THE FALLACY OF CONCENTRATION

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Mark Kritzman is the chief executive officer of Windham Capital Management in Cambridge, MA, and a senior lecturer at the MIT Sloan School of Management in Cambridge, MA.
kritzman@mit.edu
100 Main Street, Cambridge MA, 02142

David Turkington is senior managing director and head of State Street Associates in Cambridge, MA.
dturkington@statestreet.com
140 Mt Auburn Street, Cambridge MA, 02138

Key Takeaways

- Conventional wisdom holds that the stock market becomes riskier if a small number of companies grows to become a large fraction of the market's total capitalization.

- The U.S. stock market has become increasingly concentrated in a small number of technology companies in recent years as the AI revolution has channeled investment to these companies.

- However, both intuition and theory, supported by persuasive empirical evidence, belie the conventional wisdom that concentration begets risk. The U.S. stock market has not become riskier as it has become more concentrated.

Abstract

Many investors believe that the U.S. stock market is riskier than it has been historically because a large fraction of its capitalization is concentrated in a few large technology companies. Some investors, therefore, conclude that they should rebalance their portfolios toward safer assets. The authors present clear evidence that the U.S. stock market has indeed become more concentrated. However, they present practical and conceptual arguments along with persuasive empirical analysis that gives pause to the notion that investors should act to offset concentration.

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The U.S. stock market has become increasingly concentrated in a few technology companies as the AI revolution has channeled investment to these companies. Many investors, therefore, have concluded that the stock market has become riskier and that they should rebalance their portfolios toward safer assets to counteract this perceived increase in risk. We provide undeniable evidence that the U.S. stock market has become more concentrated in its holdings. However, we also offer persuasive evidence that concentration does not beget risk, thereby giving pause to the argument that investors should take measures to counteract concentration. Additionally, we discuss several practical and conceptual arguments that support our view that no action is the best action.

The U.S. Stock Market Has Become More Concentrated

When we speak of concentration, we have in mind concentration in holdings such as individual companies or groups of companies such as sectors or industries. These units do not necessarily correspond to concentration in risk factors, for example. This distinction hints at some of the practical arguments we will make later.

Specifically, we evaluate concentration by computing the effective number of assets in an index or portfolio. Therefore, a low value refers to a concentrated portfolio, whereas a high value refers to a dispersed portfolio. For a group of N assets, we compute the effective number of assets as the reciprocal of the sum of squared weights in an index or portfolio, where the sum of weights across all assets i at time t is $\sum_i^N w_{ti} = 1$, as given by equation 1.

$$\nu_t = \frac{1}{\sum_i^N w_{ti}^2} \quad (1)$$

In equation 1, ν_t equals the effective number of assets, N equals the number of assets in the portfolio, and w_{ti} equals the weight of asset i in period t .

The denominator of this equation is called the Herfindahl-Hirschman index. The reciprocal is an intuitive measure for portfolio weights because we can interpret it in the same units as N, the number of assets in the portfolio. The most broadly dispersed weights have an effective number of assets, ν_t equal to N, the number of assets, and the most concentrated weights have an effective number of assets equal to 1. A portfolio equally spread across a subset of n assets has an effective number of assets equal to n.

For our empirical analysis, we first focus on concentration across individual stocks as well as sectors of the S&P 500 Index. We obtain daily data for S&P 500 stocks and the corresponding capitalization-weighted index from January 2, 1998 through May 2, 2025. We compute the effective number of stocks based on the actual historical weights for the S&P 500 index based on free float market capitalization. We then isolate the effects of sector concentration and individual stock concentration as follows. We obtain GICS sector classifications for each stock. There are 11 total sectors including real estate, which was added as part of a sector reclassification partway through the sample. We hold within-sector stock weights constant at their full-sample average values and allow the sector weights to vary according to their historical market capitalization values. We measure the effective number of stocks for this contrived set of historical stock weights to capture changes in aggregate sector weights while holding constant the relative stock allocation within each sector. We then perform the same

experiment holding sector weights constant at their full-sample average values and allowing the individual stock weights to vary according to their historical market capitalization values. The effective number of stocks for this contrived variation of historical weights captures changes in within-sector stock weights while holding constant the aggregate sector weights.

