

1 Data

The dependent variable is always the equity premium, i.e., the total rate of return on the stock market minus the prevailing short-term interest rate.

- Stock Prices: We use S&P 500 index prices from 1926 to 2013 from CRSP's month-end values. **Stock Returns are the continuously compounded returns** on the S&P 500 index.

For yearly and longer data frequencies, we can go back as far as 1871, using data from Robert Shiller's website. For monthly frequency, we can only begin in the CRSP period.

- Risk-free Rate: The risk-free rate for the period 1920 to 2013 is the T-bill rate. Because there was no risk-free short-term debt prior to the 1920's, we had to estimate it. We obtained commercial paper rates for New York City from NBER's Macrohistory data base. These are available for the period 1871 to 1970. We estimated a regression for the period 1920 to 1971, which yielded

$$\text{T-bill Rate} = -0.004 + 0.886 \times \text{Commercial Paper Rate} \quad . \quad (1)$$

with an R^2 of 95.7%. Therefore, we instrumented the risk-free rate for the period 1871 to 1919 with the predicted regression equation. The correlation for the period 1920 to 1971 between the equity premium computed using the T-bill rate and that computed using the predicted commercial paper rate is 99.8%.

The equity premium had a mean of 4.85%, median of 6.37%, and standard deviation of 17.95% over the entire sample period of 1872 to 2013. The equity premium is 5.97% (standard deviation of 19.86%) from 1927–2013, 6.26% (standard deviation of 16.34%) from 1947–2013, and 4.31% (standard deviation of 16.65%) from 1965–2013.

Our first set of independent variables relate primarily to characteristics of stocks:

- Dividends: Dividends are twelve-month moving sums of dividends paid on the S&P 500 index. They are from Robert Shiller's website for the period 1871 to 1970. Dividends from 1971 to 2013 are from S&P Corporation.

The **Dividend Price Ratio (d/p)** is the difference between the log of dividends and the log of prices. The **Dividend Yield (d/y)** is the difference between the log of dividends and the log of lagged prices.

- Earnings: Earnings are twelve-month moving sums of earnings on the S&P 500 index. These are from Robert Shiller's website for the period 1871 to June 2003. Earnings from June 2003 to December 2013 are our own estimates based on interpolation of quarterly earnings provided by S&P Corporation.

The **Earnings Price Ratio (e/p)** is the difference between log of earnings and log of prices. **Dividend Payout Ratio (d/e)** is the difference between log of dividends and log of earnings.

- Stock Variance (svar): Stock Variance is computed as sum of squared daily returns on S&P 500. Daily returns for 1871 to 1926 are obtained from Bill Schwert while daily returns from 1926 to 2013 are obtained from CRSP.

- **Cross-Sectional Premium (csp)**: The cross-sectional beta premium measures the relative valuations of high- and low-beta stocks. We obtained this variable directly from Sam Thompson. This variable is available from May 1937 to December 2002.
- **Book Value**: Book values from 1920 to 2005 are from Value Line’s website, specifically their *Long-Term Perspective Chart* of the Dow Jones Industrial Average. Book values from 2005 to 2013 are directly from Dow Jones Inc. The **Book to Market Ratio (b/m)** is the ratio of book value to market value for the Dow Jones Industrial Average. For the months of March to December, this is computed by dividing book value at the end of previous year by the price at the end of the current month. For the months of January to February, this is computed by dividing book value at the end of 2 years ago by the price at the end of the current month.
- **Corporate Issuing Activity**: We entertain two measures of corporate issuing activity. **Net Equity Expansion (ntis)** is the ratio of twelve-month moving sums of net issues by NYSE listed stocks divided by the total market capitalization of NYSE stocks. This dollar amount of net equity issuing activity (IPOs, SEOs, stock repurchases, less dividends) for NYSE listed stocks is computed from CRSP data as

$$\text{Net Issue}_t = \text{Mcap}_t - \text{Mcap}_{t-1} \cdot (1 + \text{vwretx}_t), \quad (2)$$

where Mcap is the total market capitalization, and vwretx is the value weighted return (excluding dividends) on the NYSE index.¹ These data are available from 1926 to 2013. The second measure, **Percent Equity Issuing (eqis)**, is the ratio of equity issuing activity as a fraction of total issuing activity. This is the variable proposed in Baker and Wurgler (2000). The authors provided us with the data, except for 2005–2013, which we added ourselves. The first equity issuing measure is relative to aggregate market cap, while the second is relative to aggregate corporate issuing.

Our next set of independent variables are interest-rate related:

- **Treasury Bills (tbl)**: T-bill rates from 1920 to 1933 are the *U.S. Yields On Short-Term United States Securities, Three-Six Month Treasury Notes and Certificates, Three Month Treasury* series from NBER’s Macrohistory data base. T-bill rates from 1934 to 2013 are the *3-Month Treasury Bill: Secondary Market Rate* from the economic research database at Federal Reserve Bank at St. Louis (FRED).
- **Long Term Yield (lty)**: Long-term government bond yields for the period 1919 to 1925 is the *U.S. Yield On Long-Term United States Bonds* series from NBER’s Macrohistory database. Yields from 1926 to 2013 are from Ibbotson’s Stocks, Bonds, Bills and Inflation Yearbook.

Long Term Rate of Return (ltr): Long-term government bond returns for the period 1926 to 2013 are from Ibbotson’s Stocks, Bonds, Bills and Inflation Yearbook.

The **Term Spread (tms)** is the difference between the long term yield on government bonds and the T-bill.

¹This calculation implicitly assumes that the delisting return is –100 percent. Using the actual delisting return, where available, or ignoring delistings altogether, has no impact on our results.

- Corporate Bond Returns: Long-term corporate bond returns for the period 1926 to 2013 are from Ibbotson’s Stocks, Bonds, Bills and Inflation Yearbook.

Corporate Bond Yields: Yields on AAA- and BAA-rated bonds for the period 1919 to 2013 are from FRED.

The **Default Yield Spread (dfy)**: is the difference between BAA- and AAA- rated corporate bond *yields*.

The **Default Return Spread (dfr)**: is the difference between the return on long-term corporate bonds and returns on the long-term government bonds.

- Inflation (infl): Inflation is the *Consumer Price Index (All Urban Consumers)* for the period 1919 to 2013 from the Bureau of Labor Statistics. Because inflation information is released only in the following month, in our monthly regressions, we inserted one month of waiting before use.

The next variable is related to broad macroeconomic activity

- Investment to Capital Ratio (i/k): Investment to Capital Ratio is the ratio of aggregate (private nonresidential fixed) investment to aggregate capital for the whole economy. This is the variable proposed in Cochrane (1991), which we obtained directly from the author.

Finally, we also entertain two methods that rely on multiple variables or models (**all** and **ms**), and two models that are themselves rolling in their independent variable construction (**cay** and **ms**).

- A “Kitchen Sink” Regression, named “**all**,” which includes all the aforementioned variables. (It does not include **cay**, described below.) We do not report coefficients, just prediction statistics. Consequently, even perfect multicollinearity does not change our results—redundant variables can simply be deleted.
- A model selection approach, named “**ms**.” If there are K variables, we consider 2^K models essentially consisting of all possible combinations of variables. Every period, we select one of these models that gives the minimum cumulative prediction errors up to that time period t . This method is based on Rissanen (1986) and is recommended by Bossaerts and Hillion (1999). Essentially, this method uses our criterion of minimum OOS prediction errors to choose amongst competing models *in each time period* t . This is also similar in spirit to the use of more conventional criteria (like R^2) in Pesaran and Timmerman (1995), who however do not entertain our NULL hypothesis.
- Consumption, wealth, income ratio (cay) is suggested in Lettau and Ludvigson (2001). Although some data are available from Martin Lettau’s website, we reconstruct the data following their procedure as this allows us to expand the time-series. This allows us to have quarterly data from the first quarter of 1952 to the fourth quarter of 2013, and annual data from 1945 to 2013. Lettau-Ludvigson estimate the following equation:

$$c_t = \alpha + \beta_w w_t + \beta_y y_t + \sum_{i=-k}^k b_{w,i} \Delta w_{t-i} + \sum_{i=-k}^k b_{y,i} \Delta y_{t-i} + \epsilon_t, \quad t = k+1, \dots, T-k, \quad (3)$$

where c is the aggregate consumption, w is the aggregate wealth, and y is the aggregate income. The estimates of the above equation provide $\mathbf{cay} \equiv \widehat{cay}_t = c_t - \hat{\beta}_a a_t - \hat{\beta}_y y_t$, $t = 1, \dots, T$. Eight leads/lags are used in quarterly estimation ($k = 8$) while two lags are used in annual estimation ($k = 2$). (For further details, see Lettau and Ludvigson (2001).)

Because the Lettau-Ludvigson measure of \mathbf{cay} is constructed using look-ahead (*in-sample* regression coefficients), we created an equivalent measure that uses only prevailing data. In other words, if the current time period is ‘ s ’, then we estimated equation (3) using only the data up to ‘ s ’ through

$$c_t = \alpha + \beta_w^s w_t + \beta_y^s y_t + \sum_{i=-k}^k b_{w,i}^s \Delta w_{t-i} + \sum_{i=-k}^k b_{y,i}^s \Delta y_{t-i} + \epsilon_t, \quad t = k+1, \dots, s-k, \quad (4)$$

where the superscript on betas indicates that these are rolling estimates. This measure is called \mathbf{caya} (“ante”) to distinguish it from the traditional variable \mathbf{cayp} constructed with look-ahead bias (“post”).

The latter two models change every period, which renders an in-sample regression problematic. (We would not want to use the final models, and project them backwards as if they were static.) This is also why we did not include \mathbf{caya} in the kitchen sink specification.

2 Empirical Procedure

All regressions are estimated using OLS. The in-sample significance of a regression is determined using the F -statistic, critical values of which are estimated using the bootstrap procedure described below. The OOS forecast uses only the data available up to the time at which the forecast is made. Let e_N denote the vector of rolling OOS errors from the historical mean model and e_A denote the vector of rolling OOS errors from the OLS model. Define $d_t = e_{Nt} - e_{At}$, and $\bar{d} = T^{-1} \cdot \sum_t d_t = \text{MSE}_N - \text{MSE}_A$ over the entire OOS period. Then, our OOS statistics are computed as

$$\begin{aligned} R^2 &= 1 - \frac{\text{MSE}_A}{\text{MSE}_N}, \\ \Delta \text{MAE} &= \frac{1}{T} \sum_{t=1}^T (|e_{Nt}| - |e_{At}|), \\ \Delta \text{RMSE} &= \sqrt{\text{MSE}_N} - \sqrt{\text{MSE}_A}, \\ \text{MSE-T} &= \sqrt{T+1 - 2 \cdot h + h \cdot (h-1)/T} \cdot \left[\frac{\bar{d}}{\widehat{se}(\bar{d})} \right], \\ \text{MSE-F} &= (T-h+1) \times \left(\frac{\text{MSE}_N - \text{MSE}_A}{\text{MSE}_A} \right), \\ \text{ENC} &= \frac{T-h+1}{T} \frac{\sum_{t=1}^T (e_{Nt}^2 - e_{Nt} \cdot e_{At})}{\text{MSE}_A}, \end{aligned} \quad (5)$$

where T is the total number of forecast observations and h is the overlap degree ($h = 1$ for no overlap).

MSE-T is the Diebold and Mariano (1995) T -statistic modified by Harvey et al. (1997), and MSE-F is F -statistic by McCracken (2004). Both the MSE-T and MSE-F statistics test for equal MSE of the unconditional forecast and the conditional forecast (i.e., $\Delta\text{MSE} = 0$). ENC is the statistic proposed by Clark and McCracken (2001) for an encompassing forecast test. Clark and McCracken show that all these statistics follow non-standard distributions when testing nested models. The reason for this is that under the null, the asymptotic difference in squared forecast errors is exactly 0 with 0 variance. This renders the standard distributions asymptotically valid. Because our models are nested, we use asymptotic critical values for MSE tests provided by McCracken, and asymptotic critical values for ENC tests provided by Clark and McCracken. This does not, unfortunately, account for small-sample issues and overlapping annual-observations (for which asymptotic critical values are not available). Critical values for **ms** model are not calculated at all. The NULL hypothesis is that the unconditional forecast is not inferior to the conditional forecast, so our critical values are for a one-sided test.²

²If the regression coefficient β is small (so that explanatory power is low or in-sample R^2 is low), it may happen that our unconditional model outperforms on OOS because of estimation error in rolling estimates of β . In this case, ΔRMSE might be negative but still significant *because these tests are ultimately tests of whether β is equal to zero*.

List of Tables

| | | |
|----|---|----|
| 1 | Forecasts at Monthly Frequency | 7 |
| 2 | Forecasts at Monthly Frequency with Total Returns | 11 |
| 3 | Forecasts at Quarterly Frequency | 14 |
| 4 | Forecasts at Annual Frequency | 18 |
| 5 | Forecasts at 3-year Frequency | 22 |
| 6 | Forecasts at 5-year Frequency | 26 |
| 7 | Forecasts Using Various d/p , e/p , and d/e Ratios | 30 |
| 8 | Forecasts at Monthly Frequency with Alternative Procedures | 40 |
| 9 | Forecasts at Monthly Frequency with Alternative Procedures and Total Returns . | 44 |
| 10 | Forecasts at Monthly Frequency with Alternative Procedures and Total Returns 1946–2013 | 48 |
| 11 | Forecasts at Monthly Frequency with Alternative Procedures and Total Returns 1946–1990 | 52 |
| 12 | Forecasts at Annual Frequency (ending 1990) | 56 |
| 13 | Encompassing Tests | 60 |
| 14 | Forecasts at Monthly Frequency using Campbell and Thompson (2008) procedure | 70 |

Table 1: Forecasts at Monthly Frequency

This table presents statistics on forecast errors (*in-sample* and *out-of-sample*) for excess stock return forecasts at the monthly frequency (both in the forecasting equation and forecast). Variables are explained in Section 1. Stock return is price changes, *excluding* dividends, of S&P500. Panel A uses the full sample period for each variable and constructs first forecast 20 years after the first data observation. Panel B uses the full sample period for each variable and constructs first forecast in January 1965. Panel C uses only the sample period January 1927 to December 2013 and constructs first forecast in January 1965. The data period for **ms** model is January 1927 to December 2013. All numbers, except \bar{R}^2 , are in percent per month. A star next to IS- \bar{R}^2 denotes significance of the in-sample regression. RMSE is the root mean square error and MAE is the mean absolute error. Δ RMSE (Δ MAE) is the RMSE (MAE) difference between the unconditional forecast and the conditional forecast for the same sample/forecast period (positive numbers signify superior *out-of-sample* conditional forecast). OOS- R^2 is calculated as one minus the ratio of the variance of conditional forecast errors and the variance of the unconditional forecast errors. MSE-T is the Diebold and Mariano (1995) t -statistic modified by Harvey, Leybourne, and Newbold (1998) and MSE-F is F -statistic by McCracken (2004). Both the MSE-T and MSE-F statistics test for equal MSE of the unconditional forecast and the conditional forecast. One-sided critical values of MSE statistics are obtained from McCracken (2004) (critical values for **ms** model are not calculated). Significance levels at 90%, 95%, and 99% are denoted by one, two, and three stars, respectively.

Panel A: Full data, Forecasts begin 20 years after the first sample date

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|----------------------------------|---------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|-------|--------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 187102–201312 | -0.06 | 0.0000 | -0.08 | 0.0000 | -0.54 | -0.0059 | -0.0119 | -0.90 | -6.97 |
| d/y Dividend Yield | 187102–201312 | -0.05 | 0.0002 | -0.03 | 0.0002 | -0.51 | -0.0158 | -0.0111 | -1.29 | -6.52 |
| e/p Earning Price Ratio | 187102–201312 | 0.01 | 0.0017 | 0.01 | 0.0017 | -0.22 | -0.0158 | -0.0039 | -0.57 | -2.28 |
| d/e Dividend Payout Ratio | 187112–201312 | 0.08 | 0.0034 | -0.07 | 0.0034 | -0.65 | 0.0007 | -0.0145 | -0.85 | -8.41 |
| svar Stock Variance | 188502–201312 | 0.07 | 0.0033 | 0.08 | 0.0033 | -1.34 | -0.0022 | -0.0324 | -0.67 | -16.26 |
| csp Cross-Sectional Prem | 193705–200212 | 0.67** | 0.0185 | 0.37 | 0.0185 | -1.26 | -0.0596 | -0.0231 | -0.76 | -5.82 |
| b/m Book to Market | 192103–201312 | 0.11 | 0.0055 | -0.20 | 0.0055 | -0.85 | -0.0408 | -0.0154 | -0.90 | -6.36 |
| ntis Net Equity Expansion | 192701–201312 | 0.32** | 0.0115 | -0.36 | 0.0115 | -0.56 | 0.0109 | -0.0091 | -0.58 | -3.45 |
| tbl T-Bill Rate | 192002–201312 | 0.17* | 0.0069 | 0.52 | 0.0069 | 0.05 | 0.0080 | 0.0034 | 0.19* | 1.40** |
| lty Long Term Yield | 191901–201312 | 0.03 | 0.0033 | 0.15 | 0.0033 | -0.63 | -0.0020 | -0.0112 | -0.53 | -4.60 |
| ltr Long Term Return | 192601–201312 | 0.07 | 0.0045 | 0.56 | 0.0045 | -1.26 | -0.0329 | -0.0240 | -1.78 | -9.17 |
| tms Term Spread | 192002–201312 | 0.10 | 0.0051 | 0.34 | 0.0051 | 0.07 | 0.0064 | 0.0040 | 0.38* | 1.65** |
| dfy Default Yield Spread | 191901–201312 | -0.09 | 0.0000 | -0.12 | 0.0000 | -0.35 | -0.0066 | -0.0053 | -2.38 | -2.16 |
| dfr Default Return Spread | 192601–201312 | 0.15 | 0.0068 | 0.08 | 0.0068 | -0.37 | -0.0053 | -0.0053 | -0.43 | -2.02 |
| infl Inflation | 191902–201312 | -0.03 | 0.0016 | 0.16 | 0.0016 | -0.17 | 0.0025 | -0.0013 | -0.33 | -0.53 |
| all Kitchen Sink | 192701–201312 | 1.50*** | 0.0706 | 2.05 | 0.0706 | -12.51 | -0.1869 | -0.2253 | -3.31 | -79.49 |
| ms Model Selection | 192701–201312 | — | — | — | — | — | — | — | — | — |

Panel B: Full data, Forecasts begin in 196501

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|----------------------------------|---------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|-------|--------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 187102–201312 | -0.06 | 0.0000 | -0.19 | 0.0000 | -0.41 | -0.0070 | -0.0053 | -1.41 | -1.42 |
| d/y Dividend Yield | 187102–201312 | -0.05 | 0.0002 | -0.14 | 0.0002 | -0.49 | -0.0231 | -0.0071 | -0.96 | -1.89 |
| e/p Earning Price Ratio | 187102–201312 | 0.01 | 0.0017 | -0.26 | 0.0017 | -0.78 | -0.0329 | -0.0134 | -0.85 | -3.55 |
| d/e Dividend Payout Ratio | 187112–201312 | 0.08 | 0.0034 | -0.44 | 0.0034 | -1.18 | -0.0028 | -0.0223 | -1.29 | -5.89 |
| svar Stock Variance | 188502–201312 | 0.07 | 0.0033 | 0.56 | 0.0033 | 0.04 | 0.0012 | 0.0047 | 0.76* | 1.26* |
| csp Cross-Sectional Prem | 193705–200212 | 0.67** | 0.0185 | 0.45 | 0.0185 | 0.46 | 0.0059 | 0.0151 | 0.58* | 3.10** |
| b/m Book to Market | 192103–201312 | 0.11 | 0.0055 | -0.72 | 0.0055 | -1.72 | -0.0674 | -0.0341 | -1.54 | -8.98 |
| ntis Net Equity Expansion | 192701–201312 | 0.32** | 0.0115 | -0.22 | 0.0115 | -0.96 | 0.0075 | -0.0174 | -0.86 | -4.61 |
| tbl T-Bill Rate | 192002–201312 | 0.17* | 0.0069 | 0.38 | 0.0069 | 0.03 | 0.0139 | 0.0043 | 0.17 | 1.15* |
| lty Long Term Yield | 191901–201312 | 0.03 | 0.0033 | -0.01 | 0.0033 | -0.70 | 0.0027 | -0.0116 | -0.38 | -3.09 |
| ltr Long Term Return | 192601–201312 | 0.07 | 0.0045 | 0.61 | 0.0045 | -0.43 | -0.0199 | -0.0058 | -0.38 | -1.54 |
| tms Term Spread | 192002–201312 | 0.10 | 0.0051 | 0.50 | 0.0051 | 0.12 | 0.0113 | 0.0063 | 0.41 | 1.69** |
| dfy Default Yield Spread | 191901–201312 | -0.09 | 0.0000 | -0.15 | 0.0000 | -0.28 | -0.0041 | -0.0024 | -1.76 | -0.64 |
| dfr Default Return Spread | 192601–201312 | 0.15 | 0.0068 | 0.34 | 0.0068 | -0.07 | -0.0009 | 0.0022 | 0.14 | 0.60 |
| infl Inflation | 191902–201312 | -0.03 | 0.0016 | -0.09 | 0.0016 | -0.12 | 0.0059 | 0.0011 | 0.21 | 0.29 |
| all Kitchen Sink | 192701–201312 | 1.50*** | 0.0706 | 1.72 | 0.0706 | -8.42 | -0.1190 | -0.1389 | -1.84 | -35.29 |
| ms Model Selection | 192701–201312 | — | — | — | — | — | — | — | — | — |

Panel C: Data begin in 192701, Forecasts begin in 196501

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|----------------------------------|---------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|--------|--------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 192701–201312 | −0.03 | 0.0019 | −0.17 | 0.0019 | −0.42 | −0.0344 | −0.0055 | −0.45 | −1.45 |
| d/y Dividend Yield | 192701–201312 | 0.04 | 0.0037 | −0.18 | 0.0037 | −0.59 | −0.0487 | −0.0093 | −0.53 | −2.45 |
| e/p Earning Price Ratio | 192701–201312 | 0.13 | 0.0063 | −0.52 | 0.0063 | −1.59 | −0.0611 | −0.0313 | −1.11 | −8.24 |
| d/e Dividend Payout Ratio | 192701–201312 | −0.04 | 0.0015 | −0.32 | 0.0015 | −1.89 | −0.0232 | −0.0377 | −2.16 | −9.91 |
| svar Stock Variance | 192701–201312 | 0.09 | 0.0051 | 0.62 | 0.0051 | 0.09 | 0.0024 | 0.0058 | 0.86** | 1.55* |
| csp Cross-Sectional Prem | 193705–200212 | 0.67** | 0.0185 | 0.45 | 0.0185 | 0.46 | 0.0059 | 0.0151 | 0.58* | 3.10** |
| b/m Book to Market | 192701–201312 | 0.13 | 0.0062 | −0.77 | 0.0062 | −2.08 | −0.0789 | −0.0418 | −1.67 | −10.98 |
| ntis Net Equity Expansion | 192701–201312 | 0.32** | 0.0115 | −0.22 | 0.0115 | −0.96 | 0.0075 | −0.0174 | −0.86 | −4.61 |
| tbl T-Bill Rate | 192701–201312 | 0.12 | 0.0059 | 0.36 | 0.0059 | −0.07 | 0.0117 | 0.0022 | 0.09 | 0.59 |
| lty Long Term Yield | 192701–201312 | 0.01 | 0.0030 | −0.01 | 0.0030 | −0.74 | 0.0019 | −0.0124 | −0.40 | −3.30 |
| ltr Long Term Return | 192701–201312 | 0.07 | 0.0047 | 0.62 | 0.0047 | −0.40 | −0.0195 | −0.0050 | −0.32 | −1.32 |
| tms Term Spread | 192701–201312 | 0.06 | 0.0043 | 0.47 | 0.0043 | −0.01 | 0.0093 | 0.0036 | 0.27 | 0.96* |
| dfy Default Yield Spread | 192701–201312 | −0.09 | 0.0001 | −0.13 | 0.0001 | −0.25 | −0.0037 | −0.0019 | −1.15 | −0.49 |
| dfr Default Return Spread | 192701–201312 | 0.15 | 0.0067 | 0.34 | 0.0067 | −0.07 | −0.0009 | 0.0022 | 0.14 | 0.58 |
| infl Inflation | 192701–201312 | −0.00 | 0.0026 | −0.07 | 0.0026 | −0.11 | 0.0097 | 0.0013 | 0.16 | 0.34 |
| all Kitchen Sink | 192701–201312 | 1.50*** | 0.0706 | 1.72 | 0.0706 | −8.42 | −0.1190 | −0.1389 | −1.84 | −35.29 |
| ms Model Selection | 192701–201312 | — | — | — | — | — | — | — | — | — |

Table 2: Forecasts at Monthly Frequency with Total Returns

This table presents statistics on forecast errors (*in-sample* and *out-of-sample*) for excess stock return forecasts at the monthly frequency (both in the forecasting equation and forecast). Variables are explained in Section 1. Stock return is price changes, *including* dividends, of S&P500 calculated using CRSP data. Panel A uses the full sample period for each variable and constructs first forecast 20 years after the first data observation. Panel B uses the full sample period for each variable and constructs first forecast in January 1965. The data period for **ms** model is January 1927 to December 2013. All numbers, except \overline{R}^2 , are in percent per month. A star next to IS- \overline{R}^2 denotes significance of the in-sample regression. RMSE is the root mean square error and MAE is the mean absolute error. Δ RMSE (Δ MAE) is the RMSE (MAE) difference between the unconditional forecast and the conditional forecast for the same sample/forecast period (positive numbers signify superior *out-of-sample* conditional forecast). OOS- R^2 is calculated as one minus the ratio of the variance of conditional forecast errors and the variance of the unconditional forecast errors. MSE-T is the Diebold and Mariano (1995) t -statistic modified by Harvey, Leybourne, and Newbold (1998) and MSE-F is F -statistic by McCracken (2004). Both the MSE-T and MSE-F statistics test for equal MSE of the unconditional forecast and the conditional forecast. One-sided critical values of MSE statistics are obtained from McCracken (2004) (critical values for **ms** model are not calculated). Significance levels at 90%, 95%, and 99% are denoted by one, two, and three stars, respectively.

