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IAS EXECUTIVE SUMMARY

USING CAPE TO ESTIMATE FUTURE STOCK RETURNS

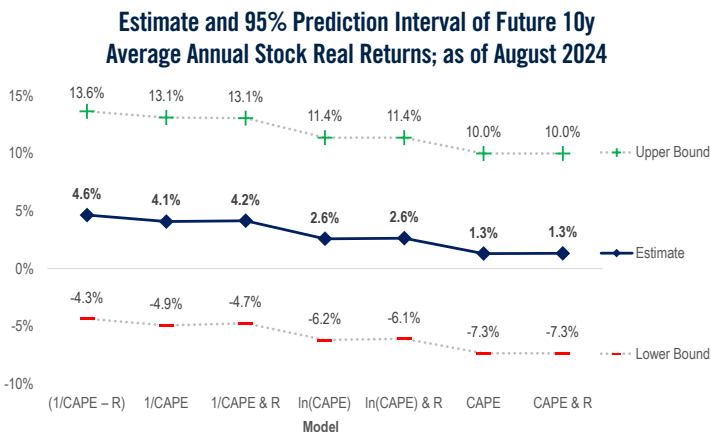
Recent Wall Street research suggests the prospect of relatively low stock returns over the next decade (e.g., 1%/y real return).¹ This is a significant reduction compared to the prior decade’s realized real return of 10.5%/y. The prospect of low future returns stems from high stock market valuation as measured by CAPE (Shiller’s S&P 500 cyclically adjusted P/E). Historically, high levels of CAPE are associated with relatively low long-term future stock returns.

However, using CAPE to generate future stock return estimates can produce significantly different forecasts depending on how CAPE is specified in the forecast model and whether there are other explanatory variables. While CAPE is viewed as an important predictor of future stock returns, there is little consensus on how to use CAPE for future return estimation.

We compare various CAPE models and identify that (1/CAPE – R) (i.e., stock earnings yield - 10y US Treasury real yield) – also known as “stock excess yield” or the “Fed Model” – has delivered the best estimation performance (of those models considered), regardless of the level of CAPE.²

(1/CAPE – R) (i.e., stock earnings yield – 10y US Treasury real yield) has been – both theoretically and empirically – the best way to incorporate CAPE in estimating future 10y stock returns, especially when CAPE is high.

Historically, the recent reading of (1/CAPE – R) suggests a **4.6%/y real return** for stocks over the next decade (vs. 10.5%/y over the past decade), translating to a **6.6%-7.6%/y nominal return** assuming 2%-3%/y inflation.



Source: Barclays, Datastream, Federal Reserve Bank of St. Louis, FRED, Haver Analytics, Robert Shiller, S&P, US Treasury and PGIM IAS. Provided for illustrative purposes only.

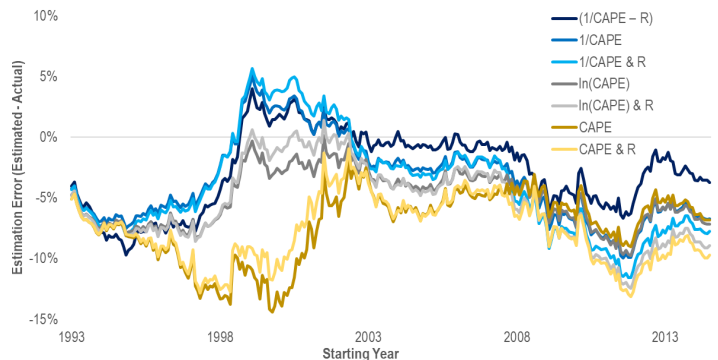
Theoretically, stock returns would be expected to have a linear relationship with 1/CAPE – not CAPE or ln(CAPE) – suggesting that 1/CAPE might be the best empirical specification for “CAPE.” However, we “let the data speak” and compare the **evolution of estimation accuracy** across different CAPE models **with an expanding window**.

We also consider adding 10y US Treasury *real* yields (“R”) as an explanatory variable, along with CAPE, to account for the impact of *real* interest rates on future stock *real* returns.

Overall, 1/CAPE-based models (with and without the additional regressor, R) have generally outperformed others with lower estimation errors over time, while CAPE-based models have persistently *underestimated* future stock returns. Furthermore, 1/CAPE-based models are intuitively easier to interpret, as stock earnings yield (1/CAPE) – a “return” – directly relates to stock returns.

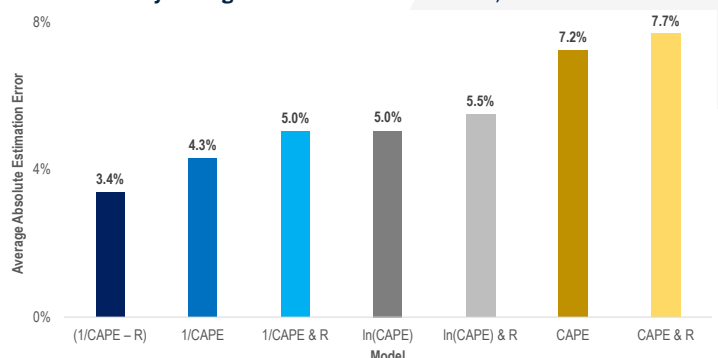
Among the models examined, (1/CAPE – R) has delivered the best forecast performance with the highest estimation accuracy (lowest average absolute estimation error). It has consistently topped other models since 2003.

Estimation Error (Estimate – Actual; Out of Sample; %/y) of Future 10y Average Annual Stock Real Returns Based on An Expanding Window; Monthly, 3/1993 – 9/2014



Note: We run regressions and calculate estimation errors every month using data with an expanding window starting from April 1953 (when data become available) until that month, to avoid look-ahead bias. Regressions start in March 1993 (40y since April 1953) to allow for sufficient data to generate the first estimate. Source: Barclays, Datastream, Federal Reserve Bank of St. Louis, FRED, Haver Analytics, Robert Shiller, S&P, US Treasury and PGIM IAS. Provided for illustrative purposes only.

Average Absolute Estimation Error (%/y) of Future 10y Average Annual Stock Real Returns; 3/1993 – 9/2014



Source: Barclays, Datastream, Federal Reserve Bank of St. Louis, FRED, Haver Analytics, Robert Shiller, S&P, US Treasury and PGIM IAS. Provided for illustrative purposes only.

¹ See *Updating Our Long-Term Return Forecast for US Equities to Incorporate the Current High Level of Market Concentration*, Goldman Sachs, October 2024.

² See *Higher Bond Yields & the Fed Model – Implications for Future Stock-Bond Relative Returns*, PGIM IAS, November 2023

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