The current number of effective stocks is near its lowest value in 27 years, driven both by concentration in sector weights and concentration in stock weights within sectors.[1] Exhibit 1 shows how concentration has varied since 1998 due to sector concentration, stock concentration, and the combined effect of both. Lower values imply greater concentration.

Exhibit 1: Effective Number of Stocks and Attribution of Sector and Stock Effects
January 2, 1998 through May 2, 2025

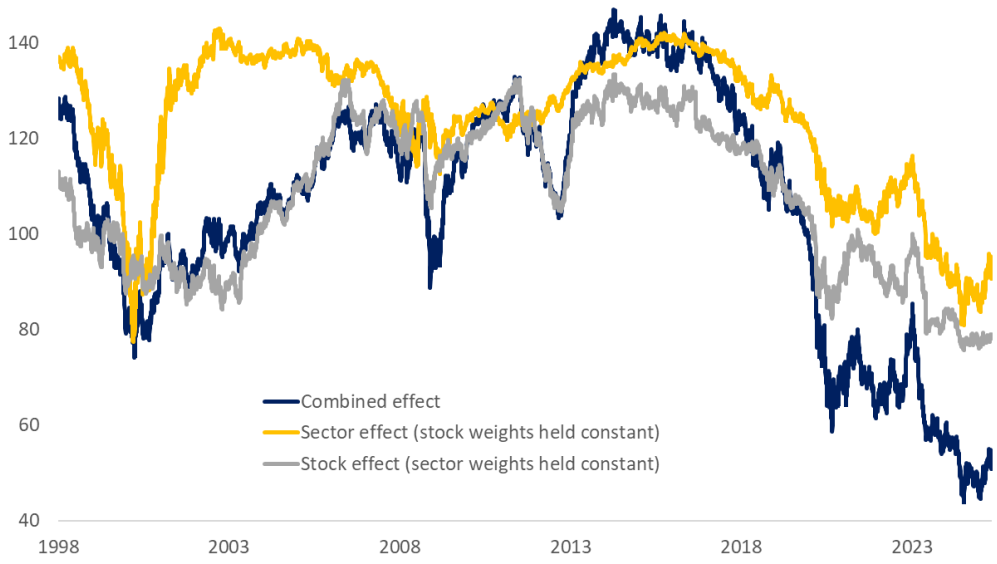


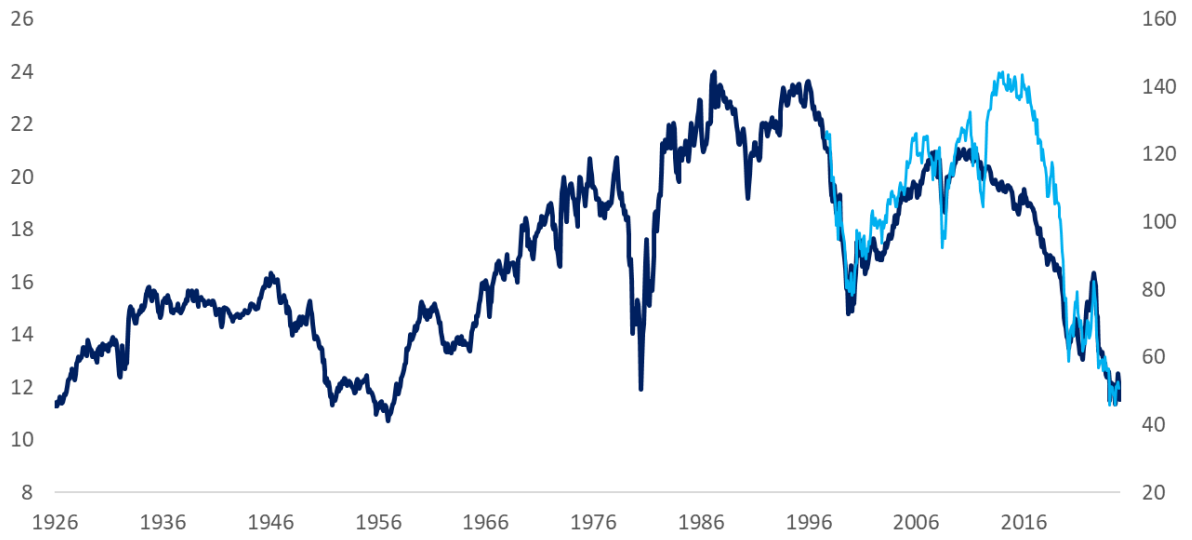
Exhibit 1 clearly shows that the S&P 500 Index recently has become more concentrated than any time since 1998 and that this concentration is due both to sector and stock effects. But Exhibit 1 covers a relatively short period. We therefore obtain monthly market

capitalization data for 49 industries from Ken French's online data website from July 1926 through June 2025.[2]

