying products and services central to this trend;
+ investors in the late 1980s might have been investing based on 'The Rise of Japan' as a theme.

However, such stories were always placed in the context of a given asset class like US or European equities. Pure thematic investing represents the next step in this evolution. In thematic funds, 'the theme', i.e. the story, is at the centre of the investment process, and they are mostly freed from country or sector constraints.

Introducing the WisdomTree Thematic Classification

Hundreds of equity funds and Exchange Traded Funds (ETFs) are launched globally every year, and each fund has its own goals and processes. Historically, those funds would end up being classified by the geography in which they invest, the sector in which they specialise, the size of their target companies or the type of stocks they focus on. Quite logically, they would end up in a very well-defined box, like, for example, US Large-cap Value or European Consumer Discretionary. Thematic strategies sit outside of such classifications. This is part of what makes thematic investing exciting, as there is a feeling of 'stepping outside' the conventional framework in an attempt to add value. It is also hard to generate excitement with the phrase 'European Consumer Discretionary. However, this also means that existing classification methods are not relevant for thematic investing, and it is necessary to find new ways to classify and organise those funds. Unfortunately, there is no universally approved classification. This is the gap that the WisdomTree Thematic Classification aims to fill.

• 4 Clusters, 35 Themes

The first step to making sense of the thematic universe is to list and organise the different investment themes. Academics, consultants, international organisations (like the World Economic Forum), or think-tanks have all been publishing lists or scans of megatrends that are impacting or will impact the world in the long term. While those lists all differ from one another, they still share some commonality. Collating a range of those reports, **we highlighted four areas of consensus, leading to the creation of four thematic clusters:**

+ **Technological Shifts:** This cluster focuses on the different themes that originate from the introduction of new technologies and innovation. It incorporates disruptive and emerging technologies as well as their impact on societies and economies, such as the increasing digitalisation and connectivity of the world.
+ **Demographic and Social Shifts:** This cluster focuses on the themes that originate from changes in population and societies alike. For example, it incorporates changes in the world's pyramid of age, the impact of the growing, younger, wealthier populations in emerging markets, as well as changes to societal values and lifestyles.
+ **Environmental Pressures:** Focusing on the environment and, more importantly, on the impact of human activities on the planet, this cluster incorporates changes driven by sustainability issues, the increasing scarcity of resources and the need to address global warming and climate change.
+ **Geopolitical Shifts:** This cluster focuses on the themes driven by the globalisation and the changes in the global geopolitical order with the rise of new powers like China. It also taps into the increasing polarisation of modern societies as a counterforce to globalisation.

Each of the four clusters is then divided into sub-clusters, and then split into specific investment themes. This leads us to a current list of 35 themes, as illustrated in Figure 1. The description of each sub-cluster and theme can be found in the appendix.

Megatrends and investment themes are truly time-dependent in two primary ways:

1. At any time, the current technology and environment create a foundation for future themes. For example, some investment themes emerging in 2021 would not exist without billions of people using smartphones daily. So new investment themes will appear regularly, extending the thematic landscape. A successful classification system has to be able to evolve with time.
2. Some investment themes may reach a point where their impact on society has reached its limit, and its effects have been fully integrated into the world. The internal combustion car across most developed markets has probably reached this point, for example.

This means that the classification will change and evolve over time, mainly through the addition of themes. When an investment theme reaches its fruition, it could be removed from the classification. However, for the purpose of historical analysis, removing a theme would lead to removing all of the funds that have historically populated that theme, creating a 'survivorship bias'. So, while some themes may end up 'empty', i.e. without any existing funds populating them, they will remain in the classification as a container for past, closed funds.

FIGURE 1: THE WISDOMTREE THEMATIC CLASSIFICATION

Diversified Thematics							
DEMOGRAPHIC AND SOCIAL SHIFTS		TECHNOLOGICAL SHIFTS		GEOPOLITICAL SHIFTS		ENVIRONMENTAL PRESSURES	
Demographic Shifts	Social Shifts	Disruptive Technologies	Hyper Connectivity & Digitalisation	Globalisation	Multi-polarity	Climate Change & Sustainability	Limited Resources
Millennials	Equality, Inclusion & Diversity	Artificial Intelligence	Cloud Computing	Global Logistics	China's Rise	Decarbonisation	Agriculture
Aging Population	Rise of the Middle Class	Robotics & Automation	Cybersecurity		Polarisation	Sustainable Mobility	Natural Resources
	Rise of EM Consumer	Health Tech	Digital Infrastructure		Rise of Tension	Sustainable Energy Production	
	Wellness	Industry 4.0	Platforms & Digital Markets			Sustainable Energy Storage	
		Next Gen Communications	Internet of Things			Sustainable Food	
		Blockchain	Social Media & Media			Sustainable Cities	
		Nano Tech	Gaming & Entertainment			Sustainable Resource Mgt	
		Space	Fintech & Digitalisation of Finance				

Source: WisdomTree, Morningstar, Bloomberg. As of 28th February 2021. See the appendix for more details on the WisdomTree Thematic Classification and the definition of the different clusters, sub-clusters, and themes.

- **Thematic or not thematic, that is the question**

The second step in creating the WisdomTree Thematic Classification is to populate it with all existing thematic funds and ETFs. The main hurdle to achieve this is to know if a fund is indeed thematic. While developing our classification, we decided to use two complementary definitions:

+ A negative definition, which states that any fund that ends up easily in one of the 'classic' boxes, such as sector, country or small-cap, is not thematic. This excludes, for example, all strategies focused on a country or a sector at large (Communications, Consumer Staples etc.). It is worth mentioning that adding an ESG[1] screen to a non-thematic fund (like a sector fund) would not make it thematic. In our judgement, the focus of the strategy would remain the same with or without the ESG screen.
+ A positive definition, which states that a thematic fund has to deliver a value proposition based on a potential for growth linked directly to one or more megatrends. The strategy needs to invest proactively in a group of stocks that reflect similar values, beliefs, or objectives. The connection to that 'big story' must be there.

Combining both definitions is a powerful tool to weed out non-thematic funds and focus on the funds that lean truly into the thematic space.

When populating the WisdomTree Thematic Classification, we have decided to focus on:

+ all Exchange Traded Funds globally;
+ all Europe-domiciled open-ended funds.

This allows us to cover a wide range of thematic investments globally, but we do not claim that we have covered the entirety of the global universe.

Within the classification, all thematic ETFs and open-ended funds can now be organised into a coherent universe. They can be classified into:

+ **Diversified thematics,** if they try to harness a large number of megatrends in one go. Those funds tend to have a very diluted focus, which could mean that it might be harder to find sources of potential differentiation against a broad market benchmark.
+ A specific **cluster,** if they try to harness multiple themes across sub-clusters but within one particular cluster. For example, a fund investing in Artificial Intelligence, Robotics, Cloud, and Cybersecurity would be classified as a 'Technological Shifts' fund.
+ A particular **sub-cluster,** if a strategy aims to invest in most of the themes within that sub-cluster. For example, a fund investing in Cloud Computing, Platforms, Cybersecurity, and Fintech would be classified as a 'Hyperconnectivity & Digitalisation' fund.
+ A **theme,** if the investment strategy is focused on a specific, clear theme.

Note that we make an exception for funds that focus clearly on two specific investment themes. For example, a fund focused on Robotics and Artificial Intelligence (AI) would not be classified in Disruptive Technologies but would be classified 50% in Robotics & Automation and 50% in AI

Whilst every decision is subjective, in some way, our main objective when building the classification and its rules was to make each decision transparent and easy to understand.

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1 ESG stands for environmental, social and governance.

As of 28th February 2021, the WisdomTree Thematic Classification is populated by 410 live ETFs globally and 366 live open-ended mutual funds domiciled in Europe. 247 investment products have been terminated globally over the last 20 years, bringing the total to 1023 products. Technological Shifts and Environmental Pressures are the biggest clusters by number of funds by a fair margin.

The WisdomTree Thematic Classification – a lens to make sense of the thematic universe

The *WisdomTree Thematic Classification* allows us to make better sense of the thematic space by bringing structure to it. Leveraging that structure, we can identify and follow the prominent trends that drive the thematic universe.

Looking at the last twenty years, we observe that:

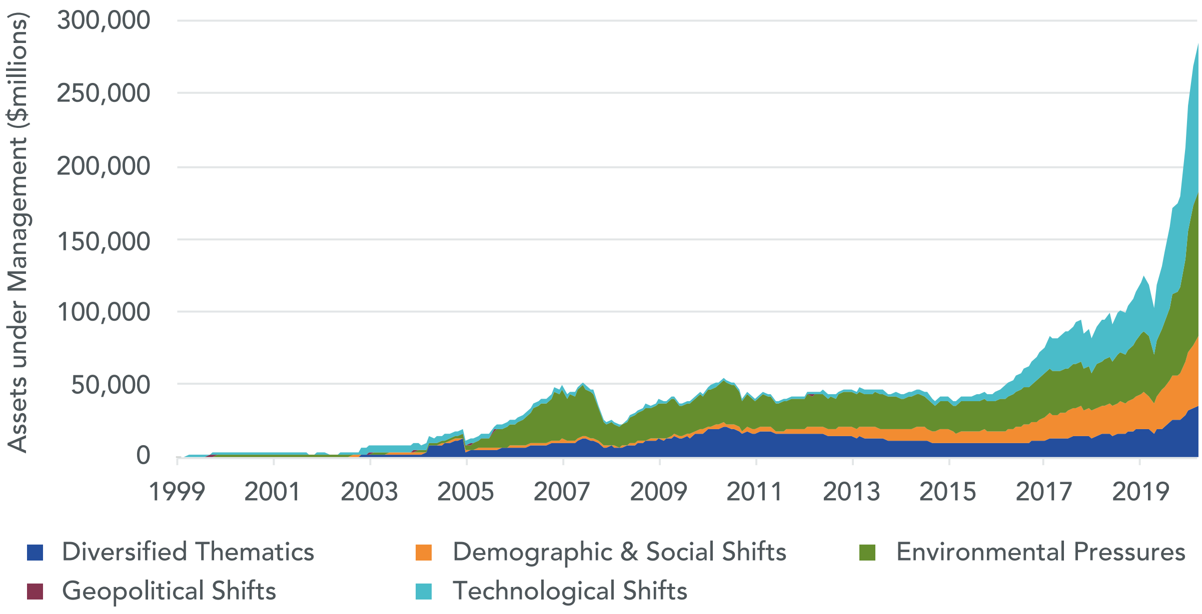
+ **Thematic investing is in its second wave of expansion**, following a first wave in the early 2000s.
+ **Technological Shifts and Environmental Pressures are leading in terms of flows and assets under management (AuM).**
+ The European thematic market stands out versus the rest of the world. While, Europe has gathered the majority of assets for thematic investments, most of those assets are in open-ended, active funds. Elsewhere, most of the assets are invested in ETFs. The European thematic ETF market is therefore lagging the rest of the world significantly. In Europe, thematic ETFs represent only $36.5bn[2] of assets out of $215bn[2] invested in thematic ETFs worldwide.
+ After a late start, **ETFs in Europe are set to catch-up with open-ended funds, with a growing market share of 12.8% as of 28th February 2021 as illustrated in Figure 4.**
+ **Flows and performance in thematic funds exhibit strong rotation over time,** with positive and negative years varying between themes and clusters.

• A thematic universe in rapid expansion

Interest in thematic investments started to gain momentum in Europe at the turn of the century. **Between 2000 and 2007, the first wave focused mainly on growth-oriented, diversified investments (classified as diversified thematics) and on strategies classified in environmental and sustainability themes.** But with the Great Financial Crisis, the growth of the thematic landscape stopped rather abruptly. Thematic funds went through a slowdown phase. Interest has started to rise again in the last five years, notably around three clusters: Technological Shifts, Demographic/Social Shifts and Environmental Pressures. **As of 28th February 2021, $285bn were invested in Europe-domiciled vehicles across all clusters.**

2 Source: WisdomTree, Morningstar, Bloomberg. As of 28th February 2021.

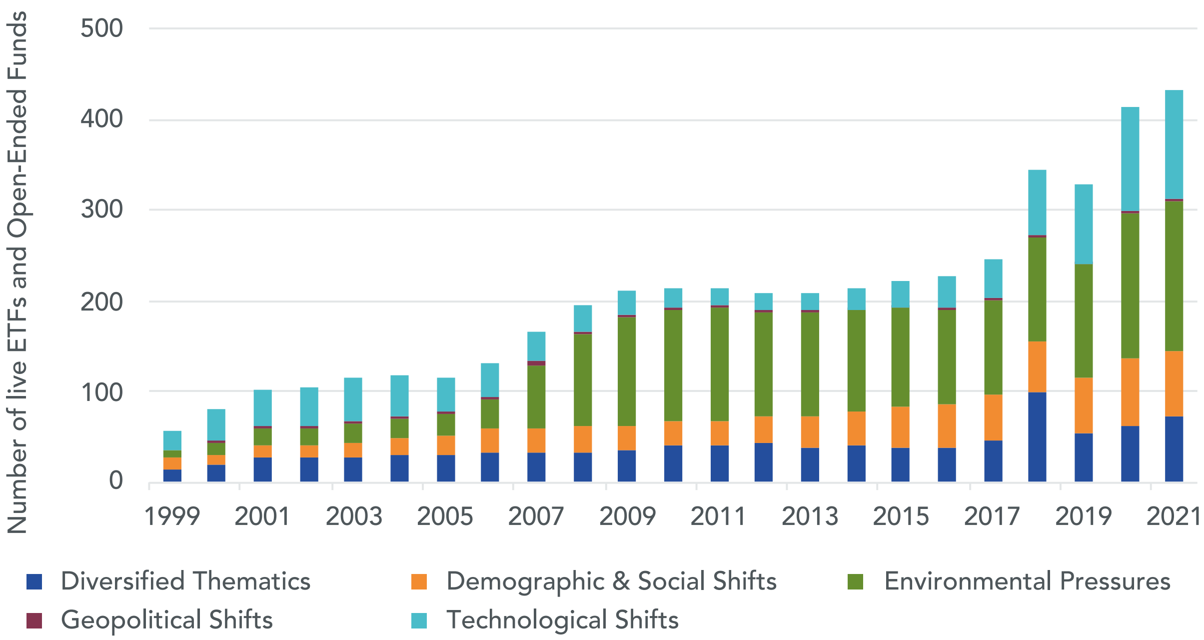
FIGURE 2: ASSETS UNDER MANAGEMENT IN EUROPE-DOMICILED ETFs AND OPEN-ENDED FUNDS BY CLUSTERS SINCE 2000



Source: WisdomTree, Morningstar, Bloomberg. From 31st December 1999 to 28th February 2021. In US Dollars. See the appendix for more details on the WisdomTree Thematic Classification and the definition of the different Clusters. ***Historical performance is not an indication of future performance and any investments may go down in value.***

As illustrated in Figure 3, the number of funds followed a similar trajectory as the assets under management. It is worth noting, though, the slight difference around technological themes. In the wake of the information technology bubble, a significant number of funds focusing on the rise of the internet never found their place and closed. In the early 2000s, most of those technology focused themes rotated around the internet and social media, and classic information technology sector strategies were a healthy competition. In the last five years, a new wave of very focused Technological Shifts-oriented funds have been launched and have gathered very significant AuM. **This second wave of thematic expansion is more diversified than the first one, with more Clusters and more themes enjoying growth in AuM.**

FIGURE 3: NUMBER OF EUROPE-DOMICILED ETFs AND OPEN-ENDED FUNDS BY CLUSTERS SINCE 2000



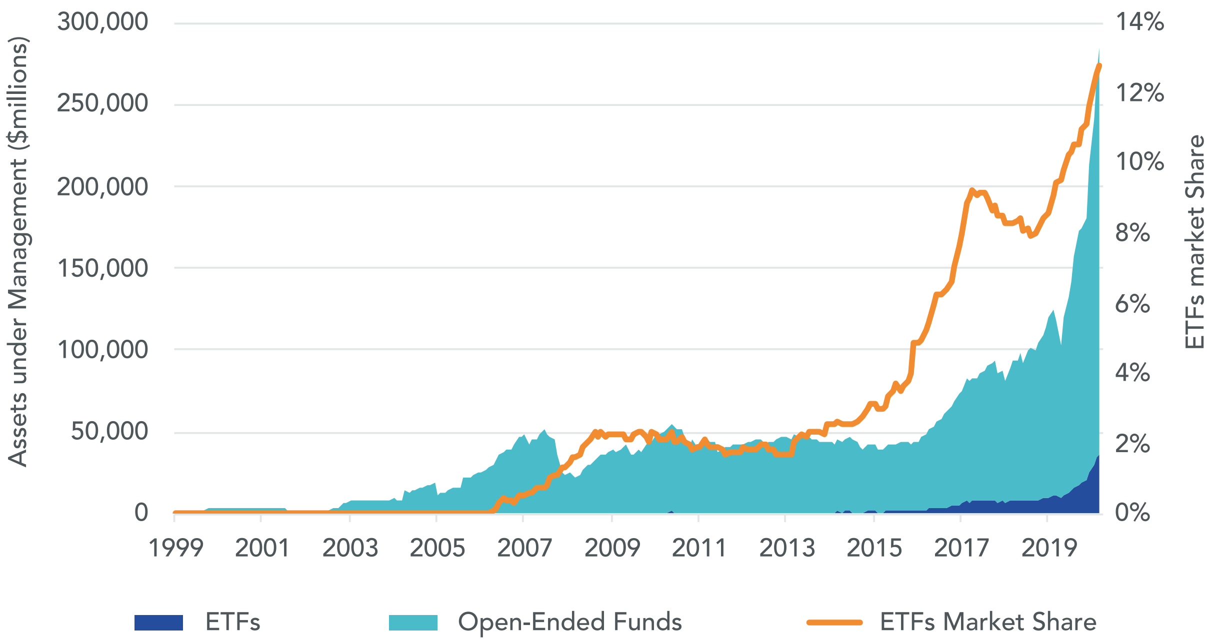
Source: WisdomTree, Morningstar, Bloomberg. From 31st December 1999 to 28th February 2021. See the appendix for more details on the WisdomTree Thematic Classification and the definition of the different Clusters. ***Historical performance is not an indication of future performance and any investments may go down in value.***

- **Thematic ETFs — late entrants with exponential growth**

In Europe, active managers used to be the only players in the thematic space. While ETF providers used to focus on market access and classic beta exposures. However, with ETFs growing in Europe, this has changed dramatically. Index construction has evolved, and an index can now comprise a mixture of many different stock selection and weighting parameters. It can be far more specific than what was previously accepted. Since the 2000s, investors have also accepted that ETFs are an improved investment wrapper, and anything that can be done within an actively managed fund could be implemented in an ETF. That is a significant behavioural shift that occurred over these 20 years. With these changes, **the number of thematic ETFs started to pick up around 2015, and AuM started to move. ETFs went from representing 3.1%[3] of the European thematic AuM with only 1.1bn[3] under management five years ago to 12.8% and $36.4 bn on 28th February 2021[3] as illustrated in Figure 4.**

3 Source: WisdomTree, Morningstar, Bloomberg. From February 2016 to February 2021. In US Dollars.

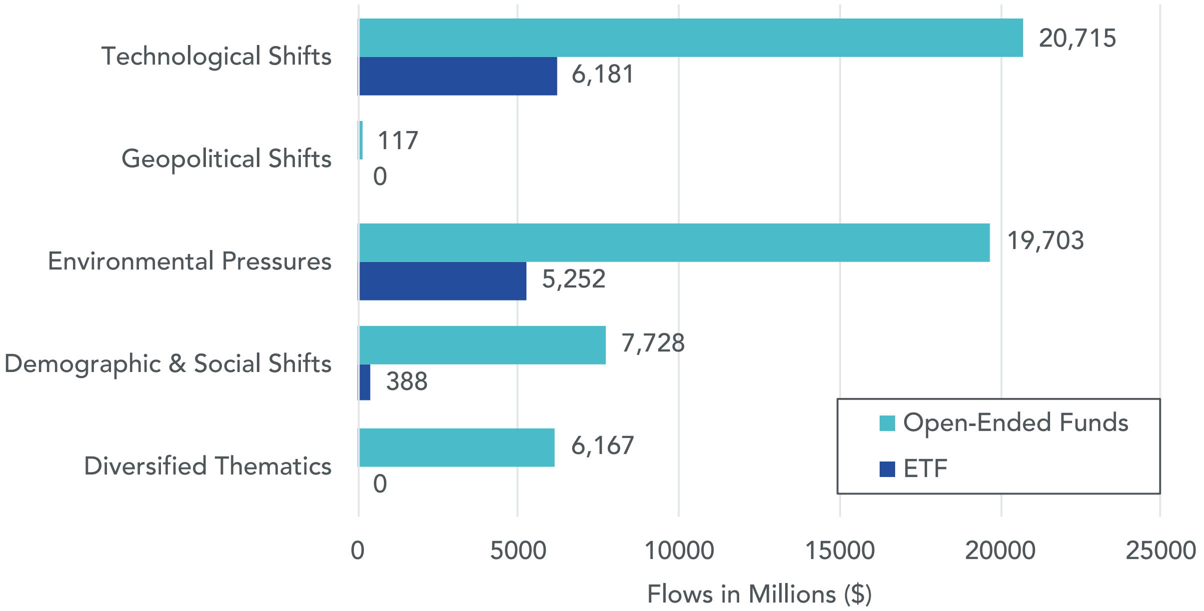
FIGURE 4: ASSETS UNDER MANAGEMENT IN EUROPE-DOMICILED THEMATIC FUNDS BY WRAPPERS SINCE 2000



Source: WisdomTree, Morningstar, Bloomberg. From 31st December 1999 to 28th February 2021.See the appendix for more details on the WisdomTree Thematic Classification and the definition of the different Clusters. ***Historical performance is not an indication of future performance and any investments may go down in value.***

In 2020, ETFs also gathered a significant share of flows in the Technological Shifts and Environmental Pressure clusters. Figure 5 shows that Europe-domiciled ETFs raised $6.1bn and $5.2bn in each Cluster, respectively. In the meantime, the corresponding figures in those clusters for open-ended funds stood at $20.7bn and $19.7bn. However, ETFs' share of the pie has remained tiny in Demographic and Social Shifts and in Diversified Thematics. While open-ended funds still raised $7.7bn and $6.2bn in those respective categories. Overall, ETFs' share of thematic flows in Europe picked up close to 18%, significantly above their AuM market share.

