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後疫時代主題式 ETF 發展趨勢探討

Discussion on the Development Trend of Thematic ETF in the
Post-epidemic era

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中華民國 111 年 1 月
January 2022

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Yi-Chieh Hsu in the National Chengchi University

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摘要

台灣近幾年在 ETF (Exchange Traded Funds) 蓬勃發展，無論是在整體規模、受益人數都成長迅速，對發行者來說，產品的創新設計及規劃是發行公司互相較勁的重點。對於投資人來說，投資的選擇增加許多，對於新興商品的選擇，除了廣告媒體的推薦之外，如何在投資前是否能更清楚了解各類 ETF 的利與弊，亦是相當重要，繼 Smart Beta ETF (因子投資) 後，全球現在又出現新型態的「主題式 ETF」，被視為能對特定趨勢提供精準而聚焦的投資方式，使得主題式 ETF 的規模在全球迅速崛起。

2020 年 1 月新冠肺炎 (COVID-19) 爆發，接著擴散至全球，席捲而來的風暴影響了全球的政治、經濟、生活、以及心理，也使得人們更加關注於新型態的生活方式以及未來的趨勢，這樣的觀念也延伸到了投資趨勢，而「主題式投資」創造了一個趨勢型的投資方式，自 2018 年後國內開始出現較多主題式 ETF，疫情後因應生活變化更是增加許多特定類型的主題式 ETF，本研究透過國內、外的資料搜集以及文獻整理，探討出對於台灣在未來主題式 ETF 可因應生活上所需要的新科技趨勢拓展商機，且亦建議投資人在選擇主題式 ETF 上評估自身對於趨勢認同度並需留意趨勢變化。

關鍵字：主題式投資、主題式基金、後疫時代、指數型基金

Abstract

In recent years, Taiwan has prospered in the development of Exchange Traded Funds (ETFs). Both the overall scale and the number of beneficiaries have grown rapidly. For issuers, product innovative design and planning are the focus of competition. Furthermore, for investors, investment options have noticeably increased. For the selection of emerging products, in addition to the recommendations of advertising media, it is critical to understand the pros and cons of various ETFs before investing. Following the Smart Beta ETF (Factor Investing), a new type of "Thematic ETF" is now popular worldwide, which is regarded as an investment method that can provide precise and focused investment on specific trends, causing the scale of thematic ETFs to grow rapidly around the world.

The COVID-19 pandemic emerged in January 2020 and quickly spread throughout the world. It disrupted global politics, economies, people's lives, and mental health, as well as prompted people to consider new lifestyle options or opportunities for their future. This concept has also extended to investment trends, and "thematic investment" has created a trend-based investment method. Since 2018, the number of domestic thematic ETFs has gradually increased, as did the number of specific thematic ETFs, in order to adapt to life changes after the epidemic. This research has collected domestic and foreign data, as well as a literature review and document compilation, to discuss the business opportunities for Taiwan's future thematic ETFs that can meet the needs of new technology trends in life. Furthermore, it provides suggestions that investors evaluate their recognition of the trend before choosing thematic ETFs and pay attention to trend changes.

Keywords: ETF, Thematic ETF, Thematic Investing, Post-epidemic era

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Chapter 1: Introduction

1. Research Motivation

According to the Organisation for Economic Co-operation and Development's (OECD) September 2021 Economic Outlook Report, the world has benefited from government policy support, the rapid development of vaccines, and increased coverage of vaccines. The global economy has gradually recovered since the outbreak of the epidemic at the end of 2019. It is estimated that this year Global GDP will grow by 5.7%, demonstrating that global economic momentum has returned to the level it was at before the epidemic (OECD, 2021). Now the world is striving to coexist with the new crown pneumonia. The epidemic has brought about a significant impact on the global industry. In addition to subversive changes in people's lifestyles, it is also driving the focus of investment. Changes in network communication requirements and these structural changes have also led to the emergence of specific themed Exchange Traded Funds (ETFs).

The concept of ETFs was first introduced as a basket of stocks by the S&P 500 in 1989. According to Gary Gastineau, author of *The Exchange Traded Fund Handbook*, it was the first real attempt at an ETF. Unfortunately, a Federal Court in Chicago ruled that the fund was a futures contract and must be traded on a futures exchange. After that, the Toronto Stock Exchange launched the fund in 1990 and named it the "Toronto 35 Index" (TIPs 35). Three years later, the first ETF was officially listed on the U.S. Stock Exchange in 1993, also known as the S&P 500 Depository Receipt ETF (SPDR, stock exchange code SPY), which has been established for nearly 30 years and the scale has reached 455.22 billion U.S. dollars. This is currently the largest ETF in the world; during this period, various other ETFs have sprung up globally like bamboo shoots after a spring rain.

In 1999, Asia's first ETF, the Hong Kong Tracker Fund, was launched. In 2000, the world's first ETF with Real Estate Investment Trusts (REITs) appeared, including US iShares US real estate ETF. In 2002, iShares developed a series of US Treasury ETFs; until 2003, Taiwan's first ETF emerged called the Polaris Taiwan Top 50 Tracker Fund (known as Yuanta Taiwan Top 50 ETF) (章錦正, 2020), through 20 years, this ETF has completely tracked the Financial Times

Stock Exchange (FTSE) Taiwan Stock Exchange Taiwan 50 Index, which scale grows year by year. It is now the largest ETF in Taiwan with a market value of NT\$176.371 billion with more than 300,000 beneficiaries.

As of the end of October 2021, when this study was conducted, Taiwan's epidemic prevention measures had been reduced from Level 3 to Level 2, and "conditional" unblocking had begun. As the vaccine coverage rate reached 60% for the first dose, the second dose is expected to reach 60% by the end of the year, and it will gradually move toward the stage of overall immunization as it enters the post-epidemic era. As the second dose of the vaccine carries on, people have begun to return to their normal lives and have learned to coexist with the virus. However, at this time, new forms of home office work and remote classes have become part of everyone's daily routine, or as was done during the period of self-isolation. To maintain normal work and schoolwork, the basic requirement is for stable and rapid Internet penetration. Therefore, disruptive innovation themes such as 5G have begun to attract the attention of domestic investors, and the changes in ETF products will also echo the preferences of investors. Therefore, how will thematic ETFs develop as they enter the post-epidemic era? What are the causes? What is the overall trend? These are the motives that this study intends to explore.

2. Research Question and Purpose

The development of global ETFs has taken nearly 30 years and has been embraced by investors all over the world. This is mainly because ETFs can encourage investors to buy a basket of stocks at one time and eliminate the need to keep track of the market all of the time. Compared with traditional mutual funds, ETFs possess information transparency. Regarding high and low transaction costs, if one needs to purchase or redeem a stock, they can trade at the market price, which provides sufficient flexibility and convenience (Barrer, 2020). In the 25 years from 1993 to 2018, the stock god Buffett, who is worth more than 100 billion U.S. dollars, advised investors to make good use of index funds as investment tools. In a letter to shareholders, he even stated, “For the vast majority of small and medium investors who have time to conduct sufficient individual stock research, low-cost index funds may be the best choice for them to invest in the stock market.” This can be seen in Table 1.

Table 1. *ETFs vs. Mutual Funds*

	Mutual Funds	ETFs
Buy/Sell	Through the MF company or broker, end-of-day NAV	On-exchange, intraday
Transparency of Holdings	Typically published quarterly, on a 30-day lag	Fund holdings published daily
Minimum Investments	May have high minimums	1 share
Transparency of Trading Costs	Costs of inflow/outflows are borne by all MF holders. Costs reduce NAV daily for all.	ETF buyer/seller bears trading costs. All other investors not impacted
Tax Efficiency	The PM must transact in the holdings, can generate capital gains	More tax efficient due to secondary trading and in-kind create/redeem process
Expense Ratio	Generally higher	Generally lower
Transparency of Extra Fees	Sales load, 12b-1 fees, trading fees of all in/outflows	Standard trade commissions + bid/ask Spread
Liquidity	Only underlying portfolio	Underlying basket + ADV + correlated trading vehicles

Source: Barrer, 2020

The ETF asset class has moved from the stock type familiar to investors to the fields of bonds, energy, precious metals, and exchange rates. In recent years, with the intensification of

environmental protection and extreme climate issues, emerged ETF types regarding green energy, clean energy, biotechnology, medical, social responsibility, corporate governance, and sustainable development. According to ETFGI data, the global ETF asset scale exceeded 9.46 trillion U.S. dollars in September 2021, and the net inflow of 739.54 billion U.S. dollars from the beginning of 2021 to the end of August 2021 alone was a growth that had more than doubled when compared with the 373.01 billion U.S. dollars in the same period the previous year (ETFGI, 2021). During the past two years, the epidemic continued to grow against the trend, setting a record of 26 consecutive months of net capital inflows.

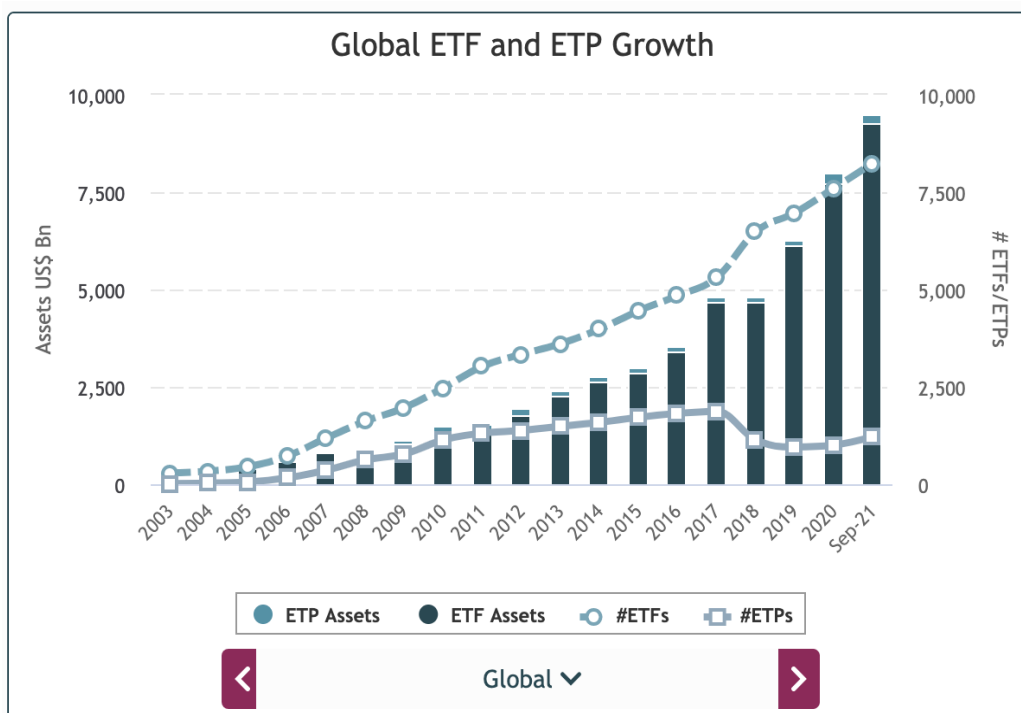


Figure 1. Global ETF and ETP Growth

Source: ETFGI, 2021

Among them, thematic investment has been the current global investment trend. In recent years, it has gradually attracted the attention of major index companies and asset management companies. According to Morgan Stanley Capital International (MSCI) information (as shown in Figure 2) as of August 2020, the scale of global thematic ETFs had exceeded 400 billion U.S. dollars (MSCI, Meet Thematic Investing, 2021).

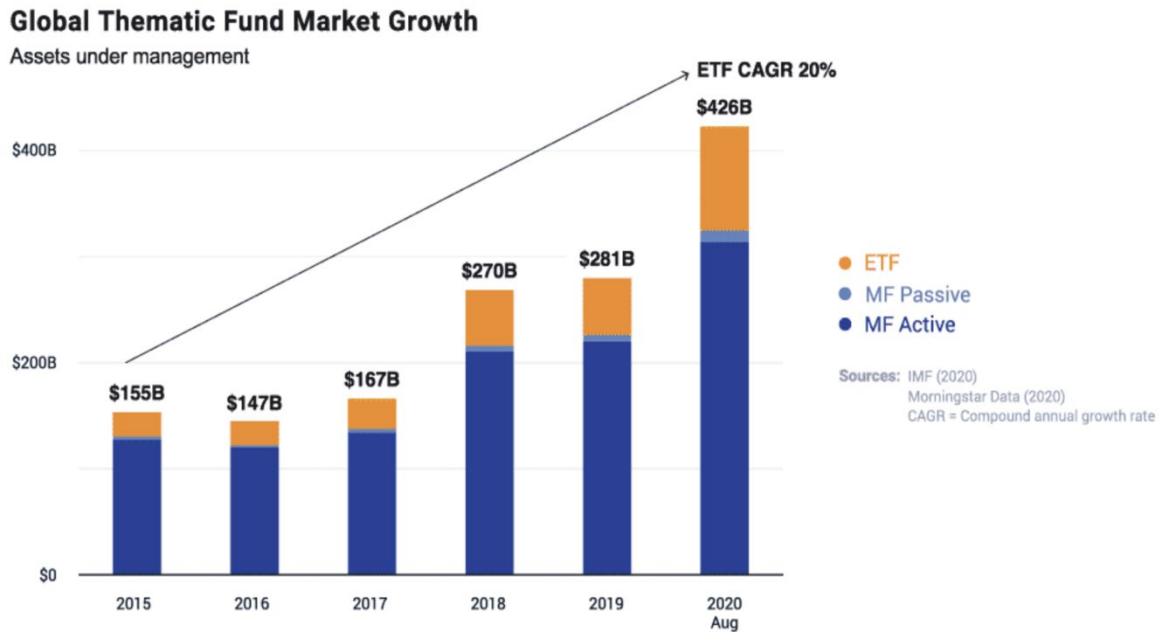


Figure 2. Global Thematic Fund Market Growth

Source: MSCI, 2021

The first ETF product launched by Taiwan in 2003 was Yuanta Taiwan 50, which was the fifth ETF issuing country in Asia that year after Hong Kong, Japan, Singapore, and South Korea. In 2006, the FSC also issued amendments to the “Securities Investment Trust Fund Management Measures” to loosen the regulations. In September 2006, the first industrial ETF “Fubon Taiwan Technology Index ETF” was launched by Fubon Investment Trust, followed by the launch of the first umbrella structure ETF. At present, the total number of ETF beneficiaries in Taiwan has exceeded two million. This demonstrates that the number of domestic investors who rely on ETF as the most reliable investment tool is quite high. Among them, it was observed that in the period following the outbreak of the epidemic in Taiwan, the number of domestic investment credits issued to thematic ETFs doubled, and the number of beneficiaries has also grown substantially. Therefore, this study selects domestic themes that are more indicative of scale and transaction volume. By using ETF as a reference sample while investigating micro-knowledge, I hope to explore the thematic ETF in the post-epidemic era, and use this to achieve the following research goals:

- Understand the difference and impact of ETF investment preferences before and after the epidemic.
- Summarize the development and trends of thematic ETFs in the post-epidemic era.

