# Predictability of Industry Momentum Portfolio Returns

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**Abstract :** The paper examines whether the returns of industry portfolios predict industry momentum portfolio returns. The results show a significant number of industry returns, including entertainment, medical equipment, and precious metals, forecast the industry momentum portfolios. To find industry momentum portfolios based on recent past are more predictable than those based on intermediate horizon past performance. Tests of economic significance show that the predictability of industry momentum returns is economically significant.

Keywords: Momentum; Predictability; Financial markets *JEL classifications:* G10; G12; G19

## 1. Introduction

Industry momentum strategies, which buy stocks from past winning industries and sell stocks from past losing industries, differ from individual stock momentum strategies formed from screening individual stocks. While the literature on momentum is extensive, only a handful of published studies focus specifically on industry momentum.Moskowitz and Grinblatt (1999) provide the seminal article on industry momentum. They show that industry momentum investment strategies, which buy stocks from past winning industries and sell stocks from past losing industries, are highly profitable, even after controlling for conventional control measures constructed using the entire cross section of US stock returns, such as size, book-to-market equity, individual stock momentum, the cross-sectional dispersion in mean returns, and potential microstructure influences. They show that the strong and prevalent momentum effect in industry components of stock returns accounts for much of the individual stock momentum anomaly. In addition, they demonstrate that traditional individual stock momentum investment strategies, which buy past winning stocks and sell past losing stocks, are significantly less profitable once they control for industry momentum. More recently, Behr, Guettler and Truebenbach (2012) show that enhancing portfolios with industry momentum exposure improves performance. They compare their industry momentum exposure enhanced portfolios to 14 well-known benchmarks and find that it substantially improves the performance of the benchmarks in terms of Sharpe Ratios and certainty equivalents. They further find that their proposed policies are particularly suitable for investors because portfolio turnover is only moderately increased compared to standard minimum-variance portfolios. Su (2011) documents significant abnormal profits for industry momentum strategies in Chinese stock markets. Ji and Giannikos (2010) examine industry momentum on a global basis. Their results show that industry momentum is profitable around the globe for various ranking and holding periods. They also find that the profits are larger in January than in other months.Gupta, Locke, and Scrimgeour (2010) using a large sample of stocks drawn from multiple countries covering a quarter of century to 2007 find that the industry momentum strategy generate positive returns. Giannikos and Ji (2007) using a large dataset covering the US and 37 international countries show that industry momentum earns significant profits worldwide and the profits are larger in January than in non-January

months. Furthermore, using portfolios generated from two-way sorts, they provide evidence that industry and individual stock momentum are independent of each other. Pan, Liano and Huang (2004) using weekly US stock returns from 1962–1998, find that industry momentum strategies can generate significant, positive profits, especially for short horizons (less than 4 weeks).

Kang and Kwon (2017) they used 6 commodity futures markets including US, China, UK, Japan, India countries and global international commodity, combination portfolios ranking periods (J) of 1,3,6,9 and 12 months, and holding periods (K) of 1,3,6 and 12 months. The significant involve 12/6 and 12/12 momentum strategies. There are include 2 items: (1) the momentum returns can predict economic busy cycle: GDP growth rate. (2) the momentum factor variable cannot be predictable by risk factors: market dividend yield (DIV), default spread (DEF), term spread (TERM)and three months yield rate(YLD). Meanwhile Andrei and Cujean (2017) applied the word-of-mouth communication spread speed ratio into the rational expectations model, the more portion can be explaining the trading by momentum strategy. The news includes the private and public information.

Recently, Dahlquist and Hasseltoft(2019) utilitied the momentum strategy into international currency market the sample period from January 1976 to March 2017,21 counties, to buy(long) the strong currency then sell(short) the weak currency by every 1 month from lookback period in short -term(1-12 month) ,medium-term(13-36 month),long-term(37-60 month)

Knowing that a particular investment strategy is profitable is different from knowing whether the returns of the portfolios formed using the strategy is predictable. None of the existing studies on industry momentum focus specifically on analyzing whether the returns of the portfolios formed using the various industry momentum strategies can be predicted. Knowing whether the returns from a particular investment strategy are predictable is important for investors since it can aid in their asset allocation and/or market timing decisions. For example, if the returns from a industry momentum strategy are predictable, investors can allocate more of their assets to portfolios constructed following that particular industry momentum strategy when their returns are predicted to be higher and less to these portfolios when their returns are predicted to be lower.

In this study, we examine whether the returns of industry portfolios (or industry returns) predict industry momentum portfolio returns. We also compare the predictability characteristics of three different variants of industry momentum strategies discussed in the literature. In addition, we provide a few tests regarding the economic significance of the documented predictability. We uncover several findings. A significant number of industry returns, including entertainment, medical equipment, and precious metals, forecast the industry momentum portfolios. Industry momentum portfolios based on recent past are more predictable than those based on intermediate horizon past performance. Finally, tests of economic significance show that the predictability of industry momentum portfolio returns is economically significant.

The remainder of the paper is organized as follows. Section 2 describes the methodology. Section 3 provides the theoretical background. Section 4 describes the data. Section 5 presents the results. Section 6 concludes.

