

# Banking on Industry Data

## Navigating the Ebbs and Flows of the Banking Sector

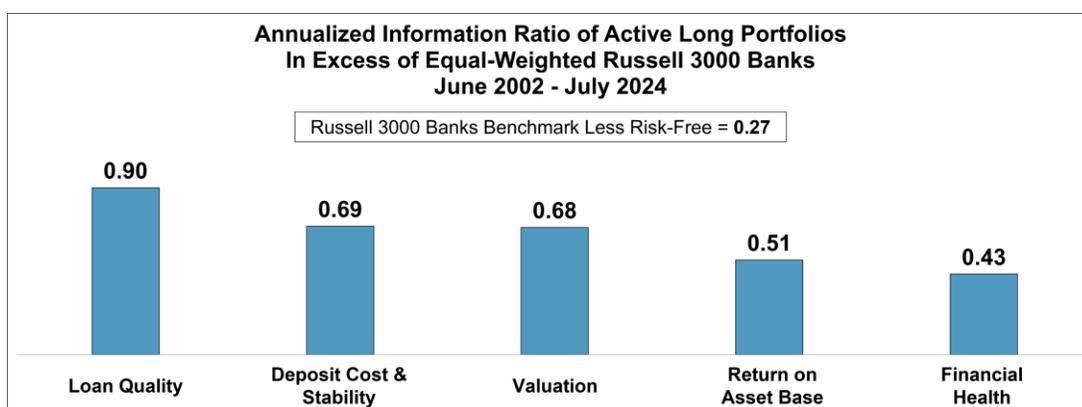
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Over the past two decades, the U.S. banking sector has experienced periods of both exuberance and turbulence, shaped by historic events such as the 2000s housing boom, the subsequent subprime crisis, the passage and eventual easing of Dodd-Frank, regional bank runs, and, more recently, expectations of a more favorable regulatory environment and pro-growth policies. **This publication aims to help investors navigate the sector's ebbs and flows by examining thirty-one stock selection strategies over a 22-year period, offering critical insights into banking characteristics that distinguish winners from losers.**

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Source: S&P Global Market Intelligence Quantitative Research & Solutions. Data as of Oct. 11, 2024.<sup>1</sup>

### Disclaimer

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Key findings for U.S. banks over the past 22 years, starting in June 2002, are:

- **Valuation and Loan Quality Stock Selection Strategies Have Historically Excelled:** U.S. banks trading at lower financial multiples or with higher-quality loan portfolios outperformed their counterparts by 9.6% per year, with an information ratio of 1.04.
- **Deposit Cost & Funding Stability Drove Outperformance for Large U.S. Banks:** Banks with lower deposit costs or more stable and diversified funding outperformed their counterparts by 8.7% per year, with an information ratio of 0.58.
- **Valuation, Loan Quality, Return on Asset Base, and Deposit Cost All Drove Outperformance for Small U.S. Banks:** Buying small banks based on these four financial dimensions outperformed their counterparts by 11.2% per year, with an information ratio of 0.96.
- **Economic and Risk-Adjusted Performance During Bear Markets Outpaced That of Bull Markets:** Valuation and Loan Quality long-short strategies excelled during bull markets, yielding 11.2% per year with an information ratio of 0.96, while defensive strategies in categories such as Return on Asset Base or Financial Strength excelled during bear markets, yielding 28.0% per year with an information ratio of 1.60.

<sup>1</sup> See Appendix A.1.

## 1. Signal Construction and Economic Intuition

This publication explores thirty-one stock selection strategies in the U.S. banking sector using both SNL fundamental and regulatory banking datasets across the following five key dimensions: i) Deposit Cost & Funding Stability ii) Financial Strength iii) Loan Quality iv) Return on Asset Base, and v) Valuation. Definitions, descriptions, and the intuition behind each signal are in Exhibit 1 and Appendix A2-A6.

**Exhibit 1: Signal Categories, Description, & Intuition**

Category (Alphabetical)	Category Description & Intuition	Signal Example
Deposit Cost & Funding Stability	Measures how well banks manage costs, particularly those related to deposits, which directly impact their profitability, as well as the stability and diversity of their deposit base. Banks with lower deposit cost or more stable sources of deposits are expected to outperform.	Core Deposit Mix
Financial Strength & Margin of Safety	Measures banks' financial health in terms of their ability to absorb potential losses in their loan portfolios, as well as assesses the quality of their collateral. Banks with greater financial strength and higher quality collateral are expected to outperform.	Tier 1 Capital Ratio
Loan Quality	Measures the quality and concentration of loans within the overall loan portfolio. Banks with a higher percentage of quality loans in their portfolio or with more diversified types of loans are expected to outperform.	1-Year Ratio Change of Loans Past 30-Day Due to Total Loans
Return on Asset (Equity) Base	Measures how much profit banks generate relative to their asset and equity bases. Banks with a high rate of return on their asset (or equity) base are expected to outperform.	Pre-Provision Profit to Asset Base
Valuation	Measures how much investors are willing to pay for banks' future earnings relative to their financials and peers. Banks trading at lower financial multiples are expected to outperform.	Pre-Provision Net Revenue to Price

Source: S&P Global Market Intelligence Quantitative Research & Solutions.

## 2. Context, Results, and Implications

The U.S. equity market over the past two decades can largely be characterized as a prolonged secular bull market, including the longest bull market in history following the subprime crisis. Valuation strategies tend to perform strongly when the economy, and by extension the banking industry, is healthy and growing. Demand for loans is strong, and balance sheets are healthy, making bank survivability an afterthought. Investors, in turn, focus on banks whose prices are viewed as unjustifiably discounted relative to their financials and peers, or on banks that can provide greater visibility into their future cash flows, thus expanding their financial multiples.

Loan Quality strategies tend to perform strongly as well, as they serve as a precursor, the canary in the coal mine, to whether banks' loan portfolios are healthy and adequately diversified, which directly influence and feed into other financial measures, including valuation.

Between June 2002 and July 2024<sup>2</sup>, Valuation and Loan Quality strategies were the top-performing categories, delivering the largest economic and risk-adjusted returns among the five categories. The *Core EPS-to-Price* long-short strategy performed the best, yielding 9.6% per year with an annualized information ratio of 0.76, while the *One-Year Change in the Percentage of Loans Past 30 Days Due* had the highest risk-adjusted performance, with an information ratio of 1.04 (top rows in Exhibit 2a, 2b).

Notably, the performance of many of these strategies saw meaningful contributions (~50%) from the long side, which is desirable given the impediments associated with shorting. Second, the two categories of strategies were negatively correlated. Investors who combined both sources of outperformance in their portfolios would have achieved higher overall returns at a reduced volatility.<sup>3</sup>

**Exhibit 2a<sup>4</sup>: Valuation Performance Summary**  
**Equal-Weighted Russell 3000 Banks | June 2002 – July 2024**

Signal	Sort Order	Avg Firm Count in Quintile	Average 1-Month IC	Ann. Long/Short Return	Ann. Info Ratio Long/Short	Long-Short Hit Rate	Ann. Long-Only Active Rtrn	Ann. Info Ratio Long-Only	Long-Only Hit Rate
Core EPS / Price	D	51	0.045***	9.61%***	0.76	62.8%***	4.87%***	0.68	62.0%***
Pre-Provision Net Revenue / Price	D	52	0.045***	9.40%***	0.70	65.4%***	3.45%	0.35	58.6%***
Pre-Provision Profit / Price	D	43	0.030***	6.13%***	0.50	59.8%***	4.09%**	0.45	54.1%*
Tangible Book Value / Price	D	44	0.026***	5.31%*	0.36	59.8%***	3.15%	0.32	57.1%**