3. Research Process and Scope

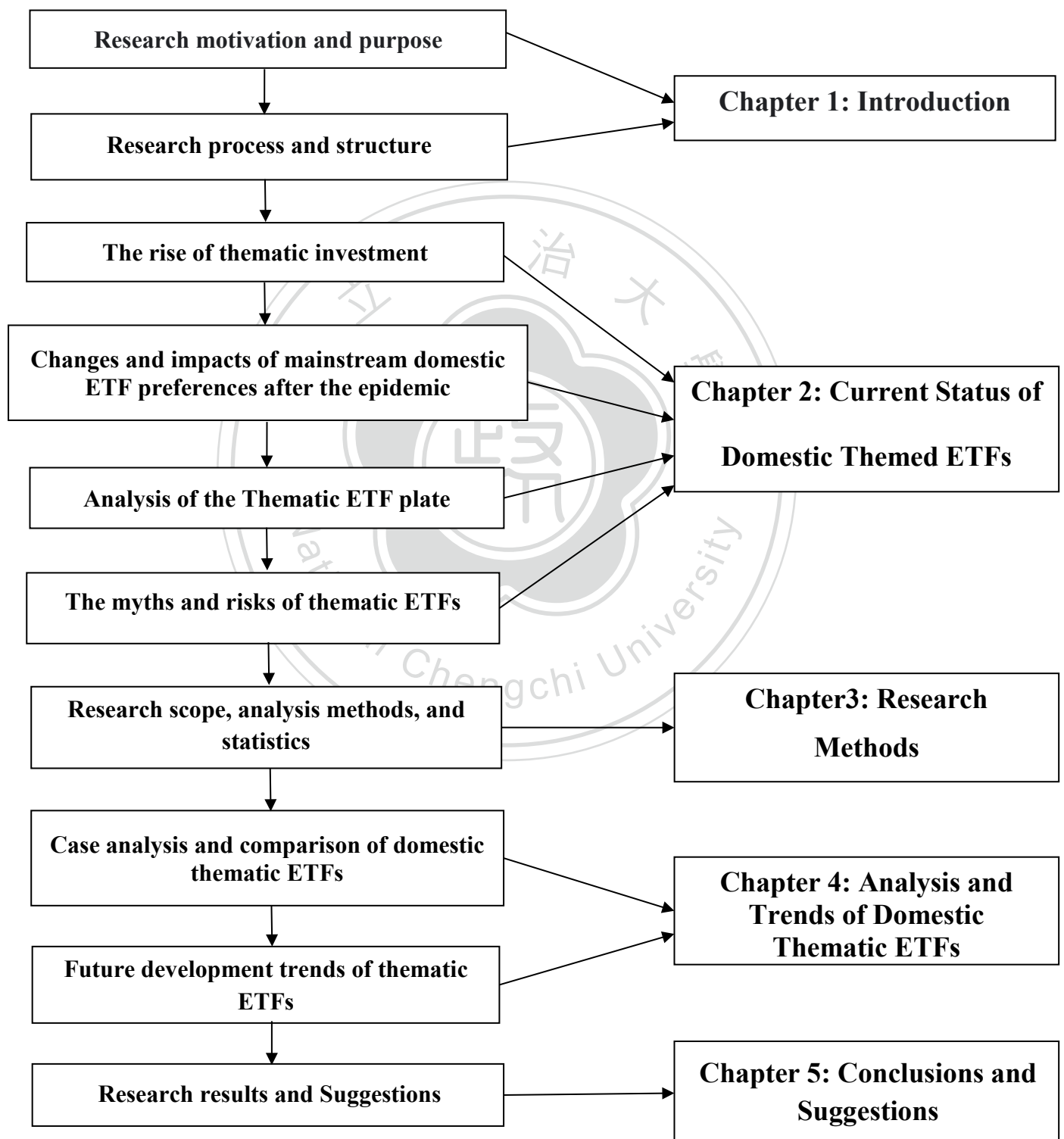
The asset scale of Taiwan's ETF has grown tremendously in the past ten years. According to data from the Financial Regulatory Commission, there were 15 ETFs listed in the Taiwan ETF market by the end of 2010, including 11 domestic ETFs, 1 linked ETF, and 3 overseas ETFs. The total asset size was NT\$83.4 billion. As of the end of September 2021, the total number of domestic ETFs listed on the OTC had reached 224, and the total asset scale had reached a record high, achieving NT\$1943.3 billion, which is rapid, regardless of the number of fund files, scale, or beneficiaries. As it expands, the commodities it offers become more diversified.

According to Securities and Futures Association data, there are 12 ETFs listed from 2020 to September 2021. The sample will exclude the targets that are too small and if the average number of transactions per month is too low, and will choose the ETFs issued in Taiwan from 2020 to present if the scale exceeds NT\$20 billion, the number of beneficiaries is more than 200,000 people, the monthly turnover for three months is more than NT\$7 billion, and they also meet the definition of thematic ETF at the same time. At the same time, it also compares ETFs with the same themes that have been issued, as well as compares their differences and special features.

4. Structure

The process of this research is primarily divided into five stages, including problem formation, literature review, research design, and research method decisions to collect data as well as to classify and sort the information. The work description of each stage is outlined in Table2.

Table 2. Structure



Chapter 2: Current Status of Domestic Themed ETFs

1. The Rise of Thematic Investment

“A good hockey player plays where the puck is. A great hockey player plays where the puck is going to be.” quote was famously stated by Wayne Gretzky, this quote was appeared in an article which published by Towers Watson Company on thematic investment in 2012. At the beginning, it clearly pointed out the meaning of thematic investment. “Insight and gaining opportunities” are the essence of thematic investment, which is further explained as, “Thematic investing is about capitalizing on future trends – identifying (and profiting from) the winners and, just as importantly, avoiding (or underweighting) the losers” (Watson, 2012 P1).

Figure 3 also shows that the investment themes for future trends possess a rudimentary form. This can be considered a relatively complete proposal of the core concept of thematic investment in the research literature, and the definition of thematic investment proposed by many asset management companies in the future will also be based on this extended concept.

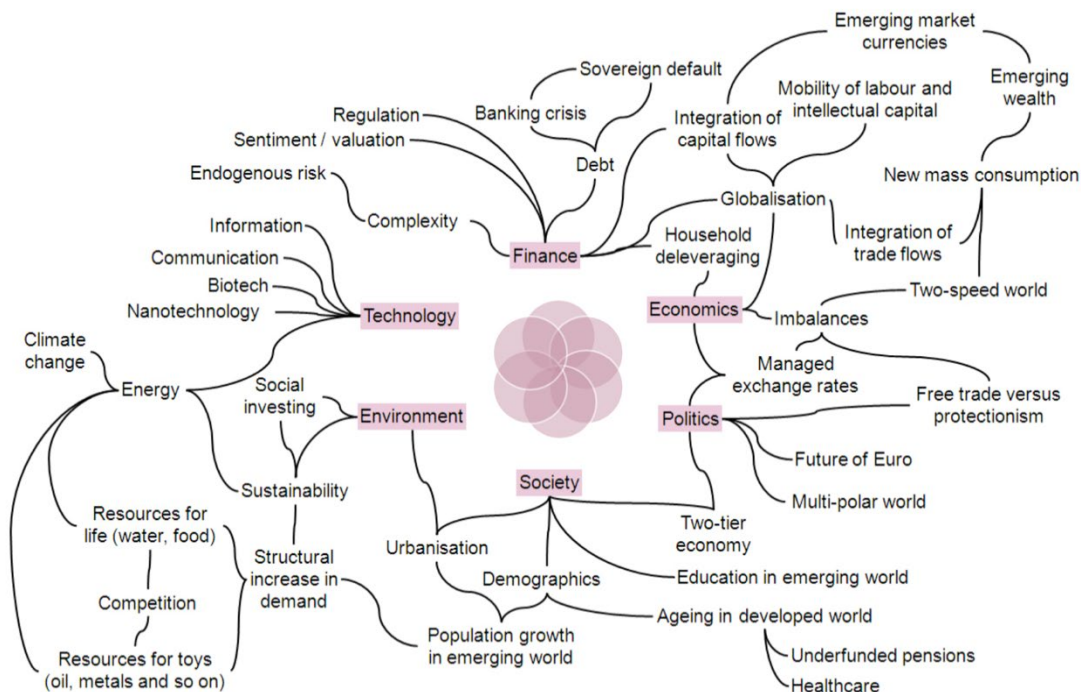


Figure 3. Long-term Investment Trends

Source: Willis Towers Watson, 2012

Prior to the emergence of thematic investment classification, the majority of the original global industry classifications adopted the Global Industry Classification Standard (GICS), which was jointly developed by MSCI and Standard & Poor's in 1999. GICS is divided into four levels using a broadly classified hierarchical classification system. In the industry sector, each company is assigned a single GICS classification at the sub-industry level according to its principal business activity. MSCI and S&P Dow Jones Indices use revenue as a key factor in determining a firm's principal business activity. Earnings and market perception, however, are recognized as important and relevant information for classification purposes and are considered during the annual review process (MSCI, The Global Industry Classification Standard, 2021).

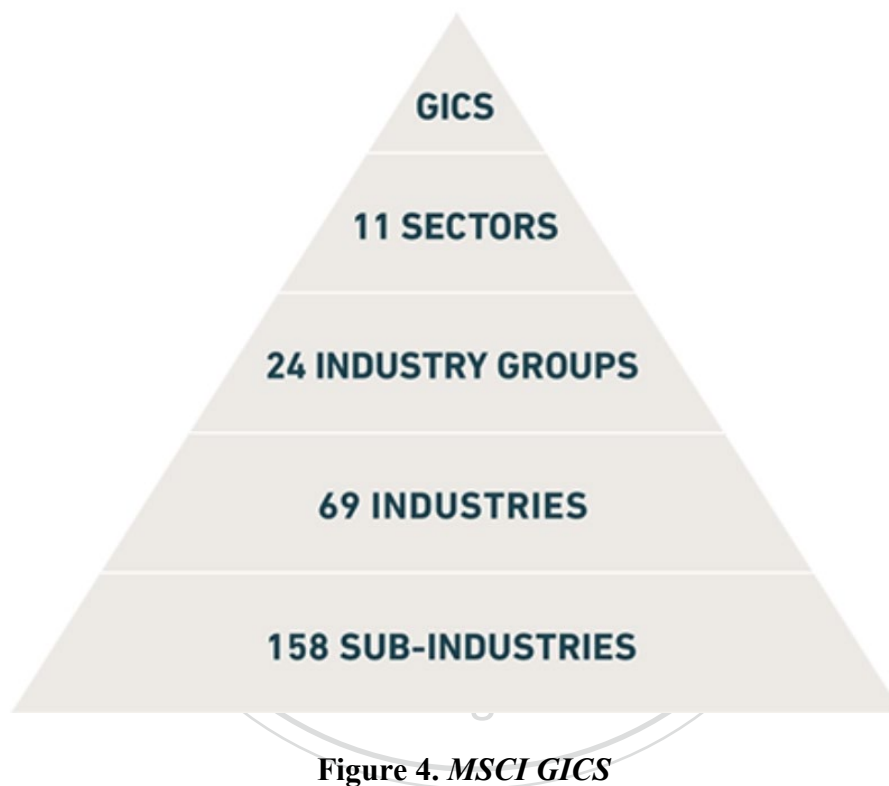
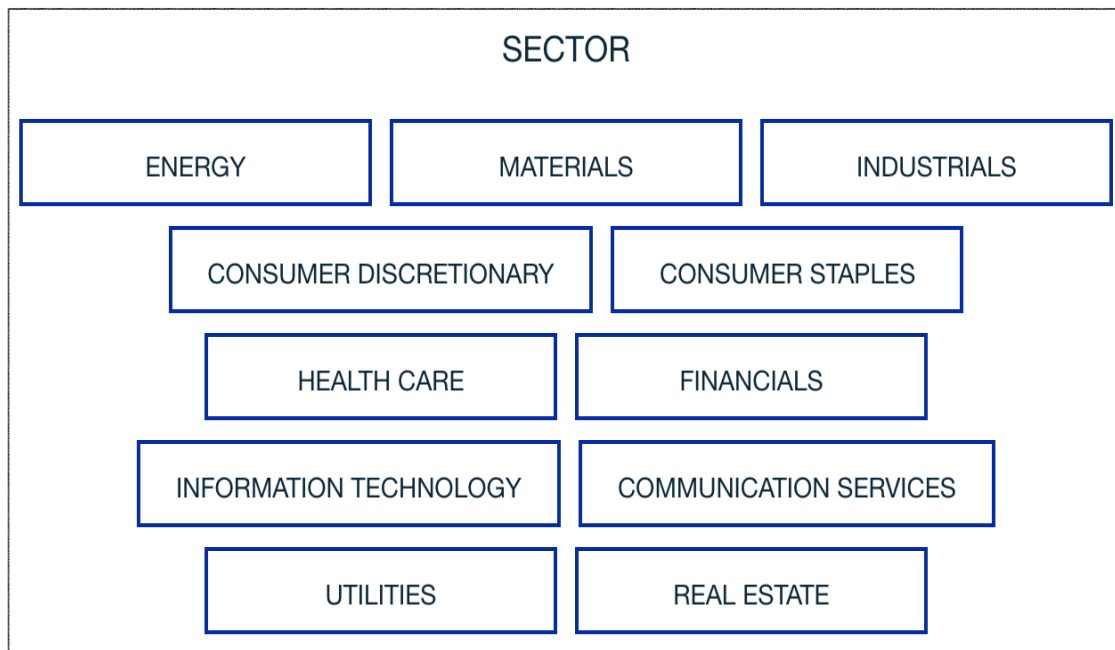


Figure 4. MSCI GICS

Source: MSCI, 2021

Table 3. Sector by GICS



Source: MSCI, 2021

Using Information Technology as an example, its Industry Groups are divided into three categories: Software & Services, Technology Hardware & Equipment, and Semiconductors & Semiconductor Equipment; and thematic investment through a different investment structure than in the past has the potential to make an investor's investment more efficient. According to McKinsey, thematic investment must respond to long-term economic, political, and social trends. It is necessary to have a considerable degree of understanding of the impact of the industry and use this to grasp investment trends. In 2014, McKinsey divided the difference between thematic investment and the corresponding investment structure into seven major projects, namely asset allocation, portfolio construction, alpha generation, decision process, investment performance, expertise, and research (Vincent Bérubé, Sacha Ghai, Jonathan Tétrault, 2014).

