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The expected value premium ☆

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Abstract

Fama and French [2002. The equity premium. Journal of Finance 57, 637–659] estimate the equity premium using dividend growth rates to measure expected rates of capital gain. We apply their method to study the value premium. From 1945 to 2005, the expected value premium is on average 6.1% per annum, consisting of an expected dividend growth component of 4.4% and an expected dividend price ratio component of 1.7%. Unlike the equity premium, the value premium has been largely stable over the last half century.

JEL classification: G12; G14

Keywords: Value; Growth; Time-varying expected returns; Dividend growth

1. Introduction

Value stocks (stocks with high book-to-market ratios) earn higher average returns than growth stocks (stocks with low book-to-market ratios). (See, for example, Rosenberg, Reid, and Lanstein, 1985; Fama and French, 1992; Lakonishok, Shleifer, and Vishny, 1994.) We ask whether the value premium (the average return of value stocks minus the average return of growth stocks) exists ex-ante. Our main finding is that the expected value premium has been stable at around 6.1% per annum over the last half century.

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Our economic question is important. Since the seminal contributions of Fama and French (1992, 1993, 1996), the value premium has become arguably as important as the equity premium in asset allocation, investment management, capital budgeting, security analysis, and many other applications. Most studies use average realized returns as the proxy for expected returns. But average returns are noisy (e.g., Elton, 1999; Fama and French, 2002), and do not necessarily converge to expected returns in finite samples. For instance, as Elton points out, there are periods longer than ten years during which the stock market return is lower, on average, than the risk-free rate (1973–1984), and periods longer than 50 years during which risky bonds underperform, on average, the risk-free rate (1927–1981). Fama and French also argue convincingly that the estimates of expected returns from economic fundamentals are more precise than the estimates from average returns.

Our idea is basically the idea of Fama and French (2002), who estimate the equity premium using dividend growth rates to measure expected rates of capital gain. We apply this insight to estimate the value premium. The expected stock return is the expected dividend price ratio plus the expected rate of capital gain:

$$\mathrm{E}[R_{t+1}] = \mathrm{E}\left[\frac{D_{t+1}}{P_t}\right] + \mathrm{E}\left[\frac{P_{t+1}}{P_t}\right], \tag{1}$$

where $\mathrm{E}[R_{t+1}]$ is the expected stock return, P_t is the stock price at the beginning of period t, and D_{t+1} is the dividend paid over period t and known at the beginning of period $t+1$. Suppose the dividend price ratio is stationary (mean reverting). Then the compound rate of dividend growth approaches the compound rate of capital gain if the sample period is long (Fama and French, 2002, p. 638). Thus, we can measure the expected stock return as

$$\mathrm{E}[R_{t+1}] = \mathrm{E}\left[\frac{D_{t+1}}{P_t}\right] + \mathrm{E}[Ag_{t+1}], \tag{2}$$

where Ag_{t+1} is the long-term dividend growth rate (see Section 2 for its precise definition).

Our results are easy to summarize. From 1945 to 2005, the expected value premium constructed from a two-by-three sort on size and book-to-market à la Fama and French (1993) is on average 6.1% per annum. This premium consists of an expected dividend growth component of 4.4% and an expected dividend price ratio component of 1.7%. In the 1963–2005 subsample, the expected value premium is on average 6.4% per annum, consisting of an expected dividend growth component of 4.2% and an expected dividend price ratio component of 2.2%. Thus, a major portion of the value premium comes from the dividend growth component. Further, unlike the equity premium that has declined over time (e.g., Fama and French, 2002), the expected value premium has been largely stable over the last half century.

Our work adds to the growing literature that uses valuation models to estimate expected stock returns (e.g., Blanchard, 1993; Claus and Thomas, 2001; Gebhardt, Lee, and Swaminathan, 2001; Jagannathan, McGrattan, and Scherbina, 2000; Constantinides, 2002; Fama and French, 2002). As noted, we study the value premium. Section 2 presents our estimation methods. Section 3 describes our sample. Section 4 measures the expected value premium, and Section 5 interprets our results.

2. Experimental design

2.1. The basic idea

Following Fama and French (2002), we estimate the expected rates of capital gain using dividend growth rates. Our underlying premise is that the dividend price ratio for an investment strategy is stationary, even though the strategy involves a changing set of firms. Stationarity implies that if the sample is long, the dividend growth rate approaches the rate of capital gain.