FIGURE 5: 2020 FLOWS INTO EUROPE-DOMICILED THEMATIC FUNDS BY WRAPPERS AND BY CLUSTERS

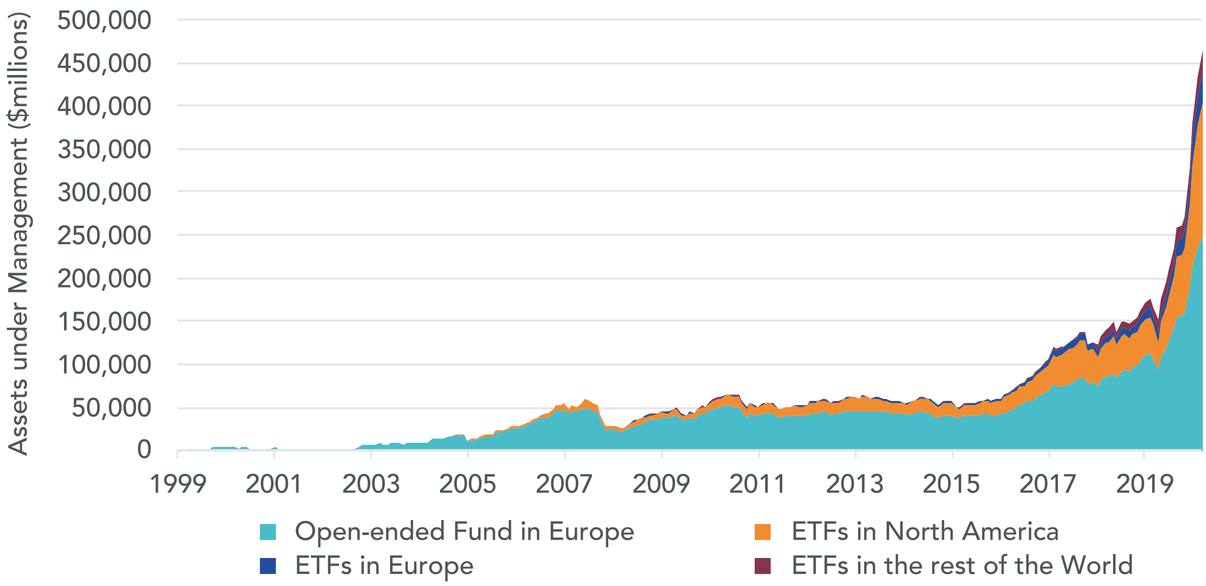


Source: WisdomTree, Morningstar, Bloomberg. Over the full year 2020. In U.S. dollars. See the appendix for more details on the WisdomTree Thematic Classification and the definition of the different Clusters. ***Historical performance is not an indication of future performance and any investments may go down in value.***

- **Europe-domiciled thematic ETFs, a growing player in this global phenomenon**

Historically, Europe-domiciled, active, open-ended funds have led thematic investing globally. As discussed previously, in Europe, they still represent around 87.2% of the total AuM invested in thematic funds. Meanwhile, in the US, ETFs dominate the space, having gathered an overwhelming proportion of the assets invested in thematic investments with a larger number of ETFs, a larger number of themes covered and a larger AuM than in Europe. On the global scene, Europe-domiciled ETFs remain both small and late due to active managers' influence in the space, as illustrated in Figure 6.

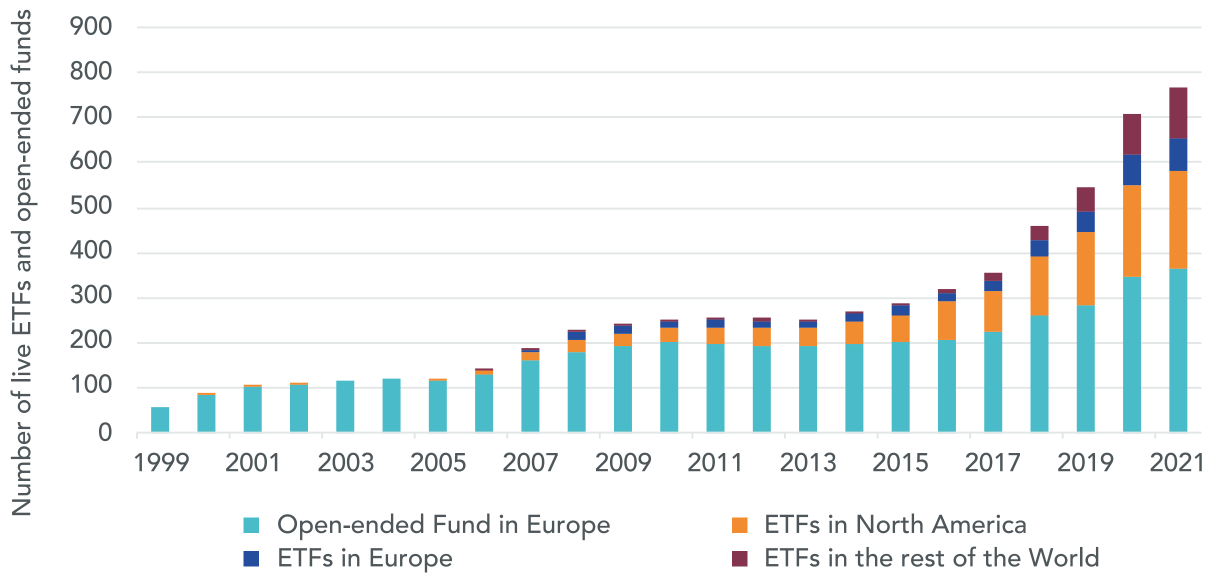
FIGURE 6: ASSETS UNDER MANAGEMENT IN THE FUNDS COVERED BY THE WISDOMTREE THEMATIC CLASSIFICATION BY REGIONS AND BY WRAPPERS SINCE 2000



Source: WisdomTree, Morningstar, Bloomberg. From 31st December 1999 to 28th February 2021. ***Historical performance is not an indication of future performance and any investments may go down in value.***

As of 28th February 2021, only $36.4bn were invested in 70 ETFs in Europe. In comparison, there were 218 ETFs with $154.4bn of assets in North America, mainly in the U.S. and $23.7bn in 122 ETFs in the rest of the world (mainly in Asia). Outside of Europe, thematic ETFs started to gather pace as early as 2005.

FIGURE 7: NUMBER OF LIVE INVESTMENT VEHICLES COVERED BY THE WISDOMTREE THEMATIC CLASSIFICATION BY REGIONS AND BY WRAPPERS SINCE 2000



Source: WisdomTree, Morningstar, Bloomberg. From 31st December 1999 to 28th February 2021. ***Historical performance is not an indication of future performance and any investments may go down in value.***

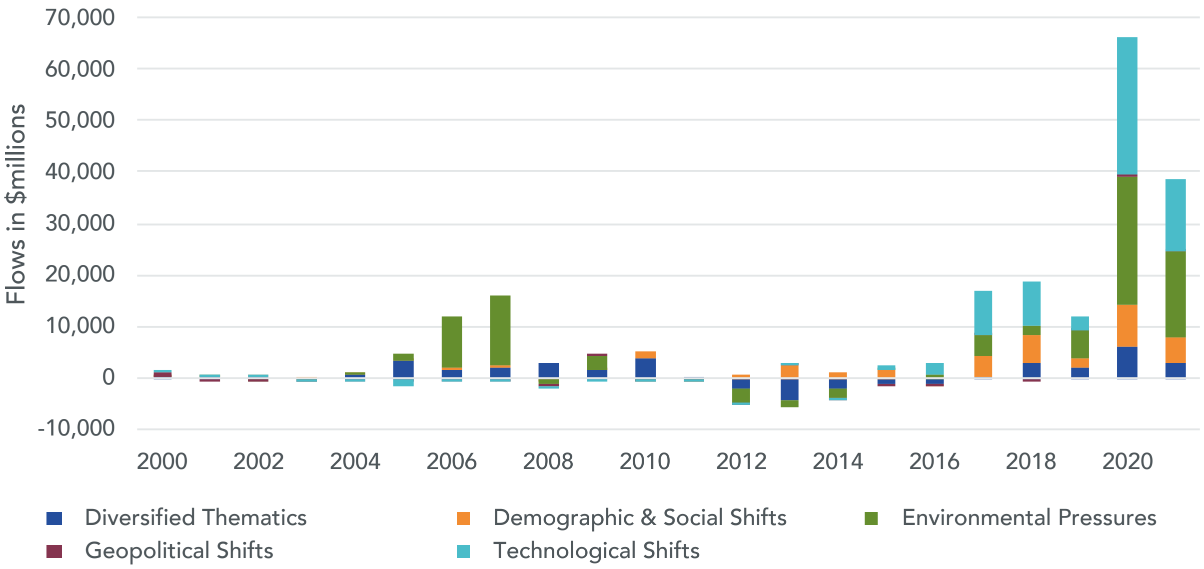
If history is any guide, the European space tends to be a few years behind the US market regarding ETFs' growth and overall market size. It is rather clear that thematic ETFs are gathering steam. However, what is notable is that US investors have a broader thematic funds palette to choose from. While only 25[4] investment themes currently have at least one live Europe-domiciled ETF linked to them, 30[4] are covered in the US. Simultaneously, in Europe, less than half of themes (17[4]) are represented by at least two ETFs. This statistic shows potential for faster near-term growth for thematic exposures in Europe.

- **Europe-domiciled thematic funds show rotation in flows and performance over time**

While the general trend for flows into thematic strategies is positive, it is clear that rotation in flows is pervasive, as illustrated in Figure 8. From one year to the following, different themes gather or lose assets depending on their individual narratives and market performance. At the end of the day, the best marketing for any theme is strong performance – a principle we would do well to remember.

Environmental Pressures flows dominated in the mid-2000s. Subsequently, flows saw a reversal post the global financial crisis. Technological Shifts have been taking the lion's share of flows since 2017, despite the revival of Environmental Pressures in 2020.

FIGURE 8: YEARLY FLOWS INTO EUROPE-DOMICILED ETFs AND OPEN-ENDED FUNDS BY CLUSTER SINCE 2000



Source: WisdomTree, Morningstar, Bloomberg. From 31st December 1999 to 28th February 2021.See the appendix for more details on the WisdomTree Thematic Classification and the definition of the different Clusters. ***Historical performance is not an indication of future performance and any investments may go down in value.***

4 Source: WisdomTree, Morningstar, Bloomberg. As of 28th February 2021.

Thematic investments also see a strong rotation in performance. Year on year performance of the different sub-clusters, as illustrated in Figure 9, has been historically very volatile. For this analysis and most analysis in the paper, we calculate the average historical performance of themes, sub-clusters, clusters, or any other group using the methodology described in the appendix[5]. The methodology's objective is to incorporate all ETFs and open-ended funds that were live at a given point in time and were part of the relevant peer group irrespective of their success and survival in the future. It is worth pointing out that there is no guarantee that a Europe-domiciled investment vehicle exists for every theme and at every point in time. Funds may have been launched and then terminated, or a particular theme may resonate more in other regions of the world. When none of the themes that form a sub-cluster has funds to represent them in a given year, then the sub-cluster does not have any average historical performance for that year either. This is why the list of sub-clusters may vary from year to year.

FIGURE 9: YEARLY PERFORMANCE OF EUROPE-DOMICILED ETFs AND OPEN-ENDED FUNDS BY SUB-CLUSTERS OVER THE LAST SIX YEARS (COMPARED TO THE MSCI ALL COUNTRY WORLD INDEX)

2015	2016	2017	2018	2019	2020
Demographic Shifts 0.7%	Limited Resources 11.4%	Disruptive Technologies 31.5%	HyperConnectivity & Digitalisation -4.8%	HyperConnectivity & Digitalisation 34.4%	HyperConnectivity & Digitalisation 54.4%
Disruptive Technologies 0.5%	MSCI All Country World 7.1%	Social Shifts 30.5%	Disruptive Technologies -9.4%	Disruptive Technologies 29.7%	Climate Change & Sustainability 43.5%
Social Shifts -1.5%	Climate Change & Sustainability 2.2%	Demographic Shifts 28.4%	MSCI All Country World -10.0%	MSCI All Country World 27.2%	Disruptive Technologies 41.0%
MSCI All Country World -2.2%	Social Shifts -0.6%	Climate Change & Sustainability 26.4%	Multipolarity -11.3%	Demographic Shifts 26.0%	Social Shifts 24.4%
HyperConnectivity & Digitalisation -3.5%	Disruptive Technologies -2.7%	MSCI All Country World 24.0%	Social Shifts -11.8%	Social Shifts 26.0%	Demographic Shifts 22.1%
Climate Change & Sustainability -3.5%	HyperConnectivity & Digitalisation -2.8%	Limited Resources 23.8%	Demographic Shifts -12.6%	Climate Change & Sustainability 22.3%	Multipolarity 20.1%
Limited Resources -7.8%	Demographic Shifts -5.9%	HyperConnectivity & Digitalisation 18.3%	Limited Resources -16.7%	Limited Resources 20.3%	Limited Resources 16.9%
Globalisation -26.1%	Globalisation -8.6%	Globalisation 3.5%	Climate Change & Sustainability -19.5%	Multipolarity 11.2%	MSCI All Country World 16.3%

Source: WisdomTree, Morningstar, Bloomberg. From 31st December 2014 to 31st December 2020. Returns are calculated in U.S. dollars on a monthly basis. ***Historical performance is not an indication of future performance and any investments may go down in value.***

Using the WisdomTree Thematic Classification to benchmark funds and create peer groups

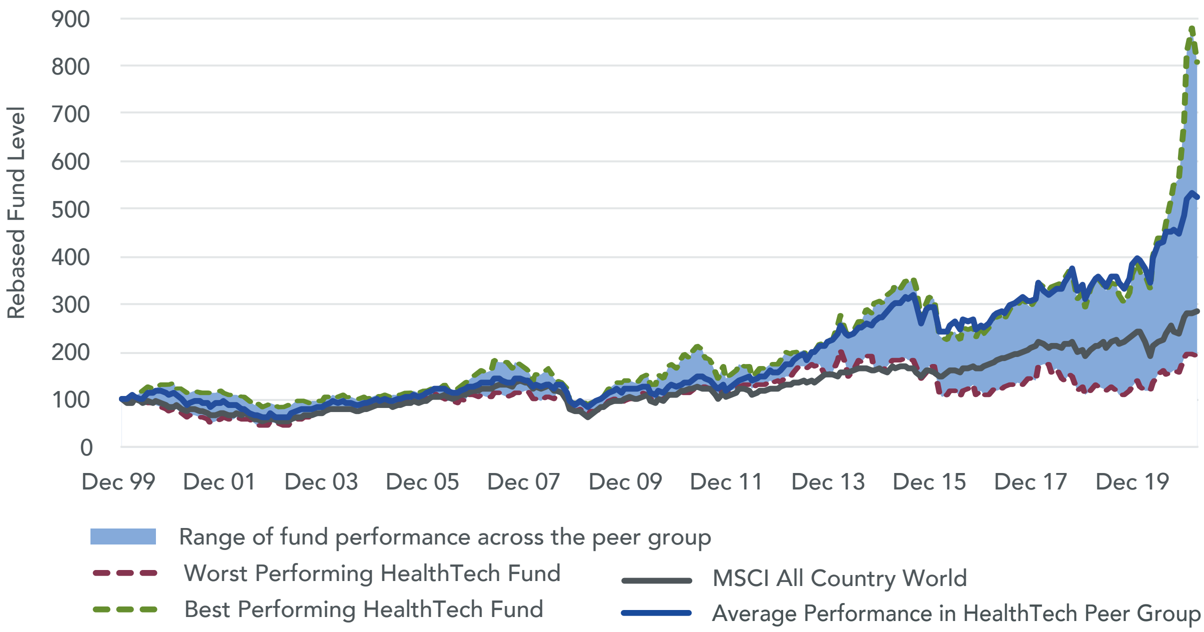
In the *WisdomTree Thematic Classification*, ETFs and open-ended funds are organised by themes. This creates a de facto peer-group for each theme:

5 See appendix "A quick guide to the average performance of clusters, sub-cluster or themes".

- At any point in time, the peer group comprises all the ETFs and open-ended funds currently classified in a given theme. All those investment vehicles share the same investment objective, which is to benefit to the maximum extent possible from the development of the theme. Using this peer group, it is possible to develop detailed analyses between each of the classified funds by comparing investment processes, philosophy, portfolio construction and the actual fund holdings as discussed in Chapter two.
- Classifying funds into themes makes it possible to benchmark the performance of any fund in the theme. By averaging every month, the performance of all ETFs and open-ended funds classified in a specific theme and with available returns for the month, we can compute the average monthly return for that theme. By collating those monthly returns, we get the theme's average historical performance net-of-fees. This average historical performance is not biased towards surviving funds or successful funds. Every fund that was live in a given month is included irrespective of its survival in the future or its success.

Taking the example of the HealthTech theme, Figure 10 illustrates how the *WisdomTree Thematic Classification* allows a fair performance comparison between thematic funds. The comparison also shows **the large dispersion in the historical performance of the different funds aiming to benefit from the development of HealthTech over the long-term.** This highlights the risks associated with selecting thematic funds and the importance of picking a robust strategy that would translate into successful performance over the long term. This brings us to our second chapter, where we plan to introduce our framework for selecting thematic funds based on five building blocks.

FIGURE 10: PERFORMANCE DISPERSION IN THE HEALTHTECH PEER GROUP



Source: WisdomTree, Morningstar, Bloomberg. From 31st December 1999 to 28th February 2021. Returns are calculated in U.S. dollars on a monthly basis. Only funds live at the time of computation of the graph and launched before December 2017 are considered. ***Historical performance is not an indication of future performance and any investments may go down in value.***

Overall, the *WisdomTree Thematic Classification* offers a roadmap to understand the thematic universe. It allows us to unearth the drivers and emerging trends in the universe. At the same time, it equips investors with a framework to better understand their own portfolios and to analyse how various thematic strategies interact with the broader, non-thematic part of the portfolio.

