SPARKLINE CAPITAL

Investing Amid Trade Wars

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Executive Summary

Rising trade tensions pose a challenge for investors, with stock markets increasingly dominated by globally exposed firms. We develop a framework to measure firms' global trade exposure based on their reliance on foreign revenues, supply chains, and employees. While global firms are vulnerable to trade shocks, they have greatly outperformed their domestic peers in recent decades. Rather than abandon global firms, we argue that investors should maintain exposure while tilting toward those best positioned to navigate trade disruption - firms with (1) low China reliance, (2) resilient supply chains, (3) significant intangible assets, and (4) non-U.S. domiciles.

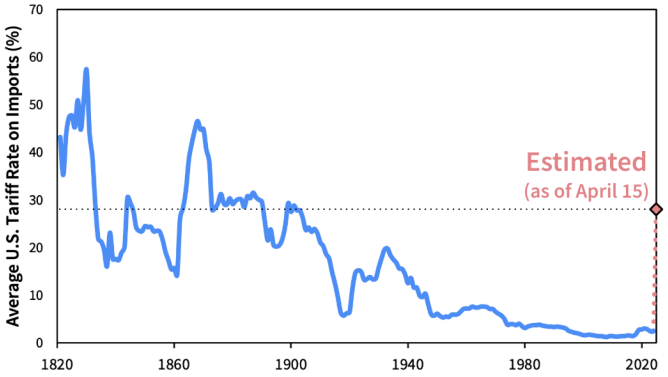
New World Order

Liberation Day

On April 2, 2025, U.S. president Donald Trump announced his intent to impose a sweeping set of bilateral tariffs that would increase the average U.S. tariff rate to levels not seen since 1900. Moreover, unlike in his first administration, these tariffs were aimed not only at China but all U.S. trading partners, from Malaysia to the McDonald Islands.

Exhibit 1

U.S. Tariff Rate



Source: Tax Foundation, Yale Budget Lab (for current estimate). As of 4/15/2025.

In the wake of this announcement, stocks exposed to global trade suffered massive losses. Restoration Hardware, which imports most of its furniture from highly-tariffed countries like Vietnam, dropped -40%. Even as Trump partially walked back his tariff threats, these stocks remain depressed amid the uncertainty caused by rapidly changing tariff policy.

Stock Markets Are Exposed

Unfortunately for investors, tariff-exposed stocks comprise the vast majority of stock indexes. While decades of rising globalization have created tremendous societal wealth, they have also led to a global economy that is now inextricably interlinked. As the next exhibit shows, the most successful companies today almost all rely heavily on global trade.

Exhibit 2

Top Stocks Are Multinational

	Market Cap ($ Billions)	Foreign Revenue (% Total)	Foreign Production (% Total)	Foreign Employees (% Total)	Company Type
Apple	3,337	64%	93%	44%	Multinational
Microsoft	2,791	49%	66%	58%	Multinational
Nvidia	2,644	53%	86%	65%	Multinational
Amazon	2,016	31%	67%	50%	Multinational
Alphabet	1,894	51%	58%	57%	Multinational
Meta	1,460	64%	52%	38%	Multinational
Berkshire Hathaway	1,149	0%	23%	12%	Domestic
Tesla	834	51%	53%	31%	Multinational
Broadcom	787	75%	75%	59%	Multinational
Eli Lilly	742	33%	55%	46%	Multinational
Taiwan Semiconductor	709	74%	12%	16%	Exporter
Average	**1,669**	**50%**	**58%**	**43%**	

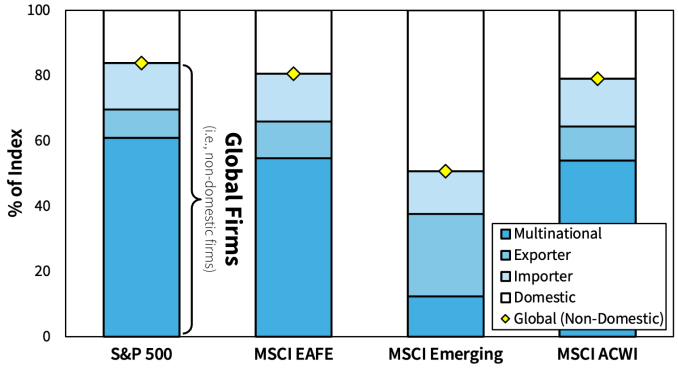
Source: S&P, SEC, LinkedIn, Sparkline. Full methodology in paper. As of 3/31/2025.

Of these leading companies, Berkshire Hathaway is the only **domestic firm**; the others are **global firms**, either exporters, importers, or full-fledged multinationals. On average, these companies derive a considerable 50% of revenue, 58% of production, and 43% of employees from abroad.

Moreover, it's not just U.S. mega-cap stocks. Many smaller firms all over the world are similarly reliant on global trade. Today, **global firms** comprise 84% of the U.S. stock index (S&P 500) and 79% of the global stock index (MSCI ACWI).

Exhibit 3

Stock Markets Are Exposed to Global Trade

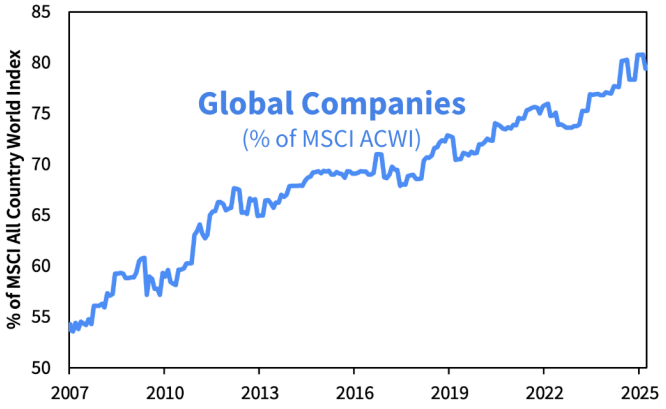


Source: S&P, MSCI, SEC, LinkedIn, Sparkline. As of 3/31/2025.

Globalization has established itself as a winning paradigm, at least for shareholders. Since 2007, **global companies** have increased as a share of the total stock market index from 54 to 79%. The stock market has never been more exposed to the disruption of a global trade war.

Exhibit 4

Global Firms Are Eating the Stock Market



Source: S&P, MSCI,SEC, LinkedIn, Sparkline. From 12/31/2006 to 3/31/2025.

Trump now seeks to arrest this trend. Trump's tariff policy reflects a broader global rise in nationalism, exemplified by movements like Brexit. As a result, even if his attempt to remake the global economic order falls short, geopolitical considerations will likely play a much greater role in firms' foreign trade and investment decisions moving forward.

Defining Trade Exposure

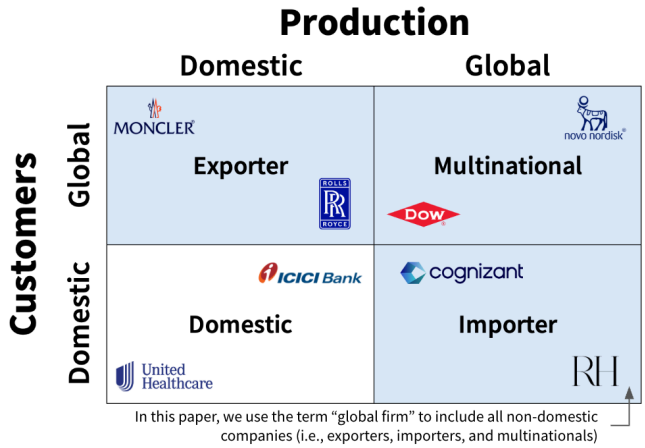
As trade tensions rise, investors increasingly require a clear, quantitative measure of their portfolio companies' global trade exposure. Broadly speaking, tariffs impose two costs on global firms. On the **customer** side, they impede access to foreign buyers; and, on the **production** side, they disrupt the functioning of global supply chains.

Using this 2-dimensional framework, we classify firms' trade exposures using a 2 x 2 matrix with four quadrants. A firm is considered to have a global customer base if over 25% of its customers are located outside its home region (Americas, Europe, Asia Pacific); and likewise for production. The next exhibit shows the matrix along with a few example firms.