Panel A: Data begin in 192701, Forecasts begin in 194701

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|----------------------------------|---------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|--------|--------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 192701–201312 | 0.11 | 0.0058 | 0.43 | 0.0058 | −0.14 | −0.0372 | −0.0003 | −0.02 | −0.13 |
| d/y Dividend Yield | 192701–201312 | 0.22* | 0.0087 | 0.53 | 0.0087 | −0.44 | −0.0545 | −0.0065 | −0.32 | −2.49 |
| e/p Earning Price Ratio | 192701–201312 | 0.33** | 0.0117 | 0.06 | 0.0117 | −1.57 | −0.0586 | −0.0303 | −0.96 | −11.45 |
| d/e Dividend Payout Ratio | 192701–201312 | −0.06 | 0.0010 | −0.30 | 0.0010 | −1.64 | −0.0118 | −0.0318 | −1.76 | −12.00 |
| svar Stock Variance | 192701–201312 | 0.07 | 0.0045 | 0.54 | 0.0045 | −0.01 | 0.0006 | 0.0024 | 0.50** | 0.93* |
| csp Cross-Sectional Prem | 193705–200212 | 0.92*** | 0.0245 | 0.36 | 0.0245 | −0.95 | −0.0554 | −0.0165 | −0.49 | −4.17 |
| b/m Book to Market | 192701–201312 | 0.35** | 0.0122 | −0.25 | 0.0122 | −1.57 | −0.0718 | −0.0303 | −1.26 | −11.44 |
| ntis Net Equity Expansion | 192701–201312 | 0.34** | 0.0119 | −0.44 | 0.0119 | −0.75 | 0.0065 | −0.0132 | −0.79 | −5.01 |
| tbl T-Bill Rate | 192701–201312 | 0.13 | 0.0061 | 0.59 | 0.0061 | −0.09 | 0.0068 | 0.0008 | 0.04 | 0.29 |
| lty Long Term Yield | 192701–201312 | 0.02 | 0.0032 | 0.25 | 0.0032 | −0.85 | −0.0137 | −0.0152 | −0.54 | −5.77 |
| ltr Long Term Return | 192701–201312 | 0.07 | 0.0045 | 0.53 | 0.0045 | −0.96 | −0.0314 | −0.0175 | −1.33 | −6.66 |
| tms Term Spread | 192701–201312 | 0.05 | 0.0040 | 0.29 | 0.0040 | −0.04 | 0.0049 | 0.0018 | 0.16* | 0.69* |
| dfy Default Yield Spread | 192701–201312 | −0.08 | 0.0004 | −0.11 | 0.0004 | −0.29 | −0.0049 | −0.0035 | −1.33 | −1.33 |
| dfr Default Return Spread | 192701–201312 | 0.15 | 0.0067 | 0.16 | 0.0067 | −0.24 | −0.0059 | −0.0025 | −0.21 | −0.96 |
| infl Inflation | 192701–201312 | −0.02 | 0.0021 | 0.02 | 0.0021 | −0.11 | 0.0050 | 0.0004 | 0.06 | 0.14 |
| all Kitchen Sink | 192701–201312 | 1.78*** | 0.0783 | 2.37 | 0.0783 | −12.71 | −0.1942 | −0.2287 | −3.32 | −80.76 |
| ms Model Selection | 192701–201312 | — | — | — | — | — | — | — | — | — |

Panel B: Data begin in 192701, Forecasts begin in 196501

| | | | In-Sample | | In-Sample for | | Relative OOS Performance | | | | | |
|-------------|-----------------------|---------------|-----------|------------------|---------------|------------------|--------------------------|------------------|--------------|---------------|---------|-------|
| Variable | | | Data | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p | Dividend Price Ratio | 192701–201312 | 0.11 | 0.0058 | −0.08 | 0.0058 | −0.22 | −0.0427 | −0.0010 | −0.06 | −0.27 | |
| d/y | Dividend Yield | 192701–201312 | 0.22* | 0.0087 | −0.06 | 0.0087 | −0.40 | −0.0585 | −0.0050 | −0.22 | −1.34 | |
| e/p | Earning Price Ratio | 192701–201312 | 0.33** | 0.0117 | −0.55 | 0.0117 | −1.63 | −0.0679 | −0.0320 | −0.93 | −8.44 | |
| d/e | Dividend Payout Ratio | 192701–201312 | −0.06 | 0.0010 | −0.28 | 0.0010 | −2.03 | −0.0275 | −0.0407 | −2.49 | −10.70 | |
| svar | Stock Variance | 192701–201312 | 0.07 | 0.0045 | 0.59 | 0.0045 | 0.02 | 0.0017 | 0.0043 | 0.68* | 1.14* | |
| csp | Cross-Sectional Prem | 193705–200212 | 0.92*** | 0.0245 | 0.46 | 0.0245 | 0.71 | 0.0090 | 0.0208 | 0.72** | 4.27*** | |
| b/m | Book to Market | 192701–201312 | 0.35** | 0.0122 | −0.87 | 0.0122 | −2.12 | −0.0927 | −0.0427 | −1.43 | −11.22 | |
| ntis | Net Equity Expansion | 192701–201312 | 0.34** | 0.0119 | −0.25 | 0.0119 | −1.22 | 0.0011 | −0.0230 | −1.07 | −6.08 | |
| tbl | T-Bill Rate | 192701–201312 | 0.13 | 0.0061 | 0.17 | 0.0061 | −0.11 | 0.0144 | 0.0013 | 0.05 | 0.36 | |
| lty | Long Term Yield | 192701–201312 | 0.02 | 0.0032 | −0.14 | 0.0032 | −0.87 | 0.0027 | −0.0154 | −0.44 | −4.09 | |
| ltr | Long Term Return | 192701–201312 | 0.07 | 0.0045 | 0.61 | 0.0045 | −0.40 | −0.0220 | −0.0049 | −0.32 | −1.32 | |
| tms | Term Spread | 192701–201312 | 0.05 | 0.0040 | 0.41 | 0.0040 | −0.02 | 0.0081 | 0.0032 | 0.22 | 0.86* | |
| dfy | Default Yield Spread | 192701–201312 | −0.08 | 0.0004 | −0.08 | 0.0004 | −0.20 | −0.0031 | −0.0007 | −0.30 | −0.19 | |
| dfr | Default Return Spread | 192701–201312 | 0.15 | 0.0067 | 0.37 | 0.0067 | −0.04 | −0.0019 | 0.0029 | 0.19 | 0.77* | |
| infl | Inflation | 192701–201312 | −0.02 | 0.0021 | −0.12 | 0.0021 | −0.13 | 0.0082 | 0.0008 | 0.11 | 0.22 | |
| all | Kitchen Sink | 192701–201312 | 1.78*** | 0.0783 | 1.74 | 0.0783 | −8.65 | −0.1337 | −0.1435 | −1.88 | −36.49 | |
| ms | Model Selection | 192701–201312 | — | — | — | — | — | — | — | — | — | |

Table 3: Forecasts at Quarterly Frequency

This table presents statistics on forecast errors (*in-sample* and *out-of-sample*) for excess stock return forecasts at the quarterly frequency (both in the forecasting equation and forecast). Variables are explained in Section 1. Stock return in price changes, *excluding* dividends, of S&P500. Panel A uses the full sample period for each variable and constructs first forecast 20 years after the first data observation. Panel B uses the full sample period for each variable and constructs first forecast in the first quarter of 1965 (or 20 years after the first data observation, whichever comes later). Panel C uses only the sample period first quarter of 1927 to fourth quarter of 2009 and constructs first forecast in the first quarter of 1965 (or 20 years after the first data observation, whichever comes later). The data period for **ms** model is first quarter of 1927 to fourth quarter of 2013. All numbers, except \overline{R}^2 , are in percent per quarter. A star next to $IS-\overline{R}^2$ denotes significance of the in-sample regression. RMSE is the root mean square error and MAE is the mean absolute error. $\Delta RMSE$ (ΔMAE) is the RMSE (MAE) difference between the unconditional forecast and the conditional forecast for the same sample/forecast period (positive numbers signify superior *out-of-sample* conditional forecast). $OOS-R^2$ is calculated as one minus the ratio of the variance of conditional forecast errors and the variance of the unconditional forecast errors. MSE-T is the Diebold and Mariano (1995) *t*-statistic modified by Harvey, Leybourne, and Newbold (1998) and MSE-F is *F*-statistic by McCracken (2004). Both the MSE-T and MSE-F statistics test for equal MSE of the unconditional forecast and the conditional forecast. One-sided critical values of MSE statistics are obtained from McCracken (2004) (critical values for **ms** model are not calculated). Significance levels at 90%, 95%, and 99% are denoted by one, two, and three stars, respectively.

Panel A: Full data, Forecasts begin 20 years after the first sample date

| | | | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|-------------|------------------------|-------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|-------|--------|
| Variable | | Data | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p | Dividend Price Ratio | 18712–20134 | −0.16 | 0.0009 | −0.12 | 0.0009 | −1.90 | −0.0794 | −0.0821 | −1.06 | −8.19 |
| d/y | Dividend Yield | 18712–20134 | −0.15 | 0.0012 | −0.11 | 0.0012 | −1.26 | −0.0771 | −0.0511 | −1.66 | −5.12 |
| e/p | Earning Price Ratio | 18712–20134 | 0.09 | 0.0123 | 0.07 | 0.0123 | −0.69 | −0.0746 | −0.0235 | −0.52 | −2.36 |
| d/e | Dividend Payout Ratio | 18712–20134 | 0.01 | 0.0087 | −0.28 | 0.0087 | −1.97 | −0.0077 | −0.0853 | −0.96 | −8.51 |
| svar | Stock Variance | 18851–20134 | −0.19 | 0.0000 | −0.23 | 0.0000 | −5.36 | −0.0473 | −0.2525 | −1.21 | −21.21 |
| b/m | Book to Market | 19211–20134 | 0.98** | 0.0654 | −0.97 | 0.0654 | −4.22 | −0.2171 | −0.1512 | −1.24 | −10.86 |
| ntis | Net Equity Expansion | 19271–20134 | 1.94*** | 0.1193 | −1.96 | 0.1193 | −3.32 | 0.0922 | −0.1148 | −0.93 | −7.63 |
| tbl | T-Bill Rate | 19201–20134 | 0.24 | 0.0262 | 0.98 | 0.0262 | −0.39 | −0.0255 | −0.0021 | −0.02 | −0.15 |
| lty | Long Term Yield | 19191–20134 | −0.05 | 0.0112 | 0.18 | 0.0112 | −2.20 | −0.0803 | −0.0746 | −0.67 | −5.48 |
| ltr | Long Term Return | 19261–20134 | 0.04 | 0.0172 | 0.43 | 0.0172 | −0.89 | 0.0372 | −0.0205 | −0.31 | −1.40 |
| tms | Term Spread | 19201–20134 | 0.17 | 0.0225 | 0.78 | 0.0225 | −0.04 | 0.0447 | 0.0120 | 0.21* | 0.89* |
| dfy | Default Yield Spread | 19191–20134 | −0.19 | 0.0038 | −0.43 | 0.0038 | −1.83 | −0.0775 | −0.0598 | −2.38 | −4.41 |
| dfr | Default Return Spread | 19261–20134 | −0.21 | 0.0042 | 0.55 | 0.0042 | −6.27 | −0.1448 | −0.2300 | −3.04 | −15.11 |
| infl | Inflation | 19192–20134 | −0.15 | 0.0060 | 0.22 | 0.0060 | −0.34 | −0.0067 | 0.0000 | 0.00 | 0.00 |
| i/k | Invstmnt Capital Ratio | 19471–20134 | 2.99*** | 0.1330 | 1.46 | 0.1330 | 0.98 | 0.0406 | 0.0643 | 0.49* | 2.89** |
| cayp | Cnsmptn, Wlth, Incme | 19521–20134 | 3.24*** | 0.1476 | 2.28 | 0.1476 | 1.20 | 0.1415 | 0.0767 | 0.52* | 3.06** |
| caya | Cnsmptn, Wlth, Incme | 19521–20134 | — | — | — | — | −11.65 | −0.2862 | −0.4556 | −1.67 | −16.62 |
| all | Kitchen Sink | 19271–20134 | 3.13** | 0.3360 | 0.40 | 0.3360 | −44.84 | −1.1066 | −1.4074 | −4.27 | −75.02 |
| ms | Model Selection | 19271–20134 | — | — | — | — | — | — | — | — | — |

Panel B: Full data, Forecasts begin in 19651

| | | | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|-------------|------------------------|-------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|-------|--------|
| Variable | | Data | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p | Dividend Price Ratio | 18712–20134 | −0.16 | 0.0009 | −0.42 | 0.0009 | −1.30 | −0.0984 | −0.0324 | −0.94 | −1.52 |
| d/y | Dividend Yield | 18712–20134 | −0.15 | 0.0012 | −0.35 | 0.0012 | −1.31 | −0.1085 | −0.0328 | −0.89 | −1.53 |
| e/p | Earning Price Ratio | 18712–20134 | 0.09 | 0.0123 | −0.92 | 0.0123 | −2.95 | −0.1354 | −0.1002 | −0.93 | −4.63 |
| d/e | Dividend Payout Ratio | 18712–20134 | 0.01 | 0.0087 | −1.18 | 0.0087 | −3.02 | −0.0075 | −0.1033 | −1.31 | −4.77 |
| svar | Stock Variance | 18851–20134 | −0.19 | 0.0000 | −0.51 | 0.0000 | −0.81 | −0.0073 | −0.0122 | −1.19 | −0.57 |
| b/m | Book to Market | 19211–20134 | 0.98** | 0.0654 | −2.88 | 0.0654 | −7.14 | −0.3516 | −0.2709 | −1.73 | −12.11 |
| ntis | Net Equity Expansion | 19271–20134 | 1.94*** | 0.1193 | −1.21 | 0.1193 | −4.61 | 0.0772 | −0.1682 | −1.07 | −7.66 |
| tbl | T-Bill Rate | 19201–20134 | 0.24 | 0.0262 | 0.49 | 0.0262 | −0.71 | −0.0256 | −0.0080 | −0.06 | −0.37 |
| lty | Long Term Yield | 19191–20134 | −0.05 | 0.0112 | −0.31 | 0.0112 | −2.57 | −0.0941 | −0.0848 | −0.53 | −3.92 |
| ltr | Long Term Return | 19261–20134 | 0.04 | 0.0172 | 0.50 | 0.0172 | −0.94 | 0.0479 | −0.0176 | −0.21 | −0.82 |
| tms | Term Spread | 19201–20134 | 0.17 | 0.0225 | 1.02 | 0.0225 | −0.08 | 0.0726 | 0.0182 | 0.22 | 0.86* |
| dfy | Default Yield Spread | 19191–20134 | −0.19 | 0.0038 | −0.29 | 0.0038 | −0.49 | −0.0204 | 0.0011 | 0.06 | 0.05 |
| dfr | Default Return Spread | 19261–20134 | −0.21 | 0.0042 | 0.52 | 0.0042 | −5.12 | −0.0893 | −0.1893 | −2.25 | −8.59 |
| infl | Inflation | 19192–20134 | −0.15 | 0.0060 | −0.18 | 0.0060 | −0.39 | −0.0026 | 0.0051 | 0.24 | 0.24 |
| i/k | Invstmnt Capital Ratio | 19471–20134 | 2.99*** | 0.1330 | 1.46 | 0.1330 | 0.98 | 0.0406 | 0.0643 | 0.49* | 2.89** |
| cayp | Cnsmptn, Wlth, Incme | 19521–20134 | 3.24*** | 0.1476 | 2.28 | 0.1476 | 1.20 | 0.1415 | 0.0767 | 0.52* | 3.06** |
| caya | Cnsmptn, Wlth, Incme | 19521–20134 | — | — | — | — | −11.65 | −0.2862 | −0.4556 | −1.67 | −16.62 |
| all | Kitchen Sink | 19271–20134 | 3.13** | 0.3360 | −2.97 | 0.3360 | −36.21 | −0.9591 | −1.1165 | −3.07 | −43.50 |
| ms | Model Selection | 19271–20134 | — | — | — | — | — | — | — | — | — |

Panel C: Data begin in 19271, Forecasts begin in 19651

| | | | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|-------------|------------------------|-------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|-------|--------|
| Variable | | Data | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p | Dividend Price Ratio | 19271–20134 | 0.07 | 0.0194 | −0.46 | 0.0194 | −1.58 | −0.2115 | −0.0442 | −0.49 | −2.06 |
| d/y | Dividend Yield | 19271–20134 | −0.01 | 0.0151 | −0.21 | 0.0151 | −1.02 | −0.1762 | −0.0211 | −0.27 | −0.99 |
| e/p | Earning Price Ratio | 19271–20134 | 0.41 | 0.0371 | −1.73 | 0.0371 | −5.77 | −0.2306 | −0.2156 | −1.21 | −9.74 |
| d/e | Dividend Payout Ratio | 19271–20134 | −0.24 | 0.0028 | −0.83 | 0.0028 | −4.86 | −0.1054 | −0.1785 | −2.11 | −8.12 |
| svar | Stock Variance | 19271–20134 | −0.29 | 0.0000 | −0.52 | 0.0000 | −0.88 | −0.0111 | −0.0150 | −1.71 | −0.70 |
| b/m | Book to Market | 19271–20134 | 1.04** | 0.0710 | −2.99 | 0.0710 | −8.55 | −0.4286 | −0.3273 | −1.93 | −14.50 |
| ntis | Net Equity Expansion | 19271–20134 | 1.94*** | 0.1193 | −1.21 | 0.1193 | −4.61 | 0.0772 | −0.1682 | −1.07 | −7.66 |
| tbl | T-Bill Rate | 19271–20134 | 0.11 | 0.0215 | 0.46 | 0.0215 | −0.92 | −0.0357 | −0.0170 | −0.14 | −0.79 |
| lty | Long Term Yield | 19271–20134 | −0.11 | 0.0096 | −0.30 | 0.0096 | −2.74 | −0.0959 | −0.0921 | −0.58 | −4.25 |
| ltr | Long Term Return | 19271–20134 | 0.03 | 0.0171 | 0.50 | 0.0171 | −0.94 | 0.0463 | −0.0178 | −0.22 | −0.83 |
| tms | Term Spread | 19271–20134 | 0.06 | 0.0184 | 0.96 | 0.0184 | −0.39 | 0.0487 | 0.0054 | 0.07 | 0.25 |
| dfy | Default Yield Spread | 19271–20134 | −0.18 | 0.0056 | −0.24 | 0.0056 | −0.46 | −0.0178 | 0.0024 | 0.12 | 0.11 |
| dfr | Default Return Spread | 19271–20134 | −0.21 | 0.0044 | 0.54 | 0.0044 | −5.04 | −0.0886 | −0.1858 | −2.24 | −8.44 |
| infl | Inflation | 19271–20134 | −0.16 | 0.0068 | −0.12 | 0.0068 | −0.44 | −0.0036 | 0.0033 | 0.12 | 0.15 |
| i/k | Invstmnt Capital Ratio | 19471–20134 | 2.99*** | 0.1330 | 1.46 | 0.1330 | 0.98 | 0.0406 | 0.0643 | 0.49* | 2.89** |
| cayp | Cnsmptn, Wlth, Incme | 19521–20134 | 3.24*** | 0.1476 | 2.28 | 0.1476 | 1.20 | 0.1415 | 0.0767 | 0.52* | 3.06** |
| caya | Cnsmptn, Wlth, Incme | 19521–20134 | — | — | — | — | −11.65 | −0.2862 | −0.4556 | −1.67 | −16.62 |
| all | Kitchen Sink | 19271–20134 | 3.13** | 0.3360 | −2.97 | 0.3360 | −36.21 | −0.9591 | −1.1165 | −3.07 | −43.50 |
| ms | Model Selection | 19271–20134 | — | — | — | — | — | — | — | — | — |

Table 4: Forecasts at Annual Frequency

This table presents statistics on forecast errors (*in-sample* and *out-of-sample*) for excess stock return forecasts at the annual frequency (both in the forecasting equation and forecast). Variables are explained in Section 1. Stock return is price changes, *including* dividends, of S&P500. Panel A uses the full sample period for each variable and constructs first forecast 20 years after the first data observation. Panel B uses the full sample period for each variable and constructs first forecast in 1965 (or 20 years after the first data observation, whichever comes later). Panel C uses only the sample period 1927 to 2013 and constructs first forecast in 1965 (or 20 years after the first data observation, whichever comes later). The data period for **ms** model is 1927 to 2013. All numbers, except \overline{R}^2 , are in percent per year. A star next to $\text{IS-}\overline{R}^2$ denotes significance of the in-sample regression. RMSE is the root mean square error and MAE is the mean absolute error. ΔRMSE (ΔMAE) is the RMSE (MAE) difference between the unconditional forecast and the conditional forecast for the same sample/forecast period (positive numbers signify superior *out-of-sample* conditional forecast). $\text{OOS-}R^2$ is calculated as one minus the ratio of the variance of conditional forecast errors and the variance of the unconditional forecast errors. MSE-T is the Diebold and Mariano (1995) *t*-statistic modified by Harvey, Leybourne, and Newbold (1998) and MSE-F is *F*-statistic by McCracken (2004). Both the MSE-T and MSE-F statistics test for equal MSE of the unconditional forecast and the conditional forecast. One-sided critical values of MSE statistics are obtained from McCracken (2004) (critical values for **ms** model are not calculated). Significance levels at 90%, 95%, and 99% are denoted by one, two, and three stars, respectively.

Panel A: Full data, Forecasts begin 20 years after the first sample date

| Variable | | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|-------------|------------------------|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|--------|--------|
| | | | \overline{R}^2 | Δ RMSE | \overline{R}^2 | Δ RMSE | \overline{R}^2 | Δ MAE | Δ RMSE | MSE-T | MSE-F |
| d/p | Dividend Price Ratio | 1872–2013 | 0.37 | 0.0972 | 1.15 | 0.0972 | −2.16 | −0.2255 | −0.1222 | −0.56 | −1.58 |
| d/y | Dividend Yield | 1872–2013 | 0.50 | 0.1087 | 1.17 | 0.1087 | −2.36 | −0.2615 | −0.1413 | −0.40 | −1.82 |
| e/p | Earning Price Ratio | 1872–2013 | 0.45 | 0.1049 | 0.51 | 0.1049 | −2.50 | −0.2851 | −0.1537 | −0.68 | −1.98 |
| d/e | Dividend Payout Ratio | 1872–2013 | −0.70 | 0.0015 | −0.70 | 0.0015 | −4.17 | −0.2805 | −0.3065 | −2.38 | −3.91 |
| svar | Stock Variance | 1885–2013 | −0.22 | 0.0516 | −0.54 | 0.0516 | −23.61 | −0.8081 | −2.0508 | −1.34 | −20.00 |
| b/m | Book to Market | 1921–2013 | 2.92* | 0.3795 | 1.16 | 0.3795 | −1.67 | 0.1219 | −0.0211 | −0.04 | −0.19 |
| ntis | Net Equity Expansion | 1927–2013 | 5.90** | 0.6822 | −6.75 | 0.6822 | −11.19 | 0.2821 | −0.7633 | −0.86 | −5.81 |
| eqis | Pct Equity Issuing | 1927–2013 | 5.74** | 0.6666 | −1.17 | 0.6666 | −2.61 | −0.0728 | −0.0864 | −0.14 | −0.70 |
| tbl | T-Bill Rate | 1920–2013 | 0.66 | 0.1639 | 1.75 | 0.1639 | −2.03 | −0.2402 | −0.0520 | −0.10 | −0.47 |
| lty | Long Term Yield | 1919–2013 | −0.43 | 0.0618 | −0.09 | 0.0618 | −6.20 | −0.7468 | −0.3844 | −0.54 | −3.41 |
| ltr | Long Term Return | 1926–2013 | 0.77 | 0.1850 | −0.02 | 0.1850 | −9.63 | −0.6116 | −0.6419 | −0.91 | −5.03 |
| tms | Term Spread | 1920–2013 | 0.50 | 0.1485 | 0.95 | 0.1485 | −1.22 | 0.0352 | 0.0134 | 0.04 | 0.12 |
| dfy | Default Yield Spread | 1919–2013 | −0.90 | 0.0170 | −1.03 | 0.0170 | −2.64 | −0.0950 | −0.1019 | −1.25 | −0.93 |
| dfr | Default Return Spread | 1926–2013 | −0.91 | 0.0257 | −1.45 | 0.0257 | −5.79 | 0.0370 | −0.3412 | −0.78 | −2.75 |
| infl | Inflation | 1919–2013 | −0.73 | 0.0333 | −1.17 | 0.0333 | −3.13 | −0.1983 | −0.1415 | −1.15 | −1.28 |
| i/k | Invstmnt Capital Ratio | 1947–2013 | 8.65*** | 0.8431 | 4.13 | 0.8431 | 2.69 | −0.3702 | 0.4153 | 0.48* | 2.37** |
| cayp | Cnsmptn, Wlth, Incme | 1945–2013 | 6.37** | 0.6414 | 6.31 | 0.6414 | 5.13 | 0.2695 | 0.6159 | 0.92** | 3.75** |
| caya | Cnsmptn, Wlth, Incme | 1945–2013 | — | — | — | — | −4.17 | −0.5588 | −0.1694 | −0.22 | −0.96 |
| all | Kitchen Sink | 1927–2013 | 9.84* | 2.2955 | −4.35 | 2.2955 | −142.42 | −5.4050 | −6.7121 | −3.31 | −33.22 |
| ms | Model Selection | 1927–2013 | — | — | — | — | — | — | — | — | — |

Panel B: Full data, Forecasts begin in 1965

| Variable | | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|-------------|------------------------|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|--------|--------|
| | | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p | Dividend Price Ratio | 1872–2013 | 0.37 | 0.0972 | 0.13 | 0.0972 | −3.83 | −0.6351 | −0.1377 | −0.25 | −0.80 |
| d/y | Dividend Yield | 1872–2013 | 0.50 | 0.1087 | −0.29 | 0.1087 | −7.05 | −0.8348 | −0.3946 | −0.49 | −2.25 |
| e/p | Earning Price Ratio | 1872–2013 | 0.45 | 0.1049 | −1.41 | 0.1049 | −3.78 | −0.3519 | −0.1338 | −0.23 | −0.78 |
| d/e | Dividend Payout Ratio | 1872–2013 | −0.70 | 0.0015 | −1.93 | 0.0015 | −4.44 | −0.1269 | −0.1867 | −2.25 | −1.09 |
| svar | Stock Variance | 1885–2013 | −0.22 | 0.0516 | −0.19 | 0.0516 | −0.86 | 0.1466 | 0.1034 | 1.27** | 0.62 |
| b/m | Book to Market | 1921–2013 | 2.92* | 0.3795 | −5.58 | 0.3795 | −9.94 | −0.5851 | −0.6348 | −0.80 | −3.48 |
| ntis | Net Equity Expansion | 1927–2013 | 5.90** | 0.6822 | −3.81 | 0.6822 | −14.96 | 0.4108 | −1.0221 | −0.87 | −5.47 |
| eqis | Pct Equity Issuing | 1927–2013 | 5.74** | 0.6666 | −1.22 | 0.6666 | −6.43 | −0.2586 | −0.3494 | −0.43 | −1.98 |
| tbl | T-Bill Rate | 1920–2013 | 0.66 | 0.1639 | −1.34 | 0.1639 | −2.60 | −0.3091 | −0.0389 | −0.05 | −0.22 |
| lty | Long Term Yield | 1919–2013 | −0.43 | 0.0618 | −3.26 | 0.0618 | −9.06 | −1.0451 | −0.5612 | −0.54 | −3.11 |
| ltr | Long Term Return | 1926–2013 | 0.77 | 0.1850 | −0.00 | 0.1850 | −14.06 | −0.8973 | −0.9550 | −1.13 | −5.13 |
| tms | Term Spread | 1920–2013 | 0.50 | 0.1485 | 2.61 | 0.1485 | −1.22 | 0.0837 | 0.0755 | 0.16 | 0.44 |
| dfy | Default Yield Spread | 1919–2013 | −0.90 | 0.0170 | −0.76 | 0.0170 | −2.93 | −0.0455 | −0.0658 | −1.15 | −0.38 |
| dfr | Default Return Spread | 1926–2013 | −0.91 | 0.0257 | −2.22 | 0.0257 | −7.53 | 0.0119 | −0.4391 | −0.78 | −2.46 |
| infl | Inflation | 1919–2013 | −0.73 | 0.0333 | −1.59 | 0.0333 | −2.38 | −0.1113 | −0.0211 | −0.17 | −0.12 |
| i/k | Invstmnt Capital Ratio | 1947–2013 | 8.65*** | 0.8431 | 4.13 | 0.8431 | 2.69 | −0.3702 | 0.4153 | 0.48* | 2.37** |
| cayp | Cnsmptn, Wlth, Incme | 1945–2013 | 6.37** | 0.6414 | 6.31 | 0.6414 | 5.13 | 0.2695 | 0.6159 | 0.92** | 3.75** |
| caya | Cnsmptn, Wlth, Incme | 1945–2013 | — | — | — | — | −4.17 | −0.5588 | −0.1694 | −0.22 | −0.96 |
| all | Kitchen Sink | 1927–2013 | 9.84* | 2.2955 | −23.44 | 2.2955 | −157.28 | −5.3309 | −6.5224 | −3.02 | −23.61 |
| ms | Model Selection | 1927–2013 | — | — | — | — | — | — | — | — | — |

Panel C: Data begin in 1927, Forecasts begin in 1965

| Variable | | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|-------------|------------------------|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|--------|--------|
| | | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p | Dividend Price Ratio | 1927–2013 | 1.55 | 0.2608 | 0.31 | 0.2608 | −1.85 | −0.6397 | 0.0225 | 0.03 | 0.13 |
| d/y | Dividend Yield | 1927–2013 | 1.97 | 0.3013 | −0.67 | 0.3013 | −6.72 | −0.9131 | −0.3726 | −0.34 | −2.11 |
| e/p | Earning Price Ratio | 1927–2013 | 1.67 | 0.2724 | −2.55 | 0.2724 | −6.61 | −0.5853 | −0.3641 | −0.41 | −2.06 |
| d/e | Dividend Payout Ratio | 1927–2013 | −1.15 | 0.0042 | −1.82 | 0.0042 | −8.35 | −0.2646 | −0.5033 | −2.32 | −2.81 |
| svar | Stock Variance | 1927–2013 | −0.86 | 0.0309 | −0.76 | 0.0309 | −1.86 | 0.0323 | 0.0217 | 0.50* | 0.13 |
| b/m | Book to Market | 1927–2013 | 3.54** | 0.4523 | −6.28 | 0.4523 | −15.48 | −1.0844 | −1.0622 | −1.13 | −5.67 |
| ntis | Net Equity Expansion | 1927–2013 | 5.90** | 0.6822 | −3.81 | 0.6822 | −14.96 | 0.4108 | −1.0221 | −0.87 | −5.47 |
| eqis | Pct Equity Issuing | 1927–2013 | 5.74** | 0.6666 | −1.22 | 0.6666 | −6.43 | −0.2586 | −0.3494 | −0.43 | −1.98 |
| tbl | T-Bill Rate | 1927–2013 | 0.58 | 0.1682 | −1.32 | 0.1682 | −6.41 | −0.7502 | −0.3482 | −0.34 | −1.97 |
| lty | Long Term Yield | 1927–2013 | −0.71 | 0.0458 | −2.96 | 0.0458 | −11.73 | −1.3674 | −0.7705 | −0.68 | −4.21 |
| ltr | Long Term Return | 1927–2013 | 0.72 | 0.1814 | 0.02 | 0.1814 | −12.40 | −0.7697 | −0.8232 | −1.05 | −4.48 |
| tms | Term Spread | 1927–2013 | 1.32 | 0.2385 | 2.85 | 0.2385 | −0.58 | 0.1281 | 0.1274 | 0.21 | 0.75* |
| dfy | Default Yield Spread | 1927–2013 | −0.99 | 0.0194 | −0.68 | 0.0194 | −2.71 | −0.0404 | −0.0479 | −0.96 | −0.28 |
| dfr | Default Return Spread | 1927–2013 | −0.94 | 0.0240 | −2.19 | 0.0240 | −7.34 | −0.0231 | −0.4228 | −0.78 | −2.38 |
| infl | Inflation | 1927–2013 | −1.08 | 0.0102 | −2.65 | 0.0102 | −6.35 | −0.1170 | −0.3429 | −1.51 | −1.94 |
| i/k | Invstmnt Capital Ratio | 1947–2013 | 8.65*** | 0.8431 | 4.13 | 0.8431 | 2.69 | −0.3702 | 0.4153 | 0.48* | 2.37** |
| cayp | Cnsmptn, Wlth, Incme | 1945–2013 | 6.37** | 0.6414 | 6.31 | 0.6414 | 5.13 | 0.2695 | 0.6159 | 0.92** | 3.75** |
| caya | Cnsmptn, Wlth, Incme | 1945–2013 | — | — | — | — | −4.17 | −0.5588 | −0.1694 | −0.22 | −0.96 |
| all | Kitchen Sink | 1927–2013 | 9.84* | 2.2955 | −23.44 | 2.2955 | −157.28 | −5.3309 | −6.5224 | −3.02 | −23.61 |
| ms | Model Selection | 1927–2013 | — | — | — | — | — | — | — | — | — |

Table 5: Forecasts at 3-year Frequency

This table presents statistics on forecast errors (*in-sample* and *out-of-sample*) for excess stock return forecasts at the 3-year frequency (both in the forecasting equation and forecast). Variables are explained in Section 1. Stock return is price changes, *including* dividends, of S&P500. Panel A uses the full sample period for each variable and constructs first forecast 20 years after the first data observation. Panel B uses the full sample period for each variable and constructs first forecast in 1965 (or 20 years after the first data observation, whichever comes later). Panel C uses only the sample period 1927 to 2013 and constructs first forecast in 1965 (or 20 years after the first data observation, whichever comes later). The data period for **ms** model is 1927 to 2013. All numbers, except \overline{R}^2 , are in percent per 3-year. A star next to $IS-\overline{R}^2$ denotes significance of the in-sample regression. RMSE is the root mean square error and MAE is the mean absolute error. $\Delta RMSE$ (ΔMAE) is the RMSE (MAE) difference between the unconditional forecast and the conditional forecast for the same sample/forecast period (positive numbers signify superior *out-of-sample* conditional forecast). $OOS-R^2$ is calculated as one minus the ratio of the variance of conditional forecast errors and the variance of the unconditional forecast errors. MSE-T is the Diebold and Mariano (1995) *t*-statistic modified by Harvey, Leybourne, and Newbold (1998) and MSE-F is *F*-statistic by McCracken (2004). Both the MSE-T and MSE-F statistics test for equal MSE of the unconditional forecast and the conditional forecast. One-sided critical values of MSE statistics are obtained from McCracken (2004) (critical values for **ms** model are not calculated). Significance levels at 90%, 95%, and 99% are denoted by one, two, and three stars, respectively.