**2. Methodology**

The paper construct our industry momentum strategies based on the past returns of the Fama-French 49 industries. Specifically, we use the Fama-French 49 industries as the investment opportunity set and construct industry momentum strategies each month by buying winners and selling losers based on past performance of the Fama-French 49 industries, where winners and losers are defined as the upper and lower terciles, of cumulative returns over a test period of the Fama-French 49 industries. The *n-m* strategy is defined as portfolios sorted on cumulative returns $r_{n,m}$ from *n* to *m* months (inclusive) prior to portfolio formation. In this paper for ease of exposition we will let $MOM_{n-m}$ denote both the *n-m* strategy and its return series. The momentum strategies analyzed in this study are equal-weighted portfolios. The paper analyze the predictability of three different industry momentum strategies, $MOM_{6-2}$, $MOM_{9-4}$, and $MOM_{12-7}$, formed by sorting on recent, semi-intermediate, and intermediate horizon past performance ($r_{6,2}$, $r_{9,4}$, and $r_{12,7}$, respectively).The $MOM_{6-2}$ strategy corresponds to the commonly studied conventional momentum strategy analyzed in the literature that ranks stocks based on cumulative returns from 6 to 2 months (inclusive) prior to portfolio formation (Jegadeesh and Titman (1993), for example). The $MOM_{12-7}$ strategy corresponds to the intermediate horizon momentum strategy proposed by Novy-Marx (2012) which ranks stocks based on cumulative returns from 12 to 7 months (inclusive) prior to portfolio formation. For US stocks Novy-Marx (2012) shows that intermediate horizon momentum strategy produces significantly higher average returns than the conventional momentum strategy based on recent past performance. To keep the number of strategies under consideration manageable, we fix the holding period at one month.

**3. Theoretical background**

Several previous studies have confirmed that some industry portfolios appear to be able to forecast the aggregate stock market (Eleswarapu and Tiwarti (1996); Pollet (2002); Hong, Torous, and Valkanov (2007). The various industry momentum portfolios analyzed in this study can be considered as transformed subsets of the aggregate stock market portfolio, constructed from defined fixed rule selection processes based on expected conditional projections of the information reflected in the history of all industries in the market portfolio. As such, just as industry portfolios can forecast the aggregate stock market, Hypothesize that they may likewise be able to forecast returns from the various industry momentum strategies analyzed in this study. In other words, at any point in time, existence of industry portfolios that forecast the aggregate stock market portfolio implies that there should exist industry portfolios that forecast industry momentum portfolios (which are transformed subsets of the market portfolio), though they may not necessarily the same industries as those that forecast the market returns.

**4. Data**

The data used in this covers the sample period from January 1945 through December 2016. The paper consider equal-weighted strategy returns and construct industry momentum strategies based on recent,

semi-intermediate, and intermediate horizon past performance ( $MOM_{6-2}$, $MOM_{9-4}$, and $MOM_{12-7}$ ) using the Fama-French 49 industries. The paper construct the strategies using all available data, employing returns starting from January 1945.

In addition to the industry returns, we use several other variables. Table 1 presents a summary of the variables used in this study. In Panel A, the variables are the returns of the forty-nine industry portfolios. In Panel B, MP_6_2, MP_9_4, and MP_12_7 denote the returns from the $MOM_{6,2}$, $MOM_{9,4}$, and $MOM_{12,7}$ strategies, respectively. RM is the CRSP value-weighted market portfolio return in excess of the risk-free rate.INF is the CPI inflation rate. DSPR is the default spread between BAA-rated and AAA-rated bonds is the dividend yield of the S&P 500 market index from Shiller (1989). TERM is the term spread between the 10-year Note and the three-month T-bill. FFR is the federal funds rate. MVOL is the market volatility. IPG is industrial production growth. IPD is industrial production. SWD is the Stock and Watson (1989) coincident index of economic activity and USCI is the U.S. Coincident Index constructed by Economic Cycle Research Institute (ECRI). All variables are from January 1946, except for TERM and FFR, which are from July 1954, IPG which is from February 1946, SWG which is from February 1959 to June 2016, and USCI which is from January 1949. The data are at monthly frequency and in monthly percentage points.

The summary statistics for the mean momentum returns show that none of the momentum strategies produce mean returns higher than RM. We double check the accuracy of our computed industry momentum returns by comparing our results with those computed by Novy-Marx (2012). The paper find that they are reasonably close. Novy-Marx computes the mean return for his MP_12_7 as 0.57 and MP_6_2 as 0.27 using his sample period. The mean return we compute using our sample period for MP_12_7 is 0.491 and MP_6_2 is 0.242. Our results confirm that none of these Novy-Marx industry momentum portfolios produce mean returns higher than RM. However, a simple transformation by dividing these momentum returns by their corresponding standard deviations shows that the MP_12_7 gives a higher sharp ratio than that of RM. Whether a particular momentum strategy outperforms the RM portfolio under a particular measure will not affect our conclusions regarding their relative predictability. We provide the descriptive statistics for these momentum portfolios for the sake of completeness and we should not let these results distract from the focus of this study. These descriptive statistics should, however, serve as a reminder for investors that many of the momentum strategies discussed in the literature may actually generate less average returns than RM prior to some sort of risk adjustment (i.e. sharp measure) transformation.