Domestic firms, such as UnitedHealth, rely on both domestic production and customers. **Exporters**, like Moncler, utilize domestic production but sell to global customers, while **importers**, such as RH, rely on global production but sell to domestic customers. We define **multinationals**, like Novo Nordisk, as having both global production and customers.

Exhibit 5

Global Trade Risk Matrix



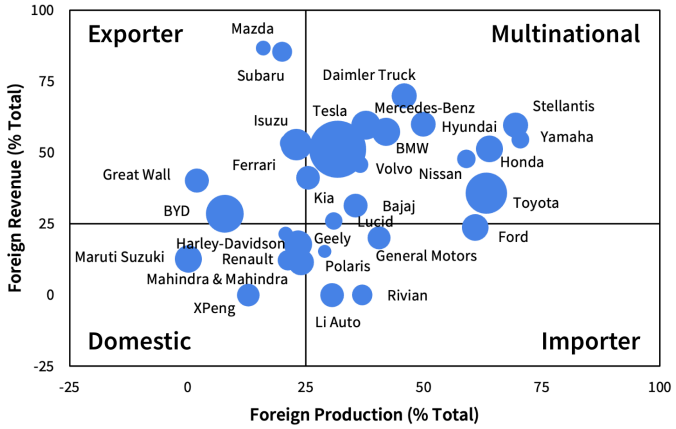
Source: Sparkline. Company logos for illustrative purposes only. As of 3/31/2025.

In order to quantify these two dimensions of trade exposure, we leverage a combination of accounting, unstructured, and alternative data. For customers, we use regional segment revenues from annual reports. For production, we build a structured metric of supply chain exposure by parsing millions of corporate documents using our AI analyst from Investing in AI: Navigating the Hype (Jul 2023); we also use LinkedIn data on geographical workforce distribution.

In order to make this framework more concrete, the next exhibit applies it to the automotive industry.

Exhibit 6

Automotive Industry Example



Source: S&P, SEC, LinkedIn, Sparkline. Bubbles based on market cap. As of 3/31/2025.

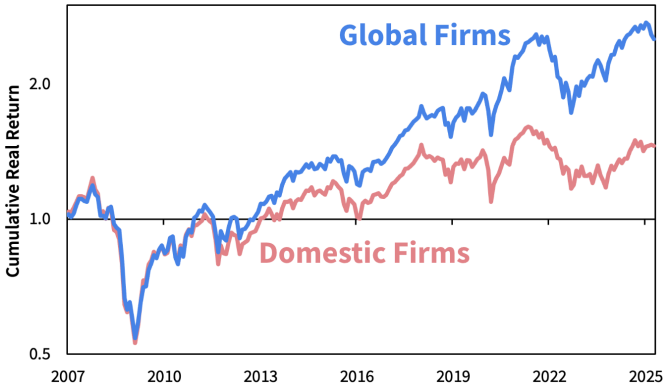
The automotive industry is particularly global. Domestic firms, such as Harley-Davidson and Renault, only comprise 19% of industry players. Of the other 81%, 45% are multi-nationals, like Stellantis and BMW; 19% are exporters like Ferrari and Subaru; and 17% are importers like Ford and GM.

Global Companies

Killing the Golden Goose

Before we go any further, let's address the question many investors are asking today: "If we expect a trade war, why own global firms at all?" The answer lies in the next exhibit comparing the stock returns of global and domestic firms.

Exhibit 7
Global Firms Have Outperformed

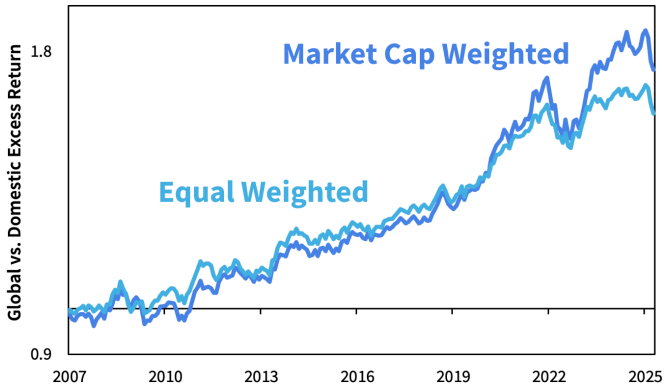


Source: S&P, MSCI, SEC, BLS, LinkedIn, Sparkline. Universe is MSCI ACWI IMI. Domestic stocks have less than 25% exposure to both foreign customers and production. Global stocks are the remainder of the universe. Portfolios are market-cap weighted and rebalanced monthly. Returns deflated using CPI-U. Excludes transaction and financing costs. See important backtest disclosure below. From 12/31/2006 to 4/23/2025.

Global corporations are the "golden goose" of capitalism. Since 2007, global firms have outperformed their domestic counterparts by a considerable margin, generating over $50 trillion in total returns in a massive boon for stock investors.

Importantly, the outperformance of global firms extends beyond the giants of the Magnificent 7 (e.g., Apple, Nvidia). As the next exhibit shows, global firms beat their domestic peers on not only a market-cap-weighted but also equal-weighted basis, although the former has pulled ahead lately.

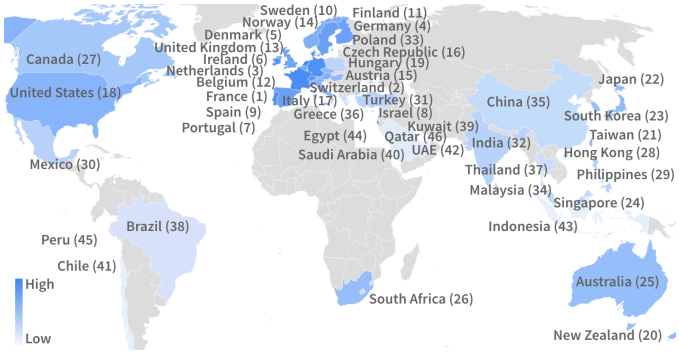
Exhibit 8
Global vs. Domestic Firm Outperformance



Source: S&P, MSCI, SEC, LinkedIn, Sparkline. Universe is MSCI ACWI IMI. Domestic stocks have less than 25% exposure to both foreign customers and production. Global stocks are the remainder of the universe. Blue(teal) line shows cap(equal)-weighted returns of global vs. domestic stocks. Excludes transaction and financing costs. See important backtest disclosure below. From 12/31/2006 to 4/23/2025.

Moreover, global firms are not a U.S.-specific phenomenon. As the next exhibit shows, the countries with the greatest concentrations of global firms are European nations, such as France, the Netherlands, Switzerland and Denmark. The U.S. ranks only slightly higher than Asian exporters like Taiwan, Japan and Korea. Interestingly, China and India are lower on the list, given their huge domestic consumer markets.

Exhibit 9
Global Firm Share of Country Stock Indexes



Source: S&P, MSCI, SEC, LinkedIn, Sparkline. Shading proportional to global firms' share of country index weight. Parentheses are ranks (1 is highest). As of 3/31/2025.

Rather than analyze each country individually, we aggregate to the region level using the MSCI taxonomy. The next exhibit shows examples of multinational firms in each of the three major regions, along with each firm's foreign share of revenues and production.

Exhibit 10
Multinationals by Region

United States	Non-U.S. Developed	Emerging
94 | 87% Philip Morris International	95 | 90% Rio Tinto	86 | 38% TCS
75 | 81% Qualcomm	89 | 83% Chubb	85 | 35% Vale
90 | 71% Booking.com	82 | 85% Philips	61 | 50% Foxconn
73 | 73% Baker Hughes	85 | 69% AB InBev	60 | 50% Hyundai
39 | 81% FactSet	64 | 75% EssilorLuxottica	56 | 32% Samsung
71 | 61% Estée Lauder	58 | 68% Canon	42 | 36% Xiaomi
Foreign Revenue (% total)	Foreign Production (% total)	

Source: S&P, SEC, LinkedIn, Sparkline. As of 3/31/2025.

