

Visualizing the Rate Game: Uncovering Stock Market Winners and Losers

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Executive Summary

This analysis focuses on the dynamic impact of interest rate movements on stock and sector performance within the Russell 1000 universe. With the U.S. Federal Reserve signaling a shift toward cutting interest rates, active investors must navigate the ripple effects that rate changes create across different sectors and individual stocks. By examining distributions of both historical stock returns and correlations with the U.S. 10-year Treasury yield, this report highlights which constituents are poised to benefit or struggle in changing interest rate environments.

Key findings from the analysis reveal stark disparities in performance across sectors over the past decade. High-growth technology companies such as NVIDIA, Apple, and Tesla have delivered significantly above-average returns, driven by innovations in AI, e-commerce, and electric vehicles. These tech-driven sectors thrived due to the increasing reliance on digital solutions and technological advancements. Conversely, companies in traditional industries like retail (Macy's), energy (Southwestern Energy), and fashion (VF Corp) have underperformed due to sector-specific headwinds such as disruptive shifts to online retail, volatile commodity prices, and changing consumer preferences.

By mapping stock returns against their correlations with interest rates, using the innovative “quantamental” data visualization platform by Sismo, the report identifies sectors that are more sensitive to rate changes. Sectors like Financials, Energy, and Materials benefit from rising rates, while Utilities, Real Estate, and Consumer Staples struggle in such environments. The analysis also highlights those sectors such as Technology—especially Semiconductors—performed strongly regardless of their sensitivity to interest rates, driven by global demand for computing power and hardware.

The incorporation of two-factor regression models reveals the critical role that interest rates play in explaining stock performance variance. This is particularly evident in sectors like Banking and Real Estate, which show contrasting responses to rate changes. Banks benefit from expanding net interest margins in a rising-rate environment, while real estate stocks suffer due to increasing

borrowing costs. Sectors such as Utilities and Household & Personal Products are also sensitive to rate fluctuations, benefiting from falling rates but facing challenges when rates rise.

For investors, understanding the sector-specific responses to interest rates is essential when formulating allocation strategies. The report offers insights into how both defensive and growth-sensitive sectors react to interest rate changes, providing a roadmap for optimizing portfolios based on the prevailing and expected interest rate environment. By examining correlation and beta metrics over time, the analysis enables investors to anticipate shifts in sector performance, mitigate risks, and identify alpha opportunities in both rising- and falling-rate environments.

Introduction

As the U.S. Federal Reserve signals a shift towards cutting interest rates, investors are bracing for significant ripple effects across the stock market. Lower borrowing costs may provide a boost to certain sectors and stocks, while others could struggle to adjust to the new economic landscape. In this changing environment, rate cuts create a dynamic playing field, producing clear winners and losers among companies and industries. Understanding who stands to gain—and who may falter—can help investors navigate the complex market reactions that accompany such policy changes.

Over the past ten years, stock returns within the Russell 1000¹ have fluctuated significantly, making it challenging to pinpoint the impact of interest rates without deeper analysis. The Sismo-generated charts below highlight starkly contrasting performances with outsized gains by Nvidia, Celsius, and Advanced Micro Devices returning respective annualized returns of 72.3%, 67.2%, and 42.7% over the past ten years², while losing companies like Southwestern Energy, Warner Bros., and Walgreens Boots Alliance posted respective ten-year annualized returns of -17.0%, -16.2%, and -14.8%. This disparity underscores the importance of managing risk by understanding sector-specific trends and company fundamentals and how stock relationships change through time with rates. High-growth technology companies like Celsius, Nvidia, and Advanced Micro Devices have benefitted from explosive demand in their respective markets. Nvidia and AMD have capitalized on surging interest in artificial intelligence, gaming, and data processing, while Celsius tapped into the booming health and energy drink market, leading to their impressive annualized returns. These companies' ability to innovate and meet evolving consumer and industry demands has driven their outsized growth.

On the other hand, companies like Southwestern Energy, Warner Bros. Discovery, and Walgreens Boots Alliance have faced industry headwinds, resulting in significantly negative returns. Southwestern Energy has struggled amid volatile energy prices and a shift towards renewable energy sources, while Warner Bros. and Walgreens have faced challenges due to shifting consumer behavior, intense competition, and structural changes in the media and retail pharmacy industries. These factors have led to their respective declines over the past decade.

¹ Russell 1000 data is represented by iShares Russell 1000 ETF (Ticker: IWB)

² All data have been calculated at close of Sept. 10, 2024.

Each company faces unique opportunities and challenges in adapting to an evolving market landscape, as clearly illustrated in exhibits 1 and 2 by the divergence in stock returns despite changes in U.S. 10-Year yields. This underscores the importance of further analyzing the relationship between stock performance and interest rates.

Exhibit 1: Unclear Impact of Interest Rates on Biggest Gainers and Losers in the Russell 1000



Source: Sismo

Stock and Sector Return Distribution

To further explore potential alpha opportunities within the Russell 1000 universe, Exhibit 2 visualizes the distribution of stock returns across sectors and individual companies, helping identify both top performers and laggards over the past decade. The exhibit maps the 10-year total returns of Russell 1000 stocks, using a red-to-green gradient to depict relative performance. Stocks with below-average returns are shaded red, while those with above-average returns are shown in green. Notably, 90.2% of stocks delivered positive 10-year returns, underscoring the overall strength of the index during this period.

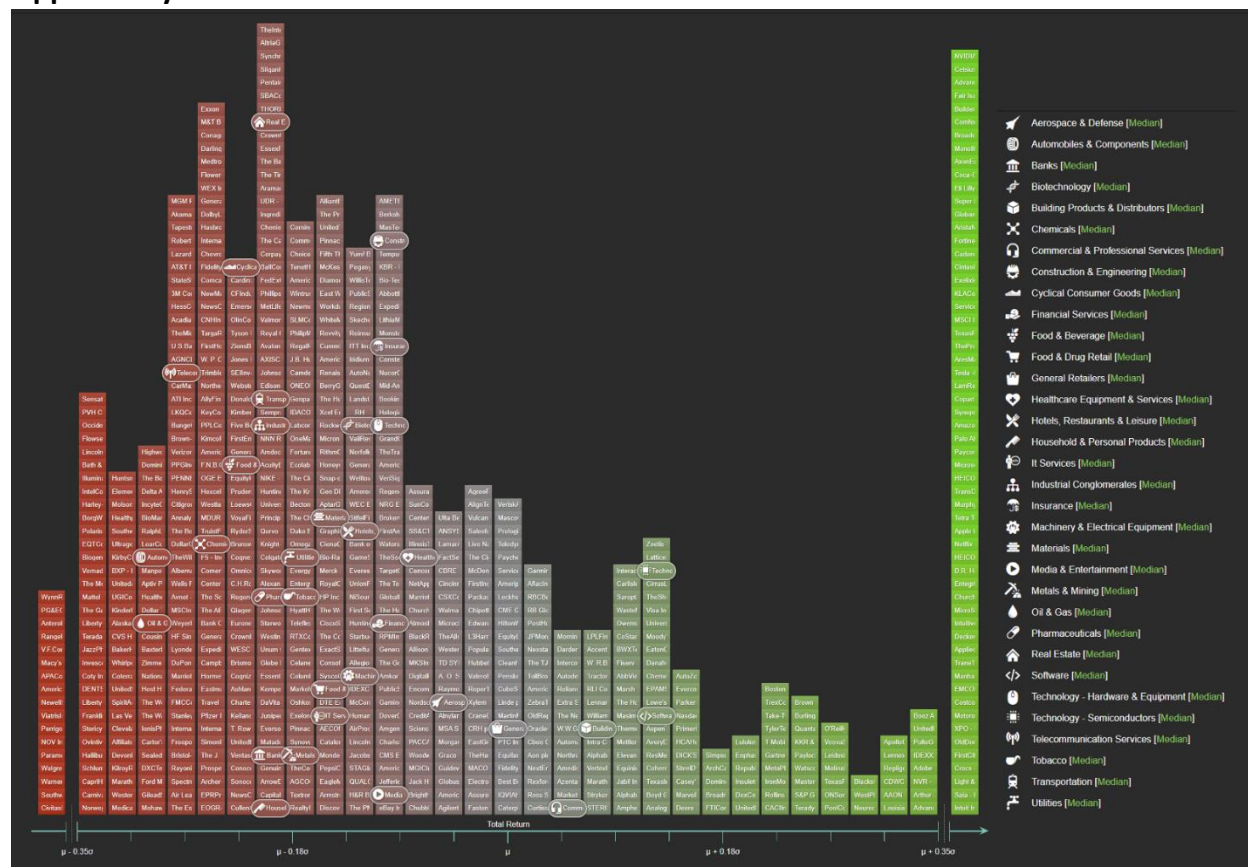
Stocks in the green zone, such as NVIDIA, Apple, Amazon, and Tesla, significantly outperformed their peers over the last decade. These companies benefited from transformative technological innovations: NVIDIA's leadership in artificial intelligence, Amazon's dominance in e-commerce, Tesla's rise in the electric vehicle market, and Apple's success in consumer electronics. These growth drivers were further accelerated by increasing global digitization and demand for cutting-edge tech solutions.