Table 4. Relative and Thematic Frameworks

	Relative framework	Thematic framework
Asset allocation	Asset classes as building blocks	Sector and country exposure as building blocks (matrix view)
Portfolio construction	Weight of asset classes in portfolio based on economic cycles and market conditions	Selection of themes, sectors, or regions across asset classes based on underlying market trends
Alpha generation	Based on security selection relative to an index	Based on selecting groups of companies that will benefit from long-term support of structural trends
Decision process	Portfolio managers allocate capital within defined mandates	Investment committee arbitrages opportunities across themes
Investment performance	Measured relative to an index (typically on an annual basis)	Measured against an absolute target or a risk-adjusted index (over a 3- to 5-year rolling history)
Expertise	Investment professionals with experience in a given asset class or sector	Investment professionals with a combination of in-depth regional and sector experience across asset classes
Research	Typically occurs within portfolios, with research performed at security level	Central group develops house views on priority themes and opportunities for institution

Source: Vincent Bérubé, 2014

Taking electric vehicles as an example of one of the hottest topics today, the original GICS classified investment is in the Information Technology industry. Take, for example, Vanguard Information Technology ETF (VGT), whose top ten holdings include various technology industries, including software and hardware computer development (APPLE), semiconductors (NVIDIA), technical services and data analysis consulting (ACCENTURE), and even the financial technology industry (VISA, MASTERCARD), whose total equity sector is: Application Software (12.2%), Communications Equipment (3.1%), Data Processing & Outsourced Services (10.1%), Electronic Components (0.8%), Electronic Equipment & Instruments (1.2%), Electronic Manufacturing Services (0.7%), Internet Services & Infrastructure (2.1%), IT Consulting & Other Services (3.8%), Semiconductor Equipment (3.3%), Semiconductors (17.8%), Systems Software (21.7%), Technology Distributors (0.4%), and Technology Hardware, Storage & Peripheral (22.8%). The holdings are quite broad and cannot be locked into a specific trend, such as telecommunications technology or electric vehicles (Vanguard, 2021).

Table 5. Vanguard Information Technology ETF Ten Largest Holdings

Rank/holdings
1 Apple Inc.
2 Microsoft Corp.
3 NVIDIA Corp.
4 Adobe Inc.
5 Visa Inc.
6 salesforce.com Inc.
7 Mastercard Inc.
8 Cisco Systems Inc.
9 Broadcom Inc.
10 Accenture plc

Source: Vanguard, 2021

The classification of thematic investment is available. Thematic investment is used to predict the long-term growth of a specific trend, focusing on the long-term changes of the entire global market rather than limiting investment to a specific company or industry. BlackRock’s thematic investment concept is used as an example, including (DEMARCO, 2021):

1. Rapid urbanization
2. Climate change and resource scarcity
3. Shifting economic power
4. Demographic and social change

Whether they focus on 5G themes or electric vehicles, there are target classifications. In recent years, GLOBAL X, which has been committed to the development of thematic ETFs, defines thematic investment as “the process of identifying powerful disruptive macro-level trends and the underlying investments that stand to benefit from the materialization of those trends” (Palandrani, 2021 P2). GLOBAL X’s classification of Thematic ETFs is described in four levels as follows: 1) Category; 2) Mega-theme; 3) Theme; and 4) Sub-theme. Each layer’s focus will be concentrated on in turn. The largest category includes three disruptive factors, namely Disruptive Technology, People & Demographics, and Physical Environment. The next category is Mega-theme, and then the most important “Theme” is promoting technological progress and changing consumer demand, or disruptive changes affecting the environment, with 40 thematic

categories currently available. By identifying disruptive macro trends and investment themes that are highly connected to these trends, the classification process is divided into top-down and bottom-up two-way strategies.

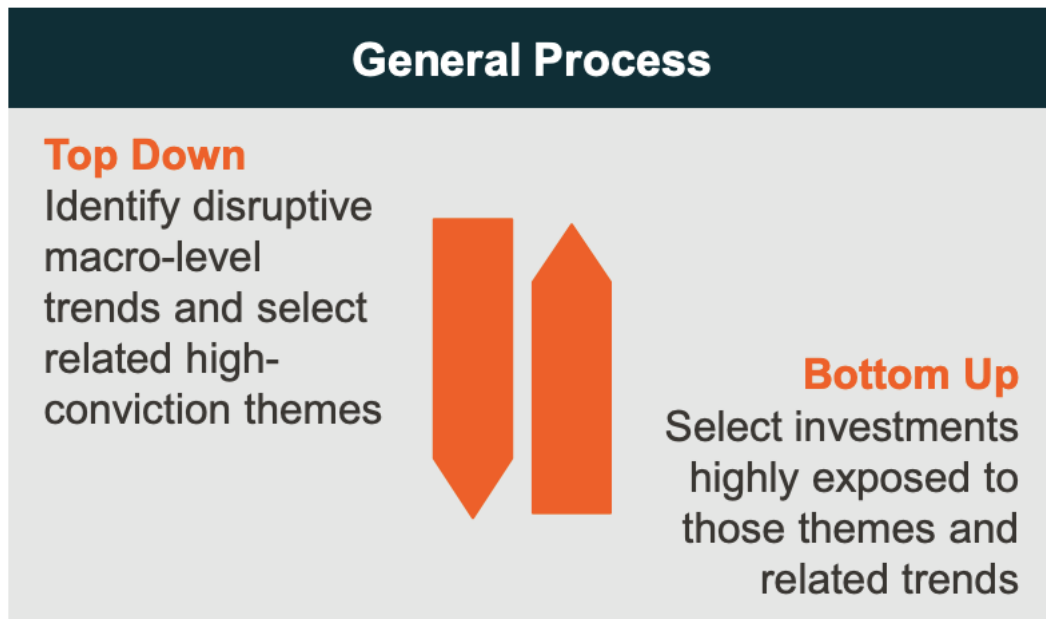


Figure 5. Thematic Investing General Process

Source: Global X, 2021



Table 6. Defining & Categorizing Themes Classification System by Global X

Category	Mega-Theme	Theme	Sub-Theme
Disruptive Technology	Big Data	Machine/Deep Learning	
		Cybersecurity	
		Quantum Computing	
		Cloud/Edge Computing	Remote Work, MarTech
	Mobility	Autonomous Vehicles	
		Electric Vehicles	Lithium/Batteries
	Digital Content	AR/VR	
		Video Games	E-sports
		Social Media	
		Streaming	
	FinTech	Mobile Payments	
		Peer-to-Peer Lending	
		Crowdfunding	
		Blockchain	
	Connectivity	Digital Infrastructure	
		5G/Next Gen Networking	
		Emerging Markets Internet	
		Internet of Things	Smart Devices, Smart Cities, IIoT
Space/Satellite Communications			
Robotics	AI/Automation		
	3D Printing		
	Drones		
People & Demographics	New Consumer	Millennials & Gen Z	
		Emerging Market Consumers	
		Urbanization	
		E-commerce	
		Education	
		Sharing/Gig Economy	
		Safety and Security	
		Cannabis	
		Sports Betting	
		Professional Sports	
	Health	Healthcare Innovation	Telemedicine & Digital Health, Genomics, Immunotherapy, Public Health
		Aging Population	Senior Care, Senior Economy
		Health & Wellness	Obesity, Organics
		Emerging Markets Healthcare	
Alternative Medicine			
Physical Environment	Climate Change	CleanTech	
		Clean & Renewable Energy	Solar, Wind, Hydrogen
		Resource Scarcity	Water, Waste/Recycling, Rare Earths, Sustainable Food
	Infrastructure Development		

Source: Global X, 2021

This classification has four characteristics:

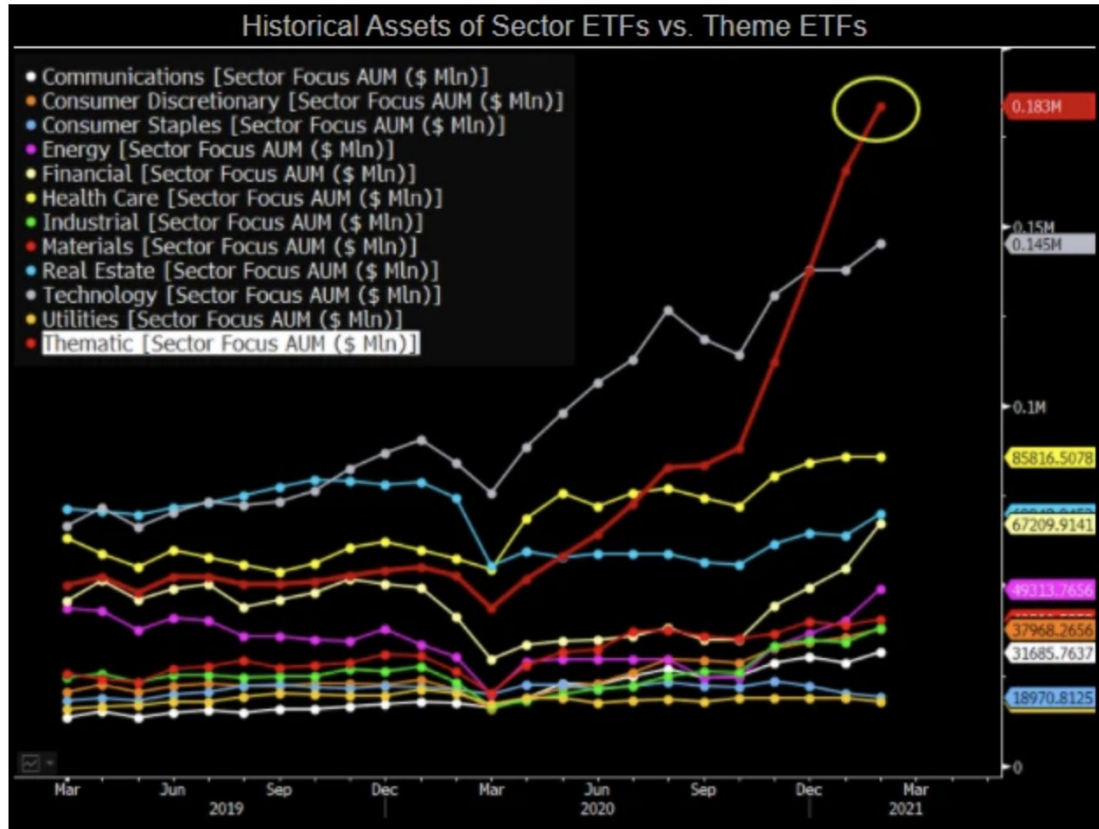
1. This strategy is based on long-term, growth-focused strategies
2. Unconstrained by geographies or sectors
3. Focused, often on technology and new consumers
4. Relatable concepts that impact our daily lives

(Palandrani, 2021)

Additionally, these four major characteristics also represent the long-term trend of the flow of money and people, as well as future business opportunities.

According to Bloomberg’s 2021 survey, the scale of thematic ETFs reached US\$183 billion, which is much higher than any other CIGS industry fund. Within five years, the scale of thematic ETFs may surpass traditional industry-specific ETFs and reach US\$500 billion. The scale demonstrates that thematic ETFs are the future development trend of ETFs (Bloomberg, 2021).

Figure 6. Historical Assets of Sector ETFs vs Theme ETFs



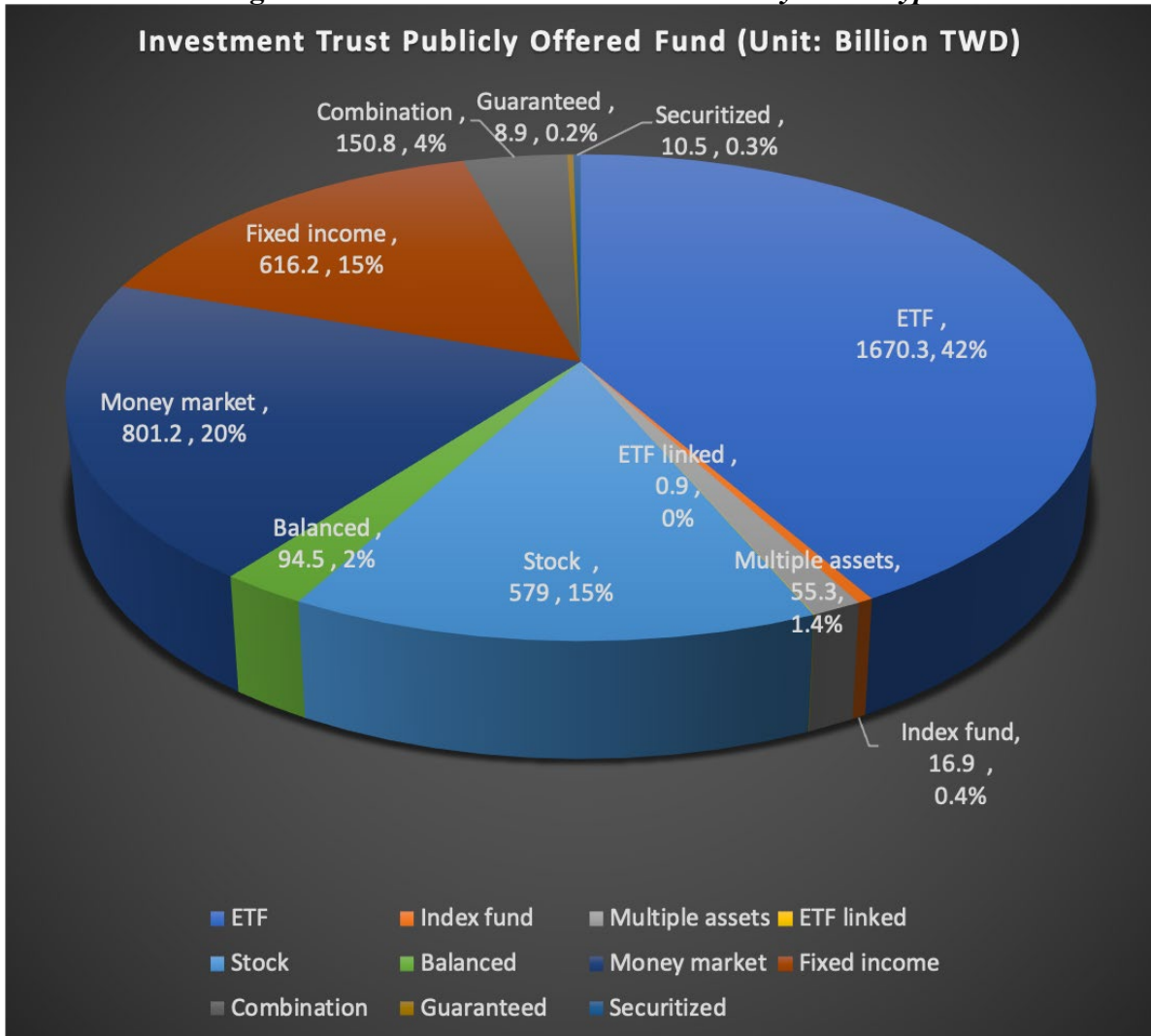
Source: Bloomberg Intelligence, 2021

2. Changes and Impacts of Mainstream Domestic ETF Preferences After the Epidemic

Looking back at the global economic situation prior to the outbreak of the epidemic in 2019, despite the significant pressure brought on by the US-China trade war, the US changed its supply chain policy and the subsequent easing of policies of the US Federal Reserve to support corporate operations through the purchase of corporate bonds. In turn, it has driven strong consumer spending and lowered the unemployment rate. The S&P 500 index rose by 28.9% in 2019, and the global stock market rose by more than 20%. The order shifting effect brought about by the US-China trade conflict has also driven Taiwan's information technology and audio-visual products. Taiwan exports increased in the first three quarters of 2019, and private investment also increased. Taiwan's weighted index rose in the first quarter of 2019 and remained above 10,000 points.

