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Kai Wu

Founder & Chief Investment Officer
kai@sparklinecapital.com

Executive Summary

Superstar brands are reaching new heights in the digital age, yet many remain undervalued. We identify superstar brands with trademark moats, exposure to growing product markets, and high web search interest. Consistent with prior research on “intangible value,” firms with undervalued brand portfolios have outperformed the stock market. Finally, we use our brand database to build industry classifications that allow for multi-segment firms (e.g., Amazon).

Introduction

Economic Stimulus (Taylor’s Version)

“May was the strongest month for hotel revenue in Philadelphia since the onset of the pandemic, in large part due to an influx of guests for the Taylor Swift concerts in the city.”

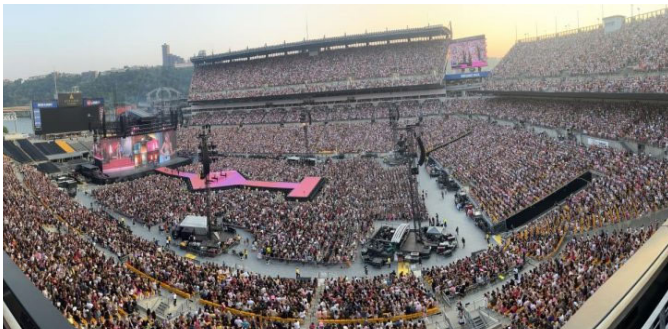
🔔 Federal Reserve of Philadelphia ([Jul 2023](#))

For over a year, economists have issued dire warnings of an imminent recession. Yet, as 2024 begins, the downturn is still nowhere to be found. Apparently, economists failed to account for the impact of the superstar trio of Taylor Swift, Beyoncé, and Barbie, whom the [Wall Street Journal](#) credits with carrying us through the summer (and beyond)!

Taylor Swift’s sensational ‘Eras Tour’ is on track to become the first to gross \$1 billion. Moreover, it is projected to add another [\\$4.6 billion](#) to the U.S. economy as fans splurge on travel, hotels, and merchandise. Beyoncé’s tour is providing similar stimulus. With \$2.1 billion in projected ticket sales, it has even been blamed for stoking [inflation](#) in Sweden!

Exhibit 1

Shaking Off Recession Fears



Source: Katie Masko, Sparkline.

This summer’s Barbie movie was another runaway success. Already raking in nearly \$1.4 billion, the better half of the [Barbenheimer](#) duo threw a lifeline to the struggling theater industry. In addition, the film spurred sales of a wide array of merchandise and even led to a global shortage of pink paint.

The year 2023, which culminated in Swift being named [Time Person of the Year](#), was a triumph for the modern superstar brand. By expertly wielding social media, these superstars engage billions of fans across the globe. Beyoncé and Swift alone have a mind-boggling 600 million Instagram followers, apparently a key omitted variable in central bank models!

Digital media also powered Barbie’s blockbuster marketing campaign. Mattel deftly orchestrated collaborations with an unprecedented roster of 165 brands spanning suitcases, burgers, and insurance. Recruiting dozens of celebrities and even listing a real-life DreamHouse on Airbnb, Mattel’s viral stunts lit up social media all summer. 🔥

Exhibit 2

Barbie Brand Partnerships



Source: Mattel, InStyle, Sparkline.

Intangible Brands ✨

“Products are made in the factory, but brands are created in the mind.”

💡 Walter Landor

Despite owning the brand, Mattel did not actually produce the Barbie movie. Instead, it worked with Warner Bros, who did most of the heavy lifting. Mattel’s main contribution was its intellectual property (IP), which it also licensed to its 165 product collaborators. After all, Mattel has no interest in being in the business of making ice cream, sofas, or candles.

This “asset-light” approach is a pure expression of brand as an intangible asset. As Mattel’s CEO said on a recent earnings call, “the Barbie movie is a showcase for the cultural resonance of our IP ... and the significant progress of our strategy to capture the full value of our IP.”

It also highlights Barbie’s aim to transcend its roots as a doll maker for young girls. In marketing speak, this strategy is called “brand extension.” While not without risks, brands that successfully break the confines of their original product category enjoy greater relevance and market opportunities.

Exhibit 3

Superstar Brand Examples



Source: Sparkline.

Superstar brands are valuable intangible assets that drive consumer loyalty, sales and profits. However, as explained in [Intangible Value](#) (Jun 2021), brand equity is not accounted for in financial statements. As a result, brands, like many other intangible assets, tend to be undervalued by investors.

Rather than rely on accounting data, we value brands using a combination of alternative data, machine learning, AI, and natural language processing (NLP). In doing so, we confirm that superstar brands are indeed often undervalued, offering opportunities for investors willing to embrace new methods.

Superstar Brands

Trademark Data™

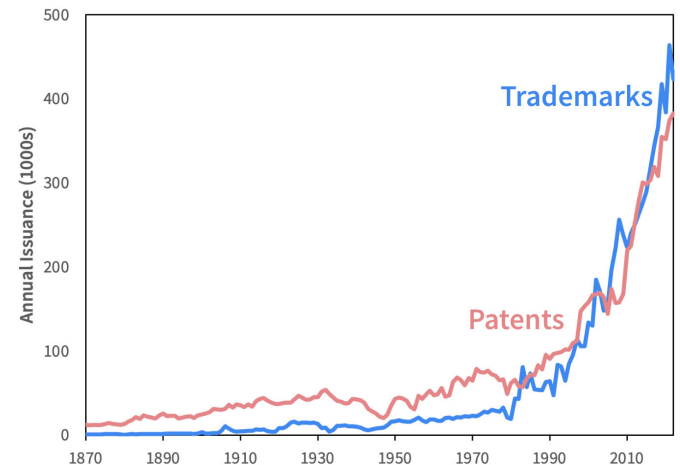
In [Investing in Innovation](#) (Apr 2022), we studied innovation using two centuries of patent data from the U.S. Patent and Trademark Office (USPTO). As its name suggests, the USPTO also maintains a deep history of millions of trademarks.

As the next exhibit shows, both patents and trademarks have enjoyed exponentially growing use. Relative to patents, trademarks are a newer invention, only taking their modern

form with the Lanham Act of 1946. However, since then, trademark usage has skyrocketed. In fact, trademark has exceeded patent issuance in each of the past five years.

Exhibit 4

USPTO Annual Issuance



Source: USPTO, Sparkline. Issuance (not applications). From 1870 to 2022.

While trademarks provide valuable insight on brands and their owners, they are rarely studied in the finance literature. 85% of the 1,000 largest U.S. public firms use trademarks, yet few researchers have applied this data to firm valuation. We believe this makes them an underrated source of alpha.

To introduce the data, below is a screenshot from the USPTO trademark database ([TESS](#)) related to Mattel’s Barbie brand.

Exhibit 5

Barbie Trademark Examples

	Serial Number	Reg. Number	Word Mark	Check Status	Live/Dead	Class(es)
17	90531086	6800290	BARBIE YOU CAN BE ANYTHING SERIES	TSDR	LIVE	
18	90178758	6719769	BARBIE BIG CITY, BIG DREAMS	TSDR	LIVE	
19	88934636	6325496	BARBIE	TSDR	LIVE	
20	88934633	6324165	BARBIE	TSDR	LIVE	
21	88829816	6302628	BARBIE	TSDR	LIVE	
22	88666763	6290394	BARBIE PRINCESS ADVENTURE	TSDR	LIVE	
23	88211001	6267202	BARBIE	TSDR	LIVE	
24	88210995	6267201	BARBIE	TSDR	LIVE	
25	88764362	6085856	HOLIDAY BARBIE	TSDR	LIVE	
26	87379265	5602186	BARBIE DREAMHOUSE ADVENTURES	TSDR	LIVE	041
27	87379261	5602185	BARBIE DREAMHOUSE ADVENTURES	TSDR	LIVE	028
28	87379252	5460374	BARBIE ON THE GO	TSDR	LIVE	028
29	87379269	5441651	BARBIE LIVE! IN THE DREAMHOUSE	TSDR	LIVE	041
30	87307001	5371526	BARBIE SIGNATURE	TSDR	LIVE	028
31	87192362	5318480	BARBIE SPARKLE BLAST	TSDR	LIVE	009
32	87228893	5222835	BARBIE	TSDR	LIVE	009
33	86830181	7115540	SUPERSTAR BARBIE	TSDR	LIVE	
34	86789611	5233292	BARBIE DREAMTOPIA	TSDR	LIVE	
35	86789616	5346799	BARBIE DREAMTOPIA	TSDR	LIVE	041

Source: USPTO, Sparkline. Only a subset is shown. As of 8/31/2023.