Panel A: Full data, Forecasts begin 20 years after the first sample date

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|-----------------------------------|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|---------|----------|
| | | \overline{R}^2 | Δ RMSE | \overline{R}^2 | Δ RMSE | \overline{R}^2 | Δ MAE | Δ RMSE | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 1872–2013 | 3.72** | 0.6553 | 6.25 | 0.6553 | -2.22 | -0.8376 | -0.2094 | -0.18 | -1.63 |
| d/y Dividend Yield | 1872–2013 | 2.43* | 0.4640 | 4.37 | 0.4640 | -5.08 | -1.5383 | -0.6367 | -0.56 | -4.85 |
| e/p Earning Price Ratio | 1872–2013 | 3.24* | 0.5848 | 3.92 | 0.5848 | -1.36 | -0.6785 | -0.0797 | -0.10 | -0.62 |
| d/e Dividend Payout Ratio | 1872–2013 | -0.52 | 0.0312 | -0.14 | 0.0312 | -5.28 | -0.5825 | -0.6668 | -3.35 | -5.07 |
| svar Stock Variance | 1885–2013 | 0.77 | 0.2310 | 0.35 | 0.2310 | -83.46 | -3.3390 | -10.9469 | -1.30 | -48.13 |
| b/m Book to Market | 1921–2013 | 8.07** | 1.5062 | 1.29 | 1.5062 | -14.11 | -1.9173 | -1.6653 | -0.59 | -7.90 |
| ntis Net Equity Expansion | 1927–2013 | 12.25** | 2.2102 | -14.59 | 2.2102 | -19.21 | -1.9191 | -2.2583 | -1.51 | -9.63 |
| eqis Pct Equity Issuing | 1927–2013 | 8.33 | 1.5504 | -13.64 | 1.5504 | -23.69 | -2.4672 | -2.8039 | -1.45 | -11.64 |
| tbl T-Bill Rate | 1920–2013 | 1.88* | 0.4819 | 5.09 | 0.4819 | -7.81 | -1.3550 | -0.8478 | -0.56 | -4.29 |
| lty Long Term Yield | 1919–2013 | -0.41 | 0.1118 | 0.83 | 0.1118 | -22.16 | -2.7863 | -2.6689 | -1.20 | -12.43 |
| ltr Long Term Return | 1926–2013 | -0.84 | 0.0576 | -1.52 | 0.0576 | -10.52 | -1.1560 | -1.1722 | -2.26 | -5.38 |
| tms Term Spread | 1920–2013 | 3.27* | 0.7063 | 1.82 | 0.7063 | -10.67 | -0.2277 | -1.2171 | -0.87 | -6.04 |
| dfy Default Yield Spread | 1919–2013 | 1.00 | 0.3362 | -3.25 | 0.3362 | -18.40 | -1.5151 | -2.2041 | -1.68 | -10.50 |
| dfr Default Return Spread | 1926–2013 | -1.20 | 0.0009 | -1.58 | 0.0009 | -2.76 | -0.0270 | -0.1655 | -1.15 | -0.80 |
| infl Inflation | 1919–2013 | -1.08 | 0.0055 | -1.60 | 0.0055 | -5.75 | -0.3084 | -0.5832 | -1.28 | -3.02 |
| i/k Invstmnt Capital Ratio | 1947–2013 | 19.97*** | 2.9432 | 12.24 | 2.9432 | 16.63 | 2.4524 | 2.8703 | 1.41*** | 10.17*** |
| cayp Cnsmpn, Wlth, Incme | 1945–2013 | 26.80*** | 3.9050 | 26.18 | 3.9050 | 26.75 | 3.5957 | 4.4235 | 1.66*** | 18.53*** |
| caya Cnsmpn, Wlth, Incme | 1945–2013 | — | — | — | — | -1.54 | -1.9192 | 0.0839 | 0.03 | 0.27 |
| all Kitchen Sink | 1927–2013 | 35.21*** | 8.1934 | 8.66 | 8.1934 | -188.89 | -11.2361 | -14.5329 | -1.96 | -37.50 |
| ms Model Selection | 1927–2013 | — | — | — | — | — | — | — | — | — |

Panel B: Full data, Forecasts begin in 1965

| Variable | | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|-------------|------------------------|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|---------|----------|
| | | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p | Dividend Price Ratio | 1872–2013 | 3.72** | 0.6553 | 3.83 | 0.6553 | −12.79 | −1.2371 | −1.3151 | −0.41 | −4.44 |
| d/y | Dividend Yield | 1872–2013 | 2.43* | 0.4640 | 1.20 | 0.4640 | −18.07 | −2.2610 | −1.9426 | −0.69 | −6.34 |
| e/p | Earning Price Ratio | 1872–2013 | 3.24* | 0.5848 | −3.62 | 0.5848 | −9.72 | −1.5843 | −0.9434 | −0.47 | −3.25 |
| d/e | Dividend Payout Ratio | 1872–2013 | −0.52 | 0.0312 | −0.61 | 0.0312 | −7.37 | −0.4433 | −0.6552 | −1.60 | −2.30 |
| svar | Stock Variance | 1885–2013 | 0.77 | 0.2310 | 0.32 | 0.2310 | 0.08 | 0.3861 | 0.2826 | 0.77* | 1.04* |
| b/m | Book to Market | 1921–2013 | 8.07** | 1.5062 | −19.68 | 1.5062 | −43.20 | −5.7605 | −5.0902 | −1.45 | −13.48 |
| ntis | Net Equity Expansion | 1927–2013 | 12.25** | 2.2102 | −6.65 | 2.2102 | −31.12 | −2.8973 | −3.5539 | −1.89 | −10.39 |
| eqis | Pct Equity Issuing | 1927–2013 | 8.33 | 1.5504 | −11.83 | 1.5504 | −31.94 | −2.9494 | −3.6488 | −1.40 | −10.62 |
| tbl | T-Bill Rate | 1920–2013 | 1.88* | 0.4819 | −6.24 | 0.4819 | −5.61 | −1.5617 | −0.4684 | −0.23 | −1.55 |
| lty | Long Term Yield | 1919–2013 | −0.41 | 0.1118 | −7.07 | 0.1118 | −17.74 | −3.2597 | −2.0310 | −0.77 | −6.23 |
| ltr | Long Term Return | 1926–2013 | −0.84 | 0.0576 | 0.18 | 0.0576 | −6.49 | −0.6040 | −0.5676 | −1.18 | −1.93 |
| tms | Term Spread | 1920–2013 | 3.27* | 0.7063 | 8.19 | 0.7063 | 1.60 | 1.3990 | 0.5101 | 0.49* | 1.78** |
| dfy | Default Yield Spread | 1919–2013 | 1.00 | 0.3362 | 0.62 | 0.3362 | 1.24 | 0.6768 | 0.4582 | 0.93** | 1.60** |
| dfr | Default Return Spread | 1926–2013 | −1.20 | 0.0009 | −2.17 | 0.0009 | −3.50 | 0.0002 | −0.1802 | −0.90 | −0.62 |
| infl | Inflation | 1919–2013 | −1.08 | 0.0055 | −2.13 | 0.0055 | −4.18 | −0.2987 | −0.2750 | −2.11 | −0.92 |
| i/k | Invstmnt Capital Ratio | 1947–2013 | 19.97*** | 2.9432 | 12.24 | 2.9432 | 16.63 | 2.4524 | 2.8703 | 1.41*** | 10.17*** |
| cayp | Cnsmpn, Wlth, Incme | 1945–2013 | 26.80*** | 3.9050 | 26.18 | 3.9050 | 26.75 | 3.5957 | 4.4235 | 1.66*** | 18.53*** |
| caya | Cnsmpn, Wlth, Incme | 1945–2013 | — | — | — | — | −1.54 | −1.9192 | 0.0839 | 0.03 | 0.27 |
| all | Kitchen Sink | 1927–2013 | 35.21*** | 8.1934 | −15.81 | 8.1934 | −316.16 | −17.0266 | −20.4750 | −2.34 | −31.94 |
| ms | Model Selection | 1927–2013 | — | — | — | — | — | — | — | — | — |

Panel C: Data begin in 1927, Forecasts begin in 1965

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|-----------------------------------|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|---------|----------|
| | | \overline{R}^2 | Δ RMSE | \overline{R}^2 | Δ RMSE | \overline{R}^2 | Δ MAE | Δ RMSE | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 1927–2013 | 9.15*** | 1.6868 | 2.24 | 1.6868 | -17.20 | -1.8901 | -1.9023 | -0.40 | -6.04 |
| d/y Dividend Yield | 1927–2013 | 6.49** | 1.2452 | -0.95 | 1.2452 | -29.78 | -3.4097 | -3.3988 | -0.80 | -10.01 |
| e/p Earning Price Ratio | 1927–2013 | 5.43** | 1.0717 | -6.72 | 1.0717 | -19.91 | -3.4330 | -2.2323 | -0.77 | -6.97 |
| d/e Dividend Payout Ratio | 1927–2013 | 0.45 | 0.2648 | 1.09 | 0.2648 | -4.23 | -0.1572 | -0.2734 | -0.50 | -0.95 |
| svar Stock Variance | 1927–2013 | 0.26 | 0.2351 | 0.13 | 0.2351 | 0.09 | 0.2366 | 0.2913 | 0.79** | 1.04* |
| b/m Book to Market | 1927–2013 | 11.13** | 2.0193 | -23.99 | 2.0193 | -76.88 | -8.8551 | -8.4394 | -1.88 | -19.86 |
| ntis Net Equity Expansion | 1927–2013 | 12.25** | 2.2102 | -6.65 | 2.2102 | -31.12 | -2.8973 | -3.5539 | -1.89 | -10.39 |
| eqis Pct Equity Issuing | 1927–2013 | 8.33 | 1.5504 | -11.83 | 1.5504 | -31.94 | -2.9494 | -3.6488 | -1.40 | -10.62 |
| tbl T-Bill Rate | 1927–2013 | 1.91 | 0.5001 | -6.07 | 0.5001 | -36.49 | -4.7673 | -4.1671 | -1.23 | -11.83 |
| lty Long Term Yield | 1927–2013 | -0.91 | 0.0491 | -5.12 | 0.0491 | -35.35 | -4.5849 | -4.0388 | -1.18 | -11.54 |
| ltr Long Term Return | 1927–2013 | -0.88 | 0.0538 | 0.12 | 0.0538 | -7.17 | -0.7425 | -0.6509 | -1.34 | -2.21 |
| tms Term Spread | 1927–2013 | 6.51** | 1.2491 | 7.26 | 1.2491 | -3.17 | 0.7385 | -0.1360 | -0.09 | -0.47 |
| dfy Default Yield Spread | 1927–2013 | 0.20 | 0.2264 | 0.33 | 0.2264 | -0.23 | 0.3755 | 0.2490 | 0.67* | 0.89* |
| dfr Default Return Spread | 1927–2013 | -1.22 | 0.0005 | -2.18 | 0.0005 | -3.51 | -0.0429 | -0.1802 | -0.98 | -0.63 |
| infl Inflation | 1927–2013 | -0.91 | 0.0490 | -2.84 | 0.0490 | -8.55 | -1.0193 | -0.8275 | -2.45 | -2.78 |
| i/k Invstmnt Capital Ratio | 1947–2013 | 19.97*** | 2.9432 | 12.24 | 2.9432 | 16.63 | 2.4524 | 2.8703 | 1.41*** | 10.17*** |
| cayp Cnsmpn, Wlth, Incme | 1945–2013 | 26.80*** | 3.9050 | 26.18 | 3.9050 | 26.75 | 3.5957 | 4.4235 | 1.66*** | 18.53*** |
| caya Cnsmpn, Wlth, Incme | 1945–2013 | — | — | — | — | -1.54 | -1.9192 | 0.0839 | 0.03 | 0.27 |
| all Kitchen Sink | 1927–2013 | 35.21*** | 8.1934 | -15.81 | 8.1934 | -316.16 | -17.0266 | -20.4750 | -2.34 | -31.94 |
| ms Model Selection | 1927–2013 | — | — | — | — | — | — | — | — | — |

Table 6: Forecasts at 5-year Frequency

This table presents statistics on forecast errors (*in-sample* and *out-of-sample*) for excess stock return forecasts at the 5-year frequency (both in the forecasting equation and forecast). Variables are explained in Section 1. Stock return is price changes, *including* dividends, of S&P500. Panel A uses the full sample period for each variable and constructs first forecast 20 years after the first data observation. Panel B uses the full sample period for each variable and constructs first forecast in 1965 (or 20 years after the first data observation, whichever comes later). Panel C uses only the sample period 1927 to 2013 and constructs first forecast in 1965 (or 20 years after the first data observation, whichever comes later). The data period for **ms** model is 1927 to 2013. All numbers, except \overline{R}^2 , are in percent per 5-years. A star next to $\text{IS-}\overline{R}^2$ denotes significance of the in-sample regression. RMSE is the root mean square error and MAE is the mean absolute error. ΔRMSE (ΔMAE) is the RMSE (MAE) difference between the unconditional forecast and the conditional forecast for the same sample/forecast period (positive numbers signify superior *out-of-sample* conditional forecast). $\text{OOS-}R^2$ is calculated as one minus the ratio of the variance of conditional forecast errors and the variance of the unconditional forecast errors. MSE-T is the Diebold and Mariano (1995) *t*-statistic modified by Harvey, Leybourne, and Newbold (1998) and MSE-F is *F*-statistic by McCracken (2004). Both the MSE-T and MSE-F statistics test for equal MSE of the unconditional forecast and the conditional forecast. One-sided critical values of MSE statistics are obtained from McCracken (2004) (critical values for **ms** model are not calculated). Significance levels at 90%, 95%, and 99% are denoted by one, two, and three stars, respectively.

Panel A: Full data, Forecasts begin 20 years after the first sample date

| | | | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|-------------|------------------------|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|---------|----------|
| Variable | | Data | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p | Dividend Price Ratio | 1872–2013 | 10.23*** | 2.0435 | 14.50 | 2.0435 | −0.87 | 0.2278 | −0.0075 | −0.00 | −0.05 |
| d/y | Dividend Yield | 1872–2013 | 4.89** | 1.0340 | 7.62 | 1.0340 | −5.07 | 0.0350 | −0.8041 | −0.36 | −4.76 |
| e/p | Earning Price Ratio | 1872–2013 | 3.44 | 0.7647 | 3.59 | 0.7647 | −3.55 | −0.1587 | −0.5169 | −0.35 | −3.09 |
| d/e | Dividend Payout Ratio | 1872–2013 | 3.22** | 0.7234 | 6.10 | 0.7234 | −2.51 | −0.1148 | −0.3203 | −0.26 | −1.93 |
| svar | Stock Variance | 1885–2013 | 2.17** | 0.5529 | 1.33 | 0.5529 | −88.77 | −4.7602 | −14.5020 | −1.15 | −48.86 |
| b/m | Book to Market | 1921–2013 | 11.81** | 2.6355 | 5.13 | 2.6355 | −8.78 | −0.7411 | −1.3084 | −0.28 | −4.68 |
| ntis | Net Equity Expansion | 1927–2013 | 6.65** | 1.5294 | −8.29 | 1.5294 | −6.27 | −1.0656 | −0.8730 | −0.60 | −2.81 |
| eqis | Pct Equity Issuing | 1927–2013 | 3.88 | 0.9854 | −7.95 | 0.9854 | −10.86 | −1.5123 | −1.7020 | −0.79 | −5.30 |
| tbl | T-Bill Rate | 1920–2013 | 2.65 | 0.7539 | 8.26 | 0.7539 | −19.57 | −3.3859 | −3.1230 | −0.60 | −10.64 |
| lty | Long Term Yield | 1919–2013 | −0.25 | 0.1743 | 2.23 | 0.1743 | −112.12 | −14.1517 | −16.1639 | −2.10 | −37.07 |
| ltr | Long Term Return | 1926–2013 | −1.07 | 0.0310 | −1.09 | 0.0310 | −7.22 | −2.5837 | −1.0841 | −0.82 | −3.40 |
| tms | Term Spread | 1920–2013 | 4.65* | 1.1571 | 5.30 | 1.1571 | −28.97 | −2.5528 | −4.6438 | −0.95 | −14.97 |
| dfy | Default Yield Spread | 1919–2013 | 6.22** | 1.4655 | −0.87 | 1.4655 | −48.22 | −5.4548 | −7.5721 | −1.44 | −22.44 |
| dfr | Default Return Spread | 1926–2013 | −0.21 | 0.1974 | 0.65 | 0.1974 | −3.86 | −0.1354 | −0.4504 | −0.92 | −1.45 |
| infl | Inflation | 1919–2013 | −1.07 | 0.0129 | −1.67 | 0.0129 | −9.92 | −1.1434 | −1.4960 | −1.74 | −5.52 |
| i/k | Invstmnt Capital Ratio | 1947–2013 | 30.80*** | 6.0432 | 21.80 | 6.0432 | 16.34 | 3.9879 | 3.9431 | 1.14** | 9.54*** |
| cayp | Cnsmptn, Wlth, Incme | 1945–2013 | 35.47*** | 6.9818 | 38.42 | 6.9818 | 32.54 | 7.7298 | 7.7731 | 1.91*** | 23.12*** |
| caya | Cnsmptn, Wlth, Incme | 1945–2013 | — | — | — | — | 4.22 | 2.4358 | 1.3118 | 0.36* | 2.98** |
| all | Kitchen Sink | 1927–2013 | 43.65*** | 11.8041 | 46.06 | 11.8041 | −290.82 | −25.3849 | −29.8684 | −2.66 | −43.30 |
| ms | Model Selection | 1927–2013 | — | — | — | — | — | — | — | — | — |

Panel B: Full data, Forecasts begin in 1965

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|-----------------------------------|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|---------|----------|
| | | \overline{R}^2 | Δ RMSE | \overline{R}^2 | Δ RMSE | \overline{R}^2 | Δ MAE | Δ RMSE | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 1872–2013 | 10.23*** | 2.0435 | 10.34 | 2.0435 | −21.13 | 0.7943 | −2.9209 | −0.45 | −7.06 |
| d/y Dividend Yield | 1872–2013 | 4.89** | 1.0340 | 4.23 | 1.0340 | −16.94 | 1.2654 | −2.2971 | −0.41 | −5.70 |
| e/p Earning Price Ratio | 1872–2013 | 3.44 | 0.7647 | −5.99 | 0.7647 | −11.39 | −0.4669 | −1.4541 | −0.43 | −3.74 |
| d/e Dividend Payout Ratio | 1872–2013 | 3.22** | 0.7234 | 10.34 | 0.7234 | 6.63 | 1.0391 | 1.4379 | 1.06** | 4.22*** |
| svar Stock Variance | 1885–2013 | 2.17** | 0.5529 | 3.16 | 0.5529 | 2.26 | 0.9123 | 0.7209 | 0.81* | 2.02** |
| b/m Book to Market | 1921–2013 | 11.81** | 2.6355 | −18.33 | 2.6355 | −33.98 | −4.6105 | −5.3548 | −0.89 | −10.70 |
| ntis Net Equity Expansion | 1927–2013 | 6.65** | 1.5294 | 0.32 | 1.5294 | −18.49 | −2.8049 | −2.7778 | −1.97 | −6.21 |
| eqis Pct Equity Issuing | 1927–2013 | 3.88 | 0.9854 | −4.87 | 0.9854 | −18.22 | −2.5870 | −2.7334 | −0.93 | −6.12 |
| tbl T-Bill Rate | 1920–2013 | 2.65 | 0.7539 | −10.48 | 0.7539 | −30.56 | −4.9761 | −4.8462 | −0.63 | −9.80 |
| lty Long Term Yield | 1919–2013 | −0.25 | 0.1743 | −10.70 | 0.1743 | −65.60 | −9.4424 | −10.1011 | −1.05 | −17.25 |
| ltr Long Term Return | 1926–2013 | −1.07 | 0.0310 | 0.55 | 0.0310 | −16.34 | −2.9567 | −2.3836 | −1.76 | −5.50 |
| tms Term Spread | 1920–2013 | 4.65* | 1.1571 | 13.93 | 1.1571 | 0.44 | 0.9433 | 0.4689 | 0.17 | 1.16* |
| dfy Default Yield Spread | 1919–2013 | 6.22** | 1.4655 | 10.00 | 1.4655 | 9.72 | 2.1486 | 2.2090 | 1.60*** | 5.90*** |
| dfr Default Return Spread | 1926–2013 | −0.21 | 0.1974 | 1.78 | 0.1974 | −1.14 | 0.3270 | 0.1717 | 0.40* | 0.44 |
| infl Inflation | 1919–2013 | −1.07 | 0.0129 | −2.33 | 0.0129 | −6.10 | −0.5435 | −0.7113 | −1.47 | −1.68 |
| i/k Invstmnt Capital Ratio | 1947–2013 | 30.80*** | 6.0432 | 21.80 | 6.0432 | 16.34 | 3.9879 | 3.9431 | 1.14** | 9.54*** |
| cayp Cnsmpn, Wlth, Incme | 1945–2013 | 35.47*** | 6.9818 | 38.42 | 6.9818 | 32.54 | 7.7298 | 7.7731 | 1.91*** | 23.12*** |
| caya Cnsmpn, Wlth, Incme | 1945–2013 | — | — | — | — | 4.22 | 2.4358 | 1.3118 | 0.36* | 2.98** |
| all Kitchen Sink | 1927–2013 | 43.65*** | 11.8041 | 29.56 | 11.8041 | −332.32 | −22.6135 | −28.8407 | −1.87 | −31.12 |
| ms Model Selection | 1927–2013 | — | — | — | — | — | — | — | — | — |

Panel C: Data begin in 1927, Forecasts begin in 1965

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|-----------------------------------|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|---------|----------|
| | | \overline{R}^2 | Δ RMSE | \overline{R}^2 | Δ RMSE | \overline{R}^2 | Δ MAE | Δ RMSE | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 1927–2013 | 21.53*** | 4.5986 | 7.51 | 4.5986 | -8.74 | 1.2773 | -1.1479 | -0.15 | -2.74 |
| d/y Dividend Yield | 1927–2013 | 12.41*** | 2.6865 | 1.42 | 2.6865 | -11.60 | 1.6548 | -1.6328 | -0.23 | -3.82 |
| e/p Earning Price Ratio | 1927–2013 | 8.15* | 1.8271 | -12.24 | 1.8271 | -22.96 | -2.3645 | -3.5031 | -0.62 | -7.62 |
| d/e Dividend Payout Ratio | 1927–2013 | 6.82*** | 1.5631 | 13.22 | 1.5631 | 7.66 | 1.7403 | 1.7686 | 1.15** | 4.77*** |
| svar Stock Variance | 1927–2013 | 1.19* | 0.4664 | 2.28 | 0.4664 | 0.25 | 0.5264 | 0.4216 | 0.68* | 1.07* |
| b/m Book to Market | 1927–2013 | 14.43** | 3.1015 | -19.68 | 3.1015 | -46.68 | -5.7023 | -7.1471 | -1.03 | -13.67 |
| ntis Net Equity Expansion | 1927–2013 | 6.65** | 1.5294 | 0.32 | 1.5294 | -18.49 | -2.8049 | -2.7778 | -1.97 | -6.21 |
| eqis Pct Equity Issuing | 1927–2013 | 3.88 | 0.9854 | -4.87 | 0.9854 | -18.22 | -2.5870 | -2.7334 | -0.93 | -6.12 |
| tbl T-Bill Rate | 1927–2013 | 3.56 | 0.9249 | -11.14 | 0.9249 | -61.29 | -6.0131 | -9.2470 | -0.73 | -16.51 |
| lty Long Term Yield | 1927–2013 | -0.41 | 0.1601 | -9.85 | 0.1601 | -112.11 | -11.9275 | -15.8901 | -1.14 | -23.33 |
| ltr Long Term Return | 1927–2013 | -1.05 | 0.0379 | 0.78 | 0.0379 | -11.87 | -2.2997 | -1.6787 | -1.65 | -3.92 |
| tms Term Spread | 1927–2013 | 8.20** | 1.8371 | 14.05 | 1.8371 | 0.58 | 1.4201 | 0.4816 | 0.12 | 1.23* |
| dfy Default Yield Spread | 1927–2013 | 3.35* | 0.8827 | 8.00 | 0.8827 | 4.65 | 1.1630 | 1.2165 | 1.40*** | 3.20** |
| dfr Default Return Spread | 1927–2013 | -0.13 | 0.2132 | 1.84 | 0.2132 | -1.12 | 0.3988 | 0.1774 | 0.37 | 0.45 |
| infl Inflation | 1927–2013 | -1.13 | 0.0232 | -2.46 | 0.0232 | -10.96 | -1.5388 | -1.5246 | -1.48 | -3.58 |
| i/k Invstmnt Capital Ratio | 1947–2013 | 30.80*** | 6.0432 | 21.80 | 6.0432 | 16.34 | 3.9879 | 3.9431 | 1.14** | 9.54*** |
| cayp Cnsmpn, Wlth, Incme | 1945–2013 | 35.47*** | 6.9818 | 38.42 | 6.9818 | 32.54 | 7.7298 | 7.7731 | 1.91*** | 23.12*** |
| caya Cnsmpn, Wlth, Incme | 1945–2013 | — | — | — | — | 4.22 | 2.4358 | 1.3118 | 0.36* | 2.98** |
| all Kitchen Sink | 1927–2013 | 43.65*** | 11.8041 | 29.56 | 11.8041 | -332.32 | -22.6135 | -28.8407 | -1.87 | -31.12 |
| ms Model Selection | 1927–2013 | — | — | — | — | — | — | — | — | — |

Table 7: Forecasts Using Various d/p , e/p , and d/e Ratios

This table presents statistics on forecast errors (*in-sample* and *out-of-sample*) for excess stock return forecasts at various frequencies. Variables are explained in Section 1. Stock return is price changes, *including* dividends, of S&P500 (monthly panel uses CRSP data for calculation of stock returns). All numbers, except \overline{R}^2 , are in percent per frequency corresponding to the panel. A star next to $IS-\overline{R}^2$ denotes significance of the in-sample regression. RMSE is the root mean square error and MAE is the mean absolute error. $\Delta RMSE$ (ΔMAE) is the RMSE (MAE) difference between the unconditional forecast and the conditional forecast for the same sample/forecast period (positive numbers signify superior *out-of-sample* conditional forecast). $OOS-R^2$ is calculated as one minus the ratio of the variance of conditional forecast errors and the variance of the unconditional forecast errors. MSE-T is the Diebold and Mariano (1995) t -statistic modified by Harvey, Leybourne, and Newbold (1998) and MSE-F is F -statistic by McCracken (2004). Both the MSE-T and MSE-F statistics test for equal MSE of the unconditional forecast and the conditional forecast. One-sided critical values of MSE statistics are obtained from McCracken (2004). Significance levels at 90%, 95%, and 99% are denoted by one, two, and three stars, respectively.