**Exhibit 2b: Loan Quality Performance Summary**  
**Equal-Weighted Russell 3000 Banks | June 2002 – July 2024**

Signal	Sort Order	Avg Firm Count in Quintile	Average 1-Month IC	Ann. Long/Short Return	Ann. Info Ratio Long/Short	Long-Short Hit Rate	Ann. Long-Only Active Rtrn	Ann. Info Ratio Long-Only	Long-Only Hit Rate
1YChg30DLoanDue/TotLoan	A	42	0.026***	7.21%***	1.04	58.6%***	3.99%***	0.90	57.5%***
1Y Change in Modified Texas Ratio	A	51	0.031***	8.23%***	0.66	56.4%**	3.73%***	0.66	59.0%***
1Y Change in Nonaccrual Loans to Total Assets	A	51	0.024***	6.41%***	0.57	58.6%***	2.08%*	0.37	55.6%**
Loan Loss Indicator	A	44	0.024***	5.83%**	0.56	57.1%**	3.44%***	0.64	56.8%**

\*\*\* Significant at the 1% level; \*\* Significant at the 5% level; \* Significant at the 10% level; 'D' = Descending; 'A' = Ascending. Source: S&P Global Market Intelligence Quantitative Research. Data as of October 11, 2024. For all exhibits, all returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results.

<sup>2</sup> SNL U.S. bank data begins in 1990, offering sufficient cross-sectional coverage for rigorous empirical analysis. In this publication, the results start in June 2002 to ensure that all examined strategies are subjected to the same macro interest rate environments. For results prior to 2002, please see Ning et al. (2017).

<sup>3</sup> The average pairwise inter-category correlation is -0.32 during the sample period.

<sup>4</sup> See Appendix A.8 and A.9 for cap-weighted results for Exhibits 2a and 2b, respectively.

Strategies in the Return on Asset Base, Deposit Cost, and Financial Health categories have also demonstrated the ability to identify outperformers in the past two decades. Their economic and risk-adjusted performances, however, were more muted compared to those in the Valuation and Loan Quality categories (see A.7). As our readers will see in the following sections, these three categories of strategies have been more meaningful drivers of outperformance for larger U.S. banks or during bear markets.

### Drivers of Outperformance for Large and Small Banks<sup>5</sup>

Larger banks benefit from economies of scale and a significant market share. Investor focus is on profitability for these banks and their ability to protect their existing loan markets while opening new ones for growth. Deposit costs are crucial to a bank's profitability because they directly influence the net interest margin, which is the primary way banks generate revenue.<sup>6</sup> Deposit stability and the composition of the deposit base are also important factors. A well-diversified and stable deposit base can reduce reliance on more expensive funding sources, further boosting profitability.

For large U.S. banks, strategies in the Deposit Cost category have been the most meaningful drivers of outperformance. Since 2002, the *loan funding* long-short strategy, which measures the proportion of a bank's loans financed with cheaper liabilities – has yielded 7.2% per year with an information ratio of 0.58 (top row in Exhibit 3).

### Exhibit 3: Deposit Cost & Stability Performance Summary Cap-Weighted<sup>7</sup> Russell 3000 Banks | June 2002 – July 2024

Signal	Sort Order	Avg Firm Count in Quintile	Average 1-Month IC	Ann. Long/Short Return	Ann. Info Ratio Long/Short	Long-Short Hit Rate	Ann. Long-Only Active Return	Ann. Info Ratio Long-Only	Long-Only Hit Rate
Loan Funding	A	43	0.020***	7.19%***	0.58	55.3%**	3.47%**	0.43	58.3%***
Core Deposit Mix	D	43	0.012*	6.71%**	0.52	54.5%*	3.06%	0.35	54.1%*
Deposit Cost	A	43	0.023***	8.73%**	0.49	56.4%**	1.83%	0.24	54.1%*
Time Deposit Mix	D	44	0.017**	5.10%*	0.41	53.4%	1.07%	0.14	50.4%

\*\*\* Significant at the 1% level; \*\* Significant at the 5% level; \* Significant at the 10% level; 'D' = Descending; 'A' = Ascending. Source: S&P Global Market Intelligence Quantitative Research. Data as of October 11, 2024. For all exhibits, all returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results.

<sup>5</sup> There are on average about 40+ banks in the Russell 1000 universe. The publication uses cap-weighted performance as a proxy for large-cap bank performance.

<sup>6</sup> Lending at a higher rate and paying out at a lower rate.

<sup>7</sup> See Appendix A.10 for equal-weighted results.

For small U.S. banks, strategies in the Valuation, Loan Quality, Return on Asset Base, and Deposit Cost categories all have historically driven outperformance. Relative to their larger peers, smaller banks are riskier, have more room to grow, and are less efficiently priced. Improvements across any financial dimensions can lead to outperformance (Exhibit 4).

**Exhibit 4<sup>8</sup>: Performance Summary**  
**Equal-Weighted Russell 2000 Banks | June 2002 – July 2024**

Signal	Sort Order	Avg Firm Count in Quintile	Average 1-Month IC	Ann. Long/Short Return	Ann. Info Ratio Long/Short	Long-Short Hit Rate	Ann. Long-Only Active Return	Ann. Info Ratio Long-Only	Long-Only Hit Rate
1YChg30DLoanDue/TotLoan (Loan Quality)	A	35	0.032***	7.45%***	0.96	60.5%***	3.55%***	0.75	57.9%***
Core EPS to Price (Valuation)	D	43	0.049***	11.23%***	0.94	65.4%***	5.67%***	0.78	65.4%***
3Y Change in Total Pretax Expense to Average Assets (Return on Asset Base)	A	43	0.031***	7.31%***	0.64	57.5%**	2.60%**	0.49	57.9%**
Deposit Cost (Deposit Cost & Stability)	A	36	0.023***	6.43%***	0.61	58.3%***	3.28%***	0.62	55.3%**

\*\*\* Significant at the 1% level; \*\* Significant at the 5% level; \* Significant at the 10% level; 'D' = Descending; 'A' = Ascending. Source: S&P Global Market Intelligence Quantitative Research. Data as of October 11, 2024. For all exhibits, all returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results.

**Drivers of Outperformance during Bull and Bear Markets<sup>9</sup>**

Bull markets in the U.S. equity markets are characterized by economic and corporate profit growth, low unemployment rate, and investor optimism. During bull markets, investors tend to be more risk-seeking and are willing to pay a higher financial multiple for future profits. In contrast, during bear markets, the opposite occurs: investors become more risk-averse and flock to firms with stronger financial strength, where the likelihood of survival is high.

Investors in banks are no exception. Historically, valuation strategies during bull markets have delivered the highest economic and risk-adjusted performance for U.S. banks, with long-short strategies yielding up to 11.2% per year and an information ratio of 0.96. Banks trading at lower financial multiples tend to be riskier investments, as investors have less visibility into the sustainability of their future profitability and cash flows. During bull markets, investors are more inclined to take on risk where the risk-reward tradeoff is more favorable (Exhibit 5a).

<sup>8</sup> See Appendix A.11 for cap-weighted results.

<sup>9</sup> The publication defines the commencement of a bull (or bear) market as the closing price of the SPY ETF being 20% above (or below) the most recent minimum low (or maximum high) in the latest bear (or bull) market. See Appendix A.16 for the months when the U.S. equity market is in a bull market and a bear market.

During bear markets, however, a bank's survivability becomes the top concern, as investors scrutinize and take refuge in banks with stronger balance sheets and financial strength capable of weathering financial storms. Investors become more risk-averse and navigate away from smaller banks or those with riskier assets. Strategies in the Financial Strength and Return on Asset Base categories have historically excelled during bear markets, with long-short strategies yielding up to 28.0% per year, with an information ratio of 1.60. Notably, during bear markets, the economic and risk-adjusted performance of these defensive strategies was higher than those that excelled during bull markets, even after accounting for the elevated volatilities, with meaningful contributions from the long-side (Exhibit 5b).