2. Selecting thematic funds: How to separate the wheat from the chaff?

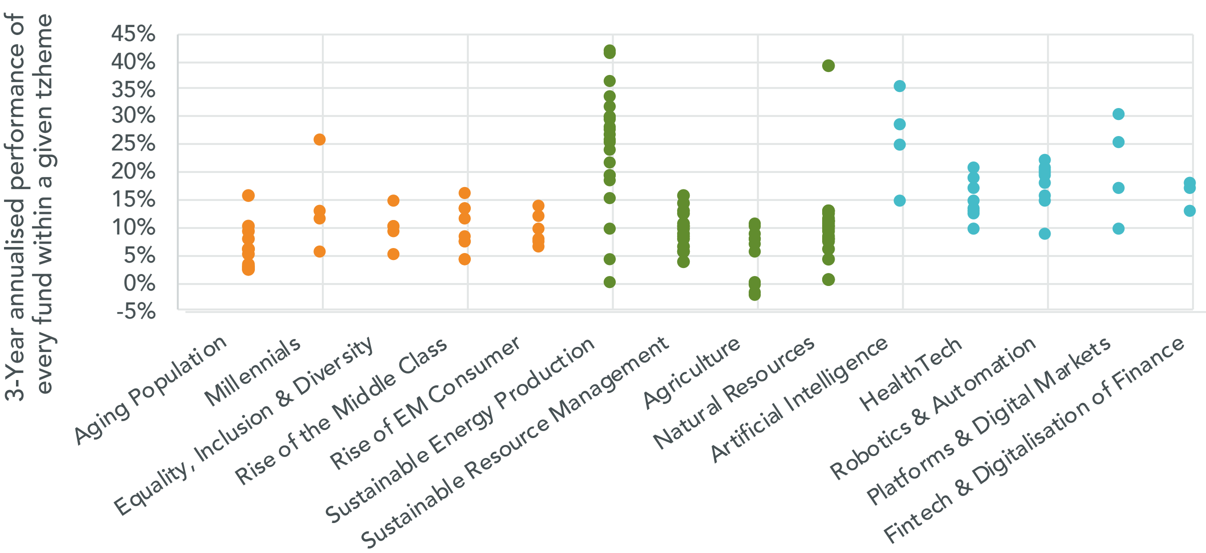
Benchmarks are one of the leading forces in investment management. For decades they have been used to constrain and compare mutual funds. With the rise of passive investments, they have also become direct competitors to active managers when wrapped in index funds or ETFs. In many cases, fund selection processes rely on the use of pre-established benchmarks and pre-established peer groups. Unfortunately, in the thematic universe, such benchmarks and peer groups are rare and hard to come by.

Performance history is also important to fund selection, but it needs to be handled with care. Any theme in its early development stage lacks a track record. Thus, one faces a track record trade-off when investing in a theme early in the cycle with an expectation of reaping higher benefits in the long-term. Think of what it would have been like to invest in Apple or Amazon in the late 1990s before the business track record of Steve Jobs or Jeff Bezos was where we know it to be today—investing early within a theme is quite similar.

Short of this standard selection toolkit, investors might be discouraged from making allocations to thematic investments or might limit their selection to asset managers they know based on other successful products. However, we believe that with the appropriate framework, it is possible to achieve success in selecting thematic funds. This selection is also particularly important because the performance dispersion between strategies claiming to invest in a given theme can be stark indeed.

Figure 11 shows the last 3-year performance of every Europe-domiciled ETF and open-ended fund for a set of investment themes. **In each of the 14 themes below, the difference between the best performing and the worst-performing fund is higher than 5% on average per year.** In Sustainable Energy Production, the difference is 41.7% every year for three years. The opportunity cost in picking the wrong thematic fund even within a well-defined theme like Artificial Intelligence (AI) or HealthTech can be very high.

FIGURE 11: 3-YEAR PERFORMANCE DISPERSION OF THE EUROPE-DOMICILED ETFs AND OPEN-ENDED FUNDS ACROSS SELECTED INVESTMENT THEMES



Source: WisdomTree, Morningstar, Bloomberg. From 28th February 2018 to 28th February 2021. Returns are calculated in U.S. dollars on a monthly basis. Only funds live for the whole 3-year period and classified in the 14 investment Themes above are considered. ***Historical performance is not an indication of future performance and any investments may go down in value.***

Introducing our building blocks for selecting thematic strategies

As discussed, the main challenge in selecting thematic funds is that the standard selection approaches are severely limited. At the core, fund selection aims to help people mitigate the risk associated with choosing the 'wrong' fund for their purposes. We propose to investors to focus their selection criteria on strategy construction and their beliefs about a given theme. While knowing a particular thematic space well can be helpful, it is not a requirement. A lack of familiarity with underlying companies should not be a stumbling block for investors seeking to invest in thematic funds.

In this section, we present a holistic framework to approach fund selection in the thematic space. **Our goal is to provide clear steps for understanding which strategy might best represent an investor's conviction in a theme and its underlying story.** Our framework is conceptualised below in five intuitive building blocks that we believe provide the keys to choosing successful funds in the long run:

+ **Clarity of theme:** The investment is focused on benefitting from a well-defined theme aligned with an investor's long-term views around megatrends. The selected strategy is built to focus on the Theme precisely and reflects the investor's beliefs about the theme. Figure 12 and Figure 13 show that **broad-focus thematic funds are more correlated to market cap benchmark and have historically, on average, underperformed funds that had a narrower investment focus.**
+ **Expertise:** The investment process harnesses the necessary expertise to identify the companies that offer exposure to a Theme and stand to benefit the most from its further proliferation. **Using the Artificial Intelligence and the Sustainable Mobility peer groups, we show in Figure 16 that, in 2020, 'expert-driven' funds have performed better by picking high performing stocks that non 'expert-driven' funds did not find.**
+ **Purity of exposure:** A strategy is focused on pure players and companies within a given theme's ecosystem that are expected to benefit the most as themes evolve further and experience increasing adoption. At the same time, the strategy reduces the exposure to companies that only dabble in the theme. **While recognizing that purity of exposure is quite a subjective notion, we propose four ways of analysing a given strategy's focus on purity or a lack thereof. In Figure 20, we observe that while we would expect thematic funds to invest significantly in high-growth, high-performance businesses, not all thematic funds do.**
+ **Differentiation:** The portfolio is additive to an investor's existing equity portfolio, i.e. the overlap with traditional equity benchmarks is minimal. The portfolio also stands out among the peers by offering a unique play on a theme of choice through differentiated geographical or sectorial exposure, expertise, or compelling strategy construction. **As illustrated in Figure 21, some funds, regardless of their expert status, purity, or type of wrapper, show higher concentration in holdings akin to standard benchmarks, potentially minimising diversification benefits coming with thematic investments.**
+ **Transparency, investability & discipline:** The portfolio is constructed for scalability and liquidity. The investment process is also fully transparent allowing investors to monitor their portfolio. A strategy of choice should also demonstrate discipline in the investment process and time consistency so that investors can efficiently manage their investment and its interaction with a broader thematic sleeve or equity portfolio overall.

By combining the above framework and the de-facto peer-groups generated by the WisdomTree Thematic Classification, investors are equipped with a road map to identify compelling thematic investments poised for future growth.

In the following sub-sections, we focus on each building block in detail and provide clear instructive steps for analysing and understanding thematic funds as illustrated by qualitative and quantitative analyses.

Clarity of theme tends to give strategies better focus on growth

Focusing on a single Theme tends to provide multiple advantages:

1. **Comprehensive exposure to a theme:** It allows constructing a strategy that would provide a diversified and comprehensive exposure to a theme's growth potential, capturing the theme with a higher degree of granularity. If a strategy tries to cover multiple themes in a single portfolio, there is a high probability that only the most obvious parts of each theme will be covered.
2. **Differentiation away from established equity benchmarks:** A truly unique and very differentiated portfolio can be created. A portfolio that would try to harness multiple themes would need to compromise and pick larger companies involved in numerous themes at the same time. It would create a more generic portfolio with a higher likelihood to mimic traditional indices.
3. **Flexibility in timing of the adoption cycle:** Finally, as we will discuss later on, each theme has its own adoption cycle and its own ebbs and flows. By using focused investment products, investors can use this cycle to their advantages and better position their portfolios. While strategies allocating to multiple themes at once would render the timing impossible and would not allow investors to favour one theme over the other.

In Figure 12, we compare the historical performance of broad-focus thematic funds (classified as Diversified Thematics in our classification) and funds that invest in one investment theme only.

To do so, we compare two possible ways to invest in a diversified group of investment themes:

1. Through a broad-focus thematic fund proxied by the average historical performance of all funds classified in the Diversified Thematics cluster using the methodology described in the appendix[6]. The methodology calculates every month the average monthly performance of all funds in a cluster irrespective of their success and survival in the future, giving a fair representation of the cluster.
2. Through a diversified basket of 6 thematic funds with clarity of theme, i.e. each fund focuses on one investment theme only. To create a fair comparison, we construct 10,000 random portfolios of 6 investment themes removing hindsight from the analysis. Each portfolio invests every quarter in six randomly selected themes, where two themes come from each of the three following clusters - Social & Demographic Shifts, Technological Shifts and Environmental Pressures[7]. The performance of each investment theme is calculated using the methodology described in appendix[6]. To minimise the survivorship bias, we incorporate every ETF and open-ended fund that was active at a given point in time, irrespective of its survival in the future or its success. To increase the robustness of our analysis, we focus on the period starting from 2005 and onwards that offers greater diversity in the funds within our thematic universe.

The result is fascinating – the Diversified Thematic investments would have underperformed 94% of the 10,000 simulated portfolios investing randomly in 6 different investment themes. In fact, Figure 12 shows that:

+ the funds in the Diversified Thematics cluster would have delivered an average cumulative performance of 127% in the last 15 years;

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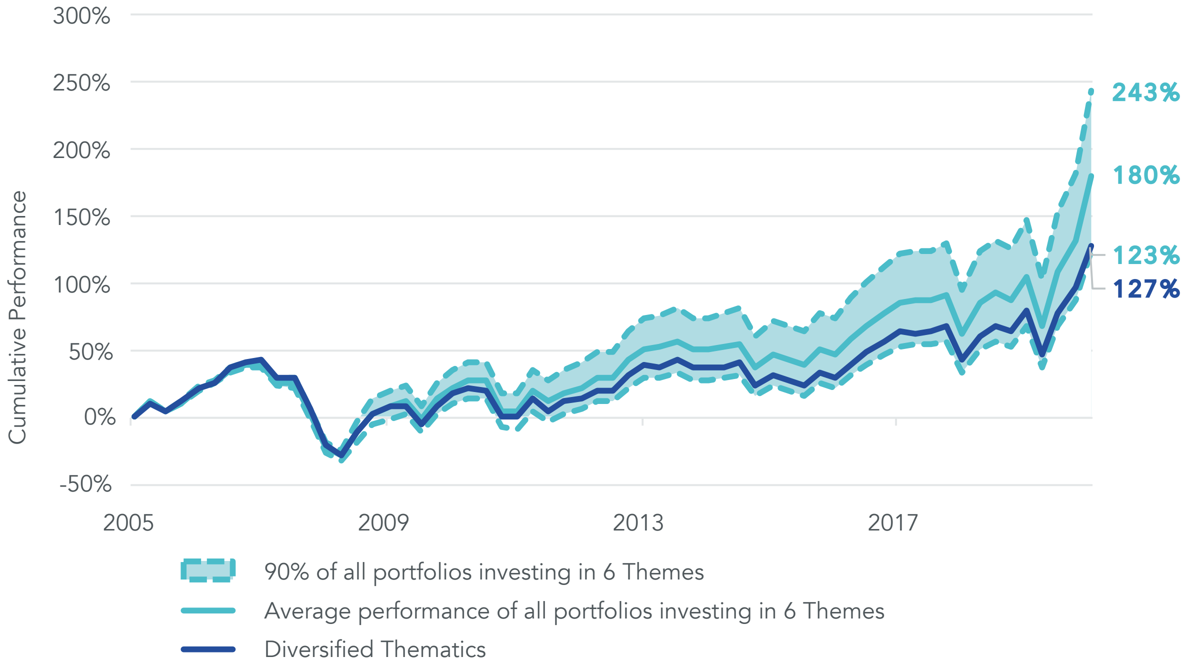
6 See appendix "A quick guide to the average performance of a Cluster, a Sub-Cluster or a Theme".

7 Due to the scarcity of funds within the Geopolitical Shifts historically, we exclude this Cluster from our analysis.

+ on average, the 10,000 portfolios randomly investing in 6 Themes would have delivered an average cumulative performance of 180% over the same period;
+ 5% of the same 10,000 portfolios would have delivered an average cumulative performance of more than 243%;
+ 5% of the same 10,000 portfolios would have delivered an average performance of less than 123%.

Historically, a diversified basket of thematic funds with clarity of theme in many cases would have significantly outperformed a fund with a broad-focus approach to thematic investing.

FIGURE 12: HISTORICAL PERFORMANCE OF BROAD-FOCUS THEMATIC FUNDS (I.E. CLASSIFIED AS BELONGING TO DIVERSIFIED THEMATICS CLUSTER) vs PORTFOLIOS RANDOMLY ALLOCATING TO SIX STAND-ALONE THEMES



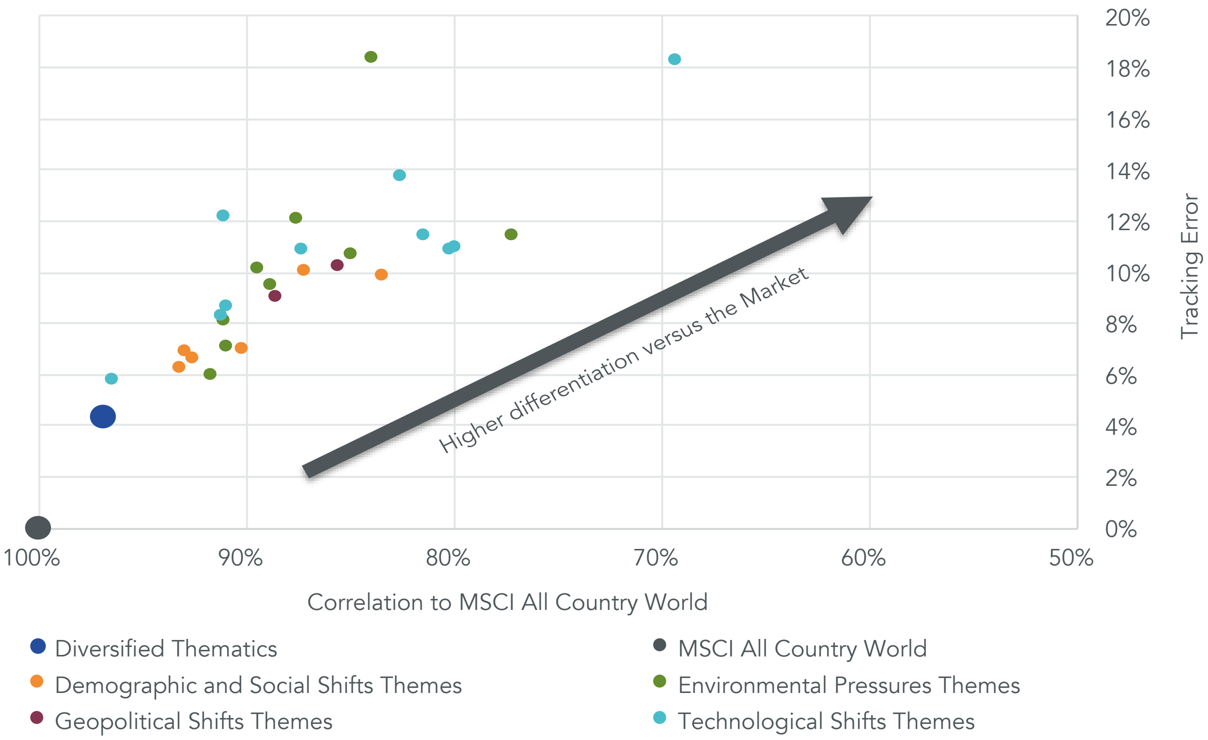
Source: WisdomTree, Morningstar, Bloomberg. From December 2005 to December 2020. Returns are calculated in U.S. dollars on a monthly basis. This graph represents the cumulative performance of 10,000 simulated portfolios. Each simulated portfolio randomly picks six investment Themes (across three Clusters - Social & Demographic Shifts, Technological Shifts and Environmental Pressures) every quarter. The monthly performance of each simulated portfolio is calculated as the average of each of the six Themes' monthly performance. The monthly performance of each investment Theme is calculated as the average monthly performance of every Europe-domiciled fund live at that point in time and classified in the Theme, as explained in appendix[6]. We focus on the period starting from 2005 and onwards that offers greater diversity in the funds within our thematic universe. ***Historical performance is not an indication of future performance and any investments may go down in value.***

In Figure 13, we look at the risk taken by broad-focus thematic funds (classified as Diversified Thematics in our classification) and funds focused on a single theme compared to traditional market-cap indices. To do so, we calculate the historical correlation to the MSCI All Country World Index and the tracking error versus the same index of:

1. The funds classified in the Diversified Thematics cluster using the methodology described in the appendix[8].
2. The funds classified in each investment theme using the methodology described in appendix[8].

Our analysis, in Figure 13, shows that funds investing in a stand-alone theme exhibits a lower correlation to the broad market than broad-focus thematic funds. It also shows that funds focusing on a stand-alone theme have significantly higher tracking error than funds classified within Diversified Thematics. This is pretty intuitive as the diversified thematic funds are expected to tap into a large number of megatrends simultaneously and therefore have to spread their portfolio pretty thin, leading to a relative lack of focus.

FIGURE 13: INVESTMENTS WITH CLARITY OF THEME OFFER LESS CORRELATED RETURNS AND HAVE HIGHER TRACKING ERROR vs MSCI ALL COUNTRY WORLD INDEX THAN DIVERSIFIED THEMATIC STRATEGIES



Source: WisdomTree, Morningstar, Bloomberg. From December 1999 to February 2021. Returns are calculated in U.S. dollars on a monthly basis. The correlation and tracking error is calculated against MSCI All Country World Index only when returns are available for the considered investment Theme. ***Historical performance is not an indication of future performance and any investments may go down in value.***

Clarity of theme can, therefore, deliver higher performance and higher growth potential than more diversified thematic funds. However, providing clarity of theme is easier said than done. Finding the pure players in emerging investing themes can be challenging among all the stocks that recently went through an initial public offering ("IPO"), pivoting start-ups and older mid-caps. A successful thematic strategy requires an understanding of the whole ecosystem, supporting the development of a theme. Thus, a higher clarity of theme hinges on the involvement of experts that can inform the selection of stocks and ensure that the portfolio evolves together with the theme and stays focused. This argument motivates the considerations of expertise as our second building block.

8 See appendix "A quick guide to the average performance of Clusters, Sub-Cluster or Theme".

Expert knowledge is critical to creating strategies most closely exposed to a stand-alone theme

The success of a thematic strategy is directly linked to the identification of companies that are poised to benefit the most from the growth of a given theme. Before the recent proliferation of thematic strategies, it would have been the conventional wisdom, in Europe, that active managers had a better chance of selecting the 'right stock in the right theme at the right times.' Today, ETF providers have democratised access to thematic investments by offering strategies that integrate expert-led selection and bring an active stock-picking element into the strategy construction.

We believe that the second key to the success of thematic strategies is the ability to harness the necessary expertise to identify the companies that, while offering the exposure to a theme, stand to benefit the most from the further proliferation of the theme and are poised to grow with it. This is what we call an 'expert-driven' fund.

In Figure 14, we propose a framework to identify the level of expert involvement in a strategy by looking at the 'stock selection' and the 'portfolio weighting' processes. 'Expert-driven' strategies are not determined by their wrapper or by an artificial divide between active and passive. It is the depth of the expertise and its integration within the strategy construction itself, which needs to be assessed. Overall, an 'expert-driven' strategy utilises theme-specific expertise for the stock selection or the portfolio construction overall, extending expertise to stock weighting.