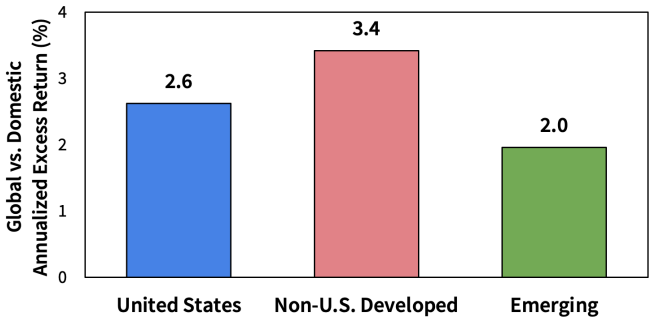
In the United States, the most multinational firm is Philip Morris, which derives 94% of its revenue and 87% of its production from outside the U.S. Factset is also notable:

although it primarily serves U.S. customers, over 80% of its production is offshore, mainly in India and the Philippines.

The non-U.S. developed region also has many well-known multinationals, such as Rio Tinto, Philips, AB InBev, and Canon. Emerging market multinationals are less global than their developed peers. While they are similarly global on the customer side, they are far less likely to offshore production, given their inherent manufacturing cost advantage.

Despite these regional differences, global companies have outperformed their domestic peers in all three regions.

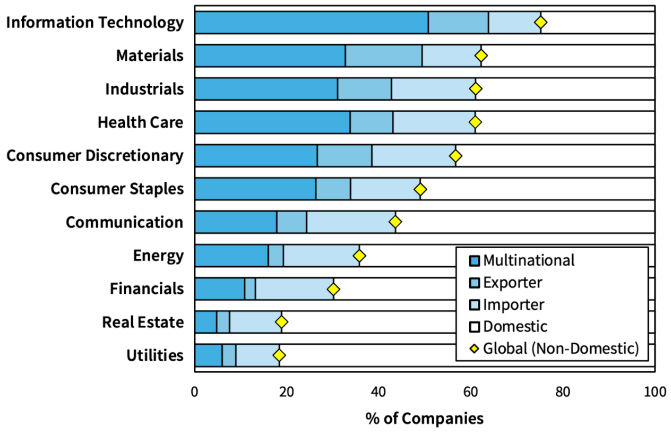
Exhibit 11
Global Firms Have Outperformed in All Regions



Source: S&P, MSCI, SEC, LinkedIn, Sparkline. Universes: MSCI USA IMI, MSCI ACWI ex-US IMI, and MSCI ACWI. Domestic stocks have less than 25% exposure to both foreign customers and production. Global stocks are the remainder of the universe. Portfolios are market-cap weighted and rebalanced monthly. Excludes transaction and financing costs. See important backtest disclosure below. From 12/31/2006 to 4/23/2025.

Finally, we ensure global firms' outperformance is not solely due to higher exposure to the outperforming tech sector. As the next exhibit shows, while global companies are heavily represented in technology, they also are a large share of the materials, industrials, health care, and consumer sectors.

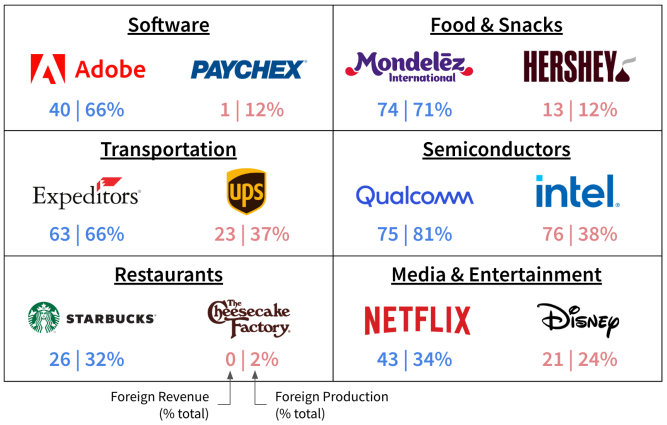
Exhibit 12
Global Trade Exposure by Sector



Source: S&P, SEC, LinkedIn, Sparkline. As of 3/31/2025.

Moreover, significant dispersion exists within industries. The next exhibit highlights some examples. While the restaurant industry tends to be dominated by local players, Starbucks is more global than a typical domestic chain like Cheesecake Factory. At the other extreme, despite both being in the very global semiconductor industry, Intel conducts a significantly higher share of production in the U.S. than does Qualcomm.

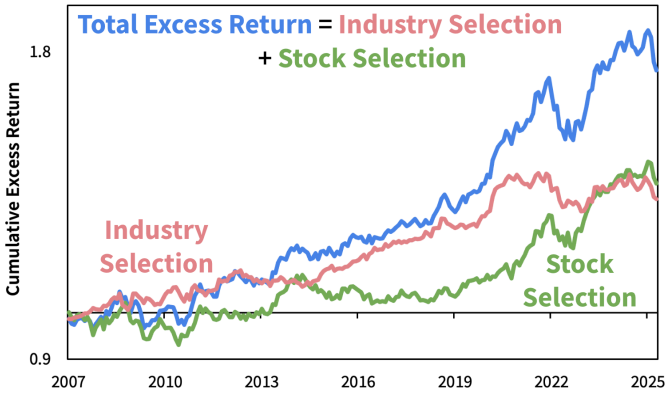
Exhibit 13
Sector Dispersion Example



Source: S&P, SEC, LinkedIn, Sparkline. As of 3/31/2025.

Global firms have outperformed, even after controlling for sector membership. The next exhibit decomposes the total excess returns of global vs. domestic stocks into those derived from industry- and stock-selection. A bit more than half of the value added came from picking the right stocks within each sector, rather than the right sectors themselves.

Exhibit 14
Industry vs. Stock Selection



Source: S&P, MSCI, SEC, LinkedIn, Sparkline. Universe is MSCI ACWI IMI. Total excess return shows returns of global vs. domestic stocks. Industry selection applies the same GICS sector tilts holds sector indexes instead of individual stocks. Stock selection is the residual return resulting from selecting stocks from within each sector. Total Excess Return = Industry Selection + Stock Selection. Excludes transaction and financing costs. See important backtest disclosure below. From 12/31/2006 to 4/23/2025.

The Returns to Globalization 🌍

Global expansion appears to be beneficial for companies of all shapes and sizes. Why might this be the case?

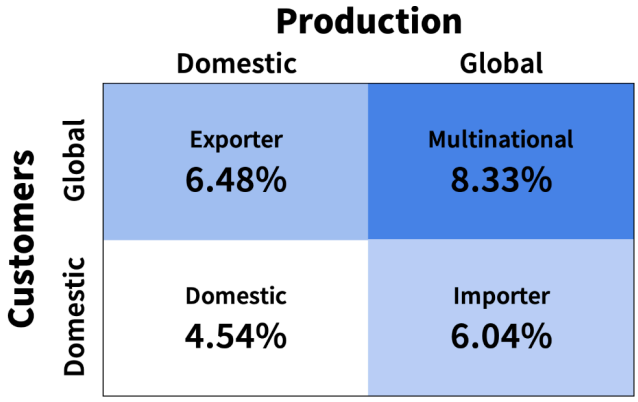
First of all, global companies have larger total addressable markets, as they are able to sell to a broader pool of global customers. This scale advantage allows them to spread fixed costs, such as R&D and operational overhead, over a larger customer base, enhancing firm-level profitability.

In addition, global firms enjoy production advantages, as they are able to offshore production to foreign countries and suppliers with either lower costs (e.g., Vietnamese apparel) or unique specializations (e.g., Swiss watches, Taiwanese semiconductors). They can also take advantage of global regulatory and tax arbitrages, such as by shifting profits to subsidiaries in low-tax jurisdictions (e.g., Ireland).

Finally, global companies benefit from positive selection bias. Doing business on a global scale implies higher upside but also fiercer competition. Better-run companies are more likely to vie for these greater spoils in the global arena, while lesser firms tend to be more content with the lower stakes of their domestic markets.