The prior analysis of the S&P 500 Index pertains to relatively large capitalization stocks owing to the composition of the index. The foregoing industry analysis includes a larger universe of stocks of all sizes. Nevertheless, it stands to reason that the sizes of larger companies will have a substantial effect on the total capitalization of most industries. These industries are less granular than individual companies, but more granular than the 11 top-level GICS sectors.

Exhibit 2 shows effective number of industries for the market index that comprises market capitalization weights in these 49 industry portfolios. The dark blue line shows these results and corresponds to the left-hand-side axis. The latest data shows an effective number of industries of around 11, which closely matches other prior low points in history. It is not unprecedented. We overlay the overall effective number of stocks shown earlier (light blue line), which corresponds to the right axis. The values are larger because they pertain to the stock level, rather than the industry level. We should not expect these measures to be identical, but the fact that the trends are similar lends credence to both measurements and suggests that the industry calculation captures most of the dominant effects at both the sector level and the individual stock level.

Exhibit 2: Shifts in Industry and Stock Concentration
Industry – July 1926 through June 2025
Stock – January 1998 through June 2025



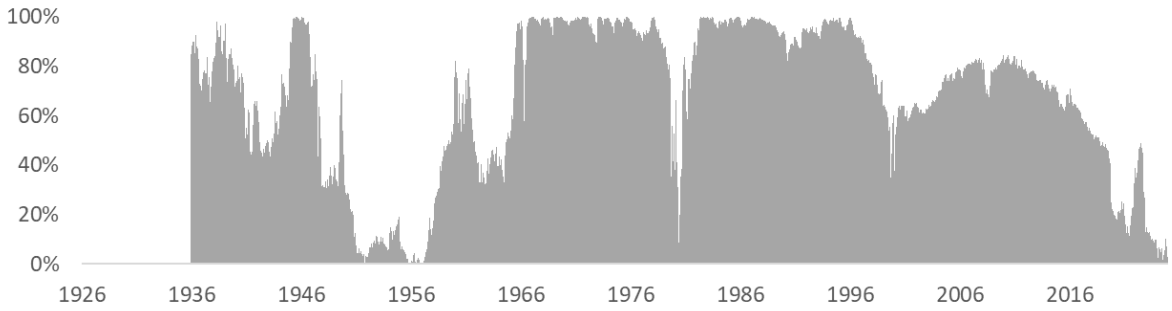
Does Concentration Beget Risk?

We have shown that the U.S. equity market has become highly concentrated compared to historical levels of concentration owing to stock, sector, and industry effects. This outcome is not surprising as growth naturally leads to concentration, as we will discuss later. We now address whether concentration increases risk and whether investors should take measures to counteract concentration.

First, we test a dynamic trading rule that varies exposure to stocks and cash as a function of the effective number of stocks in the portfolio. Specifically, we compute the percentage rank of the effective number of stocks starting with a 10-year window beginning January 1926 and expanding the window through May 2025.

Each month, we invest the amount of this percentage rank in stocks, as represented by Ken French's overall capitalization weighted stock market index, and the remainder in cash, as represented by the risk-free rate. This dynamic trading rule cuts exposure to stocks as the effective number of stocks drops, which indicates a more concentrated index, and it increases stock exposure as the effective number of stocks rises, which indicates a less concentrated index. Exhibit 3 shows the allocation to the aggregate stock index over time as a function of this rule.