**Exhibit 5a<sup>10</sup>: Performance Summary during Bull Markets<sup>11</sup>  
Equal-Weighted Russell 3000 Banks | June 2002 – July 2024**

Signal	Sort Order	Avg Firm Count in Quintile	Average 1-Month IC	Ann. Long/Short Return	Ann. Info Ratio Long/Short	Long-Short Hit Rate	Ann. Long-Only Active Return	Ann. Info Ratio Long-Only	Long-Only Hit Rate
Pre-Provision Net Revenue to Price (Valuation)	D	52	0.051***	11.21%***	0.96	67.5%***	5.34%***	0.60	60.6%***
1YChg30DLoanDue/TotLoan (Loan Quality)	A	42	0.028***	7.28%***	1.12	59.8%***	4.47%***	1.02	58.1%**
Loan Funding (Deposit Cost & Stability)	A	44	0.018**	5.63%***	0.60	61.0%**	3.15%***	0.61	51.6%
3Y Change in Total Pretax Expense to Average Assets (Return on Asset Base)	A	52	0.027***	4.97%**	0.48	57.7%**	2.12%**	0.47	57.3%**
Tier 1 Capital Ratio (Financial Health)	D	41	0.009	4.09%*	0.42	52.8%	1.78%	0.34	46.7%

**Exhibit 5b<sup>12</sup>: Performance Summary during Bear Markets<sup>13</sup>  
Equal-Weighted Russell 3000 Banks | June 2002 – July 2024**

Signal	Sort Order	Avg Firm Count in Quintile	Average 1-Month IC	Ann. Long/Short Return	Ann. Info Ratio Long/Short	Long-Short Hit Rate	Ann. Long-Only Active Return	Ann. Info Ratio Long-Only	Long-Only Hit Rate
Adj Op Income to Total Asset (Return on Asset Base)	D	37	0.062**	21.95%**	1.59	65.0%	12.32%***	2.11	75.0%**
Core Deposit Mix (Deposit Cost & Stability)	A	39	0.085**	27.76%*	1.35	70.0%*	11.62%*	1.52	70.0%*
Cost Efficiency (Financial Health)	A	38	0.086***	21.17%*	1.32	75.0%**	12.85%*	1.48	60.0%
1Y Change in Nonaccrual Loans to Total Assets (Loan Quality)	A	48	0.046*	21.22%	1.14	60.0%	8.20%	1.11	60.0%
Core EPS to Price (Valuation)	D	48	0.012	15.31%	0.68	55.0%	-3.24%	-0.24	40.0%

\*\*\* Significant at the 1% level; \*\* Significant at the 5% level; \* Significant at the 10% level; 'D' = Descending; 'A' = Ascending. Source: S&P Global Market Intelligence Quantitative Research. Data as of October 11, 2024. For all exhibits, all returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results.

<sup>10</sup> See Appendix A.12 for cap-weighted results.

<sup>11</sup> See Appendix A.16 for bull and bear market months.

<sup>12</sup> See Appendix A.13 for cap-weighted results.

<sup>13</sup> See Appendix A.16 for bull and bear market months.

One economic implication from the bull and bear market analysis is that a blended composite strategy -- combining strategies in the Valuation or Loan Quality categories (which excelled during bull markets) with strategies in the Return on Asset Base or Deposit Cost categories (which excelled during bear markets) -- results in a potential all-weather strategy that offers investors performance upside in bull markets and downside protection in bear markets. For instance, a composite long-short strategy that allocates evenly in the equal-weighted *Pre-Provision Net Revenue / Price* strategy in the Valuation category and *Loan Funding* in the Deposit Cost category yielded 7.8% per year with an information ratio of 1.56, 2x higher than the information ratio of the two standalone strategies.

### 3. Methodology and Data

#### **SNL Fundamentals (SNL Sector Financials FIG Content)**

FIG content includes comprehensive fundamental coverage of banking institutions and insurance companies. Bank fundamental coverage provides detailed insights into performance analysis, asset quality, regulatory capital, and deposit/loan composition while Insurance fundamentals provide increased insight into investment level details, underwriting analysis, solvency, embedded value, and distribution channels.

#### **SNL Bank Regulatory Data**

SNL Regulatory Data captures the financial statement filings that banks, credit unions, and investment advisors (asset managers and broker-dealers) are mandated to file with regulatory agencies. Regulatory bodies may include: the US Federal Reserve, US Federal Deposit Insurance Corporation (FDIC), the Office of the Comptroller of the Currency (OCC), and the National Credit Union Administration (NCUA), as well as information drawn from Securities and Exchange Commission (SEC) filings of US companies that offer specialized financial services.

Within the SNL Bank Regulatory domain, the dataset distinguishes between company-level data (e.g., Bank of New York) and aggregate level data (e.g., all New York commercial banks). In addition, the specific period for which the information is reported to the regulators is identified in the data set.

#### **Alpha Factor Library**

The Alpha Factor Library package provides hundreds of pre-calculated factors including financial ratios, valuation metrics, price and momentum statistics, and analyst expectations. These factors are constructed historically using point-in-time data and are updated daily. Data is also compiled into various models. This data set allows you to focus on researching alpha-producing factors and portfolio construction instead of performing raw ratio calculations.

Appendix

Appendix A.1: Signals under Each Category in the Cover Page Chart

Category	Signal
Loan Quality	1YChg30DLoanDue / Total Loan
Deposit Cost & Stability	Deposit Cost
Valuation	Core EPS to Price
Return on Asset Base	3Y Change in Total Pretax Expense to Average Assets
Financial Health	Tier 1 Capital Ratio

Appendix A.2: Definitions of Valuation Signals

Valuation			
Signal	Definition/Intuition	Sort Order	SNL Dataset
Core EPS / Price	Core income on a diluted per-share basis divided by price. Core income is net income after taxes and before extraordinary items, less net income attributable to noncontrolling interest, gain on the sale of held to maturity and available for sale securities, amortization of intangibles, goodwill and nonrecurring items.	D	Fundamentals
Pre-Provision Net Revenue / Price	Bank operating revenue less non-credit-related expenses (i.e., before provision for loan losses) on a per share basis divided by price.	D	Fundamentals
Pre-Provision Profit / Price	Bank operating revenue less total noninterest expense on a per share basis divided by price. Total noninterest expense equals total of salaries and employee benefits, expenses of premises and fixed assets, and other noninterest expense.	D	Bank Regulatory
Tangible Book Value / Price	Tangible common equity on a per share basis divided by price. Tangible common equity represents total equity capital excluding minority interest, adjusted for preferred stock, goodwill and other intangibles. Mortgage servicing rights are not treated as intangible assets.	D	Bank Regulatory

Note: Sort order 'D' represents descending, and 'A' represents ascending in sorting stocks by ratio values. Source: S&P Global Market Intelligence Quantitative Research.

Appendix A.3: Definitions of Financial Health Signals

Financial Health & Margin of Safety			
Signal	Definition/Intuition	Sort Order	SNL Dataset
Cost Efficiency	Total noninterest expense divided by total noninterest income. This ratio measures efficiency especially in periods when net interest margins are being squeezed.	A	Bank Regulatory
Tier 1 Capital Ratio	Tier 1 capital divided by total risk-weighted assets. This ratio measures a bank's ability to absorb losses arising from its credit portfolio. Banks with higher ratios are in a better position to absorb losses.	D	Fundamentals & Bank Regulatory

Note: Sort order 'D' represents descending, and 'A' represents ascending in sorting stocks by ratio values. Source: S&P Global Market Intelligence Quantitative Research.