More precisely, let R_{t+1} denote the one-year realized real stock return from time t to $t+1$, that is, $1 + R_{t+1} = (D_{t+1} + P_{t+1})/P_t$. Following Blanchard (1993), we solve the equation recursively forward (assuming that the dividend price ratio does not explode) to get P_t, the present discounted value of future dividends. Dividing both sides by D_t, taking conditional expectations at time t, and linearizing yields the expected return at time t as

$$\mathrm{E}_t[R_{t+1}] = \mathrm{E}_t\left[\frac{D_{t+1}}{P_t}\right] + \mathrm{E}_t[Ag_{t+1}], \tag{3}$$

where Ag_{t+1} is the long-run dividend growth rate, which is defined as the annuity of future dividend growth:

$$Ag_{t+1} \equiv \left[\frac{\overline{r}-\overline{g}}{1+\overline{r}}\right]\sum_{i=0}^{\infty}\left[\frac{1+\overline{g}}{1+\overline{r}}\right]^i g_{t+i+1}. \tag{4}$$

In Eq. (4), $\overline{g}$ and $\overline{r}$ are the average real growth rate of dividends and the average real stock return, respectively, and g_{t+i+1} denotes the realized real growth rate of dividends from time $t+i$ to $t+i+1$.

From Eq. (3), the expected return is the expected dividend price ratio plus the expected long-run dividend growth rate, conditional on the information set at time t. This method of estimating expected returns is a dynamic extension of the dividend growth model in Fama and French (2002). In our context, Eq. (3) implies that the expected value premium is the sum of the difference in the expected dividend price ratio and the difference in the expected long-run dividend growth rate between value and growth portfolios.

2.2. Estimation details

To provide a precise description of our procedure used to measure realized dividend growth rates of portfolios, we introduce additional notation borrowed from Fama and French (2005). Let:

P_t = market value at time t of the securities allocated to the portfolio when it is formed at time t.
$P_{t,t+1}$ = market value at time $t+1$ of the securities allocated to the portfolio at time t.
$D_{t,t+1}$ = dividends paid between t and $t+1$ on the securities allocated to the portfolio at time t.
$R_{t,t+1}$ = return (with dividends) observed at time $t+1$ on a portfolio formed at time t.
$R^X_{t,t+1}$ = return (without dividends) observed at time $t+1$ on a portfolio formed at time t.

Whenever there are two time subscripts on a given variable, the first subscript indicates the time when the portfolio is formed and the second subscript indicates the time when the variable is observed. For simplicity, we use P_t rather than $P_{t,t}$ as the market value of a portfolio when formed at time t.

2.2.1. Dividend price ratios

For each portfolio, we first construct the real dividend price ratio from the value-weighted realized stock returns with and without dividends and the Consumer Price Index (CPI) from the U.S. Bureau of Labor Statistics:

$$\frac{D_{t,t+1}}{P_t} = \left(R_{t,t+1} - R^X_{t,t+1}\right)\left(\frac{\mathrm{CPI}_t}{\mathrm{CPI}_{t+1}}\right). \tag{5}$$

Because monthly total returns are compounded to get annual returns in the Center for Research in Securities Prices (CRSP), the dividend price ratio includes dividends and the reinvestment returns earned from the time a dividend is paid to the end of the annual return period.

2.2.2. Dividend growth rates

We measure portfolio real dividend growth rates as

$$g_{t+1} = \left(\frac{D_{t,t+1}/P_t}{D_{t-1,t}/P_{t-1}}\right)\left(R^X_{t-1,t}+1\right)\left(\frac{\mathrm{CPI}_{t-1}}{\mathrm{CPI}_t}\right) - 1 = \left(\frac{D_{t,t+1}/P_t}{D_{t-1,t}/P_{t-1}}\right)\left(\frac{P_{t-1,t}}{P_{t-1}}\right) - 1, \tag{6}$$

where the second equality follows because $(R^X_{t-1,t}+1)(\mathrm{CPI}_{t-1}/\mathrm{CPI}_t) = P_{t-1,t}/P_{t-1}$ (real rates of capital gain). The second equality says that the dividend growth rate is: (dividends at $t+1$ per dollar invested at t multiplied by dollars invested at t)/(dividends at t per dollar invested at $t-1$ multiplied by dollars invested at $t-1$). It is clear that the reinvested capital gains, $(P_{t-1,t}/P_{t-1})$, are an important part of the dividend growth rates. Higher reinvested capital gains from $t-1$ to t mean more dollars to invest at t, which in turn mean higher dividend growth rates (given the dividend price ratios).