## 5. Results

### *5.1. Predictive regressions*

We begin by exploring the ability of industry returns and other variables to predict returns from the various momentum strategies. We estimate the following specification separately for each of the forty-nine industry portfolios:[1]

[1] Alternatively, rather than investigating whether different industries lead the market separately, we can modify equation (1) by simultaneously including all 49 industry returns. This alternative is discussed in more detail in the robustness tests section. In this section our goal is to get a gauge on which of the 49 industries have ability

$$MOM_{n,m} = \alpha_i + \lambda_i R_{i,t-1} + A_i Z_{z-1} + \varepsilon_{i,t}, \qquad (1)$$

where $MOM_{n,m}$ is the return of industry momentum (n, m) strategy in month $t$. $R_{i,t-1}$ is the excess return of industry portfolio $i$ lagged one month, and $Z_{t-1}$ is a vector of additional variables. The vector $Z_{t-1}$ includes a number of well-known market predictors. They include, for example, inflation (Fama and Schwert, 1977), the default spread (Fama and French, 1989), and the market dividend yield (Campbell and Shiller, 1988).

The results shown on Table 2 give us an idea of how many of these industries have ability to predict the returns from the various momentum strategies. Our regression specification includes a constant, the lagged one-month industry return, lagged one-month RM, and the control variables INF, DSPR, MDY, MVOL, TERM, FFR (all lagged by one month). For clarity of exposition, we report just the coefficient of the lagged one-month industry return along with its statistical significance, rather than report the coefficient of each of the independent variables for every one of the 49 industries. The standard errors shown on the table are formulated to account for correlation of the residuals across the 49 industry returns at a point in time as well as for serial correlation (Hayashi, 2000; Vuolteenaho (2002); and Rogers (1993)).

The dependent variables corresponding to the three main columns in the table are the next month's return from the three momentum strategies, $MOM_{6,2}$, $MOM_{9,4}$, and $MOM_{12,7}$, respectively. Industries that significantly predict momentum returns are denoted by asterisks. There are four industries including entertainment (Fun), medical equipment (MedEq), gold (Gold) and real estate (RlEst) with coefficients of the corresponding lagged industry return that are significant at the 5% level. Two additional industries, toys (Toys) and books (Books), have coefficients that are significant at the 10% level. Altogether, there are a total of six industries that can predict at the 10% level of significance the various momentum returns. The $MOM_{9,4}$ portfolio is predictable by the most number of industries. A total of five different industries show ability to predict the returns produced by this portfolio. Three industries show ability to predict the returns produced by the $MOM_{6,2}$ portfolio. Two industries show ability to predict the returns produced by the $MOM_{12,7}$ portfolio. Of the various industries, medical equipment shows the strongest ability to predict momentum returns, predicting all three momentum portfolios at the 5% level. In comparison, entertainment and gold was only able to predict the $MOM_{9,4}$ portfolio at the 5% level. Real estate was only able to predict the $MOM_{6,2}$ portfolio at the 5% level.[2]

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to predict the returns of the various industry momentum strategies. Also, it turns out that our conclusions are not significantly affected by whether we run the forecasting regressions separately or by pooling all the lagged industry returns. So for clarity of exposition and sake of precision, we present the results using equation (1) here and discuss the results when we pool all the industries into one regression in the robustness tests section later in the paper.

[2] We also run a joint test (results not shown) of the null hypothesis that all the $\lambda_i$'s are equal to zero $(\lambda_1 = \lambda_2 = \cdots = \lambda_{49} = 0)$ for each of the three momentum strategies by stacking the regressions given by (1) into a

Except for books, the lagged returns of the remaining five industries that significantly predict momentum returns are positively related to next period's momentum return. In as much as momentum returns reflect economic health, the signs on the predictability coefficients for several of these industries that predict momentum returns also seem to make economic sense. For example, entertainment, medical equipment, and real estate are sectors that, when they are booming, are generally thought to be signs of a thriving economy. This suggests that these predictive regressions maybe capturing the slow diffusion of industry sector information into stocks in the broad market, which in turn affects industry momentum portfolio returns since the industry momentum portfolios analyzed in this study are transformed subsets of the aggregate stock market portfolio, constructed from defined fixed rule selection processes based on expected conditional projections of the information reflected in the past history of all industries in the market portfolio and not from a particular industry.

***5.2. Tests of economic significance***

In Table 3 we compare the forecasting power of industry returns to gauge the economic relevance of our findings. To do so, we construct a measure of "Economic Significance" as the response of the return from a particular momentum strategy to a two-standard-deviation shock of the corresponding industry return using the point estimates equation (1). In the table, the upper and lower bounds shown in parentheses below the economic significance measures are computed by using the standard errors of the coefficient estimates of Table 1. The "Absolute relative significance" is the absolute value from dividing "Economic Significance" by the standard deviation of the return from a particular momentum strategy. Table 3.1, Table 3.2, and Table 3.3 present the results for MP_6_2, MP_9_4, and MP_12_7, respectively. The industries listed on the tables are those that have statistically significant ability to predict momentum returns in Table 1. In each of the tables, the most economically significant industry is listed first, the second most economically significant industry is listed next, and so on, in descending order.