### Appendix A.4: Definitions of Loan Quality Signals

Loan Quality			
Signal	Definition/Intuition	Sort Order	SNL Dataset
1Y Change in Modified Texas Ratio	The 1-year change in the ratio of non-performing assets and loans 90-days or more past due but still accruing interest divided by total equity and loan loss reserves.	A	Fundamentals
1Y Change in Nonaccrual Loans to Total Assets	The 1-year change in the ratio of non-accrual loans divided by total assets.	A	Fundamentals
1YChg30DLoanDue / Total Loan	Year-over-year percentage change in the ratio of loans and leases 30-89 days past due and still accruing divided by total loan (total of loans, lease financing receivables, held for investment and held for sale). A rapid growth in this ratio might lead to future write downs.	A	Bank Regulatory
Loan Diversity	The sum of squares of various loan types (agricultural, real estate, credit card, individual among others) over gross loans. This is a variation of the Herfindahl index and is used to determine a bank's concentration risk. Low values indicate a balanced portfolio mix and that the bank is not concentrated in one or two product lines	A	Bank Regulatory
Loan Loss Indicator	All loans past due at least 30 days divided by the total loan and lease financing receivables.	A	Bank Regulatory

Loan Quality			
Signal	Definition/Intuition	Sort Order	SNL Dataset
Non-Perf Asts / Earn Asts	Non-performing assets divided by average earning assets. Banks with high values are not operating at optimal levels and will see compressed revenue/earnings compared to banks with low values.	A	Bank Regulatory
Problem Loan Ratio	The ratio of total loans past due more than 90 days divided by total loans.	A	Bank Regulatory
Problem Loans to Total Equity plus Loan Loss Reserves	Problem loans divided by the sum of total equity and loan loss reserves. Problem loans here refer to the value that the bank most commonly presents. If the bank commonly reports multiple values, SNL selects based on the following priority (at SNL's discretion): Nonperforming Loans, Gross Impaired Loans, Net Impaired Loans, and Other Problem Loans.	A	Fundamentals
Provision Rate	Provision for loan and lease losses divided by total assets. A high ratio might be an indication of a deteriorating loan book.	A	Bank Regulatory
Texas Ratio	The ratio of non-performing loans and other real estate loans over the sum of tangible common equity and loan loss reserves.	A	Bank Regulatory
Loss Absorption Power	The ratio of a bank's non-accrual loans and loans past due over tangible common equity and loan loss reserves.	A	Bank Regulatory

Note: Sort order 'D' represents descending, and 'A' represents ascending in sorting stocks by ratio values. Source: S&P Global Market Intelligence Quantitative Research.

### Appendix A.5: Definitions of Return on Asset or Equity Base Signals

Return on Asset or Equity Base			
Signal	Definition/Intuition	Sort Order	SNL Dataset
3Y Change in Operating Income to Tier 1 Common Equity	The 3-year change in the ratio of operating income (net interest income + noninterest income - noninterest expense - provision for loan losses) divided by Tier 1 common equity	D	Fundamentals
3Y Change in Total Pretax Expense to Average Assets	The 3-year change in the ratio of total pre-tax expense (interest expense + noninterest expense + provision for loan losses) divided by average assets	A	Fundamentals
Adj Op Income / Tot Asset	The sum of net interest income on a tax equivalent basis and total noninterest income divided by quarterly average of total assets.	D	Bank Regulatory
Pre-Provision Profit / Assets	Bank operating revenue less total noninterest expense divided by total assets.	D	Bank Regulatory
Pre-Provision Profit / Earn Asts	Bank operating revenue less total noninterest expense divided by quarterly average of total earning assets.	D	Bank Regulatory
Return on Risk Weighted Assets	The ratio of operating income (net interest income + noninterest income - noninterest expense - provision for loan losses) over the last 12 months to total risk-weighted assets computed on the same period	D	Fundamentals
Return on Tang Comm Equity	The ratio of net income over tangible common equity. Net income equals the sum of net interest income after provision, noninterest income, gain on securities, extraordinary items less noninterest expense and taxes.	D	Bank Regulatory

Note: Sort order 'D' represents descending, and 'A' represents ascending in sorting stocks by ratio values. Source: S&P Global Market Intelligence Quantitative Research.

### Appendix A.6: Definitions of Deposit Cost & Stability Signals

Deposit Cost & Stability			
Signal	Definition/Intuition	Sort Order	SNL Dataset
Core Deposit Mix	Core deposits divided by total deposits. Core deposits provide a stable cost of funding and are less interest rate sensitive than most of other types of funding.	D	Bank Regulatory
Demand Deposit Mix	Demand deposits divided by total deposits. Demand deposits can be withdrawn immediately and generally pay lower rates than time deposits.	D	Bank Regulatory
Deposit Cost	Total interest expense on deposits as a percent of two-point average interest-bearing deposits. The two-point average is based on the current and previous calendar quarters. A high ratio suggests that a bank can't attract cheap sources of funding (checking accounts)	A	Bank Regulatory
Loan Funding	Quarterly average for loans and leases net of unearned income, in both U.S. and non-U.S. offices, divided by core deposits. This ratio measures the level of a bank's loans funded by stable deposits. Banks with lower values are funding a higher proportion of assets with cheap liabilities.	A	Bank Regulatory
Savings & Money Market Deposit Accounts to Total Deposits	Savings and money market account deposits divided by total deposits. Low-cost core deposits are a critical source of bank funding, due to their stability and positive effect on net interest margin.	D	Fundamentals
Time Deposit Mix	Total time deposits divided by total deposits. Time deposits cannot be withdrawn for a certain period of time but pay higher fixed interest rates, making them less desirable for banks to hold as they decrease profit margins.	A	Bank Regulatory

Note: Sort order 'D' represents descending, and 'A' represents ascending in sorting stocks by ratio values. Source: S&P Global Market Intelligence Quantitative Research.

## Appendix A.7: Deposit Cost & Stability, Return on Asset Base, and Financial Health Performance Summary

### A.7a Equal-Weighted Russell 3000 Banks | June 2002 – July 2024

Signal	Sort Order	Avg Firm Count in Quintile	Average 1-Month IC	Ann. Long/Short Return	Ann. Info Ratio Long/Short	Long-Short Hit Rate	Ann. Long-Only Active Rtrn	Ann. Info Ratio Long-Only	Long-Only Hit Rate
Deposit Cost (Deposit Cost & Stability)	A	43	0.023***	6.72%***	0.65	59.0%***	3.69%***	0.69	54.1%*
Loan Funding (Deposit Cost & Stability)	A	43	0.020***	6.20%***	0.62	61.7%***	3.27%***	0.60	52.3%
3Y Change in Total Pretax Expense to Avg Assets (Return on Asset Base)	A	52	0.027***	6.64%***	0.60	57.9%**	2.40%**	0.51	57.1%**
Adj Op Income to Total Assets (Return on Asset Base)	D	42	0.010	3.04%	0.35	53.0%	1.62%	0.33	49.6%
Tier 1 Capital Ratio (Financial Health)	D	41	0.012	5.22%**	0.53	53.8%	2.38%**	0.43	48.1%
Cost Efficiency (Financial Health)	A	43	0.011	3.07%	0.31	49.2%	1.18%	0.21	52.3%

\*\*\* Significant at the 1% level; \*\* Significant at the 5% level; \* Significant at the 10% level; 'D' = Descending; 'A' = Ascending. Source: S&P Global Market Intelligence Quantitative Research. Data as of October 11, 2024. For all exhibits, all returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results.