Exhibit 3: Allocation to Stocks Based on Concentration Trading Rule

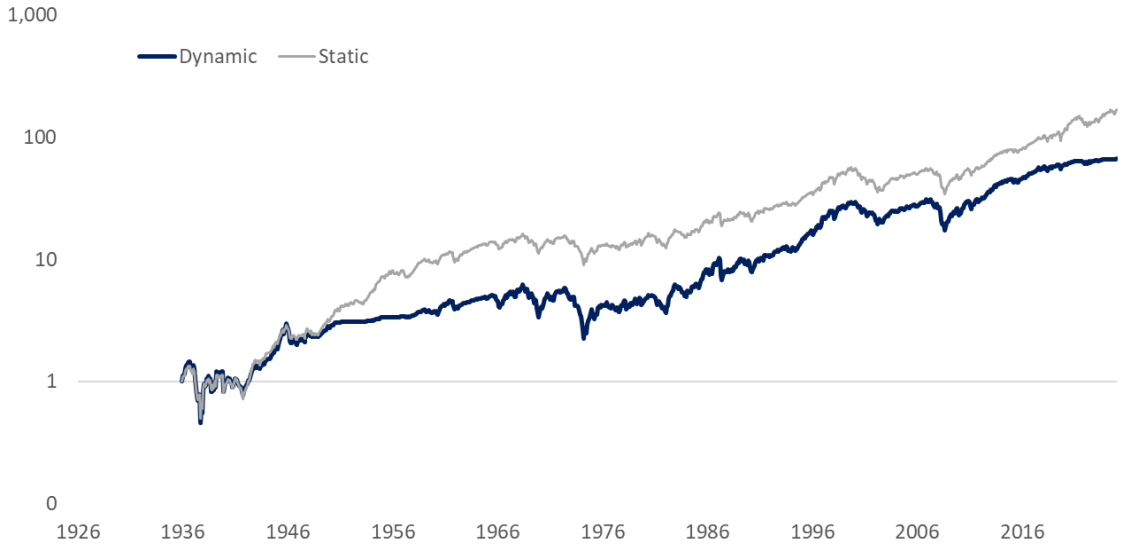


Exhibits 4 and 5 show the results of this dynamic trading rule compared to a buy-and-hold strategy with the same ex post average stock exposure of the dynamic trading rule. This rule of investing less in the stock market when it is more concentrated reduces return and increases risk compared to the buy-and-hold strategy that allows concentration to evolve naturally.

Exhibit 4: Return and Risk of Constant and Dynamic Strategies

	Constant	Dynamic
Average excess return	5.6%	4.7%
Standard deviation	10.7%	12.1%
Sharpe ratio	0.52	0.39
Average equity exposure	67.8%	67.8%

Exhibit 5: Cumulative Returns of Constant and Dynamic Strategies (Log Scale)



The key takeaway from Exhibits 4 and 5 is that concentration historically has been beneficial. The buy-and-hold strategy generated more than twice as much wealth as the dynamic strategy during this period, and it did so with less risk.

Does Concentration Explain Performance Outcomes?

We next seek to determine if variation in concentration cross-sectionally and through time explains variation in performance outcomes. For this analysis, we return to our shorter sample of stocks and sectors, and we continue to evaluate concentration using the effective number of stocks, for which lower values indicate greater concentration.

We consider each sector as its own market capitalization weighted index and compute the effective number of stocks for each of 10 sectors as of the end of each calendar year from 1998 through 2023. We ignore real estate, which is not available for the full sample.

Exhibit 6 shows the effective number of stocks for 260 measurements (26 years by 10 sectors). It shows there is a significant amount of variation both cross-sectionally and through time.[3]

Exhibit 6: Effective Number of Stocks Across Sectors and Through Time

	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Energy	6	3	4	3	4	4	5	6	6	7	5	8	9	8	8	9	10	8	9	9	8	8	8	8	8	8
Materials	11	12	11	12	12	13	14	16	17	14	14	16	15	16	18	17	17	16	16	11	11	15	15	15	14	13
Industrials	7	5	6	7	10	9	9	9	9	11	16	19	19	20	19	21	23	19	23	31	31	34	38	41	37	45
Consumer Discretionary	26	19	19	18	21	31	32	35	37	36	26	34	35	33	32	34	35	25	23	18	9	9	6	7	10	7
Consumer Staples	14	12	13	13	12	12	13	11	11	12	12	13	14	14	15	16	16	18	17	16	14	13	13	13	13	14
Health Care	12	13	12	13	13	12	16	18	18	19	18	16	18	17	18	21	23	24	23	24	23	25	26	26	23	23
Financials	31	22	22	19	25	25	24	27	27	31	25	21	24	29	28	29	29	29	21	21	20	20	22	24	23	24
Information Technology	11	15	19	12	10	15	16	18	18	17	16	17	17	15	13	15	15	16	16	15	12	11	9	8	9	7
Communication Services	9	8	6	6	5	5	5	5	4	3	2	3	3	3	3	3	2	2	2	2	9	9	9	7	8	6
Utilities	27	23	20	25	22	24	22	21	20	19	19	23	23	22	20	20	19	19	19	19	19	18	15	14	16	18