Panel A: Forecasting monthly return with total returns

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|---|---------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|-------|--------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| e/p Earning(1Y) Price Ratio | 192701–201312 | 0.33** | 0.0117 | -0.55 | 0.0117 | -1.63 | -0.0679 | -0.0320 | -0.93 | -8.44 |
| e/p Earning(3Y) Price Ratio | 192701–201312 | 0.19* | 0.0080 | -0.27 | 0.0080 | -0.43 | -0.0416 | -0.0058 | -0.32 | -1.54 |
| e/p Earning(5Y) Price Ratio | 192701–201312 | 0.28** | 0.0105 | -0.31 | 0.0105 | -0.57 | -0.0551 | -0.0087 | -0.42 | -2.32 |
| e/p Earning(10Y) Price Ratio | 192701–201312 | 0.48** | 0.0158 | -0.17 | 0.0158 | -0.66 | -0.0668 | -0.0107 | -0.41 | -2.84 |
| d/p Dividend(1Y) Price Ratio | 192701–201312 | 0.11 | 0.0058 | -0.08 | 0.0058 | -0.22 | -0.0427 | -0.0010 | -0.06 | -0.27 |
| d/p Dividend(3Y) Price Ratio | 192701–201312 | 0.19* | 0.0079 | -0.06 | 0.0079 | -0.16 | -0.0457 | 0.0001 | 0.01 | 0.04 |
| d/p Dividend(5Y) Price Ratio | 192701–201312 | 0.28** | 0.0105 | -0.01 | 0.0105 | -0.22 | -0.0532 | -0.0010 | -0.05 | -0.27 |
| d/p Dividend(10Y) Price Ratio | 192701–201312 | 0.23* | 0.0091 | -0.02 | 0.0091 | -0.17 | -0.0489 | -0.0000 | -0.00 | -0.00 |
| d/e Dividend(1Y) Earning(1Y) Ratio | 192701–201312 | -0.06 | 0.0010 | -0.28 | 0.0010 | -2.03 | -0.0275 | -0.0407 | -2.49 | -10.70 |
| d/e Dividend(1Y) Earning(3Y) Ratio | 192701–201312 | -0.10 | 0.0000 | -0.17 | 0.0000 | -1.09 | -0.0160 | -0.0201 | -2.29 | -5.32 |
| d/e Dividend(1Y) Earning(5Y) Ratio | 192701–201312 | -0.08 | 0.0004 | -0.25 | 0.0004 | -1.30 | -0.0158 | -0.0247 | -2.46 | -6.53 |
| d/e Dividend(1Y) Earning(10Y) Ratio | 192701–201312 | 0.06 | 0.0042 | -0.24 | 0.0042 | -1.20 | -0.0056 | -0.0226 | -1.81 | -5.97 |
| d/e Dividend(3Y) Earning(3Y) Ratio | 192701–201312 | -0.05 | 0.0012 | -0.09 | 0.0012 | -0.30 | -0.0122 | -0.0030 | -0.59 | -0.79 |
| d/e Dividend(5Y) Earning(5Y) Ratio | 192701–201312 | -0.01 | 0.0025 | 0.01 | 0.0025 | -0.16 | -0.0121 | 0.0002 | 0.03 | 0.06 |
| d/e Dividend(10Y) Earning(10Y) Ratio | 192701–201312 | -0.10 | 0.0000 | -0.17 | 0.0000 | -0.84 | -0.0116 | -0.0147 | -2.95 | -3.91 |

Panel B: Forecasting 1 year return - Forecast begins 1902

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|---|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|--------|--------|
| | | $\overline{R^2}$ | $\Delta RMSE$ | $\overline{R^2}$ | $\Delta RMSE$ | $\overline{R^2}$ | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| e/p Earning(1Y) Price Ratio | 1882–2013 | 0.56 | 0.1208 | 0.43 | 0.1208 | -4.01 | -0.3512 | -0.2927 | -1.02 | -3.34 |
| e/p Earning(3Y) Price Ratio | 1882–2013 | 2.35** | 0.2837 | 2.45 | 0.2837 | -0.98 | 0.1588 | -0.0067 | -0.02 | -0.08 |
| e/p Earning(5Y) Price Ratio | 1882–2013 | 2.60** | 0.3072 | 2.87 | 0.3072 | -0.60 | -0.0273 | 0.0295 | 0.08* | 0.34* |
| e/p Earning(10Y) Price Ratio | 1882–2013 | 4.82*** | 0.5111 | 5.80 | 0.5111 | 2.19 | 0.0377 | 0.2969 | 0.56** | 3.55** |
| d/p Dividend(1Y) Price Ratio | 1882–2013 | 1.08 | 0.1685 | 1.54 | 0.1685 | -1.89 | -0.2075 | -0.0930 | -0.26 | -1.08 |
| d/p Dividend(3Y) Price Ratio | 1882–2013 | 1.53* | 0.2087 | 2.22 | 0.2087 | -1.78 | -0.2738 | -0.0829 | -0.19 | -0.96 |
| d/p Dividend(5Y) Price Ratio | 1882–2013 | 2.15* | 0.2653 | 2.96 | 0.2653 | -0.83 | -0.3767 | 0.0080 | 0.02 | 0.09* |
| d/p Dividend(10Y) Price Ratio | 1882–2013 | 1.84* | 0.2372 | 2.88 | 0.2372 | -1.28 | -0.5166 | -0.0355 | -0.07 | -0.41 |
| d/e Dividend(1Y) Earning(1Y) Ratio | 1882–2013 | -0.58 | 0.0174 | -0.43 | 0.0174 | -3.34 | -0.3027 | -0.2304 | -1.02 | -2.64 |
| d/e Dividend(1Y) Earning(3Y) Ratio | 1882–2013 | -0.74 | 0.0028 | -0.98 | 0.0028 | -4.70 | -0.1179 | -0.3577 | -2.09 | -4.06 |
| d/e Dividend(1Y) Earning(5Y) Ratio | 1882–2013 | -0.69 | 0.0080 | -0.96 | 0.0080 | -5.78 | -0.3774 | -0.4577 | -1.67 | -5.15 |
| d/e Dividend(1Y) Earning(10Y) Ratio | 1882–2013 | 1.21 | 0.1800 | 1.13 | 0.1800 | -1.79 | 0.0327 | -0.0832 | -0.15 | -0.96 |
| d/e Dividend(3Y) Earning(3Y) Ratio | 1882–2013 | -0.74 | 0.0034 | -0.73 | 0.0034 | -4.39 | -0.3822 | -0.3287 | -3.28 | -3.74 |
| d/e Dividend(5Y) Earning(5Y) Ratio | 1882–2013 | -0.44 | 0.0306 | -0.11 | 0.0306 | -4.06 | -0.4449 | -0.2979 | -1.29 | -3.40 |
| d/e Dividend(10Y) Earning(10Y) Ratio | 1882–2013 | -0.65 | 0.0117 | -0.96 | 0.0117 | -5.91 | -0.2799 | -0.4699 | -2.10 | -5.29 |

Panel C: Forecasting 1 year return - Forecast begins 1965

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|---|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|-------|-------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| e/p Earning(1Y) Price Ratio | 1882-2013 | 0.56 | 0.1208 | -1.48 | 0.1208 | -3.72 | -0.3376 | -0.1290 | -0.22 | -0.75 |
| e/p Earning(3Y) Price Ratio | 1882-2013 | 2.35** | 0.2837 | -0.60 | 0.2837 | -2.75 | -0.4105 | -0.0507 | -0.08 | -0.30 |
| e/p Earning(5Y) Price Ratio | 1882-2013 | 2.60** | 0.3072 | -1.02 | 0.3072 | -4.35 | -0.5832 | -0.1793 | -0.26 | -1.04 |
| e/p Earning(10Y) Price Ratio | 1882-2013 | 4.82*** | 0.5111 | 0.62 | 0.5111 | -8.16 | -0.9496 | -0.4824 | -0.48 | -2.73 |
| d/p Dividend(1Y) Price Ratio | 1882-2013 | 1.08 | 0.1685 | 0.33 | 0.1685 | -5.11 | -0.8952 | -0.2401 | -0.32 | -1.39 |
| d/p Dividend(3Y) Price Ratio | 1882-2013 | 1.53* | 0.2087 | 0.32 | 0.2087 | -6.43 | -1.0207 | -0.3456 | -0.41 | -1.98 |
| d/p Dividend(5Y) Price Ratio | 1882-2013 | 2.15* | 0.2653 | 0.62 | 0.2653 | -8.02 | -1.2417 | -0.4715 | -0.51 | -2.67 |
| d/p Dividend(10Y) Price Ratio | 1882-2013 | 1.84* | 0.2372 | 0.62 | 0.2372 | -7.62 | -1.2652 | -0.4404 | -0.51 | -2.50 |
| d/e Dividend(1Y) Earning(1Y) Ratio | 1882-2013 | -0.58 | 0.0174 | -1.61 | 0.0174 | -3.43 | -0.1848 | -0.1058 | -0.66 | -0.62 |
| d/e Dividend(1Y) Earning(3Y) Ratio | 1882-2013 | -0.74 | 0.0028 | -2.37 | 0.0028 | -8.65 | -0.1039 | -0.5213 | -1.76 | -2.94 |
| d/e Dividend(1Y) Earning(5Y) Ratio | 1882-2013 | -0.69 | 0.0080 | -2.79 | 0.0080 | -11.31 | -0.1218 | -0.7293 | -1.81 | -4.04 |
| d/e Dividend(1Y) Earning(10Y) Ratio | 1882-2013 | 1.21 | 0.1800 | -3.62 | 0.1800 | -13.37 | 0.1436 | -0.8887 | -1.33 | -4.86 |
| d/e Dividend(3Y) Earning(3Y) Ratio | 1882-2013 | -0.74 | 0.0034 | -1.97 | 0.0034 | -4.69 | -0.2127 | -0.2071 | -2.21 | -1.20 |
| d/e Dividend(5Y) Earning(5Y) Ratio | 1882-2013 | -0.44 | 0.0306 | -1.24 | 0.0306 | -3.64 | -0.3040 | -0.1223 | -0.56 | -0.71 |
| d/e Dividend(10Y) Earning(10Y) Ratio | 1882-2013 | -0.65 | 0.0117 | -2.13 | 0.0117 | -8.79 | -0.1306 | -0.5326 | -1.89 | -3.00 |

Panel D: Forecasting 3 year return - Forecast begins 1902

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|---|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|--------|---------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| e/p Earning(1Y) Price Ratio | 1882-2013 | 4.22* | 0.7318 | 4.28 | 0.7318 | -0.90 | -0.7731 | 0.0018 | 0.00 | 0.01 |
| e/p Earning(3Y) Price Ratio | 1882-2013 | 6.10** | 1.0126 | 6.80 | 1.0126 | 1.45 | -0.4568 | 0.3665 | 0.32* | 2.64** |
| e/p Earning(5Y) Price Ratio | 1882-2013 | 9.68*** | 1.5539 | 10.97 | 1.5539 | 4.58 | -0.0571 | 0.8579 | 0.58** | 6.33*** |
| e/p Earning(10Y) Price Ratio | 1882-2013 | 12.51*** | 1.9882 | 14.94 | 1.9882 | 3.38 | -0.4452 | 0.6692 | 0.32* | 4.89*** |
| d/p Dividend(1Y) Price Ratio | 1882-2013 | 5.67** | 0.9477 | 7.50 | 0.9477 | -0.96 | -0.9562 | -0.0081 | -0.01 | -0.06 |
| d/p Dividend(3Y) Price Ratio | 1882-2013 | 7.01*** | 1.1481 | 9.24 | 1.1481 | -0.24 | -0.9970 | 0.1036 | 0.06* | 0.74* |
| d/p Dividend(5Y) Price Ratio | 1882-2013 | 8.06*** | 1.3068 | 10.67 | 1.3068 | -0.60 | -0.8660 | 0.0482 | 0.03* | 0.34* |
| d/p Dividend(10Y) Price Ratio | 1882-2013 | 6.31** | 1.0439 | 9.26 | 1.0439 | -5.75 | -1.9324 | -0.7372 | -0.38 | -5.03 |
| d/e Dividend(1Y) Earning(1Y) Ratio | 1882-2013 | -0.32 | 0.0670 | 0.25 | 0.0670 | -6.85 | -0.6756 | -0.9027 | -2.26 | -6.12 |
| d/e Dividend(1Y) Earning(3Y) Ratio | 1882-2013 | -0.30 | 0.0702 | 0.33 | 0.0702 | -11.99 | -0.8533 | -1.6642 | -1.47 | -10.89 |
| d/e Dividend(1Y) Earning(5Y) Ratio | 1882-2013 | -0.72 | 0.0103 | -1.07 | 0.0103 | -7.01 | -0.7434 | -0.9273 | -1.37 | -6.28 |
| d/e Dividend(1Y) Earning(10Y) Ratio | 1882-2013 | 0.77 | 0.2259 | 0.29 | 0.2259 | -6.74 | -0.6530 | -0.8861 | -0.58 | -6.01 |
| d/e Dividend(3Y) Earning(3Y) Ratio | 1882-2013 | 0.59 | 0.1992 | 1.84 | 0.1992 | -9.73 | -1.0282 | -1.3313 | -1.56 | -8.84 |
| d/e Dividend(5Y) Earning(5Y) Ratio | 1882-2013 | 0.04 | 0.1197 | 0.98 | 0.1197 | -6.77 | -0.9546 | -0.8909 | -1.59 | -6.04 |
| d/e Dividend(10Y) Earning(10Y) Ratio | 1882-2013 | -0.73 | 0.0076 | -1.10 | 0.0076 | -7.05 | -0.6226 | -0.9327 | -2.03 | -6.31 |

Panel E: Forecasting 3 year return - Forecast begins 1965

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|---|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|-------|-------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| e/p Earning(1Y) Price Ratio | 1882-2013 | 4.22* | 0.7318 | -4.46 | 0.7318 | -10.38 | -1.8174 | -1.0286 | -0.49 | -3.51 |
| e/p Earning(3Y) Price Ratio | 1882-2013 | 6.10** | 1.0126 | -2.99 | 1.0126 | -10.88 | -1.7841 | -1.0898 | -0.41 | -3.71 |
| e/p Earning(5Y) Price Ratio | 1882-2013 | 9.68*** | 1.5539 | -0.47 | 1.5539 | -12.67 | -1.6522 | -1.3073 | -0.38 | -4.40 |
| e/p Earning(10Y) Price Ratio | 1882-2013 | 12.51*** | 1.9882 | 2.24 | 1.9882 | -21.50 | -2.0511 | -2.3552 | -0.53 | -7.49 |
| d/p Dividend(1Y) Price Ratio | 1882-2013 | 5.67** | 0.9477 | 3.65 | 0.9477 | -16.45 | -1.5355 | -1.7606 | -0.46 | -5.78 |
| d/p Dividend(3Y) Price Ratio | 1882-2013 | 7.01*** | 1.1481 | 4.69 | 1.1481 | -17.48 | -1.7273 | -1.8831 | -0.48 | -6.14 |
| d/p Dividend(5Y) Price Ratio | 1882-2013 | 8.06*** | 1.3068 | 5.66 | 1.3068 | -19.04 | -1.8945 | -2.0665 | -0.52 | -6.68 |
| d/p Dividend(10Y) Price Ratio | 1882-2013 | 6.31** | 1.0439 | 4.29 | 1.0439 | -17.11 | -2.0539 | -1.8389 | -0.52 | -6.01 |
| d/e Dividend(1Y) Earning(1Y) Ratio | 1882-2013 | -0.32 | 0.0670 | -0.06 | 0.0670 | -6.02 | -0.3396 | -0.4900 | -1.45 | -1.73 |
| d/e Dividend(1Y) Earning(3Y) Ratio | 1882-2013 | -0.30 | 0.0702 | 0.90 | 0.0702 | -10.15 | -0.7600 | -1.0005 | -1.82 | -3.42 |
| d/e Dividend(1Y) Earning(5Y) Ratio | 1882-2013 | -0.72 | 0.0103 | -3.03 | 0.0103 | -25.13 | -1.8026 | -2.7744 | -1.92 | -8.64 |
| d/e Dividend(1Y) Earning(10Y) Ratio | 1882-2013 | 0.77 | 0.2259 | -4.63 | 0.2259 | -22.25 | -1.0370 | -2.4417 | -1.53 | -7.73 |
| d/e Dividend(3Y) Earning(3Y) Ratio | 1882-2013 | 0.59 | 0.1992 | 2.44 | 0.1992 | -1.47 | -0.0135 | 0.0837 | 0.21 | 0.30 |
| d/e Dividend(5Y) Earning(5Y) Ratio | 1882-2013 | 0.04 | 0.1197 | 0.45 | 0.1197 | -3.69 | -0.3578 | -0.1973 | -0.51 | -0.71 |
| d/e Dividend(10Y) Earning(10Y) Ratio | 1882-2013 | -0.73 | 0.0076 | -2.32 | 0.0076 | -18.30 | -1.4440 | -1.9793 | -2.12 | -6.42 |

Panel F: Forecasting 5 year return - Forecast begins 1902

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|---|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|--------|---------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| e/p Earning(1Y) Price Ratio | 1882-2013 | 4.22* | 0.9269 | 4.34 | 0.9269 | -0.88 | -0.1307 | 0.0058 | 0.00 | 0.03 |
| e/p Earning(3Y) Price Ratio | 1882-2013 | 12.14*** | 2.4407 | 13.65 | 2.4407 | 4.81 | 0.9627 | 1.1363 | 0.53** | 6.49*** |
| e/p Earning(5Y) Price Ratio | 1882-2013 | 17.11*** | 3.4259 | 19.46 | 3.4259 | 6.28 | 1.6153 | 1.4354 | 0.53** | 8.29*** |
| e/p Earning(10Y) Price Ratio | 1882-2013 | 17.06*** | 3.4147 | 21.02 | 3.4147 | -1.46 | 0.2649 | -0.1084 | -0.03 | -0.59 |
| d/p Dividend(1Y) Price Ratio | 1882-2013 | 12.21*** | 2.4546 | 15.46 | 2.4546 | -0.51 | -0.2271 | 0.0785 | 0.03* | 0.43* |
| d/p Dividend(3Y) Price Ratio | 1882-2013 | 13.04*** | 2.6165 | 17.14 | 2.6165 | -1.71 | -0.1086 | -0.1557 | -0.05 | -0.85 |
| d/p Dividend(5Y) Price Ratio | 1882-2013 | 13.53*** | 2.7136 | 18.06 | 2.7136 | -3.52 | -0.0670 | -0.5074 | -0.15 | -2.72 |
| d/p Dividend(10Y) Price Ratio | 1882-2013 | 9.62*** | 1.9515 | 14.35 | 1.9515 | -15.02 | -1.5493 | -2.6735 | -0.71 | -13.25 |
| d/e Dividend(1Y) Earning(1Y) Ratio | 1882-2013 | 3.40** | 0.7746 | 6.26 | 0.7746 | -6.64 | -0.8407 | -1.1078 | -0.75 | -5.81 |
| d/e Dividend(1Y) Earning(3Y) Ratio | 1882-2013 | 0.52 | 0.2422 | 1.86 | 0.2422 | -20.92 | -2.9853 | -3.7441 | -1.46 | -17.88 |
| d/e Dividend(1Y) Earning(5Y) Ratio | 1882-2013 | -0.78 | 0.0029 | -0.80 | 0.0029 | -9.20 | -1.1684 | -1.5929 | -1.39 | -8.20 |
| d/e Dividend(1Y) Earning(10Y) Ratio | 1882-2013 | -0.80 | 0.0001 | -0.95 | 0.0001 | -11.60 | -1.0662 | -2.0421 | -1.39 | -10.35 |
| d/e Dividend(3Y) Earning(3Y) Ratio | 1882-2013 | 1.22 | 0.3702 | 3.26 | 0.3702 | -12.42 | -1.6614 | -2.1936 | -1.32 | -11.05 |
| d/e Dividend(5Y) Earning(5Y) Ratio | 1882-2013 | 0.07 | 0.1598 | 1.37 | 0.1598 | -11.99 | -1.8828 | -2.1152 | -2.15 | -10.69 |
| d/e Dividend(10Y) Earning(10Y) Ratio | 1882-2013 | -0.80 | 0.0000 | -0.93 | 0.0000 | -17.32 | -2.6846 | -3.0946 | -3.00 | -15.11 |

Panel G: Forecasting 5 year return - Forecast begins 1965

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|---|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|--------|---------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| e/p Earning(1Y) Price Ratio | 1882-2013 | 4.22* | 0.9269 | -6.94 | 0.9269 | -12.06 | -0.5985 | -1.5693 | -0.44 | -3.99 |
| e/p Earning(3Y) Price Ratio | 1882-2013 | 12.14*** | 2.4407 | 2.05 | 2.4407 | -5.37 | 1.2474 | -0.5202 | -0.11 | -1.38 |
| e/p Earning(5Y) Price Ratio | 1882-2013 | 17.11*** | 3.4259 | 3.37 | 3.4259 | -11.71 | 1.8084 | -1.5158 | -0.25 | -3.86 |
| e/p Earning(10Y) Price Ratio | 1882-2013 | 17.06*** | 3.4147 | 7.47 | 3.4147 | -17.85 | 0.9658 | -2.4530 | -0.35 | -6.00 |
| d/p Dividend(1Y) Price Ratio | 1882-2013 | 12.21*** | 2.4546 | 10.05 | 2.4546 | -24.41 | 0.2220 | -3.4266 | -0.49 | -8.06 |
| d/p Dividend(3Y) Price Ratio | 1882-2013 | 13.04*** | 2.6165 | 10.97 | 2.6165 | -23.19 | 0.0920 | -3.2476 | -0.48 | -7.69 |
| d/p Dividend(5Y) Price Ratio | 1882-2013 | 13.53*** | 2.7136 | 10.59 | 2.7136 | -25.75 | -0.5186 | -3.6225 | -0.54 | -8.45 |
| d/p Dividend(10Y) Price Ratio | 1882-2013 | 9.62*** | 1.9515 | 7.81 | 1.9515 | -17.55 | 0.6370 | -2.4078 | -0.39 | -5.90 |
| d/e Dividend(1Y) Earning(1Y) Ratio | 1882-2013 | 3.40** | 0.7746 | 10.55 | 0.7746 | 6.85 | 1.0872 | 1.4859 | 1.14** | 4.34*** |
| d/e Dividend(1Y) Earning(3Y) Ratio | 1882-2013 | 0.52 | 0.2422 | 2.49 | 0.2422 | -4.90 | -0.3864 | -0.4449 | -0.80 | -1.19 |
| d/e Dividend(1Y) Earning(5Y) Ratio | 1882-2013 | -0.78 | 0.0029 | -1.82 | 0.0029 | -27.43 | -3.0391 | -3.8672 | -1.98 | -8.94 |
| d/e Dividend(1Y) Earning(10Y) Ratio | 1882-2013 | -0.80 | 0.0001 | -2.40 | 0.0001 | -13.08 | -1.0571 | -1.7267 | -1.68 | -4.36 |
| d/e Dividend(3Y) Earning(3Y) Ratio | 1882-2013 | 1.22 | 0.3702 | 2.72 | 0.3702 | 0.65 | 0.3247 | 0.4519 | 0.57 | 1.26* |
| d/e Dividend(5Y) Earning(5Y) Ratio | 1882-2013 | 0.07 | 0.1598 | 0.12 | 0.1598 | -6.46 | -0.6528 | -0.6930 | -1.46 | -1.83 |
| d/e Dividend(10Y) Earning(10Y) Ratio | 1882-2013 | -0.80 | 0.0000 | -2.33 | 0.0000 | -20.79 | -2.3642 | -2.8931 | -2.24 | -6.95 |

Panel H: Forecasting 10 year return - Forecast begins 1902

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|---|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|-------|--------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| e/p Earning(1Y) Price Ratio | 1882–2013 | 21.46*** | 5.6015 | 24.04 | 5.6015 | -9.06 | -1.9260 | -2.1729 | -0.41 | -7.70 |
| e/p Earning(3Y) Price Ratio | 1882–2013 | 21.42*** | 5.5906 | 24.86 | 5.5906 | -6.71 | -1.0453 | -1.5552 | -0.29 | -5.60 |
| e/p Earning(5Y) Price Ratio | 1882–2013 | 20.52*** | 5.3519 | 24.44 | 5.3519 | -1.98 | -0.0437 | -0.2915 | -0.06 | -1.09 |
| e/p Earning(10Y) Price Ratio | 1882–2013 | 18.68*** | 4.8629 | 23.80 | 4.8629 | 1.73 | 0.3234 | 0.7223 | 0.20* | 2.77** |
| d/p Dividend(1Y) Price Ratio | 1882–2013 | 15.70*** | 4.0867 | 21.33 | 4.0867 | -1.12 | -1.1936 | -0.0567 | -0.01 | -0.21 |
| d/p Dividend(3Y) Price Ratio | 1882–2013 | 13.92*** | 3.6272 | 20.02 | 3.6272 | -0.32 | -0.5362 | 0.1603 | 0.04* | 0.60* |
| d/p Dividend(5Y) Price Ratio | 1882–2013 | 13.09*** | 3.4146 | 19.39 | 3.4146 | 0.78 | -0.4302 | 0.4600 | 0.12* | 1.75** |
| d/p Dividend(10Y) Price Ratio | 1882–2013 | 11.91*** | 3.1165 | 18.68 | 3.1165 | -6.24 | -1.7549 | -1.4324 | -0.29 | -5.17 |
| d/e Dividend(1Y) Earning(1Y) Ratio | 1882–2013 | -0.62 | 0.0506 | -1.37 | 0.0506 | -10.28 | -2.1040 | -2.4918 | -2.16 | -8.75 |
| d/e Dividend(1Y) Earning(3Y) Ratio | 1882–2013 | -0.80 | 0.0072 | -1.22 | 0.0072 | -18.90 | -5.0673 | -4.6915 | -2.04 | -15.58 |
| d/e Dividend(1Y) Earning(5Y) Ratio | 1882–2013 | -0.82 | 0.0041 | -0.78 | 0.0041 | -13.35 | -2.5450 | -3.2862 | -1.59 | -11.31 |
| d/e Dividend(1Y) Earning(10Y) Ratio | 1882–2013 | -0.68 | 0.0369 | -0.53 | 0.0369 | -4.53 | 0.2996 | -0.9765 | -0.79 | -3.57 |
| d/e Dividend(3Y) Earning(3Y) Ratio | 1882–2013 | -0.73 | 0.0244 | -1.38 | 0.0244 | -13.84 | -3.4566 | -3.4109 | -2.35 | -11.70 |
| d/e Dividend(5Y) Earning(5Y) Ratio | 1882–2013 | -0.82 | 0.0032 | -1.18 | 0.0032 | -17.95 | -4.0049 | -4.4545 | -3.53 | -14.88 |
| d/e Dividend(10Y) Earning(10Y) Ratio | 1882–2013 | -0.81 | 0.0060 | -0.67 | 0.0060 | -74.23 | -15.9674 | -17.2337 | -1.80 | -43.34 |

Panel I: Forecasting 10 year return - Forecast begins 1965

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|---|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|-------|----------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| e/p Earning(1Y) Price Ratio | 1882-2013 | 21.46*** | 5.6015 | 15.98 | 5.6015 | 19.73 | 1.8730 | 5.3797 | 0.86* | 10.89*** |
| e/p Earning(3Y) Price Ratio | 1882-2013 | 21.42*** | 5.5906 | 18.67 | 5.5906 | 21.07 | 2.8998 | 5.7337 | 0.76* | 11.76*** |
| e/p Earning(5Y) Price Ratio | 1882-2013 | 20.52*** | 5.3519 | 21.67 | 5.3519 | 21.45 | 3.4896 | 5.8317 | 0.69* | 12.00*** |
| e/p Earning(10Y) Price Ratio | 1882-2013 | 18.68*** | 4.8629 | 25.77 | 4.8629 | 18.44 | 3.1810 | 5.0439 | 0.52 | 10.09*** |
| d/p Dividend(1Y) Price Ratio | 1882-2013 | 15.70*** | 4.0867 | 19.31 | 4.0867 | -1.71 | -1.5597 | 0.0981 | 0.01 | 0.17 |
| d/p Dividend(3Y) Price Ratio | 1882-2013 | 13.92*** | 3.6272 | 17.52 | 3.6272 | 2.25 | -0.5895 | 1.0270 | 0.09 | 1.79** |
| d/p Dividend(5Y) Price Ratio | 1882-2013 | 13.09*** | 3.4146 | 16.51 | 3.4146 | 2.03 | -0.8875 | 0.9747 | 0.09 | 1.70** |
| d/p Dividend(10Y) Price Ratio | 1882-2013 | 11.91*** | 3.1165 | 13.94 | 3.1165 | -7.53 | -3.4507 | -1.2380 | -0.10 | -2.01 |
| d/e Dividend(1Y) Earning(1Y) Ratio | 1882-2013 | -0.62 | 0.0506 | -2.83 | 0.0506 | -20.23 | -3.3686 | -4.0312 | -1.44 | -6.02 |
| d/e Dividend(1Y) Earning(3Y) Ratio | 1882-2013 | -0.80 | 0.0072 | -2.84 | 0.0072 | -33.91 | -6.3303 | -6.8802 | -1.56 | -9.49 |
| d/e Dividend(1Y) Earning(5Y) Ratio | 1882-2013 | -0.82 | 0.0041 | -2.50 | 0.0041 | -23.83 | -4.6357 | -4.7966 | -1.61 | -7.01 |
| d/e Dividend(1Y) Earning(10Y) Ratio | 1882-2013 | -0.68 | 0.0369 | -3.00 | 0.0369 | -5.61 | -0.7439 | -0.8024 | -2.00 | -1.32 |
| d/e Dividend(3Y) Earning(3Y) Ratio | 1882-2013 | -0.73 | 0.0244 | -2.58 | 0.0244 | -24.02 | -4.2940 | -4.8359 | -1.52 | -7.06 |
| d/e Dividend(5Y) Earning(5Y) Ratio | 1882-2013 | -0.82 | 0.0032 | -2.49 | 0.0032 | -24.14 | -4.5153 | -4.8606 | -1.82 | -7.09 |
| d/e Dividend(10Y) Earning(10Y) Ratio | 1882-2013 | -0.81 | 0.0060 | -3.43 | 0.0060 | -29.26 | -6.5515 | -5.9297 | -2.74 | -8.40 |

Table 8: Forecasts at Monthly Frequency with Alternative Procedures

This table presents statistics on forecast errors (*in-sample* and *out-of-sample*) for excess stock return forecasts at the monthly frequency (both in the forecasting equation and forecast). Variables are explained in Section 1. Stock return is price changes, *excluding* dividends, of S&P500. Panel A uses the unadjusted betas (and is the same as Panel A of Table 1), Panel B corrects betas following Stambaugh (1999), and Panel C corrects betas following Lewellen (2004). All numbers, except \overline{R}^2 , are in percent per month. A star next to IS- \overline{R}^2 denotes significance of the in-sample regression. RMSE is the root mean square error and MAE is the mean absolute error. Δ RMSE (Δ MAE) is the RMSE (MAE) difference between the unconditional forecast and the conditional forecast for the same sample/forecast period (positive numbers signify superior *out-of-sample* conditional forecast). OOS- R^2 is calculated as one minus the ratio of the variance of conditional forecast errors and the variance of the unconditional forecast errors. MSE-T is the Diebold and Mariano (1995) t -statistic modified by Harvey, Leybourne, and Newbold (1998) and MSE-F is F -statistic by McCracken (2004). Both the MSE-T and MSE-F statistics test for equal MSE of the unconditional forecast and the conditional forecast. One-sided critical values of MSE statistics are obtained from McCracken (2004). Significance levels at 90%, 95%, and 99% are denoted by one, two, and three stars, respectively.