The results show that of the industries showing statistically significant ability to predict momentum returns, MedEq and Fun among the leaders in terms of economic significance. This was true for all three momentum strategies. MedEq, for example, is very significant in predicting all three momentum returns, with a two-standard-deviation shock in its returns resulting in a movement of MP_6_2 returns that is 4.05 of MP_6_2 volatility, a movement of MP_9_4 returns that is 3.96 of MP_9_4 volatility, and a movement of MP_12_7 returns that is 3.67 of MP_12_7 volatility. For predicting the momentum returns from MP_9_4, the most economically significant industry is Fun, with a two-standard-deviation shock in its returns resulting in a movement of MP_9_4 returns that is 23.9% of MP_9_4 volatility. For predicting MP_6_2 and MP_12_7,

GMM system and then calculating the Wald test of the joint significance of the coefficients. The Wald tests reject the null hypothesis that all the λ_i's are equal to zero at less than the 1% level of significance for $MOM_{6,2}$ and $MOM_{9,4}$ strategies, and at less than the 5% level of significance for the $MOM_{12,7}$ strategy. The results are similar to those reported in the robustness tests section discussed later that runs an augmented version of equation (1) that simultaneously include all 49 industry returns as independent variables. For clarity of exposition, the joint test results of the later specification are discussed in more detail along with other issues in the robustness tests section.

MedEq is the most economically significant industry. The results reveal general pattern of declining predictability in the momentum returns, from MP_6_2 to MP_9_4 to MP_12_7, with the near horizon momentum portfolio MP_6_2 being more predictable than the intermediate horizon portfolio MP_12_7.

***5.3. Robustness tests***

As a robustness check, we forecast the various momentum portfolios using all industry returns simultaneously along with the control variables specified in the previous tables. Table 4 presents the results of forecasting the returns from the various momentum portfolios in month $t$ using all industry portfolio returns at month $t-1$ and other information available at month $t-1$. The control variables are lagged RM, INF, DSPR, MDY, and MVOL. For each of the three momentum portfolios, we test three hypotheses. The first hypothesis is whether the coefficients on the lagged industry returns are jointly zero. The second hypothesis is whether the coefficients on the other lagged control variables are jointly zero. The third hypothesis is whether the coefficients on the lagged industry returns and the lagged controls are jointly zero. The Wald-tests and P-values use the Newey-West serial correlation and heteroskedasticity robust standard errors calculated with three monthly lags.

The first row of Panel A shows that we can strongly reject the null that industry returns jointly do not forecast momentum returns at the 1% level MP_6_2 and MP_9_4. For MP_12_7, it is rejected at the 5% level. The second row of Panel A shows the results for testing the null hypotheses that the control variables jointly do not forecast the various momentum portfolio returns. For MP_6_2 and MP_9_4, we can reject these null hypotheses at the 5% level. For MP_12_7, it is rejected at the 10% level. The third row of Panel A reports the results for testing the null hypotheses that all industry returns and all control variables do not jointly forecast the various momentum portfolio returns. The results are similar to those for the first hypothesis in that we can reject that these variables do not jointly have forecasting power for MP_6_2 and MP_9_4 at the 1% level, and MP_12_7 at the 5% level.

Panel B reports the regression coefficient and P-values associated with the MedEq industry from three different forecasting specifications. The first row of Panel B presents the estimated coefficient associated with MedEq when the various momentum returns are forecasted using all industries in the regression. For MP_6_2 it is positive and statistically significant at the 1% level. For MP_9_4 and MP_12_7 this coefficient is positive and statistically significant at the 5% level. The second row of Panel B shows the results for the MedEq coefficient when the various momentum returns are forecasted using only MedEq industry plus all control variables. The results for this specification are similar to the previous regressions using all industry returns. For MP_6_2 it is positive and statistically significant at the 1% level. For MP_9_4 and MP_12_7 the coefficient is positive and statistically significant at the 5% level. The third row of Panel B shows the results for the MedEq coefficient when the various momentum returns are forecasted using all industries and all control variables in the regression. Under this specification, the MedEq coefficient is positive and statistically significant at the 5% level for all three momentum returns.

The results of Table 4 confirm the overall pattern concerning the predictability of the different momentum portfolios uncovered in the previous tables. Predictability decreases as we move from short-term momentum (MP_6_2) to intermediate-term momentum (MP_12_7). This was true for all three hypotheses test

specifications examined in Panel A. This pattern also appears when examining the coefficient associated with the MedEq industry in the three regressions specifications of Panel B, with the coefficient being more statistically significant in the short-term momentum (MP_6_2) regressions and less statistically significant in the intermediate-term momentum (MP_12_7) regressions.

**6. Conclusion**

This study uncovers several findings concerning the predictability of the returns from industry momentum strategies. To find that industry returns can predict the returns from industry momentum strategies. A significant number of industry returns, including entertainment, medical equipment, and precious metals, forecast the industry momentum portfolios. Of these, medical equipment seems to be the most powerful and robust in that it was shown to be able to forecast all three momentum portfolios of this study, from near horizon momentum portfolios to intermediate horizon momentum portfolios. Using a battery of measures and methodologies, we find conventional near horizon industry momentum strategies (i.e. MP_6_2) to be more predictable than intermediate horizon industry momentum strategies (i.e. MP_12_7). That is, industry momentum portfolios based on recent past are more predictable than those based on intermediate horizon past performance. Finally, the tests of economic significance show that industry returns are economically significant leading indicators of the returns from industry momentum strategies.

The results concerning the predictability characteristics of the returns from industry momentum strategies are important for investors. Understanding that the industry momentum portfolios can be predicted facilitates the design of more profitable strategies. Future research can include looking for other assets or measures that can be used to predict momentum portfolios.