Note that multiple trademarks exist for the same word mark. This is because each trademark only protects the mark for a specified use case. For example, the next exhibit shows a

recent trademark protecting the use of the “Barbie” mark in the product category of “sanitary marks.”

**Exhibit 6
Trademark Example**

BARBIE	
Word Mark	BARBIE
Goods and Services	IC 010. US 026 039 044. G & S: SANITARY MASKS MADE OF CLOTH FOR PROTECTION AGAINST VIRAL INFECTION. FIRST USE: 20201204. FIRST USE IN COMMERCE: 20201204
Serial Number	88934636
Filing Date	May 27, 2020
Published for Opposition	February 2, 2021
Registration Number	6325496
Registration Date	April 20, 2021
Owner	(REGISTRANT) MATTEL, INC. CORPORATION DELAWARE TWR 15-1 333 CONTINENTAL BOULEVARD EL SEGUNDO CALIFORNIA 90245



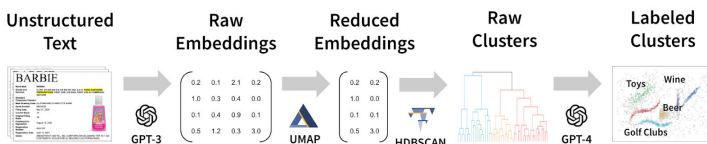
Source: USPTO, Mattel, Sparkline. As of 8/31/2023.

When applying for a trademark, firms must list in “Goods and Services” the specific product market they are targeting (and provide proof of usage). This field contains valuable information on firms’ business lines, but working with the data can be tricky since it consists of messy, freeform text.

In [Deep Learning in Investing](#) (Jul 2020), we argued that the “killer app” of AI for investors is its ability to unlock insights in unstructured text. Large language models (LLMs) provide a powerful tool to wrangle this unruly data. By combining LLMs with other modern machine learning tools, we can transform arbitrary text into a structured taxonomy.

First, we create embeddings for each text description using GPT-3. Second, we reduce embedding dimensionality using a manifold learning algorithm called UMAP. Third, we group trademarks based on these embeddings using a hierarchical clustering algorithm called HDBSCAN. Finally, we use GPT-4 to label each cluster based on its constituent descriptions.

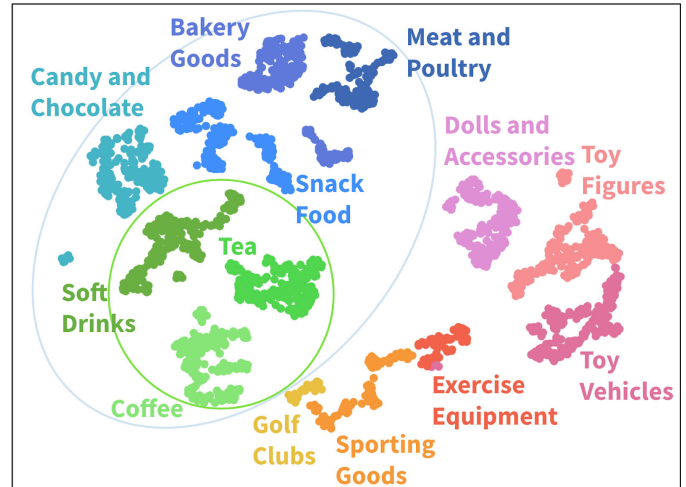
**Exhibit 7
Clustering Algorithm**



Source: Sparkline.

Using this four-step process, we organize our 15 million trademarks into several clusters. Below is a visualization of this clustering process applied to a small slice of our data.

**Exhibit 8
Trademark Clustering Visualization**

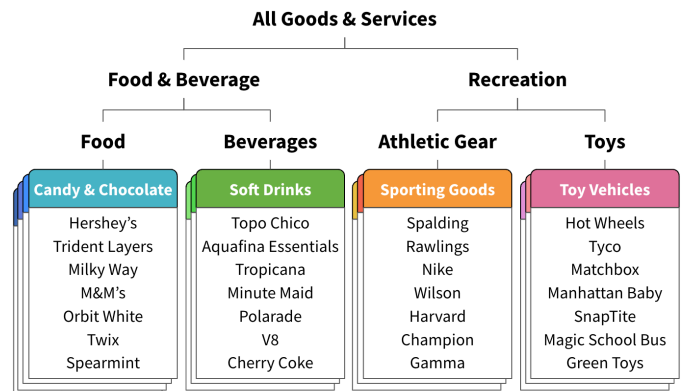


Source: USPTO, Sparkline. As of 8/31/2023.

This visualization reveals the nested structure of trademark descriptions. First, we see two major product sectors (i.e., “food & beverage” in the upper left and “recreation” in the lower right). Each sector contains two smaller regions (e.g., food vs. beverages) and each region is in turn composed of 3 to 4 narrow clusters (e.g., coffee, tea, and soft drinks).

This intuitive topography results from our hierarchical clustering algorithm. The next exhibit recasts this taxonomy as a dendrogram. Brands such as Hershey’s and Twix are grouped together in “Candy & Chocolate,” which feeds up to “Food,” which in turn flows up to “Food & Beverage.”

**Exhibit 9
Trademark Hierarchical Clustering**



Source: USPTO, Sparkline. As of 8/31/2023.

We can use this same methodology to assign word marks to larger “brand clusters.” For example, “Barbie,” “Holiday Barbie,” and “Barbie Dreamtopia” are not distinct brands but members of the larger “Barbie” brand umbrella. As a

sanity check, the next exhibit shows Mattel’s brand clusters ranked by the number of trademarks.

**Exhibit 10
Top Mattel Brands by Trademark Count**



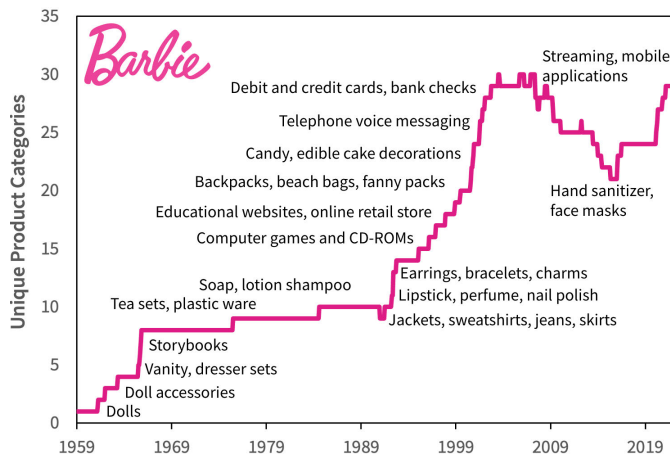
Source: Sparkline. As of 8/31/2023.

As we know, Barbie and Hot Wheels are Mattel’s two most important brands. Now that we have a methodology for structuring the “word mark” and “goods and services” fields, let’s go hunting for some good brands!

Searching for Superstars 🏆

As the Barbie “face mask” trademark suggests, brands often apply for trademarks as they enter new product markets. As such, trademarks allow us to trace the evolution of a firm’s brand extension strategy. Let’s look at the history of Barbie.