FIGURE 14: A PROPOSED FRAMEWORK FOR CLASSIFYING THEMATIC STRATEGIES BY THE LEVEL OF EXPERTISE INVOLVED IN THE STRATEGY

Understanding strategy construction		Stock selection examples	Weighting examples
Quantitative & Fundamental	Traditional methods	Company identification based on the sector/ industry classification Company identification based on the sector classification of a company's revenue	Market cap-based weighting Equal weighting
		Fundamentals-based screening Fundamental analysis Quantitative analysis	Fundamentals-based weighting Discretionary weighting based on the fundamental analysis Discretionary weighting based on the quantitative analysis
	AI-driven	Company identification and screening is driven by AI-generated insights from various sources of data, for example, using NLP technology AI-based classification of companies	Weighting based on the AI-generated insights (systematic and discretionary)
Expert-driven	Theme specific and expert-driven	Identification of a company's exposure to a Theme Identification of a company's role in a Theme's ecosystem or value chain based on a Theme specific classification Estimation of a company's purity of exposure	Systematic modified equal weighting within [the proprietary] classification categories Discretionary weighting based on a Theme specific proprietary research and expert judgement

Source: WisdomTree.

- **Stock selection – The benefit of an expert-driven approach**

Investment themes have a cutting-edge feel to them. Standard or widely used classification systems cannot adequately drive the selection of companies involved in a theme. Specific knowledge of nascent companies and recent technological developments or trends is needed to identify potential investment targets adequately. Contrary to a sector or country fund where a public, recognised, clear-cut classification of companies commands the portfolio selection; no such classification exists, for example, for themes like Artificial Intelligence or Sustainable Mobility.

In the context of this paper, we split strategy construction approaches, based on stock selection, into 'Expert-driven' and 'Quantitative & Fundamental':

1. **Quantitative & Fundamental selection:** Assumes that companies are deemed to belong to a theme using a rules-based approach employing some measurable criteria, being AI driven or not. In that case, we classify the approach as 'quantitative' in nature.
2. **'Expert-driven' selection:** In an expert-led strategy, the selection of stocks is driven by proprietary research, classification or ranking that uses human judgement and theme-specific knowledge to identify the companies with exposure to a theme of interest. Expertise can also be directed at classifying a company's role in the Theme's ecosystem or value chain.

- **Weighting – Quantify the level of your conviction**

When classifying strategies between 'expert-driven' strategies and non 'expert-driven' strategies, the weighting methodology can be viewed as an additional layer of information within the portfolio construction to complement the analysis. Stock weighting, like stock selection, is an integral part of the investment process that can help investors better understand how the exposure to a theme is built.

As for stock selection, the analysis is based solely on expertise and goals driving the weighting of companies and not on the investment wrapper delivering the strategy. We divide weighting approaches into 'Quantitative & Fundamental' and 'Expert-driven':

1. **'Quantitative & Fundamental' weighting:** If a strategy applies a weighting approach that does not involve any theme specific expertise and where criteria, regardless of their complexity, can be applied to equities generally, then it is not considered 'expert-driven'.
2. **'Expert-driven' weighting:** An 'expert-driven' weighting, in most cases, is the continuation of an 'expert-driven' selection. This means that 'expert-driven' weighting uses the outcomes of an expert assessment of stocks to refine the exposure to a theme.

As part of this framework, we believe selection should take priority over weighting. This means that weighting can only colour our view of an 'expert-driven' fund, while very rarely would an 'expert-driven' weighting approach be enough to overcome a 'Quantitative & Fundamental' Selection approach. Therefore, the role of the weighting in the strategy construction ultimately depends on the selection. In some strategies, selection can be already focused on a very specific group of stocks within the theme, pure-play companies, and in that case, the role of the weighting might be less critical.

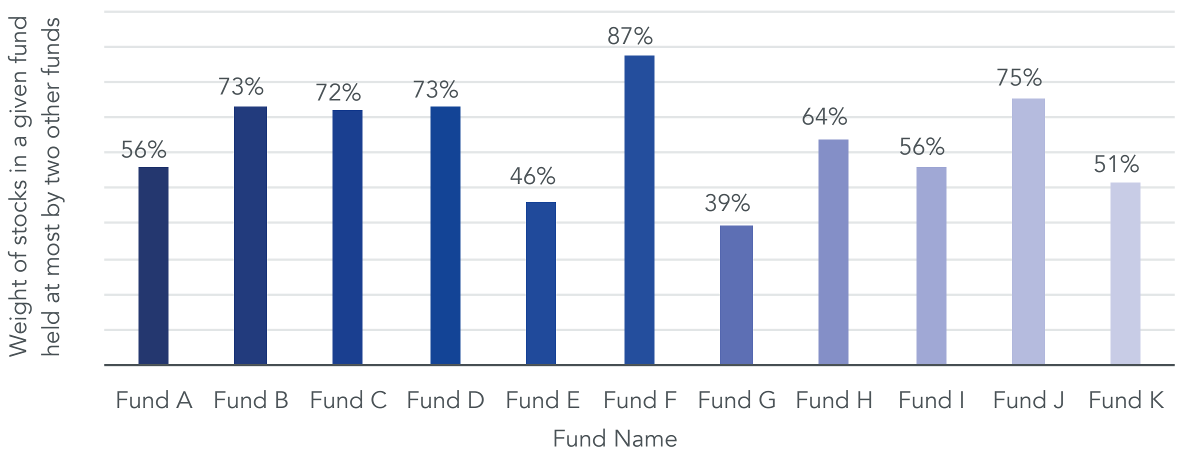
- **Historically, expert-driven approaches have been able to select better-performing stocks in relevant themes**

Having discussed the benefits of an expert-driven approach to the investment process qualitatively, this section aims to analyse those benefits quantitatively. To do so, we focus on two specific themes within our thematic universe – Artificial Intelligence and Sustainable Mobility. Both themes offer sufficient breadth and diversity of funds and strategies for our analysis.

Digging into the holdings of the 11 ETFs and open-ended funds in the Artificial Intelligence peer group, we first note that, **contrary to intuition, holdings in each fund are very different.** Intuitively, we would expect to see a much lower dispersion in the weight allocated to unique stocks; if all 11 funds were focusing on the pure-play companies, most funds would own the same stocks. In reality, **there is no kernel of stocks that most AI funds invest in.** This dispersion in holdings could be one of the drivers of the dispersion in performance observed in Figure 10 and Figure 11. It illustrates further the pitfalls of thematic investments, as discussed earlier in this paper.

In Figure 15, within each fund, we look at the weight of stocks that are selected only by two other funds, i.e. stocks that appear in at most three funds out of eleven. Clearly, this number is significantly higher than 50% for most funds, with Fund F showing 87%. Our analysis for the Sustainable Mobility peer group suggests the same pattern.

FIGURE 15: WEIGHT OF STOCKS IN A GIVEN FUND SELECTED AT MOST BY TWO OTHER FUNDS IN THE ARTIFICIAL INTELLIGENCE PEER GROUP



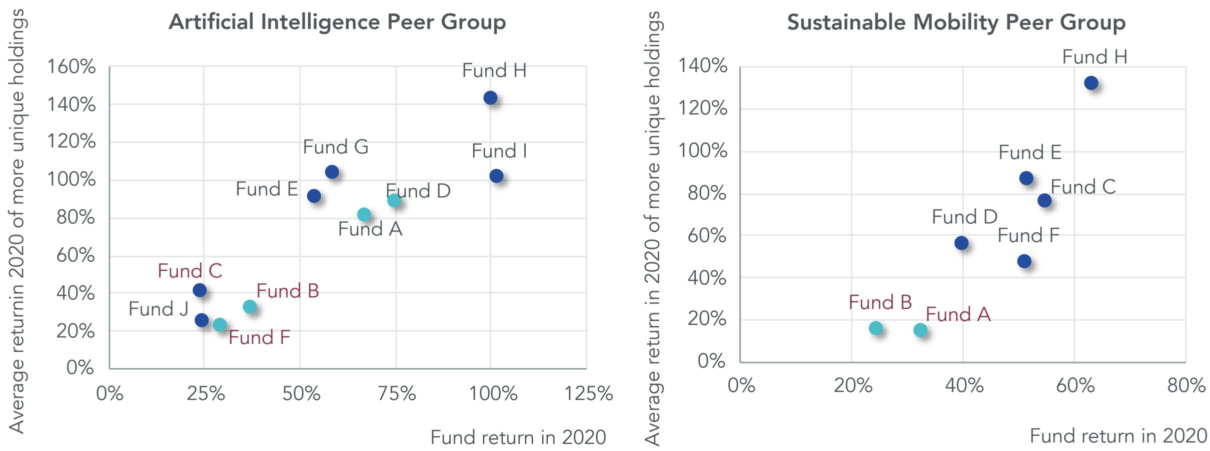
Source: WisdomTree, Morningstar, Bloomberg. Holdings data as of 31st December 2020. The histogram represents the total weight of stocks with a holdings frequency of 3 or less in each fund. Holdings frequency represents the frequency of a stock appearing within the Artificial Intelligence Peer Group holdings. Portfolio weight within every fund is rescaled to 100% based on the positions in equities only, i.e. any positions in cash are excluded from the analysis. ***Historical performance is not an indication of future performance and any investments may go down in value.***

Digging further, Figure 16 examines the relationship between those stocks that are almost unique to each fund and the funds' performance. To do so, we compare the performance of each fund in 2020 with the equal-weighted performance, in 2020, of this group of stocks that is almost unique to each fund. We separate 'expert-driven' funds (the label is in grey) from non 'expert-driven' funds (the label is in red) using our framework proposed in Figure 14. We also separate ETFs, in teal, from open-ended funds, in dark blue.

What is striking about the scatter plots in Figure 16, both for AI and Sustainable Mobility, is that:

+ The higher returns of those 'unique' holdings are associated with higher fund's return. In other words, **the funds with good performance in 2020 are the funds that have identified high performing stocks that most of the other funds in the peer group missed.**
+ Most non 'expert-driven' strategies (label in red) performed poorly in 2020, associated with the relatively poor performance of their 'unique' holdings. **The lack of expertise in those funds may have led to poor stock selection.**
+ **The distinction between ETFs and open-ended active funds does not appear very relevant here.** Some ETFs are 'expert-driven' and have selected very high performing 'unique' stocks, while some open-ended funds are not 'expert-driven' and have selected lacklustre 'unique' stocks.

FIGURE 16: RETURNS OF FUNDS WITHIN THE ARTIFICIAL INTELLIGENCE AND SUSTAINABLE MOBILITY PEER GROUPS vs AVERAGE RETURNS OF HOLDINGS THAT HAVE BEEN SELECTED BY AT MOST TWO OTHER FUNDS IN THEIR RESPECTIVE PEER GROUPS



Source: WisdomTree, Morningstar, Bloomberg. Holdings data as of 31st December 2020, except for Fund C within the Sustainable Mobility Peer Group with holdings data as of 30th November 2020. More unique holdings are represented by the funds' holdings with frequency 1-3. Holdings frequency represents the frequency of a stock appearing within the holdings of funds in the respective Peer Groups. Fund return is the return of a fund delivered in the year 2020. ETFs are represented by teal markers and mutual funds by dark blue markers. The red colour of the font indicates non 'expert-driven' funds. Stocks that do not have performance data for the full year 2020 are discarded. ***Historical performance is not an indication of future performance and any investments may go down in value.***

It is worth noting that there is still a large dispersion between 'expert-driven' funds. **Not all the funds have been successful in expressing their convictions in those more unique stocks. Overall, in 2020, some** 'expert-driven' **funds have performed better by picking and allocating more to high performing stocks that non** 'expert-driven' **funds did not find.**

One of the factors that might explain these differences in returns observed across the funds is the notion of the 'purity of exposure' and how an expert-driven strategy integrates this concept into their selection and weighting approach. This is why purity is our third building block within our thematic fund selection framework.

Purity of exposure – is purer better?

The third building block of our approach to thematic fund selection is the purity of exposure. Our belief is that thematic strategies should be focused on pure players and companies within a given theme's ecosystem that are expected to benefit the most as the theme evolves further and experiences increasing adoption.

Purity of exposure can be hard to estimate as it might be pretty subjective at times. However, certain observations can still be made relatively easily and guide us towards an answer. **In this section, we showcase, four characteristics that could point to a lack of purity:**

1. High number of holdings
2. High overlap with large-caps and mega-caps
3. Low investment in small caps
4. Exposure to unusual industries (compared to the rest of the peer group)

This list is by no means exhaustive, but it is nonetheless useful to assess the purity of funds in a peer group.

The first characteristic is the number of holdings in a fund. While diversification of holdings in a fund is very important, **it is pretty evident that investing in many companies is not the best way to concentrate the fund's exposure on pure players.** For example, in the AI peer group, Fund F invests in 256 stocks, almost three times more than any other peer. This is a first indication that this fund's exposure may be quite diluted.

In Figure 17, for each fund in the AI peer group, we calculate the weight allocated to the top 10 companies in the NASDAQ-100. The dispersion, here again, is vast. Fund E and G allocate almost a third of their assets to those 10 tech mega cap companies when Fund D or Fund F invest less than 5%. **We believe that most investors do not invest in a thematic fund to double down on their exposure in mega-caps. Furthermore, due to the diversified nature of tech giants, it is hard to view them as pure-play businesses** within the Artificial Intelligence theme. So significant exposure to mega caps could also signal a lack of purity. Fund E and Fund G stand out and will need further consideration.

FIGURE 17: WEIGHT ALLOCATED TO THE TOP 10 COMPANIES IN THE NASDAQ-100 INDEX WITHIN THE FUNDS IN THE ARTIFICIAL INTELLIGENCE PEER GROUP

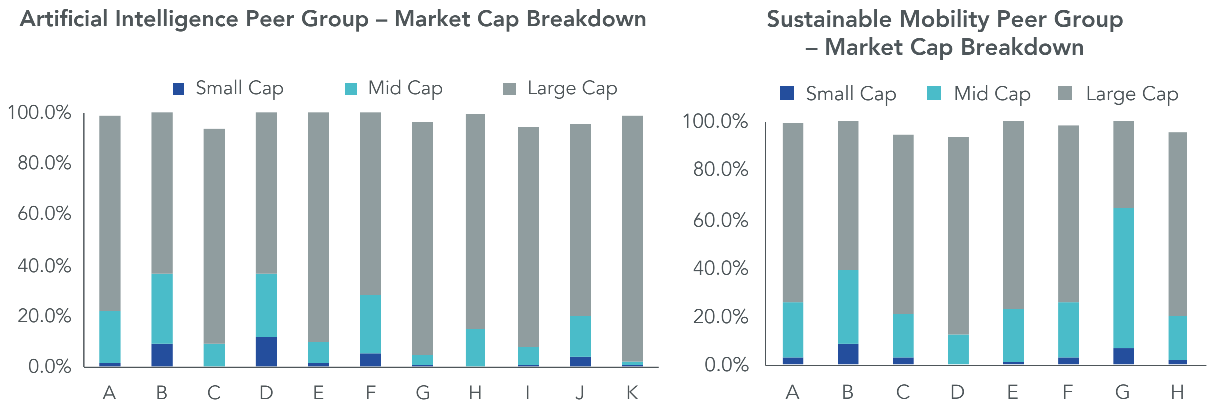
	Fund A	Fund B	Fund C	Fund D	Fund E	Fund F	Fund G	Fund H	Fund I	Fund J	Fund K
# Holdings	70	98	40	56	66	256	56	34	70	44	44
Apple		1.1%		0.4%	1.7%	0.4%	2.9%		3.7%		2.1%
Miscrosoft	1.6%	0.8%	1.3%	0.4%	4.9%	0.4%	3.0%	2.0%	0.4%	3.1%	2.1%
Amazon.com	1.6%	0.9%		0.4%	4.9%	0.4%	3.9%	2.1%	3.8%		1.9%
Tesla	1.4%			0.5%	0.8%	0.4%	2.8%		4.9%		
Facebook		0.9%			4.5%	0.4%	3.9%		2.8%	0.5%	1.4%
Google	1.5%	0.9%	1.8%	0.4%	5.5%	0.4%	4.0%		2.2%	3.6%	1.8%
Nvidia	1.5%	1.1%	1.8%	1.4%	1.8%	0.4%	3.0%	4.0%	0.5%	1.6%	2.9%
Paypal		1.0%			1.4%	0.4%			1.0%		
Adobe	1.2%	0.9%	1.3%		1.6%	0.4%	3.0%		1.0%		1.6%
Comcast						0.4%					
TOTAL	9%	8%	6%	3%	27%	4%	26%	8%	20%	9%	14%

Source: WisdomTree, Morningstar, Bloomberg. Holdings data as of 31st December 2020.

Thinking of the 'purity of exposure' and connecting this to a company's market capitalisation, it is intuitive to assume that most niche players within emerging theme, i.e. those that could most likely be described as pure-play companies, would tend to be stocks with smaller market capitalisation. They would not have benefitted from the required time yet to achieve scale. While this is not a 100% rule, **it would be challenging to consider that a fund exhibits high purity if it allocates only a tiny portion of its portfolio to mid and small-cap companies.** Some pure players might achieve the status of large caps[9] quickly, see what happened to Zoom and the Cloud Computing theme from the onset of the global pandemic[10], but this is more the exception than the rule.

Figure 18 illustrates **the disparity between funds when it comes to allocation to small-caps.** Fund G (in the AI peer group), for example, invests more than 95% in large caps when Fund D invests barely 60%.

FIGURE 18: PORTFOLIO BREAKDOWN BY MARKET CAPITALISATION WITHIN THE ARTIFICIAL INTELLIGENCE AND SUSTAINABLE MOBILITY PEER GROUPS



Source: WisdomTree, Morningstar, Bloomberg. Holdings data as of 31st December 2020. Small caps are companies with a market value below or equal to $2 Billion. Mid-caps are companies with a market value from $2 Billion and up to $10 Billion. Large caps are companies with a market value above $10 Billion.

The last characteristic we want to analyse is the sector concentration through the funds' holdings split by Global Industry Classification Standard ("GICS") Industries. In Figure 19, we start with the analysis of funds within the Artificial Intelligence peer group. We note that weights in three industries vary significantly:

+ **'Semiconductors & Semiconductor Equipment':** This difference of allocation in the 'Semiconductors & Semiconductor Equipment' Industry can be explained by experts' views on this part of the market. As a provider of the infrastructure and the components for running AI-powered products and solutions, it may or may not be considered part of the theme depending on the experts' views about the importance of this part of the value chain to the theme.
+ **'Software':** Differences in exposure to this industry could be linked to varying purity of exposure. While not all pure-play AI companies can be found within the 'Software' industry, low allocation to this specific industry might indicate funds with diluted exposures.

9 We define large caps to be the companies with market capitalization above $10 Billion.

10 Zoom Video Communications gained 395.7% in 2020 alone. Its market capitalisation changed from $18.8billions to $96.5billions in a single year.

+ **Industries using AI technology (but not necessarily developing them):** Some funds, for example, allocate a significant weight to users or adopters of AI technology that represent the last link in the value chain. Fund J has an 11% exposure to 'Banks' industry and only 20% exposure to the top 2 industries within the Artificial Intelligence peer group. Similarly, Fund I allocates 10% to 'Entertainment', and Fund C allocates 11%.

Discrepancies in industry allocations can be indicative of a lack of purity or a lack of expertise. Fund J and I stand out significantly in this analysis.