For example, suppose at the end of June of year $t-1$, an investor invests \$100 in the value portfolio that value weights a set of value stocks ($P_{t-1} = \$100$). The value portfolio has a dividend price ratio of 5% ($D_{t-1,t}/P_{t-1} = 5\%$), so at the end of June of year t the investor gets dividends of \$5. Because of capital gains, the market value of the value portfolio becomes \$110 at the end of June of year t ($P_{t-1,t} = \$110$). The investor thus has more dollars to invest in the time-t value portfolio that value weights a new set of value stocks. Suppose the new portfolio has a dividend price ratio of 6% ($D_{t,t+1}/P_t = 6\%$). At the end of June of year $t+1$, the investor receives dividends of $\$110 \times 6\% = \$6.6$. The dividend growth rate from the end of June of year t to the end of June of year $t+1$ is $\$6.6/\$5 - 1 = 32\%$, which is exactly what Eq. (6) obtains: $(6\%/5\%)(\$110/\$100) - 1 = 32\%$.

Our calculations of dividend price ratios and dividend growth rates do not involve double counting. The returns earned from reinvesting dividends within a year do appear in both dividend price ratios and dividend growth rates. But if investors reinvest dividends within a year, dividends used in calculating dividend growth rates should include both cash dividends and reinvestment returns. Because we treat dividends consistently when calculating dividend price ratios and dividend growth rates, our results have a clean economic interpretation.

2.2.3. Long-run dividend growth rates

We construct the long-run dividend growth rate, Ag_{t+1}, based on Eq. (4).

Following Blanchard (1993), we estimate $\bar{r}$ as the sample average of the realized real equity returns and $\bar{g}$ as the sample average of the real dividend growth rates. From Eq. (4), Ag_{t+1} is an infinite sum of future real dividend growth rates. In practice, we use a finite sum of 100 years of future growth. We assume that future real dividend growth rates beyond 2005 equal the average dividend growth rate in the 1963–2005 sample. Using the full 1945–2005 sample average yields quantitatively similar results (not reported).

2.2.4. Expected long-run growth rates and expected dividend price ratios

Following Blanchard (1993), we perform annual predictive regressions of Ag_{t+1} and D_{t+1}/P_t on a set of conditioning variables. We use the simulation method of Nelson and Kim (1993) to adjust for the Stambaugh (1999) small-sample bias. The fitted values from these regressions provide the time series of the expected long-run dividend growth and the expected dividend price ratio. The sum of these two components provides the time series of the expected returns.

Our choice of the set of conditioning variables is standard from the time-series literature. These variables include: (i) the aggregate dividend yield, computed as the sum of dividend payments accruing to the CRSP value-weighted market portfolio over the previous 12 months divided by the contemporaneous level of the index (e.g., Fama and French, 1988)[1]; (ii) the default premium, defined as the yield spread between Moody's Baa and Aaa corporate bonds from the monthly database of the Federal Reserve Bank of St. Louis (e.g., Keim and Stambaugh, 1986; Fama and French, 1989); (iii) the term premium, defined as the yield spread between long-term and one-year Treasury bonds from Ibbotson Associates (e.g., Campbell, 1987; Fama and French, 1989); and (iv) the one-month Treasury bill rate from CRSP (e.g., Fama and Schwert, 1977; Fama, 1981).

Previous studies (e.g., Cohen, Polk, and Vuolteenaho, 2003; Campbell and Vuolteenaho, 2004) find that the value spread—the log book-to-market of the value decile minus the log book-to-market of the growth decile from a one-way sort on book-to-market—can predict future value-minus-growth returns. Given our focus on the value premium, we also use the value spread to predict the long-run dividend growth rates and the dividend price ratios.[2] The data on the year-end book-to-market ratios of the extreme book-to-market deciles are from Kenneth French's web site.

[1] We call $D_{t-1,t}/P_t$ the dividend yield (observable at the beginning at time t), and we call $D_{t,t+1}/P_t$ the dividend price ratio (observable only at the end of time t).

[2] Our results are not materially affected by alternative sets of instruments such as excluding the value spread from or including Lettau and Ludvigson's (2001a, 2005) *cay* and *cdy* variables into the set of instruments (not reported).