**Exhibit 11
Expanding Barbie World**



Source: USPTO, Sparkline. Registered trademarks only. As of 8/31/2023.

The original Barbie doll trademark was granted in Dec 1959. Over the next few years, Mattel received trademarks for doll accessories and toy furniture. In the decades that followed, Barbie expanded from toys into children’s furniture, apparel, cosmetics, and food. Starting in the 1990s, Mattel introduced many new products leveraging the Internet revolution.

However, it hasn’t always been smooth sailing. As the Barbie brand struggled for relevance in the 2010s, Mattel let many trademarks in unused areas expire (e.g., credit cards). But the past few years have seen a resurgence as Mattel works to revive the brand. Active product categories are back to 27.

We can apply this methodology to our full brand database to identify other superstar brands. The next exhibit shows how Barbie compares to several other iconic brands based on the number of active product categories

**Exhibit 12
Superstar Brands: Distinct Product Categories**



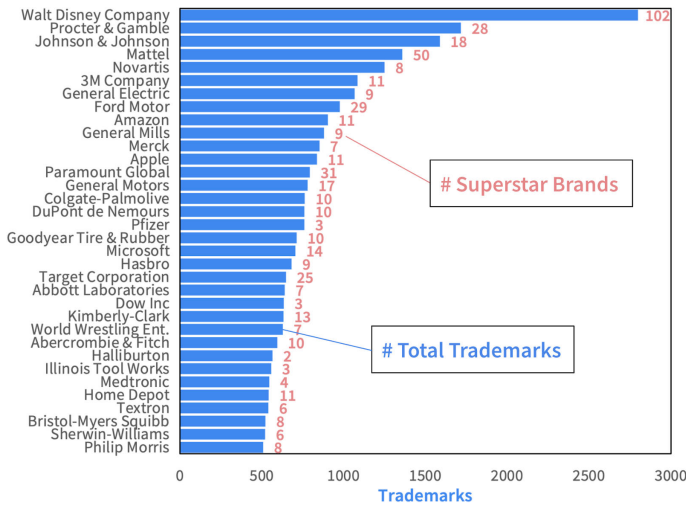
Source: USPTO, Sparkline. Number of unique product categories for each brand. Registered trademarks only. As of 8/31/2023.

The Ford brand reigns supreme, used not only in an array of automotive products but [merchandise](#) ranging from hats to stuffed animals. Other superstar brands include Disney, 3M, Kirkland Signature, and Ferrari. Even those who do not own a tractor or motorcycle can appreciate the power of the Caterpillar or Harley-Davidson brands.

However, as investors, we generally cannot buy individual brands. Instead, we invest in portfolios of brands held at the corporate level. As we saw with Mattel, these portfolios can consist of dozens of brands. Fortunately, trademark data provides a way to map the hundreds of thousands of distinct brands to their corporate owners.

The next exhibit ranks U.S. public companies based on the strength of their brand portfolios. We rank firms on two different metrics: number of superstar brands (**red labels**) and total number of registered trademarks (**blue bars**).

Exhibit 13
Top Trademark Portfolios

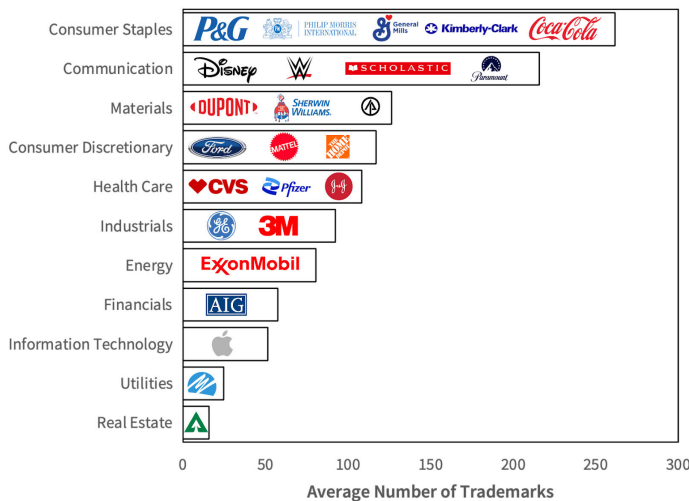


Source: USPTO, Sparkline. Registered trademarks only. U.S. public companies only. As of 8/31/2023.

The strongest brand portfolio belongs to the Walt Disney Company, which owns not only the Disney brand but also the Marvel and Star Wars franchises. In second place is Procter & Gamble, the owner of Pampers, Tide, and Gillette. While Mattel has the second most superstar brands, it has only the fourth most total trademarks.

The next exhibit further examines trademark ownership by sector. The bars show the average number of trademarks owned by firms from each sector. For context, we include representative firm logos for each sector.

Exhibit 14
Trademark Ownership by Sector



Source: USPTO, S&P, Sparkline. Registered trademarks only. Top 1,000 largest U.S. public companies by market capitalization only. As of 8/31/2023.





As expected, consumer staples and discretionary firms are prolific trademark users. Communications, which includes media and entertainment, is second. Perhaps surprisingly, materials and industrials also score highly. Although they are by far the heaviest users of patents, healthcare and tech companies are much less active in trademarks.

For investors, one of the attractive features of trademarks is their use in a wide range of industries. Firms in both the new and old economies utilize trademarks. Moreover, firms can trademark not only goods but also services, of particular importance in today's service economy. Trademarks provide a powerful and versatile lens for finding superstar brands.

Intangible Value ✨

In [Intangible Value](#) (Jun 2021), we argued that intangible assets tend to be undervalued as investors have been slow to adapt their metrics to today's asset-light economy. We defined four pillars of intangible assets.

Exhibit 15
Four Intangible Pillars

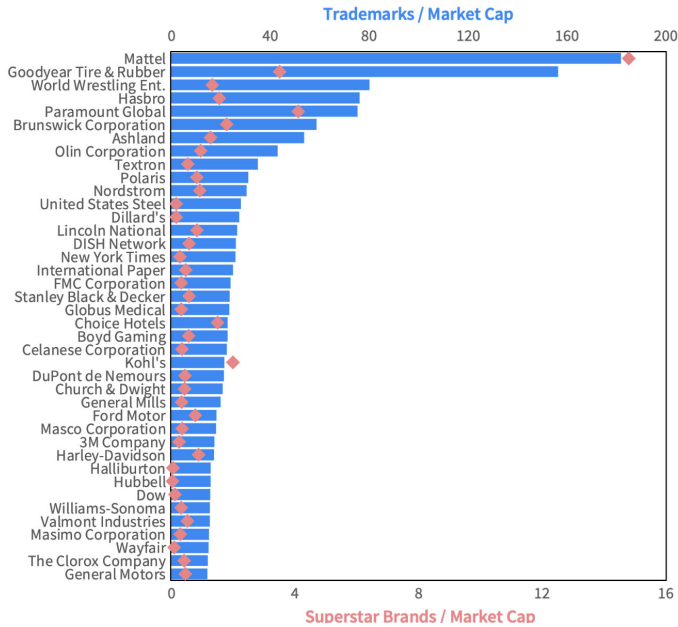
- 
Intellectual Property
Proprietary knowledge, patents, technology, and data
- 
Brand Equity
Strong brand recognition and customer loyalty
- 
Human Capital
Highly skilled, aligned, and motivated workforce
- 
Network Effects
Engaged ecosystem of external producers and consumers

Source: Sparkline.

In the last section, we used trademarks to identify firms with valuable brand equity. As value investors, however, we don't simply want to buy the stocks with the most total trademarks (or superstar brands), as this merely favors large firms. Instead, we want to maximize the number of trademarks (or superstar brands) obtained per dollar of market capitalization. Similar to a dividend or earnings yield, we call this value-based metric "trademark yield."

The next exhibit highlights the U.S. stocks with the highest trademark yields, defined based on both total trademarks (blue) and superstar brands (red).