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**Table 1:** Summary statistics

The table presents summary statistics of the variables of interest. In Panel A, the variables are the returns of the forty-nine industry portfolios. In Panel B, MP_6_2, MP_9_4, and MP_12_7momentum profits definite by Novy-Marx(2012) short and intermediate term.RM is the CRSP value-weighted market portfolio return in excess of the risk-free rate. INF is the CPI inflation rate. DSPR is the default spread between BAA-rated and AAA-rated bonds. MDY is the dividend yield of the market portfolio. TERM is the term spread between the 10-year Note and the three-month T-bill. FFR is the federal funds rate. MVOL is the market volatility. IPG is industrial production growth, IPD is industrial production, SWD is the Stock and Watson (1989) coincident index of economic activity and USCI is the U.S. Coincident Index constructed by Economic Cycle Research Institute (ECRI). All variables are from January 1946, except for TERM and FFR, which are from July 1954, IPG which is from February 1946, SWG which is from February 1959 to June 2016 and USCI which is from January 1949. The data are at monthly frequency and in monthly percentage points.

**Panel A**: Industry Portfolio Returns

| Industry | Mean | Std.dev. | Industry | Mean | Std.dev. | Industry | Mean | Std.dev. |
|---|---|---|---|---|---|---|---|---|
| Agric | 0.654 | 7.994 | Cnstr | 0.720 | 8.878 | Hardw | 0.953 | 7.909 |
| Food | 0.726 | 5.263 | Steel | 0.601 | 8.700 | Softw | 0.519 | 13.946 |
| Soda | 0.811 | 8.319 | FabPr | 0.254 | 9.294 | Chips | 0.802 | 8.442 |
| Beer | 0.739 | 6.438 | Mach | 0.701 | 7.330 | LabEq | 0.865 | 7.881 |
| Smoke | 0.981 | 7.211 | ElcEq | 0.925 | 7.618 | Paper | 0.722 | 6.828 |
| Toys | 0.653 | 9.101 | Autos | 0.705 | 8.079 | Boxes | 0.791 | 6.271 |
| Fun | 0.937 | 9.256 | Aero | 0.923 | 8.383 | Trans | 0.628 | 6.581 |
| Books | 0.653 | 7.526 | Ships | 0.576 | 8.051 | Whlsl | 0.678 | 6.323 |
| Hshld | 0.712 | 5.944 | Guns | 0.707 | 8.533 | Rtail | 0.718 | 5.924 |
| Clths | 0.651 | 7.525 | Gold | 0.777 | 13.010 | Meals | 0.829 | 6.926 |
| Hlth | 0.633 | 10.776 | Mines | 0.792 | 8.244 | Banks | 0.707 | 6.525 |
| MedEq | 0.885 | 7.113 | Coal | 1.257 | 11.210 | Insur | 0.687 | 6.640 |
| Drugs | 0.852 | 6.383 | Oil | 0.884 | 6.525 | RlEst | 0.438 | 8.670 |
| Chems | 0.689 | 6.651 | Util | 0.583 | 4.858 | Fin | 0.853 | 6.830 |
| Rubbr | 0.759 | 7.373 | Telcm | 0.516 | 5.383 | Other | 0.417 | 7.569 |
| Txtls | 0.630 | 8.534 | PerSv | 0.518 | 8.284 | | | |
| BldMt | 0.691 | 7.213 | BusSv | 0.596 | 6.786 | | | |

**Panel B**: Other Variables

| Variable | Mean | Std.dev. | Variable | Mean | Std.dev. | Variable | Mean | Std.dev. |
|---|---|---|---|---|---|---|---|---|
| MP_12_7 | 0.491 | 3.673 | DSPR | 0.088 | 0.043 | IPG | 0.282 | 1.302 |
| MP_9_4 | 0.383 | 3.960 | MDY | 0.330 | 0.136 | SWG | 0.275 | 1.064 |
| MP_6_2 | 0.242 | 4.050 | MVOL | 4.303 | 2.550 | USCI | 3.021 | 4.329 |
| RM | 0.646 | 5.308 | TERM | 0.134 | 0.117 | | | |
| INF | 0.361 | 0.528 | FFR | 0.501 | 0.332 | | | |

**Table 2:** Predictive regressions involving various industry and industry momentum portfolio returns
This table presents forecasts of the industry momentum portfolio returns using various industry portfolio returns (separately) for different momentum strategies (MP_6_2, MP_9_4, and MP_12_7). The other forecasting variables lagged RM, INF (the CPI inflation rate), DSPR (the default spread between BAA-rated and AAA-rated bonds), MDY (the dividend yield of the market portfolio), and market volatility (MVOL). We only report the coefficients in front of the lagged industry return. The coefficients are estimated using GMM. The standard errors (used in the computation of t-statistics) are Newey-West serial correlation and heteroskedasticity corrected using three monthly lags. The sample period is January 1945-December 2016. *Significant at 10% level. **Significant at 5% level.