### A.7b Cap-Weighted Russell 3000 Banks | June 2002 – July 2024

Signal	Sort Order	Avg Firm Count in Quintile	Average 1-Month IC	Ann. Long/Short Return	Ann. Info Ratio Long/Short	Long-Short Hit Rate	Ann. Long-Only Active Rtrn	Ann. Info Ratio Long-Only	Long-Only Hit Rate
Deposit Cost (Deposit Cost & Stability)	A	43	0.023***	8.73%**	0.49	56.4%**	1.83%	0.24	54.1%*
Loan Funding (Deposit Cost & Stability)	A	43	0.020***	7.19%***	0.58	55.3%**	3.47%**	0.43	58.3%***
3Y Change in Total Pretax Expense to Avg Assets (Return on Asset Base)	A	52	0.027***	1.78%	0.10	48.1%	1.33%	0.16	50.4%
Adj Op Income to Total Assets (Return on Asset Base)	D	42	0.010	3.33%	0.23	50.8%	-0.92%	-0.12	47.4%
Tier 1 Capital Ratio (Financial Health)	D	41	0.012	4.22%	0.27	52.3%	3.20%	0.31	53.4%
Cost Efficiency (Financial Health)	A	43	0.011	2.68%	0.16	50.8%	0.50%	0.09	51.5%

\*\*\* Significant at the 1% level; \*\* Significant at the 5% level; \* Significant at the 10% level; 'D' = Descending; 'A' = Ascending. Source: S&P Global Market Intelligence Quantitative Research. Data as of October 11, 2024. For all exhibits, all returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results.

**Appendix A.8: Valuation Performance Summary**  
**Cap-Weighted Russell 3000 Banks | June 2002 – July 2024**

Signal	Sort Order	Avg Firm Count in Quintile	Average 1-Month IC	Ann. Long/Short Return	Ann. Info Ratio Long/Short	Long-Short Hit Rate	Ann. Long-Only Active Rtm	Ann. Info Ratio Long-Only	Long-Only Hit Rate
Core EPS / Price	D	51	0.045***	6.79%	0.34	56.0%**	2.29%	0.23	55.3%**
Pre-Provision Net Revenue / Price	D	52	0.045***	7.18%*	0.38	56.0%**	0.24%	0.02	50.4%
Pre-Provision Profit / Price	D	43	0.030***	1.29%	0.09	57.9%***	1.16%	0.11	54.5%*
Tangible Book Value / Price	D	44	0.026***	4.30%	0.27	52.3%	2.56%	0.21	50.0%

\*\*\* Significant at the 1% level; \*\* Significant at the 5% level; \* Significant at the 10% level; 'D' = Descending; 'A' = Ascending. Source: S&P Global Market Intelligence Quantitative Research. Data as of October 11, 2024. For all exhibits, all returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results.

**Appendix A.9: Loan Quality Performance Summary**  
**Cap-Weighted Russell 3000 Banks | June 2002 – July 2024**

Signal	Sort Order	Avg Firm Count in Quintile	Average 1-Month IC	Ann. Long/Short Return	Ann. Info Ratio Long/Short	Long-Short Hit Rate	Ann. Long-Only Active Rtm	Ann. Info Ratio Long-Only	Long-Only Hit Rate
1YChg30DLoanDue/TotLoan	A	42	0.026***	3.99%	0.26	51.5%	2.82%	0.27	55.3%**
1Y Change in Modified Texas Ratio	A	51	0.031***	1.27%	0.07	48.5%	-1.20%	-0.11	48.5%
1Y Change in Nonaccrual Loans to Total Assets	A	51	0.024***	6.13%	0.35	53.0%	0.35%	0.03	48.1%
Loan Loss Indicator	A	44	0.024***	4.00%	0.25	55.3%**	3.54%	0.32	52.6%

\*\*\* Significant at the 1% level; \*\* Significant at the 5% level; \* Significant at the 10% level; 'D' = Descending; 'A' = Ascending. Source: S&P Global Market Intelligence Quantitative Research. Data as of October 11, 2024. For all exhibits, all returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results.

### Appendix A.10: Deposit Cost & Stability Performance Summary Equal-Weighted Russell 3000 Banks | June 2002 – July 2024

Signal	Sort Order	Avg Firm Count in Quintile	Average 1-Month IC	Ann. Long/Short Return	Ann. Info Ratio Long/Short	Long-Short Hit Rate	Ann. Long-Only Active Return	Ann. Info Ratio Long-Only	Long-Only Hit Rate
Loan Funding	A	43	0.020***	6.20%***	0.62	61.7%***	3.27%***	0.60	52.3%
Core Deposit Mix	D	43	0.012*	3.63%	0.34	53.8%	1.72%	0.33	50.8%
Deposit Cost	A	43	0.023***	6.72%***	0.65	59.0%***	3.69%***	0.69	54.1%*
Time Deposit Mix	D	44	0.017**	4.16%**	0.44	56.8%**	1.68%	0.32	54.9%*

\*\*\* Significant at the 1% level; \*\* Significant at the 5% level; \* Significant at the 10% level; 'D' = Descending; 'A' = Ascending. Source: S&P Global Market Intelligence Quantitative Research. Data as of October 11, 2024. For all exhibits, all returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results.

### Appendix A.11: Performance Summary Cap-Weighted Russell 2000 Banks | June 2002 – July 2024

Signal	Sort Order	Avg Firm Count in Quintile	Average 1-Month IC	Ann. Long/Short Return	Ann. Info Ratio Long/Short	Long-Short Hit Rate	Ann. Long-Only Active Return	Ann. Info Ratio Long-Only	Long-Only Hit Rate
1YChg30DLoanDue/TotLoan (Loan Quality)	A	35	0.032***	5.78%***	0.75	60.9%***	2.58%**	0.50	55.3%**
Core EPS to Price (Valuation)	D	43	0.049***	6.48%**	0.47	61.3%***	3.49%*	0.39	61.7%***
3Y Change in Total Pretax Expense to Average Assets (Return on Asset Base)	A	43	0.031***	4.79%**	0.43	56.4%**	2.12%*	0.40	54.5%*
Deposit Cost (Deposit Cost & Stability)	A	36	0.023***	6.30%**	0.50	54.5%*	2.16%*	0.38	53.4%

\*\*\* Significant at the 1% level; \*\* Significant at the 5% level; \* Significant at the 10% level; 'D' = Descending; 'A' = Ascending. Source: S&P Global Market Intelligence Quantitative Research. Data as of October 11, 2024. For all exhibits, all returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results.

### Appendix A.12: Performance Summary during Bull Markets Cap-Weighted Russell 3000 Banks | June 2002 – July 2024

Signal	Sort Order	Avg Firm Count in Quintile	Average 1-Month IC	Ann. Long/Short Return	Ann. Info Ratio Long/Short	Long-Short Hit Rate	Ann. Long-Only Active Return	Ann. Info Ratio Long-Only	Long-Only Hit Rate
Pre-Provision Net Revenue to Price (Valuation)	D	52	0.051***	5.58%*	0.37	56.1%**	0.93%	0.10	52.0%
1YChg30DLoanDue/TotLoan (Loan Quality)	A	42	0.028***	4.75%	0.34	52.4%	3.10%	0.30	56.5%**
Loan Funding (Deposit Cost & Stability)	A	44	0.018**	7.27%***	0.61	55.7%**	3.41%*	0.42	59.3%***
3Y Change in Total Pretax Expense to Average Assets (Return on Asset Base)	A	52	0.027***	-2.30%	-0.17	46.7%	0.47%	0.06	49.2%
Tier 1 Capital Ratio (Financial Health)	D	41	0.009	2.13%	0.14	51.2%	1.15%	0.11	52.0%

\*\*\* Significant at the 1% level; \*\* Significant at the 5% level; \* Significant at the 10% level; 'D' = Descending; 'A' = Ascending. Source: S&P Global Market Intelligence Quantitative Research. Data as of October 11, 2024. For all exhibits, all returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results.