3. Data

We obtain data from three main sources. The first is the CRSP monthly stock file that contains information on stock prices, shares outstanding, dividends, and returns with and without dividends for NYSE, AMEX, and Nasdaq stocks. The second source is the COMPUSTAT annual research file that provides accounting information for publicly traded U.S. firms. To alleviate the potential survivor bias due to backfilling data, we require that firms appear in COMPUSTAT for at least two years before using the data. The third source is Moody's book equity information in Davis, Fama, and French (2000) from Kenneth French's web site.

Our sample period is from 1945 to 2005. In earlier years, the proportion of firms paying dividends in the one-way-sorted value quintile is low (around 10% from 1930 to 1940) and extremely unstable. This instability leads to unrealistically large swings in the resulting portfolio dividend growth rates. Further, as Cohen, Polk, and Vuolteenaho (2003) point out, potential problems with disclosure regulations also affect the starting date of the sample period.[3]

Our definition of book equity is from Fama and French (1993). Book equity is stockholder equity plus balance sheet-deferred taxes (item 74) and investment tax credits (item 208 if available) plus post-retirement benefit liabilities (item 330 if available) minus the book value of preferred stock. Depending on data availability, we use redemption (item 56), liquidation (item 10), or par value (item 130), in this order, to represent the book value of preferred stock. Stockholder equity is equal to Moody's book equity (whenever available) or the book value of common equity (item 60) plus the par value of preferred stock. If neither is available, stockholder equity is calculated as the book value of assets (item 6) minus total liabilities (item 181).

We construct value and growth portfolios by sorting on book-to-market ratios. We implement both a one-way sort to obtain five book-to-market quintiles and a two-way, two-by-three sort on size and book-to-market to obtain six portfolios à la Fama and French (1993). We denote the one-way-sorted portfolios as quintiles Low, 2, 3, 4, and High. The difference between quintiles High and Low, denoted p5-1, represents the value strategy from the one-way sort. We construct six portfolios (denoted $S/L, B/L, S/M, B/M, S/H$, and B/H) from the two-way sort. In particular, the S/L portfolio contains the stocks in the small size group that are also in the low book-to-market group, and the B/H portfolio contains the large stocks that are also in the high book-to-market group. The two-way-sorted value strategy, denoted HML, is defined as $(S/H + B/H)/2 - (S/L + B/L)/2$.

Our timing in portfolio construction differs slightly from that used in Fama and French (1993). In particular, instead of forming portfolios at the end of June, we form portfolios at the end of December for each year t. Accordingly, portfolio ranking is effective from January to December of year $t+1$, and we use book equity from the fiscal year ending in calendar year $t-1$ divided by market equity at the end of December of year t. Doing so avoids any look-ahead bias that might arise because accounting information from the current fiscal year is sometimes not available at the end of the calendar year, and is more in line with the timing of dividend growth. Our different timing is not a source of concern, however: using lagged information on book value makes it harder to find a positive expected value premium, and using the conventional timing yields quantitatively similar results (not reported).

Our method is essentially a dynamic extension of Fama and French's (2002) method for estimating the equity premium. Before we report our value premium estimates, it is important to ask whether our equity premium estimates are comparable to theirs. The answer is affirmative.

During the 1951–2000 period studied by Fama and French (2002), our estimates of the expected aggregate real dividend growth rate, the expected aggregate real dividend price ratio, the expected real equity market return, and the average realized real market return are 1.35%, 3.74%, 4.93%, and 9.11% per annum, respectively. These estimates are close to those reported by Fama and French, i.e., 1.05%, 3.70%, 4.75%, and 9.62%, respectively. Our equity premium estimate is also much lower than the average realized market excess return. From 1945 to 2005, the equity premium is 5.19% per annum, lower than the realized equity premium, 8.46%, consistent with Fama and French's conclusion that "the average stock return of the last half-century is a lot higher than expected (p. 637)."

[3]Before the Securities Exchange Act of 1934, there was essentially no regulation to ensure the flow of accurate and systematic accounting information. The Act prescribes specific annual and periodic reporting and record-keeping requirements for publicly traded companies.

As in Fama and French (2002), our estimated equity premium also has declined over time. The equity premium reaches its peak of about 9.5% per annum in the early 1950s, declines over the next two decades to about 2.5% in the mid-1970s, climbs up to about 5.5% in the mid-1980s, and declines again over the next one-and-a-half decades to about 2% in the early 2000s.