During the same period, Taiwan accelerated the opening up of financial measures, and the loosening of laws and regulations prompted the active development of the financial, investment, and credit industries. In 2019, the overall size of public funds reached NT\$7,651.8 billion, compared with the size of NT\$507,573 in 2018, public funds scale increased by 32.9%. In 2018, the scale of investment trust public funds was NT\$2571.9 billion. In 2019, the scale increased significantly to 4 trillion yuan, a 55.7% increase from 2018. There are 11 different types: stock, balanced, money market, fixed income, portfolio, guaranteed, real estate securitization, index stock, index, multiple asset, and ETF-linked. Among these, the scale of index stocks has begun to climb. In 2018, the scale of index stocks was NT\$724.4 billion, accounting for 28% of the overall scale of investment trust mutual funds and surpassed 488.8 billion (19%) of general equity funds for the first time, which became the largest fund type (SITCA, R.O.C.產業調查報告 2018, 2019). By 2019, the scale of index stocks had doubled to NT\$1.670.3 billion, accounting for 42%. The size of general equity funds for the year was NT\$578 billion, accounting for 14%. For fixed-income funds, the scale was NT\$616.2 billion, accounting for 15%. The combined scale of equity and fixed income funds was not as large as index equity funds. Therefore, 2019 could be considered the beginning of a new milestone for domestic index equity funds (SITCA, R.O.C.產業調查報告 2019, 2020).

Figure 7. Investment Trust Public Funds: by Fund Type



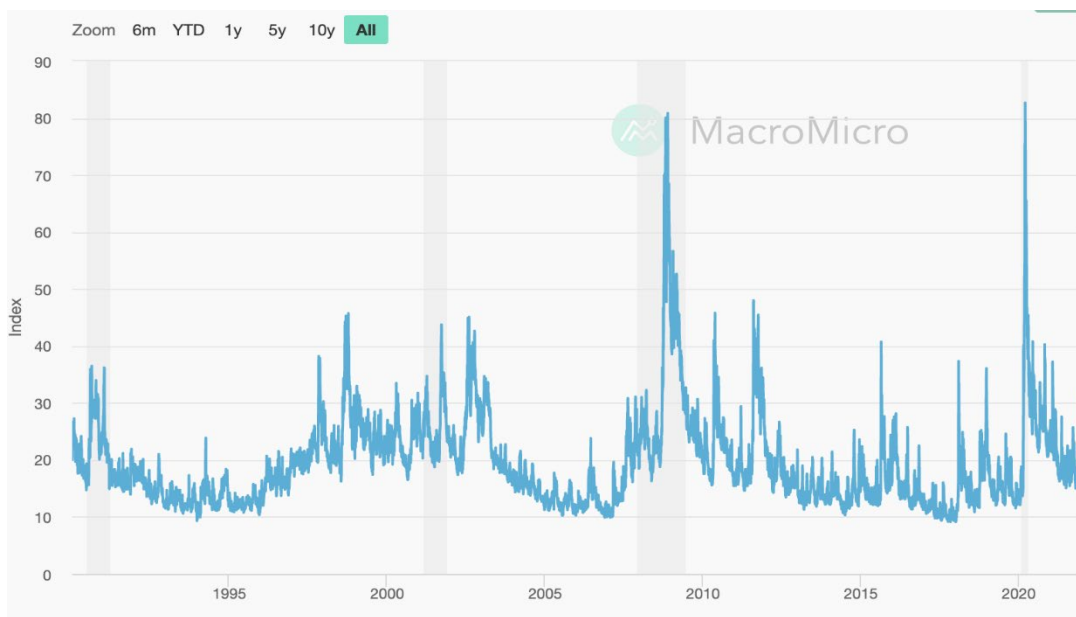
Source: SITCA, 2019

At the beginning of 2020, there was a global impact event and the COVID-19 pandemic began to spread globally. The first case of the foreign epidemic was discovered in Thailand in January 2020 (excluding the origin of China), and the Taiwan Disease Control Agency listed the new disease as one of the five types of notifiable infectious diseases, and the three-level central epidemic command center was launched on January 20, officially entering national epidemic control.

The World Health Organization declared COVID-19 as a global pandemic on March 10 of the same year. At that time, the global economy was already in a state of severe panic, and global stock markets continued to fall. In March of 2020, the U.S. stock market experienced four meltdowns in a single month. At the same time, the VIX panic index hit a record high, breaking

through 82 points to 82.69 points, surpassing the previous high of 80.74 points set during the 2008 financial tsunami (MacroMicro, 2020). Within a month, the S&P 500 index fell from its highest point (3393.52 points) in February to its lowest point of 2191.86 points, a drop of 35%. At that time, the global stock market value had lost 30% of its value.

Figure 8. VIX Index



Source: MacroMicro, 2020

It is worth noting that the global pandemic caused a sharp drop in the stock market, evaporation of wealth, and a decline in consumption momentum, but it is still substantially different from the previous global financial tsunami in 2008. The main difference is that the 2008 Global Financial Crisis was caused by financial factors. The proportion of leveraged operations in the system was too high, and long-term high-leverage profits had led to insufficient risk awareness of issuers and investors. When there is a funding gap, the entire financial system, as well as the majority of upstream, midstream, and downstream companies that require capital to operate, will fall into a vicious circle of liquidity. COVID-19 is a pandemic disaster that carries the risk of reducing the flow of people, rather than capital liquidity.

With the increasing popularity of vaccines, most large companies can trade through digital services, and the impact of the epidemic on the industry is obviously asymmetric. Restaurants, catering, energy, and other industries were the most negatively affected, but there were also

industries that achieved high performance due to the epidemic, such as software services, pharmaceuticals, and semiconductor industries. The government's bailout policy is also directed toward directly assisting companies and household finance departments. Employment protection and subsidies and overall bankruptcy are relatively minor (中央銀行專題報告, 2020). Therefore, compared with the global financial tsunami, most companies have had a greater ability to withstand the epidemic, so the rebound force is much faster than in 2008. Stimulated by the global government's vigorous efforts to rescue the market through monetary and interest rate policies, the stock market rebounded in less than three months, and the S&P 500 index had almost recovered 80% of its lost ground by June 2020.

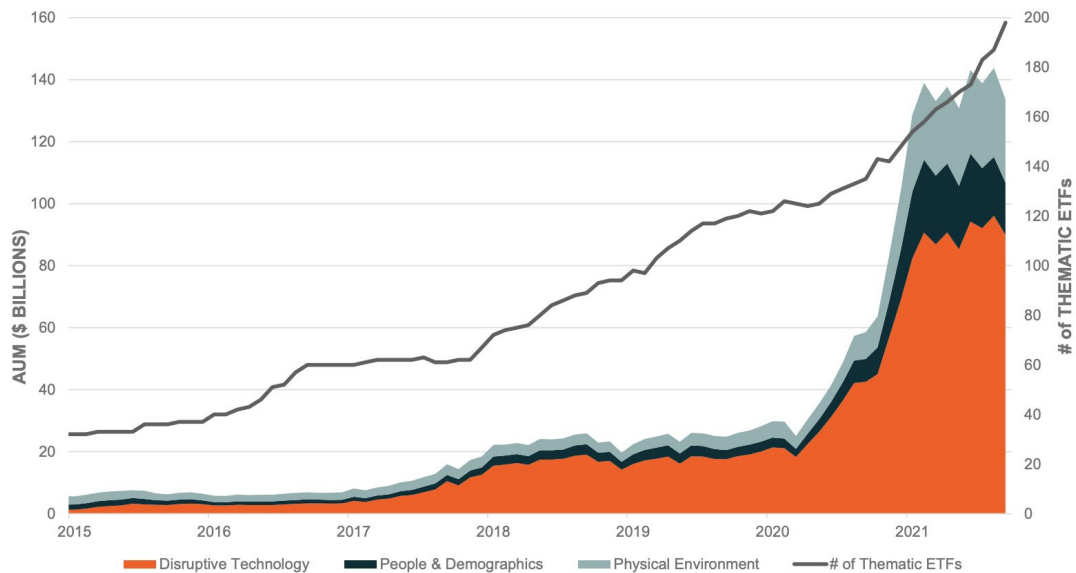
Table 7. Comparison of the Global Financial Crisis and the COVID-19 Crisis: Causes and Impact on the Real Economy

	Global Financial Crisis	Coronavirus crisis
Cause	<ul style="list-style-type: none"> The inherent instability of the financial system affects the wider real economy. 	<ul style="list-style-type: none"> Similar to the impact of natural disasters on the real economy, the widespread impact on the real economy has spread to the financial system.
GDP	<ul style="list-style-type: none"> The global GDP fell by 1.74% in 2009 and grew by 4.23% in 2010, showing little rebound. 	<ul style="list-style-type: none"> The global GDP fell by 3.73% last year and is expected to grow by 5.68% this year (2021), showing a strong rebound. Mainland China's GDP recovered rapidly in the second quarter of last year, which is different from other G20 countries.
Global trade	<ul style="list-style-type: none"> The global merchandise trade volume fell by 12.8%, and it took 25 months to recover. 	<ul style="list-style-type: none"> The global merchandise trade volume fell by 5.3% last year, but it returned to the pre-epidemic level in November of last year, and the recovery took only 10 months. The performance of trade in services remains sluggish, partly due to tourism bans in many countries that have restricted the recovery of the tourism industry.

	Global Financial Crisis	Coronavirus crisis
Unemployment rate	<ul style="list-style-type: none"> • The global unemployment rate in 2009 was 7.33%. • As far as the United States is concerned, the unemployment rate was 4.7% in November 2007, and then continued to soar, reaching a peak of 10% in October 2009; it did not fall to 6.7% until December 2013. 	<ul style="list-style-type: none"> • The global unemployment rate last year was 8.09%. • As far as the United States is concerned, the unemployment rate in March last year was only 4.4%. As the epidemic became more severe, it soared to 14.8% in April of last year; in May of this year, the unemployment rate had dropped to 5.8%.
Affected industries	<ul style="list-style-type: none"> • The global financial crisis triggered a full-scale recession, and the industries that have been hit particularly hard include construction, manufacturing, service, retail, and finance. 	<ul style="list-style-type: none"> • The new crown pneumonia crisis triggered a major blockade, and its impact on the industry was asymmetrical. -Those who are more negatively affected: consumer service industries that have close contact with people (such as restaurants, catering, gaming, cruise companies, etc.), energy, transportation, and auto parts industries. -Those who are more positively affected: real estate industry, software service industry, pharmaceutical industry, semiconductor industry, etc.
Corporate bankruptcy	<ul style="list-style-type: none"> • According to OECD data, during the global financial crisis, many countries, such as the United States, Norway, Denmark, and the Netherlands, appeared to have serious corporate bankruptcies. 	<ul style="list-style-type: none"> • During the COVID-19 crisis, corporate bankruptcies in many countries seem to be relatively mild, indicating that the policy support provided by the policy authorities to ease the short-term financial pressure on companies seems to have worked, but whether this relatively benign phenomenon can continue remains to be seen. • The OECD pointed out that its currently available information is still mainly concentrated in large and medium-sized companies. In the future, if more companies (especially smaller and more vulnerable companies) declare relevant information, a more complete picture can be obtained. In addition, problems such as debt accumulation and corporate zombification may gradually emerge.

Source: CBC Taiwan, 2020

At the beginning of 2019, the global-themed ETF was approximately 20 billion U.S. dollars in scale, and the number of stalls had not exceeded 100. Six months after the outbreak of the epidemic, the size of the global thematic ETF displayed an explosive growth. As of the third quarter of 2021, there were 198 thematic ETFs. The total amount was 133.7 billion U.S. dollars (Palandrani, 2021).



Source: Global X ETFs, Bloomberg, As of Sep 30, 2021.
 Note: AUM includes assets of funds closed until the last month of trading activity.