| | MP_6_2 | | MP_9_4 | | MP_12_7 | |
|---|---|---|---|---|---|---|
| Industry | IND(-1) | $R^2$ | IND(-1) | $R^2$ | IND(-1) | $R^2$ |
| Agric | -0.019 | 0.028 | -0.020 | 0.017 | -0.027 | 0.006 |
| | (-0.77) | | (-0.36) | | (-1.24) | |
| Food | 0.050 | 0.029 | 0.021 | 0.016 | 0.014 | 0.003 |
| | (0.93) | | (0.36) | | (0.27) | |
| Soda | 0.028 | 0.027 | 0.026 | 0.015 | -0.011 | 0.004 |
| | (0.87) | | (0.77) | | (-0.37) | |
| Beer | 0.038 | 0.029 | 0.030 | 0.017 | 0.025 | 0.004 |
| | (1.19) | | (0.90) | | (0.75) | |
| Smoke | 0.023 | 0.029 | 0.027 | 0.017 | -0.012 | 0.004 |
| | (0.85) | | (0.96) | | (-0.40) | |
| Toys | 0.033 | 0.031 | 0.030 | 0.017 | 0.007 | 0.003 |
| | (1.53) | | (1.64)* | | (0.32) | |
| Fun | 0.047 | 0.033 | 0.053 | 0.020 | 0.035 | 0.007 |
| | (1.79)* | | (1.97)** | | (1.41) | |
| Books | -0.006 | 0.027 | -0.048 | 0.019 | -0.006 | 0.002 |
| | (-0.19) | | (-1.62)* | | (-0.19) | |
| Hshld | 0.071 | 0.032 | 0.036 | 0.016 | 0.011 | 0.002 |
| | (1.59) | | (0.75) | | (0.28) | |
| Clths | -0.026 | 0.028 | -0.040 | 0.017 | -0.018 | 0.004 |
| | (-0.72) | | (-1.10) | | (-0.56) | |
| Hlth | 0.009 | 0.025 | -0.001 | 0.016 | 0.009 | 0.004 |
| | (0.29) | | (-0.04) | | (0.37) | |
| MedEq | 0.074 | 0.036 | 0.065 | 0.020 | 0.050 | 0.007 |
| | (2.59)** | | (2.47)** | | (2.31)** | |
| Drugs | 0.050 | 0.030 | 0.048 | 0.019 | 0.019 | 0.004 |
| | (1.24) | | (1.38) | | (0.64) | |
| Chems | -0.048 | 0.029 | -0.022 | 0.016 | -0.018 | 0.004 |
| | (-0.94) | | (-0.46) | | (-0.41) | |
| Rubbr | 0.038 | 0.030 | 0.015 | 0.016 | -0.007 | 0.003 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (1.21) | | (0.54) | | (-0.29) | |
| Txtls | 0.014 | 0.028 | -0.007 | 0.016 | -0.017 | 0.004 |
| | (0.52) | | (-0.33) | | (-0.75) | |
| BldMt | 0.009 | 0.027 | -0.030 | 0.016 | -0.017 | 0.004 |
| | (0.20) | | (-0.80) | | (-0.45) | |
| Cnstr | 0.007 | 0.027 | -0.014 | 0.016 | -0.003 | 0.003 |
| | (0.22) | | (-0.55) | | (-0.10) | |
| Steel | -0.004 | 0.027 | 0.025 | 0.017 | 0.019 | 0.004 |
| | (-0.15) | | (0.93) | | (0.66) | |
| FabPr | -0.024 | 0.029 | -0.003 | 0.013 | -0.009 | 0.005 |
| | (-0.77) | | (-0.10) | | (-0.37) | |
| Mach | -0.034 | 0.028 | -0.007 | 0.016 | -0.019 | 0.004 |
| | (-0.84) | | (-0.20) | | (-0.68) | |
| ElcEq | 0.029 | 0.028 | -0.010 | 0.016 | 0.051 | 0.007 |
| | (0.68) | | (-0.22) | | (1.48) | |
| Autos | 0.022 | 0.028 | -0.006 | 0.016 | -0.038 | 0.007 |
| | (0.58) | | (-0.15) | | (-1.34) | |
| Aero | 0.024 | 0.029 | -0.004 | 0.016 | 0.003 | 0.002 |
| | (0.92) | | (-0.15) | | (0.50) | |
| Ships | 0.010 | 0.027 | 0.032 | 0.018 | 0.030 | 0.005 |
| | (0.28) | | (1.12) | | (1.04) | |
| Guns | -0.032 | 0.030 | -0.025 | 0.015 | -0.020 | 0.004 |
| | (-1.09) | | (-0.96) | | (-0.78) | |
| Gold | 0.011 | 0.028 | 0.028 | 0.020 | 0.024 | 0.005 |
| | (0.78) | | (2.05)** | | (1.83)* | |
| Mines | 0.002 | 0.027 | 0.027 | 0.017 | 0.029 | 0.006 |
| | (0.06) | | (1.09) | | (1.38) | |
| Coal | 0.021 | 0.030 | 0.020 | 0.018 | 0.017 | 0.005 |
| | (0.88) | | (0.81) | | (1.00) | |
| Oil | -0.033 | 0.029 | -0.029 | 0.017 | -0.007 | 0.003 |
| | (-1.07) | | (-0.87) | | (-0.22) | |
| Util | -0.026 | 0.028 | -0.069 | 0.020 | -0.047 | 0.005 |
| | (-0.49) | | (-1.44) | | (-0.99) | |
| Telcm | -0.063 | 0.031 | -0.045 | 0.017 | 0.002 | 0.003 |
| | (-1.19) | | (-1.08) | | (0.48) | |
| PerSv | -0.011 | 0.028 | -0.034 | 0.019 | -0.030 | 0.005 |
| | (-0.46) | | (-1.34) | | (-1.32) | |
| BusSv | 0.023 | 0.028 | 0.013 | 0.016 | 0.029 | 0.004 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (0.65) | | (0.36) | | (0.84) | |
| Hardw | 0.023 | 0.028 | 0.033 | 0.018 | -0.019 | 0.003 |
| | (0.87) | | (1.09) | | (-0.89) | |
| Softw | 0.022 | 0.032 | 0.013 | 0.016 | 0.025 | 0.004 |
| | (1.03) | | (0.53) | | (1.63) | |
| Chips | 0.005 | 0.027 | 0.022 | 0.017 | 0.023 | 0.004 |
| | (0.20) | | (0.89) | | (0.95) | |
| LabEq | -0.024 | 0.028 | -0.021 | 0.016 | -0.041 | 0.003 |
| | (-0.81) | | (-0.73) | | (-0.43) | |
| Paper | -0.004 | 0.027 | -0.021 | 0.016 | -0.036 | 0.005 |
| | (-0.12) | | (-0.77) | | (-1.30) | |
| Boxes | 0.001 | 0.027 | -0.017 | 0.016 | -0.021 | 0.004 |
| | (0.00) | | (-0.39) | | (-0.55) | |
| Trans | -0.006 | 0.027 | -0.023 | 0.016 | -0.017 | 0.004 |
| | (-0.18) | | (-0.65) | | (-0.44) | |
| Whlsl | 0.023 | 0.028 | 0.011 | 0.016 | 0.037 | 0.004 |
| | (0.50) | | (0.43) | | (1.31) | |
| Rtail | 0.009 | 0.027 | -0.011 | 0.016 | -0.013 | 0.003 |
| | (0.22) | | (-0.29) | | (-0.33) | |
| Meals | 0.029 | 0.028 | 0.016 | 0.016 | 0.011 | 0.003 |
| | (0.87) | | (0.51) | | (0.33) | |
| Banks | 0.009 | 0.027 | -0.018 | 0.016 | -0.043 | 0.005 |
| | (0.24) | | (-0.49) | | (-0.43) | |
| Insur | -0.020 | 0.028 | -0.038 | 0.018 | -0.041 | 0.006 |
| | (-0.70) | | (-1.40) | | (-1.51) | |
| RlEst | 0.036 | 0.032 | 0.023 | 0.017 | 0.011 | 0.004 |
| | (2.03)** | | (1.22) | | (0.58) | |
| Fin | -0.034 | 0.029 | -0.013 | 0.016 | -0.032 | 0.004 |
| | (-0.58) | | (-0.25) | | (-0.33) | |
| Other | -0.001 | 0.027 | 0.001 | 0.047 | -0.021 | 0.004 |
| | (-0.01) | | (0.13) | | (-0.80) | |