4. Main results

4.1. Sources of the expected value premium

The expected HML return is on average 6.1% per annum from 1945 to 2005.

4.1.1. Point estimates

From the first two rows of all panels in Table 1, the value strategies earn reliably positive average returns. The average return of the one-way-sorted p5-1 is 4.8% per annum (t-statistic $= 2.78$) in the 1945–2005 full

Table 1

Descriptive statistics for realized returns, realized dividend growth, expected long-run dividend growth, expected dividend price ratio, and expected returns for value and growth portfolios, all in real terms (1945–2005)

This table reports the sample averages of the realized return, $\overline{R_{t+1}}$, the realized dividend growth, $\overline{g_{t+1}}$, the expected long-run dividend growth, $\overline{\mathrm{E}_t[Ag_{t+1}]}$, the expected dividend price ratio, $\overline{\mathrm{E}_t[D_{t+1}/P_t]}$, and the expected return, $\overline{\mathrm{E}_t[R_{t+1}]}$ for various value and growth portfolios. All the series are adjusted for inflation. The t-statistics adjusted for autocorrelations are reported in parentheses below the corresponding sample averages. We report the results for both the full sample from 1945 to 2005 and for the subsample from 1963 to 2005. Panels A and B contain the results for five quintiles sorted on book-to-market. In these two panels, "p5-1" denotes the high-minus-low portfolio constructed from the one-way-sorted book-to-market quintiles. Panels C and D contain the results for six portfolios from a two-by-three sort on size and book-to-market à la Fama and French (1993). These six portfolios are denoted by $(S/L, B/L, S/M, B/M, S/H, B/H)$. For example, portfolio S/L contains stocks in the small size group that are also in the low book-to-market group (30%). Portfolio B/H contains large stocks that are also in the high book-to-market group (30%). HML is defined as $(S/H + B/H)/2 - (S/L + B/L)/2$.

	Panel A: 1945–2005, one-way sort						*Panel B: 1963–2005, one-way sort*					
	Low	2	3	4	High	p5-1	Low	2	3	4	High	p5-1
$\overline{R_{t+1}}$	0.076	0.081	0.094	0.108	0.123	0.048	0.061	0.065	0.085	0.112	0.114	0.052
	(3.47)	(4.61)	(6.59)	(6.43)	(6.65)	(2.78)	(2.30)	(3.14)	(5.46)	(5.62)	(5.51)	(2.33)
$\overline{g_{t+1}}$	0.031	0.034	0.033	0.037	0.064	0.032	0.033	0.033	0.034	0.046	0.064	0.031
	(1.72)	(1.90)	(2.33)	(2.30)	(2.88)	(1.31)	(1.30)	(1.36)	(1.73)	(2.47)	(2.13)	(0.92)
$\overline{\mathrm{E}_t[Ag_{t+1}]}$	0.030	0.032	0.032	0.037	0.057	0.027	0.034	0.035	0.032	0.037	0.058	0.024
	(7.03)	(9.84)	(18.59)	(32.25)	(23.88)	(11.18)	(11.14)	(16.03)	(13.02)	(24.86)	(19.31)	(8.05)
$\overline{\mathrm{E}_t[D_{t+1}/P_t]}$	0.029	0.039	0.045	0.051	0.051	0.022	0.022	0.032	0.040	0.048	0.049	0.026
	(5.48)	(7.38)	(10.38)	(12.45)	(12.90)	(7.34)	(12.04)	(11.01)	(9.75)	(8.49)	(9.70)	(7.82)
$\overline{\mathrm{E}_t[R_{t+1}]}$	0.060	0.071	0.077	0.088	0.108	0.049	0.056	0.067	0.072	0.085	0.107	0.051
	(15.23)	(17.70)	(21.53)	(18.24)	(28.37)	(31.99)	(12.60)	(15.43)	(36.75)	(13.59)	(25.58)	(51.41)