Next, for each of these 260 observations, we calculate several performance metrics for each sector index in the following calendar year. Specifically, we calculate:

1. Cumulative return for the year
2. Volatility of daily returns during the year
3. Downside volatility of daily returns during the year
4. Maximum drawdown that occurred during the year. We measure drawdowns as the magnitude of cumulative returns with more negative values representing larger losses.

We then run a separate panel regression for each performance metric with the effective number of stocks as the sole independent variable. The performance metric of each sector depends heavily on time, but we are not interested in time variation by itself. Therefore, we include year fixed effects in the regressions.

Our results, as shown in Exhibit 7, reveal that the effective number of stocks fails to meaningfully explain variation in these performance metrics. The t-statistics are insignificant for all the predictions. We also compute the incremental R-squared of the effective number of stocks variable as the difference in R-squared for the regression with the effective number of stocks plus fixed effects and the regression with only the fixed effects. The amount of concentration explains only a few thousandths of the total variation in outcomes.

consider Exhibit 7: Explanatory Power of Concentration with Year Fixed Effects

Dependent variable in panel regression	Coefficient	t-statistic	Incremental R-squared
Predicting return	-0.00086	-0.68	0.001
Predicting volatility	-0.00042	-0.90	0.001
Predicting downside volatility	-0.00042	-1.02	0.001
Predicting max drawdown	-0.00055	-1.32	0.004

The results shown in Exhibit 7 consider how the effective number of stocks explains differences in sector performance outcomes on average. Even though these effects are very small, we might still worry that relationships explaining the average cross-section could be spurious because there are only 10 sectors and there are many other plausible reasons why some sectors may have persistently higher or lower return or risk than others. Therefore, we next control for sector fixed effects in addition to year fixed effects. The relationships remain insignificant, and most of them become weaker, as shown in Exhibit 8.

Exhibit 8: Explanatory Power of Concentration with Year and Sector Fixed Effects

Dependent variable in panel regression	Coefficient	t-statistic	Incremental R-squared
Predicting return	-0.00213	-1.16	0.003
Predicting volatility	0.00020	0.37	0.000
Predicting downside volatility	-0.00001	-0.03	0.000
Predicting max drawdown	-0.00044	-0.69	0.001

Exhibits 7 and 8 clearly show that concentration is not significantly related to variation in these performance metrics.

Risk Properties of Large and Small Stocks

We now consider whether large stocks have different risk properties than small stocks. Using the S&P 500 universe since 1998, we compute returns for 10 decile portfolios sorted by market capitalization and rebalanced daily. Each decile portfolio, therefore, comprises 50 stocks. Importantly, we weight the stocks within each portfolio equally so that the effective number of stocks is equivalent across the decile portfolios. Therefore, each portfolio has the same amount of weight concentration – they are just concentrated in different stocks.

We compute full-sample annualized volatility, skewness, excess kurtosis compared to a normal distribution, and the 10^{th} and 90^{th} percentile of return outcomes. We compute these measures at daily and monthly frequencies.

Exhibit 9 reveals that the largest decile, which comprises approximately the 50 largest stocks, has the lowest volatility and kurtosis of all portfolios, and this decile has more favorable skewness and 10^{th} percentile loss outcomes than almost every other decile.

Exhibit 9: Risk Properties of Large and Small Stocks Sorted into Deciles by Number of Stocks
S&P 500 Universe – January 1998 through May 2025