Conversely, companies in the red zone, including Macy's, Southwest Airlines, and VF Corp, struggled over the same period. Many of these businesses faced sector-specific challenges: Macy's was disrupted by the shift to online retail, Southwest Airlines grappled with fluctuating fuel prices and global travel disruptions, and VF Corp struggled with growing competition and changing consumer preferences in the fashion and apparel industry.

The sector map offers further insights into the median returns of different sectors. When examined alongside the stock-level mapping, it becomes clear that technology-driven sectors, such as Semiconductors and Software, consistently outperformed others like cyclical consumer goods, oil & gas, and media & entertainment, which are more concentrated in the red and median zones. This performance disparity reflects the high-growth potential of tech companies in a world increasingly reliant on digital solutions, while sectors like oil & gas were impacted by volatile commodity prices and the global transition toward renewable energy.

Sectors like Technology – Semiconductors and Technology – Hardware & Equipment dominate the green section, reflecting their strong long-term performance. The increasing demand for chips across multiple industries and the global reliance on hardware for computing and connectivity were key drivers of this growth. In contrast, sectors such as Real Estate, Retailers, and Financial Services are more prominent in the red zone, showing relative underperformance. These sectors faced macroeconomic headwinds, including rising interest rates that negatively impacted real estate, and slow consumer spending that hurt traditional retail businesses.

Exhibit 2: Russell 1000 Stock and Sector Performance Mapping Distribution Shows Alpha Opportunity



Source: Sismo. Ten-year total return ending September 10, 2024.

Distribution of Stock and Sector Correlations to Interest Rates

Since one of the primary objectives for most portfolio managers is to minimize risk for a given level of return, starting with a correlation analysis based on interest rates can help identify which stocks and sectors might optimize portfolio efficiency. Exhibits 3 and 4 illustrate the 10-year monthly correlation between Russell 1000 stocks and interest rates, represented by the U.S. 10-year Treasury yield. While Exhibit 3 provides a comprehensive view of the correlation distribution between Russell 1000 stocks and sectors with interest rates, Exhibit 4 is designed for investors seeking alpha by highlighting the 60 stocks most sensitive to rate changes—featuring those with the strongest negative and positive correlations.

Investors can leverage these charts to develop strategies aligned with interest rate movements. In a declining-rate environment, sectors like Consumer Staples, Utilities, and Technology are likely to benefit. Conversely, in a rising-rate scenario, Financials, Insurance, and Energy sectors become more attractive opportunities due to their positive correlation with interest rate increases.

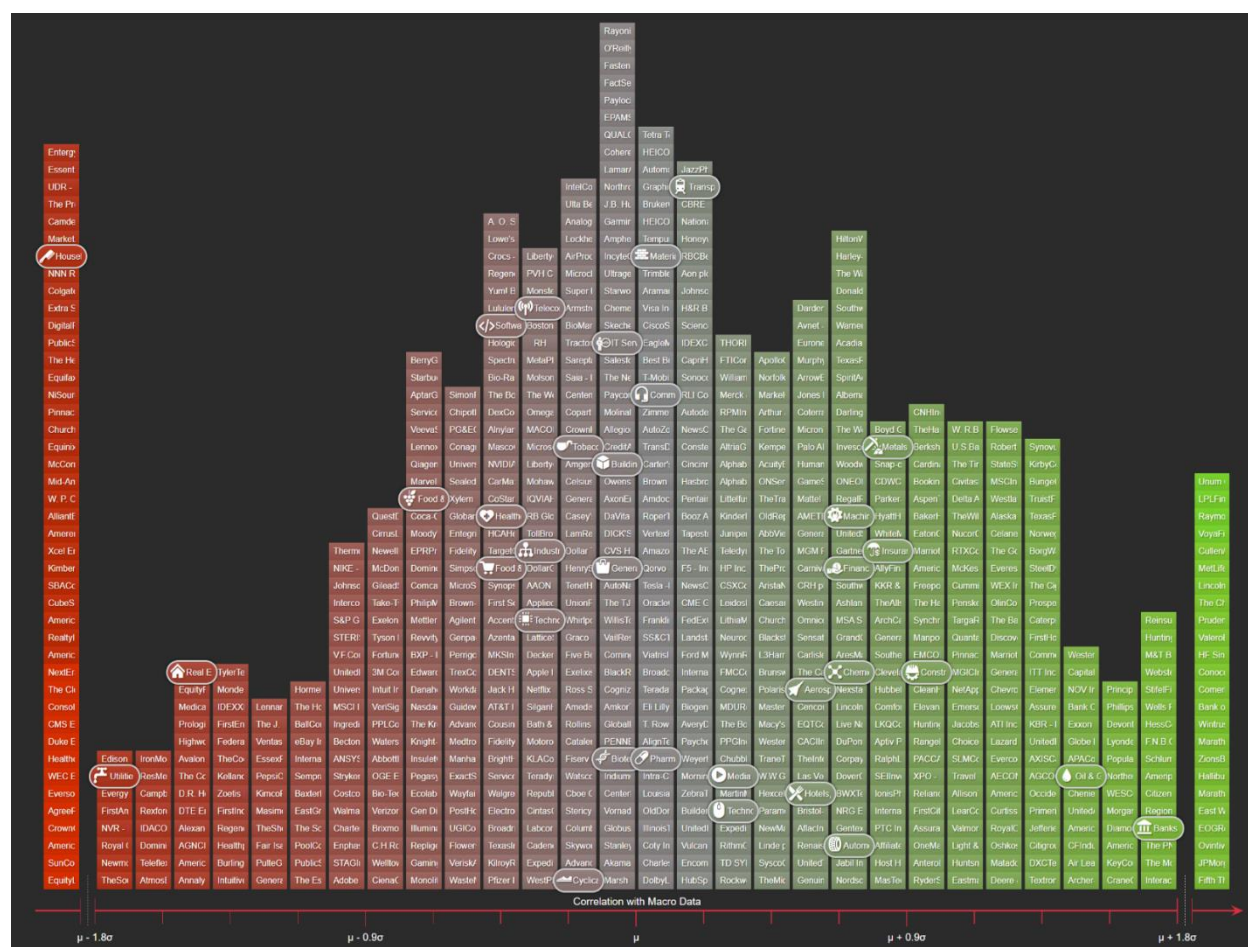
At the far-left of the spectrum, companies with a strong negative correlation to interest rates—such as Colgate, Pfizer, General Mills, and Procter & Gamble—tend to perform better when rates decline. These defensive stocks, mostly in Consumer Staples, thrive in low-rate environments as borrowing costs decrease, boosting consumer spending on essential goods. Similarly, Utilities (e.g., PG&E, Con Edison) also benefit from lower rates, as their debt-heavy financing becomes cheaper, improving their margins.

In the center of the spectrum, moderately correlated stocks from sectors like Technology (e.g., Apple, Microsoft, Alphabet) and Healthcare (e.g., Johnson & Johnson, Merck) show less sensitivity to interest rate fluctuations. These companies are more influenced by innovation, consumer demand, and broader global trends than by direct rate movements. Additionally, cyclical sectors like Industrials and Materials are found in this zone, indicating their performance is tied more to economic conditions than to direct interest rate sensitivity.

On the far-right of the spectrum, stocks with strong positive correlations to interest rates include Banks (e.g., JP Morgan, Wells Fargo, LPL Financial), Insurance companies (e.g., Unum, MetLife), and Energy companies (e.g., ExxonMobil, Chevron). Financial institutions benefit from rising rates as they increase the spread between borrowing and lending, boosting profitability. Energy companies are similarly positively correlated, as rising rates often indicate a growing economy and higher demand for energy. Additionally, inflation, which is often linked to rising rates, can drive up oil and gas prices, supporting strong performance in the energy sector.


These correlation charts offer valuable insights into how different sectors and stocks within the Russell 1000 react to interest rate changes. By analyzing these patterns, investors can craft strategies tailored to both current and anticipated interest rate environments. Whether in a low or high-rate context, these charts help identify potential beneficiaries and underperformers, guiding informed investment decisions.

Exhibit 3: Consumer Staples, Tech, and Financials are Impacted Differently by Interest Rates



Source: Sismo. Ten years monthly correlation to US 10Y Treasury yield on Russell 1000 stocks. Data ending September 10, 2024.