	Panel C: 1945–2005, two-way sort							*Panel D: 1963–2005, two-way sort*						
	S/L	B/L	S/M	B/M	S/H	B/H	HML	S/L	B/L	S/M	B/M	S/H	B/H	HML
$\overline{R_{t+1}}$	0.086	0.078	0.124	0.085	0.151	0.117	0.052	0.076	0.063	0.123	0.075	0.154	0.108	0.062
	(3.04)	(3.37)	(4.80)	(4.47)	(5.46)	(4.99)	(4.06)	(2.27)	(2.28)	(4.23)	(3.65)	(4.97)	(4.91)	(4.01)
$\overline{g_{t+1}}$	0.021	0.027	0.055	0.018	0.103	0.044	0.050	0.020	0.024	0.065	0.016	0.105	0.045	0.053
	(0.82)	(1.39)	(2.62)	(1.25)	(3.49)	(2.28)	(1.88)	(0.61)	(0.91)	(2.35)	(0.86)	(3.16)	(1.82)	(1.56)
$\overline{\mathrm{E}_t[Ag_{t+1}]}$	0.021	0.024	0.055	0.015	0.094	0.039	0.044	0.023	0.028	0.059	0.013	0.097	0.039	0.042
	(7.88)	(8.44)	(17.48)	(8.86)	(18.74)	(80.75)	(27.36)	(7.56)	(8.69)	(19.76)	(7.50)	(15.26)	(48.02)	(19.33)
$\overline{\mathrm{E}_t[D_{t+1}/P_t]}$	0.027	0.031	0.038	0.045	0.038	0.054	0.017	0.017	0.024	0.029	0.041	0.033	0.052	0.022
	(4.42)	(7.74)	(7.02)	(11.24)	(8.43)	(12.07)	(4.50)	(6.33)	(12.75)	(8.71)	(9.77)	(7.23)	(8.96)	(6.50)
$\overline{\mathrm{E}_t[R_{t+1}]}$	0.048	0.056	0.093	0.060	0.132	0.093	0.061	0.040	0.052	0.089	0.054	0.130	0.091	0.064
	(10.00)	(15.12)	(21.63)	(13.47)	(78.41)	(18.44)	(16.75)	(16.47)	(12.76)	(35.26)	(15.49)	(62.60)	(13.85)	(32.03)

sample and 5.2% (t-statistic = 2.33) in the 1963–2005 subsample. (The t-statistics are adjusted for autocorrelations of up to six lags.) The variable HML has an average return of 5.2% per annum in the full sample and 6.2% in the subsample, with t-statistics both above four.

The expected value premium is reliably positive. From the seventh and eighth rows in all panels of Table 1, the average expected dividend price ratio is higher for value firms than for growth firms. Because the expected long-run dividend growth and the expected dividend price ratio are both higher for value portfolios, their expected returns are higher than the expected returns of growth portfolios. The expected return of p5-1 is 4.9% per annum in the full sample and 5.1% in the subsample. And the expected HML return is 6.1% per annum in the full sample and 6.4% in the subsample. All the expected return estimates have t-statistics higher than those of the average realized returns, suggesting that expected returns are more precisely estimated than average returns.

It is worth noting that the expected returns of the individual portfolios are generally lower than their average realized returns (except for quintile two in the subsample). Fama and French (2002) report a similar discrepancy between expected returns and average returns for the market portfolio and argue that average returns are a lot higher than expected. We reinforce their conclusion by showing that it also holds for size and book-to-market portfolios. However, both p5-1 and HML have expected returns close to their average returns. This evidence suggests that the difference between expected returns and average returns is similar in magnitude across value and growth portfolios.

Table 1 shows that an important source of the expected value premium is the expected long-run dividend growth, Ag_{t+1}. From the one-way sort, the expected long-run dividend growth accounts for about one-half of the average expected p5-1 return in both samples. The average long-run dividend growth of HML is 4.4% per annum in the full sample and 4.2% in the subsample, contributing more than 65% of the expected HML return in their respective samples.

4.1.2. Dividend growth rates

Given the importance of long-run dividend growth, we present detailed evidence on dividend growth rates. From rows three and four in all panels of Table 1, the one-year-ahead real dividend growth rates, g_{t+1}, for value portfolios are higher on average than those of growth portfolios, but the differences are often insignificant. For example, the real dividend growth rate of portfolio p5-1 is on average 3.2% per annum in the full sample (t-statistic = 1.31). Controlling for size increases the average growth rate further to 5% for HML (t-statistic = 1.88).