Figure 9. Thematic ETF Landscape

Source: Global X, 2021

According to Deloitte’s “Opportunities and Challenges of Taiwan’s Consumer Industry in the Post-2020 Epidemic Era,” in order to overcome the global economic crisis, companies must focus on four major factors:

- Cash flow management
- New business investment
- Supply chain management
- Organizational digital transformation

And two major trends:

- Online channels rising
- Reduced physical contact

All industries should actively develop digital transformation in business management, supply chains, products and services, and suggest software and hardware. Furthermore, the outbreak of the epidemic has increased obstacles to global logistics and transportation, and the economic

impact caused by delays in supplier delivery requires an assessment of whether it is necessary to build a backup supply chain and increase the sources of alternative goods. Deloitte (2021) proposes three suggestions on how enterprises can respond to consumers' needs in the post-epidemic era:

1. Optimize brand portfolio and service experience: The impact of the epidemic has forced the industry to change. Many companies continue to exhibit shops when rents have more bargaining space, and at the same time launch new ones. Brands, flagship stores, concept stores, and so on raise the threshold of competition and consolidate advantages. For example, Hi-Lai Foods Co. opened a restaurant called “ENERGY” that caters to young customers with a personal chicken soup pot; and Pousheng Group opened a concept store called “Next Store” in Hsinchu Science Park, which is a new business model that focuses on providing sports experiences and direct-to-customer services.
2. Lifting equipment and technology: The epidemic has brought demand to the consumer industry for a “contactless economy,” and some business and behavioral models that meet the needs of epidemic prevention may become long-term changes. For example, if consumers reduce their shopping frequency and increase the items and quantity of single consumer products, enterprises must increase the capacity of their warehouses. In addition, there will be need change in the volume of storage and logistics, and the introduction of new product packaging and formats, such as hand-crank beverage stores launching liter products and the catering industry launching frozen packages to meet consumer needs.
3. Accelerate digital transformation and strengthen management system: Under the wave of digitization in the consumer industry, many interviewed companies have accelerated their digital transformation during the epidemic, including strengthening the functions and connections of ERP, CRM, POS, PMS, and other systems, from the establishment, management, and analysis of consumer profiles, and even within the enterprise real-time information management of manpower, inventory, and working capital, optimize the front-to-back management system, while further integrating internal and external information of the enterprise and strengthening the grasp of customers.

Therefore, it is conceivable that in the post-epidemic era, whether it is a company or an investor, concepts and equipment must be upgraded simultaneously, to enter the so-called “new normal” after the epidemic. The “new normal” began immediately following the outbreak and is closely related to our daily lives, such as telemedicine, telecommuting, tele-education, and online

banking. Therefore, advanced digital applications will become the “new normal” of everyday life (歐宜佩, 2020).

Due to the emergence of the “new normal,” many investment opportunities have also emerged in the post-epidemic era. Whether students or office workers, the time spent at home increased significantly, and entertainment equipment at home became the focus. Video game sales grew significantly in 2020. According to the NPD Group survey data, as of November 2020, Americans had spent a total of 6.97 billion U.S. dollars on game consoles, game accessories, digital services, and videos, an increase of 35% YoY¹, of which only game hardware devices accounted for approximately 1.4 billion U.S. dollars. Among them, the sales of game console giants, such as Microsoft Xbox and PlayStation 5, increased by 58% YoY, while the expenditure of video games increased from 36.47 billion in 2019 to 44.5 billion U.S. dollars, an increase of 22% YoY. This situation was also identified in the Taiwan-themed ETF market. In general, as of December 2020, the scale of Taiwan index equity funds had reached NT\$1,791 billion, and by September 2021, the size had approached NT\$2 trillion; when it comes to NT\$1,943.3 billion, it can be seen that domestic ETFs are growing against the trend of the epidemic, and product preferences have also changed. From 2018 to December 2019, before the outbreak, there were 29 domestic ETFs listed. Among the 29 files, there were four themed ETFs, accounting for 13.7% of the total.

Table 8. Domestic Thematic ETFs Before COVID-19

Listing date	Code	Name	Issuer	Underlying Index
2018.06.11	00737	Cathay Nasdaq CTA Artificial Intelligence and Robotics ETF	Cathay Securities Investment Trust	Nasdaq CTA Artificial Intelligence and Robotics Index
2019.01.23	00762	Yuanta STOXX Global Artificial Intelligence ETF	Yuanta Securities Investment Trust	STOXX® Global Artificial Intelligence Index
2019.08.12	00851	Taishin SG Global AI and Robotics Select ETF	Taishin Securities Investment Trust	SG Global AI and Robotics Select PR USD
2019.11.19	00861	Yuanta Global Future Telecommunication ETF	Yuanta Securities Investment Trust	ICE FactSet Global NextGen Communications Index

Source: Taiwan Stock Exchange, 2021

¹ YoY: year-on-year

In the post-epidemic era, the proportion of thematic ETFs has increased significantly, as there were 12 domestically listed ETFs from 2020 to September 2021, of which there were seven thematic ETFs, accounting for 58%. Furthermore, all of the ETF themes fall under the category of “disruptive innovation technology,” including 5G, electric vehicles, and information security, and all are closely related to changes in daily routines, disruptive technologies, rapidly changing consumption habits, and payment methods.

Figure 10. Domestic ETFs Issued after COVID-19 (2020.1–2021.10)

Listing date	Code	Name	Issuer	Underlying Index
2020.03.30	00875	Cathay Cyber Security ETF	Cathay Securities Investment Trust	Nasdaq ISE Cyber Security Index
2020.07.07	00876	Yuanta Global NexGen Communication Innovative Technology ETF	Yuanta Securities Investment Trust	iSTOXX Global NexGen Communication Innovative Technology Index
2020.12.10	00881	Cathay Taiwan 5G Plus ETF	Cathay Securities Investment Trust	TIP FactSet Taiwan 5G Plus Communications Index
2021.05.28	00891	CTBC Taiwan ESG Leading Semiconductor ETF	CTBC Investments	ICE FactSet Taiwan ESG Leading Semiconductor Index
2021.07.01	00893	Cathay Global Autonomous and Electric Vehicles ETF	Cathay Securities Investment Trust	Cathay Global Autonomous and Electric Vehicles ETF
2021.08.12	00895	Fubon MSCI ACWI IMI Select Future Mobility Top 30 Capped ETF	Fubon Securities Investment Trust	MSCI ACWI IMI Select Future Mobility Top 30 Capped Index
2021.09.16	00896	CTBC TIP Customized Taiwan Green Energy and Electric Vehicles ETF	CTBC Investments	TIP Customized Taiwan Green Energy and Electric Vehicles Index

Source: Taiwan Stock Exchange, 2021

3. Analysis of Thematic ETF Plate

Because Beta Shares targets the U.S. adoption of technology tables from 1990 to 2020, it is clear that over the past century, the adoption rate of major technological changes, such as telephones, electricity, automobiles, and radios, has made rapid progress in technological innovation, consistent with our previous premise. Changes in the Internet, smartphones, and social media have shown that the density of changes in the sector is increasing, and the application speed is growing faster (BetaShares, 2021).

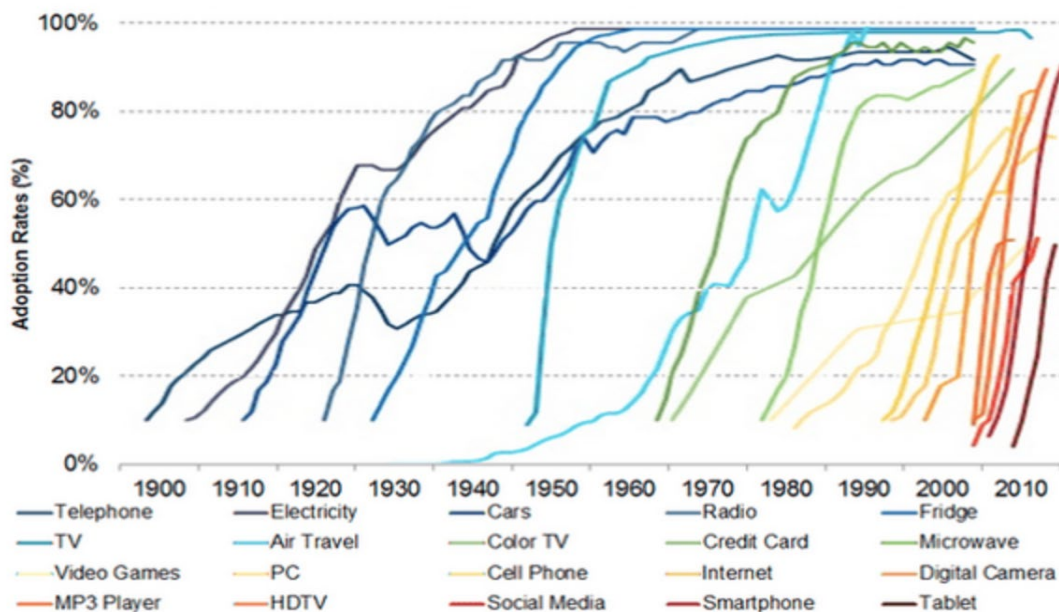


Figure 11. Adoption of Technology in the United States (1990 to 2020)

Source: BetaShares, 2021

Most fund issuers agree that thematic investment can help investors benefit from long-term trends. Among them, we can observe the different proportions of investment in various topics and in different regions. Currently, as measured by MSCI's thematic exposure dataset, equity markets have high exposure to technology and lifestyle-oriented themes. We can observe that North America and emerging markets place the most exposure on transformative technologies, whereas the second priority is on society & lifestyle. North America accounted for 30.1% and 27.7%, respectively, and emerging markets accounted for each at 28.14% and 25.37%, respectively (Rao, 2020).

Regional Thematic Exposure

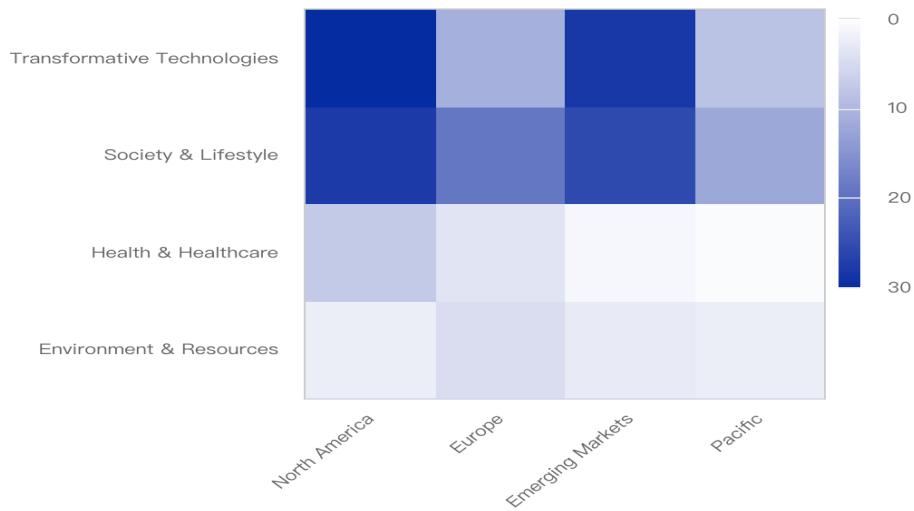


Figure 12. Regional Thematic Exposure

Source: MSCI, 2020

The main exposure blocks in North America and emerging markets are internet innovation, fintech, cybersecurity, robotics, digital economy, autonomous industry, disruptive technology, and future mobility. This phenomenon is also consistent with the trend of Taiwan ETFs.

Geography of High Exposure Firms

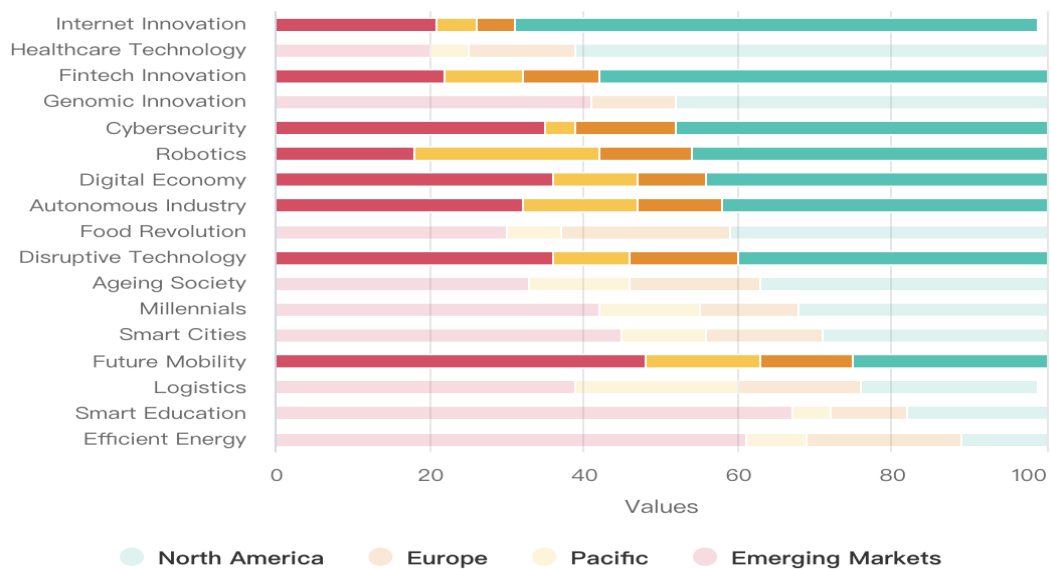


Figure 13. Geography of High Exposure Firms

Source: MSCI, 2020

Table 9. Taiwan thematic ETF classification

Category	Mega-Theme	Thematic ETF	
Disruptive Technology	Robotics	Cathay Nasdaq CTA Artificial Intelligence and Robotics ETF	Yuanta Global NexGen Communication Innovative Technology ETF
		Yuanta STOXX Global Artificial Intelligence ETF	
		Taishin SG Global AI and Robotics Select ETF	
	Connectivity	Yuanta Global Future Telecommunication ETF	CTBC Taiwan ESG Leading Semiconductor ETF
		Cathay Taiwan 5G Plus ETF	
	Big Data	Cathay Cyber Security ETF	
	Mobility	Cathay Global Autonomous and Electric Vehicles ETF	
Fubon MSCI ACWI IMI Select Future Mobility Top 30 Capped ETF			
CTBC TIP Customized Taiwan Green Energy and Electric Vehicles ETF			

Since domestic thematic investment began to rise in 2020, we have listed the classification and sub-themes of ETFs that are all focused on disruptive technologies. It can reflect life during the epidemic and can force everyone to rely on high-speed and stable network communications. The Internet of technology, social media, and big data privacy protection are also among the most intimate needs for the lives of enterprises and the general public.

4. Myths and Risks of Thematic ETFs

Global X analyst Jay Jacobs published an article this year in which he stated that some investors and articles on the market generally list six myths about thematic investment: (Six Myths)

1. Thematic investing is easy
2. Thematic investors are mostly self-directed retail
3. Thematic is just repackaging the tech sector
4. Thematic investing encourages chasing “shiny objects” or following popular fads
5. Thematic valuations have risen too high
6. It’s too late to invest in certain high growth themes

The author has clarified these six points and explained them in order as follows: For the first point, topic identification requires a significant amount of time to evaluate whether it is profitable and whether it is interdependent with other technologies. Therefore, it is about belief, investability, the time frame needed, and the subsequent driving factors and potential company status must all be taken into consideration, which is a challenge. The second point is that retail investors have increased; however, according to Global X ETF data, retail investors accounted for only 33% of the net added assets of the US ETF theme series in 2020. Other investors include financial intermediaries (wirehouses, registered investment advisors, and independent broker-dealers), accounting for 52%, and other general legal entities accounting for 15%, indicating that thematic investors are not primarily self-directed retail.