Exhibit 4: The Companies and Sectors in the Russell 1000 Most Influenced by Rates May Present Alpha Opportunities

Top 30 Stocks with Highest Negative Correlation				Top 30 Stocks with Highest Positive Correlation			
Equity Lifestyle Properties - Inc.			-0.4360	Unum Group			0.5546
Sun Communities - Inc.			-0.4296	Lpl Financial Holdings Inc.			0.5237
American Water Works Company ...			-0.4288	Raymond James Financial - Inc.			0.4836
Crown Castle Inc.			-0.4287	Voya Financial - Inc.			0.4769
Agree Realty Corporation			-0.4240	Cullen/frost Bankers - Inc.			0.4696
Eversource Energy			-0.4167	Metlife - Inc.			0.4663
Wec Energy Group - Inc.			-0.4138	Lincoln National Corporation			0.4650
Healthcare Realty Trust Informat...			-0.4116	The Charles Schwab Corporation			0.4628
Duke Energy Corporation			-0.3843	Prudential Financial - Inc.			0.4513
Cms Energy Corporation			-0.3762	Valero Energy Corporation			0.4491
Consolidated Edison - Inc.			-0.3669	Hf Sinclair Corporation			0.4456
The Clorox Company			-0.3659	Conocophillips			0.4408
Nextera Energy - Inc.			-0.3655	Comerica Incorporated			0.4328
American Tower Corporation			-0.3593	Bank Of America Corporation			0.4315
Realty Income Corporation			-0.3544	Wintrust Financial Corporation			0.4219
American Electric Power Compan...			-0.3542	Marathon Petroleum Corporation			0.4185
Cubesmart			-0.3472	Zions Bancorporation - National A...			0.4155
Sba Communications Corporation			-0.3444	Halliburton Company			0.4063
Kimberly-clark Corporation			-0.3426	Marathon Oil Corporation			0.4004
Xcel Energy Inc.			-0.3398	East West Bancorp - Inc.			0.3973
Ameren Corporation			-0.3368	Eog Resources - Inc.			0.3946
Alliant Energy Corporation			-0.3352	Ovintiv Inc. [NP]			0.3935
W. P. Carey Inc.			-0.3349	Jpmorgan Chase & Co.			0.3909
Mid-america Apartment Communit...			-0.3299	Fifth Third Bancorp			0.3907
Mccormick & Company - Incorpor...			-0.3248	Reinsurance Group Of America - I...			0.3849
Equinix - Inc.			-0.3208	Huntington Bancshares Incorporated			0.3844
Church & Dwight Co. - Inc.			-0.3181	M&t Bank Corporation			0.3836
Pinnacle West Capital Corporation			-0.3132	Webster Financial Corporation			0.3802
Nisource Inc.			-0.3116	Stifel Financial Corp.			0.3751
Equifax Inc.			-0.3112	Wells Fargo & Company			0.3725

Source: Sismo. Ten years monthly correlation to US 10Y Treasury Yield on Russell 1000 stocks. Data ending September 10, 2024.

Alpha In Relation to Diversification

To deepen the analysis of interest rate impacts on stocks and sectors, Exhibit 5 offers a visual representation of the relationship between the 10-year correlation to the U.S. 10-year Treasury yield (x-axis) and the 10-year total return of stocks (y-axis). Each column represents a quartile of stocks grouped by their correlation with the Treasury yield, with lower correlations on the left and higher correlations on the right. The top arrow indicates the correlation scale, ranging from negative correlation on the left (-0.4360) to positive correlation on the right (+0.5546). The y-axis shows total stock returns, with higher returns at the bottom (up to +22,960%) and lower or negative returns at the top (-98.9%). A color gradient visually enhances the data, where red indicates poor relative performance and green highlights stronger returns.

The chart's first column, representing stocks with the lowest correlation to the 10-year Treasury yield, offers insight into how certain sectors have outperformed in a falling-rate environment. Sectors such as real estate, utilities, and household & personal products dominate this group. These sectors typically thrive in environments where interest rates are falling, as lower rates reduce borrowing costs, making capital-intensive sectors like real estate and utilities more profitable. Despite their low correlation to interest rates, these sectors have struggled during periods of rising rates over the past 10 years, as seen in the red shading indicating weaker performance. In contrast, when rates fall, these sectors benefit from lower financing costs, providing greater stability and stronger returns for dividend-oriented business models, especially in real estate and utilities.

In the second column, which includes nearly uncorrelated stocks to the Treasury yield, defensive sectors such as healthcare, food & drug retail, and cyclical consumer goods have performed relatively better in environments of falling rates. Although returns in these sectors remain subdued, as indicated by the lighter red shading, they are generally more resilient to economic downturns and falling rates. Healthcare, in particular, tends to benefit from reduced financing costs in a low-rate environment, while demand for essential products in food retail and consumer goods remains stable, providing modest improvements over other sectors.

In the third column, which features stocks with slightly positive correlations to interest rates, we see a shift toward neutral returns. Sectors such as consumer discretionary, industrials, and technology (hardware) demonstrate resilience during both rising and falling rate environments. Although they exhibit some sensitivity to rate changes, they tend to maintain more consistent performance due to their diversified revenue streams. Consumer discretionary stocks, in particular, benefit when falling rates increase consumer spending power, and technology companies, driven by innovation, can capitalize on lower borrowing costs to fuel growth.

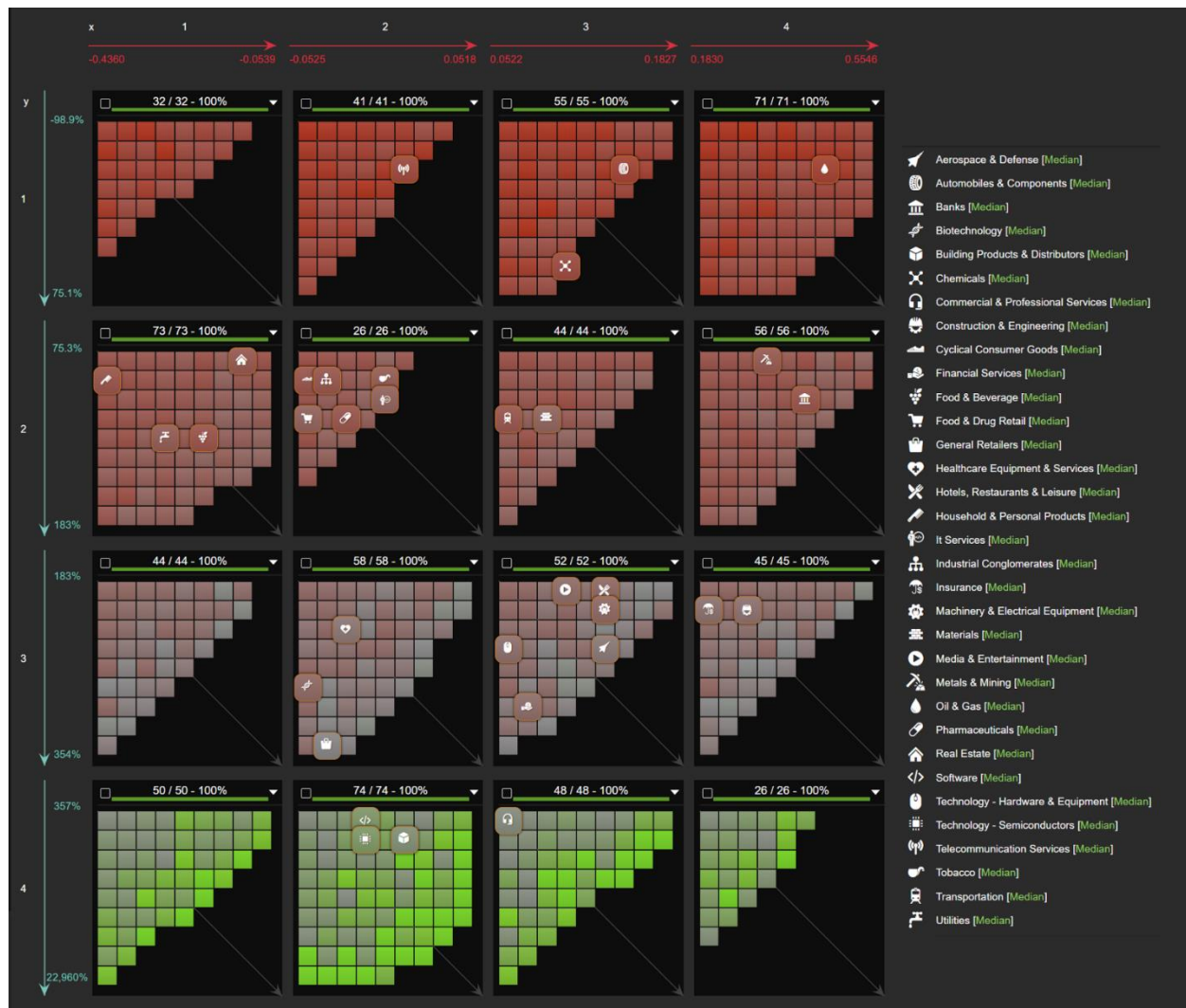
On the far-right, in the fourth column representing stocks with the highest positive correlations to interest rates, sectors such as financials, construction & engineering, and energy have experienced strong performance during rising-rate periods. However, in falling-rate environments, these sectors may face challenges. Financials, which typically rely on interest rate spreads to boost profitability, see their margins narrow when rates decline. Energy companies, often tied to economic growth and inflation, also experience reduced demand and profitability in periods of falling rates, as economic growth slows.

Exhibit 5 underscores that sectors with low or negative correlations to interest rates—such as real estate, utilities, and consumer staples—tend to perform well in a falling-rate environment, even though their ten-year returns are below the median. These sectors, reliant on stable cash flows and debt-financed growth, benefit greatly when borrowing costs decrease. Utilities and real estate, which depend heavily on debt financing, become more attractive as lower rates make their dividends more appealing compared to bonds. Additionally, sectors like consumer staples maintain strong demand for essential products, providing stability when economic conditions weaken and rates decline.

On the other hand, growth-oriented sectors such as technology and consumer discretionary have shown consistent performance across rate cycles, thriving both in falling-rate environments and in periods of economic expansion. Despite their lower correlation to interest rates, these sectors generate high returns through innovation and consumer demand, which can be further fueled by low borrowing costs when rates are cut.