Exhibit 16
Top Trademark Yield Stocks

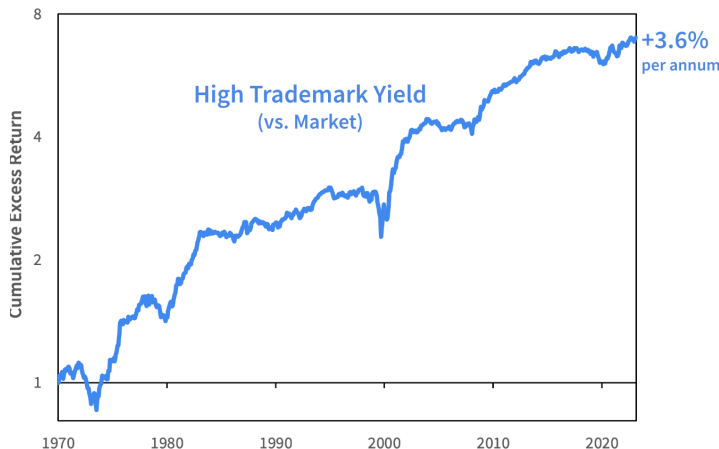


Source: USPTO, S&P, Sparkline. Registered trademarks only. Top 1,000 largest U.S. public companies by market capitalization only. As of 8/31/2023.

Normalizing by market cap greatly changes our rankings. Many large-cap stocks, such as Disney, Procter & Gamble, and Amazon, drop out. On the other hand, we see the rise of small brand-intensive firms like WWE, Brunswick, and Choice Hotels (Radisson, Comfort Inn). And Barbie fans will be pleased to see Mattel back in the top spot!

Next, let's see whether stocks with high trademark yields are indeed undervalued. The next exhibit shows the backtested returns of a strategy that buys stocks with high trademark yields relative to the market over the past fifty years.

Exhibit 17
Undervalued Brand Backtest

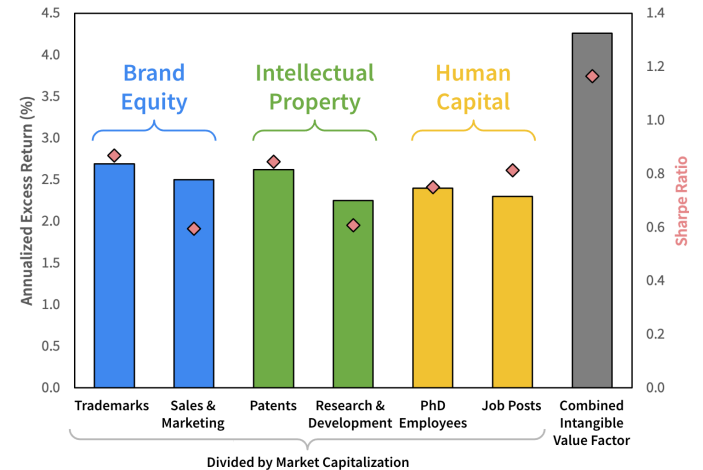


Source: S&P, USPTO, Sparkline. Market is defined as the top 1,000 U.S. stocks by market cap. Strategy owns stocks in the top quartile of trademark yield from within the market. Line shows cumulative returns of the strategy relative to the market. Portfolios are rebalanced monthly and equal-weighted. Excludes transaction and financing costs. See important backtest disclosure below. From 1/1/1970 to 8/31/2023.

Since 1970, the strategy has outperformed the market by an average of +3.6% per year with high consistency. We arrive at similar results if we repeat this analysis while neutralizing industry tilts, assuring us that the outperformance is not due simply due to a bias toward staples and communications.

Over the past few years, our research has identified many other intangible value factors that have also outperformed the market. The next exhibit compares the trademark factor to five other intangible value factors as well as the **combined intangible value factor** from [Intangible Value: A Sixth Factor](#) (May 2023), which is a composite of dozens such metrics.

Exhibit 18
Intangible Factor Lineup (Backtested)



Source: S&P, USPTO, Sparkline. Returns are for long-short strategies, sorted on each of the 7 metrics shown within a universe of the 1,000 largest U.S. stocks. Positions are rebalanced monthly and equal-weighted. Excludes transaction and financing costs. See important backtest disclosure below. Sharpe ratio is annualized excess return divided by volatility. From 1/1/2010 to 8/31/2023.

The trademark factor provides similar excess returns to the other intangible value factors with a slightly better Sharpe Ratio. Importantly, its average correlation to the other five factors is only 12% (35% with S&M). Low correlation across metrics (and especially pillars) explains why the **combined factor** is superior to its individual components.

Trademarks provide a useful tool for finding strong brands. These brands are often undervalued, delivering subsequent excess returns. This finding adds to our increasingly robust corpus of research showing intangible value outperforms across a wide range of data sources and intangible pillars.

Consumer Trends

Rise of the Consumer 🛍️

“The 19th century has been the century of producers. Let us hope that the 20th century will be that of consumers. May their kingdom come!”

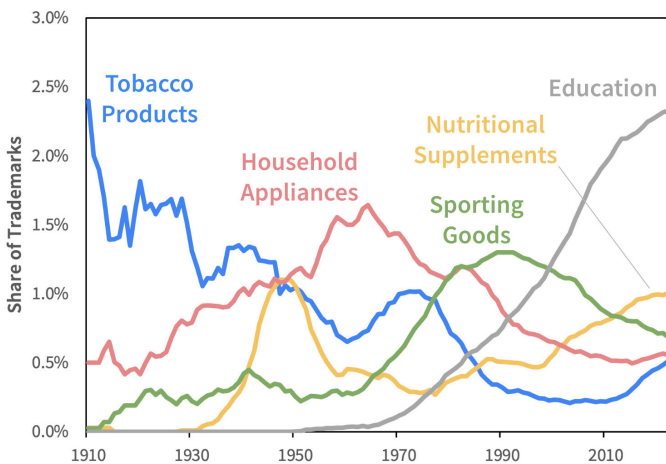
👑 Charles Gide (1898)

In the modern economy, the consumer is king. His insatiable desire for iPhones, Nike shoes, SUVs, and Parisian vacations shape supply chains, geopolitics, and the wealth of nations. Over the past century, rising global wealth has only further swelled the ranks of the [almighty consumer](#).

However, King Consumer is a capricious ruler. Social media has democratized influence. Gone are the days when brands such as Coca-Cola or Marlboro dictated consumer tastes by advertising on the airwaves. As investors, we need a way to stay on top of rapidly changing consumer trends.

Our trademark-based product clusters can help. In [Investing in Innovation](#) (Apr 2022), we used patent-based clusters to map past technological revolutions (e.g., rail, electricity). We follow a similar approach here but instead use trademarks. This allows us to trace the evolution of consumer tastes.

Exhibit 19 Evolving American Consumer



Source: USPTO, Sparkline. 10-year moving average. Trademark registrations only. From 1/1/1900 to 12/31/2019.

Since 1900, consumer tastes have greatly changed. **Tobacco products** steadily lost popularity in the face of public health campaigns but are seeing a minor resurgence with vaping. Demand for **household appliances** peaked in the 1960s and **sporting goods** in the 1990s. **Nutritional supplements** first

caught fire with the vitamin craze in the 1940s and are again riding high. **Education** is a steadily growing product category in today’s knowledge economy. The next exhibit shows the fastest-growing categories each decade.