Panel A: Unadjusted betas

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|----------------------------------|---------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|-------|--------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 187102–201312 | −0.06 | 0.0000 | −0.08 | 0.0000 | −0.55 | −0.0061 | −0.0119 | −0.90 | −7.01 |
| d/y Dividend Yield | 187102–201312 | −0.05 | 0.0002 | −0.03 | 0.0002 | −0.51 | −0.0159 | −0.0112 | −1.30 | −6.56 |
| e/p Earning Price Ratio | 187102–201312 | 0.01 | 0.0017 | 0.01 | 0.0017 | −0.23 | −0.0160 | −0.0039 | −0.58 | −2.32 |
| d/e Dividend Payout Ratio | 187112–201312 | 0.08 | 0.0034 | −0.07 | 0.0034 | −0.65 | 0.0004 | −0.0145 | −0.85 | −8.46 |
| svar Stock Variance | 188502–201312 | 0.07 | 0.0033 | 0.08 | 0.0033 | −1.34 | −0.0026 | −0.0325 | −0.67 | −16.29 |
| csp Cross-Sectional Prem | 193705–200212 | 0.67** | 0.0185 | 0.37 | 0.0185 | −1.26 | −0.0595 | −0.0232 | −0.77 | −5.85 |
| b/m Book to Market | 192103–201312 | 0.11 | 0.0055 | −0.20 | 0.0055 | −0.84 | −0.0403 | −0.0153 | −0.89 | −6.29 |
| ntis Net Equity Expansion | 192701–201312 | 0.32** | 0.0115 | −0.36 | 0.0115 | −0.55 | 0.0113 | −0.0089 | −0.56 | −3.40 |
| tbl T-Bill Rate | 192002–201312 | 0.17* | 0.0069 | 0.52 | 0.0069 | 0.07 | 0.0095 | 0.0039 | 0.23* | 1.61** |
| lty Long Term Yield | 191901–201312 | 0.03 | 0.0033 | 0.15 | 0.0033 | −0.62 | −0.0019 | −0.0112 | −0.52 | −4.58 |
| ltr Long Term Return | 192601–201312 | 0.07 | 0.0045 | 0.56 | 0.0045 | −1.26 | −0.0332 | −0.0241 | −1.79 | −9.20 |
| tms Term Spread | 192002–201312 | 0.10 | 0.0051 | 0.34 | 0.0051 | 0.10 | 0.0080 | 0.0045 | 0.43* | 1.85** |
| dfy Default Yield Spread | 191901–201312 | −0.09 | 0.0000 | −0.12 | 0.0000 | −0.35 | −0.0064 | −0.0052 | −2.38 | −2.15 |
| dfr Default Return Spread | 192601–201312 | 0.15 | 0.0068 | 0.08 | 0.0068 | −0.38 | −0.0056 | −0.0053 | −0.44 | −2.05 |
| infl Inflation | 191902–201312 | −0.03 | 0.0016 | 0.16 | 0.0016 | −0.17 | 0.0025 | −0.0013 | −0.33 | −0.54 |

Panel B: Betas adjusted for Stambaugh correction

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|----------------------------------|---------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|-------|--------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 187102–201312 | -0.10 | -0.0009 | -0.18 | -0.0009 | -0.88 | -0.0061 | -0.0202 | -1.12 | -11.85 |
| d/y Dividend Yield | 187102–201312 | -0.05 | 0.0002 | -0.04 | 0.0002 | -0.57 | -0.0158 | -0.0125 | -1.34 | -7.34 |
| e/p Earning Price Ratio | 187102–201312 | -0.00 | 0.0014 | -0.01 | 0.0014 | -0.25 | -0.0118 | -0.0046 | -0.93 | -2.70 |
| d/e Dividend Payout Ratio | 187112–201312 | 0.08 | 0.0034 | -0.07 | 0.0034 | -0.75 | -0.0020 | -0.0171 | -0.94 | -9.95 |
| svar Stock Variance | 188502–201312 | 0.07 | 0.0033 | 0.08 | 0.0033 | -1.36 | -0.0024 | -0.0329 | -0.67 | -16.53 |
| csp Cross-Sectional Prem | 193705–200212 | 0.67** | 0.0185 | 0.36 | 0.0185 | -1.21 | -0.0579 | -0.0221 | -0.74 | -5.57 |
| b/m Book to Market | 192103–201312 | 0.08 | 0.0047 | -0.10 | 0.0047 | -0.54 | -0.0280 | -0.0089 | -0.72 | -3.68 |
| ntis Net Equity Expansion | 192701–201312 | 0.32** | 0.0115 | -0.36 | 0.0115 | -0.56 | 0.0111 | -0.0092 | -0.58 | -3.51 |
| tbl T-Bill Rate | 192002–201312 | 0.17* | 0.0069 | 0.53 | 0.0069 | -0.00 | 0.0085 | 0.0024 | 0.13* | 0.97* |
| lty Long Term Yield | 191901–201312 | 0.03 | 0.0032 | 0.15 | 0.0032 | -0.93 | -0.0044 | -0.0178 | -0.73 | -7.27 |
| ltr Long Term Return | 192601–201312 | 0.07 | 0.0045 | 0.56 | 0.0045 | -1.26 | -0.0331 | -0.0239 | -1.78 | -9.14 |
| tms Term Spread | 192002–201312 | 0.10 | 0.0051 | 0.34 | 0.0051 | 0.07 | 0.0072 | 0.0040 | 0.38* | 1.64** |
| dfy Default Yield Spread | 191901–201312 | -0.09 | -0.0000 | -0.11 | -0.0000 | -0.25 | -0.0022 | -0.0029 | -1.22 | -1.21 |
| dfr Default Return Spread | 192601–201312 | 0.15 | 0.0068 | 0.08 | 0.0068 | -0.38 | -0.0056 | -0.0053 | -0.44 | -2.05 |
| infl Inflation | 191902–201312 | -0.03 | 0.0016 | 0.16 | 0.0016 | -0.17 | 0.0025 | -0.0013 | -0.32 | -0.52 |

Panel C: Betas adjusted for Lewellen correction

| | | | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|-------------|-----------------------|---------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|-------|--------|
| Variable | | Data | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p | Dividend Price Ratio | 187102–201312 | -0.29 | -0.0056 | -0.45 | -0.0056 | -1.69 | -0.0071 | -0.0404 | -1.82 | -23.56 |
| d/y | Dividend Yield | 187102–201312 | -0.05 | 0.0001 | -0.05 | 0.0001 | -0.49 | -0.0117 | -0.0107 | -1.17 | -6.26 |
| e/p | Earning Price Ratio | 187102–201312 | -0.33 | -0.0066 | -0.35 | -0.0066 | -0.82 | -0.0093 | -0.0188 | -3.16 | -11.03 |
| d/e | Dividend Payout Ratio | 187112–201312 | 0.08 | 0.0033 | -0.08 | 0.0033 | -0.60 | 0.0025 | -0.0132 | -0.77 | -7.69 |
| svar | Stock Variance | 188502–201312 | -1.91 | -0.0451 | -1.90 | -0.0451 | -4.97 | -0.0264 | -0.1247 | -1.20 | -60.93 |
| csp | Cross-Sectional Prem | 193705–200212 | 0.66** | 0.0185 | 0.36 | 0.0185 | -1.01 | -0.0520 | -0.0178 | -0.63 | -4.49 |
| b/m | Book to Market | 192103–201312 | -0.36 | -0.0073 | -0.32 | -0.0073 | -0.37 | 0.0051 | -0.0053 | -1.00 | -2.18 |
| ntis | Net Equity Expansion | 192701–201312 | 0.32** | 0.0115 | -0.40 | 0.0115 | -0.63 | 0.0105 | -0.0107 | -0.64 | -4.07 |
| tbl | T-Bill Rate | 192002–201312 | 0.17* | 0.0069 | 0.53 | 0.0069 | -0.00 | 0.0087 | 0.0023 | 0.13* | 0.97* |
| lty | Long Term Yield | 191901–201312 | 0.03 | 0.0032 | 0.15 | 0.0032 | -0.58 | -0.0031 | -0.0102 | -0.50 | -4.17 |
| ltr | Long Term Return | 192601–201312 | -0.62 | -0.0143 | -0.15 | -0.0143 | -4.09 | -0.1040 | -0.0832 | -1.71 | -31.11 |
| tms | Term Spread | 192002–201312 | 0.10 | 0.0051 | 0.34 | 0.0051 | 0.05 | 0.0065 | 0.0036 | 0.33* | 1.47** |
| dfy | Default Yield Spread | 191901–201312 | -0.17 | -0.0023 | -0.13 | -0.0023 | -0.20 | 0.0031 | -0.0019 | -0.30 | -0.77 |
| dfr | Default Return Spread | 192601–201312 | -2.51 | -0.0660 | -5.10 | -0.0660 | -3.95 | -0.0608 | -0.0802 | -1.54 | -30.02 |
| infl | Inflation | 191902–201312 | -0.07 | 0.0004 | 0.31 | 0.0004 | -0.09 | 0.0060 | 0.0004 | 0.08 | 0.18 |

Table 9: Forecasts at Monthly Frequency with Alternative Procedures and Total Returns

This table presents statistics on forecast errors (*in-sample* and *out-of-sample*) for excess stock return forecasts at the monthly frequency (both in the forecasting equation and forecast). Variables are explained in Section 1. Stock return is price changes, *including* dividends, of S&P500 calculated using CRSP data. Panel A uses the unadjusted betas (and is the same as Panel A of Table 2), Panel B corrects betas following Stambaugh (1999), and Panel C corrects betas following Lewellen (2004). The sample period is January 1927 to December 2013 and the first forecast is constructed in January 1965. All numbers, except \overline{R}^2 , are in percent per month. A star next to IS- \overline{R}^2 denotes significance of the in-sample regression. RMSE is the root mean square error and MAE is the mean absolute error. Δ RMSE (Δ MAE) is the RMSE (MAE) difference between the unconditional forecast and the conditional forecast for the same sample/forecast period (positive numbers signify superior *out-of-sample* conditional forecast). OOS- R^2 is calculated as one minus the ratio of the variance of conditional forecast errors and the variance of the unconditional forecast errors. MSE-T is the Diebold and Mariano (1995) t -statistic modified by Harvey, Leybourne, and Newbold (1998) and MSE-F is F -statistic by McCracken (2004). Both the MSE-T and MSE-F statistics test for equal MSE of the unconditional forecast and the conditional forecast. One-sided critical values of MSE statistics are obtained from McCracken (2004). Significance levels at 90%, 95%, and 99% are denoted by one, two, and three stars, respectively.

Panel A: Unadjusted betas

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|----------------------------------|---------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|--------|---------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 192701–201312 | 0.11 | 0.0058 | −0.08 | 0.0058 | −0.22 | −0.0427 | −0.0011 | −0.06 | −0.29 |
| d/y Dividend Yield | 192701–201312 | 0.22* | 0.0087 | −0.06 | 0.0087 | −0.40 | −0.0585 | −0.0051 | −0.22 | −1.36 |
| e/p Earning Price Ratio | 192701–201312 | 0.33** | 0.0117 | −0.55 | 0.0117 | −1.63 | −0.0679 | −0.0321 | −0.93 | −8.46 |
| d/e Dividend Payout Ratio | 192701–201312 | −0.06 | 0.0010 | −0.28 | 0.0010 | −2.03 | −0.0275 | −0.0407 | −2.49 | −10.72 |
| svar Stock Variance | 192701–201312 | 0.07 | 0.0045 | 0.59 | 0.0045 | 0.02 | 0.0017 | 0.0042 | 0.67* | 1.12* |
| csp Cross-Sectional Prem | 193705–200212 | 0.92*** | 0.0245 | 0.46 | 0.0245 | 0.70 | 0.0089 | 0.0206 | 0.71** | 4.23*** |
| b/m Book to Market | 192701–201312 | 0.35** | 0.0122 | −0.87 | 0.0122 | −2.12 | −0.0927 | −0.0428 | −1.43 | −11.24 |
| ntis Net Equity Expansion | 192701–201312 | 0.34** | 0.0119 | −0.25 | 0.0119 | −1.22 | 0.0011 | −0.0230 | −1.07 | −6.10 |
| tbl T-Bill Rate | 192701–201312 | 0.13 | 0.0061 | 0.17 | 0.0061 | −0.11 | 0.0144 | 0.0013 | 0.05 | 0.34 |
| lty Long Term Yield | 192701–201312 | 0.02 | 0.0032 | −0.14 | 0.0032 | −0.88 | 0.0028 | −0.0155 | −0.45 | −4.11 |
| ltr Long Term Return | 192701–201312 | 0.07 | 0.0045 | 0.61 | 0.0045 | −0.40 | −0.0220 | −0.0050 | −0.32 | −1.34 |
| tms Term Spread | 192701–201312 | 0.05 | 0.0040 | 0.41 | 0.0040 | −0.03 | 0.0081 | 0.0032 | 0.22 | 0.84* |
| dfy Default Yield Spread | 192701–201312 | −0.08 | 0.0004 | −0.08 | 0.0004 | −0.21 | −0.0031 | −0.0008 | −0.33 | −0.21 |
| dfr Default Return Spread | 192701–201312 | 0.15 | 0.0067 | 0.37 | 0.0067 | −0.04 | −0.0019 | 0.0028 | 0.18 | 0.75* |
| infl Inflation | 192701–201312 | −0.02 | 0.0021 | −0.12 | 0.0021 | −0.14 | 0.0082 | 0.0008 | 0.10 | 0.20 |

Panel B: Betas adjusted for Stambaugh correction

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|----------------------------------|---------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|--------|---------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 192701–201312 | 0.02 | 0.0033 | −0.08 | 0.0033 | −0.27 | −0.0225 | −0.0022 | −0.27 | −0.59 |
| d/y Dividend Yield | 192701–201312 | 0.22* | 0.0087 | −0.04 | 0.0087 | −0.36 | −0.0561 | −0.0042 | −0.19 | −1.12 |
| e/p Earning Price Ratio | 192701–201312 | 0.30** | 0.0108 | −0.29 | 0.0108 | −0.85 | −0.0437 | −0.0149 | −0.60 | −3.97 |
| d/e Dividend Payout Ratio | 192701–201312 | −0.06 | 0.0010 | −0.30 | 0.0010 | −2.14 | −0.0294 | −0.0430 | −2.51 | −11.32 |
| svar Stock Variance | 192701–201312 | 0.07 | 0.0045 | 0.61 | 0.0045 | 0.04 | 0.0017 | 0.0046 | 0.73** | 1.24* |
| csp Cross-Sectional Prem | 193705–200212 | 0.92*** | 0.0245 | 0.46 | 0.0245 | 0.70 | 0.0091 | 0.0207 | 0.72** | 4.25*** |
| b/m Book to Market | 192701–201312 | 0.31** | 0.0113 | −0.53 | 0.0113 | −1.39 | −0.0672 | −0.0267 | −1.14 | −7.06 |
| ntis Net Equity Expansion | 192701–201312 | 0.34** | 0.0119 | −0.25 | 0.0119 | −1.24 | 0.0007 | −0.0235 | −1.08 | −6.21 |
| tbl T-Bill Rate | 192701–201312 | 0.13 | 0.0061 | 0.17 | 0.0061 | −0.24 | 0.0129 | −0.0014 | −0.05 | −0.38 |
| lty Long Term Yield | 192701–201312 | 0.02 | 0.0032 | −0.16 | 0.0032 | −1.33 | −0.0041 | −0.0254 | −0.66 | −6.72 |
| ltr Long Term Return | 192701–201312 | 0.07 | 0.0045 | 0.62 | 0.0045 | −0.40 | −0.0220 | −0.0050 | −0.32 | −1.33 |
| tms Term Spread | 192701–201312 | 0.05 | 0.0040 | 0.41 | 0.0040 | −0.05 | 0.0075 | 0.0027 | 0.19 | 0.73 |
| dfy Default Yield Spread | 192701–201312 | −0.08 | 0.0004 | −0.11 | 0.0004 | −0.34 | −0.0051 | −0.0037 | −2.18 | −0.98 |
| dfr Default Return Spread | 192701–201312 | 0.15 | 0.0067 | 0.37 | 0.0067 | −0.04 | −0.0019 | 0.0028 | 0.18 | 0.75* |
| infl Inflation | 192701–201312 | −0.02 | 0.0021 | −0.12 | 0.0021 | −0.14 | 0.0082 | 0.0008 | 0.10 | 0.20 |

Panel C: Betas adjusted for Lewellen correction

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|----------------------------------|---------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|--------|---------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 192701–201312 | -0.19 | -0.0027 | -0.26 | -0.0027 | -0.83 | -0.0057 | -0.0145 | -1.99 | -3.86 |
| d/y Dividend Yield | 192701–201312 | 0.22* | 0.0086 | -0.03 | 0.0086 | -0.27 | -0.0516 | -0.0022 | -0.10 | -0.60 |
| e/p Earning Price Ratio | 192701–201312 | -0.07 | 0.0008 | -0.16 | 0.0008 | -1.16 | -0.0190 | -0.0217 | -1.13 | -5.76 |
| d/e Dividend Payout Ratio | 192701–201312 | -0.06 | 0.0009 | -0.32 | 0.0009 | -1.88 | -0.0248 | -0.0374 | -2.44 | -9.86 |
| svar Stock Variance | 192701–201312 | -1.58 | -0.0407 | 0.90 | -0.0407 | 0.79 | 0.0085 | 0.0213 | 0.61* | 5.72*** |
| csp Cross-Sectional Prem | 193705–200212 | 0.92*** | 0.0245 | 0.45 | 0.0245 | 0.71 | 0.0094 | 0.0209 | 0.75** | 4.28*** |
| b/m Book to Market | 192701–201312 | -0.13 | -0.0010 | -0.17 | -0.0010 | -0.26 | -0.0000 | -0.0020 | -0.79 | -0.54 |
| ntis Net Equity Expansion | 192701–201312 | 0.33** | 0.0119 | -0.27 | 0.0119 | -1.34 | -0.0010 | -0.0256 | -1.13 | -6.76 |
| tbl T-Bill Rate | 192701–201312 | 0.13 | 0.0061 | 0.17 | 0.0061 | -0.19 | 0.0141 | -0.0005 | -0.02 | -0.12 |
| lty Long Term Yield | 192701–201312 | 0.02 | 0.0032 | -0.16 | 0.0032 | -0.79 | 0.0011 | -0.0135 | -0.42 | -3.59 |
| ltr Long Term Return | 192701–201312 | -0.63 | -0.0147 | -0.33 | -0.0147 | -5.88 | -0.1629 | -0.1240 | -1.90 | -31.73 |
| tms Term Spread | 192701–201312 | 0.05 | 0.0040 | 0.41 | 0.0040 | -0.05 | 0.0067 | 0.0027 | 0.18 | 0.71 |
| dfy Default Yield Spread | 192701–201312 | -0.17 | -0.0021 | -0.34 | -0.0021 | -0.59 | -0.0076 | -0.0092 | -2.61 | -2.45 |
| dfr Default Return Spread | 192701–201312 | -2.58 | -0.0682 | -4.58 | -0.0682 | -2.99 | -0.0556 | -0.0616 | -0.90 | -16.10 |
| infl Inflation | 192701–201312 | -0.04 | 0.0016 | -0.13 | 0.0016 | -0.18 | 0.0101 | -0.0003 | -0.03 | -0.07 |

Table 10: Forecasts at Monthly Frequency with Alternative Procedures and Total Returns 1946–2013

This table presents statistics on forecast errors (*in-sample* and *out-of-sample*) for excess stock return forecasts at the monthly frequency (both in the forecasting equation and forecast). Variables are explained in Section 1. Stock return is price changes, *including* dividends, of S&P500 calculated using CRSP data. Panel A uses the unadjusted betas (and is the same as Panel A of Table 2), Panel B corrects betas following Stambaugh (1999), and Panel C corrects betas following Lewellen (2004). The sample period is January 1946 to December 2013 and the first forecast is constructed in January 1965. All numbers, except \overline{R}^2 , are in percent per month. A star next to IS- \overline{R}^2 denotes significance of the in-sample regression. RMSE is the root mean square error and MAE is the mean absolute error. Δ RMSE (Δ MAE) is the RMSE (MAE) difference between the unconditional forecast and the conditional forecast for the same sample/forecast period (positive numbers signify superior *out-of-sample* conditional forecast). OOS- R^2 is calculated as one minus the ratio of the variance of conditional forecast errors and the variance of the unconditional forecast errors. MSE-T is the Diebold and Mariano (1995) t -statistic modified by Harvey, Leybourne, and Newbold (1998) and MSE-F is F -statistic by McCracken (2004). Both the MSE-T and MSE-F statistics test for equal MSE of the unconditional forecast and the conditional forecast. One-sided critical values of MSE statistics are obtained from McCracken (2004). Significance levels at 90%, 95%, and 99% are denoted by one, two, and three stars, respectively.

Panel A: Unadjusted betas

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|----------------------------------|---------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|--------|---------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 194601–201312 | 0.42** | 0.0114 | -0.15 | 0.0114 | -0.32 | -0.0519 | -0.0032 | -0.14 | -0.86 |
| d/y Dividend Yield | 194601–201312 | 0.49** | 0.0130 | -0.10 | 0.0130 | -0.26 | -0.0560 | -0.0019 | -0.08 | -0.51 |
| e/p Earning Price Ratio | 194601–201312 | 0.24* | 0.0076 | -0.25 | 0.0076 | -0.61 | -0.0373 | -0.0097 | -0.41 | -2.59 |
| d/e Dividend Payout Ratio | 194601–201312 | -0.09 | 0.0006 | -0.16 | 0.0006 | -0.98 | -0.0164 | -0.0178 | -1.43 | -4.70 |
| svar Stock Variance | 194601–201312 | 1.02*** | 0.0242 | 1.16 | 0.0242 | 0.07 | -0.0037 | 0.0053 | 0.22 | 1.41* |
| csp Cross-Sectional Prem | 194601–200212 | 0.90*** | 0.0222 | 0.47 | 0.0222 | 0.77 | 0.0106 | 0.0221 | 1.01** | 4.54*** |
| b/m Book to Market | 194601–201312 | -0.02 | 0.0021 | -0.27 | 0.0021 | -1.14 | -0.0368 | -0.0214 | -1.31 | -5.66 |
| ntis Net Equity Expansion | 194601–201312 | -0.10 | 0.0004 | -0.12 | 0.0004 | -1.21 | -0.0152 | -0.0229 | -1.18 | -6.05 |
| tbl T-Bill Rate | 194601–201312 | 0.49** | 0.0130 | 0.14 | 0.0130 | -0.24 | 0.0213 | -0.0015 | -0.04 | -0.41 |
| lty Long Term Yield | 194601–201312 | 0.17 | 0.0061 | -0.17 | 0.0061 | -0.56 | 0.0172 | -0.0085 | -0.24 | -2.26 |
| ltr Long Term Return | 194601–201312 | 0.61** | 0.0156 | 0.70 | 0.0156 | 0.01 | -0.0262 | 0.0039 | 0.12 | 1.04* |
| tms Term Spread | 194601–201312 | 0.29* | 0.0088 | 0.46 | 0.0088 | -0.47 | -0.0047 | -0.0066 | -0.21 | -1.76 |
| dfy Default Yield Spread | 194601–201312 | -0.08 | 0.0009 | -0.00 | 0.0009 | -0.86 | -0.0103 | -0.0151 | -1.06 | -4.00 |
| dfr Default Return Spread | 194601–201312 | 0.15 | 0.0057 | 0.34 | 0.0057 | -0.61 | 0.0005 | -0.0097 | -0.60 | -2.59 |
| infl Inflation | 194601–201312 | 0.58** | 0.0148 | -0.27 | 0.0148 | -0.35 | 0.0220 | -0.0040 | -0.19 | -1.06 |

Panel B: Betas adjusted for Stambaugh correction

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|----------------------------------|---------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|--------|---------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 194601–201312 | 0.18 | 0.0064 | −0.06 | 0.0064 | −0.33 | −0.0281 | −0.0036 | −0.33 | −0.96 |
| d/y Dividend Yield | 194601–201312 | 0.49** | 0.0130 | −0.08 | 0.0130 | −0.24 | −0.0549 | −0.0014 | −0.06 | −0.39 |
| e/p Earning Price Ratio | 194601–201312 | 0.19 | 0.0065 | −0.14 | 0.0065 | −0.52 | −0.0180 | −0.0078 | −0.65 | −2.06 |
| d/e Dividend Payout Ratio | 194601–201312 | −0.10 | 0.0006 | −0.15 | 0.0006 | −1.01 | −0.0171 | −0.0186 | −1.36 | −4.91 |
| svar Stock Variance | 194601–201312 | 1.02*** | 0.0242 | 1.16 | 0.0242 | 0.09 | −0.0038 | 0.0057 | 0.23* | 1.53** |
| csp Cross-Sectional Prem | 194601–200212 | 0.90*** | 0.0222 | 0.46 | 0.0222 | 0.76 | 0.0106 | 0.0220 | 1.01** | 4.52*** |
| b/m Book to Market | 194601–201312 | −0.13 | −0.0001 | −0.17 | −0.0001 | −0.89 | −0.0109 | −0.0157 | −1.88 | −4.17 |
| ntis Net Equity Expansion | 194601–201312 | −0.11 | 0.0004 | −0.11 | 0.0004 | −1.34 | −0.0177 | −0.0257 | −1.25 | −6.79 |
| tbl T-Bill Rate | 194601–201312 | 0.49** | 0.0129 | 0.12 | 0.0129 | −0.55 | 0.0180 | −0.0084 | −0.20 | −2.23 |
| lty Long Term Yield | 194601–201312 | 0.16 | 0.0060 | −0.21 | 0.0060 | −1.10 | 0.0109 | −0.0204 | −0.53 | −5.41 |
| ltr Long Term Return | 194601–201312 | 0.61** | 0.0156 | 0.70 | 0.0156 | −0.00 | −0.0264 | 0.0037 | 0.11 | 0.99* |
| tms Term Spread | 194601–201312 | 0.29* | 0.0088 | 0.46 | 0.0088 | −0.54 | −0.0066 | −0.0081 | −0.26 | −2.16 |
| dfy Default Yield Spread | 194601–201312 | −0.08 | 0.0009 | −0.01 | 0.0009 | −0.85 | −0.0106 | −0.0150 | −1.05 | −3.99 |
| dfr Default Return Spread | 194601–201312 | 0.15 | 0.0057 | 0.34 | 0.0057 | −0.61 | 0.0005 | −0.0097 | −0.60 | −2.57 |
| infl Inflation | 194601–201312 | 0.58** | 0.0148 | −0.28 | 0.0148 | −0.35 | 0.0221 | −0.0040 | −0.19 | −1.08 |

Panel C: Betas adjusted for Lewellen correction

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|----------------------------------|---------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|--------|---------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 194601–201312 | 0.26* | 0.0081 | −0.05 | 0.0081 | 0.44 | −0.0140 | 0.0134 | 0.85** | 3.60** |
| d/y Dividend Yield | 194601–201312 | 0.49** | 0.0130 | −0.09 | 0.0130 | −0.23 | −0.0547 | −0.0013 | −0.05 | −0.34 |
| e/p Earning Price Ratio | 194601–201312 | 0.06 | 0.0038 | −0.12 | 0.0038 | −0.96 | −0.0205 | −0.0175 | −0.77 | −4.62 |
| d/e Dividend Payout Ratio | 194601–201312 | −0.10 | 0.0005 | −0.15 | 0.0005 | −0.69 | −0.0124 | −0.0114 | −1.03 | −3.03 |
| svar Stock Variance | 194601–201312 | −2.55 | −0.0509 | −3.22 | −0.0509 | −4.79 | −0.0883 | −0.1006 | −1.14 | −25.90 |
| csp Cross-Sectional Prem | 194601–200212 | 0.90*** | 0.0222 | 0.46 | 0.0222 | 0.77 | 0.0108 | 0.0221 | 1.03** | 4.53*** |
| b/m Book to Market | 194601–201312 | −0.17 | −0.0010 | −0.18 | −0.0010 | −0.24 | 0.0024 | −0.0015 | −0.20 | −0.39 |
| ntis Net Equity Expansion | 194601–201312 | −0.11 | 0.0002 | −0.10 | 0.0002 | −1.83 | −0.0274 | −0.0364 | −1.47 | −9.58 |
| tbl T-Bill Rate | 194601–201312 | 0.49** | 0.0128 | 0.10 | 0.0128 | −0.43 | 0.0215 | −0.0058 | −0.15 | −1.54 |
| lty Long Term Yield | 194601–201312 | 0.16 | 0.0060 | −0.21 | 0.0060 | −0.57 | 0.0160 | −0.0088 | −0.26 | −2.33 |
| ltr Long Term Return | 194601–201312 | −0.27 | −0.0030 | −0.37 | −0.0030 | −7.44 | −0.1962 | −0.1574 | −2.21 | −39.78 |
| tms Term Spread | 194601–201312 | 0.29* | 0.0087 | 0.47 | 0.0087 | −0.79 | −0.0142 | −0.0137 | −0.39 | −3.64 |
| dfy Default Yield Spread | 194601–201312 | −0.09 | 0.0008 | −0.05 | 0.0008 | −0.87 | −0.0111 | −0.0154 | −1.08 | −4.09 |
| dfr Default Return Spread | 194601–201312 | −4.50 | −0.0912 | −4.09 | −0.0912 | −1.20 | −0.0259 | −0.0227 | −0.39 | −6.01 |
| infl Inflation | 194601–201312 | 0.36** | 0.0102 | −0.67 | 0.0102 | −0.88 | 0.0198 | −0.0156 | −0.52 | −4.13 |

Table 11: Forecasts at Monthly Frequency with Alternative Procedures and Total Returns 1946–1990

This table presents statistics on forecast errors (*in-sample* and *out-of-sample*) for excess stock return forecasts at the monthly frequency (both in the forecasting equation and forecast). Variables are explained in Section 1. Stock return is price changes, *including* dividends, of S&P500 calculated using CRSP data. Panel A uses the unadjusted betas (and is the same as Panel A of Table 2), Panel B corrects betas following Stambaugh (1999), and Panel C corrects betas following Lewellen (2004). The sample period is January 1946 to December 1990 and the first forecast is constructed in January 1965. All numbers, except \overline{R}^2 , are in percent per month. A star next to IS- \overline{R}^2 denotes significance of the in-sample regression. RMSE is the root mean square error and MAE is the mean absolute error. Δ RMSE (Δ MAE) is the RMSE (MAE) difference between the unconditional forecast and the conditional forecast for the same sample/forecast period (positive numbers signify superior *out-of-sample* conditional forecast). OOS- R^2 is calculated as one minus the ratio of the variance of conditional forecast errors and the variance of the unconditional forecast errors. MSE-T is the Diebold and Mariano (1995) t -statistic modified by Harvey, Leybourne, and Newbold (1998) and MSE-F is F -statistic by McCracken (2004). Both the MSE-T and MSE-F statistics test for equal MSE of the unconditional forecast and the conditional forecast. One-sided critical values of MSE statistics are obtained from McCracken (2004). Significance levels at 90%, 95%, and 99% are denoted by one, two, and three stars, respectively.