Overall, this analysis highlights the importance of understanding sector sensitivity in a falling-rate environment. Stocks with low or negative correlations to interest rates, particularly in sectors like real estate, utilities, and household products, have outperformed when rates decrease, benefiting from lower financing costs and stable demand. Financials, energy, and industrials, which are more closely tied to interest rate cycles, have seen strong returns in rising-rate environments but may struggle when rates decline. The software and semiconductor sectors stand as exceptions, continuing to outperform despite low correlation to interest rates, underscoring the capacity for growth and innovation sectors to excel regardless of macroeconomic conditions. Investors can use these insights to position portfolios strategically in response to anticipated rate cuts or other changes in the interest rate environment.

Exhibit 5: Divergent Performance Across Russell 1000 Constituents Based on Interest Rate Sensitivity



Source: Sismo. From left to right, the chart displays the 10-year monthly correlation to the 10-year Treasury yield (with the top arrow indicating the scale, and each column representing a quartile). From top to bottom, it shows the 10-year total return of stocks (with the scale on the left). The same return data is also visually represented through a color gradient, centered on the average. Data ending September 10, 2024.

Explanatory Power of Interest Rates on Stocks and Sectors

This next visualization offers a more comprehensive analysis of how stocks and sectors react to interest rates by incorporating both one-factor and two-factor regressions—against interest rates and the broader stock index to account for collinearity. By using this multi-faceted approach, we gain deeper insights into how interest rate movements influence stock performance. It allows us to distinguish stocks positively influenced by rising rates, such as banks, from those negatively impacted, like those in the real estate sector. Furthermore, it highlights sectors that benefit from falling rates, such as utilities and consumer staples, which tend to outperform as borrowing costs decrease. By examining where correlation, one-factor, and two-

factor regression results intersect, we can better grasp the impact of interest rate fluctuations on specific stocks and sectors.

Exhibit 6 illustrates how stocks and sectors respond to changes in the U.S. 10-Year Treasury yield using three key indicators: correlation, single-factor beta, and two-factor beta (with the Russell 1000 index). This alignment across metrics shows that sectors like utilities, real estate, and consumer staples are positioned to thrive in a falling-rate environment, while financials, particularly banks (highlighted in white), are more likely to face challenges when rates decrease. The convergence of these indicators underscores the importance of understanding how sectors react to falling interest rates, especially those reliant on debt financing or stable, dividend-focused returns.

In this chart, stocks on the left side have negative correlations to the U.S. 10-Year Treasury yield, indicating they are likely to benefit from falling rates. Stocks on the right show positive correlations, meaning they perform better when rates rise. The first column on the left highlights stocks that tend to outperform in falling-rate environments, especially those at the top of the chart, where a combination of negative correlation and negative beta suggests these stocks move inversely to interest rate changes. This is particularly evident in sectors like utilities, real estate, and consumer staples, which thrive when rates decline due to their dependence on lower borrowing costs and stable demand. The red shading in the first column indicates a negative beta with the U.S. 10-Year Treasury yield in a 2-factor regression, which differentiates index movements from changes in interest rates to avoid collinearities. The convergence of results across the three metrics strengthens the analysis.

The y-axis represents the beta of stocks to the U.S. 10-Year Treasury yield. Stocks higher on the chart have negative beta, meaning they tend to outperform when rates fall, as their movement is inversely related to interest rate changes. Conversely, stocks lower on the chart, with positive beta, are more likely to perform well when rates rise. Stocks concentrated in the top-left quadrant, with negative correlation and negative beta, are best positioned to benefit from falling rates. These stocks—often in the utilities and real estate sectors—gain from lower borrowing costs, allowing for greater profitability and more attractive dividend yields relative to bonds.

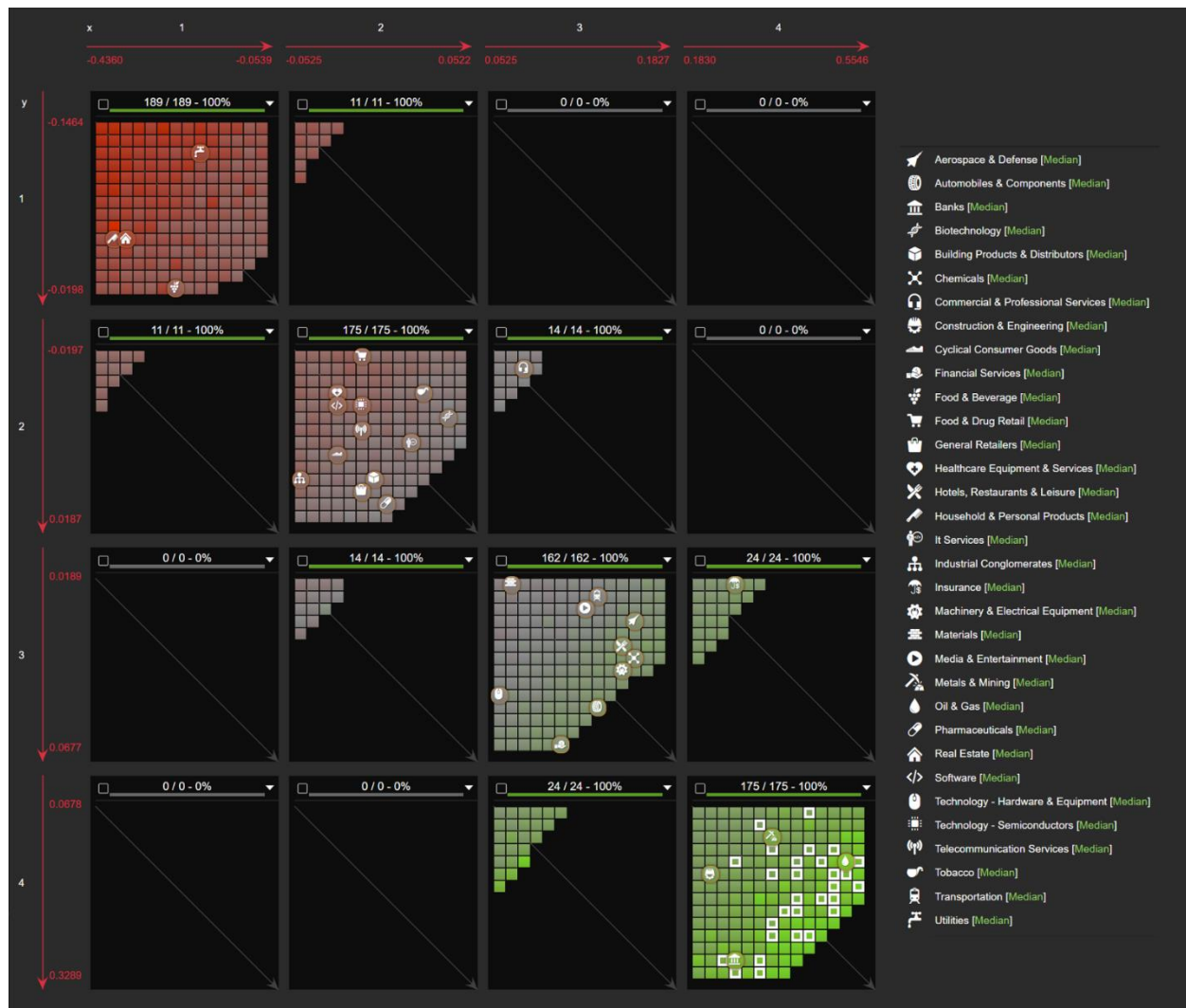
The color gradient, ranging from red (weaker performance) to green (stronger performance), reflects the 10-year weekly beta in a two-factor regression model that includes both the Treasury yield and the Russell 1000 index. Stocks shaded in green, predominantly on the right side of the chart, have benefited more from rising rates, while those shaded in red, predominantly on the left side, have outperformed during periods of falling rates. Sectors such as utilities, real estate, and consumer staples are highlighted here as key beneficiaries of declining interest rates. These sectors rely on lower borrowing costs to fuel growth, particularly in capital-intensive industries like real estate and infrastructure-heavy sectors like utilities.

While financials and banks typically benefit from rising rates, they face challenges when rates fall. In a falling-rate environment, banks experience narrower spreads between borrowing and lending rates, which can compress profitability. The green shading for banks in the bottom-right quadrant shows that they tend to perform well during rising-rate periods, but may struggle to

maintain this performance when rates drop. As such, falling rates create headwinds for the financial sector, which depends on higher rates to drive lending profitability.

Overall, Exhibit 6 highlights that stocks with strong negative correlations and beta values, particularly those in the top-left quadrant, tend to outperform in a falling-rate environment. Sectors such as utilities, real estate, and consumer staples are poised to benefit from reduced borrowing costs, improving their capacity to finance projects and maintain higher dividends. In contrast, sectors in the bottom-right quadrant, particularly banks and financials, typically underperform when rates fall, as lower rates compress profit margins and reduce incentives for lending. By considering multiple factors, including correlation, single-factor regression, and two-factor regression, investors can better assess how different stocks and sectors are likely to respond to interest rate changes, particularly during periods of declining yields.

Exhibit 6: Interest Rates Impact on Stocks Based on Mix of Correlation, One-Factor, And Two-Factor Regression Results



Source: Sismo. From left to right, the chart displays the 10-year monthly correlation to the 10-year Treasury yield (with the top arrow indicating the scale, and each column representing a quartile). From top to bottom, it shows the 10-year monthly single beta with the 10-year Treasury yield. From red to green, it shows the 10-year monthly beta with the 10-year Treasury yield in a 2-factor regression that includes the Russell 1000 Index. Banks are highlighted with a white frame. Data ending September 10, 2024.