Size decile:	Smallest	2	3	4	5	6	7	8	9	Largest
DAILY										
Volatility (annualized)	28.8%	23.1%	22.3%	21.3%	20.8%	20.1%	20.2%	20.0%	19.8%	19.2%
Skewness	-0.15	-0.10	-0.14	-0.11	-0.06	-0.10	-0.01	0.07	-0.01	0.07
Kurtosis	11.93	9.74	10.08	10.77	9.85	10.43	11.55	11.18	10.30	9.08
10th percentile	-1.8%	-1.5%	-1.4%	-1.3%	-1.3%	-1.3%	-1.2%	-1.2%	-1.3%	-1.2%
90th percentile	1.7%	1.4%	1.4%	1.4%	1.4%	1.3%	1.3%	1.3%	1.3%	1.3%
MONTHLY										
Volatility (annualized)	27.9%	21.3%	20.1%	18.0%	17.2%	16.6%	16.1%	16.3%	15.8%	15.2%
Skewness	-0.36	-0.39	-0.37	-0.45	-0.40	-0.15	-0.27	-0.36	-0.28	-0.22
Kurtosis	4.41	2.18	1.99	2.21	1.21	1.88	0.94	1.27	0.73	0.45
10th percentile	-8.6%	-6.3%	-6.2%	-5.0%	-5.0%	-4.6%	-4.4%	-4.3%	-4.5%	-4.4%
90th percentile	7.2%	7.3%	7.1%	7.0%	6.8%	6.4%	6.7%	7.2%	6.5%	6.9%

We perform the same analysis using size decile portfolios obtained from the Ken French data website which goes back to 1926. This analysis yields the same qualitative results. Given the monthly frequency of the data and its longer history, we consider monthly and yearly frequencies for this analysis.

Exhibit 10: Risk Properties of Large and Small Stocks Sorted into Deciles by Number of Stocks
Ken French Data - January 1926 through May 2025

Size decile:	Smallest	2	3	4	5	6	7	8	9	Largest
MONTHLY										
Volatility (annualized)	36.3%	31.3%	28.5%	26.8%	25.0%	24.1%	22.9%	21.7%	20.6%	18.4%
Skewness	4.13	2.68	1.85	1.75	0.81	1.02	0.74	0.62	0.40	0.21
Kurtosis	40.33	26.91	19.14	17.97	9.95	12.11	10.13	9.66	9.25	7.22
10th percentile	-7.4%	-7.5%	-7.0%	-7.0%	-6.6%	-6.2%	-6.0%	-5.5%	-5.2%	-4.9%
90th percentile	10.0%	9.1%	8.6%	8.4%	8.1%	7.9%	7.6%	7.3%	7.0%	6.1%
YEARLY										
Volatility	48.9%	40.2%	31.4%	30.5%	26.9%	25.9%	25.6%	23.3%	21.7%	19.1%
Skewness	1.61	2.36	0.96	0.90	0.11	0.24	0.29	0.10	-0.36	-0.50
Kurtosis	4.69	13.09	4.33	3.66	0.76	1.35	2.01	1.59	0.77	0.16
10th percentile	-24.7%	-21.2%	-19.8%	-22.5%	-18.7%	-16.0%	-13.9%	-14.6%	-10.3%	-11.2%
90th percentile	82.8%	63.1%	50.9%	50.1%	49.1%	47.2%	40.2%	36.8%	37.3%	35.0%

The portfolios in Exhibits 9 and 10 comprise vastly different fractions of total capitalization. In Exhibit 11 we, therefore, stratify the market into 10 deciles, each with same aggregate capitalization. The decile of the smallest stocks, for example, contains on average 230

stocks that collectively have the same aggregate capitalization as the decile of the largest stocks, which contains on average only three stocks. As we did in Exhibits 9 and 10, we equally weight the stocks within each decile. This comparison of the equal capitalization deciles of the smallest and largest stocks starkly illustrates the extreme concentration of the U.S. stock market.

Exhibit 11:
Risk Properties of Large and Small Stocks Sorted into Deciles by Aggregate Capitalization
S&P 500 Universe – January 1998 through May 2025

Size decile:	Smallest	2	3	4	5	6	7	8	9	Largest
Average number of companies	230	98	60	38	25	17	11	8	5	3
DAILY										
Volatility (annualized)	22.8%	20.2%	19.8%	19.9%	20.5%	19.7%	20.1%	21.7%	24.6%	24.5%
Skewness	-0.07	-0.19	-0.07	-0.19	-0.10	-0.13	-0.06	0.03	0.15	0.04
Kurtosis	10.47	11.12	10.41	10.70	9.12	7.91	8.85	6.91	7.13	6.54
10th percentile	-1.4%	-1.3%	-1.3%	-1.3%	-1.3%	-1.3%	-1.3%	-1.5%	-1.6%	-1.6%
90th percentile	1.4%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.5%	1.6%	1.7%
MONTHLY										
Volatility (annualized)	20.5%	16.4%	16.1%	16.0%	16.9%	16.6%	16.3%	18.0%	20.5%	20.7%
Skewness	-0.17	-0.62	-0.55	-0.60	-0.50	-0.37	-0.26	-0.49	0.23	0.02
Kurtosis	2.14	2.07	1.31	1.48	1.14	0.94	1.06	0.80	2.35	1.24
10th percentile	-5.8%	-5.0%	-4.9%	-4.6%	-4.9%	-5.7%	-4.8%	-6.4%	-6.5%	-7.3%
90th percentile	7.8%	6.1%	6.0%	6.0%	6.5%	6.1%	6.2%	6.8%	7.4%	7.3%