GLOBAL X ETFs – US THEMATIC INFLOWS BY CHANNEL (%)
Source: Global X ETFs, data from Jan 1, 2020 to Dec 31, 2020.

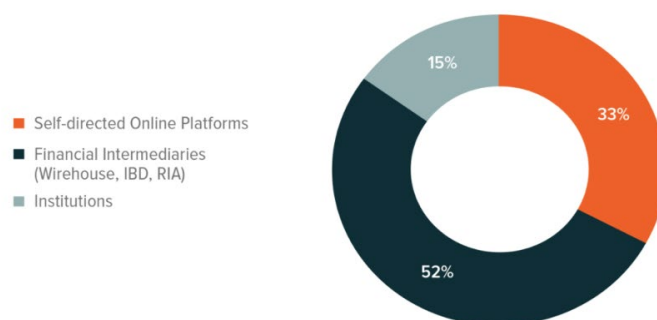


Figure 14. GLOBAL X ETFs–US Thematic Inflows by Channel (%)

Source: GLOBAL X ETFs, 2020

The third point is answered above because thematic investment has a characteristic that it is not restricted by a specific industry. For artificial intelligence robots, the original industry classification can be organized into the automotive industry, communications, and medical care. For health care, from a trend point of view, there is no problem with repackaging. The fourth point is that thematic ETFs will make people feel like chasing hot topics, but systematic ETF issuers do not use this as an investment strategy. Jacobs uses The Diffusion of Innovations Theory and the Hype Cycle, popularized by Professor EM Rogers. The IT research firm, Gartner, makes comparisons, but it is still recommended to combine theory with practice and adopt a long-term investment trend perspective.

ADOPTION CURVE VS. HYPE CYCLE

Source: E.M. Rogers, Diffusion of Innovations, Gartner, Global X Research.

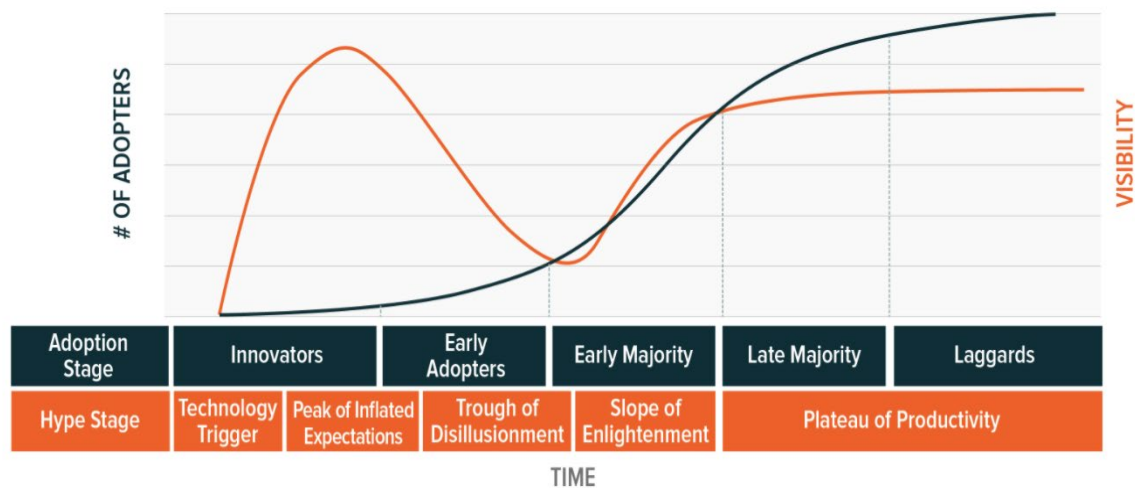


Figure 15. Adoption Curve vs. Hype Cycle

Source: E.M. Rogers, Diffusion of Innovations, Gartner, Global X Research

The fifth point, which is the focus of thematic investment, is to look at the long-term investment trend, and in the first half of the economic recovery period, under the financial stimulus of 2 trillion U.S. dollars, there are long-term investment advantages.

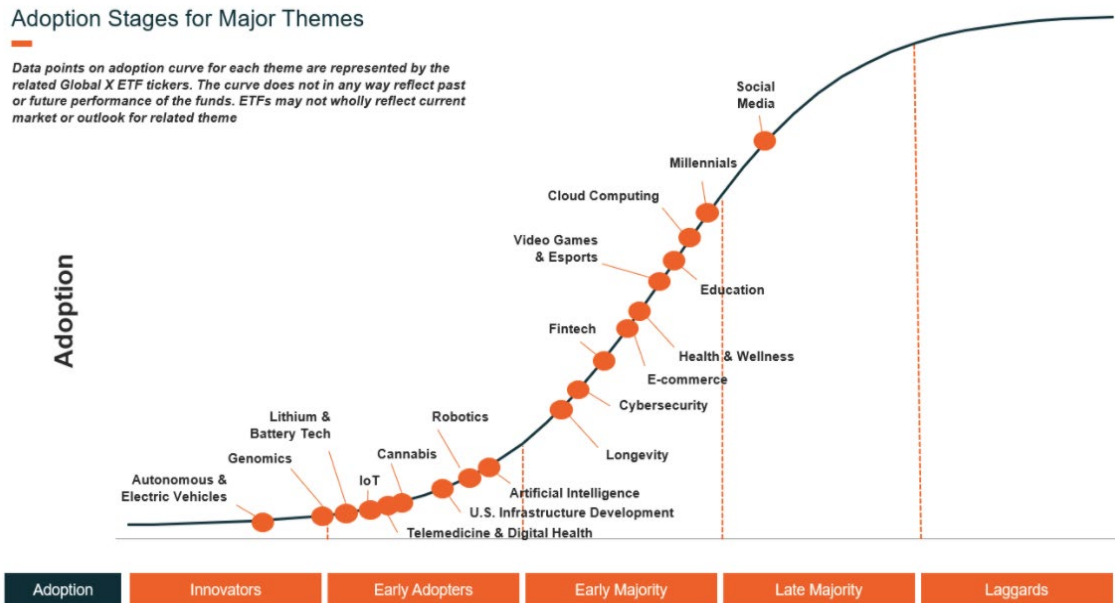


Figure 16. Adoption Stages for Major Themes

Source: Jacobs, 2021

For the sixth point, we should focus on the original intention of thematic investment. Thematic investing is a long-term approach to capturing structural disruptions. Take Global X thematic ETF research for example. In the chart above (Figure 16), we observe that changes in technology, consumer habits, regulations, and other factors can accelerate or decelerate adoption, as well as expand or contract the total addressable market over time, signifying that adoption curves and penetration are dynamic by nature.

In recent years, investors have gradually come to realize that “information asymmetry” in investment is quite detrimental to investment decision-making. Schroder Asset Management believes that as awareness of the requirement for “information transparency” increases day by day, the advantage of thematic investment is that investors can be optimistic about it. The precise investment of the block, as investors' awareness and emotions on various topics, increase, allow investors to choose a specific and long-term trend that fits their own identity to invest in, and long-term investments can be made directly on topics such as climate change, urbanization, energy transformation, medical innovation, manufacturing innovation, and lifestyle changes (Docherty, 2021). However, predicting the trend is relatively difficult, which means that if the trend changes, the expected return may be greatly reduced.

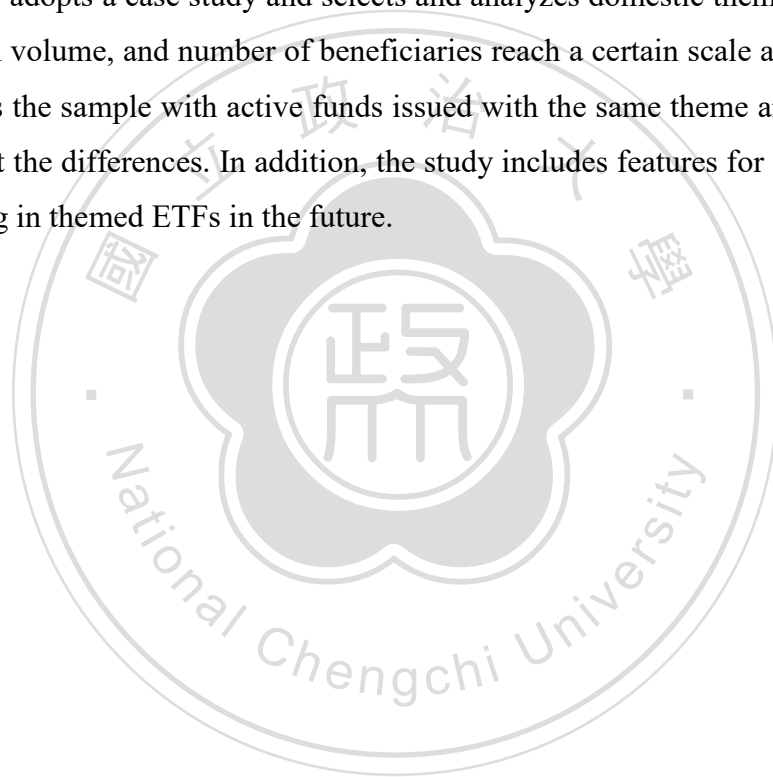
According to Morningstar, an investment research company, when looking for innovative themes, investors should consider if they investing in smaller, less liquid stocks that may flood into the same company's stocks. Micro stocks can provide a promising upside, but limited liquidity means that the cost of trading them in a short period of time can be high. With the increasing popularity of theme funds and ETFs, their exposure is often small. If it is passively managed, it must be bought and sold in accordance with index rules, which increases the risk of liquidity problems.



Chapter 3: Research Methods

1. Research Scope

As domestic theme funds are still in the early stages of development, there are 12 newly listed ETFs in Taiwan after the epidemic and during the research period (2020 to September 2021), including seven theme ETFs. Although they have grown substantially since then, they account for less than 1% of global ETFs, and most of the beneficiaries are concentrated in the top 20 ETFs. This study adopts a case study and selects and analyzes domestic thematic ETFs whose scale, transaction volume, and number of beneficiaries reach a certain scale as case studies, as well as compares the sample with active funds issued with the same theme and uses narrative statistics to count the differences. In addition, the study includes features for investors to refer to when investing in themed ETFs in the future.



2. Analysis methods and statistics

Although there are 224 ETFs in Taiwan, except for the Yuanta Taiwan Top 50 ETF (0050) and the Yuanta Taiwan Dividend Plus ETF (0056), most of the larger ETFs are concentrated in bond ETFs. Since the beginning of this year, there have been approximately 155 ETFs with daily trading volume below NT\$10 million, the thematic ETFs in Taiwan are still in the development stage, so, as a case study, we will screen out the most representative thematic ETFs among the ETFs issued in Taiwan. The selection process is as follows: First, the ETF with the largest scale, trading volume, and the largest number beneficiaries is chosen from among the existing domestic thematic ETFs. As a result, a selected study template can be selected. Through literature analysis and descriptive statistics, as well as by comparing funds of the same type, we can identify differences in selection strategies and compare the performance of mutual funds in 3 months, 6 months, and 1 year to determine the reasons for the popularity and advantage of this ETF.

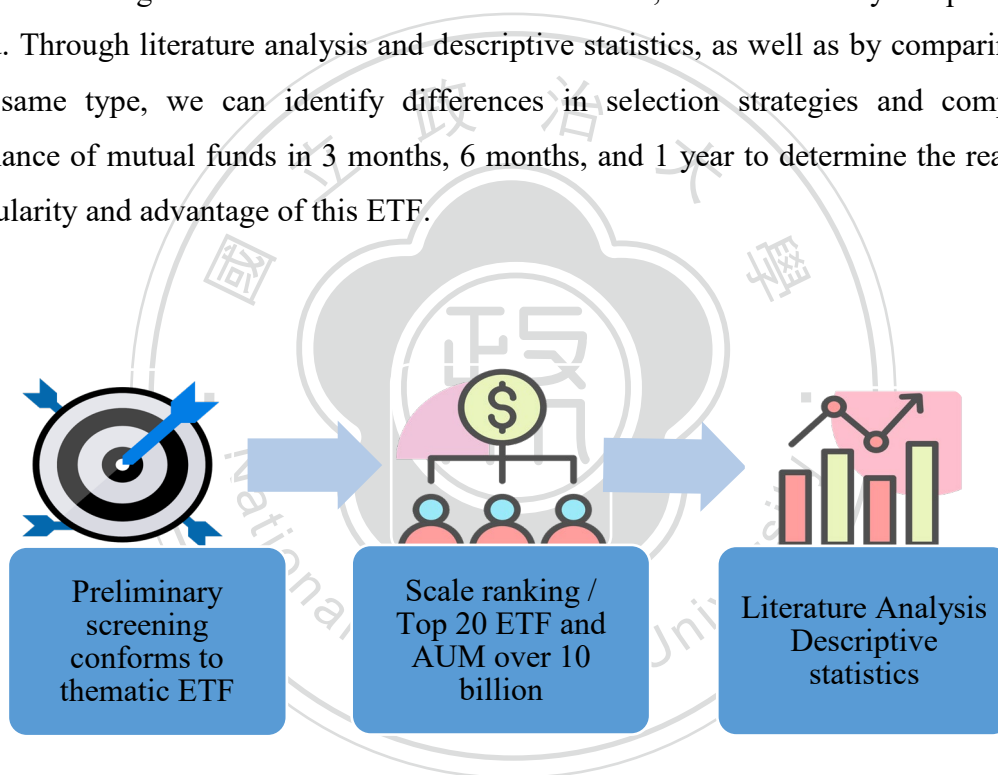


Figure 17. *Analysis methods and process*

Chapter 4: Analysis and Trends of Domestic Thematic ETFs

1. Case Analysis and Comparison of Domestic Thematic ETFs

After screening, the following table lists the current domestic ETF scale rankings. The eligible thematic ETF is the Cathay Taiwan 5G Plus ETF. The current market value is NT\$35.547 billion. It is currently the only thematic ETF in Taiwan with a scale of more than 1 billion U.S. dollars.