Bank Stocks Beta to Interest Rates Over Time

Given the sensitivity of banks to interest rates, a deeper analysis is necessary to better understand the associated risks and changes over time. Exhibit 7 visualizes the 10-year rolling monthly beta of a sample of large U.S. banks, calculated through a two-factor regression model. This compares their stock performance against the U.S. 10-Year Treasury yield and the Russell 1000 index, allowing for a clearer picture of how sensitive each bank's stock is to changes in interest rates while controlling for broader market movements.

The chart covers significant economic periods such as the aftermath of the Subprime Crisis, the COVID-19 pandemic, and the subsequent recovery period, followed by the inflationary pressures and rate hikes initiated by the Federal Reserve. The bump observed between September 2018 and April 2019 reflects the distortion caused by the Subprime Crisis ten years earlier, influencing the beta values due to the ripple effects on correlation during that time. The unusually low correlation of banks to interest rates up to this point is driven by these lagging effects. After April 2019, when the peak of the subprime crisis was no more in the 10-year rolling period, a clearer picture of banks' sensitivity to interest rates emerged.

As of September 10, 2024, U.S. Bancorp (teal line) has the lowest beta at 0.0623, reflecting its lower sensitivity to interest rates due to its smaller exposure to lending margins compared to larger banks. Citigroup (dark blue line) follows with a beta of 0.0829, with its global exposure and diversified revenue streams tempering its sensitivity to U.S. rate changes. The PNC Financial Services Group (orange line) has a beta of 0.0939, showing moderate sensitivity due to its more regionally focused operations. JPMorgan Chase & Co. (red line) has a beta of 0.0994, reflecting its significant sensitivity to rate changes driven by its broad exposure to lending and financial services. Wells Fargo (white line) exhibits a beta of 0.1175, driven by its reliance on domestic lending markets, making it more sensitive to U.S. interest rate movements. Lastly, Bank of America (green line) has the highest beta at 0.1426, reflecting its substantial exposure to U.S. lending markets and its heightened sensitivity to interest rate fluctuations.

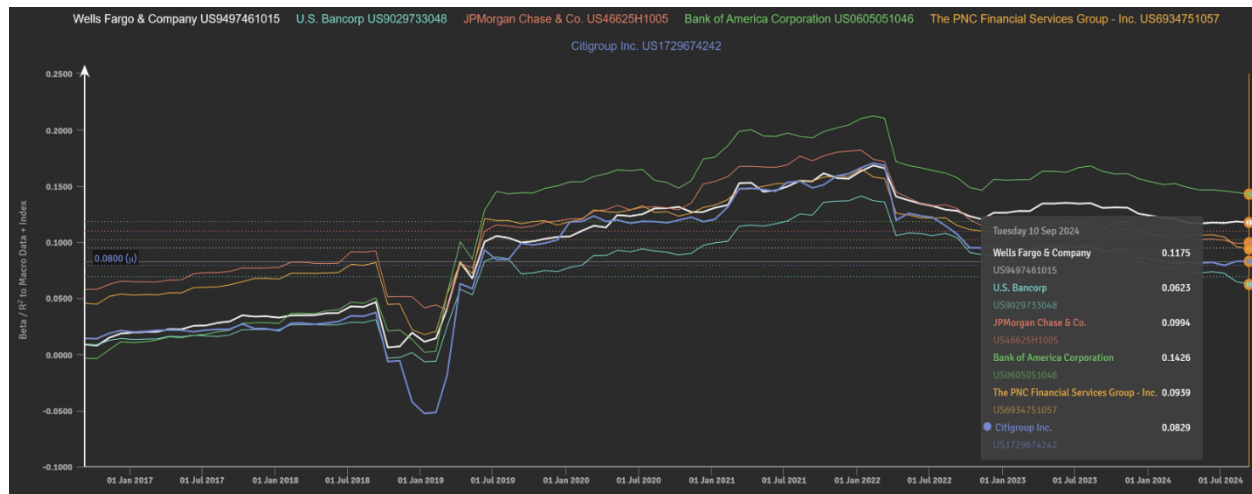
The chart demonstrates that all banks in the sample currently have positive beta values relative to the 10-Year Treasury yield, meaning their stock prices tend to rise as interest rates increase. This reflects how banks benefit from rising rates, which typically expand their net interest margins (the difference between what they earn on loans and what they pay on deposits).

From late 2020 to early 2021, there was a peak in beta values, aligning with the sharp economic recovery and rising bond yields as markets anticipated post-pandemic growth and inflationary pressures. This period also saw increased expectations for rate hikes as the Federal Reserve signaled tightening monetary policy. However, by mid-2022, beta values for most banks began to trend downward, likely reflecting the market's adaptation to the higher-rate environment and the Federal Reserve's aggressive rate hikes to curb inflation.

The clustering of beta values between 0.06 and 0.14 suggests that while these banks are sensitive to interest rate changes, they are also significantly influenced by broader economic factors represented by the Russell 1000 index. The two-factor regression helps isolate the effect of interest rates, but overall market conditions still play a crucial role in bank stock performance.

For investors, it is essential to recognize that large banks like JPMorgan Chase, Bank of America, and Wells Fargo are closely linked to interest rate movements, and their stocks tend to perform well in rising-rate environments. The beta values suggest that JPMorgan Chase and Bank of America are particularly sensitive to rate changes, offering greater upside or downside potential depending on the direction of interest rates. In contrast, U.S. Bancorp exhibits more moderate sensitivity, making it less volatile in response to interest rate movements.

Exhibit 7: Bank Stock Sensitivity to Interest Rates Change Through Time and Economic Conditions



Source: Sismo. Rolling 10-year monthly beta against the US 10-year yield, based on two-factor regressions including the Russell 1000 index. The sample consists of large U.S. banks.

Enhancing Analysis for Interest Rate Sensitive Sectors

A deeper analysis of the statistical relationship between interest rates and sector performance, using R-squared to assess the goodness of fit of regression models and delta R-squared to evaluate the additional variance explained by adding interest rates to the market index in a two-factor regression, reveals key insights into sectors most vulnerable to rate changes. Incorporating the 10-year Treasury yield significantly enhances the explained variance for interest rate-sensitive sectors like banking and real estate.

While rising interest rates positively impact the banking sector, they have a negative effect on real estate. Falling rates, on the other hand, tend to support real estate by reducing borrowing costs and easing access to capital, making real estate stocks more attractive. Conversely, banks benefit from rising rates due to higher loan spreads, but may experience compressed profit margins when rates decline. These dynamics underscore the importance of tailoring sector-specific strategies based on the interest rate environment.

The real estate sector is particularly sensitive to changes in rates, with higher rates often presenting a significant hurdle. As reflected in Exhibit 8, real estate exhibits negative beta values (-0.0646 in the one-factor regression and -0.0818 in the two-factor regression), signaling that when interest rates fall, real estate becomes more favorable for investment. Lower rates reduce financing costs, making it easier to fund new projects and refinance debt, which in turn stimulates growth in the sector.

On the other hand, banks are shown to significantly benefit from rising interest rates, as evidenced by their relatively high R-squared values and positive delta R-squared. Banks display a positive correlation with interest rates (0.3577), and their beta values remain positive (0.1348 in the one-factor regression and 0.1175 in the two-factor regression). This positive beta reflects the expansion of banks' net interest margins, as they can charge higher interest on loans relative to

their borrowing costs, boosting profitability. The improvement in R-squared after adding interest rates indicates that a large portion of the variance in bank stock prices can be attributed to rate movements, which are crucial to bank performance. However, when rates fall, banks face tighter margins, potentially constraining profitability. Historically, banks have mitigated this by exploring alternative revenue streams or increasing lending volumes to offset the impact of lower rates.

In summary, Exhibit 8 demonstrates that incorporating the 10-year Treasury yield into two-factor regressions significantly enhances the ability to explain stock performance variance. This approach proves particularly effective in sectors like banking and real estate, which experience contrasting pressures: banks benefit from expanding net interest margins when rates rise, while real estate benefits from lower borrowing costs when rates decline. Additionally, this method is valuable for analyzing other rate-sensitive sectors, such as utilities and household & personal products. Investors should take these sector dynamics into account when developing allocation strategies, especially in environments where interest rates are expected to fluctuate or remain elevated.