FIGURE 19: TOP 10 GICS INDUSTRIES WITHIN THE ARTIFICIAL INTELLIGENCE PEER GROUP

Fund name	A	B	C	D	E	F	G	H	I	J	K
Software	39%	36%	21%	45%	23%	15%	20%	35%	15%	15%	30%
Semiconductors & Semiconductor Equipment	11%	14%	18%	37%	16%	9%	15%	6%	18%	5%	7%
IT Services	12%	9%	4%	4%	9%	8%	13%	26%	10%	11%	25%
Interactive Media & Services	7%	6%	4%	1%	16%	2%	11%	9%	13%	8%	9%
Internet & Direct Marketing Retail	9%	5%	0%	1%	13%	2%	9%	10%	6%	2%	11%
Entertainment	5%	0%	11%	0%	4%	4%	2%	2%	10%	1%	5%
Technology Hardware, Storage & Peripherals	1%	11%	1%	0%	4%	8%	3%	0%	4%	4%	2%
Electronic Equipment, Instruments & Components	1%	6%	8%	2%	2%	6%	0%	2%	0%	0%	0%
Communications Equipment	2%	4%	2%	2%	5%	4%	0%	0%	0%	1%	0%
Banks	0%	1%	0%	0%	0%	2%	0%	0%	2%	11%	0%

Source: WisdomTree, Morningstar, Bloomberg. Holdings data as of 31st December 2020. GICS Industry represents the 3rd tier of classification within GICS (Global Industry Classification Standard) hierarchy.

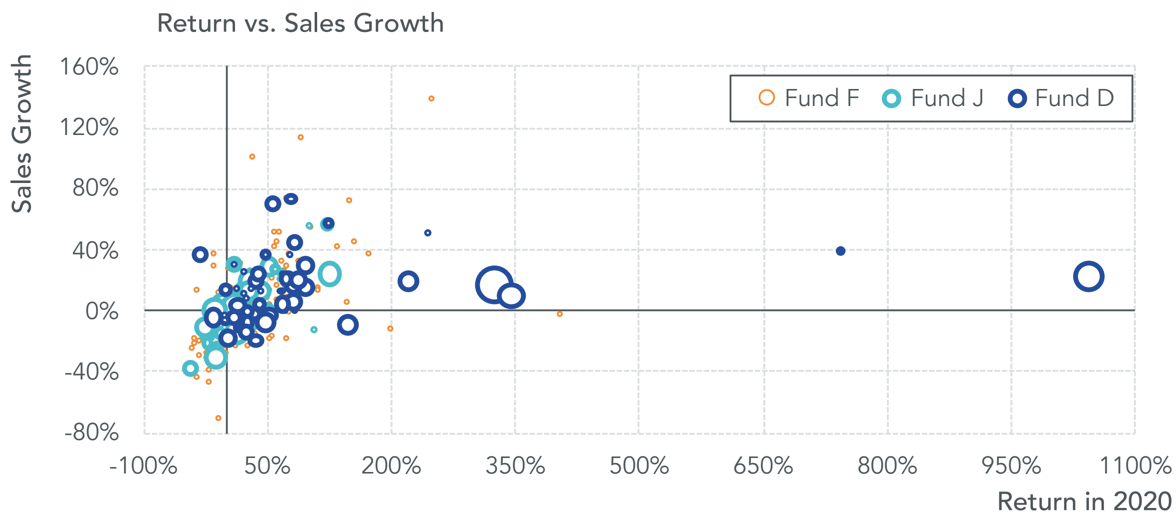
In Figure 20, we compare two funds that some of the analyses above have flagged as potentially lacking purity of exposure (F and J) to a fund that has not been flagged (D). Fund F invests in a large number of stocks which may indicate a lack of conviction. Fund J invests in GICS Industries like 'Banks' that are not an obvious choice for the theme.

In Figure 20, we look at the Sales growth and performance in 2020 of all the companies held by those three funds. Each bubble represents one stock held by the funds. The size of the bubble is indicative of the weight of the stock in the funds. The difference between those funds is stark indeed:

+ While investing in some high growth or high performing stocks, Fund F is spread thin across a large number of holdings. The fund does not, therefore, reap the reward for some of its stock selection.
+ Compared to Fund F and D, Fund J does not seem to have picked the higher growth or higher-performing stocks.
+ Fund D is more concentrated, and it exhibits large weights in high growth and high-performance stocks which is not the case for both Fund F and J.

So, answering the question 'is purer better?', we believe that focusing on funds with a higher purity of exposure helps realise a theme's potential to a greater extent. It also helps avoid some of the pitfalls in thematic investments like significant overlaps with traditional indices or diluted, unfocused exposures.

FIGURE 20: SALES GROWTH AND 2020 PERFORMANCE OF ALL THE STOCKS HELD IN FUNDS D, F AND J



Source: WisdomTree, Morningstar, Bloomberg. As of 31st December 2020. Focusing on 3 Artificial Intelligence Funds in the WisdomTree Thematic Classification. ***Company returns*** *presented on a total return basis in USD for the period from 31st December 2019 to 31st December 2020.* ***Sales growth*** *is presented on a year-over-year (YoY) basis from either quarterly, semi-annual, or annual data, based on whichever is available in Bloomberg as of 31st December 2020 starting from quarterly data. Stocks that do not have performance data for the full year 2020 are discarded.* ***Historical performance is not an indication of future performance and any investments may go down in value.***

Differentiation – focus on diversification within a broader thematic sleeve

Differentiated exposure and future growth potential are the key benefits of thematic investments piquing investors' interest. However, aiming for a differentiated exposure and achieving one in practice does not come without challenges. With this in mind, 'differentiation' is a very intuitive building block to add to our thematic fund selection framework.

In this section, we continue to suggest some analysis that can help identify funds within the peer groups that might best serve your portfolio needs. We will look at the differentiation offered by thematic funds through the prism of differentiation from standard market-cap benchmarks, differentiation from other themes and differentiation from peers.

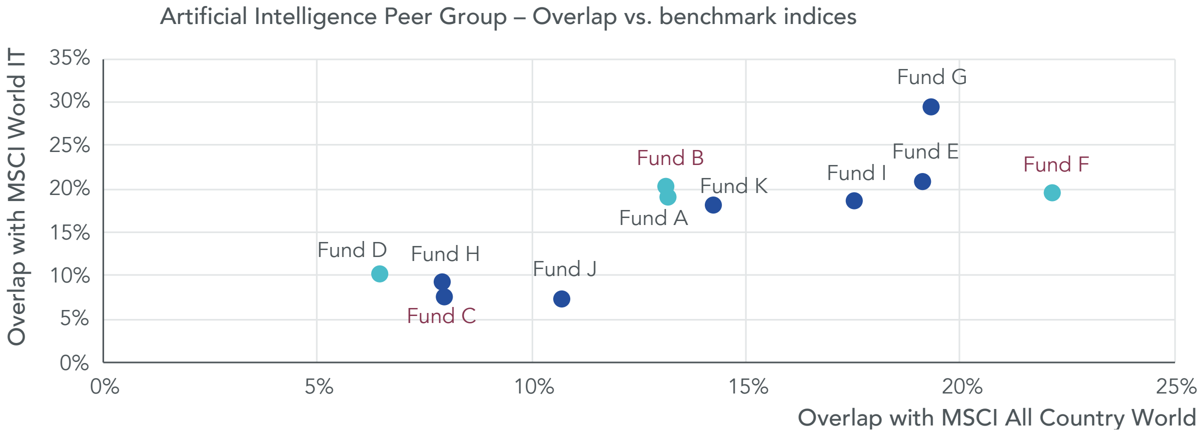
• Differentiation from standard, market-cap-weighted benchmarks

With exchange-traded products, asset managers have done a remarkable job at providing efficient, inexpensive exposure to the returns of well-known benchmarks. Therefore, for any strategy to seize investor's attention, in addition to its value proposition, it has to offer a degree of differentiation in comparison to what investors already hold in their core allocation. **The differentiation potential offered within thematic strategies is quite high. However, due to the varying degree of 'purity of exposure' within each fund, that potential is not always realised.**

In Figure 21, we compute the aggregate overlap weight of common holdings between the Artificial Intelligence Peer Group funds and two market cap benchmarks – a broader equity benchmark, the MSCI All Country World Index, and, since AI is a Tech-centric theme, a technology benchmark, the MSCI World Information Technology. The overlap weight is the smallest weight of the common holding within a given fund and a given benchmark.

This analysis illustrates the large dispersion in overlap weights. Some funds have aggregate overlaps of more than 20% with both indices when some funds have overlap below 10%. Besides, **we note that neither active funds nor funds classified as 'expert-driven' are associated with any particular degree of differentiation against the benchmarks.** This highlights that a focus on a single building block, for example, expertise, will not result in selecting a compelling strategy.

FIGURE 21: OVERLAP WITH THE BENCHMARK INDICES WITHIN THE ARTIFICIAL INTELLIGENCE PEER GROUP



Source: WisdomTree, Morningstar, Bloomberg. Holdings data as of 31st December 2020. ***ETFs*** *are represented by teal markers and* ***mutual funds*** *by dark blue markers. 'Non 'expert-driven' funds are indicated by the red colour of the label.*

The low overlap against the MSCI World Information Technology illustrates how themes cannot be simply captured through sectorial investments. They offer a reasonable degree of differentiation potentially due to:

1. **Earlier inclusion of newly public companies:** Established benchmarks tend to be constrained by their success, in that if trillions of USD worth of AuM follows them, there need to be elevated hurdles around adding new companies. thematic funds still may have stringent eligibility criteria, but it is not atypical to see minimum market capitalisation requirements from $100 to $500 million, depending on the strategy.
2. **Higher allocation to smaller stocks.** Over time, thematic investments might gain from exposure to smaller and mid-cap stocks that grow. The fact that these stocks are growing may signal companies achieving scale in their business, better turning revenue to profit, and improving quality metrics.

• Differentiation from other themes

Within the 'Expertise' building block, we have drawn attention to the fact that there are no established standards for what constitutes, for example, an AI company, an 'Ageing Population' company or a 'Sustainable Food' company. However, we did not discuss the fact that the same company can have exposures across multiple themes. For example, if we look at Splunk Inc[11], we can find this stock in an AI fund, a Cloud Computing fund, and a Cybersecurity fund.

11 Splunk Inc. is an American public multinational corporation based in San Francisco, California, that produces software for searching, monitoring, and analyzing machine-generated big data via a Web-style interface.

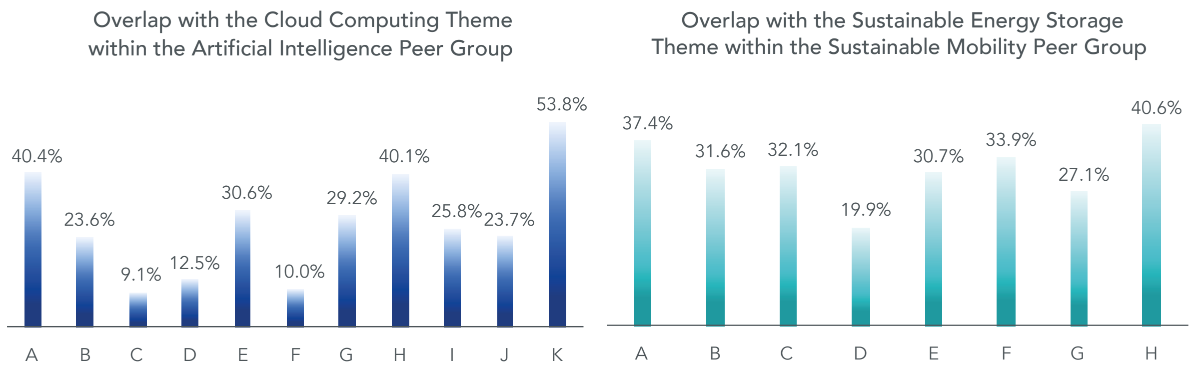
In Figure 22, we create a universe of companies that belong to the 'Cloud Computing' theme and a universe of companies that belong to the 'Sustainable Energy Storage' theme based on the holdings of the largest products classified within each Theme. The overlap metric is computed as the weight in a given fund held in holdings that belong to the other theme's universe, i.e. 'Cloud Computing' for AI funds or' Sustainable Energy Storage' for Sustainable Mobility funds.

We observe that:

+ **The overlap with other themes varies significantly between funds.** In the AI Peer Group, for example, the overlap spans 9% to 54%.
+ **The overlap with other themes can reach very high levels.** Is Fund K an AI fund with significant overlap to Cloud or a Cloud Computing fund with significant overlap to AI?

While this issue is subservient to the rest of the framework mentioned above, it is still important to monitor, at least from a portfolio construction point of view. **If neglected, a high overlap with adjacent themes could be detrimental to the diversification potential of a thematic fund in the broader portfolio allocation. It could also make the performance attribution and market timing a lot harder.**

FIGURE 22: OVERLAP WITH THE CLOUD COMPUTING THEME AND THE ENERGY STORAGE THEME WITHIN THE ARTIFICIAL INTELLIGENCE AND THE SUSTAINABLE MOBILITY PEER GROUPS



Source: WisdomTree, Morningstar, Bloomberg. Holdings data as of 31st December 2020. ***Overlap with a theme*** *is computed as the weight in a given fund held in holdings that belong to the respective theme's universe, i.e. 'Cloud Computing' or' Sustainable Energy Storage'. Each theme's universe consists of the holdings of the two largest Europe-domiciled ETFs in terms of AuM classified within each theme.*

- **Differentiation from peer strategies**

The third layer in the differentiation analysis is the overlap between funds in the same peer group. This is an important consideration for investors investing in multiple funds in the same theme. For large peer groups, **it can also serve as an easy tool for qualifying potentially strong candidates and flagging funds that might only dabble in a theme of interest.**

In Figure 23, we consider the overlap between all the funds in the Artificial Intelligence peer group.

For some funds, like C, F and J, for example, the limited overlap can highlight issues with the fund:

+ Fund F has a very large number of holdings (256), leading to a dilution of the exposure to the Theme.
+ Fund J focuses on Big Data as well as its end users, i.e. companies that integrated Big Data into their core business, leading to unusual GICS industry allocation (11% to Banks, for example).
+ Fund C is not 'expert-driven' and uses an AI-driven algorithm in the company selection process.

For other Funds, like D, it is indicative of a unique, differentiated play on AI comparing this matrix, for example, to exposures across the GICS industries, we can see much higher allocation within the fund to 'Software' and 'Semiconductors & Semiconductor Equipment'. Therefore, the peer overlap analysis might have helped to qualify Fund D for further selection and disqualify funds C, J and F.

FIGURE 23: PEER OVERLAP ANALYSIS WITHIN THE ARTIFICIAL INTELLIGENCE PEER GROUP

Holdings	70	98	40	56	66	256	56	34	70	44	44
1Y Return	67.4%	37.4%	24.2%	74.9%	53.9%	29.3%	58.8%	100.1%	101.7%	24.6%	n.a.
	Fund A	Fund B	Fund C	Fund D	Fund E	Fund F	Fund G	Fund H	Fund I	Fund J	Fund K
Fund A	100%	22%	14%	16%	22%	12%	28%	20%	19%	12%	29%
Fund B	22%	100%	12%	13%	18%	29%	13%	7%	13%	9%	12%
Fund C	14%	12%	100%	15%	18%	6%	10%	7%	7%	14%	11%
Fund D	16%	13%	15%	100%	10%	11%	12%	8%	13%	6%	11%
Fund E	22%	18%	18%	10%	100%	11%	34%	15%	20%	18%	24%
Fund F	12%	29%	6%	11%	11%	100%	11%	3%	11%	7%	6%
Fund G	28%	13%	10%	12%	34%	11%	100%	17%	30%	13%	28%
Fund H	20%	7%	7%	8%	15%	3%	17%	100%	15%	7%	48%
Fund I	19%	13%	7%	13%	20%	11%	30%	15%	100%	7%	22%
Fund J	12%	9%	14%	6%	18%	7%	13%	7%	7%	100%	9%
Fund K	29%	12%	11%	11%	24%	6%	28%	48%	22%	9%	100%

Source: WisdomTree, Morningstar, Bloomberg. Holdings data as of 31st December 2020. ***1Y Return*** *is the return of each fund for the year 2020.* ***Holdings*** *represent the number of holdings in each fund based on positions in equities only.* ***Columns*** *in the table represent funds within the Artificial Intelligence Peer Group colour coded into ETFs with light blue shade and mutual funds with dark blue shade.*

Up to this point within our selection framework, we have decided to focus on thematic specific characteristics. Those analyses do not provide any clear insights on the benefits of choosing one investment wrapper over the other. However, fundamental differences between ETFs and active funds are still relevant when selecting thematic investments in the context of their broader portfolio leading us to our final building block within the fund selection framework.

Transparency, Investability, Discipline – vital traits for any successful investment experience

Stepping slightly away from thematic funds, certain characteristics are desirable for any investments. Transparency, investability and discipline are among those. In general, as well as in thematic investments, those characteristics differ between ETFs and open-ended active funds, defining the investment experience.

• Transparency

Active strategies have traditionally been less transparent than exchange-traded products. Instead of revealing positions daily, it may be customary only to reveal positions every quarter. However, the transparency of an investment strategy is an undeniable benefit for any investor. **There is very little downside for an investor to have an option of seeing daily the companies he invests in through the different funds in his portfolio. On the contrary, the lack of transparency directly impacts investors' ability to compare different funds in a peer group to inform the fund selection decision and reduces investors' ability to adapt their portfolios in response to any changes in circumstances.** This is even truer for thematic funds. While megatrends are long-term forces, the ecosystems of companies they create are evolving ever faster, reacting to the changes in societies or modern economies.

In the context of a portfolio with multiple thematic funds, transparency is key to allowing investors to manage potential interaction between the funds and the overlap between themes. The global pandemic and its impact on Cloud Computing offers an easy illustration here. Imagine an investor in AI and Cloud Computing, whose allocation to the Cloud Computing Theme has significantly risen due to its performance. When deciding to reallocate between the two funds, knowing the exact exposure within the AI fund to companies held in the Cloud fund (which is only possible with perfect transparency in both funds) would help the investor decide on the size of the rebalancing.

• Liquidity

As discussed previously, the focus on the 'purity of exposure' within thematic strategies might naturally increase the allocation to mid-cap and small-cap stocks. The recent growth of thematic strategies might, therefore, raise concerns among investors around:

+ the potential deterioration of the liquidity profile of some thematic funds,
+ the possible concentration of ownership in the smaller companies,
+ the impact on the volatility of those stock prices related to increased trading and rebalances.

2021 has seen some stories develop around the extreme concentration in a very small number of names of some very large strategies tracking clean energy or around the disproportionate ownership of illiquid mirco caps by some other strategies.

However, as with everything else in investing, the keyword is balance. This is why we decided to include this last building blocks in our approach to thematic funds. **Notwithstanding the rest of the framework, portfolio construction expertise and know-how are key to building successful equity strategies, thematic or not. ETF providers have been honing these skills for decades now, offering very liquid, robust, time-tested investments in asset classes that used to be considered too dangerous or too illiquid, like small-caps or high-yield bonds.** As part of the fund selection framework, understanding the process around the liquidity and concentration risks of some smaller stocks or stocks that have recently experienced phenomenal momentum is key to managing the strategy's overall risk. In most cases, we expect good index providers and ETF issuers to introduce rules in their methodology to address those concerns within thematic ETFs. When it comes to active strategies, there is more discretion around the size of the position, and it can be challenging to know the inner workings of the portfolios.

- **Discipline**

As we have pointed out before, there is no widely established consensus within the thematic landscape, whether a company sits in a theme or not. This gives wide latitude to managers when creating and managing a fund. **One of the risks with discretionary, active funds is that without benchmarks, peer groups, or systematic strategy rules and methodology to constrain them, performance chasing is tempting. Systematic strategies, even 'expert-driven', are constrained by a methodology and rules, ensuring time consistency of the approach.** Some of the top-performing managers in 2020 were defined by their positions in Tesla[12]. If Tesla logically fits their theme, this is great. If Tesla was a way to chase performance, then no one knows what the next 'Tesla-like' performance story is. Is that manager going to go after that next story continually?

This discretion allows, for example, active managers to change their allocation to adjacent themes over time. For example, when there is a short-term return differential between 2 adjacent Themes, say, Artificial Intelligence and Cloud Computing, like in 2020. There might be certain incentives for a manager offering a strategy in Artificial Intelligence theme to build within the portfolio an exposure to the Cloud Computing to chase this potential higher return in the shorter term. When the situation is inverted, the active manager might disinvest from Cloud and reinvest in more focused AI. These deviations may be detrimental to investors in multiple ways. First, performance chasing is not always successful, and the timing of such divergence may be ill-advised. Second, combined with the lack of transparency, this could lead to a reduced diversification in the overall portfolio of the investor leading to overconcentration in specific stocks or sectors.