**Table 3.1:** Industry predictive regressions--economic significance (MP_6_2)
In Panel A, the column "Economic Significance" computes the response of the near horizon industry momentum portfolio returns (MP_6_2) to a two-standard- deviation shock of the corresponding industry return using the point estimates from equation (1). Lower and upper bounds are given in parentheses below. The column "Absolute relative significance" computes the absolute value from dividing "Economic significance" by the standard deviation of MP_6_2 returns. Same calculations are done for the other MP_6_2 predictors in Panel B.

| Industry | Economic significance | Absolute relative significance | Industry | Economic significance | Absolute relative significance |
|---|---|---|---|---|---|
| Panel A: By industries | | | | | |
| EX_MedEq | 0.967 | 0.239 | EX_Toys | 0.592 | 0.147 |
| | (0.023, 0.147) | | | (-0.009, 0.091) | |
| EX_Fun | 0.842 | 0.208 | EX_Books | -0.178 | -0.044 |
| | (-0.004, 0.117) | | | (-0.071, 0.059) | |
| EX_RlEst | 0.664 | 0.164 | EX_Gold | 0.292 | 0.072 |
| | (0.003, 0.085) | | | (-0.020, 0.048) | |
| Panel B: By other MP predictors | | Economic significance | | Absolute relative significance | |
| RM(-1) | | -1.541 | | -0.381 | |
| | | (-0.285, -0.079) | | | |
| INF(-1) | | -0.097 | | -0.024 | |
| | | (-0.564, 0.354) | | | |
| DSPR(-1) | | -0.676 | | -0.167 | |
| | | (-18.174, -0.117) | | | |
| MDY(-1) | | -0.330 | | -0.082 | |
| | | (-3.422, 0.628) | | | |
| MVOL(-1) | | -0.648 | | -0.160 | |
| | | (-0.340, 0.047) | | | |

**Table 3.2:** Industry predictive regressions--economic significance (MP_9_4)
In Panel A, the column "Economic Significance" computes the response of the near horizon industry momentum portfolio returns (MP_9_4) to a two-standard- deviation shock of the corresponding industry return using the point estimates from equation (1). Lower and upper bounds are given in parentheses below. The column "Absolute relative significance" computes the absolute value from dividing "Economic significance" by the standard deviation of MP_9_4 returns. Same calculations are done for the other MP_9_4 predictors in Panel B.