Panels A and B of Fig. 1 plot the real dividend growth rates for value and growth portfolios from 1945 to 2005. In both one-way and two-way sorts, the real dividend growth rates of the value portfolios are frequently

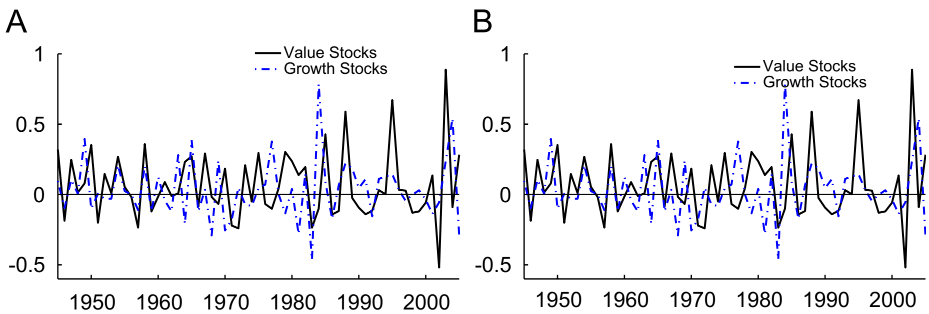

Fig. 1. Time-series of annual realized real dividend growth rates for value and growth portfolios (1945–2005). Panels A and B plot the calendar time evolution of annual realized real dividend growth rates for value and growth portfolios, one-way-sorted (Panel A) and two-way-sorted (Panel B). We construct value and growth portfolios using a one-way sort on book-to-market (to form five quintiles) and a double, two-by-three sort on size and book-to-market (to form six portfolios à la Fama and French (1993). We construct dividend price ratios as $D_{t,t+1}/P_t = (R_{t,t+1} - R^X_{t,t+1})(\mathrm{CPI}_t/\mathrm{CPI}_{t+1})$, where $R_{t,t+1}$ and $R^X_{t,t+1}$ are the nominal value-weighted portfolio returns with and without dividends, respectively, over the period from time t to $t+1$ for portfolios formed at time t. CPI_t is the consumer price index at time t. We measure the real dividend growth rates as $g_{t+1} = [(D_{t,t+1}/P_t)/(D_{t-1,t}/P_{t-1})](R^X_{t-1,t}+1)(\mathrm{CPI}_{t-1}/\mathrm{CPI}_t) - 1$, where $D_{t,t+1}$ is the dividends paid over the period from time t to $t+1$ by the firms in the portfolio formed at time t.

higher than those of the growth portfolios. The dividend growth rates are also volatile. From 1945 to 2005, the volatilities of the dividend growth rates for the value and growth quintiles are 24.03% and 20.81% per annum, close to the volatilities of their stock returns, 21.15% and 18.24%, respectively. For the two-way sorts, the volatilities of the dividend growth rates for the value and growth portfolios are 18.40% and 17.76%, again close to the volatilities of their stock returns, 21.05% and 19.15%, respectively. The high volatilities of dividend growth rates are likely driven by the high volatilities of the reinvested capital gains and by the changes in portfolio composition from annual rebalancing.[4]

Our evidence that value portfolios have higher dividend growth rates than growth portfolios does not contradict the conventional wisdom that growth firms have more growth options and grow faster than value firms.[5] When the portfolios are rebalanced annually, the firms in the growth portfolio next year are not the same as the firms in the portfolio this year. With different sets of firms, there is no particular reason to expect the dividend growth of growth portfolios to be higher than that of value portfolios. More important, higher dividend growth rates of value portfolios from year t to $t+1$ come from higher reinvested capital gains from year $t-1$ to t, which means more dollars to invest at t. Our definition of dividend growth rates captures the reinvested capital gains. The dividend growth rates of value portfolios will be lower without reinvesting these capital gains.

4.2. Dynamics for the expected value premium

Unlike the equity premium, the expected value premium has been stable over the last half century.

4.2.1. Trend dynamics

From Panel A of Fig. 2, the expected HML return is positive throughout our sample.[6] From Panel B, the expected long-run dividend growth for HML declines somewhat from the mid-1940s to the early 1980s, but increases thereafter. The expected dividend price ratio displays the opposite long-term movements. Because of the opposite movements, there is no noticeable long-term trend in the expected HML return. To isolate its cyclical component from the low-frequency component, we use the Hodrick and Prescott (1997, HP hereafter) filter. From Panel C, there is no downward trend in the low-frequency component of the expected HML return.