The next exhibit shows annualized stock returns since 2007 for firms in each of the four quadrants. Globalization has indeed provided benefits on both the sales and production sides, with firms taking advantage of both performing best.

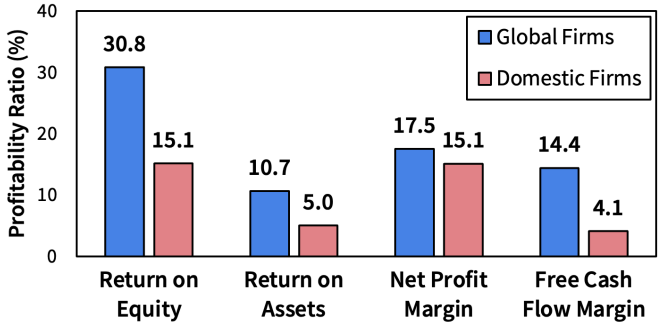
Exhibit 15
Annualized Returns (2007-Present)



Source: S&P, MSCI, SEC, LinkedIn, Sparkline. Universe is MSCI ACWI IMI. Numbers are annualized returns. Exporters have over 25% foreign revenues, importers have over 25% foreign production, multinationals have both, and domestics have neither. Portfolios are market-cap weighted and rebalanced monthly. Excludes transaction and financing costs. See important backtest disclosure below. From 12/31/2006 to 4/23/2025.

In addition to producing higher returns, these operational advantages translate into superior business quality. As the next exhibit shows, global companies enjoy significantly higher profitability than their domestic peers – for example, generating over twice the return on equity. Importantly, this finding holds even after adjusting for differences in sector and country composition.

Exhibit 16
Global Firms Are More Profitable



Source: S&P, SEC, LinkedIn, Sparkline. Metrics are winsorized at 1% and 99%. Universe is MSCI ACWI IMI. Domestic stocks have less than 25% exposure to both foreign customers and production. Global stocks are the remainder of the universe. Portfolios are market-cap weighted. As of 3/31/2025.

In Monopolies Are Distorting the Stock Market (Sep 2020), we described the "profit puzzle," whereby U.S. corporate profit margins have been elevated since the late 1990s. The rising share of highly-profitable global firms in the S&P 500 over this period may help explain this phenomenon.

Geopolitical Risk Premium 🪖

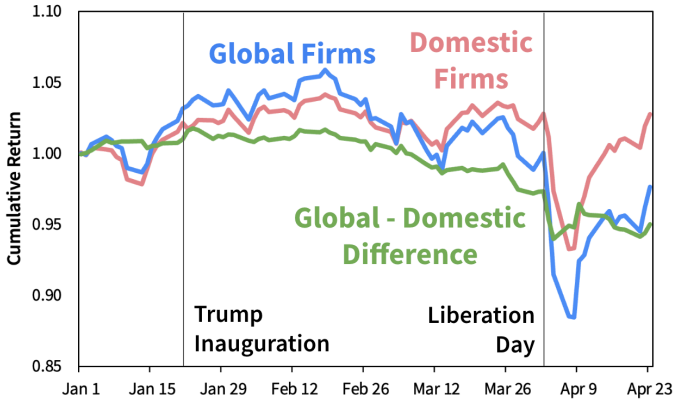
Why have global firms outperformed? In an efficient market, we would expect their profitability advantage to be offset by higher valuations. However, in practice, global companies have consistently traded at a discount relative to their profitability-adjusted intrinsic value.

One plausible explanation for this discount is that it reflects a "geopolitical risk premium." Investors recognize that the many benefits of globalization also come with increased risks. Global supply chains have many points of failure, especially when they wind through countries with authoritarian governments and weak investor protections.

Trump's attempt to remake the world order has led to the realization of this risk. As the next exhibit shows, global firms have underperformed domestic firms this year. Interestingly, the selloff actually began around Trump's inauguration, as markets started to take his tariff threats seriously, before accelerating into Liberation Day and beyond.

Exhibit 17

Trump Has Been Bad for Global Firms

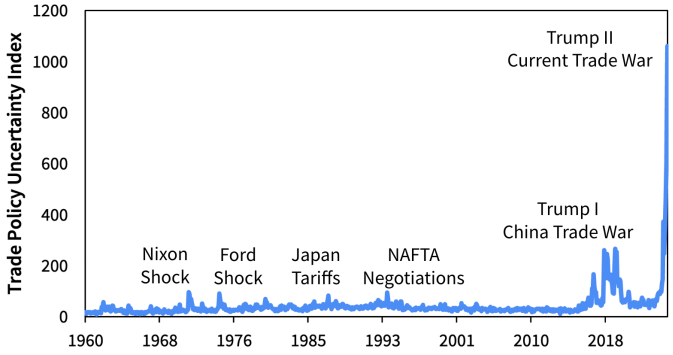


Source: S&P, MSCI, SEC, LinkedIn, Sparkline. Universe is MSCI ACWI IMI. Domestic stocks have less than 25% exposure to both foreign customers and production. Global stocks are the remainder of the universe. Portfolios are market-cap weighted and rebalanced monthly. Excludes transaction and financing costs. See important backtest disclosure below. From 12/31/2006 to 4/23/2025.

Of course, we should refrain from drawing conclusions from a single example. The next exhibit shows the Trade Policy Uncertainty Index, which provides a historical measure of U.S. trade policy uncertainty based on mentions in major newspapers (e.g., Wall Street Journal, New York Times).

Exhibit 18

Trade Policy Uncertainty Index



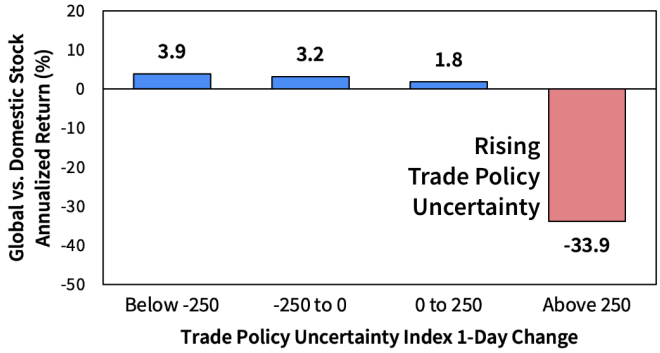
Source: Caldara et al (2020), Sparkline. From 1/1/1960 to 4/22/2025.

From 1960 to 2010, the index exhibited episodic spikes around the Nixon and Ford shocks, Japan tariffs, and NAFTA negotiations. However, these spikes were dwarfed by a massive surge in the 2018 Trump China trade war, and then again in Trump's current trade war. The index is currently at an all-time high, reflecting massive uncertainty arising from Trump's rapidly changing tariff strategy.

Next, let's take a look at how global firms have performed relative to their domestic peers in periods of rising trade policy uncertainty. As the next exhibit shows, global stocks greatly underperform when the index rapidly increases.

Exhibit 19

Global Stocks Suffer in Trade Shocks



Source: S&P, MSCI, SEC, LinkedIn, Caldara et al (2020), Sparkline. Universe is MSCI ACWI IMI. Domestic stocks have less than 25% exposure to both foreign customers and production. Global stocks are the remainder of the universe. Portfolios are market-cap weighted and rebalanced monthly. Excludes transaction and financing costs. See important backtest disclosure below. We use the daily version of the trade policy index, which is available from 2/2/2015 to 4/22/2025.

We caution readers that these extreme spikes are quite rare, representing only 0.6% of the sample. That said, this study does provide some support for the theory that the excess returns associated with global firms are compensation for their greater geopolitical risk.

Staying the Course 🏕️

Amid rising trade tensions, investors' gut instinct may be to seek shelter in domestic stocks. However, this amounts to nothing more than a bet that trade tensions will continue to escalate; if trade fears abate, domestic stocks are likely to underperform. This is a hard bet to make.

