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Dividend growth and equity premium predictability☆

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ABSTRACT

This paper studies dividend growth predictability without restricting the conditioning information set to dividend yield alone. We highlight that predictability crucially hinges on how dividend growth is constructed. While there is little predictability in the market-reinvested dividend growth, the pure dividend growth is significantly predictable both in-sample and out-of-sample by a number of economic fundamentals. This strong pure dividend growth predictability leads to improved equity premium prediction under the present-value framework.

1. Introduction

Asset prices can move unexpectedly because investors update expectations of either future cash flows or discount rates or both. Understanding the source of variation in prices is important not only for asset pricing models but also in understanding how markets work and how market participants behave. As a well accepted measure for cash flows, dividends are critical for the economic analysis of stock price movement. As pointed out by Bansal and Yaron (2007), "Predicability of dividends and/or returns form, in many ways, the rational paradigm to interpret asset price variation." To study the dynamics of dividends and/or returns, the standard academic paradigm of predictability is based on dividend-price ratio (see, for example, Cochrane, 1992, 2008, 2009; Ang, 2012; Chen, 2009; Engsted & Pedersen, 2010). The prevailing belief is that cash flows are less predictable than discount rates at the aggregate level (see, for example, Cochrane, 1992, 2008, 2009; Campbell, 1991; Lettau & Ludvigson, 2005). As such, it has been typical to rule out dividend growth predictability in studying asset price variation.

Several possible explanations for the lack of dividend growth predictability by dividend-price ratio are proposed in the literature. Lettau and Ludvigson (2005) argue that movements in expected dividend growth are positively correlated with movements in expected returns, and this comovement has offsetting effects on the dividend-price ratio, which make it unable to uncover the time-varying nature of expected dividend growth. Chen (2009) reports that part of the lack of dividend growth predictability in the prewar period stems from how dividends are constructed. However, in the postwar period, dividend growth is unpredictable regardless of how dividends are

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constructed. Chen, Da, and Priestley (2012) argue that smoothing, manipulation, and censoring of dividends, together with structural shifts in firms' corporate financial policy in the postwar period, bury the predictability of dividend growth.

There is an active stream of literature studying return predictability, which significantly expands return predictability inquiry in the dimensions of both conditioning information set and modelling techniques. In contrast, few studies focus on dividend growth predictability, and almost all of the existing studies limit the information set to the dividend-price ratio only. Our paper attempts to fill in the void and provides the first comprehensive study on dividend growth predictability, both in-sample and out-of-sample, conditioning on a large set of economic variables. We then investigate the links between dividend growth predictability and stock return predictability. We report the following findings.

We demonstrate that dividend growth predictability is crucially hinged on how it has been constructed. Due to seasonality, dividend series are always considered at annual frequency, regardless of whether the data are taken at annual or monthly frequency. To sum the dividends, one has to take a stance on how dividends are reinvested within a year. Some studies assume that dividends are reinvested in the stock market upon their receipt (see, for example, Cochrane, 1992, 2008, 2009) while some studies assume no reinvestment (see, for example, Ang & Bekaert, 2007). Our findings complement the findings of Chen (2009) that dividend yield can predict dividend growth for the prewar period depending on reinvestment strategy. However, Chen only performs in-sample tests and restricts the information set to dividend yield. Our study is more comprehensive in the sense that we carry out both in-sample and out-of-sample predictability tests and expand the conditioning information set to include various state variables. Three findings stand out. First, it is hard to detect predictable movement in market-reinvested dividend growth; second, dividend yield fails the out-of-sample predictability test completely; and third, a handful of economic fundamental variables including lagged dividend growth, payout ratio, and stock variance can strongly predict pure dividend growth both in- and out-of-sample.

This discovered predictability is consistent with the view that managers cannot "hide cash flows" forever. While dividends are dramatically more smoothed in the postwar period, the literature argues that a manager's dividend-smoothing ability is imperfect over the business cycle (see, for example Gertler & Hubbard, 1993; Bernanke, Gertler, and Gilchrist, 1996). Although dividend smoothing is possible over long horizons, it is more difficult over horizons corresponding to the business cycle. The recent sudden and prolong financial crisis from 2007 to 2009 (GFC) serves as a natural experiment to test this hypothesis. We therefore expect an increased dividend growth predictability as a result of imperfect dividend smoothing. We show that this is indeed the case during the GFC period, with a number of business-cycle related variables significantly predicting dividend growth during this period.

We then investigate the links between dividend growth predictability and return predictability under the present-value framework. Following Lacerda and Santa-Clara (2010) and Golez (2014), we examine whether dividend growth predictability can improve return forecasts. To forecast dividend growth, Lacerda and Santa-Clara (2010) rely on the historical means and Golez (2014) uses the implied dividend growth extracted from derivative markets. Our study predict dividend growth using various economic state variables, which provides an alternative way to extract future expected dividend growth using a rich set of information. We then construct adjusted dividend-price ratio under the present-value framework, which filters out variation in the dividend-price ratio due to variation in expected dividend growth. Compared with using the raw dividend-price ratio, we can obtain a substantial improvement in equity premium predictability. Moreover, we show that out-of-sample equity premium predictability based on our method is robust and not sensitive to the choice of sample period.

The rest of the paper proceeds as follows. In Section 2, we present the theoretical framework of present value relation. In Section 3, we describe the data for our empirical studies. In Section 4, we report the evidence of dividend growth predictability both in-sample and out-of-sample. Section 5 incorporates dividend growth predictability into stock return prediction. A brief conclusion and future research are provided in section 6.

2. Theoretical framework

2.1. Present-value relationship

Define the total log return of the aggregate stock market between period t and period $t+1$ as

$$r_{t+1} = \log\left(\frac{P_{t+1} + D_{t+1}}{P_t}\right),$$

where P denotes the stock price and D denotes dividend. Define the aggregate log dividend growth rate between period t and period $t+1$ as

$$\Delta d_{t+1} = \log\left(\frac{D_{t+1}}{D_t}\right),$$

and the dividend-price ratio at period t as

$$dp_t = \log\left(\frac{D_t}{P_t}\right).$$

Hence, the log price-dividend ratio is $pd_t = \log(P_t/D_t) = -dp_t$.

The return identity follows from the return log-linearization derived in the seminal work of Campbell and Shiller (1988):