Panel A: Unadjusted betas

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|----------------------------------|---------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|---------|---------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 194601–199012 | 1.70*** | 0.0397 | 0.98 | 0.0397 | 1.44 | 0.0218 | 0.0402 | 1.40*** | 5.58*** |
| d/y Dividend Yield | 194601–199012 | 1.88*** | 0.0436 | 1.19 | 0.0436 | 1.66 | 0.0197 | 0.0452 | 1.51*** | 6.30*** |
| e/p Earning Price Ratio | 194601–199012 | 0.62** | 0.0170 | −0.01 | 0.0170 | −0.27 | −0.0089 | 0.0011 | 0.05 | 0.16 |
| d/e Dividend Payout Ratio | 194601–199012 | −0.02 | 0.0034 | −0.10 | 0.0034 | −0.77 | −0.0060 | −0.0101 | −0.62 | −1.38 |
| svar Stock Variance | 194601–199012 | 0.41* | 0.0125 | 0.46 | 0.0125 | −1.07 | −0.0104 | −0.0170 | −1.20 | −2.31 |
| csp Cross-Sectional Prem | 194601–199012 | 0.81** | 0.0209 | 0.04 | 0.0209 | 0.61 | 0.0194 | 0.0211 | 0.73** | 2.92** |
| b/m Book to Market | 194601–199012 | 0.18 | 0.0076 | −0.00 | 0.0076 | −1.46 | −0.0258 | −0.0257 | −0.91 | −3.49 |
| ntis Net Equity Expansion | 194601–199012 | 0.53** | 0.0151 | 1.26 | 0.0151 | −0.79 | −0.0143 | −0.0107 | −0.33 | −1.46 |
| tbl T-Bill Rate | 194601–199012 | 1.02** | 0.0253 | 0.17 | 0.0253 | 0.05 | 0.0245 | 0.0084 | 0.12 | 1.16* |
| lty Long Term Yield | 194601–199012 | 0.28 | 0.0097 | −0.61 | 0.0097 | −0.94 | 0.0268 | −0.0140 | −0.22 | −1.92 |
| ltr Long Term Return | 194601–199012 | 1.34*** | 0.0323 | 1.84 | 0.0323 | 0.80 | −0.0193 | 0.0256 | 0.49* | 3.54** |
| tms Term Spread | 194601–199012 | 1.16*** | 0.0284 | 1.43 | 0.0284 | 0.39 | −0.0014 | 0.0162 | 0.31 | 2.24** |
| dfy Default Yield Spread | 194601–199012 | 0.18 | 0.0077 | 1.13 | 0.0077 | −0.80 | −0.0044 | −0.0107 | −0.43 | −1.46 |
| dfr Default Return Spread | 194601–199012 | −0.14 | 0.0009 | −0.13 | 0.0009 | −0.92 | 0.0072 | −0.0136 | −0.57 | −1.85 |
| infl Inflation | 194601–199012 | 1.53*** | 0.0361 | −0.09 | 0.0361 | 0.44 | 0.0260 | 0.0174 | 0.54* | 2.40** |

Panel B: Betas adjusted for Stambaugh correction

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|----------------------------------|---------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|---------|---------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 194601–199012 | 1.51*** | 0.0357 | 0.81 | 0.0357 | 0.58 | 0.0119 | 0.0204 | 1.32** | 2.82** |
| d/y Dividend Yield | 194601–199012 | 1.88*** | 0.0436 | 1.19 | 0.0436 | 1.64 | 0.0198 | 0.0448 | 1.52*** | 6.24*** |
| e/p Earning Price Ratio | 194601–199012 | 0.37* | 0.0117 | −0.04 | 0.0117 | −0.39 | −0.0022 | −0.0014 | −0.22 | −0.20 |
| d/e Dividend Payout Ratio | 194601–199012 | −0.03 | 0.0033 | −0.08 | 0.0033 | −0.73 | −0.0037 | −0.0091 | −0.51 | −1.25 |
| svar Stock Variance | 194601–199012 | 0.41* | 0.0124 | 0.46 | 0.0124 | −1.04 | −0.0105 | −0.0162 | −1.10 | −2.21 |
| csp Cross-Sectional Prem | 194601–199012 | 0.81** | 0.0209 | 0.05 | 0.0209 | 0.60 | 0.0193 | 0.0211 | 0.73** | 2.91** |
| b/m Book to Market | 194601–199012 | 0.05 | 0.0049 | −0.09 | 0.0049 | −1.13 | −0.0097 | −0.0183 | −1.35 | −2.50 |
| ntis Net Equity Expansion | 194601–199012 | 0.53** | 0.0151 | 1.29 | 0.0151 | −0.93 | −0.0179 | −0.0137 | −0.40 | −1.87 |
| tbl T-Bill Rate | 194601–199012 | 1.01** | 0.0252 | 0.15 | 0.0252 | −0.45 | 0.0174 | −0.0028 | −0.04 | −0.39 |
| lty Long Term Yield | 194601–199012 | 0.23 | 0.0088 | −0.80 | 0.0088 | −1.85 | 0.0146 | −0.0345 | −0.49 | −4.68 |
| ltr Long Term Return | 194601–199012 | 1.34*** | 0.0323 | 1.84 | 0.0323 | 0.80 | −0.0196 | 0.0254 | 0.48* | 3.52** |
| tms Term Spread | 194601–199012 | 1.16*** | 0.0284 | 1.43 | 0.0284 | 0.29 | −0.0047 | 0.0138 | 0.25 | 1.90** |
| dfy Default Yield Spread | 194601–199012 | 0.18 | 0.0077 | 1.16 | 0.0077 | −0.79 | −0.0047 | −0.0106 | −0.42 | −1.45 |
| dfr Default Return Spread | 194601–199012 | −0.14 | 0.0009 | −0.13 | 0.0009 | −0.92 | 0.0073 | −0.0135 | −0.57 | −1.85 |
| infl Inflation | 194601–199012 | 1.53*** | 0.0361 | −0.09 | 0.0361 | 0.44 | 0.0260 | 0.0174 | 0.54* | 2.40** |

Panel C: Betas adjusted for Lewellen correction

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|----------------------------------|---------------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|---------|---------|
| | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 194601–199012 | 1.06*** | 0.0262 | 0.50 | 0.0262 | 1.11 | 0.0253 | 0.0325 | 1.95*** | 4.51*** |
| d/y Dividend Yield | 194601–199012 | 1.88*** | 0.0436 | 1.19 | 0.0436 | 1.66 | 0.0199 | 0.0451 | 1.53*** | 6.28*** |
| e/p Earning Price Ratio | 194601–199012 | 0.08 | 0.0057 | -0.17 | 0.0057 | -0.11 | 0.0061 | 0.0048 | 0.37 | 0.66 |
| d/e Dividend Payout Ratio | 194601–199012 | -0.03 | 0.0032 | -0.08 | 0.0032 | -0.74 | -0.0042 | -0.0096 | -0.55 | -1.31 |
| svar Stock Variance | 194601–199012 | -6.74 | -0.1354 | -9.23 | -0.1354 | -4.02 | -0.0841 | -0.0832 | -0.94 | -11.10 |
| csp Cross-Sectional Prem | 194601–199012 | 0.80** | 0.0209 | 0.05 | 0.0209 | 0.61 | 0.0195 | 0.0213 | 0.75** | 2.94** |
| b/m Book to Market | 194601–199012 | -0.30 | -0.0023 | -0.44 | -0.0023 | -0.26 | 0.0062 | 0.0014 | 0.11 | 0.19 |
| ntis Net Equity Expansion | 194601–199012 | 0.52* | 0.0148 | 1.35 | 0.0148 | -1.61 | -0.0341 | -0.0290 | -0.69 | -3.94 |
| tbl T-Bill Rate | 194601–199012 | 1.00** | 0.0249 | 0.13 | 0.0249 | -0.18 | 0.0237 | 0.0033 | 0.05 | 0.46 |
| lty Long Term Yield | 194601–199012 | 0.26 | 0.0093 | -0.73 | 0.0093 | -0.92 | 0.0237 | -0.0136 | -0.22 | -1.85 |
| ltr Long Term Return | 194601–199012 | -3.26 | -0.0640 | -4.23 | -0.0640 | -6.74 | -0.2059 | -0.1434 | -1.32 | -18.77 |
| tms Term Spread | 194601–199012 | 1.16*** | 0.0283 | 1.41 | 0.0283 | -0.06 | -0.0171 | 0.0060 | 0.10 | 0.82* |
| dfy Default Yield Spread | 194601–199012 | 0.18 | 0.0077 | 1.21 | 0.0077 | -0.78 | -0.0045 | -0.0104 | -0.42 | -1.42 |
| dfr Default Return Spread | 194601–199012 | -0.86 | -0.0141 | -0.40 | -0.0141 | -0.29 | -0.0143 | 0.0007 | 0.03 | 0.10 |
| infl Inflation | 194601–199012 | 1.21*** | 0.0295 | -0.42 | 0.0295 | 0.20 | 0.0238 | 0.0118 | 0.27 | 1.63** |

Table 12: Forecasts at Annual Frequency (ending 1990)

This table presents statistics on forecast errors (*in-sample* and *out-of-sample*) for excess stock return forecasts at the annual frequency (both in the forecasting equation and forecast) *as of 1990*. Variables are explained in Section 1. Stock return is price changes, *including* dividends, of S&P500. Panel A uses the full sample period (but ending in 1990) for each variable and constructs first forecast 20 years after the first data observation. Panel B uses the full sample period (but ending in 1990) for each variable and constructs first forecast in 1965 (or 20 years after the first data observation, whichever comes later). Panel C uses only the sample period 1927 to 1990 and constructs first forecast in 1965 (or 20 years after the first data observation, whichever comes later). The data period for **ms** model is 1927 to 1990. All numbers, except \overline{R}^2 , are in percent per year. A star next to $\text{IS-}\overline{R}^2$ denotes significance of the in-sample regression. RMSE is the root mean square error and MAE is the mean absolute error. ΔRMSE (ΔMAE) is the RMSE (MAE) difference between the unconditional forecast and the conditional forecast for the same sample/forecast period (positive numbers signify superior *out-of-sample* conditional forecast). $\text{OOS-}R^2$ is calculated as one minus the ratio of the variance of conditional forecast errors and the variance of the unconditional forecast errors. MSE-T is the Diebold and Mariano (1995) *t*-statistic modified by Harvey, Leybourne, and Newbold (1998) and MSE-F is *F*-statistic by McCracken (2004). Both the MSE-T and MSE-F statistics test for equal MSE of the unconditional forecast and the conditional forecast. One-sided critical values of MSE statistics are obtained from McCracken (2004) (critical values for **ms** model are not calculated). Significance levels at 90%, 95%, and 99% are denoted by one, two, and three stars, respectively.

Panel A: Full data, Forecasts begin 20 years after the first sample date

| Variable | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|-----------------------------------|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|--------|--------|
| | | \overline{R}^2 | Δ RMSE | \overline{R}^2 | Δ RMSE | \overline{R}^2 | Δ MAE | Δ RMSE | MSE-T | MSE-F |
| d/p Dividend Price Ratio | 1872–1990 | 1.73* | 0.2319 | 3.47 | 0.2319 | -0.28 | 0.1018 | 0.0699 | 0.40** | 0.74* |
| d/y Dividend Yield | 1872–1990 | 2.60** | 0.3108 | 4.30 | 0.3108 | 0.53 | 0.1334 | 0.1464 | 0.46** | 1.56** |
| e/p Earning Price Ratio | 1872–1990 | 1.18 | 0.1827 | 1.08 | 0.1827 | -1.63 | -0.1081 | -0.0561 | -0.37 | -0.59 |
| d/e Dividend Payout Ratio | 1872–1990 | -0.86 | 0.0002 | -0.98 | 0.0002 | -4.72 | -0.3316 | -0.3412 | -2.21 | -3.49 |
| svar Stock Variance | 1885–1990 | -0.58 | 0.0355 | -0.97 | 0.0355 | -29.29 | -1.0728 | -2.5487 | -1.35 | -18.69 |
| b/m Book to Market | 1921–1990 | 5.68** | 0.6893 | 4.36 | 0.6893 | 3.47 | 0.8568 | 0.4326 | 0.67** | 2.88** |
| ntis Net Equity Expansion | 1927–1990 | 12.93*** | 1.4570 | -3.11 | 1.4570 | -3.69 | 0.4490 | -0.0994 | -0.18 | -0.56 |
| eqis Pct Equity Issuing | 1927–1990 | 11.08*** | 1.2658 | 6.56 | 1.2658 | 5.11 | 0.1311 | 0.5805 | 0.83** | 3.47** |
| tbl T-Bill Rate | 1920–1990 | 0.83 | 0.2171 | 3.18 | 0.2171 | -2.73 | -0.3841 | -0.0532 | -0.07 | -0.34 |
| lty Long Term Yield | 1919–1990 | -0.55 | 0.0852 | 0.11 | 0.0852 | -9.37 | -1.0712 | -0.5532 | -0.52 | -3.51 |
| ltr Long Term Return | 1926–1990 | 1.70 | 0.3224 | 0.56 | 0.3224 | -13.27 | -0.9277 | -0.8082 | -0.76 | -4.35 |
| tms Term Spread | 1920–1990 | 1.08 | 0.2411 | 2.86 | 0.2411 | 0.20 | 0.2752 | 0.1733 | 0.46* | 1.14* |
| dfy Default Yield Spread | 1919–1990 | -1.36 | 0.0085 | -1.90 | 0.0085 | -4.03 | -0.1410 | -0.1545 | -1.30 | -1.02 |
| dfr Default Return Spread | 1926–1990 | 0.62 | 0.2170 | 1.41 | 0.2170 | -0.81 | 0.2818 | 0.1150 | 0.32* | 0.68* |
| infl Inflation | 1919–1990 | -1.13 | 0.0304 | -1.96 | 0.0304 | -5.05 | -0.2977 | -0.2309 | -1.26 | -1.51 |
| i/k Invstmnt Capital Ratio | 1947–1990 | 9.92** | 0.9653 | -3.32 | 0.9653 | -0.23 | -0.5883 | 0.3373 | 0.21 | 1.03* |
| cayp Cnsmptn, Wlth, Incme | 1945–1990 | 8.58** | 0.8388 | 8.07 | 0.8388 | 8.34 | 0.4111 | 0.9992 | 0.94** | 3.55** |
| caya Cnsmptn, Wlth, Incme | 1945–1990 | — | — | — | — | -14.34 | -0.1692 | -0.7692 | -0.87 | -2.31 |
| all Kitchen Sink | 1927–1990 | 16.70** | 3.5297 | -0.79 | 3.5297 | -214.51 | -6.5190 | -7.8817 | -2.80 | -24.59 |
| ms Model Selection | 1927–1990 | — | — | — | — | — | — | — | — | — |

Panel B: Full data, Forecasts begin in 1965

| Variable | | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|-------------|------------------------|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|---------|---------|
| | | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p | Dividend Price Ratio | 1872–1990 | 1.73* | 0.2319 | 6.11 | 0.2319 | 6.15 | 0.2486 | 0.7722 | 1.43** | 2.86*** |
| d/y | Dividend Yield | 1872–1990 | 2.60** | 0.3108 | 5.18 | 0.3108 | 5.25 | 0.1617 | 0.7030 | 0.72 | 2.58*** |
| e/p | Earning Price Ratio | 1872–1990 | 1.18 | 0.1827 | 2.51 | 0.1827 | 0.62 | 0.2627 | 0.3532 | 0.82* | 1.25** |
| d/e | Dividend Payout Ratio | 1872–1990 | −0.86 | 0.0002 | −4.15 | 0.0002 | −7.29 | −0.1854 | −0.2264 | −2.49 | −0.76 |
| svar | Stock Variance | 1885–1990 | −0.58 | 0.0355 | −2.67 | 0.0355 | −2.59 | 0.1159 | 0.1164 | 1.91*** | 0.40 |
| b/m | Book to Market | 1921–1990 | 5.68** | 0.6893 | 1.04 | 0.6893 | −9.71 | 0.2028 | −0.4186 | −0.40 | −1.31 |
| ntis | Net Equity Expansion | 1927–1990 | 12.93*** | 1.4570 | 9.92 | 1.4570 | −6.57 | 0.8069 | −0.1795 | −0.20 | −0.59 |
| eqis | Pct Equity Issuing | 1927–1990 | 11.08*** | 1.2658 | 2.55 | 1.2658 | 2.27 | −0.0781 | 0.4903 | 0.43 | 1.71** |
| tbl | T-Bill Rate | 1920–1990 | 0.83 | 0.2171 | −6.77 | 0.2171 | −4.53 | −0.6521 | −0.0280 | −0.02 | −0.09 |
| lty | Long Term Yield | 1919–1990 | −0.55 | 0.0852 | −9.82 | 0.0852 | −18.66 | −1.9580 | −1.0613 | −0.51 | −3.18 |
| ltr | Long Term Return | 1926–1990 | 1.70 | 0.3224 | 1.02 | 0.3224 | −25.46 | −1.6972 | −1.5352 | −0.98 | −4.41 |
| tms | Term Spread | 1920–1990 | 1.08 | 0.2411 | 5.46 | 0.2411 | 1.63 | 0.5976 | 0.4502 | 0.64* | 1.53** |
| dfy | Default Yield Spread | 1919–1990 | −1.36 | 0.0085 | −2.42 | 0.0085 | −5.93 | −0.0937 | −0.1331 | −1.38 | −0.43 |
| dfr | Default Return Spread | 1926–1990 | 0.62 | 0.2170 | 1.34 | 0.2170 | −1.02 | 0.4135 | 0.2394 | 0.48 | 0.81* |
| infl | Inflation | 1919–1990 | −1.13 | 0.0304 | −4.75 | 0.0304 | −5.19 | −0.2332 | −0.0771 | −0.32 | −0.25 |
| i/k | Invstmnt Capital Ratio | 1947–1990 | 9.92** | 0.9653 | −3.32 | 0.9653 | −0.23 | −0.5883 | 0.3373 | 0.21 | 1.03* |
| cayp | Cnsmptn, Wlth, Incme | 1945–1990 | 8.58** | 0.8388 | 8.07 | 0.8388 | 8.34 | 0.4111 | 0.9992 | 0.94** | 3.55** |
| caya | Cnsmptn, Wlth, Incme | 1945–1990 | — | — | — | — | −14.34 | −0.1692 | −0.7692 | −0.87 | −2.31 |
| all | Kitchen Sink | 1927–1990 | 16.70** | 3.5297 | −61.41 | 3.5297 | −350.85 | −7.1507 | −8.3013 | −2.43 | −14.91 |
| ms | Model Selection | 1927–1990 | — | — | — | — | — | — | — | — | — |

Panel C: Data begin in 1927, Forecasts begin in 1965

| Variable | | Data | In-Sample | | In-Sample for OOS Period | | Relative OOS Performance | | | | |
|-------------|------------------------|-----------|------------------|---------------|-----------------------------|---------------|--------------------------|--------------|---------------|---------|---------|
| | | | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | $\Delta RMSE$ | \overline{R}^2 | ΔMAE | $\Delta RMSE$ | MSE-T | MSE-F |
| d/p | Dividend Price Ratio | 1927–1990 | 4.25* | 0.5759 | 9.94 | 0.5759 | 11.89 | 0.5241 | 1.2551 | 1.83*** | 4.74*** |
| d/y | Dividend Yield | 1927–1990 | 6.74** | 0.8243 | 6.53 | 0.8243 | 10.24 | 0.3205 | 1.1213 | 0.81* | 4.17*** |
| e/p | Earning Price Ratio | 1927–1990 | 3.88* | 0.5384 | 3.52 | 0.5384 | -1.20 | 0.2442 | 0.2243 | 0.25 | 0.76 |
| d/e | Dividend Payout Ratio | 1927–1990 | -1.61 | 0.0026 | -4.23 | 0.0026 | -14.94 | -0.4786 | -0.7881 | -2.18 | -2.44 |
| svar | Stock Variance | 1927–1990 | -1.48 | 0.0157 | -3.31 | 0.0157 | -4.07 | -0.0087 | 0.0070 | 0.19 | 0.02 |
| b/m | Book to Market | 1927–1990 | 9.23*** | 1.0757 | -1.51 | 1.0757 | -10.82 | -0.0546 | -0.4917 | -0.40 | -1.56 |
| ntis | Net Equity Expansion | 1927–1990 | 12.93*** | 1.4570 | 9.92 | 1.4570 | -6.57 | 0.8069 | -0.1795 | -0.20 | -0.59 |
| eqis | Pct Equity Issuing | 1927–1990 | 11.08*** | 1.2658 | 2.55 | 1.2658 | 2.27 | -0.0781 | 0.4903 | 0.43 | 1.71** |
| tbl | T-Bill Rate | 1927–1990 | 0.62 | 0.2183 | -6.61 | 0.2183 | -13.30 | -1.5679 | -0.6709 | -0.33 | -2.10 |
| lty | Long Term Yield | 1927–1990 | -0.96 | 0.0651 | -8.74 | 0.0651 | -24.78 | -2.5667 | -1.4764 | -0.66 | -4.29 |
| ltr | Long Term Return | 1927–1990 | 1.52 | 0.3069 | 1.19 | 0.3069 | -22.51 | -1.4819 | -1.3201 | -0.92 | -3.89 |
| tms | Term Spread | 1927–1990 | 2.16 | 0.3690 | 5.55 | 0.3690 | 3.23 | 0.6577 | 0.5652 | 0.56* | 1.99** |
| dfy | Default Yield Spread | 1927–1990 | -1.53 | 0.0104 | -2.26 | 0.0104 | -5.44 | -0.0866 | -0.0955 | -1.18 | -0.31 |
| dfr | Default Return Spread | 1927–1990 | 0.47 | 0.2044 | 1.29 | 0.2044 | -1.06 | 0.3472 | 0.2348 | 0.49 | 0.80* |
| infl | Inflation | 1927–1990 | -1.36 | 0.0272 | -4.04 | 0.0272 | -12.79 | -0.1769 | -0.6342 | -1.41 | -1.99 |
| i/k | Invstmnt Capital Ratio | 1947–1990 | 9.92** | 0.9653 | -3.32 | 0.9653 | -0.23 | -0.5883 | 0.3373 | 0.21 | 1.03* |
| cayp | Cnsmptn, Wlth, Incme | 1945–1990 | 8.58** | 0.8388 | 8.07 | 0.8388 | 8.34 | 0.4111 | 0.9992 | 0.94** | 3.55** |
| caya | Cnsmptn, Wlth, Incme | 1945–1990 | — | — | — | — | -14.34 | -0.1692 | -0.7692 | -0.87 | -2.31 |
| all | Kitchen Sink | 1927–1990 | 16.70** | 3.5297 | -61.41 | 3.5297 | -350.85 | -7.1507 | -8.3013 | -2.43 | -14.91 |
| ms | Model Selection | 1927–1990 | — | — | — | — | — | — | — | — | — |

Table 13: Encompassing Tests

This table presents statistics on encompassing tests for excess stock return forecasts at various frequencies. Variables are explained in Section 1. All numbers are in percent per frequency corresponding to the panel. λ gives the ex-post weight on the conditional forecast for the optimal forecast that minimizes the MSE. ENC is the test statistic proposed by Clark and McCracken (2001) for a test of forecast encompassing. One-sided critical values of ENC statistic are obtained from Clark and McCracken (2001) (critical values for **ms** model are not calculated). Significance levels at 90%, 95%, and 99% are denoted by one, two, and three stars, respectively. ΔRMSE^* is the RMSE difference between the unconditional forecast and the optimal forecast for the same sample/forecast period. ΔRMSE^{*r} is the RMSE difference between the unconditional forecast and the optimal forecast for the same sample/forecast period using rolling estimates of λ .

Panel A: Monthly Data

| | | | All Data | | | | | All Data | | | | | After 192701 | | | | |
|------------------------------|-----------------------|---------------|------------------|-----------|---------|-----------------|--------------------|--------------|---------|-----------------|--------------------|------------------|--------------|---------|-----------------|--------------------|--|
| | | | After 20 years | | | | | After 196501 | | | | | After 196501 | | | | |
| Estimation: OOS Forecast: | | | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | |
| Data | | | | | | | | | | | | | | | | | |
| d/p | Dividend Price Ratio | 187102–201312 | -0.06 | -0.64 | -1.95 | 0.0021 | -0.0110 | -2.59 | -0.60 | 0.0058 | -0.0116 | -0.03 | 0.23 | 0.63 | 0.0006 | -0.0142 | |
| d/y | Dividend Yield | 187102–201312 | -0.05 | -1.07 | -2.22 | 0.0041 | -0.0109 | -0.45 | -0.45 | 0.0008 | -0.0139 | 0.04 | 0.27 | 1.48* | 0.0015 | -0.0120 | |
| e/p | Earning Price Ratio | 187102–201312 | 0.01 | 0.19 | 0.71 | 0.0002 | -0.0073 | -0.15 | -0.41 | 0.0002 | -0.0203 | 0.13 | 0.05 | 0.43 | 0.0001 | -0.0193 | |
| d/e | Dividend Payout Ratio | 187112–201312 | 0.08 | 0.12 | 1.29 | 0.0003 | -0.0087 | -0.24 | -0.96 | 0.0009 | -0.0172 | -0.04 | -0.88 | -3.16 | 0.0106 | -0.0049 | |
| svar | Stock Variance | 188502–201312 | 0.07 | -0.28 | -2.93 | 0.0017 | -0.2001 | 2.72 | 0.77 | 0.0079 | -0.0536 | 0.09 | 2.75 | 0.95 | 0.0098 | -0.0301 | |
| csp | Cross-Sectional Prem | 193705–200212 | 0.67** | 0.29 | 3.96** | 0.0045 | -0.0196 | 0.79 | 4.24*** | 0.0163 | -0.0076 | 0.67** | 0.79 | 4.24*** | 0.0163 | -0.0076 | |
| b/m | Book to Market | 192103–201312 | 0.11 | 0.19 | 2.02* | 0.0010 | -0.0164 | -0.13 | -0.92 | 0.0004 | -0.0235 | 0.13 | -0.10 | -0.88 | 0.0003 | -0.0213 | |
| ntis | Net Equity Expansion | 192701–201312 | 0.32** | 0.25 | 1.79* | 0.0012 | -0.0203 | 0.12 | 0.75 | 0.0003 | -0.0214 | 0.32** | 0.12 | 0.75 | 0.0003 | -0.0214 | |
| tbl | T-Bill Rate | 192002–201312 | 0.17* | 0.57 | 5.42*** | 0.0076 | -0.0397 | 0.57 | 4.99*** | 0.0106 | -0.0173 | 0.12 | 0.54 | 4.04*** | 0.0082 | -0.0270 | |
| lty | Long Term Yield | 191901–201312 | 0.03 | 0.33 | 4.37** | 0.0035 | -0.0399 | 0.37 | 4.52*** | 0.0064 | -0.0191 | 0.01 | 0.36 | 4.19*** | 0.0057 | -0.0179 | |
| ltr | Long Term Return | 192601–201312 | 0.07 | -0.26 | -1.57 | 0.0011 | -0.0225 | 0.30 | 1.15* | 0.0013 | -0.0201 | 0.07 | 0.33 | 1.31* | 0.0016 | -0.0196 | |
| tms | Term Spread | 192002–201312 | 0.10 | 0.69 | 2.97** | 0.0050 | -0.1005 | 0.71 | 2.88** | 0.0076 | -0.0228 | 0.06 | 0.66 | 1.98** | 0.0049 | -0.0267 | |
| dfy | Default Yield Spread | 191901–201312 | -0.09 | -3.53 | -0.95 | 0.0082 | -0.0222 | -6.30 | -0.30 | 0.0070 | -0.0003 | -0.09 | -3.96 | -0.22 | 0.0033 | -0.0076 | |
| dfr | Default Return Spread | 192601–201312 | 0.15 | 0.05 | 0.12 | 0.0000 | -0.0357 | 0.69 | 1.09* | 0.0028 | -0.0344 | 0.15 | 0.69 | 1.05 | 0.0027 | -0.0354 | |
| infl | Inflation | 191902–201312 | -0.03 | -0.18 | -0.07 | 0.0000 | -0.2193 | 1.00 | 0.29 | 0.0011 | -0.0398 | -0.00 | 0.77 | 0.50 | 0.0014 | -0.0382 | |
| all | Kitchen Sink | 192701–201312 | 1.50*** | 0.06 | 5.90* | 0.0011 | -0.0166 | 0.16 | 8.08** | 0.0051 | -0.0256 | 1.50*** | 0.16 | 8.08** | 0.0051 | -0.0256 | |

Panel B: Monthly Data with Total Returns

| | | OOS Forecast: | After 194701 | | | | | After 196501 | | | |
|-------------|-----------------------|---------------|------------------|-----------|---------|-----------------|---------------------|--------------|---------|-----------------|---------------------|
| | | Data | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{**r}$ | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{**r}$ |
| d/p | Dividend Price Ratio | 192701–201312 | 0.11 | 0.49 | 4.15** | 0.0053 | -0.0121 | 0.48 | 2.73** | 0.0049 | -0.0097 |
| d/y | Dividend Yield | 192701–201312 | 0.22* | 0.42 | 6.69*** | 0.0074 | -0.0100 | 0.43 | 4.13*** | 0.0067 | -0.0071 |
| e/p | Earning Price Ratio | 192701–201312 | 0.33** | 0.30 | 8.64*** | 0.0069 | -0.0141 | 0.19 | 2.64** | 0.0019 | -0.0180 |
| d/e | Dividend Payout Ratio | 192701–201312 | -0.06 | -0.09 | -0.94 | 0.0002 | -0.0131 | -1.08 | -3.65 | 0.0151 | 0.0007 |
| svar | Stock Variance | 192701–201312 | 0.07 | 1.91 | 0.63 | 0.0032 | -0.0420 | 2.47 | 0.72 | 0.0066 | -0.0487 |
| csp | Cross-Sectional Prem | 193705–200212 | 0.92*** | 0.37 | 6.21*** | 0.0092 | -0.0138 | 0.82 | 5.51*** | 0.0219 | -0.0007 |
| b/m | Book to Market | 192701–201312 | 0.35** | 0.18 | 3.09** | 0.0014 | -0.0361 | 0.07 | 0.99 | 0.0003 | -0.0218 |
| ntis | Net Equity Expansion | 192701–201312 | 0.34** | 0.18 | 1.44 | 0.0007 | -0.0199 | 0.06 | 0.38 | 0.0001 | -0.0215 |
| tbl | T-Bill Rate | 192701–201312 | 0.13 | 0.51 | 5.59*** | 0.0075 | -0.0185 | 0.52 | 5.02*** | 0.0098 | -0.0173 |
| lty | Long Term Yield | 192701–201312 | 0.02 | 0.36 | 7.57*** | 0.0072 | -0.0069 | 0.37 | 5.56*** | 0.0077 | -0.0129 |
| ltr | Long Term Return | 192701–201312 | 0.07 | -0.08 | -0.44 | 0.0001 | -0.0120 | 0.33 | 1.30* | 0.0016 | -0.0198 |
| tms | Term Spread | 192701–201312 | 0.05 | 0.59 | 2.33* | 0.0036 | -0.0292 | 0.62 | 2.22** | 0.0052 | -0.0480 |
| dfy | Default Yield Spread | 192701–201312 | -0.08 | -2.00 | -0.53 | 0.0028 | -0.0045 | -0.43 | -0.04 | 0.0001 | -0.0183 |
| dfr | Default Return Spread | 192701–201312 | 0.15 | 0.26 | 0.53 | 0.0004 | -0.0237 | 0.76 | 1.13* | 0.0032 | -0.0366 |
| infl | Inflation | 192701–201312 | -0.02 | 0.59 | 0.46 | 0.0007 | -0.0120 | 0.70 | 0.40 | 0.0010 | -0.0395 |
| all | Kitchen Sink | 192701–201312 | 1.78*** | 0.07 | 7.01* | 0.0015 | -0.0156 | 0.15 | 7.97** | 0.0048 | -0.0377 |