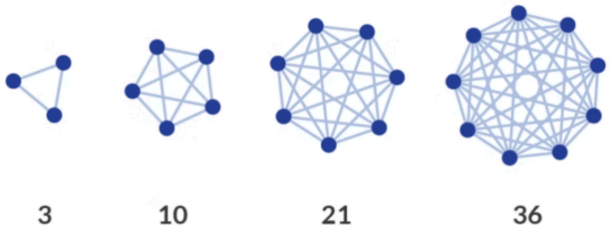
More importantly, we do not view domestic stocks as a good long-term structural allocation. While they do stand to suffer least in a trade shock and may even benefit from reduced import competition, this may be offset by higher input costs and weaker demand in a tariff-led recession. Moreover, any advantage is likely to be only temporary until multinational firms are able to reconfigure their supply chains.

In addition, domestic firms are simply lower quality than global firms, with weaker profitability and growth prospects and a concentration in mature industries like real estate and utilities. As we saw, the most dynamic and high-performing firms, in both the U.S. and abroad, are multinationals.

Ultimately, we believe globalization is here to stay, if for no other reason than that its benefits are simply too great to abandon. The potential gains from trade have steadily

increased over time as the world has become more and more connected through technological advances such as the internet, containerization, and modern logistics. As a result, we view a repeat of the post-World War I deglobalization as unlikely in today's globally integrated economy.

Exhibit 20
Global Trade Has Network Effects



Source: SeaRates. Reproduced from The Platform Economy (Dec 2020).

That said, even if we do not experience a full-blown collapse in global trade under Trump, the world appears to at least be headed toward a new era of "re-globalization," in which global trade is not destroyed but instead reconfigured along newly drawn regional and geopolitical lines.

While we expect global firms will continue to thrive in this new era, we believe investors should tilt their portfolios toward those best positioned to navigate trade disruption. As we discuss in the next section, these include firms with (1) low China reliance, (2) resilient supply chains, (3) significant intangible assets, and (4) non-U.S. domiciles.

Navigating Trade Wars

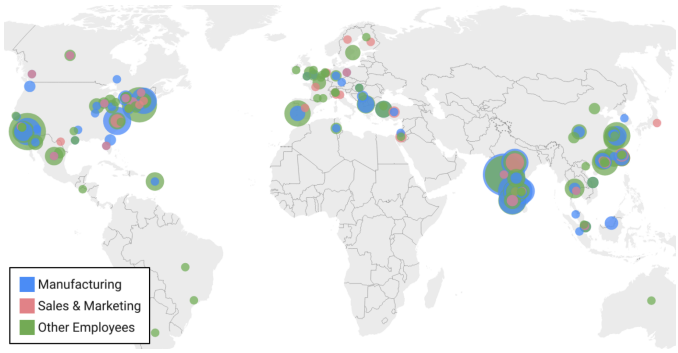
Beyond China 🇨🇳

Since its ascension into the global economy, China has become the world's factory, producing everything from children's toys to smartphone components.

However, the U.S. and China are increasingly at political odds, with one of Trump's tariff policy goals being to reduce U.S. reliance on Chinese manufacturing. Notably, on April 9, Trump announced a 90-day pause on "reciprocal" tariffs for all countries except China, which was instead immediately hit with a punitive 145% tariff.

If not repealed, these tariffs will be extremely detrimental to the many companies that rely on Chinese manufacturing. For example, the next exhibit shows the employee footprint of Amphenol, a Fortune 500 electronics manufacturer with significant operations in China. Using job titles, we are able to identify employees in manufacturing roles.

Exhibit 21
Amphenol Employee Footprint



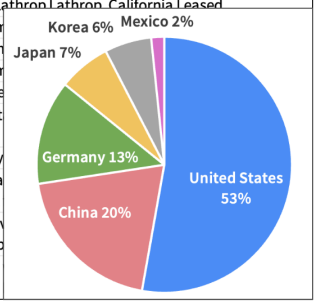
Source: LinkedIn, DataWrapper, Sparkline. As of 3/31/2025.

Amphenol is headquartered in Connecticut, but over 90% of its workforce is outside the U.S. The three largest clusters of manufacturing employees are in China, India, and Mexico. In fact, Amphenol's latest annual report specifically highlights Chinese geopolitical risk and discloses 60 Chinese-based subsidiaries.

While our employee dataset is helpful for companies that manufacture in house, many firms outsource production to third-party suppliers (e.g., Apple and Foxconn). In this case, we can often still obtain this information from corporate documents. We have our AI analyst automate the tedious process of reading millions of documents to find mentions of factory and supplier locations. The next exhibit shows an example of a recent response from our AI analyst for Tesla.

Exhibit 22
Tesla AI Response Example

ISO Code	Country	Type	Citations
USA	United States	INTERNAL	We currently have manufacturing facilities in the U.S. in California, New York, Texas and Nevada.
USA	United States	INTERNAL	Gigafactory Texas Austin, Texas Owned
USA	United States	INTERNAL	Fremont Factory Fremont, California Owned
USA	United States	INTERNAL	Gigafactory Nevada Sparks, Nevada Owned
USA	United States	INTERNAL	Gigafactory New York Buffalo, New York Leased
USA	United States	INTERNAL	Megafactory Lathrop Lathrop, California Leased
CHN	China	INTERNAL	We also have n
CHN	China	INTERNAL	Gigafactory Sh
DEU	Germany	INTERNAL	We also have n
DEU	Germany	INTERNAL	Gigafactory Be
USA	United States	EXTERNAL	We'll actually t deliver it to us
CHN	China	EXTERNAL	We have a very
JPN	Japan	EXTERNAL	Under our arra the full output
KOR	South Korea	EXTERNAL	Panasonic, obv amazing comp
MEX	Mexico	INTERNAL	In March 2023, Gigafactory in



Source: S&P, SEC, Sparkline. From 3/31/2020 to 3/31/2025.

Tesla is known for its vertical integration, with production concentrated at Gigafactories in the U.S., China and Germany. However, Tesla still relies on external suppliers, such as LG, Panasonic, CATL, BYD and Nvidia, located in the U.S., China, Japan and Korea. Our AI picks up both internal and external production, tallies them up and scales by the total. Using this method, we estimate Tesla's China exposure at 20%.

The next exhibit highlights notable U.S. companies with at least 20% Chinese production exposure, calculated as the average of our workforce- and text-based metrics.

Exhibit 23

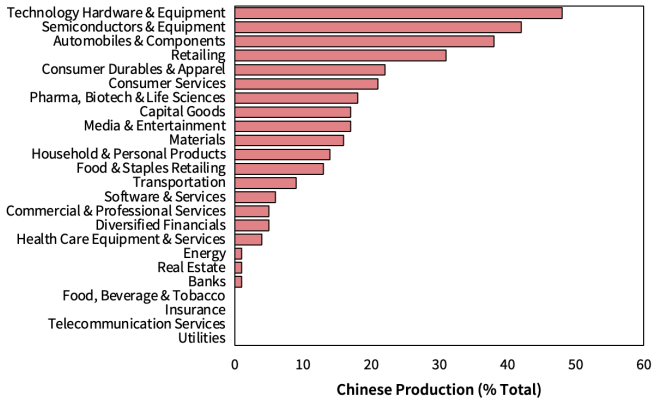
China-Exposed Stocks

Source: S&P, SEC, LinkedIn, Sparkline. As of 3/31/2025.

The next exhibit computes the average China supply chain exposure of U.S. firms by industry. Technology hardware and semiconductor companies are the most reliant on Chinese production, followed by those in autos, retail, consumer durables, and apparel.

Exhibit 24

China Exposure by Industry

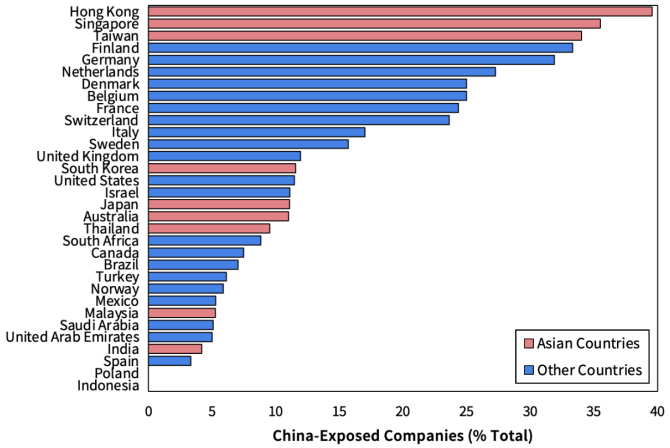


Source: S&P, SEC, LinkedIn, Sparkline. Universe is MSCI USA IMI. As of 3/31/2025.