Concluding our selection framework, we would like to highlight that selecting a successful thematic investment vehicle is easier said than done. While there is never any guarantee in investing, the five building blocks listed in this chapter form a framework that can help investors differentiate between potentially compelling thematic strategies and those that are not as well-positioned to capture the potential offered by a given theme. Having provided a framework to classify and organise thematic investments based on their objective and investment process, the next chapter will focus on ways to consider embedding those best thematic funds in an investor's portfolio.

12 Tesla share price moved from $83.66 per share on the 31st December 2019 to $705.67 per share on the 31st December 2020. A gain of 643.5% in 2020.

3. Investing in thematic funds: Finding their rightful place in a portfolio

Whether thematic investments are used tactically or strategically, investors' portfolio allocation should be able to accommodate for them efficiently. Since thematic funds do not conform to classic investment classification such as sectors or countries, a clear, innovative portfolio allocation strategy is necessary to leverage their full potential.

After focusing on fund selection in chapter two, this third chapter will focus on different solutions to use thematic investments optimally. In particular, we will consider two main topics:

+ **How are the different themes interacting with each other? Whether investors are using thematic investment strategically or tactically, building a coherent, fit for purpose thematic sub-portfolio is key to success.** In most cases, a well-thought-out combination of thematic investments will deliver better results than a single investment. For a strategic approach, **Figure 25 illustrates how a diversified basket of investment themes across cluster and sub-cluster can provide long-term growth while controlling for downside risk.** For tactical investments, **simple momentum-driven strategies can deliver further added value, as demonstrated in Figure 27.**
+ **Where do thematic investments fit in the portfolio?** We will focus on three main approaches to incorporate thematic funds most efficiently, starting from low impact approaches and moving to more involved portfolio revamps: The Core Satellite Approach, The Global Equity Approach, The Long-Term Approach.

We will also look at how the selection criteria for thematic funds can make it easier to leverage their potential in an asset allocation or make it more complicated.

Strategic or tactical thematic portfolio: how to combine the different themes?

Thematic investments can be used either strategically to benefit from the long-term growth inherent to investing in world-changing megatrends or tactically, trying to benefit from the hype cycle that such investment themes can go through. Depending on the investor's objectives, different strategies can combine thematic investments in a value-added approach.

• Strategic thematic investment

Investment themes and their underlying stories are intimately grounded in the long-term. Their growth potential is linked to transformative megatrends that promise to change the world over multiple years, not multiple weeks. Furthermore, **themes offer a tangible relationship between the underlying drivers of long-term economic growth and the day-to-day developments in our life. This can help investors evaluate the long-term potential of thematic investments and visualise their current position on the path to success.** This is a possible way to anchor portfolio success to long-term growth.

Having said that, the considerable return potential of thematic investments is also linked to significant risks. Going in tandem with higher return expectations, thematic investments tend to exhibit higher volatility as well as higher valuations. However, there is an obvious diversification potential when considering thematic investments, especially those with high clarity of theme and high purity of exposure, as discussed in chapter two. Even if most thematic strategies remain correlated to broader equity benchmarks, the idiosyncratic tailwinds and challenges facing each theme might provide significant diversification.

Each theme behaves differently in the face of the same set of circumstances, and 2020 was no different:

+ In H1 2020, a large part of the world transitioned from office working to remote working, boosting thematic strategies such as Cloud Computing.
+ In H2 2020, with the pandemic continuing unabated, the demand for laptops, video games, entertainment, or streaming increased, leading to increased demand for semiconductors.
+ With President Joe Biden's election and the promise that the U.S. would re-enter the Paris Climate Accord and focus on Climate Change issues, environmental oriented Themes benefitted from a boost in late 2020.

Any of the events above would have been tough to forecast—accurately predicting all of them and how markets would respond would have been nearly impossible. A strategic basket of differentiated thematic funds would have handled such events more robustly. In everything investment-related, diversification is crucial, and it is the case for thematic investments as well.

Figure 24 shows the correlation matrix of historical excess returns (vs MSCI All Country World Index) between ten different Themes[13]. **This matrix demonstrates the significant diversification potential between the themes. In building a strategic thematic portfolio, higher diversification could be achieved by spreading the investments across themes, clusters, and sub-clusters.**

13 Performance is calculated using the methodology described in the appendix "A quick guide to the average performance of clusters, sub-cluster, or themes", which minimises survivorship bias.

FIGURE 24: HISTORICAL CORRELATION OF THE EXCESS RETURN vs THE MSCI ALL COUNTRY WORLD INDEX OF SOME THEMES IN THE WISDOMTREE THEMATIC CLASSIFICATION

	Aging Population	Rise of the Middle Class	Wellness	Sustainable Energy Production	Sustainable Resource Management	Natural Resources	HealthTech	Robotics & Automation	Platforms & Digital Markets	Fintech & Digitalisation of Finance
Aging Population	100%	19%	55%	-2%	55%	14%	64%	13%	25%	10%
Rise of the Middle Class		100%	22%	10%	21%	11%	5%	3%	15%	21%
Wellness			100%	3%	25%	40%	52%	-26%	21%	20%
Sustainable Energy Production				100%	42%	25%	-4%	-2%	12%	15%
Sustainable Resource Management					100%	26%	27%	15%	22%	12%
Natural Resources						100%	9%	-43%	6%	23%
HealthTech							100%	9%	11%	13%
Robotics & Automation								100%	29%	-24%
Platforms & Digital Markets									100%	12%
Fintech & Digitalisation of Finance										100%

Source: WisdomTree, Morningstar, Bloomberg. From December 1999 to February 2021. Returns are calculated in US dollars on a monthly basis. The correlation is calculated only when returns are available from both themes in the considered pair. Themes are colour coded according to the cluster they belong to. ***Historical performance is not an indication of future performance and any investments may go down in value.***

Taking this example further, in Figure 25, we have created random illustrative thematic portfolios with increasing diversification characteristics.

1. In the top left graph in Figure 25, we focus on a portfolio that would invest in one theme only at any point in time:

+ We create 10,000 portfolio simulations. In each simulated portfolio, every quarter, a different Theme is selected. This random sampling of themes' proxies for the fact that investors cannot in advance know for sure which theme will perform the best going forward. It also simulates the performance of a typical investment rotating between multiple concentrated strategies, focused on one theme, as opposed to thematic investments offering a more diluted exposure.

+ Each quarter, the performance of the simulated portfolio is represented by the historical average performance of the chosen theme using the methodology described in the appendix[14].

+ As illustrated in the graph, on average, such an **investment in one theme would have gained 172% net of fees from the end of 2005 to the end of 2020. However, the performance dispersion of the simulated portfolio paths is very high. 10% of the simulations would have returned less than 56% over the 15-year periods.** Depending on the themes an investor would have picked each quarter, the thematic portfolio could have done very well or very poorly.

2. In the top right graph in Figure 25, we increase the diversification potential by picking randomly not one but three different themes to invest in at any point in time:

+ We create 10,000 portfolio simulations. In each simulated portfolio, every quarter, three different themes are selected.

+ Each quarter, the performance of the simulated portfolio is represented by the average performance of the three chosen theme.

+ **The average performance of those portfolios is very similar to the previous example, but the performance dispersion of simulated portfolios is significantly reduced. Now the worst 10% percentile stands at 107% instead of 56%.**

3. In the bottom left graph in Figure 25, we further improve diversification by randomly investing in six themes:

+ We create 10,000 portfolio simulations. In each simulated portfolio, every quarter, six different Themes are selected.

+ **Again, the average performance is the same, at 172%, but the performance is significantly reduced, the worst 10% percentile stands at 130% instead of 107%.**

4. In the bottom right graph in Figure 25, we increase the diversification by forcing a diversification across clusters:

+ We create 10,000 portfolio simulations. Every quarter, in each simulated portfolio, six different themes are selected with the constraint that every quarter two themes per cluster are picked[15].

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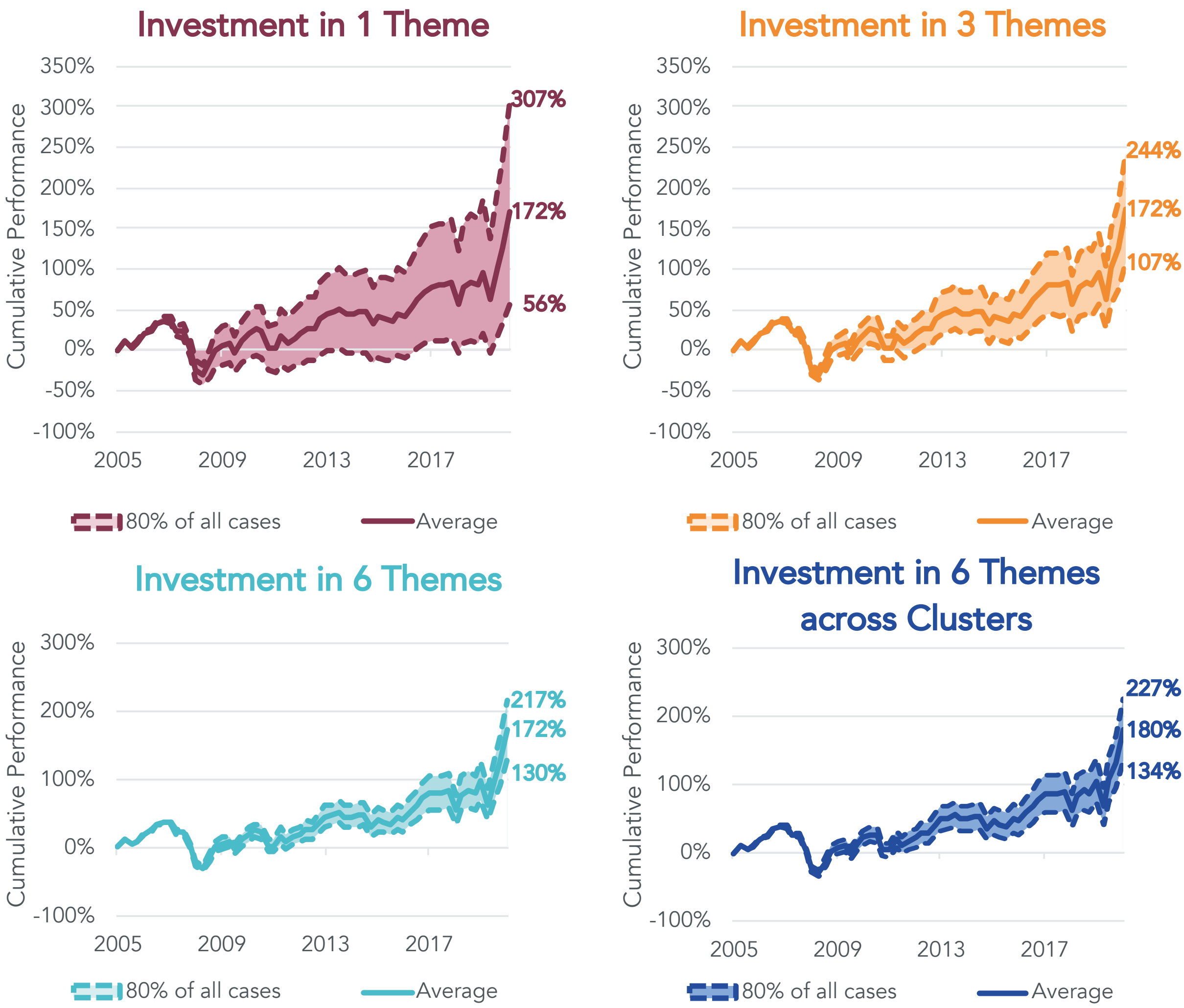
14 See appendix "A quick guide to the average performance of Clusters, Sub-Cluster or Themes".

+ **The increased diversification improves the average performance to 180%. Even more importantly, the worst 10% percentile stands at 134%.** This is an 78% improvement compared to the portfolios investing in one Theme.

The clear conclusion of this analysis is that by investing in multiple themes (through multiple thematic investments dedicated each to one specific theme), it is possible to improve the thematic portfolio's robustness without compromising the performance.

FIGURE 25: PERFORMANCE DISPERSION OF SIMULATED THEMATIC PORTFOLIOS BASED ON THE NUMBER OF THEMES THEY RANDOMLY SELECT EACH QUARTER



Source: WisdomTree, Morningstar, Bloomberg. From December 2005 to December 2020. Returns are calculated in US dollars on a monthly basis. Each graph plots the average of the simulated cumulative performance of 10000 simulated portfolios. In each simulation, a group of investment themes are picked randomly (one theme, three themes or six themes in the respective graphs) every quarter. The monthly performance of the portfolio in each simulation is calculated as the average monthly performance of each of the themes in the portfolio. The monthly performance of each investment theme is calculated as the average monthly performance of every Europe-domiciled fund live at that point in time and classified in the theme, as explained in appendix[14]. ***Historical performance is not an indication of future performance and any investments may go down in value.***

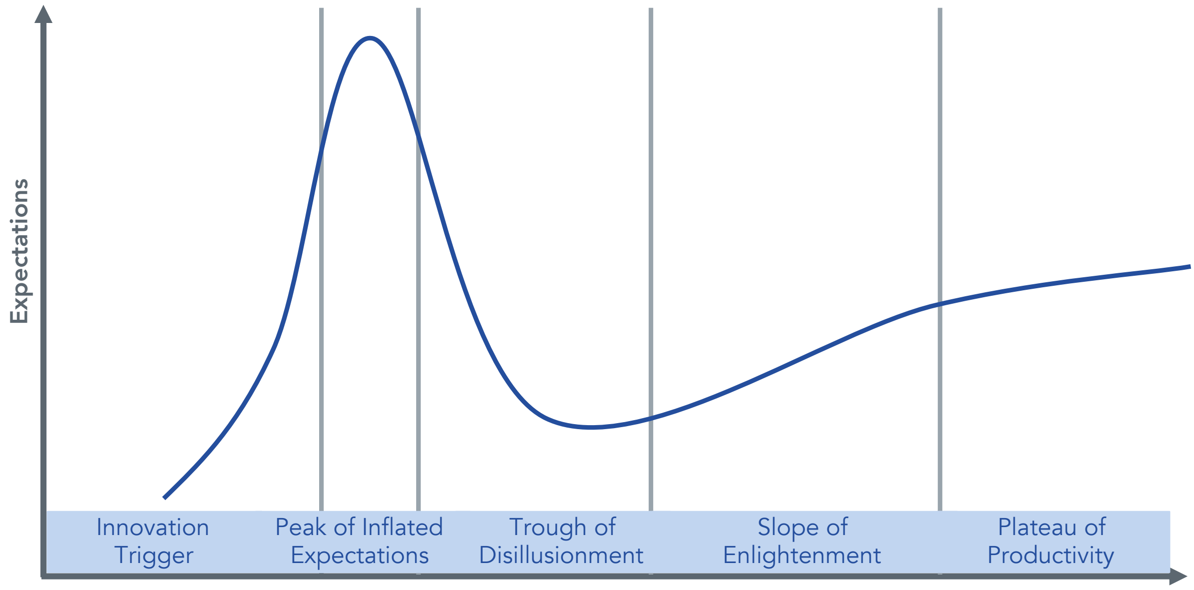
15 Due to the lack of data historically in the Geopolitical Shifts Cluster, we have only focused on the other three Clusters.

- **Tactical thematic investment**

Even though thematic investments tap into megatrends' long-term growth potential, they do not guarantee linear market-beating returns. As discussed previously, **each theme has its own set of idiosyncratic factors and, therefore, its own path to success or failure.** Companies' financial performance and, by extension, funds' performance will fluctuate over time, following the meandering course of the relevant Theme's development and adoption globally. **Such a meandering path to growth can, of course, lend itself to a more tactical approach. Investors could try to improve or optimise their return by benefiting from the peak and trough experienced by each investment theme.**

In that mindset, the Gartner 'Hype Cycle', Figure 26, is a helpful conceptual framework to illustrate how the world tends to behave in the face of new technological innovations and, by extension, showcases the different steps in the evolution of a theme. While it would be nice if expectations were linear and 'accurate', the 'Hype Cycle' helps characterise how emotions come into this important equation.

FIGURE 26: THE GARTNER HYPE CYCLE



Source: Gartner.

Phase 1: The Innovation Trigger

When the information about new technology is first introduced and comes out, it begins to proliferate widely. It gets picked up by journalists and media in general, and the excitement about its potential starts to build. It tends to climb steeply as people's expectations rise quickly.

Phase 2: The Peak of Inflated Expectations

When the news about a given technology has been shared widely, the story itself is no longer new. Everyone is excited, and all you might hear are incredibly optimistic forecasts about upcoming trends and events. It is unlikely to hear too much about risks at this stage. It is usually much easier (and faster) for people to raise their expectations than it is for the technology to scale and gain wide adoption. At this point in the cycle, expectations frequently outrun the fundamentals.

3: The Trough of Disillusionment

The Trough of Disillusionment is the result of people awakening to the concept of risk during Phase 2. Upon recognising the risk, and the realisation that while the technology's potential is still intact, its development or adoption will take time. What can happen is akin to the 'bursting of a bubble'. People awaken to the potential unforeseen challenges and circumstances that can extend the time before the new technology is widely and fully adopted in a profitable, efficient manner.

Phase 4: The Slope of Enlightenment

Investors start to see how the various risks realised in Phase 3 could be productively dealt with. This is usually a phase where adoption gets more sweeping. Investors now have a more appropriate baseline, recognising the risks and challenges while seeing how their effects could be mitigated. Now the technology is being adopted more sustainably.

Phase 5: The Plateau of Productivity

The end of the cycle. The new technology is no longer 'new' — it is now fully adopted across its addressable market. Instead of being viewed as an 'innovation', it might be more appropriate to think of it as part of the world, as part of everyday life.

Investors, particularly tactical investors, in thematic funds would be well-served to have some version of this framework in mind. **Using that 'Hype Cycle', investors could better position their investments in this continuum and better set their expectations.** At or near the 'Peak of Inflated Expectations', the risk is higher, leading to either positive or negative returns. On the 'Slope of Enlightenment', the risk can be lower, but the returns may not be as high as during the road to the 'Peak of Inflated Expectations'.

One exciting example illustrating the potential of tactical investment in the thematic landscape is a momentum-driven thematic strategy. Academics have shown over and over that Momentum is pervasive across asset classes, across time periods and delivers improved risk-adjusted returns through rotation. We create two illustrative strategies to test this hypothesis:

1. the **WisdomTree Illustrative Thematic Momentum Portfolio** invests every quarter in the five themes that performed the best in the prior twelve months (with one month lag to deal with short-term reversal effect and ensuring that no front running is involved). Performance is calculated using the methodology described in the appendix[16], which minimises Survivorship bias. In this strategy, no fund selection is applied as each theme is represented by all the funds in the relevant peer group.
2. the **WisdomTree Illustrative Thematic Tactical Portfolio**, which uses Momentum to select the themes as well as the investment vehicles. This strategy aims to harness both the momentum between themes and the dispersion among investment funds targeting each investment theme. **The portfolio invests in the same momentum-selected themes as the first portfolio, but instead of investing in all the funds, the portfolio picks the fund with the best performance in the prior twelve months in each of the five selected themes (with one month lag).**

In Figure 27, we compare the performance of the two strategies above to:

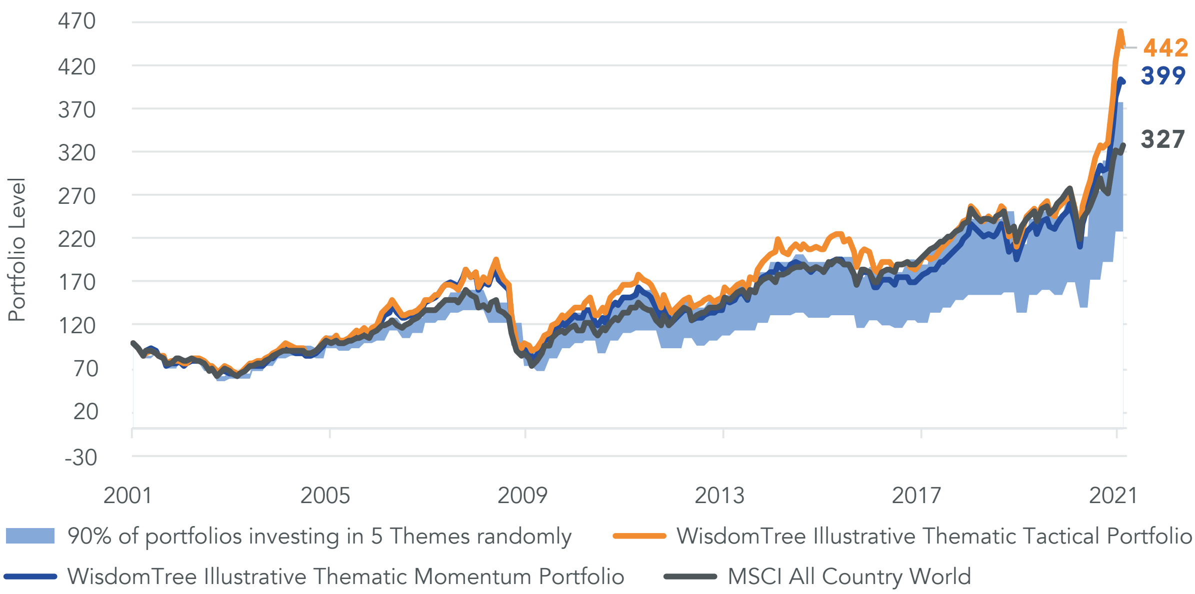
+ The MSCI All Country World Index
+ A diversified basket of five investment themes. We construct 10,000 random portfolios of five investment themes removing hindsight from the analysis. Each portfolio invests every quarter in five randomly selected themes. The performance of each investment theme using the methodology described in the appendix[16].