### Appendix A.13: Performance Summary during Bear Markets Cap-Weighted Russell 3000 Banks | June 2002 – July 2024

Signal	Sort Order	Avg Firm Count in Quintile	Average 1-Month IC	Ann. Long/Short Return	Ann. Info Ratio Long/Short	Long-Short Hit Rate	Ann. Long-Only Active Return	Ann. Info Ratio Long-Only	Long-Only Hit Rate
Adj Op Income to Total Asset (Return on Asset Base)	D	37	0.062**	38.73%	1.14	85.0%***	11.40%	1.04	75.0%**
Core Deposit Mix (Deposit Cost & Stability)	A	39	0.085**	14.19%	0.76	65.0%	13.86%	1.19	70.0%*
Cost Efficiency (Financial Health)	A	38	0.086***	28.07%	0.62	60.0%	15.68%**	1.84	70.0%*
1Y Change in Nonaccrual Loans to Total Assets (Loan Quality)	A	48	0.046*	29.36%	0.81	55.0%	2.50%	0.19	45.0%
Core EPS to Price (Valuation)	D	48	0.012	39.79%	0.81	55.0%	9.40%	0.52	55.0%

\*\*\* Significant at the 1% level; \*\* Significant at the 5% level; \* Significant at the 10% level; 'D' = Descending; 'A' = Ascending. Source: S&P Global Market Intelligence Quantitative Research. Data as of October 11, 2024. For all exhibits, all returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results.

Appendix A.14a: Pairwise Correlations of Long-Short Returns  
Equal-Weighted Russell 3000 Banks | June 2002 – July 2024 | Part 1

Pairwise Correlation of Equal-Weighted Long-Short Returns		Valuation		Return on Asset Base		Deposit Cost & Stability		Financial Strength & Margin of Safety		Loan Quality	
		Core EPS to Price	Pre-Provision Profit/Price	Pre-Provision Profit/Assets	Return on Risk Weighted Assets	Core Deposit Mix	Time Deposit Mix	Cost Efficiency	Tier 1 Capital Ratio	1Y Change in Modified Texas Ratio	Loan Loss Indicator
Valuation	Core EPS to Price		0.38	0.30	0.46	-0.08	0.02	-0.08	-0.02	0.12	0.20
	Pre-Provision Profit/Price			0.33	-0.29	-0.65	-0.38	-0.31	-0.26	-0.52	-0.37
Return on Asset Base	Pre-Provision Profit/Assets				0.44	0.04	0.10	0.22	0.25	0.03	0.05
	Return on Risk Weighted Assets					0.57	0.57	0.53	0.49	0.72	0.57
Deposit Cost & Stability	Core Deposit Mix						0.63	0.55	0.47	0.69	0.52
	Time Deposit Mix							0.68	0.13	0.59	0.42
Financial Strength & Margin of Safety	Cost Efficiency								0.28	0.52	0.24
	Tier 1 Capital Ratio									0.50	0.40
Loan Quality	1Y Change in Modified Texas Ratio										0.64
	Loan Loss Indicator										

Pearson correlations colored by red (green) for positive (negative) values. The darker the color shades, the more extreme the correlation. Source: S&P Global Market Intelligence Quantitative Research. Data as of October 11, 2024.

Appendix A.14b: Pairwise Correlations of Long-Short Returns  
Equal-Weighted Russell 3000 Banks | June 2002 – July 2024 | Part 2

Pairwise Correlation of Equal-Weighted Long-Short Returns		Valuation		Return on Asset Base		Deposit Cost & Stability		Financial Strength & Margin of Safety		Loan Quality	
		Pre-Provision Net Revenue / Price	Tangible Book Value/Price	3Y Change in Total Pretax Expense to Average Assets	Adj Op Income / Tot Asset	Deposit Cost	Loan Funding	Cost Efficiency	Tier 1 Capital Ratio	1Y Change in Nonaccrual Loans to Total Assets	1YChg30D LoanDue/ TotLoan
Valuation	Pre-Provision Net Revenue / Price		0.65	-0.37	-0.33	-0.58	-0.67	-0.35	-0.41	-0.52	-0.34
	Tangible Book Value/Price			-0.65	-0.62	-0.64	-0.66	-0.65	-0.35	-0.66	-0.35
Return on Asset Base	3Y Change in Total Pretax Expense to Average Assets				0.46	0.35	0.50	0.36	0.40	0.68	0.33
	Adj Op Income / Tot Asset					0.50	0.42	0.75	0.30	0.48	0.32
Deposit Cost & Stability	Deposit Cost						0.61	0.58	0.38	0.41	0.39
	Loan Funding							0.46	0.62	0.63	0.43
Financial Strength & Margin of Safety	Cost Efficiency								0.28	0.48	0.33
	Tier 1 Capital Ratio									0.46	0.33
Loan Quality	1Y Change in Nonaccrual Loans to Total Assets 1YChg30DLoanDue/ TotLoan										0.44

Pearson correlations colored by red (green) for positive (negative) values. The darker the color shades, the more extreme the correlation. Source: S&P Global Market Intelligence Quantitative Research. Data as of October 11, 2024.

Appendix A.15a: Pairwise Correlations of Long-Short Returns  
Cap-Weighted Russell 3000 Banks | June 2002 – July 2024 | Part 1

Pairwise Correlation of Cap-Weighted Long-Short Returns		Valuation		Return on Asset Base		Deposit Cost & Stability		Financial Strength & Margin of Safety		Loan Quality	
		Core EPS to Price	Pre-Provision Profit/Price	Pre-Provision Profit/Assets	Return on Risk Weighted Assets	Core Deposit Mix	Time Deposit Mix	Cost Efficiency	Tier 1 Capital Ratio	1Y Change in Modified Texas Ratio	Loan Loss Indicator
Valuation	Core EPS to Price		0.37	0.17	0.53	-0.19	-0.10	0.45	-0.10	0.26	0.01
	Pre-Provision Profit/Price			0.10	-0.10	-0.42	-0.22	0.12	-0.18	-0.06	-0.11
Return on Asset Base	Pre-Provision Profit/Assets				0.38	0.09	0.17	0.24	0.03	0.05	0.19
	Return on Risk Weighted Assets					0.16	0.08	0.49	0.26	0.45	0.26
Deposit Cost & Stability	Core Deposit Mix						0.35	-0.12	0.11	0.18	0.22
	Time Deposit Mix							0.02	0.09	0.00	0.33
Financial Strength & Margin of Safety	Cost Efficiency								-0.09	0.28	-0.15
	Tier 1 Capital Ratio									0.36	0.49
Loan Quality	1Y Change in Modified Texas Ratio										0.16
	Loan Loss Indicator										

Pearson correlations colored by red (green) for positive (negative) values. The darker the color shades, the more extreme the correlation. Source: S&P Global Market Intelligence Quantitative Research. Data as of October 11, 2024.