Exhibit 11 reveals that the riskiness of the decile of the largest three stocks is not meaningfully riskier than the equally sized decile of the smallest 230 stocks, especially when considering higher moments of the distribution. But market analysts tend to think of market concentration in terms of a broader group of large technology companies colloquially referred to as the Magnificent Seven. We therefore stratify the S&P 500 Index into quintiles. This stratification gives a top quintile containing on average eight stocks which requires on average 328 of the smallest stocks to aggregate to the same capitalization.

Exhibit 12:
Risk Properties of Large and Small Stocks Sorted into Quintiles by Aggregate Capitalization
S&P 500 Universe – January 1998 through May 2025

Size quintile:	Smallest	2	3	4	Largest
Average number of companies	328	98	42	19	8
DAILY					
Volatility (annualized)	21.9%	19.6%	19.7%	19.6%	22.6%
Skewness	-0.12	-0.12	-0.13	-0.05	0.05
Kurtosis	10.77	10.76	9.00	8.63	6.21
10th percentile	-1.4%	-1.3%	-1.3%	-1.3%	-1.5%
90th percentile	1.4%	1.3%	1.3%	1.3%	1.5%
MONTHLY					
Volatility (annualized)	19.1%	15.8%	16.1%	15.8%	18.5%
Skewness	-0.31	-0.60	-0.50	-0.41	-0.13
Kurtosis	2.06	1.42	0.92	0.66	0.80
10th percentile	-5.1%	-5.0%	-5.4%	-4.8%	-6.5%
90th percentile	7.2%	6.0%	6.2%	6.2%	6.8%

Exhibit 12 shows that, even though one must invest in 328 of the smallest stocks in the S&P 500 Index to capture the same fraction of the index's capitalization as the largest eight stocks, the riskiness of these equal-capitalization quintiles is essentially the same. These results strongly contradict the notion that concentration affects risk.

Why Concentration Does Not Affect Risk

We offer three fundamental explanations for why concentration does not affect risk. First, large companies are intrinsically more diversified and safer than small companies. Second, concentration is a natural consequence of growth, not an aberration. And third, the U.S. stock market is highly efficient.

Intrinsic Diversification and Safety

Geographic diversification: Large companies conduct business across many markets domestically and globally. They are therefore less vulnerable to local shocks or circumstances that could derail the earnings of a locally dependent company. Additionally, they have access to multiple supply chains which insulate them from supply chain disruptions.

Product diversification: Large companies produce and distribute many products and services unlike small companies that may produce just one or a few niche products or services. Large companies are therefore less affected by changes in consumer preferences, government intervention, supply chain disruption, technological displacement, and new competition than small companies.

Large markets: Large companies offer products that appeal to many different clienteles. Their markets are large and less dependent on the shifting preferences or circumstances of a narrow group of customers. So, not only are large companies more diversified across products; they are also more diversified across customers than small companies.

Greater optionality to manage adversity: Large companies have more flexibility to manage outcomes when faced with adverse circumstances. They can shed underperforming business units, reduce payroll, postpone investment, renegotiate contracts with suppliers and service providers, and consolidate operations.

Better access to capital: Large companies have more bargaining power to negotiate favorable lending terms and to attract equity investment at better prices.

Better management and governance: Large companies attract more highly qualified personnel for senior roles. Senior executives of large companies are better vetted for having advanced

within the company, or they have valuable experience from senior roles at other companies. Moreover, large companies attract highly qualified board members by virtue of their status and resources, thereby resulting in sound and robust internal governance. Additionally, large companies are highly regulated by government authorities, and their practices and prospects are carefully monitored by investors.