Panel C: Quarterly Data

| | | Estimation: OOS Forecast: Data | All Data After 20 years | | | | | All Data After 19651 | | | | After 19271 After 19651 | | | | |
|-------------|------------------------|--------------------------------------|----------------------------|-----------|---------------------|-----------------|--------------------|-------------------------|---------------------|-----------------|--------------------|----------------------------|-----------|---------------------|-----------------|--------------------|
| | | | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ |
| d/p | Dividend Price Ratio | 18712–20134 | −0.16 | −1.47 | −3.06 | 0.0454 | −0.0969 | −0.53 | −0.39 | 0.0045 | −0.0662 | 0.07 | 0.29 | 1.44 [*] | 0.0090 | −0.0492 |
| d/y | Dividend Yield | 18712–20134 | −0.15 | −1.58 | −1.94 | 0.0308 | −0.0266 | −0.50 | −0.38 | 0.0041 | −0.0872 | −0.01 | 0.35 | 1.14 [*] | 0.0085 | −0.0692 |
| e/p | Earning Price Ratio | 18712–20134 | 0.09 | 0.27 | 1.38 | 0.0037 | −0.0386 | −0.08 | −0.33 | 0.0006 | −0.0951 | 0.41 | 0.06 | 0.67 | 0.0009 | −0.0905 |
| d/e | Dividend Payout Ratio | 18712–20134 | 0.01 | −0.14 | −0.93 | 0.0013 | −0.0594 | −0.47 | −1.16 | 0.0119 | −0.0825 | −0.24 | −1.14 | −2.82 | 0.0718 | −0.0040 |
| svar | Stock Variance | 18851–20134 | −0.19 | −3.78 | −9.37 | 0.4365 | −0.8509 | −6.88 | −0.27 | 0.0392 | −0.4459 | −0.29 | −10.29 | −0.34 | 0.0740 | 0.0103 |
| b/m | Book to Market | 19211–20134 | 0.98 ^{**} | 0.21 | 4.00 ^{**} | 0.0119 | −0.0709 | 0.02 | 0.21 | 0.0001 | −0.1140 | 1.04 ^{**} | 0.02 | 0.32 | 0.0002 | −0.0948 |
| ntis | Net Equity Expansion | 19271–20134 | 1.94 ^{***} | 0.18 | 2.19 [*] | 0.0061 | −0.0753 | 0.12 | 1.23 [*] | 0.0033 | −0.1179 | 1.94 ^{***} | 0.12 | 1.23 [*] | 0.0033 | −0.1179 |
| tbl | T-Bill Rate | 19201–20134 | 0.24 | 0.49 | 3.85 ^{**} | 0.0254 | −0.1370 | 0.47 | 3.29 ^{**} | 0.0333 | −0.1302 | 0.11 | 0.43 | 2.45 ^{**} | 0.0226 | −0.2014 |
| lty | Long Term Yield | 19191–20134 | −0.05 | 0.25 | 2.68 ^{**} | 0.0090 | −0.0820 | 0.29 | 2.62 ^{**} | 0.0163 | −0.1393 | −0.11 | 0.26 | 2.26 ^{**} | 0.0127 | −0.1300 |
| ltr | Long Term Return | 19261–20134 | 0.04 | 0.31 | 1.18 | 0.0055 | −0.1251 | 0.37 | 1.22 [*] | 0.0098 | −0.4216 | 0.03 | 0.37 | 1.13 [*] | 0.0088 | −0.4604 |
| tms | Term Spread | 19201–20134 | 0.17 | 0.62 | 2.23 [*] | 0.0187 | −0.1134 | 0.63 | 2.05 ^{**} | 0.0275 | −0.1617 | 0.06 | 0.55 | 1.28 [*] | 0.0152 | −0.2387 |
| dfy | Default Yield Spread | 19191–20134 | −0.19 | −1.44 | −1.64 | 0.0322 | −0.1523 | 0.68 | 0.10 | 0.0014 | −0.1633 | −0.18 | 0.79 | 0.15 | 0.0026 | −0.1415 |
| dfr | Default Return Spread | 19261–20134 | −0.21 | −0.77 | −4.57 | 0.0543 | 0.0015 | −1.27 | −3.09 | 0.0881 | −0.0110 | −0.21 | −1.28 | −3.03 | 0.0866 | −0.0105 |
| infl | Inflation | 19192–20134 | −0.15 | 0.51 | 0.10 | 0.0007 | −0.1853 | 1.20 | 0.21 | 0.0053 | −0.3588 | −0.16 | 0.79 | 0.21 | 0.0035 | −0.4457 |
| i/k | Invstmnt Capital Ratio | 19471–20134 | 2.99 ^{***} | 0.68 | 5.50 ^{***} | 0.0832 | −0.0275 | 0.68 | 5.50 ^{***} | 0.0832 | −0.0275 | 2.99 ^{***} | 0.68 | 5.50 ^{***} | 0.0832 | −0.0275 |
| cayp | Cnsmptn, Wlth, Incme | 19521–20134 | 3.24 ^{***} | 0.65 | 6.79 ^{***} | 0.1100 | 0.0261 | 0.65 | 6.79 ^{***} | 0.1100 | 0.0261 | 3.24 ^{***} | 0.65 | 6.79 ^{***} | 0.1100 | 0.0261 |
| caya | Cnsmptn, Wlth, Incme | 19521–20134 | — | 0.09 | 1.90 [*] | 0.0050 | −0.4608 | 0.09 | 1.90 [*] | 0.0050 | −0.4608 | — | 0.09 | 1.90 [*] | 0.0050 | −0.4608 |
| all | Kitchen Sink | 19271–20134 | 3.13 ^{**} | −0.09 | −5.83 | 0.0110 | −0.0264 | −0.12 | −4.33 | 0.0147 | −0.2487 | 3.13 ^{**} | −0.12 | −4.33 | 0.0147 | −0.2487 |

Panel D: Annual Data

| | | Estimation: OOS Forecast: Data | All Data After 20 years | | | | | All Data After 1965 | | | | After 1927 After 1965 | | | | |
|-------------|------------------------|--------------------------------------|----------------------------|-----------|---------|-----------------|--------------------|------------------------|---------|-----------------|--------------------|--------------------------|-----------|---------|-----------------|--------------------|
| | | | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{**}$ | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{**}$ | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{**}$ |
| d/p | Dividend Price Ratio | 1872–2013 | 0.37 | 0.19 | 0.49 | 0.0074 | −0.2501 | 0.33 | 0.77* | 0.0435 | −0.4497 | 1.55 | 0.52 | 2.16** | 0.1909 | −0.3126 |
| d/y | Dividend Yield | 1872–2013 | 0.50 | 0.33 | 1.78* | 0.0457 | −0.5396 | 0.23 | 0.94* | 0.0380 | −0.4801 | 1.97 | 0.37 | 2.90** | 0.1912 | −0.2673 |
| e/p | Earning Price Ratio | 1872–2013 | 0.45 | 0.04 | 0.08 | 0.0002 | −0.2440 | 0.31 | 0.64 | 0.0340 | −0.6204 | 1.67 | 0.31 | 1.68* | 0.0931 | −0.5235 |
| d/e | Dividend Payout Ratio | 1872–2013 | −0.70 | −1.82 | −1.53 | 0.2219 | 0.1114 | −7.32 | −0.51 | 0.6565 | 0.3015 | −1.15 | −4.92 | −1.28 | 1.1826 | 0.8257 |
| svar | Stock Variance | 1885–2013 | −0.22 | −0.40 | −4.42 | 0.1903 | −0.5420 | 4.16 | 0.35 | 0.2457 | −0.2064 | −0.86 | 3.16 | 0.08 | 0.0408 | −0.4869 |
| b/m | Book to Market | 1921–2013 | 2.92* | 0.49 | 4.02** | 0.2231 | −0.0596 | 0.21 | 1.31* | 0.0520 | −0.6490 | 3.54** | 0.18 | 1.60* | 0.0560 | −0.4089 |
| ntis | Net Equity Expansion | 1927–2013 | 5.90** | −0.00 | −0.01 | 0.0000 | −0.6038 | −0.04 | −0.18 | 0.0012 | −1.0616 | 5.90** | −0.04 | −0.18 | 0.0012 | −1.0616 |
| eqis | Pct Equity Issuing | 1927–2013 | 5.74** | 0.44 | 2.81** | 0.1555 | −0.2512 | 0.31 | 1.61* | 0.0890 | −0.7538 | 5.74** | 0.31 | 1.61* | 0.0890 | −0.7538 |
| tbl | T-Bill Rate | 1920–2013 | 0.66 | 0.46 | 2.39* | 0.1218 | −0.9366 | 0.48 | 2.34** | 0.1947 | −1.0121 | 0.58 | 0.37 | 2.96** | 0.1988 | −0.3784 |
| lty | Long Term Yield | 1919–2013 | −0.43 | 0.30 | 2.62** | 0.0910 | −0.5898 | 0.30 | 2.32** | 0.1279 | −0.7562 | −0.71 | 0.26 | 2.35** | 0.1165 | −0.4436 |
| ltr | Long Term Return | 1926–2013 | 0.77 | 0.32 | 4.36** | 0.1807 | −0.1124 | 0.24 | 2.32** | 0.1063 | −6.9019 | 0.72 | 0.25 | 2.30** | 0.1103 | −7.1292 |
| tms | Term Spread | 1920–2013 | 0.50 | 0.53 | 1.26 | 0.0735 | −0.8513 | 0.60 | 1.33* | 0.1369 | −0.6187 | 1.32 | 0.60 | 2.32** | 0.2346 | −0.3038 |
| dfy | Default Yield Spread | 1919–2013 | −0.90 | −2.32 | −0.38 | 0.0978 | −0.8644 | −5.64 | −0.18 | 0.1715 | 0.0457 | −0.99 | −5.16 | −0.13 | 0.1132 | −0.0507 |
| dfr | Default Return Spread | 1926–2013 | −0.91 | −0.10 | −0.22 | 0.0027 | −0.3970 | −0.14 | −0.28 | 0.0072 | −0.4908 | −0.94 | −0.17 | −0.30 | 0.0092 | −0.4976 |
| infl | Inflation | 1919–2013 | −0.73 | −1.85 | −0.51 | 0.1039 | −0.4683 | −0.10 | −0.01 | 0.0002 | −11.7385 | −1.08 | −3.69 | −0.86 | 0.5734 | −0.1889 |
| i/k | Invstmnt Capital Ratio | 1947–2013 | 8.65*** | 0.68 | 4.45*** | 0.5328 | 0.1126 | 0.68 | 4.45*** | 0.5328 | 0.1126 | 8.65*** | 0.68 | 4.45*** | 0.5328 | 0.1126 |
| cayp | Cnsmptn, Wlth, Incme | 1945–2013 | 6.37** | 1.00 | 3.74** | 0.6159 | −0.0903 | 1.00 | 3.74** | 0.6159 | −0.0903 | 6.37** | 1.00 | 3.74** | 0.6159 | −0.0903 |
| caya | Cnsmptn, Wlth, Incme | 1945–2013 | — | 0.43 | 3.03** | 0.2333 | −0.2588 | 0.43 | 3.03** | 0.2333 | −0.2588 | — | 0.43 | 3.03** | 0.2333 | −0.2588 |
| all | Kitchen Sink | 1927–2013 | 9.84* | 0.08 | 3.31 | 0.0671 | −0.0585 | −0.15 | −2.67 | 0.1297 | −0.2818 | 9.84* | −0.15 | −2.67 | 0.1297 | −0.2818 |

Panel E: 3-year Data

| | | Estimation: OOS Forecast: Data | All Data After 20 years | | | | | All Data After 1965 | | | | After 1927 After 1965 | | | | |
|-------------|------------------------|--------------------------------------|----------------------------|-----------|----------|-----------------|--------------------|------------------------|----------|-----------------|--------------------|--------------------------|-----------|----------|-----------------|--------------------|
| | | | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ |
| d/p | Dividend Price Ratio | 1872–2013 | 3.72** | 0.43 | 5.00** | 0.2789 | −0.9952 | 0.29 | 3.03*** | 0.2664 | −0.5812 | 9.15*** | 0.36 | 7.97*** | 0.9594 | 0.1612 |
| d/y | Dividend Yield | 1872–2013 | 2.43* | 0.31 | 3.98** | 0.1646 | −0.2300 | 0.18 | 1.82** | 0.1060 | −0.5641 | 6.49** | 0.28 | 6.30*** | 0.6421 | 0.0461 |
| e/p | Earning Price Ratio | 1872–2013 | 3.24* | 0.46 | 3.61** | 0.2131 | −0.4451 | 0.29 | 2.24** | 0.1922 | −0.6164 | 5.43** | 0.27 | 4.06*** | 0.3666 | −0.4565 |
| d/e | Dividend Payout Ratio | 1872–2013 | −0.52 | −7.01 | −2.37 | 2.2903 | 1.6640 | −7.85 | −1.08 | 2.5785 | 1.7877 | 0.45 | −0.09 | −0.07 | 0.0019 | −1.2176 |
| svar | Stock Variance | 1885–2013 | 0.77 | −0.50 | −12.00 | 1.6367 | −0.3871 | 1.86 | 0.71 | 0.3605 | −0.6495 | 0.26 | 2.23 | 0.67 | 0.4192 | −0.4292 |
| b/m | Book to Market | 1921–2013 | 8.07** | 0.32 | 7.11*** | 0.5007 | −0.4635 | 0.02 | 0.21 | 0.0014 | −1.2536 | 11.13** | 0.01 | 0.31 | 0.0023 | −0.7327 |
| ntis | Net Equity Expansion | 1927–2013 | 12.25** | 0.04 | 0.47 | 0.0051 | −0.6703 | −0.06 | −0.56 | 0.0121 | −0.4875 | 12.25** | −0.06 | −0.56 | 0.0121 | −0.4875 |
| eqis | Pct Equity Issuing | 1927–2013 | 8.33 | −0.09 | −0.92 | 0.0221 | −0.5965 | −0.15 | −1.20 | 0.0640 | −0.6844 | 8.33 | −0.15 | −1.20 | 0.0640 | −0.6844 |
| tbl | T-Bill Rate | 1920–2013 | 1.88* | 0.37 | 5.93*** | 0.4407 | −0.4786 | 0.45 | 6.44*** | 0.8896 | −0.6294 | 1.91 | 0.29 | 7.87*** | 0.8667 | 0.4672 |
| lty | Long Term Yield | 1919–2013 | −0.41 | 0.19 | 3.94** | 0.1725 | −0.8893 | 0.31 | 4.98*** | 0.5226 | −2.2528 | −0.91 | 0.29 | 7.68*** | 0.8384 | 0.2631 |
| ltr | Long Term Return | 1926–2013 | −0.84 | −2.25 | −2.20 | 1.1271 | 0.9190 | −1.50 | −0.72 | 0.3244 | −6.5397 | −0.88 | −1.22 | −0.78 | 0.2868 | −4.3329 |
| tms | Term Spread | 1920–2013 | 3.27* | 0.15 | 1.36 | 0.0433 | −0.6104 | 0.66 | 3.76*** | 0.7078 | −0.1463 | 6.51** | 0.48 | 6.45*** | 0.9084 | 0.5486 |
| dfy | Default Yield Spread | 1919–2013 | 1.00 | −0.68 | −3.02 | 0.4502 | −0.5546 | 1.96 | 1.08* | 0.6048 | −0.0786 | 0.20 | 1.81 | 0.61 | 0.3120 | −0.2136 |
| dfr | Default Return Spread | 1926–2013 | −1.20 | −1.68 | −0.31 | 0.1074 | −0.9769 | −1.23 | −0.22 | 0.0795 | −3.2777 | −1.22 | −1.65 | −0.24 | 0.1145 | −3.6701 |
| infl | Inflation | 1919–2013 | −1.08 | −2.99 | −1.29 | 0.7652 | −0.0863 | −10.46 | −0.44 | 1.4159 | 0.3024 | −0.91 | −1.76 | −1.08 | 0.5830 | −0.7193 |
| i/k | Invstmnt Capital Ratio | 1947–2013 | 19.97*** | 1.08 | 9.49*** | 2.8862 | 1.5998 | 1.08 | 9.49*** | 2.8862 | 1.5998 | 19.97*** | 1.08 | 9.49*** | 2.8862 | 1.5998 |
| cayp | Cnsmptn, Wlth, Incme | 1945–2013 | 26.80*** | 1.16 | 16.30*** | 4.5163 | 3.4394 | 1.16 | 16.30*** | 4.5163 | 3.4394 | 26.80*** | 1.16 | 16.30*** | 4.5163 | 3.4394 |
| caya | Cnsmptn, Wlth, Incme | 1945–2013 | — | 0.51 | 8.91*** | 1.4178 | 0.0778 | 0.51 | 8.91*** | 1.4178 | 0.0778 | — | 0.51 | 8.91*** | 1.4178 | 0.0778 |
| all | Kitchen Sink | 1927–2013 | 35.21*** | −0.07 | −2.16 | 0.0693 | −0.8209 | −0.20 | −4.61 | 0.8446 | 0.0442 | 35.21*** | −0.20 | −4.61 | 0.8446 | 0.0442 |

Panel F: 5-year Data

| | | Estimation: OOS Forecast: Data | All Data After 20 years | | | | | All Data After 1965 | | | | After 1927 After 1965 | | | | |
|-------------|------------------------|--------------------------------------|----------------------------|-----------|----------|-----------------|--------------------|------------------------|----------|-----------------|--------------------|--------------------------|-----------|----------|-----------------|--------------------|
| | | | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ |
| d/p | Dividend Price Ratio | 1872–2013 | 10.23*** | 0.50 | 16.66*** | 1.3886 | 0.6340 | 0.37 | 9.94*** | 1.6259 | 0.6408 | 21.53*** | 0.47 | 20.43*** | 4.3417 | 3.5212 |
| d/y | Dividend Yield | 1872–2013 | 4.89** | 0.38 | 7.56*** | 0.4936 | −0.7518 | 0.35 | 6.87*** | 1.0281 | −0.0587 | 12.41*** | 0.45 | 16.25*** | 3.3346 | 2.3995 |
| e/p | Earning Price Ratio | 1872–2013 | 3.44 | 0.33 | 3.03** | 0.1693 | −0.7628 | 0.28 | 2.33** | 0.2586 | −0.7395 | 8.15* | 0.30 | 5.71*** | 0.8346 | −0.2006 |
| d/e | Dividend Payout Ratio | 1872–2013 | 3.22** | 0.27 | 1.11 | 0.0496 | −0.7294 | 1.71 | 2.99*** | 1.7438 | −0.5656 | 6.82*** | 1.55 | 3.52*** | 2.0293 | −0.4399 |
| svar | Stock Variance | 1885–2013 | 2.17** | 0.15 | 9.99*** | 0.5124 | −2.0601 | 2.18 | 1.31* | 1.0248 | −0.0974 | 1.19* | 2.61 | 0.66 | 0.6831 | −1.4650 |
| b/m | Book to Market | 1921–2013 | 11.81** | 0.40 | 9.49*** | 1.1005 | −0.4363 | 0.16 | 2.50** | 0.2146 | −2.1987 | 14.43** | 0.16 | 3.32** | 0.3133 | −1.3256 |
| ntis | Net Equity Expansion | 1927–2013 | 6.65** | 0.26 | 1.47 | 0.1181 | −1.2896 | −0.14 | −0.70 | 0.0466 | −0.8084 | 6.65** | −0.14 | −0.70 | 0.0466 | −0.8084 |
| eqis | Pct Equity Issuing | 1927–2013 | 3.88 | −0.00 | −0.00 | 0.0000 | −2.3630 | −0.16 | −0.75 | 0.0567 | −1.7572 | 3.88 | −0.16 | −0.75 | 0.0567 | −1.7572 |
| tbl | T-Bill Rate | 1920–2013 | 2.65 | 0.29 | 7.51*** | 0.6787 | −0.7320 | 0.26 | 5.28*** | 0.7279 | −3.3574 | 3.56 | 0.27 | 10.03*** | 1.7829 | 0.4003 |
| lty | Long Term Yield | 1919–2013 | −0.25 | 0.01 | 0.46 | 0.0030 | −0.4765 | 0.14 | 3.44*** | 0.3283 | −5.3269 | −0.41 | 0.23 | 9.83*** | 1.9198 | 0.9943 |
| ltr | Long Term Return | 1926–2013 | −1.07 | 0.09 | 0.36 | 0.0102 | −4.5135 | −0.53 | −1.41 | 0.3350 | −0.1258 | −1.05 | −0.60 | −1.06 | 0.2789 | −0.1694 |
| tms | Term Spread | 1920–2013 | 4.65* | 0.02 | 0.36 | 0.0027 | −0.8102 | 0.57 | 4.90*** | 1.1342 | −1.4129 | 8.20** | 0.54 | 8.36*** | 1.8022 | 0.2279 |
| dfy | Default Yield Spread | 1919–2013 | 6.22** | −0.31 | −4.27 | 0.4909 | −0.5084 | 2.39 | 3.73*** | 3.3918 | 2.4481 | 3.35* | 2.99 | 1.92** | 2.2177 | 0.9305 |
| dfr | Default Return Spread | 1926–2013 | −0.21 | −1.34 | −0.53 | 0.2220 | −1.0634 | 1.24 | 0.37 | 0.1784 | −2.0987 | −0.13 | 1.08 | 0.42 | 0.1784 | −1.7273 |
| infl | Inflation | 1919–2013 | −1.07 | −3.52 | −2.42 | 2.4354 | −3.1963 | −13.34 | −0.81 | 4.9497 | 2.1523 | −1.13 | −4.21 | −1.60 | 3.0568 | −0.0595 |
| i/k | Invstmnt Capital Ratio | 1947–2013 | 30.80*** | 0.93 | 10.28*** | 3.9648 | −4.7986 | 0.93 | 10.28*** | 3.9648 | −4.7986 | 30.80*** | 0.93 | 10.28*** | 3.9648 | −4.7986 |
| cayp | Cnsmptn, Wlth, Incme | 1945–2013 | 35.47*** | 1.29 | 18.86*** | 8.2411 | 4.4468 | 1.29 | 18.86*** | 8.2411 | 4.4468 | 35.47*** | 1.29 | 18.86*** | 8.2411 | 4.4468 |
| caya | Cnsmptn, Wlth, Incme | 1945–2013 | — | 0.59 | 9.49*** | 2.5105 | −0.1551 | 0.59 | 9.49*** | 2.5105 | −0.1551 | — | 0.59 | 9.49*** | 2.5105 | −0.1551 |
| all | Kitchen Sink | 1927–2013 | 43.65*** | 0.06 | 3.19 | 0.1976 | −0.1657 | 0.07 | 2.47 | 0.2198 | −0.2843 | 43.65*** | 0.07 | 2.47 | 0.2198 | −0.2843 |

Panel G: Price Ratios Data forecasting monthly return

| | | | OOS Forecast: | After 196501 | | | | |
|------------|---------------------------------|---------------|---------------|------------------|-----------|--------|-----------------|--------------------|
| | | | Data | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ |
| e/p | Earning(1Y) Price Ratio | 192701–201312 | 0.33** | 0.19 | 2.64** | 0.0019 | −0.0180 | |
| e/p | Earning(3Y) Price Ratio | 192701–201312 | 0.19* | 0.38 | 2.39** | 0.0034 | −0.0098 | |
| e/p | Earning(5Y) Price Ratio | 192701–201312 | 0.28** | 0.36 | 2.96** | 0.0040 | −0.0082 | |
| e/p | Earning(10Y) Price Ratio | 192701–201312 | 0.48** | 0.39 | 4.93*** | 0.0072 | −0.0046 | |
| d/p | Dividend(1Y) Price Ratio | 192701–201312 | 0.11 | 0.48 | 2.73** | 0.0049 | −0.0097 | |
| d/p | Dividend(3Y) Price Ratio | 192701–201312 | 0.19* | 0.50 | 3.19** | 0.0060 | −0.0082 | |
| d/p | Dividend(5Y) Price Ratio | 192701–201312 | 0.28** | 0.48 | 4.01*** | 0.0073 | −0.0062 | |
| d/p | Dividend(10Y) Price Ratio | 192701–201312 | 0.23* | 0.50 | 3.48** | 0.0065 | −0.0067 | |
| d/e | Dividend(1Y) Earning(1Y) Ratio | 192701–201312 | −0.06 | −1.08 | −3.65 | 0.0151 | 0.0007 | |
| d/e | Dividend(1Y) Earning(3Y) Ratio | 192701–201312 | −0.10 | −1.55 | −2.01 | 0.0118 | −0.0147 | |
| d/e | Dividend(1Y) Earning(5Y) Ratio | 192701–201312 | −0.08 | −1.41 | −2.41 | 0.0129 | −0.0078 | |
| d/e | Dividend(1Y) Earning(10Y) Ratio | 192701–201312 | 0.06 | −0.75 | −1.79 | 0.0050 | −0.0254 | |
| d/e | Dividend(3Y) Earning(3Y) Ratio | 192701–201312 | −0.05 | −0.85 | −0.25 | 0.0008 | −0.0274 | |
| d/e | Dividend(5Y) Earning(5Y) Ratio | 192701–201312 | −0.01 | 0.54 | 0.39 | 0.0008 | −0.0519 | |

Panel H: Price Ratios Data forecasting 1-year return

| | | OOS Forecast: | After 1902 | | | | | After 1965 | | | |
|------------|---------------------------------|---------------|------------------|--------------|----------------|-----------------|--------------------|--------------|----------------|-----------------|--------------------|
| | | Data | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ |
| e/p | Earning(1Y) Price Ratio | 1882–2013 | 0.56 | -0.18 | -0.45 | 0.0072 | -1.1956 | 0.33 | 0.71 | 0.0402 | -0.6449 |
| e/p | Earning(3Y) Price Ratio | 1882–2013 | 2.35** | 0.49 | 2.67* | 0.1132 | -0.5233 | 0.46 | 1.92** | 0.1525 | -0.2069 |
| e/p | Earning(5Y) Price Ratio | 1882–2013 | 2.60** | 0.53 | 3.09** | 0.1405 | -0.8213 | 0.39 | 1.83** | 0.1236 | -0.2113 |
| e/p | Earning(10Y) Price Ratio | 1882–2013 | 4.82*** | 0.65 | 7.64*** | 0.4180 | -0.0791 | 0.35 | 3.05*** | 0.1899 | -0.1189 |
| d/p | Dividend(1Y) Price Ratio | 1882–2013 | 1.08 | 0.40 | 2.13* | 0.0737 | -0.9857 | 0.34 | 1.53** | 0.0920 | -0.3595 |
| d/p | Dividend(3Y) Price Ratio | 1882–2013 | 1.53* | 0.43 | 3.14** | 0.1180 | -0.5462 | 0.32 | 1.76** | 0.0997 | -0.3343 |
| d/p | Dividend(5Y) Price Ratio | 1882–2013 | 2.15* | 0.50 | 4.78** | 0.2078 | -0.3812 | 0.30 | 2.04** | 0.1105 | -0.2784 |
| d/p | Dividend(10Y) Price Ratio | 1882–2013 | 1.84* | 0.48 | 4.53** | 0.1874 | -0.3568 | 0.30 | 1.86** | 0.0996 | -0.2387 |
| d/e | Dividend(1Y) Earning(1Y) Ratio | 1882–2013 | -0.58 | -0.52 | -0.68 | 0.0311 | -0.8199 | -0.73 | -0.18 | 0.0231 | -5.1655 |
| d/e | Dividend(1Y) Earning(3Y) Ratio | 1882–2013 | -0.74 | -1.89 | -1.61 | 0.2724 | -0.2007 | -2.03 | -1.18 | 0.4383 | -0.0459 |
| d/e | Dividend(1Y) Earning(5Y) Ratio | 1882–2013 | -0.69 | -0.76 | -1.55 | 0.1065 | -1.3404 | -1.43 | -1.50 | 0.4011 | -0.2883 |
| d/e | Dividend(1Y) Earning(10Y) Ratio | 1882–2013 | 1.21 | 0.43 | 3.12** | 0.1174 | -1.4263 | -0.44 | -1.13 | 0.0934 | -1.0671 |
| d/e | Dividend(3Y) Earning(3Y) Ratio | 1882–2013 | -0.74 | -5.61 | -1.72 | 0.8728 | 0.3821 | -6.86 | -0.56 | 0.6798 | 0.4105 |
| d/e | Dividend(5Y) Earning(5Y) Ratio | 1882–2013 | -0.44 | -0.86 | -1.07 | 0.0817 | -0.3038 | -0.41 | -0.16 | 0.0113 | -2.3022 |