Exhibit 20 Greatest Hits by Decade 🌐

1900s	soft drinks	tobacco products	building materials	textile fabrics	firearms
1910s	bakery goods	newsletters	cosmetics	calculating machines	medical bandages
1920s	ice cream parlor services	cosmetics	automotive vehicles	hosiery	fresh fruits and vegetables
1930s	alcoholic beverages	comic strips	electric hair trimmers	radio	commercial aviation
1940s	gasoline	playing cards	perfume	medical bandages	adhesive tape
1950s	vinyl records	oral care products	carpets and rugs	construction	frozen vegetables
1960s	travel agency services	swimming pools	franchising services	hair spray	snack foods
1970s	coin-operated games	footwear	t-shirts	bowling	audio and video recordings
1980s	video games	telecom services	disposable diapers	child care services	pharmaceuticals
1990s	online forums / chat rooms	fiber optic communications	bar code scanners	liquid crystal displays	online auction services
2000s	software	energy drinks	identity theft / fraud protection	nutritional supplements	pet care services
2010s	smartphones	podcasts	fitness trackers	e-sports	cannabis

Source: USPTO, Sparkline. Trademark registrations only. From 1/1/1900 to 12/31/2019.

In this table, we see the impact of two World Wars, the end of Prohibition, suburban expansion, and women’s liberation. We also see the influence of new technologies, such as the radio, refrigeration, vinyl records, and the Internet. Finally, we see the rise of popular cultural trends, such as ice cream parlors, comics, hair spray, and arcade games!

Surfing Consumer Trends 🌊

“There is only one boss: the customer. And he can fire everybody in the company, from the chairman on down, simply by spending his money somewhere else.”

🛒 Sam Walton

If the customer is king, we want to invest in the companies making the stuff he desires. Trademarks can help us identify not only fast-growing product categories but also firms benefiting from these burgeoning product markets.

We follow the approach used in a few of our prior research papers. In [Investing in Innovation](#) (Apr 2022), we built a profitable strategy that invests in companies exposed to technologies trending in patent data. Similarly, in [Liquid Venture Capital](#) (Sep 2022), we replicated the venture capital return index using trends in CrunchBase private deal data.

Let’s see how this is done. To build intuition, the next exhibit shows some of the fastest-growing categories today.

Exhibit 21
Current Hot Products 🔥

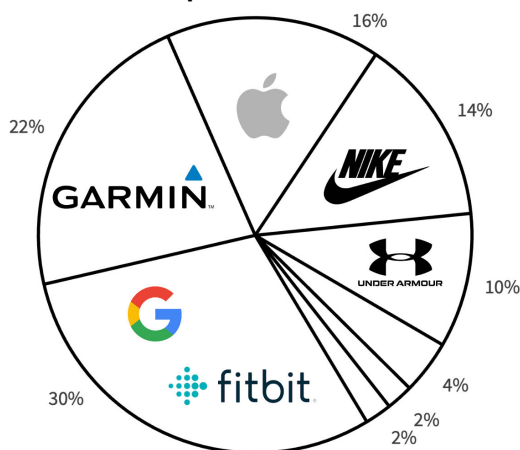
Product Category	3-Year Change	Product Category	3-Year Change
podcasts	172%	health and wellness	20%
cbd products	80%	nutritional supplements	20%
pharmaceuticals	71%	online computer games	20%
software	63%	online journals	19%
professional wrestling	41%	cancer treatment	18%
brewery services	38%	respiratory medications	18%
telecommunications	34%	legal services	18%
pet supplies	33%	hair accessories	17%
distilled spirits	32%	meat substitutes	17%
cosmetic brushes	32%	heating and air conditioning	16%
alcoholic bevs except beers	31%	liquid crystal displays	16%
virtual reality	26%	dating services	16%
fitness trackers	24%	optical devices	15%
massage apparatus	23%	non-medicated skin care	15%
stem cell storage	22%	intellectual property	15%
gambling services	22%	beauty salon services	14%
pharmacy benefit mgmt	21%	health and beauty products	14%
pharmaceutical r&d	21%	online auction services	14%
pet care services	21%	magnetically encoded cards	14%
hair care preparations	20%	charitable fundraising	14%

Source: USPTO, Sparkline. As of 8/31/2023.

Podcasts are the fastest-growing category 📈! CBD is also flying high, along with a variety of other pharmaceuticals. Health and wellness in general has taken off, with products like fitness trackers, massagers, and skin care. We also see the growing popularity of entertainment products, such as professional wrestling, gambling, and computer games.

Trademark data can also be used to identify individual firms with exposure to each of these trending product markets. The next exhibit shows an example for fitness trackers.

Exhibit 22
Fitness Tracker Example 📱

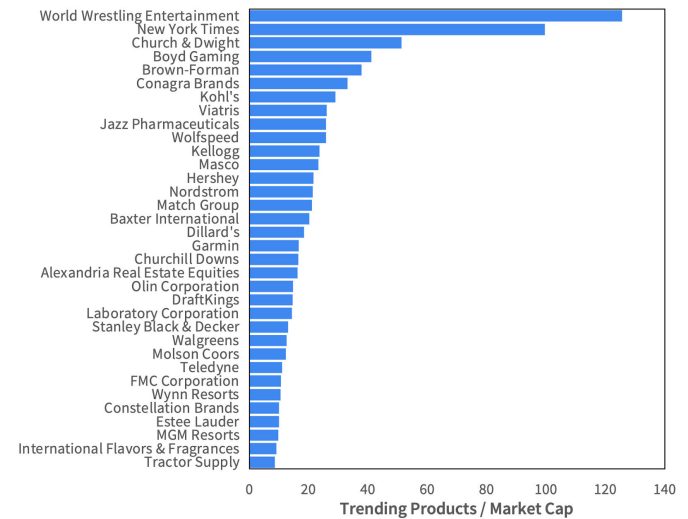


Source: USPTO, Sparkline. Top 1,000 U.S. stocks by market cap. As of 8/31/2023.

We use the relative number of trademarks as a simple proxy for market share. On this basis, Google (which owns Fitbit), Garmin, and Apple are the top players in U.S. wearables with a combined 68% of the total market.

From here, we aggregate to the company level by summing market share across all trending categories. Finally, as with our “trademark yield” strategy, we divide total market share by market cap to arrive at a valuation ratio, which we call “trending product yield.” Below are the top results today.

Exhibit 23
Top Trending Product Yield Stocks

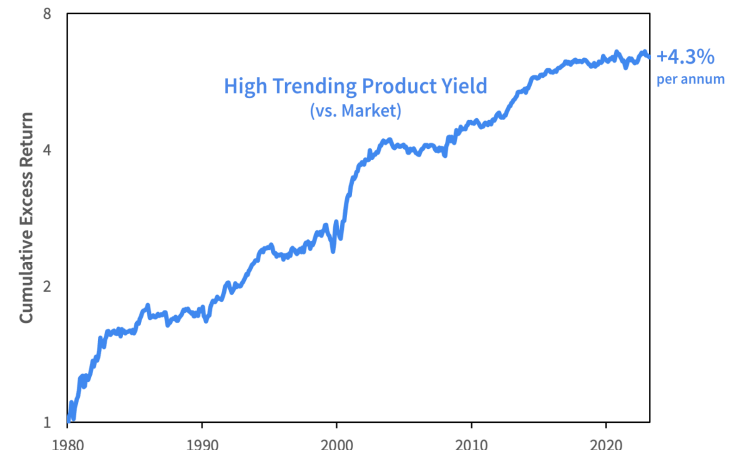


Source: USPTO, S&P, Sparkline. Top 1,000 U.S. stocks by market cap. As of 8/31/2023.

World Wrestling Entertainment (now TKO) takes the top spot. The rest of the list consists of an eclectic mix of gambling, alcohol, life sciences, home improvement, cosmetics, online dating, media, and industrial business.

Next, let’s backtest a strategy that invests in the stocks with the highest “trending product yields” each month. The next exhibit shows its returns compared to the market.

Exhibit 24
Investing in Consumer Trends Backtest



Source: S&P, USPTO, Sparkline. Market defined as the top 1,000 U.S. stocks by market cap. Strategy owns stocks in the top quartile of trending product yield from within the market. Line shows cumulative returns of the strategy relative to the market. Portfolios are rebalanced monthly and equal-weighted. Excludes transaction and financing costs. See important backtest disclosure below. From 1/1/1980 to 8/31/2023.