Exhibit 8: Significantly Enhanced Explained Variance for Banking and Real Estate

Name	▲ ▲	Score	▼	10Y Monthly Correlation →	10Y Monthly Beta (1-Fact) →	10Y Monthly Beta (2-Fact) →	R ² (2-Fact) →	ΔR ² (2-Fact vs. Mkt Beta) →
Banks [Median]			47	0.3577	0.1348	0.1175	0.4013	0.0950
Oil & Gas [Median]			43	0.3013	0.1755	0.1582	0.2324	0.0698
Construction & Engineering [Median]			38	0.2186	0.0846	0.0680	0.2881	0.0289
Financial Services [Median]			38	0.1699	0.0587	0.0375	0.4242	0.0232
Metals & Mining [Median]			37	0.2009	0.1154	0.0946	0.2369	0.0339
Machinery & Electrical Equipment ...			36	0.1710	0.0536	0.0373	0.3648	0.0161
Automobiles & Components [Medi...			36	0.1594	0.0640	0.0428	0.3296	0.0135
Chemicals [Median]			36	0.1663	0.0550	0.0367	0.3295	0.0314
Insurance [Median]			35	0.1946	0.0557	0.0431	0.2711	0.0288
Hotels, Restaurants & Leisure [Me...			31	0.1388	0.0549	0.0390	0.2753	0.0124
Aerospace & Defense [Median]			31	0.1411	0.0519	0.0370	0.2860	0.0113
Media & Entertainment [Median]			29	0.0920	0.0300	0.0124	0.3339	0.0073
Transportation [Median]			29	0.0874	0.0310	0.0124	0.2810	0.0158
Technology - Hardware & Equipm...			28	0.0915	0.0331	0.0149	0.3439	0.0022
Commercial & Professional Servic...			27	0.0562	0.0182	-0.0001	0.3234	0.0058
Materials [Median]			25	0.0607	0.0190	0.0035	0.2830	0.0017
Building Products & Distributors [...]			25	0.0301	0.0097	-0.0069	0.3165	0.0065
Industrial Conglomerates [Median]			24	-0.0104	-0.0059	-0.0200	0.3397	0.0118
IT Services [Median]			24	0.0323	0.0096	-0.0057	0.2783	0.0052
Software [Median]			24	-0.0306	-0.0105	-0.0313	0.3600	0.0108
Technology - Semiconductors [Me...			22	-0.0140	-0.0082	-0.0314	0.3503	0.0059
General Retailers [Median]			22	0.0274	0.0104	-0.0038	0.2287	0.0035
Pharmaceuticals [Median]			21	0.0445	0.0146	0.0027	0.1394	0.0058
Tobacco [Median]			20	0.0115	0.0016	-0.0069	0.1378	0.0095
Real Estate [Median]			19	-0.2099	-0.0646	-0.0818	0.3260	0.0646
Healthcare Equipment & Services ...			19	-0.0358	-0.0129	-0.0278	0.2528	0.0141
Biotechnology [Median]			19	0.0241	0.0146	-0.0006	0.0890	0.0028
Household & Personal Products [...]			19	-0.2913	-0.0589	-0.0690	0.2440	0.1122
Cyclical Consumer Goods [Median]			19	-0.0028	-0.0014	-0.0176	0.2456	0.0044
Utilities [Median]			17	-0.2641	-0.0631	-0.0711	0.2312	0.0889
Telecommunication Services [Med...			16	-0.0055	-0.0019	-0.0171	0.1230	0.0026
Food & Beverage [Median]			15	-0.0793	-0.0324	-0.0392	0.1177	0.0237
Food & Drug Retail [Median]			15	-0.0360	-0.0143	-0.0262	0.0948	0.0057

Source: Sismo. Correlations and betas against the US 10-year yield, based on one-factor and two-factor regressions including the Russell 1000 index. R² relates to the 2-factor regression. ΔR² indicates the additional variance that introducing interest rate brings in comparison to a simple market beta vs. Russell 1000 with the same frequency and period (10-year monthly).

Current Correlation to Rates Is Heightened for Some Stocks and Sectors

While correlation provides insight into how interest rates impact stocks, visualizing how these relationships evolve over time offers even more valuable perspective. Some stocks with low correlation to interest rates in 2018 saw their correlation increase sharply by 2021, continuing to rise through 2024. This shift is critical for portfolio risk management, as these stocks may lose their value as diversifiers and increase overall portfolio risk as their sensitivity to interest rates

grows. Conversely, some stocks that initially had higher correlation saw it decrease over time, making them more effective diversifiers.

Exhibit 9 provides a detailed comparison of stock and sector correlation with the U.S. 10-year Treasury yields across three timeframes. The x-axis represents correlations ending in 2018, while the y-axis reflects correlations ending in 2021. The color gradient, shifting from red (negative) to green (positive), represents the most recent 10-year correlation ending in 2024, showcasing the evolving relationship between sectors and interest rates.

A noteworthy group of stocks, represented by green squares in the upper-left quadrant of Exhibit 9, maintained low correlations from 2018 to 2021 but began showing rising correlations as 2024 approached. These shifts suggest emerging risks related to interest rate movements, which could create unintended exposures if not properly managed. This rising sensitivity, depicted by the shift from red to green in the chart, signals that certain sectors or stocks may become more vulnerable to interest rate fluctuations.

Between 2021 and 2024, a noticeable shift toward green shading occurs, reflecting changing dynamics as the Federal Reserve raised interest rates to combat inflation. Sectors like financials, energy, and industrials have increasingly aligned with rising interest rates, benefiting from economic conditions associated with higher yields. The gradual transition from red to green in these sectors indicates their growing correlation with interest rates. For example, financials benefit from expanding net interest margins as rates rise, while energy companies typically experience increased demand during periods of economic growth, often accompanied by rising rates.

In contrast, sectors such as real estate and utilities, which remain shaded in red, continue to struggle in rising-rate environments. These sectors, seen in the top-left quadrant, are vulnerable to higher borrowing costs and face competition from higher-yielding bonds, which reduce the appeal of their traditionally attractive dividend yields. The persistent red shading through 2024 underscores their negative correlation with interest rates. As rates rise, real estate and utilities face mounting challenges—from higher financing costs to reduced investor interest as bond yields become more competitive.

Real estate, utilities, and consumer staples, which consistently exhibit negative correlations with the 10-year Treasury yield from 2018 to 2021, are clearly highlighted in the top-left quadrant. The continued red shading into 2024 suggests these sectors remain negatively correlated with rising rates, as expected due to their sensitivity to borrowing costs and reliance on fixed-income-like dividend structures. As interest rates increase, these sectors encounter significant headwinds, from higher borrowing costs to less attractive dividends relative to rising bond yields.

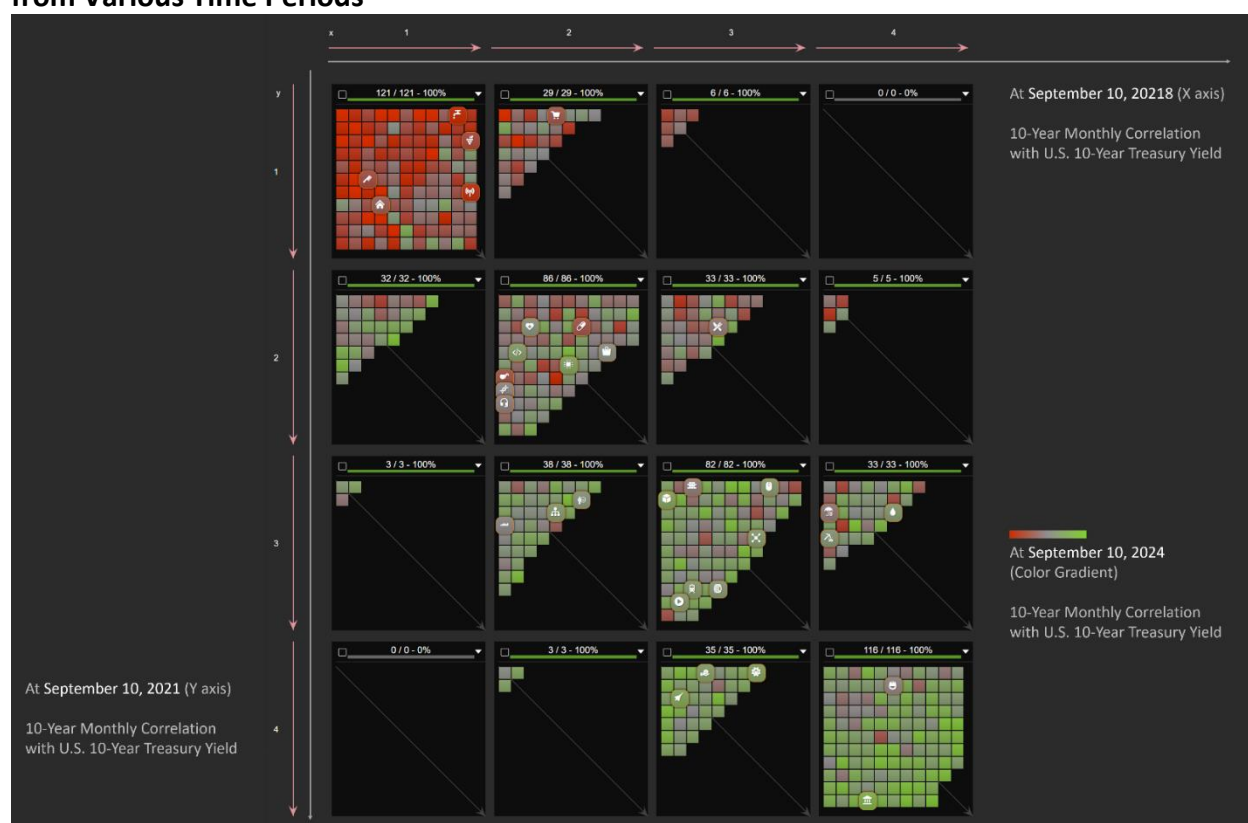
Sectors such as industrials, healthcare, and consumer discretionary, positioned more centrally in the chart, show a mixed correlation with interest rates, transitioning from red to green over time. This blend of green and red shading suggests that their sensitivity to interest rates has fluctuated depending on broader economic conditions, inflation, and monetary policy. Some sectors that had negative correlations with rates in 2018 and 2021 shifted toward more positive correlations

by 2024, indicating that these industries have adapted to higher rates, likely through better pricing power or improved capital management strategies.