Although it is Trump who is working to reduce America's reliance on Chinese manufacturing, the U.S. is far from alone in its dependence on China. As the next exhibit shows, Hong Kong and Singapore are by far the most reliant on China, given their role as gateways to the mainland. Taiwan also ranks highly. Interestingly, most European countries, such as Finland, Germany, the Netherlands, and Denmark, also have greater exposure to Chinese production than does the U.S.

Exhibit 25

China Exposure by Country



Source: S&P, SEC, LinkedIn, Sparkline. As of 3/31/2025.

Of course, Trump was not the first person to call out firms' unhealthy dependence on China. In the wake of the 2008 Global Financial Crisis, corporate leaders began to recognize China as a single point of failure and started diversifying toward a "China + 1" supply chain strategy.

This process accelerated during Trump's first term and again during China's Zero-Covid lockdowns, when the concept of "friendshoring" emerged, as firms redirected supply chains toward geopolitically aligned countries like India, Vietnam, and Mexico. As the next exhibit shows, the share of non-Chinese companies' employees based in China peaked in late 2009 and has declined steadily since.

Exhibit 26

Diversifying Chinese Supply Chain Risk

Source: S&P, SEC, LinkedIn, Sparkline. From 12/31/1994 to 3/31/2025.

While not an overnight shift, this example of "friendshoring" provides a clear illustration of how multinational companies are able to adapt their supply chains in response to evolving geopolitical, cost, and logistical pressures. Amid heightened uncertainty from Trump's tariffs, it offers a timely reminder to investors of the enduring resilience of global capitalism.

Finally, let's build a portfolio of global firms excluding those with significant China exposure. As the next exhibit shows, this exclusion allows us to reduce our China risk without materially impacting performance, at least over this period.

Exhibit 27

Returns Excluding China-Exposed Firms

Source: S&P, MSCI, SEC, BLS, LinkedIn, Sparkline. Universe is MSCI ACWI IMI. Domestic stocks have less than 25% exposure to both foreign customers and production. Global stocks are the remainder of the universe. Global (Ex-China-Exposed) is the same but excludes firms with high China exposure. Portfolios are market-cap weighted and rebalanced monthly. Returns deflated using CPI-U. Excludes transaction and financing costs. See important backtest disclosure below. From 12/31/2006 to 4/23/2025.

Resilient Supply Chains

While China presents a particularly salient risk, in theory any firm that relies exclusively on production in a single country is vulnerable to trade disruptions.

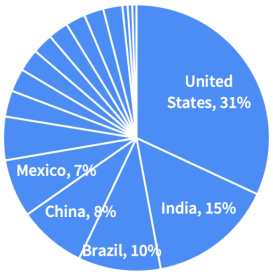
In order to quantify this risk, we develop a measure of supply chain concentration using the Herfindahl-Hirshman Index (HHI). The next exhibit offers an example, showing how we calculate concentration scores for two U.S. firms – Caterpillar and Cognizant.

Caterpillar enjoys a highly diversified supply chain, with operations in over 25 countries, including the U.S., India, Brazil, and China. As a result, its concentration score is only 15% (out of 100%). In contrast, Cognizant, a U.S.-based outsourced IT firm, has 73% of its workforce located in India, leading to a much higher concentration score of 64%.

Exhibit 28

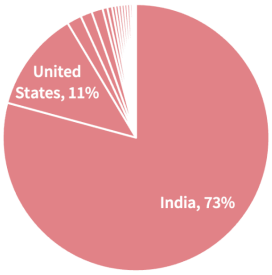
Supply Chain Concentration Example

CATERPILLAR



Concentration Score: Low
15% (out of 100%)

cognizant



Concentration Score: High
64% (out of 100%)

Source: S&P, SEC, LinkedIn, Sparkline. Concentration score is calculated using the Herfindahl-Hirschman Index. As of 3/31/2025.

Of course, simply having a geographically diversified supply chain does not insulate companies from tariffs that are imposed broadly. To address this, many companies adopt a strategy of localization, manufacturing or sourcing products in the same regions where they are consumed.

For example, in response to the 2018 U.S.-China trade war, Tesla built Gigafactories in Shanghai and Berlin to produce cars for the local Chinese and European markets. This allowed Tesla to circumvent tariffs imposed by China and the European Union on U.S.-manufactured vehicles.

We can quantify a firm's ability to "build where you sell" by comparing the geographical footprint of its customers to that of its production. We measure this alignment using cosine similarity at the regional level. Once again, we use Caterpillar and Cognizant as examples.

Exhibit 29

Supply Chain Alignment Example

CATERPILLAR

Region	Revenue	Production
North America	51%	31%
Europe & Middle East	21%	16%
Latin America	10%	17%
Asia Pacific	18%	34%

Alignment Score: High
89% (out of 100%)

cognizant

Region	Revenue	Production
North America	75%	15%
United Kingdom	9%	1%
Continental Europe	10%	2%
Rest of World	7%	81%

Alignment Score: Low
27% (out of 100%)

Source: S&P, SEC, LinkedIn, Sparkline. Alignment score is calculated using cosine similarity. As of 3/31/2025.

Caterpillar's production is slightly more offshore than its revenues. However, across its four regional segments, the distribution of its production and customers is relatively similar, earning it a high alignment score of 89%. In contrast, Cognizant is highly misaligned, with 75% of its sales coming from U.S. customers but 81% of its production based in India. As a result, its alignment score is much lower at 27%.

The next exhibit highlights several global companies with both diversified and aligned supply chains.

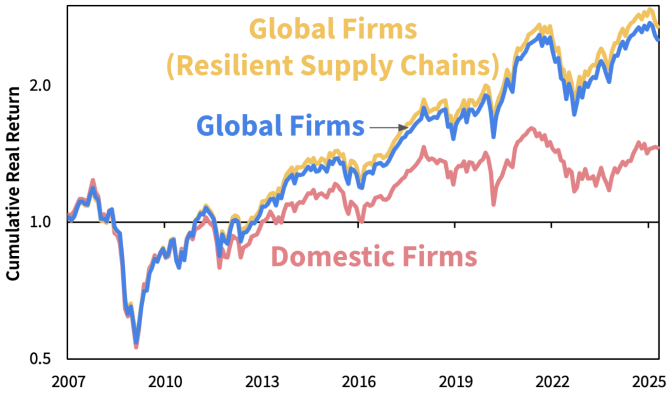
Exhibit 30
Resilient Supply Chains

Source: S&P, SEC, LinkedIn, Sparkline. As of 3/31/2025.

This list spans a wide range of industries. We find firms in technology, such as ASML and Juniper Networks; industrials, like Otis and Signify; consumer goods, such as Unilever and British American Tobacco; and professional services, like Accenture and Capgemini. These firms mitigate supply chain risk by diversifying across multiple regions and localizing production near key customer markets.

Finally, we construct a portfolio of global companies with resilient supply chains. In this case, the strategy has actually slightly outperformed the broader global company index.

Exhibit 31
Returns of Firms With Resilient Supply Chains



Source: S&P, MSCI, SEC, BLS, LinkedIn, Sparkline. Universe is MSCI ACWI IMI. Domestic stocks have less than 25% exposure to both foreign customers and production. Global stocks are the remainder of the universe. Global (Resilient Supply Chain) is the same but only owns global firms with both diversified and aligned supply chains. Portfolios are market-cap weighted and rebalanced monthly. Returns deflated using CPI-U. Excludes transaction and financing costs. See important backtest disclosure below. From 12/31/2006 to 4/23/2025.

Intangible Assets and Global Firms ✨

In Investing in the Intangible Economy (Oct 2020), we showed that the modern economy is increasingly driven by intangible assets, such as intellectual property (IP), brand equity, human capital, and network effects. Intangible assets, which now comprise 50 to 80% of corporate value, possess many unique characteristics.