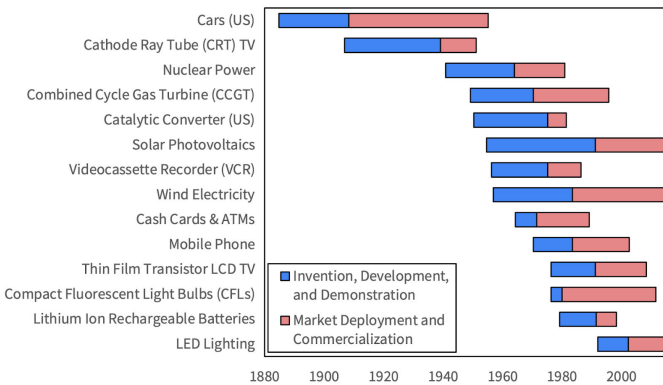
The strategy has outperformed the market by 4.3% per year. Furthermore, despite also being a value strategy, it has a low correlation to our original “trademark yield” strategy, due to its focus on a narrow subset of hot product categories.

This highlights one of the big advantages of public market investing: liquidity. Unlike firms themselves, stock investors have the ability to flexibly adjust the product mix of their portfolio to meet ever-shifting customer demands.

The Innovation Lifecycle

In [Investing in AI: Navigating the Hype](#) (Jul 2023), we framed today’s AI hype in the context of the dot-com bubble. We argued that valuations can often get ahead of actual use cases. As the next exhibit shows, it can take decades for technological breakthroughs to gain mainstream adoption.

Exhibit 25 Historical Product Lags



Source: [Hanna et al \(2015\)](#), Sparkline. As of 2015.

As investors, we need a way to track not only technological innovation but also commercial deployment. In prior work, we have used patents or academic journals to measure the progress of basic R&D. However, this does not always signify that a firm is close to launching a fully-baked product.

Trademarks provide a useful complement, as firms tend to file applications only once they are closer to deploying an actual product. Moreover, they help uncover firms deploying innovative new technologies that may have been invented elsewhere. As history has shown, the spoils of innovation do not always accrue to the original inventor.

Let’s take a look at the current example of Generative AI. So far, LLM innovation has been driven by tech giants, such as Google, Meta, and Microsoft/OpenAI. However, prompted by the breakout success of ChatGPT, early adopters from a diverse set of industries are now scrambling to incorporate LLM technology into their businesses.

Trademark data can help us identify these early adopters. For example, JPMorgan recently made industry [headlines](#) with its application for the “IndexGPT” trademark, which it described as “artificial intelligence for use in computer software selection of financial securities.”

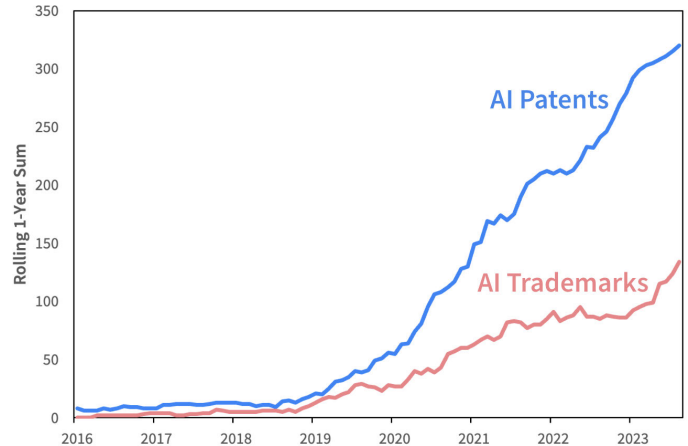
Exhibit 26 IndexGPT Trademark

<h1>IndexGPT</h1>	
Word Mark	INDEXGPT
Goods and Services	IC 042, US 100 101. G & S: Providing temporary use of on-line non-downloadable cloud computing software using artificial intelligence for use in computer software selection of financial securities and financial assets. Software as a service (SAAS) services featuring software using artificial intelligence for Generative Pre-trained Transformer models in the field of financial services. Providing consumer product information for the purpose of selecting artificial intelligence (AI) hardware and software to meet the consumer’s specifications; software as a service (SAAS) services featuring software for analyzing and selecting securities tailored to customer needs
Serial Number	97931538
Filing Date	May 11, 2023
Owner	(APPLICANT) JPMorgan Chase Bank, N.A. national banking association UNITED STATES 1111 Polaris Parkway Columbus OHIO 43240

Source: USPTO, Sparkline. G&S description abridged. As of 8/31/2023.

Of course, JPMorgan is only one of hundreds of firms that are currently experimenting with AI. The next exhibit shows the number of AI patents and trademarks granted to U.S. public companies on a rolling 1-year basis.

Exhibit 27 AI Patents and Trademarks

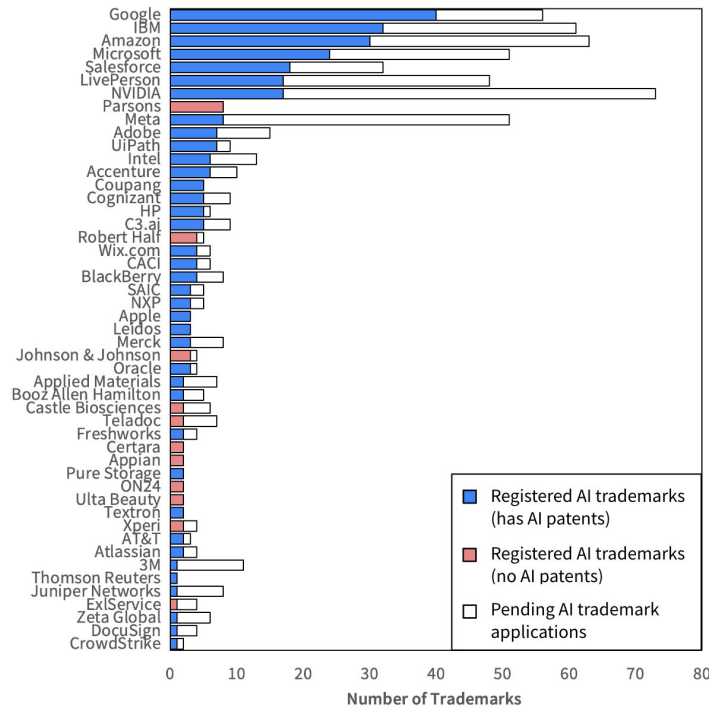


Source: USPTO, Sparkline. U.S. public companies only. As of 8/31/2023.

While both patents and trademarks have grown rapidly over the past several years, AI patents started rising a few years earlier and are still far more prevalent. We are still early in the AI innovation lifecycle, and, as such, more resources have thus far been spent on R&D than productization.

The next exhibit shows the U.S. public companies with the most registered AI trademarks. Firms with AI trademarks but no AI patents are coded red. Empty bars represent pending but not yet registered AI trademarks.

Exhibit 28
AI Early Adopters



Source: USPTO, Sparkline. U.S. public companies only. As of 8/31/2023.

Big tech dominates the leaderboard. While Google currently holds the top spot, Nvidia is set to surpass it if its 56 pending applications are all successful. Smaller AI-focused firms, like LivePerson, UiPath, and C3.ai, punch above their weight. Finally, several non-tech firms, such as Parsons, Robert Half, Johnson & Johnson, and Ulta Beauty make the cut.

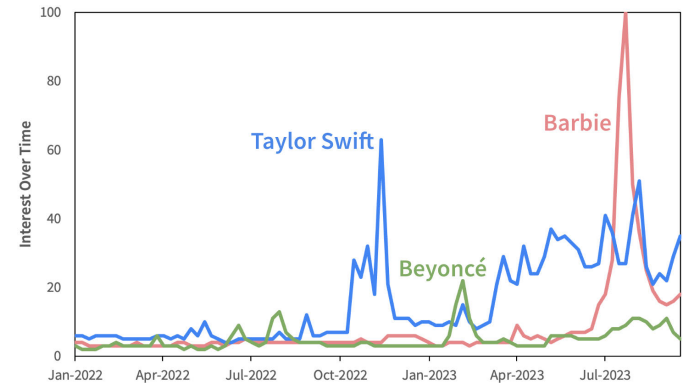
As another sign that we are still early in the AI innovation lifecycle, the total stock of AI trademarks and patents is set to increase by 50 to 150% based on the backlog of pending applications alone. Investors looking for early adopters in the impending AI revolution should closely monitor trademark data as it comes out over the next few years.