In addition to these pragmatic arguments about the relative safety of large companies, there are compelling conceptual arguments that challenge the notion that investors should act to offset concentration.

Concentration is Natural

The Power Law: Goldberg, Madhaven, Selwitz, and Shkolnik (2023) have shown that the size distribution of a capitalization-weighted index follows a power law and naturally leads to concentration as growth becomes self-reinforcing by attracting capital which leads to even more growth. One could argue that concentration is a natural consequence of success and that success follows from superior management and other favorable circumstances. Moreover, the authors point out that concentration is hardly aberrant. The same dynamics that drive the growth rates of companies also affect growth in populations, income, and wealth. To take steps to counteract concentration, therefore, one should have reason to believe that the factors that drove growth in the past no longer apply.

Market Efficiency

Efficient Market Hypothesis: Paul A. Samuelson (1965), showed that information relevant to the valuation of companies arrives randomly and is immediately acted upon by investors to revise valuations. Therefore, the valuations of companies at all points in time reflect the collective judgment of all market participants. Taking measures to counteract concentration would constitute a bold challenge to the wisdom of markets, not to mention one of the greatest economists of the 20th century.

The Market Portfolio: The Capital Asset Pricing Model, developed independently by Lintner (1965a and 1965b), Mossin (1966), Sharpe (1964), and Treynor (1999), partitions risk into two sources: systematic risk which is the risk associated with changes in the value of the market portfolio and which cannot be diversified away, and unsystematic risk which can be diversified away. It holds that investors should only bear systematic risk because they are not compensated for unsystematic risk. They should therefore hold the market portfolio irrespective of its weight distribution.

Summary

We provided undeniable evidence that the U.S. stock market is currently more concentrated in its holdings than it has been for more than a quarter of a century and nearly as concentrated as it has ever been over the past century. And we showed that this increased concentration is due to both stock effects and sector effects.

We then addressed the issue of whether concentration increases risk and what, if anything, investors should do about it. We first tested a dynamic trading rule based on data

starting in 1926 that shifts a portfolio from stocks to a safe asset to reduce exposure to the U.S. stock market to the extent it becomes more concentrated. We showed that this trading rule produced a lower average return and a higher standard deviation than a buy-and-hold strategy that is agnostic to concentration.

We then regressed several performance metrics on our indicator of concentration using a panel of stock market sectors from 1998 through 2025. We controlled for year fixed effects and sector fixed effects. Our analysis revealed that concentration did not explain variation in these performance metrics with any statistical significance.

We then examined the properties of large and small stocks across 10 size deciles that had an equal number of stocks for both our shorter sample and our longer sample. In both cases, we showed that the largest size deciles had safer risk profiles than the smaller size deciles. Using the shorter sample, we also stratified the stock market into deciles and quintiles of equal aggregate capitalization. These results showed that concentration did not meaningfully affect risk.

We then suggested explanations for why concentration in large companies does not increase risk. Large companies are more diversified across products and markets. They are better equipped to respond to business challenges. They have better access to funding sources. They have more highly experienced and better qualified leaders than small companies. And they are more thoroughly regulated and more carefully researched. These large-company advantages serve to balance whatever incremental risk would otherwise come from concentration.

Finally, we argued conceptually why investors should not act to offset concentration. We first discussed the power law which shows that concentration is a natural consequence of growth because growth is self-reinforcing. We then discussed the Efficient Market Hypothesis which holds that information arrives randomly and is immediately captured by prices; hence markets properly value companies. And we discussed the Capital Asset Pricing Model, which holds that in equilibrium investors should hold the market portfolio irrespective of its size distribution.

Our concluding observation is simple. A company is a single legal unit. And a company is a single accounting unit. But a company is not a single economic unit. Therefore, company concentration does not equate to economic concentration.

Notes

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[1] We also evaluated measures of risk concentration that account for the volatilities and correlations of stocks in addition to their index weights. All these measures revealed the same trends as simple weight concentration for this sample, so we do not show them.

[2] https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. Note that the definition of 49 sectors includes one catch-all sector defined as "Other," but this sector does not have much impact on the analysis. Its average weight is 1.4% and never exceeds 5%.

[3] Substantial reclassifications were implemented in the GICS sector definitions in 2018, which is visible in the chart. These reclassifications are not a problem for our analysis. Rather, they represent meaningfully different observations.