| Industry | Economic significance | Absolute relative significance | Industry | Economic significance | Absolute relative significance |
|---|---|---|---|---|---|
| Panel A: By industries | | | | | |
| EX_Fun | 0.946 | 0.239 | EX_Toys | 0.538 | 0.134 |
| | (0.001, 0.128) | | | (-0.006, 0.080) | |
| EX_MedEq | 0.884 | 0.223 | EX_RlEst | 0.405 | 0.103 |
| | (0.018, 0.138) | | | (-0.015, 0.068) | |
| EX_Gold | 0.719 | 0.182 | EX_Books | -0.711 | -0.18 |

| | | |
|---|---|---|
| | (0.003, 0.064) | (-0.129, 0.011) |
| Panel B: By other MP predictors | Economic significance | Absolute relative significance |
| RM(-1) | -1.260 | -0.316 |
| | (-0.243, -0.055) | |
| INF(-1) | 0.004 | 0.001 |
| | (-0.554, 0.542) | |
| DSPR(-1) | -0.320 | -0.081 |
| | (-12.461, 3.832) | |
| MDY(-1) | -0.358 | -0.091 |
| | (-3.518, 0.490) | |
| MVOL(-1) | -0.715 | -0.181 |
| | (-0.303, -0.020) | |

**Table 3.3:** Industry predictive regressions--economic significance (MP_12_7)
In Panel A, the column "Economic Significance" computes the response of the near horizon industry momentum portfolio returns (MP_12_7) to a two-standard- deviation shock of the corresponding industry return using the point estimates from equation (1). Lower and upper bounds are given in parentheses below. The column "Absolute relative significance" computes the absolute value from dividing "Economic significance" by the standard deviation of MP_12_7 returns. Same calculations are done for the other MP_12_7 predictors in Panel B.

| Industry | Economic significance | Absolute relative significance | Industry | Economic significance | Absolute relative significance |
|---|---|---|---|---|---|
| Panel A: By industries | | | | | |
| EX_MedEq | 0.690 | 0.188 | EX_Books | -0.079 | -0.022 |
| | (0.012, 0.110) | | | (-0.071, 0.058) | |
| EX_Fun | 0.632 | 0.173 | EX_RlEst | 0.170 | 0.046 |
| | (-0.015, 0.100) | | | (-0.030, 0.053) | |
| EX_Gold | 0.600 | 0.164 | EX_Toys | 0.123 | 0.034 |
| | (-0.002, 0.059) | | | (-0.042, 0.057) | |
| Panel B: By other MP predictors | | Economic significance | | Absolute relative significance | |
| RM(-1) | | -0.975 | | -0.266 | |
| | | (-0.200, -0.033) | | | |
| INF(-1) | | 0.041 | | 0.011 | |
| | | (-0.457, 0.546) | | | |
| DSPR(-1) | | -0.143 | | -0.039 | |
| | | (-10.600, 6.754) | | | |
| MDY(-1) | | -0.370 | | -0.101 | |
| | | (-3.966, 0.830) | | | |
| MVOL(-1) | | -0.108 | | -0.029 | |
| | | (-0.171, 0.122) | | | |

**Table 4:** Predictive regressions of industry momentum portfolio returns using all industry returns simultaneously

This table presents results of forecasting the returns from the various industry momentum strategies in month t using all industry portfolio returns at month t-1 and other information available at month t-1. The other control variables are lagged RM, INF (the CPI inflation rate), DSPR (the default spread between BAA-rated and AAA-rated bonds), MDY (the dividend yield of the market portfolio), and MVOL (the market volatility). In Panel A, for each of the three regressions, we test three hypotheses: (1) whether the coefficients on the lagged industry returns are jointly zero; (2) whether the coefficients on the other lagged control variables are jointly zero; and (3) whether the coefficients on the lagged industry returns and the lagged controls are jointly zero. The Wald-tests and P-values are reported below. In all tests, we use Newey-West serial correlation and heteroskedasticity robust standard errors calculated with three monthly lags. Panel B reports the regression coefficient and P-values associated with the MedEq industry from three different forecasting specifications. The first row of Panel B presents the estimated coefficient associated with MedEq when the various momentum returns are forecasted using all industries in the regression. The second row of Panel B shows the results for the MedEq coefficient when the various momentum returns are forecasted using only MedEq industry plus all control variables. The third row of Panel B shows the results for the MedEq coefficient when the various momentum returns are forecasted using all industries and all control variables in the regression. *Significant at 10% level. **Significant at 5% level. ***Significant at 1% level.

| Panel A: Forecasting using all industry returns simultaneously | MP_6_2 | | MP_9_4 | | MP_12_7 | |
|---|---|---|---|---|---|---|
| | Wald test | P-value | Wald test | P-value | Wald test | P-value |
| Coefficients of all industries equal zero | 83.90 | < 0.01 | 112.28 | < 0.01 | 70.66 | 0.01 |
| Coefficients of all controls equal zero | 15.42 | 0.01 | 16.96 | 0.01 | 10.36 | 0.01 |
| Coefficients of all industries and controls equal zero | 94.54 | < 0.01 | 118.81 | < 0.01 | 79.08 | 0.08 |
| Panel B: MedEq Coefficient using all industry returns and/or controls simultaneously to predict simultaneously | MP_6_2 | | MP_9_4 | | MP_12_7 | |
| | Beta coeff. | P-value | Beta coeff. | P-value | Beta coeff. | P-value |
| The MedEq beta coefficient using of all industries | 0.129 | 0.009*** | 0.122 | 0.011** | 0.114 | 0.038** |
| The MedEq beta coefficient using of all controls | 0.070 | 0.006*** | 0.065 | 0.025** | 0.050 | 0.019** |
| The MedEq beta coefficient using all industries and controls | 0.112 | 0.011** | 0.104 | 0.042** | 0.110 | 0.029** |