Google Trends

Brand Mappings

Growing trademark activity provides a decent proxy for consumer adoption. However, we can build an even more powerful indicator using alternative data. In [The Platform Economy](#) (Dec 2020), we showed that Google Trends could provide insight into customer demand. The next exhibit compares Google search interest for our superstar trio.

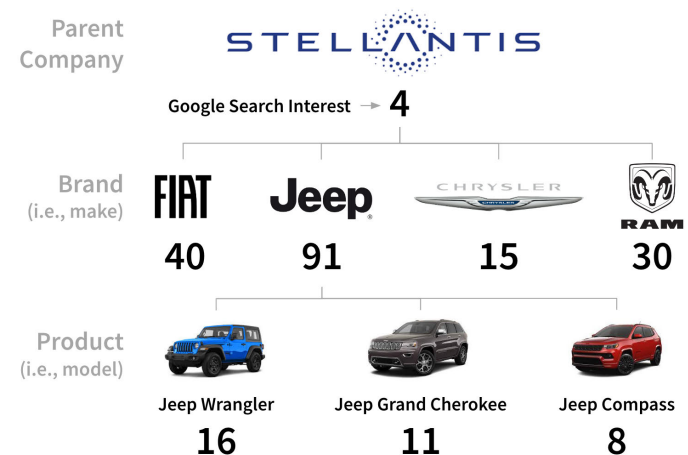
Exhibit 29
Google Trends Example



Source: Google, Sparkline. As of 9/17/2023.

Importantly, when people use Google search, they usually search for the underlying product or brand, rather than the parent company. For example, nobody types in “Stellantis” when they want to buy a car. Instead, they put in “Jeep” or perhaps even “Jeep Wrangler” depending on the specificity of their intent. The next exhibit shows search interest for a few major Stellantis makes and models.

Exhibit 30
Stellantis Google Trends Taxonomy



Source: Google, Sparkline. Average from 9/25/2022 to 9/23/2023.

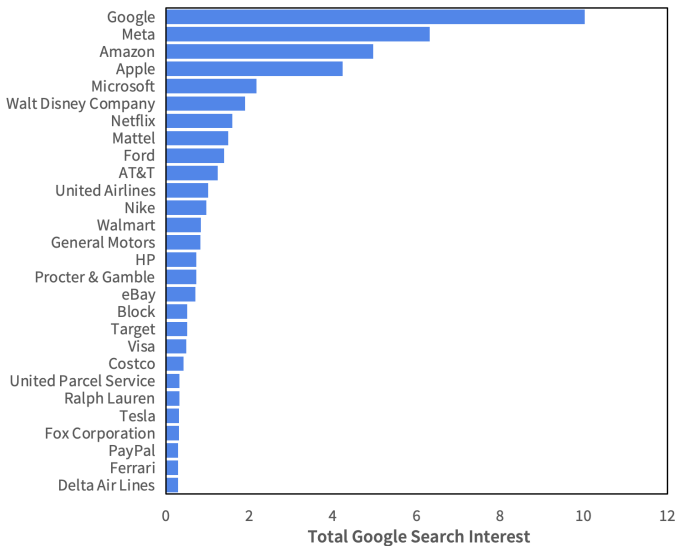
This taxonomy reveals that interest in Stellantis’ brands and products dwarfs that in the parent company. It also allows us to compare interest within tiers. Within Stellantis’ brand portfolio, Jeep and Fiat are the most popular makes; within the Jeep lineup, Wrangler is the most searched for model.

Our goal is to calculate the total search interest for each company. However, since most interest is at the brand- or product-level, it is important to first map product and brand names to their corporate owners. Fortunately, we can use our trademark database to build such a mapping.

Once this is done, we still have to deal with disambiguating brands with common words. For example, GM owns a self-driving car brand called “Cruise.” But most people searching this term are actually looking for cruise vacations (e.g., Royal Caribbean). In this case, to avoid overinflating GM’s metrics, we remove brands if they are not the top search result.

Finally, we can now sum the total Google search interest for each stock across its full brand and product portfolio. The next exhibit shows the highest ranking stocks.

Exhibit 31
Google Search Rankings



Source: USPTO, Google, Sparkline. Search interest normalized for comparison across search terms. 1-year average. U.S. public companies only. As of 8/31/2023.

Mega-cap consumer internet and product firms top the list. Big tech holds the top six spots due to high-ranking search terms like “YouTube,” “iPhone,” and “Xbox.” In the long tail, stocks either make the list due to a single powerful search term (e.g., “Tesla”) or a diversified portfolio of lesser terms (e.g., “GM,” “Chevy,” “Chevrolet,” “Cadillac”).

Search Interest Yield 🔍

Of course, search interest is highly influenced by firm size. Apple’s prodigious search interest is much less impressive given its nearly \$3 trillion market capitalization.

As value investors, our goal is to determine how much of the “good stuff” (search interest, in this case) we get per dollar invested. Thus, just as we did with our “trademark yield” metric, we scale Google search interest by market cap. The next exhibit shows some top-ranking stocks on this metric.

Exhibit 32
Top Search Interest Yield Stocks



Source: USPTO, Google, Sparkline. Search interest normalized for comparison across search terms. 1-year average. As of 8/31/2023.

Our list features many toy and apparel brands (e.g., Mattel, Guess, Ralph Lauren, Hasbro, Tapestry). It also showcases stocks from entertainment (e.g., Manchester United, Roblox, IMAX, WWE, TripAdvisor), airlines, autos, and online retail.

Finally, the next exhibit shows the backtested returns of a strategy that buys stocks with high “search interest yields.” As before, it shows returns relative to those of the market.

Exhibit 33
Google Search Yield Backtest

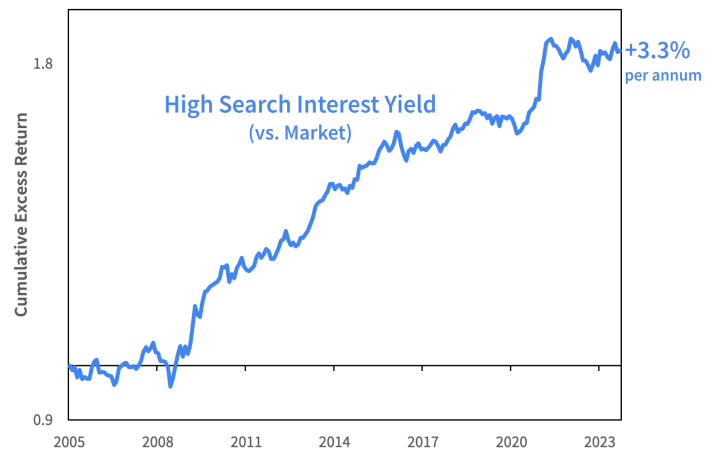


Exhibit 36
Amazon's Competitors

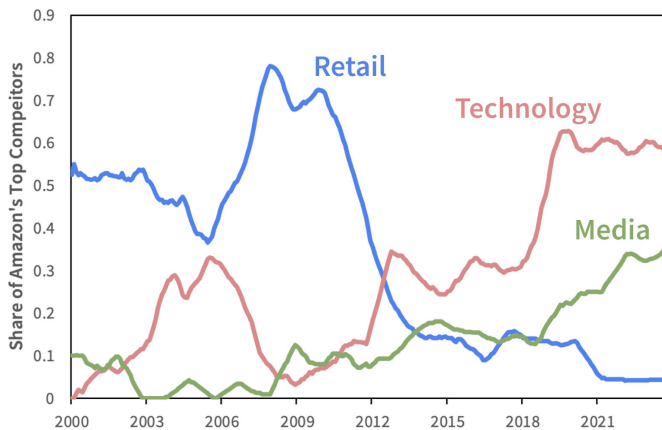
Name	GICS Sector	Score
Walt Disney Company	Communication	0.51
Netflix	Communication	0.47
VMware	Information Technology	0.47
Paramount Global	Communication	0.46
Alphabet	Communication	0.46
Intel	Information Technology	0.44
Microsoft	Information Technology	0.43
Cisco	Information Technology	0.42
Fox Corporation	Communication	0.41
Spotify	Communication	0.40
Comcast	Communication	0.39
Oracle	Information Technology	0.39
Apple	Information Technology	0.38
NVIDIA	Information Technology	0.34
Target	Consumer Staples	0.34
Walmart	Consumer Staples	0.34

Source: S&P, USPTO, Sparkline. Firms chosen for illustrative purposes. As of 8/31/2023.