Exhibit 32
Intangible Moats

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. Reproduced from Intangible Value (Jun 2021).

One of the key properties of intangible assets is scalability. Intangible assets tend to require high upfront fixed costs but once created have nearly zero marginal costs. For example, pharmaceutical companies must invest heavily in R&D to create new drugs. However, if successful, they can earn extremely high gross margins on sales of these new drugs.

The inherent scalability of intangible assets tends to lead intangible-rich firms to pursue global markets. If a company must invest heavily upfront to build an asset, it might as well spread its investment over the largest possible global customer base. In fact, some businesses, such as those relying on heavy network effects, do not even work without access to a large enough global customer market.

In addition, intangible-intensive firms often benefit from tax arbitrages available only to global firms. For example, many multinational firms house their IP in low-tax jurisdictions, such as Ireland, and license it to their global subsidiaries.

As a result, global firms tend to have much higher intangible value than their domestic peers. As the next exhibit shows, global firms provide shareholders with at least twice the R&D, sales & marketing (S&M), patents, and PhD employees per dollar invested. They also offer far greater exposure to disruptive technologies, such as AI and robotics. While we do not tabulate the results here, this advantage holds even after adjusting for differences in sector composition.

Exhibit 33

Global Firms Are More Intangible

	Global Firms	Domestic Firms
R&D / Price (%)	2.5	1.1
S&M / Price (%)	2.8	1.4
Patents / Price *	2.8	0.7
PhDs / Price *	6.2	3.0
Intellectual Property	0.5	0.1
Human Capital	0.5	0.0
Brand Equity	0.5	0.0
Network Effects	0.3	0.3
Total Intangible Value	**1.7**	**0.4**
% Disruptive	40.2	9.8

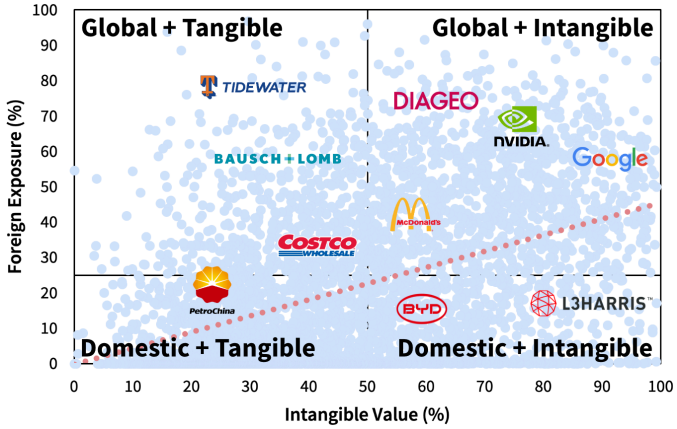
Source: S&P, SEC, USPTO, LinkedIn, Sparkline. Universe is MSCI ACWI IMI. Domestic stocks have less than 25% exposure to both foreign customers and production. Global stocks are the remainder of the universe. All calculations are weighted averages with weights equal to position size. R&D, S&M, and patents are calculated over a trailing 12-month window. *Patents and PhDs are scaled by billions (e.g., # patents per $1 billion market cap). Red metrics are Sparkline's proprietary intangible value scores, which are constructed from the weighted average of metrics such as those shown in blue (after being normalized via Z-Score). Red scores recentered by adding 0.25 so domestic totals are not negative. Disruptive companies are defined using a proprietary classification based on each firm's exposure to disruptive technologies (e.g., artificial intelligence, cloud computing). As of 3/31/2025.

While global companies tend to be more intangible, the correlation is imperfect at only 45%. The next exhibit plots all investable stocks along two dimensions: intangible value and foreign exposure, where foreign exposure is defined as the average of customer and production foreign shares.

We define quadrants using a 25% foreign share cutoff, which roughly splits the universe in half, and a 50% intangible value threshold. Firms in the upper-right quadrant, such as Google, are both global and intangible, while those in the lower-left, like PetroChina, are domestic and tangible. The upper-left captures firms that are global but tangible, such as Tidewater, while the lower-right includes domestic but intangible companies, such as L3Harris.

Exhibit 34

Intangible vs. Global Companies

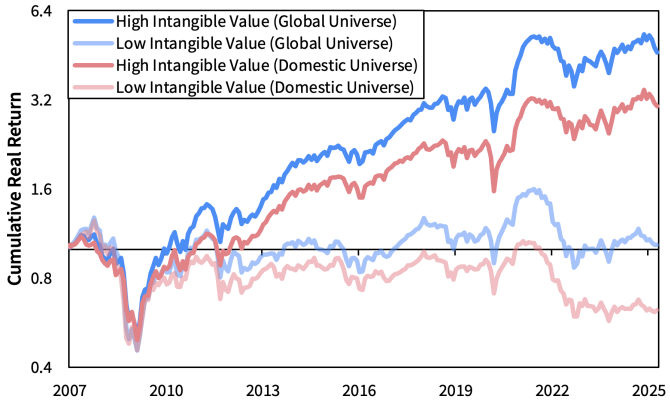


Source: S&P, SEC, LinkedIn, Sparkline. Foreign exposure is defined as the average of foreign revenues and production. Intangible value is Sparkline's proprietary intangible value score, scaled to be between 0 and 100%. As of 3/31/2025.

Next, we examine the historical returns of intangible value stocks within the global and domestic stock universes. In the next exhibit, the blue lines plot the returns of high vs. low intangible value stocks in the global universe. The red lines show the same but for the domestic universe.

Exhibit 35

Intangible Value in Global and Domestic Universes



Source: S&P, MSCI, SEC, BLS, LinkedIn, Sparkline. Universe is MSCI ACWI IMI. Domestic stocks have less than 25% exposure to both foreign customers and production. Global stocks are the remainder of the universe. High (low) intangible value is the top (bottom) 25% of intangible value stocks within the respective universe. Portfolios are market-cap weighted and rebalanced monthly. Returns deflated using CPI-U. Excludes transaction and financing costs. See important backtest disclosure below. From 12/31/2006 to 4/23/2025.

High intangible value stocks have outperformed in both the global and domestic universes. In fact, in absolute terms, high intangible value stocks have driven virtually all of the stock market's gains since 2007, with low intangible value stocks flat or down in real terms. In addition, the advantages of intangible value and globalization compound, with high intangible value global firms performing best.

We believe the **high intangible value subset of global firms** is especially compelling amid today's trade turmoil. Not only have these firms outperformed the broader global company universe, but they are also less exposed to trade barriers than their global peers that rely on physical production.

Unlike physical goods, intangible assets are not subject to tariffs. Purely digital or services businesses are therefore largely insulated from tariff risk. Even for firms that embed intangible value into physical goods (e.g., Apple, Coca-Cola, Pfizer), tariffs generally apply only to the declared import value, which may not fully capture the total economic value created by their intangible assets. While some countries have started to introduce non-tariff barriers, such as digital services taxes, their overall impact remains limited.

As a result, intangible-intensive firms enjoy a key strategic advantage in navigating trade wars. Dissanayake et al (2019) find that asset-heavy firms are much more likely to slash investment in response to rising geopolitical uncertainty, due to the difficulty of redeploying physical production when trade barriers arise. In contrast, intangible-intensive firms tend to continue to invest, as the high mobility of their assets provides flexibility in the face of such shocks.

As barriers to the movement of physical goods rise, but the movement of ideas remains relatively frictionless, the advantage of intangible-rich firms is likely to widen further. We believe **high intangible value global firms** are uniquely positioned to deliver the benefits of globalization while mitigating many of the risks posed by today's trade conflicts.