Sectors like financials, energy, and materials, located in the bottom-right quadrants, demonstrate consistently positive correlations with the 10-year Treasury yield, particularly in the period ending in 2024. The increasing green shading over time highlights how these sectors have become more aligned with rising rates. Financials benefit from rising interest rates as they enhance loan spread margins, while energy and materials sectors thrive during economic expansion, which tends to accelerate in higher-rate environments.

Exhibit 9 vividly illustrates the evolving correlations between sectors and the U.S. 10-year Treasury yield across three periods: 2018, 2021, and 2024. Defensive sectors like real estate and utilities have continued to struggle in rising-rate environments, as indicated by persistent red shading. In contrast, growth-sensitive sectors like financials, energy, and industrials have shown increasing positive correlations, particularly in recent years. The transition from red to green in several sectors underscores how some industries have adapted to higher interest rates, while others remain highly sensitive to fluctuations. Investors can leverage these insights to adjust sector allocations and manage risk exposure based on expected interest rate movements.

Exhibit 9: Managing Risk by Evaluating 10-Year Correlations of Stocks and Sectors to Rates from Various Time Periods



Source: Sismo. 10-year monthly correlation Russell 1000s stocks, ending at 10 Sept. 2018 (left to right), (ii) 10 Sept. 2021 (top to bottom) and (iii) 10 Sept. 2024 (red to green)

Event Impact on Sector Risk

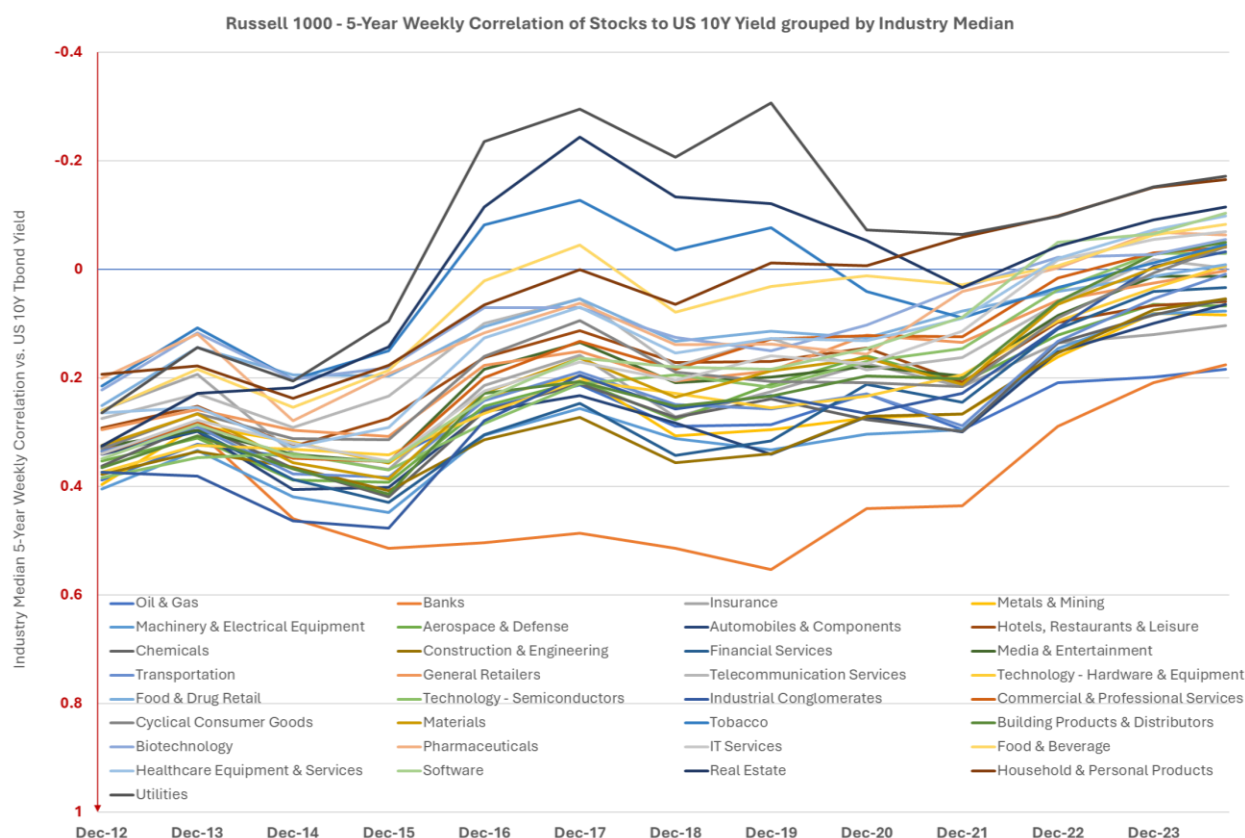
It's important to note that when examining beta relative to interest rates—whether through a 1-factor regression or a 2-factor regression with the market index—the relative positioning of industries remains quite similar to the results seen in the correlation analysis. Sismo's Exhibit 10 explores this dynamic further by using 5-year correlations at the end of each year since 2012, capturing the period following the subprime crisis.

During and immediately after the subprime crisis, equities moved in tandem with interest rates. Rates reached their lowest point in December 2008, while U.S. markets bottomed out in February 2009. Consequently, the 5-year correlation between equities and yields was broadly positive across all industries, with little distinction between sectors.

It wasn't until the 2011-2016 period that we began to see a more typical correlation spectrum, with greater differentiation between industries. During this time, Utilities and Real Estate displayed negative correlations with interest rates, while Banks showed a strongly positive correlation.

Over the last decade, U.S. stocks have become less correlated with interest rates than in previous periods. Several factors may account for this shift, including the globalization of earnings, which means U.S. companies now derive a significant portion of their revenue from overseas markets, reducing the impact of domestic interest rates. Additionally, the rise in share buybacks, quantitative easing (QE), and other accommodative monetary policies have driven interest rates so low that small increases no longer have the same shock effect. Changing investor behavior, with a growing emphasis on long-term equity allocations, also plays a significant role in reducing the immediate impact of rate fluctuations.

Exhibit 10: Industry Median Correlation to Interest Rates Changes Through Time



Source: Sismo

Identifying Industries for Alpha Opportunities

To better understand the relative positioning of industries in terms of correlation, we can detrend the chart by converting each industry's time series observations into a standard deviation distance from the mean at each point in time. Exhibit 11 applies this and highlights only industries with a significant deviation (either below or above 0.85 standard deviations from the mean of all industries).

Among the most negatively correlated, as expected, are the more defensive sectors like Utilities and Real Estate, whose high debt levels make them directly negatively correlated with interest rates. Utilities are capital-intensive, requiring substantial borrowing for infrastructure projects. Rising rates increase borrowing costs, directly impacting their profitability. Real Estate follows a similar logic, where higher interest rates increase mortgage and refinancing costs, making it more expensive for consumers and businesses to buy or invest in property. Additionally, higher bond yields make real estate investments less attractive relative to fixed-income alternatives. Also, Household & Personal Products and Food & Beverage sectors are reliant on consumer discretionary spending, so tend to suffer as rising rates reduce disposable income and spending

power. Additionally, they are often seen as safer dividend-paying stocks, which become less (more) appealing when bond yields rise (fall).