Panel I: Price Ratios Data forecasting 3-year return

| | | OOS Forecast: Data | After 1902 | | | | | After 1965 | | | |
|------------|---------------------------------|-----------------------|----------------------|-----------|----------------------|-----------------|--------------------|------------|---------------------|-----------------|--------------------|
| | | | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ |
| e/p | Earning(1Y) Price Ratio | 1882–2013 | 4.22 [*] | 0.50 | 4.47 ^{**} | 0.3182 | −0.2546 | 0.30 | 2.60 ^{**} | 0.2323 | −0.6260 |
| e/p | Earning(3Y) Price Ratio | 1882–2013 | 6.10 ^{**} | 0.62 | 6.63 ^{***} | 0.5767 | −0.2330 | 0.31 | 3.03 ^{***} | 0.2829 | −0.4222 |
| e/p | Earning(5Y) Price Ratio | 1882–2013 | 9.68 ^{***} | 0.70 | 11.09 ^{***} | 1.0551 | −0.0293 | 0.34 | 4.57 ^{***} | 0.4741 | −0.2193 |
| e/p | Earning(10Y) Price Ratio | 1882–2013 | 12.51 ^{***} | 0.59 | 16.05 ^{***} | 1.3093 | 0.4299 | 0.32 | 6.53 ^{***} | 0.6909 | −0.0546 |
| d/p | Dividend(1Y) Price Ratio | 1882–2013 | 5.67 ^{**} | 0.50 | 8.89 ^{***} | 0.6333 | −0.3092 | 0.31 | 4.65 ^{***} | 0.4557 | −0.4073 |
| d/p | Dividend(3Y) Price Ratio | 1882–2013 | 7.01 ^{***} | 0.52 | 10.92 ^{***} | 0.8040 | 0.0583 | 0.32 | 5.23 ^{***} | 0.5292 | −0.2740 |
| d/p | Dividend(5Y) Price Ratio | 1882–2013 | 8.06 ^{***} | 0.51 | 12.65 ^{***} | 0.9174 | 0.2580 | 0.32 | 5.83 ^{***} | 0.6035 | −0.1450 |
| d/p | Dividend(10Y) Price Ratio | 1882–2013 | 6.31 ^{**} | 0.39 | 9.43 ^{***} | 0.5565 | −0.0397 | 0.30 | 4.57 ^{***} | 0.4408 | −0.1899 |
| d/e | Dividend(1Y) Earning(1Y) Ratio | 1882–2013 | −0.32 | −2.40 | −2.53 | 0.9252 | 0.6081 | −5.16 | −0.79 | 1.1896 | −0.0335 |
| d/e | Dividend(1Y) Earning(3Y) Ratio | 1882–2013 | −0.30 | −0.63 | −3.03 | 0.3001 | 0.2341 | −5.60 | −1.57 | 2.7710 | 2.2325 |
| d/e | Dividend(1Y) Earning(5Y) Ratio | 1882–2013 | −0.72 | −0.23 | −1.00 | 0.0347 | −1.1470 | −1.77 | −3.37 | 2.1051 | 1.2132 |
| d/e | Dividend(1Y) Earning(10Y) Ratio | 1882–2013 | 0.77 | 0.25 | 3.01 ^{**} | 0.1130 | −2.5824 | −0.87 | −2.45 | 0.7136 | −1.0058 |
| d/e | Dividend(3Y) Earning(3Y) Ratio | 1882–2013 | 0.59 | −0.61 | −2.43 | 0.2279 | 0.1319 | 0.87 | 0.36 | 0.0857 | −5.1371 |
| d/e | Dividend(5Y) Earning(5Y) Ratio | 1882–2013 | 0.04 | −0.44 | −1.42 | 0.0940 | −0.0208 | −0.33 | −0.14 | 0.0133 | −0.8344 |

Panel J: Price Ratios Data forecasting 5-year return

| | | OOS Forecast: Data | After 1902 | | | | | After 1965 | | | |
|------------|---------------------------------|-----------------------|----------------------|-----------|----------------------|-----------------|--------------------|------------|----------------------|-----------------|--------------------|
| | | | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ |
| e/p | Earning(1Y) Price Ratio | 1882–2013 | 4.22 [*] | 0.50 | 4.57 ^{**} | 0.4220 | −0.6441 | 0.29 | 2.67 ^{***} | 0.3086 | −0.7103 |
| e/p | Earning(3Y) Price Ratio | 1882–2013 | 12.14 ^{***} | 0.69 | 11.75 ^{***} | 1.4270 | 0.3049 | 0.46 | 7.34 ^{***} | 1.2963 | 0.4221 |
| e/p | Earning(5Y) Price Ratio | 1882–2013 | 17.11 ^{***} | 0.65 | 17.93 ^{***} | 2.0351 | 0.5513 | 0.42 | 10.05 ^{***} | 1.7393 | 0.8886 |
| e/p | Earning(10Y) Price Ratio | 1882–2013 | 17.06 ^{***} | 0.49 | 16.92 ^{***} | 1.5616 | 0.2842 | 0.40 | 11.52 ^{***} | 1.9972 | 1.0264 |
| d/p | Dividend(1Y) Price Ratio | 1882–2013 | 12.21 ^{***} | 0.51 | 18.68 ^{***} | 1.7617 | 0.3179 | 0.37 | 11.54 ^{***} | 1.9715 | 0.9941 |
| d/p | Dividend(3Y) Price Ratio | 1882–2013 | 13.04 ^{***} | 0.49 | 18.27 ^{***} | 1.6834 | 0.4288 | 0.38 | 11.64 ^{***} | 1.9968 | 1.0435 |
| d/p | Dividend(5Y) Price Ratio | 1882–2013 | 13.53 ^{***} | 0.47 | 19.25 ^{***} | 1.7263 | 0.6607 | 0.36 | 11.32 ^{***} | 1.9179 | 1.0106 |
| d/p | Dividend(10Y) Price Ratio | 1882–2013 | 9.62 ^{***} | 0.31 | 10.43 ^{***} | 0.6708 | −0.2391 | 0.37 | 8.52 ^{***} | 1.3650 | 0.5151 |
| d/e | Dividend(1Y) Earning(1Y) Ratio | 1882–2013 | 3.40 ^{**} | −0.17 | −0.72 | 0.0233 | −0.5328 | 1.86 | 2.96 ^{***} | 1.9033 | −0.8415 |
| d/e | Dividend(1Y) Earning(3Y) Ratio | 1882–2013 | 0.52 | −0.32 | −3.51 | 0.2495 | 0.1229 | −1.27 | −0.43 | 0.2055 | −1.0391 |
| d/e | Dividend(1Y) Earning(5Y) Ratio | 1882–2013 | −0.78 | −0.56 | −2.17 | 0.2415 | −0.2695 | −1.90 | −3.53 | 3.2270 | 2.3499 |
| d/e | Dividend(1Y) Earning(10Y) Ratio | 1882–2013 | −0.80 | −0.21 | −1.52 | 0.0636 | −9.9856 | −2.34 | −1.80 | 1.7529 | 0.8790 |
| d/e | Dividend(3Y) Earning(3Y) Ratio | 1882–2013 | 1.22 | −0.43 | −2.55 | 0.2239 | −0.1904 | 1.17 | 1.10 [*] | 0.4615 | −4.5340 |
| d/e | Dividend(5Y) Earning(5Y) Ratio | 1882–2013 | 0.07 | −0.74 | −3.19 | 0.4845 | −5.8334 | −2.57 | −0.77 | 0.7608 | −0.4471 |

Panel K: Price Ratios Data forecasting 10-year return

| | | OOS Forecast: | After 1902 | | | | | After 1965 | | | |
|------------|---------------------------------|---------------|------------------|-----------|----------|-----------------|--------------------|------------|----------|-----------------|--------------------|
| | | Data | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ |
| e/p | Earning(1Y) Price Ratio | 1882–2013 | 21.46*** | 0.42 | 19.10*** | 2.3389 | 2.1050 | 0.74 | 16.92*** | 6.2209 | 2.2960 |
| e/p | Earning(3Y) Price Ratio | 1882–2013 | 21.42*** | 0.38 | 9.37*** | 1.0254 | 0.1981 | 0.74 | 18.14*** | 6.6081 | 5.2646 |
| e/p | Earning(5Y) Price Ratio | 1882–2013 | 20.52*** | 0.48 | 10.47*** | 1.3567 | −0.2345 | 0.75 | 17.97*** | 6.6129 | 5.1512 |
| e/p | Earning(10Y) Price Ratio | 1882–2013 | 18.68*** | 0.56 | 13.14*** | 1.9394 | −5.7602 | 0.69 | 18.59*** | 6.4822 | 4.5205 |
| d/p | Dividend(1Y) Price Ratio | 1882–2013 | 15.70*** | 0.50 | 15.20*** | 2.0538 | 0.0193 | 0.50 | 16.70*** | 5.2450 | 3.2257 |
| d/p | Dividend(3Y) Price Ratio | 1882–2013 | 13.92*** | 0.51 | 12.40*** | 1.7102 | −0.5188 | 0.53 | 13.79*** | 4.3852 | 2.2549 |
| d/p | Dividend(5Y) Price Ratio | 1882–2013 | 13.09*** | 0.54 | 12.04*** | 1.7276 | −2.2162 | 0.54 | 12.13*** | 3.8672 | 1.6945 |
| d/p | Dividend(10Y) Price Ratio | 1882–2013 | 11.91*** | 0.40 | 10.13*** | 1.1432 | −0.7680 | 0.45 | 9.88*** | 2.8871 | 0.8373 |
| d/e | Dividend(1Y) Earning(1Y) Ratio | 1882–2013 | −0.62 | −1.75 | −3.40 | 1.7564 | 1.4542 | −2.53 | −2.51 | 4.6683 | 1.9688 |
| d/e | Dividend(1Y) Earning(3Y) Ratio | 1882–2013 | −0.80 | −0.57 | −4.14 | 0.7414 | −1.2926 | −1.61 | −3.62 | 4.7660 | 2.4165 |
| d/e | Dividend(1Y) Earning(5Y) Ratio | 1882–2013 | −0.82 | −0.57 | −3.02 | 0.5216 | −0.6115 | −2.05 | −2.82 | 4.3547 | 2.3151 |
| d/e | Dividend(1Y) Earning(10Y) Ratio | 1882–2013 | −0.68 | −0.25 | −0.59 | 0.0399 | −0.9521 | −7.45 | −0.62 | 2.9127 | 1.0560 |
| d/e | Dividend(3Y) Earning(3Y) Ratio | 1882–2013 | −0.73 | −0.95 | −3.84 | 1.1118 | −1.5611 | −2.58 | −2.96 | 5.8504 | 3.3282 |
| d/e | Dividend(5Y) Earning(5Y) Ratio | 1882–2013 | −0.82 | −2.17 | −6.05 | 4.2494 | 3.8377 | −3.68 | −3.12 | 9.1647 | 7.9217 |

Panel L: Adjusted Betas

| | | | | Unadjusted betas | | | | | Stambaugh correction | | | | | Lewellen correction | | | | | 2014 version |
|------|-----------------------|---------------|----------|------------------|-----------|---------|-----------------|--------------------|----------------------|-----------|---------|-----------------|--------------------|---------------------|-----------|----------|-----------------|--------------------|--------------|
| | | Data | Forecast | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | |
| d/p | Dividend Price Ratio | 187102–201312 | 189102– | −0.06 | −0.65 | −1.98 | 0.0075 | −0.0375 | −0.10 | −0.25 | −1.99 | 0.0030 | −0.0321 | −0.29 | −0.09 | −1.76 | 0.0009 | −0.0459 | |
| d/y | Dividend Yield | 187102–201312 | 189102– | −0.05 | −1.08 | −2.24 | 0.0143 | −0.0375 | −0.05 | −1.02 | −2.46 | 0.0148 | −0.0243 | −0.05 | −1.23 | −2.22 | 0.0161 | −0.0240 | |
| e/p | Earning Price Ratio | 187102–201312 | 189102– | 0.01 | 0.19 | 0.70 | 0.0008 | −0.0254 | −0.00 | −0.14 | −0.29 | 0.0002 | −0.0262 | −0.33 | −1.60 | −4.20 | 0.0400 | 0.0086 | |
| d/e | Dividend Payout Ratio | 187112–201312 | 189112– | 0.08 | 0.11 | 1.24 | 0.0008 | −0.0296 | 0.08 | 0.11 | 1.48 | 0.0010 | −0.0281 | 0.08 | 0.16 | 1.75* | 0.0016 | −0.0293 | |
| svar | Stock Variance | 188502–201312 | 190502– | 0.07 | −0.28 | −2.93 | 0.0057 | −0.5630 | 0.07 | −0.27 | −2.87 | 0.0053 | −0.4993 | −1.91 | 0.18 | 16.72*** | 0.0213 | −0.0813 | |
| csp | Cross-Sectional Prem | 193705–200212 | 195705– | 0.67** | 0.29 | 3.89** | 0.0153 | −0.0713 | 0.67** | 0.29 | 3.81** | 0.0152 | −0.0713 | 0.66** | 0.31 | 3.60** | 0.0152 | −0.0720 | |
| b/m | Book to Market | 192103–201312 | 194103– | 0.11 | 0.20 | 2.06* | 0.0034 | −0.0589 | 0.08 | 0.15 | 0.82 | 0.0011 | −0.0659 | −0.36 | −0.67 | −0.63 | 0.0035 | −0.0627 | |
| ntis | Net Equity Expansion | 192701–201312 | 194701– | 0.32** | 0.26 | 1.85* | 0.0044 | −0.0728 | 0.32** | 0.26 | 1.86* | 0.0044 | −0.0727 | 0.32** | 0.24 | 1.91* | 0.0042 | −0.0736 | |
| tbl | T-Bill Rate | 192002–201312 | 194002– | 0.17* | 0.59 | 5.40*** | 0.0266 | −0.1325 | 0.17* | 0.55 | 5.42*** | 0.0250 | −0.1461 | 0.17* | 0.55 | 5.16*** | 0.0240 | −0.1412 | |
| lty | Long Term Yield | 191901–201312 | 193901– | 0.03 | 0.33 | 4.36** | 0.0121 | −0.1440 | 0.03 | 0.30 | 5.24*** | 0.0131 | −0.1454 | 0.03 | 0.33 | 3.94** | 0.0109 | −0.1414 | |
| ltr | Long Term Return | 192601–201312 | 194601– | 0.07 | −0.26 | −1.59 | 0.0038 | −0.0867 | 0.07 | −0.26 | −1.56 | 0.0036 | −0.0870 | −0.62 | 0.26 | 17.40*** | 0.0430 | −0.1013 | |
| tms | Term Spread | 192002–201312 | 194001– | 0.10 | 0.71 | 3.11** | 0.0186 | −0.6275 | 0.10 | 0.69 | 3.01** | 0.0174 | −0.2918 | 0.10 | 0.66 | 2.98** | 0.0166 | −0.2648 | |
| dfy | Default Yield Spread | 191901–201312 | 193901– | −0.09 | −3.54 | −0.94 | 0.0282 | −0.0743 | −0.09 | −1.23 | −0.43 | 0.0045 | −0.1113 | −0.17 | 0.30 | 0.57 | 0.0014 | −0.1314 | |
| dfr | Default Return Spread | 192601–201312 | 194601– | 0.15 | 0.05 | 0.11 | 0.0000 | −0.1290 | 0.15 | 0.05 | 0.11 | 0.0000 | −0.1290 | −2.51 | 0.15 | 6.68*** | 0.0096 | −0.1338 | |

Panel M: Adjusted Betas with Total Returns

| | | | | Unadjusted betas | | | | | Stambaugh correction | | | | | Lewellen correction | | | | |
|------|-----------------------|---------------|----------|------------------|-----------|---------|-----------------|--------------------|----------------------|-----------|---------|-----------------|--------------------|---------------------|-----------|----------|-----------------|--------------------|
| | | Data | Forecast | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ | \overline{R}^2 | λ | ENC | $\Delta RMSE^*$ | $\Delta RMSE^{*r}$ |
| d/p | Dividend Price Ratio | 192701–201312 | 196501– | 0.11 | 0.47 | 2.70** | 0.0167 | −0.0343 | 0.02 | 0.26 | 0.33 | 0.0011 | −0.0795 | −0.19 | −1.20 | −1.36 | 0.0215 | −0.0053 |
| d/y | Dividend Yield | 192701–201312 | 196501– | 0.22* | 0.43 | 4.10*** | 0.0229 | −0.0255 | 0.22* | 0.44 | 3.90*** | 0.0222 | −0.0266 | 0.22* | 0.46 | 3.73*** | 0.0224 | −0.0274 |
| e/p | Earning Price Ratio | 192701–201312 | 196501– | 0.33** | 0.19 | 2.62** | 0.0066 | −0.0634 | 0.30** | 0.21 | 1.43* | 0.0039 | −0.0674 | −0.07 | −0.63 | −1.60 | 0.0132 | −0.1951 |
| d/e | Dividend Payout Ratio | 192701–201312 | 196501– | −0.06 | −1.07 | −3.65 | 0.0518 | 0.0015 | −0.06 | −1.03 | −3.81 | 0.0523 | 0.0018 | −0.06 | −0.99 | −3.28 | 0.0430 | −0.0051 |
| svar | Stock Variance | 192701–201312 | 196501– | 0.07 | 2.44 | 0.71 | 0.0223 | −0.1592 | 0.07 | 2.53 | 0.77 | 0.0254 | −0.1455 | −1.58 | 0.77 | 8.25*** | 0.0814 | −0.1981 |
| csp | Cross-Sectional Prem | 193705–200212 | 196501– | 0.92*** | 0.82 | 5.47*** | 0.0753 | −0.0037 | 0.92*** | 0.82 | 5.39*** | 0.0751 | −0.0049 | 0.92*** | 0.85 | 5.17*** | 0.0745 | −0.0071 |
| b/m | Book to Market | 192701–201312 | 196501– | 0.35** | 0.07 | 0.97 | 0.0009 | −0.0763 | 0.31** | 0.07 | 0.54 | 0.0005 | −0.0768 | −0.13 | −2.63 | −0.23 | 0.0078 | −0.0709 |
| ntis | Net Equity Expansion | 192701–201312 | 196501– | 0.34** | 0.06 | 0.38 | 0.0003 | −0.0751 | 0.34** | 0.05 | 0.38 | 0.0003 | −0.0752 | 0.33** | 0.05 | 0.37 | 0.0002 | −0.0758 |
| tbl | T-Bill Rate | 192701–201312 | 196501– | 0.13 | 0.52 | 4.99*** | 0.0336 | −0.0607 | 0.13 | 0.48 | 5.00*** | 0.0313 | −0.0692 | 0.13 | 0.49 | 4.80*** | 0.0308 | −0.0681 |
| lty | Long Term Yield | 192701–201312 | 196501– | 0.02 | 0.36 | 5.52*** | 0.0264 | −0.0453 | 0.02 | 0.32 | 6.05*** | 0.0256 | −0.0470 | 0.02 | 0.36 | 4.79*** | 0.0228 | −0.0454 |
| ltr | Long Term Return | 192701–201312 | 196501– | 0.07 | 0.33 | 1.29* | 0.0055 | −0.0716 | 0.07 | 0.33 | 1.31* | 0.0057 | −0.0717 | −0.63 | 0.24 | 14.32*** | 0.0467 | −0.0793 |
| tms | Term Spread | 192701–201312 | 196501– | 0.05 | 0.62 | 2.21** | 0.0177 | −0.1636 | 0.05 | 0.60 | 2.16** | 0.0169 | −0.1166 | 0.05 | 0.59 | 2.23** | 0.0172 | −0.0973 |
| dfy | Default Yield Spread | 192701–201312 | 196501– | −0.08 | −0.54 | −0.05 | 0.0004 | −0.0613 | −0.08 | −6.67 | −0.46 | 0.0396 | 0.0171 | −0.17 | −5.49 | −1.12 | 0.0806 | 0.0550 |
| dfr | Default Return Spread | 192701–201312 | 196501– | 0.15 | 0.75 | 1.12* | 0.0109 | −0.1262 | 0.15 | 0.75 | 1.12* | 0.0109 | −0.1261 | −2.58 | 0.27 | 9.50*** | 0.0343 | −0.0709 |

Table 14: Forecasts at Monthly Frequency using Campbell and Thompson (2008) procedure

This table presents statistics on forecast errors in-sample (IS) and out-of-sample (OOS) for excess stock return forecasts at the monthly frequency (both in the forecasting equation and forecast) using the procedure of Campbell and Thompson (2008) (henceforth, CT). Variables are explained in Section 1. Stock return is price changes, *including* dividends, of S&P500. Panel A uses the log returns (as in the rest of the tables) while Panel B uses simple returns (as in CT). The data period is December 1927 to December 2009, except for **csp** (May 1937 to December 2002) and **cay3** (March 1952 to December 2009). A star next to \overline{R}^2 (in percent) denotes significance of the in-sample regression. Variables are sorted in increasing order of in-sample significance. ΔRMSE is the RMSE (root mean square error) difference between the unconditional forecast and the conditional forecast for the same sample/forecast period (positive numbers signify superior out-of-sample conditional forecast). $\Delta U^{\gamma=3}$ is the utility difference for mean variance utility optimizer with risk aversion coefficient $\gamma = 3$ who trades based on unconditional forecast and conditional forecast. Portfolio weights are denoted by w (a cap $w_{\max} = 150\%$ is imposed on all portfolio weights). ΔRMSE and ΔU are in percent per month while w is in percent. Subscript U is for unconditional forecast, PN is for plain conditional forecast, and CT is the CT conditional forecast. The panel header gives the utility of investing based on unconditional forecast (U_0), buy-and hold market (U_{mkt}), and the riskfree asset (U_{rf}). The column titled $\Delta U_{\text{CT}}^{\gamma=x}$ gives the utility based on risk aversion coefficient $\gamma = x$, where x equalizes the U_{mkt} and U_{rf} . Critical values of all statistics are obtained from McCracken (2004). Significance levels at 90%, 95%, and 99% are denoted by one, two, and three stars, respectively.

Panel A: Log Return $U_U = 0.5526\%$, $U_{\text{mkt}} = 0.6393\%$, $U_{\text{rf}} = 0.3635\%$

| Variable | | IS | | OOS | | | | Frcst= 0 U | | $w_{\text{CT}} =$ w_{max} | | $\Delta w_{\text{CT}} -$ Δw_U |
|-------------|--------------------------|------------------|-----------------------------------|----------------------------------|----------------------------------|-----------------------------------|--------------------------------------|---------------|------|---------------------------------------|--|--|
| | | \overline{R}^2 | $\Delta U_{\text{PN}}^{\gamma=3}$ | $\Delta \text{RMSE}_{\text{PN}}$ | $\Delta \text{RMSE}_{\text{CT}}$ | $\Delta U_{\text{CT}}^{\gamma=3}$ | $\Delta U_{\text{CT}}^{\gamma=6.13}$ | | | | | |
| | | | | | | | | | | | | |
| csp | Cross-Sectional Prem | 0.92*** | 0.1869 | -0.0165 | 0.0097** | 0.0971 | 0.0872 | 51.3 | 0.0 | 9.1 | | 4.0 |
| eqis | Pct Equity Issuing | 0.59*** | 0.1578 | -0.0018 | 0.0008 | 0.1544 | 0.0317 | 9.1 | 0.0 | 37.7 | | 1.8 |
| ntis | Net Equity Expansion | 0.46** | 0.0624 | -0.0160 | -0.0155 | 0.0475 | -0.0392 | 3.7 | 0.0 | 41.4 | | 4.8 |
| e/p | Earning(10Y) Price Ratio | 0.45** | 0.0074 | -0.0261 | -0.0055 | -0.0870 | -0.0139 | 52.8 | 0.0 | 5.7 | | 3.4 |
| b/m | Book to Market | 0.38** | -0.0137 | -0.0402 | -0.0236 | -0.0808 | -0.0857 | 48.5 | 0.0 | 17.8 | | 3.3 |
| e/p | Earning Price Ratio | 0.30** | 0.0641 | -0.0268 | -0.0065 | 0.0550 | 0.0284 | 35.6 | 0.0 | 23.6 | | 2.8 |
| d/y | Dividend Yield | 0.19* | 0.0904 | -0.0095 | 0.0029* | 0.0019 | 0.0601 | 53.6 | 0.0 | 8.3 | | 2.7 |
| dfr | Default Return Spread | 0.15 | 0.0090 | -0.0026 | -0.0055 | 0.0150 | 0.0056 | 2.4 | 2.6 | 21.8 | | 23.6 |
| tbl | T-Bill Rate | 0.12 | 0.1596 | -0.0028 | 0.0028* | 0.0719 | 0.0186 | 23.6 | 0.0 | 6.1 | | 2.4 |
| d/p | Dividend Price Ratio | 0.09 | 0.0698 | -0.0022 | 0.0016* | -0.0096 | 0.0390 | 21.7 | 0.0 | 3.7 | | 2.3 |
| tms | Term Spread | 0.09 | 0.1365 | 0.0029* | 0.0024* | 0.0920 | -0.0105 | 4.0 | 10.1 | 26.6 | | 5.5 |
| ltr | Long Term Return | 0.07 | 0.1492 | -0.0175 | 0.0022* | 0.0373 | 0.0026 | 5.2 | 34.3 | 29.0 | | 26.7 |
| svar | Stock Variance | 0.06 | 0.1562 | 0.0011* | -0.0032 | -0.0221 | -0.0125 | 0.0 | 48.0 | 22.4 | | 0.2 |
| lty | Long Term Yield | 0.00 | 0.0773 | -0.0199 | 0.0054** | 0.0694 | 0.0400 | 43.1 | 0.0 | 9.2 | | 1.2 |
| infl | Inflation | -0.02 | 0.0282 | -0.0002 | 0.0005 | 0.0211 | 0.0050 | 1.5 | 0.0 | 22.4 | | 9.2 |
| d/e | Dividend Payout Ratio | -0.05 | -0.0255 | -0.0259 | -0.0198 | 0.0094 | -0.0920 | 1.1 | 0.0 | 54.4 | | -0.1 |
| dfy | Default Yield Spread | -0.08 | -0.0038 | -0.0054 | -0.0042 | -0.0389 | -0.0334 | 2.8 | 20.6 | 21.4 | | 0.8 |
| cay3 | Cnsmptn, Wlth, Incme | 1.15*** | 0.2692 | -0.0492 | -0.0164 | 0.1344 | 0.0676 | 47.5 | 0.0 | 17.8 | | 4.3 |

Panel B: Simple Return $U_U = 0.6869\%$, $U_{\text{mkt}} = 0.7329\%$, $U_{\text{rf}} = 0.3635\%$

| Variable | | IS | | OOS | | | | Frcst= 0 U | | $w_{\text{CT}} =$ w_{max} | | $\Delta w_{\text{CT}} -$ Δw_U |
|-------------|--------------------------|------------------|-----------------------------------|----------------------------------|----------------------------------|-----------------------------------|--------------------------------------|---------------|------|---------------------------------------|--|--|
| | | \overline{R}^2 | $\Delta U_{\text{PN}}^{\gamma=3}$ | $\Delta \text{RMSE}_{\text{PN}}$ | $\Delta \text{RMSE}_{\text{CT}}$ | $\Delta U_{\text{CT}}^{\gamma=3}$ | $\Delta U_{\text{CT}}^{\gamma=7.22}$ | | | | | |
| | | | | | | | | | | | | |
| csp | Cross-Sectional Prem | 0.99*** | 0.1630 | -0.0165 | 0.0072** | 0.0603 | 0.0751 | 44.9 | 0.0 | 13.5 | | 4.7 |
| e/p | Earning(10Y) Price Ratio | 0.83*** | -0.0998 | -0.0365 | -0.0051 | -0.1103 | -0.0067 | 49.4 | 0.0 | 14.1 | | 4.7 |
| b/m | Book to Market | 0.70*** | -0.0579 | -0.0593 | -0.0394 | -0.1483 | -0.1082 | 43.5 | 0.0 | 27.4 | | 3.1 |
| eqis | Pct Equity Issuing | 0.56*** | 0.1339 | -0.0046 | -0.0016 | 0.1380 | 0.0452 | 6.2 | 0.0 | 53.5 | | 1.4 |
| ntis | Net Equity Expansion | 0.50** | 0.0417 | -0.0210 | -0.0209 | 0.0618 | -0.0451 | 0.3 | 0.0 | 55.2 | | 3.9 |
| d/y | Dividend Yield | 0.41** | 0.0125 | -0.0193 | 0.0005 | -0.0956 | 0.0695 | 53.3 | 0.0 | 14.1 | | 3.2 |
| e/p | Earning Price Ratio | 0.32** | 0.0009 | -0.0273 | -0.0107 | 0.0459 | 0.0379 | 18.3 | 0.0 | 29.9 | | 4.1 |
| d/p | Dividend Price Ratio | 0.28** | 0.0002 | -0.0050 | 0.0039** | -0.0927 | 0.0637 | 28.9 | 0.0 | 14.1 | | 3.7 |
| tbl | T-Bill Rate | 0.21* | 0.1565 | 0.0016* | 0.0076** | 0.1152 | 0.0489 | 20.4 | 0.0 | 17.4 | | 2.7 |
| dfy | Default Yield Spread | 0.19* | 0.0055 | -0.0115 | -0.0101 | -0.0586 | -0.0848 | 3.7 | 0.0 | 26.5 | | 2.5 |
| tms | Term Spread | 0.14 | 0.1372 | 0.0042** | 0.0040** | 0.1370 | 0.0244 | 3.4 | 0.0 | 55.7 | | 4.4 |
| infl | Inflation | 0.11 | 0.0492 | 0.0004 | 0.0012* | 0.0364 | 0.0104 | 1.8 | 0.0 | 41.4 | | 11.1 |
| ltr | Long Term Return | 0.10 | 0.1206 | -0.0087 | 0.0037** | 0.0676 | 0.0080 | 3.3 | 33.5 | 48.5 | | 26.3 |
| dfr | Default Return Spread | 0.06 | 0.0831 | -0.0024 | -0.0022 | 0.0510 | 0.0198 | 0.8 | 18.3 | 42.5 | | 10.0 |
| lty | Long Term Yield | 0.05 | 0.0781 | -0.0107 | 0.0085** | 0.0688 | 0.0618 | 30.1 | 0.0 | 20.6 | | 1.9 |
| svar | Stock Variance | -0.09 | 0.0259 | -0.0157 | -0.0156 | -0.0333 | -0.0658 | 0.0 | 7.7 | 33.5 | | 1.9 |
| d/e | Dividend Payout Ratio | -0.10 | 0.0068 | -0.0129 | -0.0111 | -0.0079 | -0.0546 | 0.3 | 15.3 | 53.7 | | 0.1 |
| cay3 | Cnsmptn, Wlth, Incme | 1.16*** | 0.2263 | -0.0499 | -0.0225 | 0.0773 | 0.0488 | 44.2 | 0.0 | 20.6 | | 4.1 |