Appendix A.15b: Pairwise Correlations of Long-Short Returns  
Cap-Weighted Russell 3000 Banks | June 2002 – July 2024 | Part 2

Pairwise Correlation of Cap-Weighted Long-Short Returns		Valuation		Return on Asset Base		Deposit Cost & Stability		Financial Strength & Margin of Safety		Loan Quality	
		Pre-Provision Net Revenue / Price	Tangible Book Value/Price	3Y Change in Total Pretax Expense to Average Assets	Adj Op Income / TotAsset	Deposit Cost	Loan Funding	Cost Efficiency	Tier 1 Capital Ratio	1Y Change in Nonaccrual Loans to Total Assets	1YChg30D LoanDue/ TotLoan
Valuation	Pre-Provision Net Revenue / Price		0.24	0.22	0.20	0.03	-0.33	0.32	-0.38	-0.03	0.06
	Tangible Book Value/Price			-0.27	-0.40	-0.38	-0.49	-0.39	-0.07	-0.23	-0.07
Return on Asset Base	3Y Change in Total Pretax Expense to Average Assets				0.39	0.44	0.09	0.41	0.27	0.49	0.25
	Adj Op Income / TotAsset					0.58	0.05	0.57	0.04	0.42	0.29
Deposit Cost & Stability	Deposit Cost						0.20	0.67	0.15	0.46	0.45
	Loan Funding							0.01	0.16	0.12	0.04
Financial Strength & Margin of Safety	Cost Efficiency								-0.09	0.31	0.26
	Tier 1 Capital Ratio									0.43	0.25
Loan Quality	1Y Change in Nonaccrual Loans to Total Assets										0.49
	1YChg30DLoanDue/ TotLoan										

Pearson correlations colored by red (green) for positive (negative) values. The darker the color shades, the more extreme the correlation. Source: S&P Global Market Intelligence Quantitative Research. Data as of October 11, 2024.

Appendix A.16: Breakdown of Bull & Bear Market Periods June 2002 – July 2024

Market Type	# Months During the Sample Period	YYYY.MM Included
Bull	246	2002.06, 2002.08 – 2008.06, 2008.12 – 2009.01, 2009.03 – 2020.02, 2020.04 – 2022.05, 2023.06 –
Bear	20	2002.07, 2008.07 – 2008.11, 2009.02, 2020.03, 2022.06 – 2023.05

The publication defines the commencement of a bull (or bear) market as the closing price of the SPY ETF being 20% above (or below) the most recent minimum low (or maximum high) in the latest bear (or bull) market.

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## Our Recent Research

### **December 2024: From Compliance to Competitive Edge: How Tech CEOs Changed Their Tune on Sustainability Initiatives**

Technology is transforming at a breakneck speed. Artificial Intelligence (AI) is everywhere, and every firm wants a bigger slice of the market. But there is another conversation unfolding in parallel, less glamorous yet just as urgent: sustainability. Data centers gulp down energy. New tech initiatives come with a cost to the planet. An analysis of earnings calls from U.S. and European technology giants over the last eight years reveals a shift in mindset. Sustainability is no longer a checkbox—it's a strategy, and it's shaping the future of tech.

### **October 2024: Goldilocks and the Three Market Trends Shaping Q3 2024: Earnings, AI Adoption, Price Stability Take Center Stage**

Q2 2024 marked the light at the end of the tunnel. Inflation fears subsided, and the economy stabilized. Deflation concerns and contraction risks appeared to be under control. Sentiment across S&P 500 firms hovered at a 15-year high. As the Q3 earnings season commences, key market trends to monitor are: i) Will the overall sentiment continue to hover at a 15-year high? ii) Can firms meet the robust financial outlook from the Q2 earnings season? iii) Will AI deliver the promised economic boost, or will geopolitical unrest and exogenous shocks -- such as the ILA port strike and its temporary postponement -- take the U.S. economy on a detour from entering a Goldilocks state? How the Q3 earnings season unfolds is pivotal, as it will reinforce the outlook that the U.S. economy is growing with price stability or reveal cracks in the premise.

### **August 2024: Bonding with Style Investing: Value and Momentum in Corporate Bonds**

The application of 'smart beta' strategies is expanding into corporate bonds, beyond its equity roots. This paper explores value, momentum, and short-term reversal styles in fixed income, highlighting the potential to enhance returns and diversify portfolios. The analysis shows that value and momentum strategies in iBoxx U.S. investment-grade (USIG) and high-yield (USHY) bonds generated statistically significant alpha, with low correlations to the comparable equity styles and markets premia.

### **July 2024: Calm Markets. Confident PE Executives: Private Equity Earnings Calls Reflect Renewed Optimism in Q1'24**

Stable public markets are the secret to private equity (PE) optimism. An NLP analysis of publicly traded PE firms' Q1'24 earnings call transcripts reveals a significant rebound in PE confidence over the last two years. After peaking in Q3'21, PE executives' sentiment declined in 2022 as inflation, geopolitics and fed-driven volatility ended a post-COVID calm. However, with rates finding footing, Global PMI at a 12-month high and volatility subsiding, PE sentiment in Q1'24 reflects renewed optimism. This quarter, PE executive sentiment surged to its second-highest level in 57 earnings seasons, underscoring the inverse relationship between market turbulence and PE industry morale.

**April 2024: Data Arbitrage with Proprietary Dividend Forecasts - Historically Precise Updates Led to U.S. Outperformance**

Sell-side forecasts tend to focus on the top- and bottom-line and are often slow to reflect new dividend policies. Our empirical results have shown that S&P Global Market Intelligence's Dividend Forecasting dataset has historically captured these dividend revisions in both a precise and timely manner, providing investors with an informational edge. This publication details how practitioners can leverage the dataset for equity investing in the U.S. market when the in-house FQ1 forecasts diverge from their sell-side counterparts.

**March 2024: Executives Exuberant Amid “Rightsizing” Workforce - An NLP Analysis of the Q4’23 Earnings Season**

AI, geopolitics, labor ‘rightsizing’ (and other layoff euphemisms), and a sanguine tone characterized the Q4’23 earnings season. Nvidia is riding the AI wave and pulling its connected network along with it. An NLP analysis of earnings call transcripts was used to quantify the discussion.

**March 2024: Elusive Parity: Key Gender Parity Metric Falls for First Time in 2 Decades**

The growth in women’s representation among senior corporate positions, once a bright spot for gender parity, potentially faces an alarming turning point. Exponential growth over a decade is showing signs of losing momentum. Growth no longer appears exponential. A waning focus on diversity initiatives suggests a potential inflection point and calls our previous gender parity estimates into question.

**February 2024: Deal Sourcing: A Data Science Approach - Impact of Financial Characteristics on Acquisition Likelihood**

Deal sourcing is hard. Finding a target for acquisition has been likened to finding ‘a needle in a haystack’. Firm financials are a valuable starting point for systematic identification of acquisition targets. This publication provides actionable insights and a detailed blueprint on how practitioners can leverage computational finance for deal sourcing. Specifically, five firm-level financial dimensions are identified that differentiate targets from their comparable non-targets based on global data from the most recent 10 years.

**February 2024: The Ripple Effect – Finding Company Estimates from Detailed Estimates**

Intel’s (NASDAQ: INTC) share price jumped 9.3% on Friday, Oct. 27, 2023, after the company reported strong earnings. Cadence Design Systems (NASDAQ: CDNS), which announced earlier in the week, was flat. Over the next 2 weeks (Oct 30 – Nov 14), CDNS would outperform INTC by 544 bps, as investors connected the dots between the two. INTC and CDNS do not share a GICS industry, however the two firms share something potentially more meaningful: sell-side analysts.

**November 2023: Reading Between the Lines in Earnings Calls: 6 Things to Watch as the Q3'23 Earnings Season Unfolds**

**Watch for Q3'23 sentiment near 5-year highs, despite a quarter-on-quarter decline.** Sentiment for Q3'23 is estimated to decline by 5% compared to last quarter; but remains on track to be the 7<sup>th</sup> most positive of the last 60 quarters. What a difference three quarters can make! As ranked by the sentiment of language on earnings calls, Q3'22 was one of the worst quarters of the last 5 years. Just 3 quarters later, Q2'23 sentiment improved 24% to make the season the 4<sup>th</sup> most positive over the period. Major drivers of positivity including abating supply chain disruption, declining inflation, and hope for a more dovish U.S. Federal Reserve roadmap.