16 See appendix "A quick guide to the average performance of clusters, sub-cluster or themes".

We observe that:

- Over the last 19 years, **the WisdomTree Illustrative Thematic Momentum Portfolio would have outperformed the MSCI All Country World Index by 1.0% on average per year** while only raising the volatility slightly. The Sharpe ratio is improved from 0.29 for the MSCI All Country World Index to 0.31.
- Over the last 19 years, **the WisdomTree Illustrative Thematic Tactical Portfolio would have outperformed the MSCI All Country World Index by 1.6% on average per year.** The Sharpe ratio is further improved to 0.33.
- The WisdomTree Illustrative Thematic Momentum Portfolio would have outperformed 96% of the 10,000 portfolios randomly investing in five investment themes.
- The WisdomTree Illustrative Thematic Tactical Portfolio would have outperformed 99% of the 10,000 portfolios randomly investing in five investment themes.

FIGURE 27: PERFORMANCE OF THE TWO WISDOMTREE ILLUSTRATIVE PORTFOLIOS vs MSCI ALL COUNTRY WORLD INDEX SINCE 2001



	Annualised Return	Volatility	Sharpe Ratio
WisdomTree Illustrative Thematic Momentum Portfolio	7.1%	18.1%	0.31
WisdomTree Illustrative Thematic Tactical Portfolio	7.7%	18.8%	0.33
MSCI All Country World	6.1%	16.1%	0.29

Source: WisdomTree, Bloomberg, Morningstar. 31st January 2001 to 28thFebruary 2021. Returns are calculated in US dollars on a monthly basis. The Momentum score is calculated using the last 12-month historical performance, with the most recent month return removed. Both Portfolios are rebalanced quarterly in March/June/September/December. The WisdomTree Illustrative Thematic Momentum Portfolio invests in five themes at all times. The performance of each theme is represented every month by the average monthly performance of all the funds in the theme at that point in time. The WisdomTree Illustrative Thematic Tactical Portfolio invests in five themes at all times. Each theme is represented by one fund selected as the fund with the best momentum in that Theme. ***Historical performance is not an indication of future performance and any investments may go down in value.***

Both approaches are not foolproof, of course. They benefit from numerous periods of outperformance but also suffer from some periods of underperformance. Momentum, as a strategy, tends to suffer from sharp changes in regimes, and this is the case here as well. However, both approaches underscore the potential for alpha generation through tactically rotating between Themes.

• The right thematic funds for your portfolio

To leverage a strategic investment in thematic funds to its full potential, expertise and differentiation are critical in the fund selection. The clear objective is to extract the most of a theme's growth over the long-term while benefitting from the diversification offered by thematic investments. It stands to reason that the selected investments need to provide exposure to stocks that do not traditionally feature in core investments (see Differentiation in Chapter two). The chosen thematic funds also need to deliver diversification between each other. This is why the framework highlighted in Chapter two can help investors select the most efficient funds for a strategic thematic Investment.

When investing tactically in themes, the clarity of purpose, the expertise, and the purity of exposure of the funds used by an investor represents vital characteristics. It is paramount that the selected fund focuses on the exact theme that the investor has identified for short-term performance. If the selected fund invests in adjacent themes, the investor will not benefit from the entire upside of its tactical allocation when she/he is right. This is a very real pitfall, as demonstrated in Chapter two.

The fund also needs to deliver a direct exposure to the theme. Any diluted or unfocused funds would not allow the investor to benefit from his/her investments, even if the timing and theme selection were accurate. This is why the framework highlighted in Chapter two can help investors pinpoint the most efficient funds for a tactical thematic investment.

Three approaches to fit thematic investments in a portfolio

Whether thematic investments are used tactically or strategically, an investors' portfolio allocation needs to be able to accommodate them efficiently. However, they do not fit naturally in pre-existing processes and frameworks.

Multiple approaches can be suitable depending on the investor's investment objective, her/his existing portfolio, and the extent to which she/he would want to invest in thematic funds. In most cases, the investors aim to find a place for thematic funds to thrive without disturbing the rest of the portfolio, but some investors may want to revamp their asset allocation more profoundly to leverage thematic investments more widely. This chapter focuses on three possible approaches to incorporate thematic investments in an allocation:

+ **The Core Satellite Approach:** In this approach, the portfolio is split between the core, representing the Strategic Asset Allocation and the satellites that aim to provide diversification and high-growth potential. This approach is particularly well suited to the tactical use of thematic investments. Thematic investments can be used very easily as satellites, especially if their holdings are significantly differentiated from the core. **In Figure 28, we illustrate the potential improvement to a 60/40 portfolio using five thematic satellites.**
+ **The Global Equity Approach:** The idea is to create a global equity sleeve on the side of the rest of the asset allocation. This sleeve houses thematic investments, which tend to not adhere to classic geographical or sectorial splits, without compromising the rest of the portfolio's allocation.

This approach is well suited to both tactical and strategic use of thematic investments. **Strategically adding a diversified thematic sub-portfolio to a classic multi-asset portfolio would have improved the efficient frontier over the last 15 years, as highlighted in Figure 29.**

+ **The Long-Term Approach:** Thematic funds are designed to benefit from long-term trends with high growth potential. Building a portfolio around a diversified core of thematic funds could be an innovative way to identify and invest early in the mega caps of tomorrow. This approach is explicitly suited to a strategic and diversified use of thematic investments. **While each separate thematic fund may deliver a concentrated exposure, a well-diversified portfolio of thematic funds can exhibit diversification characteristics similar to standard market-cap indices.**

• The Core Satellite Approach: Using thematic Investments as Satellites to a Core allocation

A Core-Satellite portfolio is split into two main parts:

+ The core represents the Strategic Asset Allocation of the portfolio and aims to deliver long-term positive returns while controlling for risk;
+ The satellite aims to provide diversification and high growth potential.

This approach is particularly well suited to add investments in thematic funds. Satellites can be added to the portfolio without disrupting the core, leaving the investor's strategic asset allocation intact. It is also designed to accommodate multiple satellites and, therefore, multiple thematic funds, allowing for diversification. It is particularly well suited to tactical use of thematic investments. It allows for thematic investments to be added, removed, or rotated depending on the market's evolution over time while keeping the core of the portfolio stable.

In Figure 28, we create the WisdomTree Illustrative Core Satellite Portfolio:

+ The core is a classic 60/40 portfolio investing in global equities and global bonds, using MSCI All Country World Index and Bloomberg Barclays Global Aggregate Index as proxies.
+ The satellites follow the WisdomTree Illustrative Tactical Thematic Portfolio described previously.

At all times, the portfolio is therefore invested in five satellites. We invested 20% in the satellite, i.e. 4% in each thematic fund. As illustrated in Figure 28, **The WisdomTree Illustrative Core Satellite Thematic Portfolio outperformed the Illustrative 60/40 Portfolio historically by 0.5% on average per year over the whole period, demonstrating the potential of such an approach**.

FIGURE 28: PERFORMANCE OF THE WISDOMTREE ILLUSTRATIVE CORE SATELLITE PORTFOLIO INVESTING IN FIVE THEMATIC FUNDS BASED ON THE WISDOMTREE ILLUSTRATIVE THEMATIC TACTICAL PORTFOLIO vs A CLASSIC 60/40 PORTFOLIO

	Annualised Return	Volatility	Sharpe Ratio
WisdomTree Illustrative Core Satellite Portfolio	6.3%	11.9%	0.40
WisdomTree Illustrative 60/40 Portfolio	5.8%	10.5%	0.41

Source: WisdomTree, Bloomberg, Morningstar. January 2001 to February 2021. Returns are calculated in US dollars on a monthly basis. Both Portfolios are rebalanced monthly. The WisdomTree Illustrative 60/40 Portfolio invests 60% of its assets in the MSCI All Country World net TR Index and 40% in the Bloomberg Barclays Global Aggregate TR Index. ***Historical performance is not an indication of future performance and any investments may go down in value.***

Of course, such a portfolio's success relies on the fact that the satellites deliver additive value to the core portfolio. This means, first and foremost, that the satellites have the potential to deliver high growth. However, it is also important that the thematic investments exhibit very high differentiation with the core, i.e. traditional indices.

- **The Global Equity Approach: Using a global equity sleeve to fit thematic investments**

Most portfolio allocations are built as an assemblage of region and sectors. Most thematic investments do not match such an approach. Therefore, fitting thematic investments in such a construction does not appear easy. To accommodate such investments in an already existing portfolio, a relatively straightforward way is to create a global equity sleeve. Such a sleeve can accommodate classic investments like global equity funds as well as thematic Investments. It also leaves the portfolio manager free to deal with regional and sectorial funds in the rest of the portfolio. The approach is well suited to both tactical and strategic use of thematic investments.

In the analysis below, we try to ascertain the optimal historical allocation to a strategic investment in thematic funds. Figure 29 shows the efficient frontiers of:

+ A two-asset portfolio between Equity (MSCI All Country World Index) and Fixed Income (Bloomberg Barclays Global Aggregate Index).

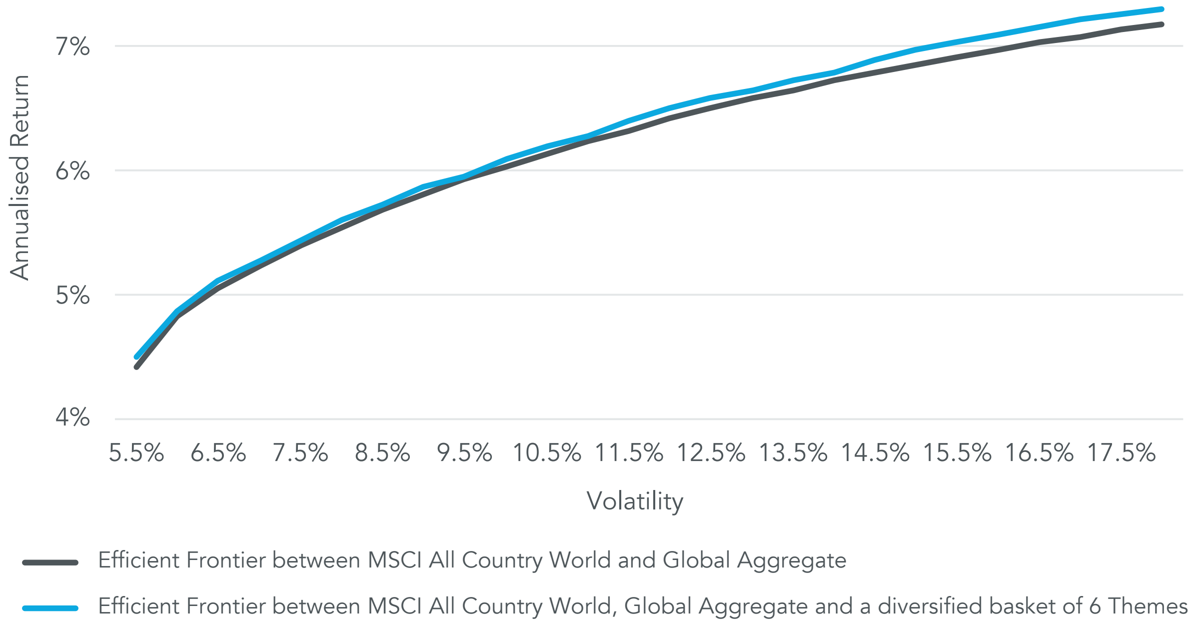
+ A three-asset portfolio between Equity, Fixed Income, and a diversified thematic sub-portfolio. As an illustration, we decide to use a portfolio of six investment themes spread across three clusters, which means the thematic sub-portfolio invests in two Themes per cluster[17].

We construct the performance of a set of 5,000 simulated thematic sub-portfolios from 2005 to 2020. Each quarter every portfolio randomly selects the six themes it invests in until the next quarter. The performance of each theme is estimated using the performance of all the funds in the theme, as explained in the appendix[18]. This random sampling of themes simulates the case when investors have no views around which themes will perform the best in the next quarter. It also simulates a typical investment in multiple concentrated thematic investments, each focused on a different single theme.

For each of the 5,000 simulated portfolios, we then calculate the efficient frontier for the set of three assets, the simulated thematic sub-portfolio, global equities (through the MSCI All Country World Index) and global bonds (through the Bloomberg Barclays Global Aggregate Index). For each of the 5,000 simulated, thematic sub-portfolios, the efficient frontier changes. In Figure 29, we show the average of all 5,000 efficient frontiers.

We observe that the introduction of the thematic sub-portfolio improves the efficient frontier for all volatility levels on average, demonstrating the advantages of investing strategically in thematic funds.

FIGURE 29: AVERAGE MARKOWITZ EFFICIENT FRONTIER FOR A SET OF THREE ASSETS: MSCI ALL COUNTRY WORLD INDEX, BLOOMBERG BARCLAYS GLOBAL AGGREGATE INDEX, AND A SIMULATED THEMATIC SUB-PORTFOLIO



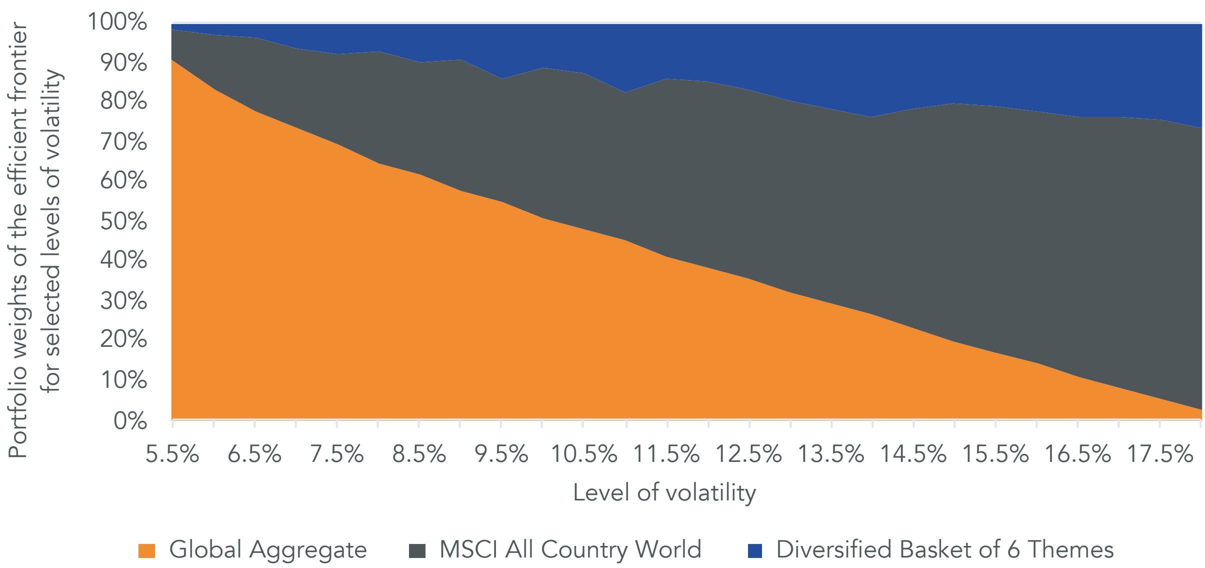
Source: WisdomTree, Bloomberg, Morningstar. December 2005 to December 2020. Returns are calculated in US dollars quarterly. The average efficient frontiers are constructed as follows. 5,000 thematic portfolios of 6 investment Themes are created by randomly selecting six Themes every quarter. For each one of those portfolios, a historical efficient frontier is calculated for a set of 3 assets: the simulated thematic sub-portfolio, MSCI All Country World net TR Index and Bloomberg Barclays Global Aggregate TR Index. The average efficient frontier is the average of those individual 5000 historical efficient frontiers. The performance of a simulated thematic

17 We do not use data from Geopolitical Shifts as the number of Europe-domiciled funds and the length of track record is limited.

*portfolio is derived from the performance of the six investment Themes held in the portfolio in each quarter computed using the methodology explained in the appendix[18]. **Historical performance is not an indication of future performance and any investments may go down in value.***

In Figure 30, we exhibit the average optimal weight of each of the three assets in the efficient portfolio for each level of volatility. **We observe that the optimal weight of the thematic sub-portfolio increases with the target volatility. For most volatilities, the optimal weight in the thematic sub-portfolio is higher than 10% and reaches close to 30% for the highest level of volatility.** It is worth noting as well that the proportion of the thematic sub-portfolio in the equity part of optimal portfolios hovers around 20% for most volatility levels. This means that historically for every $100 invested in equities, about $80 should have been invested in traditional equity funds and $20 in thematic funds.

FIGURE 30: AVERAGE WEIGHTS IN THE EFFICIENT PORTFOLIOS FOR A SET OF THREE ASSETS: MSCI ALL COUNTRY WORLD INDEX, BLOOMBERG BARCLAYS GLOBAL AGGREGATE INDEX, AND A SIMULATED THEMATIC SUB-PORTFOLIO



*Source: WisdomTree, Bloomberg, Morningstar. December 2005 to December 2020. Returns are calculated in US dollars quarterly. The average efficient frontiers are constructed as follows. 5,000 thematic portfolios of 6 investment Themes are created by randomly selecting six Themes every quarter. For each one of those portfolios, a historical efficient frontier is calculated for a set of 3 assets: the simulated thematic sub-portfolio, MSCI All Country World net TR Index and Bloomberg Barclays Global Aggregate TR Index. The average efficient frontier is the average of those individual 5000 historical efficient frontiers. The performance of a simulated thematic portfolio is derived from the performance of the six investment Themes held in the portfolio in each quarter computed using the methodology explained in the appendix[18]. **Historical performance is not an indication of future performance and any investments may go down in value.***

Such an approach relies on the thematic strategies' growth potential, but their diversification benefits are extremely important as well. If the differentiation of thematic investments versus the core is not high enough, then the potential to improve the efficient frontier is lessened significantly. This again elevates the fund selection's utmost importance for the success of the portfolio allocation, as discussed in Chapter two.

18 See appendix "A quick guide to the average performance of clusters, sub-cluster or themes".

- **The Long-Term Approach: Replacing the portfolio's core with a high-potential diversified basket of thematic funds.**

Core holdings in a portfolio are meant to deliver the strategic foundation for an investor's long-term allocations. They are meant to provide long term consistent returns reliably. Those core holdings are critical to the long-term performance of an investor's portfolio. Traditionally, investors pick a low-risk diversified basket of global large-cap stocks as their core, very often wrapped in index funds, ETFs, or mutual funds.