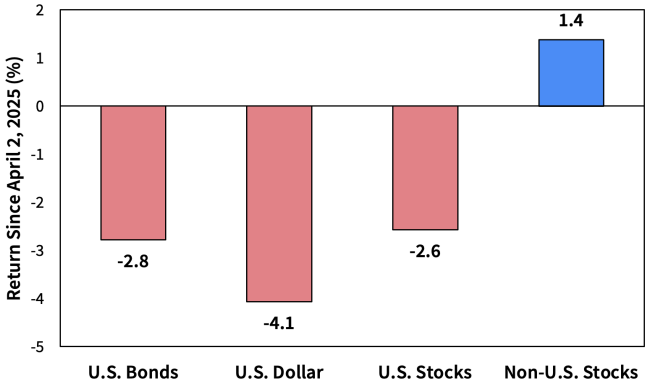
Global Firms Based Outside the U.S. ✈️

The past couple decades have been defined by significant U.S. stock market outperformance. For the most part, investors have let their winners ride, resulting in substantial overweights to U.S. equities.

However, investors are now beginning to reassess their U.S. stock overweights in light of rising U.S.-specific geopolitical risk. Historically, when global uncertainty rose, investors would flee to U.S. assets as a "safe haven." Since Liberation Day, however, we have seen an unusual pattern, with U.S. bonds, stocks, and the dollar all underperforming together. Rather than a safe haven, the U.S. is now trading more like an emerging market facing elevated country-specific risk.

Exhibit 36

U.S. Assets Have Fallen Since Liberation Day



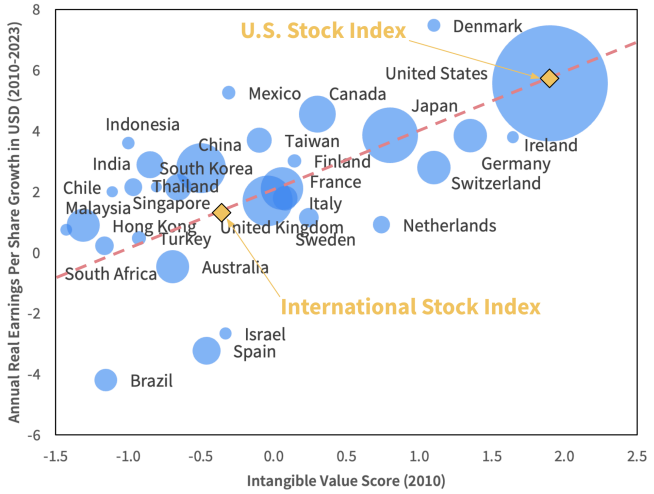
Source: S&P, Sparkline. Returns correspond to the following: U.S. Bonds are TLT ETF, U.S. Dollar is the DXY Index, U.S. Stocks are the S&P 500 Index, and Non-U.S. Stocks are the MSCI ACWI Ex-US Index. From 4/2/2025 to 4/25/2025.

Of course, three weeks is a short period. Long-term investors considering a strategic shift to a more globally diversified portfolio are likely still weighing this decision. Inevitably, they will face the familiar objection that international firms lack the dynamism of their American counterparts. However, while this may be true on average, it overlooks the many world-class international firms that have demonstrated not only strong historical performance but also resilience during this period of heightened U.S.-specific risk.

In International Intangible Value (Apr 2024), we showed that the primary driver of U.S. stock outperformance has been their higher levels of intangible investment (e.g., R&D, brand marketing, employee training). As the next exhibit shows, this greater intangible investment has led to superior U.S. earnings growth over the subsequent decade.

Exhibit 37

Intangible Investment vs. Future Growth



Source: MSCI, S&P, Sparkline. Aggregated using country-level MSCI ACWI IMI weights. Intangible value score on 1/1/2010. Real USD EPS growth from 1/1/2010 to 12/31/2023. Bubble size is proportional to market cap on 1/1/2010. Countries with less than $100B market cap on 1/1/2010 are excluded. Red line from linear regression with intercept. Reproduced from International Intangible Value (Apr 2024).

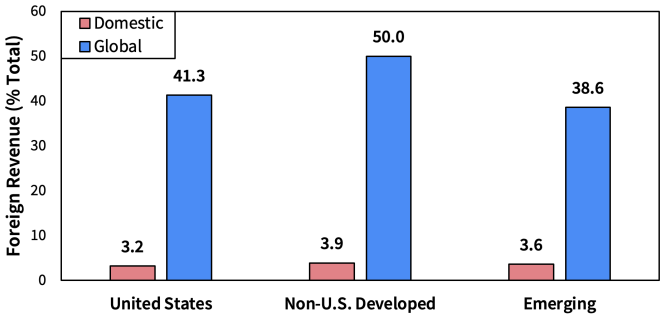
In contrast, international companies have historically under-invested in intangible assets, resulting in weaker growth. However, while this pattern holds at the broad index level, it does not apply uniformly across individual firms. As shown in the previous section, global firms are significantly more intangible-intensive than their domestic peers. As a result, the global subset of non-U.S. stocks does not suffer from the same underinvestment that has constrained the growth of their domestic counterparts.

A second objection investors will likely face is that economic growth in non-U.S. countries, such as Germany and Japan, is expected to be weak. However, this is less of a concern for multinational firms in these countries. Companies like LVMH and Novo Nordisk serve a global customer market, and are therefore levered to the same global growth drivers as U.S. competitors like Ralph Lauren and Eli Lilly.

As the next exhibit illustrates, non-U.S. global firms derive a significant share of their revenues from customers outside their home regions. As a result, they are less dependent on economic growth in their domestic markets.

Exhibit 38

Foreign Revenue Exposure



Source: S&P, MSCI, SEC, Sparkline. U.S. is MSCI USA IMI, Non-U.S. Developed is MSCI World ex-USA IMI, Emerging is MSCI Emerging Markets IMI. Domestic stocks have less than 25% exposure to both foreign customers and production. Global stocks are the remainder of the universe. As of 3/31/2025.

To make this more concrete, the next exhibit highlights examples of non-U.S. multinational firms, such as ASML, Toyota, Airbus, and Samsung. By definition, these are world-class firms, many of which enjoy industry-leading positions – even relative to their U.S. competitors.

Exhibit 39

Non-U.S. Multinationals

Source: Sparkline. As of 3/31/2025.

Despite competing in the same global arena, these firms trade at a significant discount to their U.S. peers simply due to the fact that they are domiciled and listed on non-U.S. stock exchanges. As the next exhibit shows, non-U.S. global firms trade at an average discount of -46% relative to their U.S. counterparts based on traditional valuation ratios.

Exhibit 40

The Foreign Discount

	U.S. Global Firms	Non-U.S. Global Firms	Non-U.S. Discount
Price / Earnings	29.09	17.86	-39%
Price / Sales	3.39	1.55	-54%
Price / Book	4.84	1.88	-61%
EV / EBITDA	19.06	13.34	-30%
Average			**-46%**

Source: S&P, SEC, LinkedIn, Sparkline. Universe is MSCI ACWI IMI. Domestic stocks have less than 25% exposure to both foreign customers and production. Global stocks are the remainder of the universe. Portfolios are market-cap weighted. All calculations are weighted averages with weights equal to position size. EV stands for enterprise value. As of 3/31/2025.

We believe global firms based outside the U.S. represent a particularly attractive opportunity today. Like their U.S.-based counterparts, they have outperformed on the back of robust intangible investments and occupy leading positions in their industries. However, compared to their U.S. peers, they face less U.S. geopolitical risk and trade at a significant valuation discount.

Conclusion

Globalization has been a tremendous boon for stock market investors, particularly those invested in the growing majority of firms with global exposure. While today's trade tensions

have revealed new vulnerabilities, we believe the structural advantages of global companies – larger markets, greater profitability, and the ability to leverage highly scalable intangible assets – remain firmly intact.

Rather than abandoning global exposure, investors should adapt by focusing on the global firms best positioned to withstand geopolitical shocks: those with lower reliance on China, diversified and localized supply chains, intangible-intensive business models, and non-U.S. domiciles.

Amid today's uncertain environment, these firms offer the many advantages of globalization while mitigating exposure to rising geopolitical risks. As such, we believe they are well positioned to continue delivering durable growth and attractive long-term returns for many years to come.

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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Backtest Disclosure

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.

Index returns are shown for informational purposes only and/or as a basis of comparison. Indexes are unmanaged and do not reflect management or trading fees. One cannot invest directly in an index.

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.