Table 10. Top 20 Domestic ETF Rankings

Ranking/Name	Code	Publisher	Classification	Market Value (100 million)	Volume (1000-share lot)	Turnover (1000/TWD)
1 Yuanta Taiwan Top 50	0050	Yuantafunds	Taiwan	1767.83	6,421	935,380
2 Yuanta Taiwan Dividend Plus ETF	0056	Yuantafunds	Taiwan	1133.17	8,938	300,353
3 CC9P0Bank	00724B	Capital	US Bond	720.55	137	5,693
4 Yuanta US 20YAAA-A Co.Bond	00751B	Yuantafunds	US Bond	557.19	546	23,945
5 CTBC Banking Senior 10Y Bond	00773B	CTBC	US Bond	552.73	205	9,114
6 CTBC USD Co.10Y High Grade Bond	00772B	CTBC	US Bond	547.56	1,248	54,344
7 Cathay US Corporate A-and 10Y ETF	00761B	Cathay	US Bond	531.66	101	4,551
8 Yuanta Daily Taiwan 50 Bear -1X	00632R	Yuantafunds	Taiwan	501.62	120,143	614,489
9 Cathay BBB Corporate 10Y+ ETF	00725B	Cathay	US Bond	483.97	116	5,073
10 Cathay EM Investment Grade 5Y+	00726B	Cathay	US Bond	468.89	224	9,248
11 CC8R0Telecom	00722B	Capital	US Bond	466.21	142	6,625
12 CC8TEIT	00723B	Capital	US Bond	442.33	116	4,820
13 CDG8EEMSovereign	00756B	Capital	US Bond	420.36	107	4,653
14 KGI EM USD INVESTMENT 10Y BOND	00749B	KGIfund	US Bond	387.64	101	4,235
15 FB 9-35 US Corp Bd A5	00746B	Fubon Asset	US Bond	387.35	117	5,109
16 KGI 15Y AAA - A US Corporate Bond	00777B	KGIfund	US Bond	366.64	102	4,345
17 KGI 20+Y US BANKING BOND	00778B	KGIfund	US Bond	362.42	100	4,427
18 Fuh Hwa China 5YPolicy Bank Bond	00747B	Fuh Hwa	US Bond	358.19	101	5,262
19 Cathay Taiwan 5G PLUS ETF	00881	Cathay	US Europe	355.47	10,366	196,854
20 Cathay Sustainability High Dividend	00878	Cathay	Taiwan	350.58	8,931	171,081

Source: TWSE, 2022

The basic constituent stocks of this ETF are based on the “Taiwan 5G+Communication Index,” which uses FactSet’s RBICS industry classification to filter the top 30 stocks in the new

generation of the communication industry chain that meets liquidity standards and profitability criteria. The weighted method of market capitalization is used to calculate the index, which recognizes the investment performance of the Taiwan-listed OTC stock portfolio in the 5G and future generations of the communications industry chain.

Following the epidemic, it can be discerned that the Internet of Everything has gradually replaced the previous living habits of physical contact. From mobile payments to remote medical care, a stable high-speed network is required. This is also a long-term growth investment trend that investors believe will be the subject of 5G. In early 2020, the Executive Yuan proposed the “Taiwan 5G Action Plan.” Because of its features of faster transmission speed, high bandwidth, high density, and low latency, it is extremely important for expanding the application of big data and artificial intelligence to the commercial stage and is very important to the public. Future life-related applications could include audio-visual entertainment, smart medical care, smart factories, autonomous driving, drones, and smart cities. Therefore, it has become a key component of Taiwan’s current “Digital Nation-Innovative Economic Development Plan.”

The investment strategy and characteristics of Cathay Taiwan 5G Plus ETF include:

1. Strategy: Take the constituent stocks of the underlying index and securities-related products as the primary investment targets, so that the overall exposure of the fund, including the securities and securities-related products held by the fund, can be close to 100% of the fund’s net asset value to achieve the goal of controlling tracking error and tracking difference value.
2. Investment features:
 - A. Direct investment in a specific target: At least 80% of the fund’s assets are invested in underlying index constituent stocks.
 - B. Tracking high-quality indexes: The goal of investment management is for the fund to outperform the underlying index. It aims to calculate and measure the common stocks listed on the Taiwan Stock Exchange that belong to the new generation of communication industry chains and meet the liquidity standards, profitability, and the conditional company’s investment performance.
 - C. Transparency of the investment group: Daily announcement of the list of constituent stocks of the investment portfolio, as well as the real-time estimated net value of the fund during intraday trading hours. At the same time, the index provider will regularly

or irregularly release the latest constituent stocks of the fund’s underlying index and related stocks. Investors can also obtain detailed index data through public information channels or information providers to grasp risks and investment opportunities.

D. Convenient trading: The fund is listed on Taiwan’s Stock Exchange. Investors can trade during trading hours of the stock exchange’s business day, or they can purchase and redeem in the primary market through brokerage within the time specified by the management company. The trading method is convenient. Moreover, the fund adopts passive operation, so the change in shareholding is small and the turnover rate is low, which can also reflect the relatively low transaction cost of the fund, which is conducive to long-term investment by investors.

Table 11. Portfolio Information of Cathay Taiwan 5G PLUS ETF (00881)

Portfolio Information			
SITCA Category	On-shore ETF		
Inception Date	2020/12/01	Listing Date	2020/12/10
Custodian Bank	First Commercial Bank	Portfolio Manager	Jason Su
Management Fee	0.40%	Custodian Fee	0.035%
Stock Code	00881		
Underlying Index	TIP FactSet Taiwan 5G Plus Communications Index		
Board lot	1,000 beneficiary units		
Bid/ask spread	1,000 beneficiary units		
Change(%)	10%		
Margin Trading	Trades on credit are allowed on and after the listing day on NTD counter, no short selling limits; trades on credit are not allowed on USD counter		
Trading tax	1‰		
Commission	Varies by broker but no higher than 0.1425% of the consideration		
Types of creation	Cash (NTD)		
Creation Unit / Redemption Unit	500,000 units (NTD) per board lot		
Creation / Redemption Fees	No higher than 2%		

Source: Cathay Securities Investment Trust, 2021

Seeing that Taiwan is an important global 5G industry supply chain, select representative Taiwan stocks such as semiconductor, network communications, and electric vehicle stocks are needed to build a “5G Taiwan team,” and make profits from global 5G business opportunities. The TIP FactSet Taiwan 5G Plus Communications Index uses FactSet’s RBICS industry classification to screen the top 30 free-float market capitalization stocks in the new generation communications industry chain that meet liquidity standards and profitability conditions. The

index is calculated using the tradable market capitalization weighting method, among which the constituent stocks filter the following conditions:

- A. The sample matrix is listed for OTC common stocks that meet the Level 6 Sub-industry (5G) of the RBICS industry classification, and the revenue accounts for more than 50% of the listed OTC company
- B. The average daily transaction amount in the last three months has reached 50 million yuan
- C. The sum of earnings per share in the recent four seasons is >0
- D. Sort by decreasing free-float market value and selecting the top 30 stocks (Trust, 2022).

When compared to the same type of fund with the same 5G theme, the Cathay Taiwan 5G ETF has a beta coefficient of 1 and a standard deviation of 14.09, which is better than another open-end fund in Taiwan, the NB 5G Fund, and the average performance of funds of the same type. The Cathay Taiwan 5G ETF has had lower volatility and higher returns over the past year.

Table 12. Comparison of 5G ETF / Fund Performance

Unit: %	Cathay Taiwan 5G Plus ETF	NB 5G Fund	The same type fund Avg.
3 months	-0.16	-19.66	-10.49
6 months	11.17	-14.52	-6.42
1 year	5.34	-21.74	-5.44
Standard deviation	14.09	22.19	14.93
Beta	1.00	1.95	1.14
Sharpe Ratio	0.53	-0.29	-0.06



Figure 18. Comparison between Cathay Taiwan 5G Plus ETF (00881) and NB5G Fund (USD) and NB5G Fund (TWD)

Source: Bloomberg, 2020.12.10–2021.12.29

Since its issuance day (October 12, 2020) to December 29, 2021, the performance of the Cathay Taiwan 5G Plus ETF was 28.27%, outperforming the NB5G fund, which is the only onshore 5G-themed mutual fund. Although both are 5G themes, their investment areas are different. The NB5G Fund is used to search for global 5G high-growth investment opportunities. The Cathay Taiwan 5G Plus ETF is based on Taiwan's 5G semiconductors, network communications, electric vehicles, and other related national team stocks. It has the advantage of Taiwan's supply chain strength. It was called 5G PLUS which means a long-term trend towards 6G and 7G.

Table 13. Cathay Taiwan 5G+ ETF Holdings

Stock Code	Stock Name	Shares	Weighting
2330	台積電	16,501,000	30.95%
2454	聯發科	4,245,000	12.62%
2317	鴻海	35,425,000	10.23%
2303	聯電	32,804,000	5.74%
2308	台達電	5,974,000	4.53%
6415	矽力-KY	278,000	2.99%
3034	Novatek Microelectronics Corp	1,975,000	2.73%
3037	欣興	4,306,000	2.64%
2382	Quanta Computer	9,571,000	2.47%
2379	Realtek Semiconductor Corp	1,622,000	2.41%
3008	Largan Precision Co Ltd	337,000	2.01%
3045	Taiwan Mobile Co Ltd	7,110,000	2.00%
4938	Pegatron Corporation	7,360,000	1.42%
2345	Accton Technology Corp	1,895,000	1.38%
4904	遠傳	7,619,000	1.37%
5347	世界先進	3,146,000	1.22%
3105	穩懋	1,302,000	1.20%
5483	中美晶	1,923,000	1.19%
8046	南電	744,000	1.07%
2324	仁寶	14,150,000	0.99%
3231	緯創	9,626,000	0.80%
2383	台積電	1,057,000	0.79%
2360	致茂	1,354,000	0.78%
3702	大聯大	5,215,000	0.78%
2356	英業達	10,642,000	0.74%
6239	力成	2,529,000	0.70%
4958	臻鼎-KY	2,214,000	0.61%
3044	健鼎	1,724,000	0.60%
3189	景碩	960,000	0.54%
2492	Walsin Technology Corp	1,204,000	0.52%

Source: Cathay Investment, 2021

2. Future Development Trends of Thematic ETF

As we near the end of the pandemic, many industries are undergoing hardware and software equipment upgrades, as well as the transformation of consumption concepts. The impact ranges from enterprises to individuals, from government policies to private investment, and Deloitte, which has long been concerned about the trends of the consumer industry, is now concerned with global consumption in the aftermath of the epidemic. After referring to various documents, the industry trend provides four new changes, which are summarized as follows:

1. Consumer behavior: Due to the epidemic, consumers must reduce their outings, so e-commerce has risen, and the demand for physical retailers is gradually decreasing; however, the demand for warehousing by middlemen will increase, so the largest online e-commerce retailers, like SHOPEE, have begun to have their own shipping points.
2. Project transformation: The demand for household products increases. Firstly, the time spent at home has grown longer. Secondly, to reduce direct contact with others, it is best to complete tasks such as food, clothing, housing, transportation, and entertainment independently, so that product demands, such as for cooking supplies, increase.
3. Market information: Acquiring information is as important as acquiring customer groups, and new business opportunities are hidden in the information track, so companies need to increase their acquisition of information on consumer trends, such as the recent use of multi-e-commerce, as long as the use of electronic payment functions continues, resulting in consumption discounts that can be pushed and broadcast to consumers at any time.
4. Logistics operation: In the future, when the flow of people is interrupted, maintaining stable logistics without interruption in distribution needs to be identified to avoid a loss in business opportunities. Therefore, technologies such as automated warehousing, automated logistics systems, and unmanned vehicle transportation need to be popularized.

These consumer trends could be used in the application of investment product design. In addition, trends related to population aging and precision medicine have also attracted the attention of investors. In October 2021, Fubon launched the Fubon Global Genomics and Immuno Biopharma ETF (00897), which is Taiwan's first immuno-medical ETF. The trend effect caused by the outbreak of the epidemic, coupled with the innovative revolution of medical technology, the huge market for cancer therapy, and global industry elites focusing on the most advanced medical technology, are all becoming long-term trends. Following the epidemic, the general public has become increasingly concerned with health and wellness. In

addition to traditional medical care needs, future trends such as physical care, genetic engineering, and drug reform are all future trends. With the world's population aging due to a declining birthrate, the development of self-driving vehicles can make traffic safer and smoother. The popularity of self-driving cars is a future trend, and it is also closely related to the future life of human beings. The self-driving car industry is interdependent with artificial intelligence and battery technology, according to the report by Jacobs who is CFA of Global X, who sorted out the technology and trend links behind various topics (Jacobs, 2019).

