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# Long-term perspective on the stock market matters in asset pricing<sup>☆</sup>

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## ABSTRACT

We provide a more intuitive interpretation of Campbell's (1993) intertemporal capital asset pricing model. In this model, investors' long-term perspective on the stock market matters and the revision on the perspective becomes a pricing factor. We construct this factor series from out-of-sample forecasts and it allows us to avoid the perfect foresight problem of the VAR factor model and to deal with on-going debate on the return predictability. Our empirical results suggest that the innovation factor is strongly and robustly priced across assets and has close relationship with the momentum and liquidity factors.

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## 1. Introduction

Campbell (1993) presents a discrete time version of ICAPM and shows that the state variable should predict the market return. This implies that any pricing factor excluding the market return should be the innovation to the state variable predicting the market return, and it sheds light on the nature of the risk many empirically successful yet empirically motivated pricing factors should represent: the risk premium

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of an empirical factor is the compensation to the investors' concern over the changes of the future market risk.

Despite its theoretical contribution to deepen our understanding of the nature of risk the empirical factors represent, [Campbell's \(1993\)](#) ICAPM raises some empirical feasibility questions because the predictability of the market return is still at large an open question even though many researchers seem to believe that there is some truth to the return predictability. Recall that the key idea of ICAPM is the time-varying investment opportunity set and the pricing factor that comes from the innovation to the state variable that describes the investment opportunity set. Thus, [Campbell's \(1993\)](#) ICAPM in which the market return fully describes the investment opportunity set would bear no such pricing factor if the market return is not predictable.

The literature of return predictability has a long history and has reported various empirical issues in the research.<sup>1</sup> First, the OLS slope estimator for a stochastic and persistent regressor in a typical predictive regression is biased and its finite-sample properties are substantially different from the standard regression setting. Second, it is also well-known that the empirical predictive relations are unstable over time. The choice of sample period has an important influence over the empirical results of the predictive regressions. Third, [Bossaerts and Hillion \(1999\)](#) and [Welch and Goyal \(2008\)](#) find that the out-of-sample predictive performance of various well-known predictors in the literature is very poor. Lastly, the empirical results from a long-horizon predictive regression is plagued by overlapping errors and possibly a spurious correlation. Depending on a choice of the ways to deal with these empirical issues, a predictive regression suggests different results. Some provide empirical evidence against the return predictability and some for it. Among the papers supporting the return predictability, some suggests short-term predictability is more pronounced and some others long-term predictability.

Aside from the debate on the statistical significance of the return predictability, there is a separate literature investigating the economic significance of the return predictability. [Avramov and Chordia \(2006\)](#) provide empirical evidence on the economic significance of the predictability in U.S. stock returns using a real-time asset-allocation framework. [Handa and Tiwari \(2006\)](#) find that the trading strategy performs significantly better when it relies on a model-based approach based on the CAPM. [Campbell and Thompson \(2008\)](#) show that the return predictability is economically meaningful for mean-variance investors even though the out-of-sample explanatory power of the predictors is small. These empirical findings are consistent with what is practiced in the industry. Even with much uncertainty in statistical significance of the return predictability, investors in practice will do their best to have the best possible perspective on the stock market and tend to believe in it as long as there are many benefits from having the correct market forecast. Then, in an equilibrium, the investor's revision in the market perspective (or, in other words, the innovation to the state variable in [Campbell's, 1993](#) ICAPM) would matter in asset pricing separately from the statistical significance of the return predictability.

For the empirical implementation of the ICAPM, [Campbell \(1993\)](#) proposes the Vector Autoregressive (VAR) factor model, and [Campbell \(1996\)](#) shows that the innovations to the market return predictors are priced across assets. However, we have a couple of concerns rising from the recent developments in return predictability literature. First, the VAR factor model has a perfect foresight problem because a VAR model is typically fitted with the whole sample data to generate the innovations to the return predictors. This feature of the VAR factor model is a matter of great concern when it is well known that the out-of-sample performance of the return predictors is very poor as is shown by [Bossaerts and Hillion \(1999\)](#) and [Welch and Goyal \(2008\)](#).

Second, the VAR factor model, with its typical application to a monthly dataset, basically assumes a short-term return predictability. It assumes specific statistical processes for the market return and each of the state variables. Under these statistical assumptions, a multi-period ( $H$ ) forecast is made with one period forecast at a time repeated  $H$  times. This is internally consistent, but might be in conflict with the empirical literature of return predictability in which some find empirical evidence supporting the long-term return predictability but not for the short-term.

<sup>1</sup> The literature of the return predictability is vast and we cannot hope to list all the relevant papers for the sake of brevity of the paper. We will cite only the ones directly related to our paper.

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