**August 2023: Breaking Boundaries: Women Poised for Milestone Achievement in Parity Amidst Otherwise Bleak Outlook**

Diversity in leadership has received increasing attention. However, most data show slow, incremental improvements at best. Yet in an otherwise bleak landscape, a bright spot has emerged: an analysis of 86,000 executives from 7,300 U.S. firms over 12 years found that women could reach parity in senior leadership positions between 2030 and 2037, among companies in the Russell 3000.

**June 2023: Mixed Financials Diverge from Bullish Sentiment: A Textual Review of the Q1'23 U.S. Earnings Call Season**

A bullish sentiment during the Q1'23 season has taken hold. The excitement surrounding the '*iPhone Moment*' of AI, the resiliency in the labor market, the receding likelihood of a banking crisis and the end of the current rate hike cycle have all uplifted the prospects of the U.S. economy. However, the exuded level of sentiment may not be supported by the financials. The breadth of firms citing growth deteriorated on a quarterly and yearly basis. Forecasts for the next season have come down materially from their bullish Q1'23 levels. Ominous clouds are on the horizon as banks' commercial loan portfolios come under scrutiny. Vacancy rates for office buildings have hit all-time highs. For the first time in the past five seasons, banks are prominently discussing their exposures to the commercial real estate market.

**April 2023: Sentiment Rebounds While Regional Banks Tip Their Hand: A Textual Review of the Q4'22 U.S. Earnings Call Season**

The sentiment from S&P 500 firms' latest earnings calls rebounded for the first time in 2022. Earnings continued its recovery after hitting a trough two quarters ago. The headwind surrounding the strong dollar started to recede. Defensive sectors led the way while the cyclicals continued their struggle. The recent implosions of SVB Financial Group and Signature Bank have intensified this divergence. Other regional banks appear susceptible as the sentiment from their latest calls has turned negative, a rare historical occurrence that preceded the demise of the two, now FDIC seized, banks.

**March 2023: Singing the (Banking) Blues: Navigating the Current Volatility in the Banking Industry**

The collapse of Silicon Valley Bank (SIVB) led to a reassessment of liquidity and contagion risks across the banking industry. Regional banks have borne the brunt of the subsequent market sell-off. Month-to-date, regional bank stocks are down by 28%, versus 0% for the S&P 500. This report introduces a screen to help both equity and fixed income investors navigate the current volatility in the banking industry. The screen identifies regional banks with unfavorable exposures to liquidity, investor sentiment and management sentiment indicators.

**February 2023: Watch Your Language: Executives' Remarks on Earnings Calls Impact CDS Spreads**

While company earnings calls are targeted at equity analysts, information relevant to credit investors are discussed on these calls. This report documents that executive remarks have an impact on credit default swap spreads. The percentage change in CDS spreads of companies with the worst executive sentiment reading is larger than that of companies with the best sentiment reading post earnings call. Credit investors should consider using executive sentiment as an additional tool to gauge the direction of future CDS spread movements.

**January 2023: Machines Signal Q4'22 Guidance Not Falling Off a Cliff: An In-Depth Textual Review of Q3'22 Earnings Call Transcripts**

In Q3'22, the sentiment of S&P 500 firms has deteriorated to a level not seen since the IMF Greek Debt Default. Firms' focus has shifted away from pandemic-related concerns to interest rate-related ones. Financial growth is uneven. The breadth of firms citing profitability growth remains a bright spot yet the number of firms citing bottom-line growth has been mired in an "earnings recession" throughout 2022. Guidance for Q4'22 is far from falling off a cliff. This series demonstrates the richness and the intuitiveness of insights that could be surfaced algorithmically from textual data.

**October 2022: Hanging on Every Negative Word: Natural Language Processing Analysis of Credit Rating Action Reports**

Credit ratings are opinions about credit risk. When a credit rating changes, the analyst explains why, in a report. The 'why' is important. For an equity investor, a downgrade due to a rapid decline in a company's sales has a negative implication, whereas a downgrade due to an increase in leverage arising from a share buyback program may be viewed as positive. This study finds that the relative size of the price impact following a downgrade is dependent on the magnitude of the tone and the topics of focus in the report (Figure 1). Downgrades with strong negative sentiment underperform downgrades with positive sentiment by 2.7% over the following month.

**March 2022: The Sounds of Silence: No Response Speaks Volumes**

No simple remedy for gender discrimination exists. But the first step in solving any problem is collecting the data to understand it. This research shows firms that share their data on diversity, equity, and inclusion (DEI) have taken further steps to address gender equity concerns. The S&P Global Corporate Sustainability Assessment (CSA) is a premier benchmarking survey and litmus test for inclusion in the S&P Dow Jones Sustainability Index. Firms that participated in the CSA survey in 2021 had better DEI outcomes.

**October 2021: Glass Floors and Ceilings: Why Closing the Median Wage Gap Isn't Fair**

The gender wage gap describes the disparity in compensation between women and men doing the same work. Progress on this issue is commonly measured by comparing the median compensation for women to men. This research demonstrates that firms are catering to the focus on median compensation and are paying women in a tighter range around the median, compared to men in equivalent positions. Effectively, women have been given a glass floor as redress for the still-present glass ceiling. This 'Gender-Based Compensation Management' not only undermines the goal of equitable pay; but because the high end of the compensation range can be much farther from the median than the low end, this paradigm is a net disadvantage for women.

**September 2021: The Board Matrix: The (ESG) Value of Well-Connected Directors**

Corporate boards are responsible for shaping and overseeing environmental, social and governance (ESG) policies for their organizations. This report examines the relationship between companies connected through shared board members and ESG performance. It finds that companies with strong board networks (companies with directors who serve on more than one corporate board or are well-connected) have better certain ESG outcomes than firms with weak board networks. Well-connected directors can utilize their network for information on emerging ESG trends/best practices and share this knowledge with their companies. Given their roles on multiple boards, well-connected directors are also better informed about the needs of different stakeholders (governments, communities, ESG activists) than directors with little or no network. This awareness of stakeholder management translates to better ESG performance for companies with well-connected directors.

**August 2021: Technology Momentum: Peer Networks from Patents**

Companies with similar patent portfolios exhibit peer group momentum. A strategy that buys (sells) stocks of focal companies in the Russell 3000 with outperforming (underperforming) technology peers produces an annualized risk-adjusted return of 5.23% in a historical backtest. The strategy returns are more pronounced for smaller companies. In the Russell 2000, the strategy demonstrates more efficacy with annualized long-short return of 7.32%. The strategy is distinct from sector momentum strategies. After controlling for sector momentum, 3.60% excess return in the Russell 3000 can be attributed to technology peer group momentum.

**July 2021: Branching Out: Graph Theory Fundamentals**

Investment analysis has evolved beyond financial data to non-financial, or alternative data. Typically, the focus has been on using alternative datasets that are purely time-series and tabular. Graph networks meanwhile offer investors the ability to gain deeper insights into the connections between economies, industries, and individual corporations.

**May 2021: U.S Filings: No News is Good News**

Company annual filings are a vital but often under-analyzed source of information for investors. Market moving content is buried within an ever-growing body of text that on average is equivalent to a 240-page novel. The filings contain subtle revisions making a computational linguistic approach imperative. Faced with this voluminous amount of text and the minute number of changes, investors have historically overlooked the newly embedded information and the implications of those additions.

**March 2021: Hiding in Plain Sight – Risks That Are Overlooked**

This report uses three metrics (Minimum Edit Distance, Jaccard Similarity, and Cosine Similarity) to identify companies that made significant changes to the “Risk Factors” section of their filings. These metrics can serve as alpha signals or be used to quickly identify a pool of companies that require further investigation.

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