Amazon's sprawling empire faces competition from a host of rivals hailing from multiple GICS sectors. In media, Amazon competes with Disney, Netflix, and Paramount. In cloud computing, it faces VMware, Google, and Microsoft. Despite its primary classification as a retailer, Amazon's retail rivals, Target and Walmart, are relatively low on this list.

In [The Platform Economy](#) (Jan 2021), we wrote about how Amazon evolved from an online book retailer into a full-fledged e-commerce, cloud, and media platform. Unlike GICS, our classifications update in real-time with each new trademark registration. The next exhibit shows the industry mix of Amazon's top competitors over rolling 5-year periods.

Exhibit 37
Amazon's Evolving Competitors

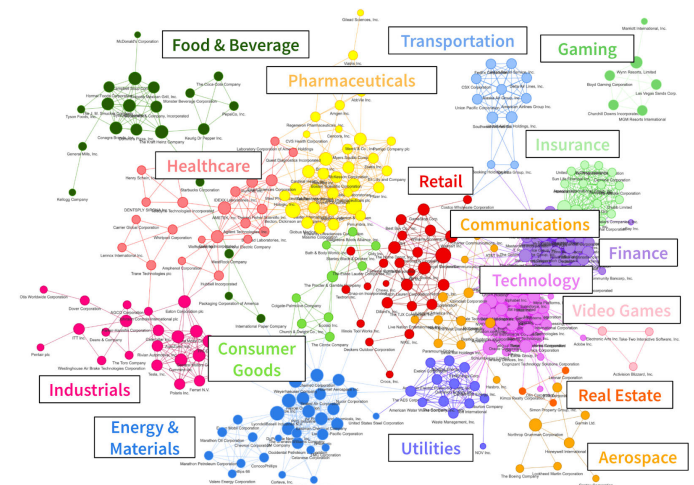


Source: S&P, USPTO, Sparkline. Groups defined using GICS industry groups to avoid discontinuity from the GICS communication sector reorganization in 2018. Top Amazon competitors defined as those above the top 90th percentile of similarity score each month. We use rolling 5-year periods with 1-year smoothing based on trademark registration date. As of 8/31/2023.

As a successful conglomerate, Amazon provides an extreme example of a company with a track record of aggressively expanding to new markets. However, our trademark-based industry classification can offer insight for single-product (i.e., “pure play”) firms as well.

We produce a similarity score (i.e., competition score) for every pair of firms with sufficient trademark data. This results in millions of pairwise relationships. In order to visualize this complex web, we utilize a network graph. The exhibit below shows competitive relationships among the 500 largest U.S. stocks, drawing connections between firms with similarity scores exceeding 0.4.

Exhibit 38
Trademark-Based Competitor Networks



Source: USPTO, Sparkline. Nodes proportional to network centrality as defined by PageRank. Edges for similarity greater than 0.4. Top 500 U.S. stocks. As of 8/31/2023.

The network graph organically surfaces traditional industry classifications, with clusters forming around GICS sectors such as technology, finance, and utilities. However, as we saw with Amazon, it is also able to represent cross-industry competition. Moreover, unlike GICS, it captures variation in the intensity of competition among firms within industries. For example, while all being in the food product industry, Kellogg is more similar to General Mills than Kraft-Heinz.


A few years ago, our paper [Investment Management in the Machine Learning Age](#) (Jun 2019) introduced “company embeddings.” We argued that NLP could be used to convert the text descriptions of company business models in 10-Ks into structured industry classifications with more richness and dynamism than GICS. As we now see, trademarks offer a promising path for further improvement.


Conclusion


In the modern age of mass production, online advertising, and endless buying options, brands have become more essential than ever for product differentiation. In response, firms have rapidly expanded their usage of trademarks to protect these increasingly coveted assets.


Trademarks contain valuable insight into the brands and products owned by each firm. They also provide information on the product markets in which each brand operates. While trademark descriptions may appear intractable, modern NLP and machine learning can be used to convert this unruly text into structured data useful for investors.

In summary:

 We use trademark data to build measures of the strength of each brand. Next, we roll up individual brands to the firm level to identify stocks with undervalued brand portfolios. We find that these stocks have produced superior returns (in backtest).

 We examine a century of trademark data to find products trending at each point in time. Firms selling high shares of these trending products relative to their market caps have outperformed. We also show that trademarks can be used for investing in themes such as “Generative AI.”

 We merge trademark data with search interest data from Google Trends. Trademarks allow us to link firms to their underlying brands and products, which is the level at which most search activity occurs. We find that stocks with undervalued search interest have outperformed.

 We address the failure of industry classifications, such as GICS, to account for the fact that many firms compete in multiple product markets. Using the example of Amazon, we show how trademarks can provide a more complete and dynamic view of competition.

This paper both adds to our understanding of brand equity and highlights trademarks as an underutilized alternative dataset. Moreover, it contributes to the growing literature on “intangible value.” Consistent with earlier research, it finds that brands, like many other intangible assets, are often undervalued and offer a potential source of excess returns.



Kai Wu

Founder & CIO, Sparkline Capital LP

Kai Wu is the founder and Chief Investment Officer of Sparkline Capital, an investment management firm applying state-of-the-art machine learning and computing to uncover alpha in large, unstructured data sets.

Prior to Sparkline, Kai co-founded and co-managed Kaleidoscope Capital, a quantitative hedge fund in Boston. With one other partner, he grew Kaleidoscope to \$350 million in assets from institutional investors. Kai jointly managed all aspects of the company, including technology, investments, operations, trading, investor relations, and recruiting.

Previously, Kai worked at GMO, where he was a member of Jeremy Grantham’s \$40 billion asset allocation team. He also worked closely with the firm’s equity and macro investment teams in Boston, San Francisco, London, and Sydney.

Kai graduated from Harvard College Magna Cum Laude and Phi Beta Kappa.

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The performance shown reflects the simulated model performance an investor may have obtained had it invested in the manner shown but does not represent performance that any investor actually attained. This performance is not representative of any actual investment strategy or product and is provided solely for informational purposes.

Hypothetical performance has many significant limitations and may not reflect the impact of material economic and market factors if funds were actually managed in the manner shown. Actual performance may differ substantially from simulated model performance. Simulated performance may be prepared with the benefit of hindsight and changes in methodology may have a material impact on the simulated returns presented.

The simulated model performance is adjusted to reflect the reinvestment of dividends and other income. Simulations that include estimated transaction costs assume the payment of the historical bid-ask spread and \$0.01 in commissions. Simulated fees, expenses, and transaction costs do not represent actual costs paid.

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No representation or warranty is made as to the reasonableness of the methodology used or that all methodologies used in achieving the returns have been stated or fully considered. There can be no assurance that such hypothetical performance is achievable in the future. Past performance is no guarantee of future results.