Recent academic research has shown that historically, the return for equity markets has been dominated by a tiny number of very successful companies. In contrast, most listed companies delivered sub-par returns. **The top best 4.31% of listed stocks in the U.S. accounted for all the wealth creation from equity investment above U.S. Treasury between 1926 and 2016[19]. Internationally, only 1.33% of all companies accounted for the net global wealth creation[20].** In other words, the equity market's long-term outperformance is driven by a handful of businesses benefitting from structural growth. These findings highlight the value that can be created by focusing on these high growth names at the expense of the rest of the market. However, there are also considerable risks attached to such an approach. It is very possible, indeed, that investors do not select the right companies to invest in. This is why most approaches rely on diversified equity investments in their core holdings, depending on casting a wide net, so to speak.

Thematic investments could provide a better solution to this problem. By design, thematic strategies provide exposure to companies with significant exposures to megatrends and, therefore, with high growth potential. A thematic investment could be an innovative way to filter between companies and create sub-baskets of companies with a higher likelihood of ending up as long-term winners. **Creating a core portfolio made of a diversified basket of thematic investments spread across clusters and sub-clusters could offer an innovative new solution to build long-term asset allocations. By diversifying their investments across multiple themes, investors could create diversification in their core portfolio and allow for the core to providing long term consistent returns reliably.**

In Figure 31, we consider a simple WisdomTree Illustrative Core Thematic Portfolio invested in the three largest thematic funds by assets under management at the end of 2020 in each of our three main clusters (i.e. Technological Shifts, Demographic and Social Shifts, Environmental Pressures). The portfolio is equal-weighted between the nine funds, which creates exposure to nine investment themes.

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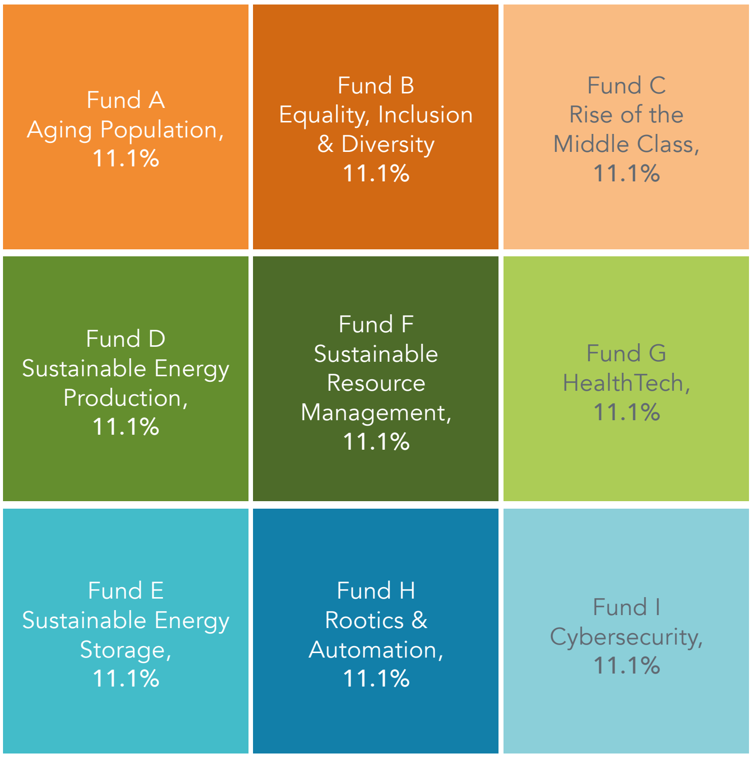
19 Bessembinder, H. 2018. Do Stocks Outperform Treasury Bills?. Journal of Financial Economics, 129(3): 440- 457.

FIGURE 31: EXAMPLE COMPOSITION OF A WISDOMTREE ILLUSTRATIVE CORE THEMATIC PORTFOLIO



Source: WisdomTree.

Some funds are individually very concentrated in a few number of sectors. Fund C, for example, invests 82% of its assets in Consumer Discretionary or Fund I is invested almost exclusively in Information & Technology as illustrated in Figure 32.

FIGURE 32: SECTOR WEIGHTS OF INDIVIDUAL THEMATIC INVESTMENTS

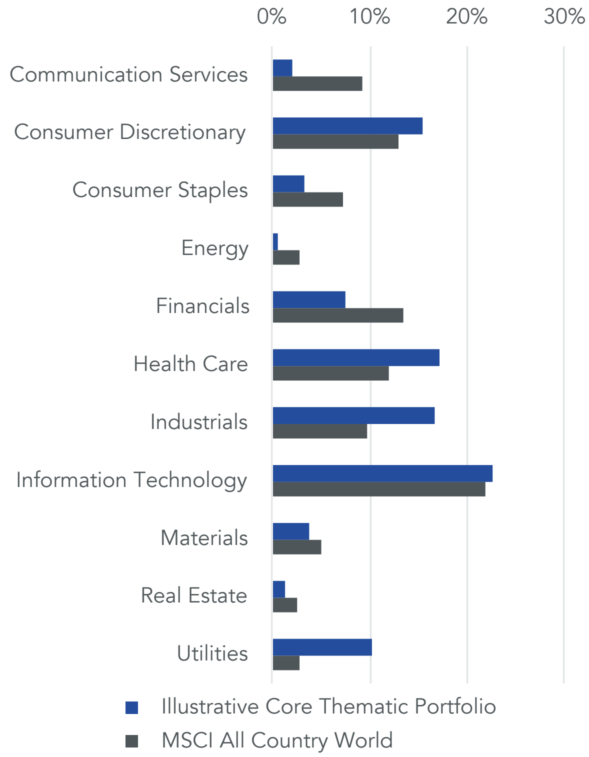
	Fund A	Fund B	Fund C	Fund D	Fund E	Fund F	Fund G	Fund H	Fund I
Communication Services	0.8%	10.5%				1.7%		4.6%	
Consumer Discretionary	9.7%	13.6%	82.6%		28.8%			4.3%	
Consumer Staples	2.4%	8.8%	17.4%						
Energy		2.1%		2.0%		0.2%			
Financials	39.3%	28.2%							
Health Care	45.2%	9.6%					97.3%	2.0%	
Industrials	0.5%	5.2%		24.9%	31.3%	47.6%		22.1%	17.5%
Information Technology		7.4%		25.8%	11.4%	6.3%	2.7%	67.1%	82.5%
Materials		3.0%			28.5%	2.5%			
Real Estate	2.1%	8.8%							
Utilities		2.8%		47.3%		41.8%			

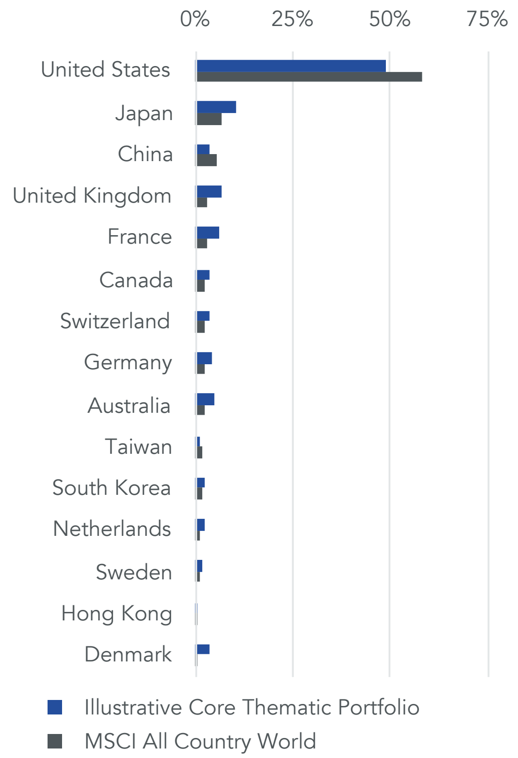
Source: WisdomTree, Bloomberg. As of 28th February 2021.

[20] Bessembinder, H., Chen, T., Choi, G., & Wei, K. 2019. Do Global Stocks Outperform US Treasury Bills? SSRN Electronic Journal.

However, by combining those different funds picked across multiple themes, the resulting portfolio is itself quite diversified across sectors, as illustrated in Figure 33. In fact, it does not exhibit larger overweight or underweight versus the MSCI All Country World Index than a classic core active mutual funds would. This analysis clearly illustrates how a diversified portfolio of thematic funds can create a core investment exhibiting similar characteristics as a more traditional investment while concentrating the portfolio in higher-growth names.

FIGURE 33: SECTOR AND COUNTRY WEIGHTS OF THE WISDOMTREE ILLUSTRATIVE CORE THEMATIC PORTFOLIO





Source: WisdomTree, Bloomberg. As of 28th February 2021.

Conclusion: Temper excitement & hype with careful analysis to harness the power of the thematic investments

As with everything in investment, there will always be below average, average, and above-average thematic investment vehicles. We hope that reading this paper will have inspired you to dive into the thematic space and embrace its opportunities and challenges.

In those last lines of our journeys through the space, we wanted to leave you with five parting thoughts:

+ It is possible that the most valuable thing that we have created is the classification itself since this allows one to go from a giant list—a veritable 'alphabet soup' of funds—to something that can be tracked and analysed. We are looking forward to doing further analysis and engaging with investors on new questions that could be investigated using the classification system. In a way, this paper marks the start of an exciting journey.
+ Figure 12 suggests that while past performance or behaviour cannot tell us the future, investors should pause and test any strategies that appear to be 'too diversified.' A basket of focused strategies has tended to do better than trying to go with strategies that attempt to 'do it all' in a single fund.
+ Figure 20 suggests that while the intuition and the expectation are that the revenue growth for companies in a theme should be higher than that of the broad market, some funds do focus on such companies with high revenue growth, placing a large amount of weight on them but also some funds do not.
+ While thematic investment is new and exciting, investors should embrace this excitement but try to ground it back in key investing principles that have existed in portfolio management for many decades. Figure 25 illustrates once again that diversification is key to avoid worst-case scenarios, and Figure 27 demonstrates how combining innovations (thematic investments) with established principles (momentum) can lead to better potential overall.
+ Finally, BEWARE OF FOMO (Fear Of Missing Out). Thematic investment is about tapping into the long-term potential of megatrends. It is not about chasing the next Tesla. For investors who have time horizons of 5, 10, 15, 20 or even more years, sticking to a strategy and only assessing possible changes at regular pre-defined intervals could be better than abandoning the strategy and trying to chase that next big thing.

We hope you enjoyed the journey through the thematic landscape with us, and we look forward to continuing our explorations in the years to come.

Appendix

Description of the different Themes

• Demographic & Social Shifts

This cluster focuses on the different forces that originate from changes in population and societies alike. It incorporates impacts of changes in the world's pyramid of age, the impact of the growing, younger, wealthier populations in emerging markets, as well as changes to societal values and lifestyle. The cluster encompasses the current evolutions in a country like India, with its very young population and a country like Japan, with one of the oldest populations in the world.

+ **Demographic Shifts:** This sub-cluster focuses on the changes driven by the rapid population growth in emerging countries as well as the decline in fertility rate and the ageing of the population in developed countries.
+ **Ageing Population:** This investment theme aims to benefit from changes driven by the lengthening of life expectancy worldwide and the increase in the proportion of persons aged above 65, particularly in developed countries.
+ **Millennials:** This investment theme aims to benefit from the switch from Baby Boomers to Millennials and Generation Z as the largest living generation, and the ripple effect in terms of way of life and consumption.
+ **Social Shifts:** The sub-cluster focuses on the evolution of lifestyle and social norms across the world.
+ **Equality, Inclusion & Diversity:** This investment theme aims to benefit from the economic boost created by, for example, closing the gender gap, increasing diversity and inclusion in companies, or boosting the proportion of female executives and board members.
+ **Rise of the Middle Class**: This investment theme aims to benefit from the enrichment of an increasing part of the population, driving larger access to discretionary purchases. This includes, for example, investments focused on luxury, travel, or tourism.
+ **Rise of the EM Consumer:** This investment theme aims to benefit from the emerging middle class in emerging markets which is sure to drive the demand for consumer categories.

• **Wellness:** This investment theme aims to benefit from the increasingly central role that health and well-being are taking in people's life. Investments focused on digital health or cannabis would be in this theme.

• Environmental Pressure

This cluster focuses on the environment and, more importantly, on the impact of human activities on the planet. It incorporates changes driven by sustainability issues, the increasing scarcity of resources and the need to address global warming and climate change.

+ **Climate Change & Sustainability:** This sub-cluster focuses on the impact of human activities on the planet, particularly on addressing global warming and climate change through changes in our overall consumption.

• **Decarbonisation:** This investment Theme aims to benefit from developing decarbonisation solutions. It focuses on companies trying to tackle climate change through the removal and fixation of carbon dioxide.

- **Sustainable Cities:** This investment theme aims to benefit from developing technologies aiming to make cities more efficient behind the scenes.
- **Sustainable Energy Production:** This investment theme aims to benefit from developing cleaner energy sources seeking to replace coal, oil, and gas for the long-term. This includes wind, hydro, solar power, or hydrogen, for example.
- **Sustainable Energy Storage:** This investment theme aims to benefit from the increasing needs in energy storage stemming from new intermittent energy sources such as solar or wind powers. It is linked to requirements in electric vehicles as well as electric grids and home solutions. Investment focused on Batteries are included in this theme.
- **Sustainable Food:** This investment theme aims to benefit from the need to produce an increasing amount of food to support a growing world population while maintaining and protecting global ecosystems and the biodiversity.
- **Sustainable Mobility:** This investment theme aims to benefit from the development and adoption of electric vehicles as a replacement for other forms of transportation. This includes, in particular, investments focused on electric cars.
- **Sustainable Resource Management:** This investment theme aims to benefit from sustainable management of limited natural resources in the face of the increase in consumption per capita and the population increase. Investments around the Circular economy, waste management, recycling, water can be included.

+ **Limited Resources:** This sub-cluster focuses on the changes driven by the increasing demand of material and commodities in a finite world.

- **Agriculture:** This investment theme aims to benefit from the increase in consumption per capita and the population increase that makes agriculture critical to feeding the planet.
- **Natural Resources:** This investment theme aims to benefit the fact that Natural Resources are limited, and demand increases exponentially. This theme focuses on the impact of the supply squeeze on different resources like timber, rare earth, or uranium, for example.

• Geopolitical Shifts

This cluster focuses on the forces driven by globalisation, the global geopolitical order changes with the rise of new geopolitical powers like China, for example, and the increasing polarisation of modern societies as a counterforce to globalisation.

+ **Globalisation:** This sub-cluster focuses on the changes driven by the globalisation.

- **Global Logistics:** This investment theme aims to benefit from the increasingly central role of logistics companies and process in a world where supply chains are globalised.

+ **Multipolarity:** This sub-cluster focused on the changes driven by the rise of new geopolitical powers like China and the increasing polarisation of modern societies as a counterforce to globalisation.

- **China's Rise:** This investment theme aims to benefit from the rise of China from a regional power to a global power able to rival the United States in particular through extensive infrastructure programs across the world like the Road & Belt.
- **Rise of Tension:** This investment theme aims to benefit from the increase in geopolitical tension and trade wars developing between regional and global powers.

- **Polarisation:** This investment theme focuses on the opportunity rising from a multipolar world.

- **Technological Shifts**

This cluster focuses on the different forces that originate from new technologies and innovation. It incorporates disruptive and emerging technologies as well as their impact on society and the economy, such as the increasing digitalisation and connectivity of the world. Over time, investment themes will come and go following the ever-changing landscape of new technologies.

+ **Disruptive Technologies:** This sub-cluster focuses on the changes driven by the introduction of emerging, disruptive technologies and the impact on societies and economies.

- **Artificial Intelligence:** This investment theme aims to benefit from the development and the adoption of Artificial Intelligence and Big Data.
- **Blockchain:** This investment theme aims to benefit from the increasing adoption of Blockchain technology across industries.
- **HealthTech:** This investment theme aims to benefit from developing biotechnology solutions and technology that have applications in human health.
- **Industry 4.0:** This investment theme aims to benefit from the digitisation of the manufacturing industry.
- **Nano Tech:** This investment theme aims to benefit from the development of nanotechnology across multiple fields like materials, medicine, and electronics.
- **NextGen Communications:** This investment theme aims to benefit from the development of new modes of communications and their related infrastructure. 5G is part of this theme.
- **Robotics & Automation:** This investment theme aims to benefit from the development of Robotics and the ever-increasing automation of the manufacturing process.
- **Space:** This investment theme aims to benefit from the shift of space-related technologies from governments to private companies.

+ **Hyperconnectivity & Digitalisation:** This sub-cluster focuses on the changes driven by the increasing digitalisation of the world and the impact of the hyperconnected world that is born from it.

- **Cloud Computing:** This investment theme aims to benefit from the shift of an ever-increasing portion of personal and enterprise software from local to cloud-based infrastructure.
- **Cybersecurity:** This investment theme aims to benefit from the increasing need for digital defence when society is more and more dependent on technology and digitalisation.
- **Digital Infrastructure:** This investment theme aims to benefit from the physical infrastructure need of digital companies. This includes data centres, fibre, towers, distributed antenna systems.
- **Internet of Things:** This investment theme aims to benefit from the development and increasing adoption of connected objects. IoT is a way to increase efficiency, save time, save money.
- **Platforms & Digital Markets:** This investment Theme aims to benefit from the development of platform-based businesses and digital markets.
- **Gaming & Entertainment:** This investment theme aims to benefit from the increasing portion of leisure of entertainment time spent online. This Theme includes streaming, gaming, virtual reality.

- **Social Media & Media:** This investment theme aims to benefit from the development of social media and the central role they are taken in the circulation of information.
- **Fintech & Digitalisation of Finance:** This investment theme aims to benefit from the banking system's digitalisation, the asset management industry, and the insurance sector.

A quick guide to the average performance of clusters, sub-cluster or themes

Please note that all performance of themes, sub-clusters or clusters are calculated directly from the net asset value of funds and ETFs. Performance is, therefore, net of fees.

- **Performance of a theme**

For any given theme, we consider each month all the ETFs and open-ended funds classified in that specific theme that have published a monthly return for that month in Morningstar. We then calculate the average of all those monthly returns to compute the average monthly return for that theme. So, the monthly return for January 2020 for the theme may include 19 funds, while the February 2020 return may comprise 21 funds (if two funds classified in that theme have been launched in the meantime). By collating monthly returns for the theme, we get the theme's average historical performance.

Therefore, the theme's average historical performance incorporates every ETF and open-ended fund focused on this theme. The theme's average historical performance is not biased towards surviving funds or successful funds. Every fund alive in a given month is included irrespective of its survival in the future or its success. Investments that try to focus on multiple themes and, therefore, classified either at Cluster or Sub-Cluster Level are not included.

- **Performance of a sub-cluster**

For any given sub-cluster, we consider each month all the themes that belong to this sub-cluster and calculate the average of the monthly returns of all those themes in Morningstar (assuming that at least one fund in the theme is live and therefore that the theme has a monthly return). By collating monthly returns for the sub-cluster, we get the sub-cluster's average historical performance. It is important to note that every fund included here focuses only on one theme. Investments that try to focus on multiple themes and, therefore, classified at a sub-cluster level are omitted.

- **Performance of a cluster**

For any given cluster, we consider each month all the themes that belong to this cluster and calculate the average of the monthly returns of all those themes in Morningstar (assuming that at least one fund in the theme is live and, therefore, that the theme has a monthly return). By collating monthly returns for the cluster, we get the cluster's average historical performance.

It is important to note that every fund included here focuses only on one theme. Investments that try to focus on multiple themes and, therefore, classified either at cluster or sub-cluster Level are not included.

- **Performance of Diversified Thematics**

We consider each month all the ETFs and open-ended funds that belong to the diversified Thematics cluster that have published a monthly return for that month in Morningstar. We then average all those monthly returns to compute the average monthly return of the Diversified Thematics cluster. By collating monthly returns for the Diversified Thematics cluster, we get the Diversified Thematics cluster's average historical performance.

Therefore, the Diversified Thematics cluster average historical performance incorporates every ETF and open-ended fund that belongs to the Diversified Thematics cluster. Only investments that try to focus on multiple clusters across the classification are therefore included here.

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