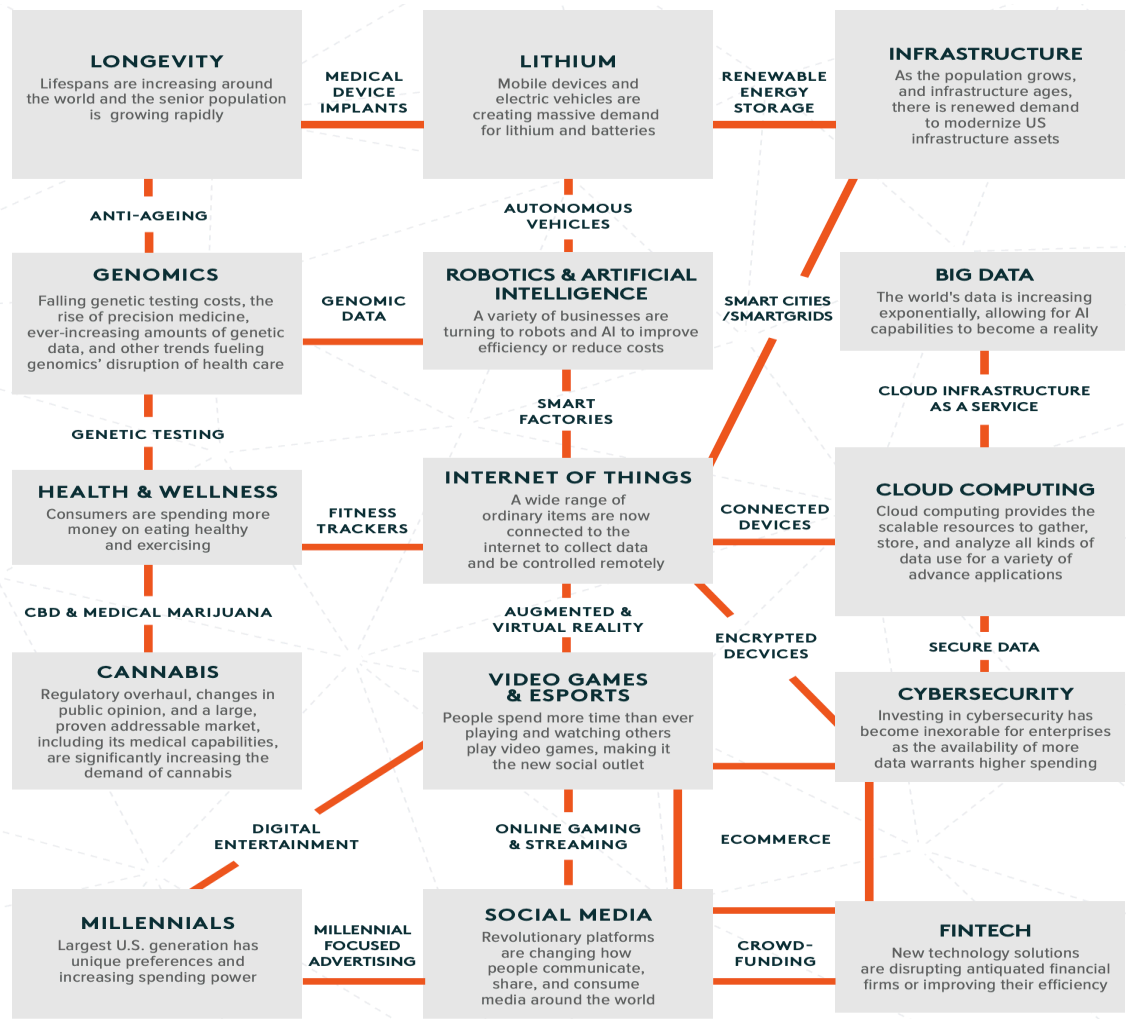


Figure 19. How various new technologies and trends are connecting these themes

Source: Global X, 2019

In the second half of 2021, the term metaverse swept the world. Facebook, which is riding the wave of social media, officially changed its name to META on October 28, 2021. It also represents the future of social media, not only in terms of keyboards but also in terms of virtual reality.

The world's first META ETF was issued by Roundhill Investments on June 30, 2021. As of December 31, 2021, the scale was US\$933 million. The index followed by this ETF is the Ball Metaverse Index, which is the first index globally designed to track the performance of the metaverse. The Index consists of a tiered weight portfolio of globally listed companies that are actively involved in the metaverse (INVESTMENT, 2022). This classification includes:

- i. Compute: companies enabling of and supplying computing power to support the Metaverse.
- ii. Networking: companies providing real-time connections, high bandwidth, and data services to consumers.
- iii. Virtual Platforms: companies developing and operating immersive digital and often three-dimensional simulations, environments, and worlds wherein users and businesses can explore, create, socialize, and participate in a wide variety of experiences.
- iv. Interchange Standards: companies building tools, protocols, formats, services, and engines that serve as actual or de facto standards for interoperability, and enable the creation, operation, and ongoing improvements of the metaverse.
- v. Payments: The support of digital payment processes and operations, which includes fiat on-ramps to pure-play digital currencies and financial services.
- vi. Content, Assets, and Identity Services: The design/creation, sale, resale, storage, secure protection, and financial management of digital assets, such as virtual goods and currencies, as connected to user data and identity.
- vii. Hardware: The sale and support of physical technologies and devices used to access, interact with, or develop the metaverse (INVESTMENT, 2022).

Fubon Securities Investment Trust will issue Taiwan's first file Metaverse ETF in January 2022. The tracked Solactive Metaverse Index is divided into three parts. First, it incorporates developed countries (including Taiwan and South Korea) into the definition of Solactive Index company's country classification and considers market value. After liquidity, the ARTIS keyword search and identification system developed by the index company is used to score the relevance of the company's public information and the universe's theme. Lastly, the companies are ranked from high to low in terms of relevance, and the top 30 are selected. The companies are included in the index constituent stocks.

Chapter 5: Conclusions and Suggestions

1. Research Results

Thematic investments have become increasingly prosperous in the market in recent years. According to MSCI data, the CAGR of thematic ETFs from 2015 to 2020 was 20%. In addition to the original advantages of ETFs, the globalized epidemic interrupted certain exchanges or strictly blocked borders, which we could not have predicted more than a year ago. As a result of the incident, investors were given an opportunity to redefine “normal” for their lifestyle. They are more aware of the environment in which they live, as well as their intentions to participate in the future. This division makes thematic investment increasingly attractive to investors. Due to the impact of the epidemic, the number of newly listed ETFs did slow significantly in terms of the total amount.

In the case study of domestic thematic ETFs, it was found that 80% of the top 20 domestic ETFs are bond ETFs, and the number of daily transactions is very small. Stock ETFs, such as Yuanta Taiwan Top 50 ETFs (0050) and Yuanta Taiwan Dividend Plus ETF (0056) continue to lead the pack. The current scale of Yuanta Taiwan Top 50 ETF is NT\$176.7 billion, and the scale of Yuanta Taiwan Dividend Plus ETF is NT\$113.3 billion. The scale of Cathay Taiwan 5G Plus ETF in this analysis is NT\$33.5 billion, which is far from the high end of the scale, but it is worth noting that the Yuanta Taiwan Top 50 ETF was established in 2003, whereas the Cathay Taiwan 5G Plus ETF was only established in October 2020, so it is growing quickly.

At present, all Taiwan-themed ETFs belong to the category of disruptive technology, demonstrating that Chinese people possess a preference for innovative technology and that the Cathay Taiwan 5G Plus ETF capitalized on Taiwan’s stability and epidemic prevention this year, as well as the advantages of maintaining the supply chain. The annual reward is bright. The metaverse, which belongs to the disruptive technology category, has become the next mainstream trend. In addition to the familiar immersive experience, the future development direction of the metaverse can also include chips, semiconductors, cloud services, audio-visual media, social platforms, biometrics, and so on, all of which are possible in the future. They are the direction of development.

2. Suggestions

During the later stages of the epidemic, the scale of domestic ETFs is still growing against the trend. It can be seen that among all 224 ETFs, more than 80% of the top 20 ETFs are bond ETFs, and the daily transaction volume and the number of beneficiaries are very low. The other two stock-based ETFs, Yuanta Taiwan Top 50 (0050) and Yuanta/P-shares Taiwan Dividend Plus ETF (0056), are dominant. The scales of these two stocks are NT\$176.7 billion and NT\$113.3 billion, respectively. The other is the subject-based ETF of this case study, the Cathay Taiwan 5G PLUS ETF, which has a scale of NT\$35.547 billion. However, it is worth noting that the Cathay Taiwan 5G PLUS ETF was only established in December 2020.

Nevertheless, if we take Cathay Pacific AI+Robo (00737), which was established in 2018, as an example, it has a current scale of less than NT\$1 billion, and this ETF was initially raised during a time when everyone was optimistic about artificial intelligence and robots. However, the real rocket-like increase of the target of this file is after the outbreak of the epidemic in 2020, in which the maximum increase grew to more than 100% and the performance was amazing; however, before 2020, the performance of this fund had not significantly increased.

Therefore, based on the collected information, three major thematic ETF investment suggestions can be presented:

1. Buy and Hold: Understand that the original intention of choosing thematic investment was to invest in capital in the long-term trend in the future. Since it is a long-term trend, it is obviously better suited for long-term investment. It is best to use the strategy of hitting and running because opportunities may be missed.
2. Break the myth: There is no antidote-style investment. People will become interested because investors believe that thematic investment has the potential to make the investment outperform the traditional index. In fact, this is an investment in the theme of basic expectations, but if the trend is interrupted or reversed, it is possible that it will affect investment performance, so risk management is always the prudent method.
3. Keep track: Many people think that ETFs are lazy investment methods, and they will no longer track them after purchase. However, the scale of domestic thematic ETFs is quite different, and some investors are short-term operations, while some ETFs may still be volatile due to fluctuations. If the ETF is too large, it will cause the ETF itself to shrink. As

long as the size of ETFs in Taiwan falls to NT\$300 million, even if they are included in high-risk groups that may be liquidated, it is recommended that investors participate in future prospects through themed funds while also paying attention to whether they hold shares. To ensure that their own investment portfolio can hold profit, investors should have a concept that is close to the theme itself and pay attention to whether there is any significant change in the scale of the net value change.



References

- Barrer, M. (2020, 3 31). *ETFs vs. Mutual Funds: The Age-Old Question*. Retrieved from wisdomtree.com: <https://www.wisdomtree.com/>
- Bloomberg. (2021, 3 11). *Themes could outgrow sectors as ETFs show sea change in effect*. Retrieved from bloomberg: <https://www.bloomberg.com/>
- DEMARCO, J. (2021, 12 13). *What Is Thematic Investing?* Retrieved from the Balance: <https://www.thebalance.com/>
- ETFGL. (2021, 8 31). *ETFGL reports*. Retrieved from ETFGL.com: <https://etfgl.com/research>
- INVESTMENT, R. (2022). *The Metaverse ETF*. Retrieved from ROUNDHILL INVESTMENT: <https://www.roundhillinvestments.com/>
- Jacobs, J. (2019, 11 6). *Investing in Tomorrow: A Whitepaper on Thematic Investing*. Retrieved from globalxetfs: <https://www.globalxetfs.com/>
- MacroMicro. (2020). *財經M平方*. Retrieved from MacroMicro: <https://www.macromicro.me>
- MSCI. (2021). *Meet Thematic Investing*. Retrieved from MSCI.com: <https://www.msci.com/>
- MSCI. (2021). *The Global Industry Classification Standard*. Retrieved from MSCI: <https://www.msci.com/>
- OECD. (2021, 9). *OECD Economic Outlook, Interim Report September 2021*. Retrieved from oecd.org: <https://www.oecd.org/>
- Palandrani, P. (2021, 10 7). *Thematic ETF Report: Q3 2021*. Retrieved from GLOBAL X : <https://www.globalxetfs.com/content/files/Thematic-ETF-Report-Q3-2021.pdf>
- Rao, A. (2020, 11 18). *Thematic Investing Is a Global Phenomenon*. Retrieved from MSCI: <https://www.msci.com/>
- SITCA. (2019, 9). *R.O.C.產業調查報告 2018*. Retrieved from SITCA: <https://members.sitca.org.tw/OPF/K0000/files/J/03/2018%E7%94%A2%E6%A5%AD%E8%AA%BF%E6%9F%A5%E5%A0%B1%E5%91%8A2019%E5%B9%B4%E6%9C%88.pdf>
- SITCA. (2020, 9). *R.O.C.產業調查報告 2019*. Retrieved from SITCA: <https://members.sitca.org.tw/OPF/K0000/files/J/03/2018%E7%94%A2%E6%A5%AD%E8%AA%BF%E6%9F%A5%E5%A0%B1%E5%91%8A2019%E5%B9%B4%E6%9C%88.pdf>
- Trust, C. S. (2022). *Cathay ETF Series*. Retrieved from Cathay Securities Investment Trust: <https://www.cathaysite.com.tw/>

Vanguard. (2021). Retrieved from Vanguard: <https://investor.vanguard.com/>

Vincent Bérubé, Sacha Ghai, Jonathan Tétrault. (2014, 12 1). *From indexes to insights: The rise of thematic investing*. Retrieved from Mckinsey & Company: <https://www.mckinsey.com>

Watson, W. T. (2012). *Thematic Investing – How we see the world*. Retrieved from Thinking Ahead Institute: <https://www.thinkingaheadinstitute.org/>

中央銀行專題報告. (2020, 3 30). 世界各國為因應新冠肺炎之衝擊，採取對策(例如：採行的QE與減稅政策等)對我國財政、金融、經濟整體環境所造成之影響與政府因應之道. Retrieved from 中華民國中央銀行全球資訊網: <https://www.cbc.gov.tw/tw/mp-1.html>

章錦正. (2020). 淺談 ETF 的現況與發展. *期貨人*(76), pp. 44-45.

BetaShares. (2021, September). *What is thematic investing?* <https://www.betashares.com.au/education/strategies-portfolio-construction/introduction-to-thematic-investing/>

BlackRock (2021, September). *iShares invest thematically*.

Deloitte. (2021). 新型冠狀病毒 (COVID-19) 對消費產業的影響. Deloitte. <file:///Users/jessicaapple1988/Downloads/rp201104-cnsr-covid19-impact.pdf>

Docherty, D. (2021, June 4). 主題投資的吸引力何在? Schroders. <https://www.schroders.com/zh-hk/hk/retail-investors/hkinsights/managers-views/what-is-the-appeal-of-thematic-investing>

證券暨期貨發展基金會. (2020, September). 我國資產管理未來趨勢之研究 <https://weblines.sfi.org.tw/>

安永會計師事務所. (2020). 2020 年安永 ETF 調查報告: 在充滿未知的後疫情時代 ETF 產業的成長是否能再創新高? <https://www.ey.com/>

歐宜佩. (2020, September 12). 後疫情時代的新數位政策議題研析—以新加坡及韓國為例. *經濟前瞻*, pp. 94–100. <https://www.cier.edu.tw/>

ETFDB (2021). *ETF directory*. ETFDB. <https://etfdb.com/etfs/>

ETFGLI. (2021, August 31). *ETFGLI reports*.

Fidelity. (2021, June 25). *Thematic investing: What is it, and how should investors think about it?* White Paper.

Interactive Investor. (2021, July 15). *Thematic ETFs: What investors need to know*.

Interactive Investor. <https://www.ii.co.uk/analysis-commentary/thematic-etfs-what-investors-need-know-ii514259>

Investopedia. (2021, February 5). *ETF essentials*. Investopedia. <https://www.investopedia.com/articles/exchangetradedfunds/12/brief-history-exchange-traded-funds.asp>

Jacobs, J. (2019, November 6). *Investing in tomorrow: A Whitepaper on thematic investing*. <https://www.globalxetfs.com/>

Global X. <https://www.globalxetfs.com/investing-in-tomorrow-a-whitepaper-on-thematic-investing/>

Johnson, B. (2021, June 8). *Are thematic funds worthy of the hype or a risky distraction?*

MSCI. <https://www.msci.com/visualizing-investment-data/thematic-investing>

J.P. Morgan. (2021). *TrackInsight Global ETF Survey 2021*. <https://am.jpmorgan.com/>

Lamont, K. (2021, January 18). *ETF research & insights: The rise of thematic ETFs*. <https://www.morningstar.co.uk/>