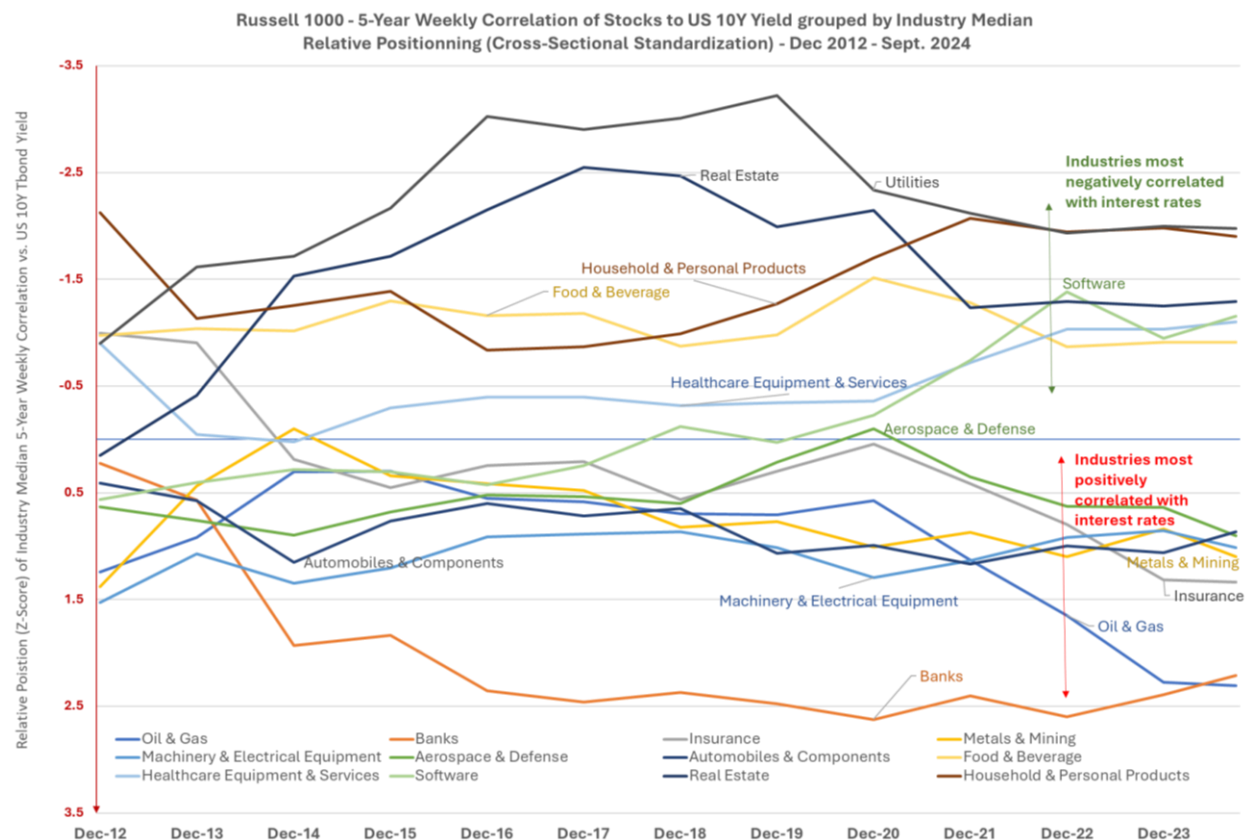
On the other hand, industries that are most consistently positively correlated with interest rates like Banks, Oil & Gas, and Metals & Mining are confirmed through the analysis. As discussed earlier, rising interest rates are beneficial for these sectors. Banks typically benefit from wider net interest margins when rates increase since they can charge more on loans relative to what they pay on deposits, enhancing profitability. Oil & Gas benefits from higher rates as demand for energy grows in periods of expansion, and rising rates often signal stronger economic activity, which typically leads to increased energy consumption. Metals & Mining along with commodity prices in general tends to perform well when economic activity is strong, often in tandem with rising rates, as demand increases for materials during growth periods.

A key observation from this chart is how some sectors transitioned over time from positive to more negative correlations with interest rates. Healthcare Equipment & Services, defensive in nature, shows signs of moderating correlation with interest rates. This could be due to increasing global healthcare demand, even in higher-rate environments, as well as improvements in cost structures for healthcare companies.

Interestingly, the software sector—typically categorized as growth stocks—shows increasingly negative correlation with interest rates, similar to defensive sectors. This could be due to the sector's sensitivity to interest rates in discounted cash flow (DCF) valuations. As rates fall, the present value of future cash flows increases, impacting stock prices. This sector's heavy reliance on future growth makes it attractive in falling-rate environments.

The cross-sectional standardization illustrated in Exhibit 11 effectively highlights how various industry relationships with rates change through time. Sectors like Utilities and Real Estate, which are the most negatively correlated, lag in periods of rising interest rates, solidifying their roles as defensive investments. Conversely, sectors such as Banks and Oil & Gas, which exhibit positive correlations, benefit from the economic upturns associated with higher rates. Post-pandemic observations reveal that sectors like Healthcare Equipment & Services have shifted towards more neutral correlations with interest rates, likely influenced by shifts in economic recovery dynamics, government spending priorities, and sustained demand for healthcare services. This nuanced understanding may help investors in adjusting their strategies based on sector-specific responses to changes in interest rates.

Exhibit 11: Industries Most Positively and Negatively Correlated with Rates



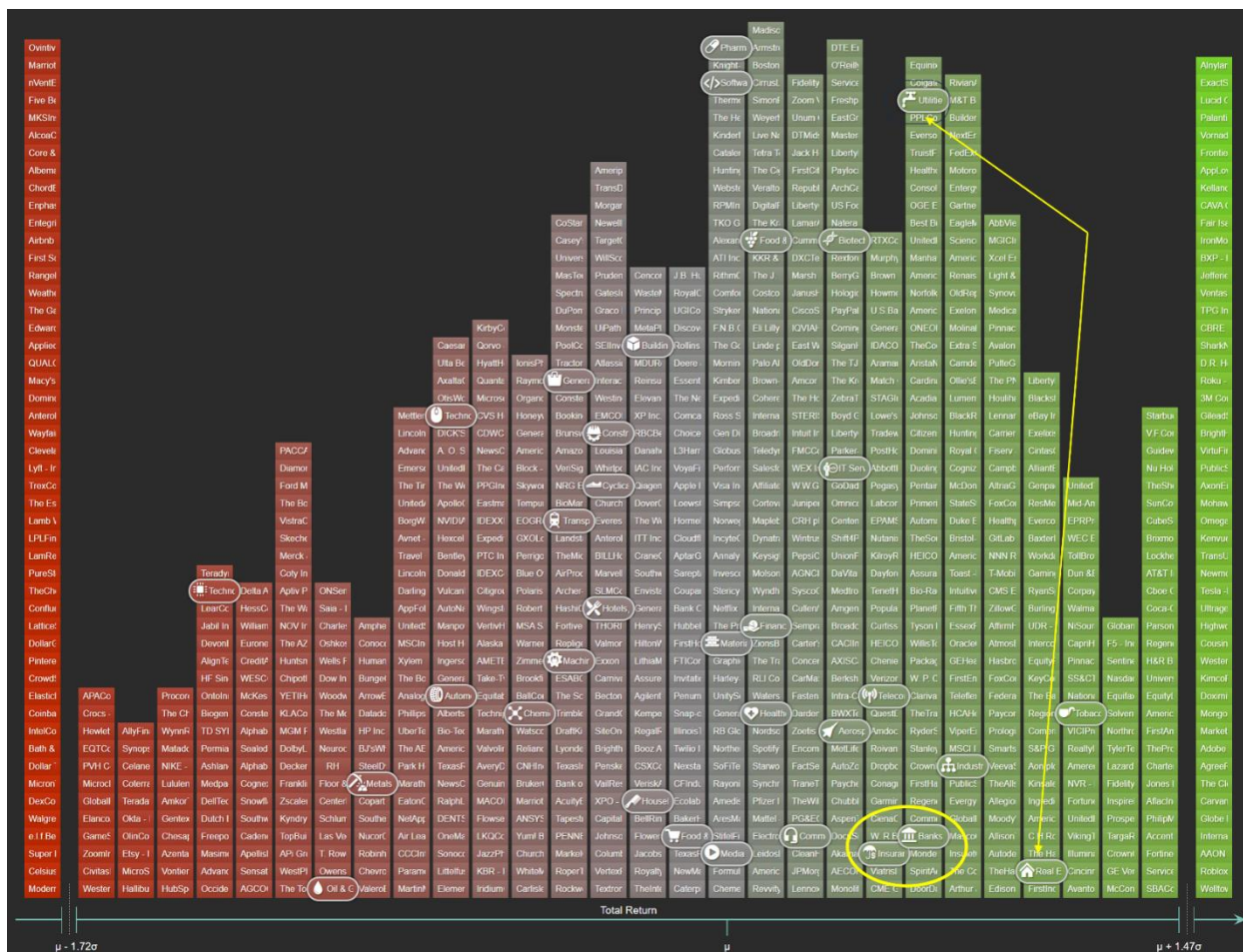
Source: Sismo

Recent Return Distribution of Stocks and Sector Show Rate Uncertainty

Now, based on the distribution of 3-month total returns for stocks in the Russell 1000 shown in Exhibit 12 at September 10, 2024, it appears the market has shown demand for the defensive sectors with Real Estate and Utilities ranking among the top-performing sectors. However, Banks and Insurance stocks have also performed well, possibly suggesting ongoing uncertainty about the pace of interest rate cuts. Investors may be pricing in continued profitability for banks and insurance companies, who could still benefit from relatively higher rates in the short term, especially if rate cuts are gradual.

The broader distribution of returns demonstrates a mixed market environment, where defensive plays have already been reflected in price action, and sectors tied to economic cycles or interest rate sensitivity, like Banks and Insurance, are showing resilience. This mix suggests that investors are navigating an unclear interest rate outlook, balancing between potential rate cuts and the ongoing performance of interest-rate-sensitive sectors.

Exhibit 12: Strong Short-Term Performance Across Sectors Show Rate Cut Uncertainty



Source: Sismo

Conclusion

As markets continue to adapt to changing interest rate environments and macroeconomic shifts, understanding sector-specific and stock sensitivities is crucial. The visualizations and data provided through tools like Sismo enable investors to gain clearer insights into how sectors and individual stocks respond to interest rate changes. Sectors such as Real Estate, Utilities, and Consumer Staples demonstrate clear benefits from falling interest rates, providing opportunities for stability and income generation in low-rate environments. Conversely, sectors such as Financials and Energy, which thrive in rising-rate conditions, offer potential for growth during periods of economic expansion.

By leveraging these insights, investors can strategically allocate portfolios to optimize returns, whether navigating periods of volatility or capitalizing on growth trends. The evolving nature of market conditions, driven by both technological advancements and global economic shifts, underscores the importance of continuous analysis and informed decision-making. Ultimately,

this approach equips investors with the tools to manage risk effectively and uncover alpha opportunities in diverse interest rate environments.

For more information, please visit www.sismo.fr or email contact@sismo.fr