In untabulated results, we use the ten-year moving averages of realized HML returns as another measure of the slow-moving component of the value premium. This experiment is valid because the expected and the average HML returns are close (see Table 1). The ten-year moving average HML return has been quite stable, although it declines from around 6% per annum in the early 1990s to about 1% in 1999. This evidence confirms Schwert's (2003) observation that the magnitude of the value premium has declined over the 1990s. Schwert's sample stops at May 2002, however. The ten-year moving average HML return spikes upward to around 5% in the last few years.

4.2.2. Cyclical dynamics

The expected value premium is weakly countercyclical.

Panel D of Fig. 2 plots the HP-filtered cyclical component of the expected HML return along with a recession dummy. We treat a given year as a recession year if it has at least five recession months according to the National Bureau of Economic Research (NBER). From Panel D, the expected HML return peaks in most of the recessions in the sample.

We also examine the lead–lag correlations between the expected value premium and a list of business cycle indicators. The list of cyclical indicators includes an NBER recession dummy, the default premium, real investment growth, and real consumption growth. The data for the latter three indicators are from the Federal

[4]We thank the referee for making this important point.

[5]Bodie, Kane, and Marcus (2008, p. 116) describe the conventional wisdom: "[G]rowth stocks have high ratios, suggesting that investors in these firms must believe that the firm will experience rapid growth to justify the prices at which the stocks sell."

[6]Using the one-way-sorted portfolio returns yields largely similar results (not reported).

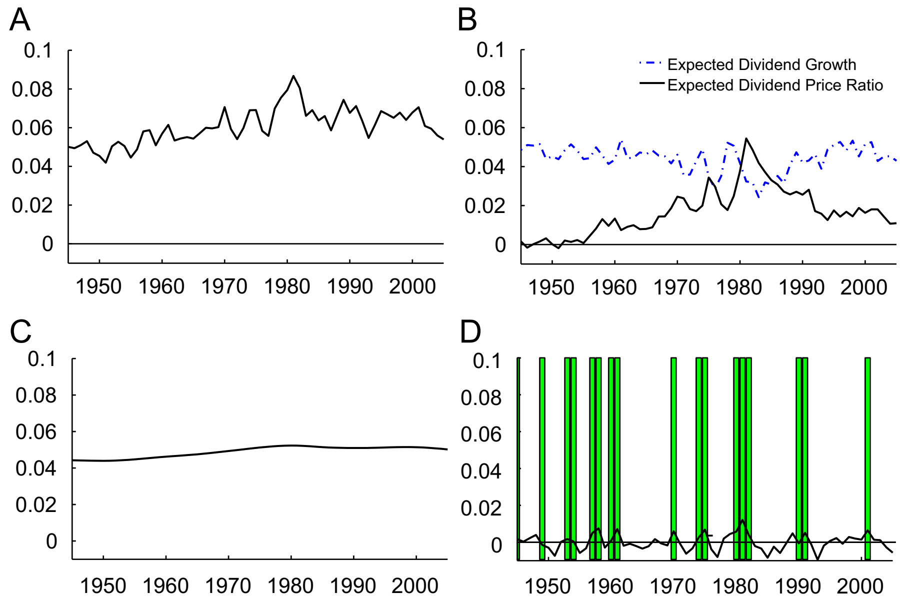

Fig. 2. Time-series plots of the expected return, expected long-run dividend growth, and expected dividend price ratio for *HML* and the trend and cyclical components of the expected *HML* return (1945–2005). We plot the times series of the expected return (Panel A) and its two components including the expected long-run dividend growth and the expected dividend price ratio (Panel B) for the *HML* portfolio. We also plot HP-filtered trend (Panel C) and cyclical components (Panel D) of the expected *HML* return. In Panel D, the shadowed rectangles represent the NBER recession dummy that takes the value of one in recessions and zero otherwise.

Reserve Bank of St. Louis. The default premium and the recession dummy are countercyclical, whereas the real consumption and investment growth are procyclical.

From Table 2, the expected value premium correlates negatively with the procyclical variables and positively with the countercyclical variables. The contemporaneous correlations of the expected *HML* return with real investment growth and real consumption growth are -0.27 and -0.48 (p-values testing zero correlations $= 0.04$ and 0.00), respectively. The contemporaneous correlations of the expected *HML* return with the default premium and the recession dummy are 0.38 and 0.60 (p-values $= 0.00$), respectively. Other lead-lag correlations follow largely similar patterns, but have smaller magnitudes. The evidence is similar for the post-1963 sample.

To evaluate the economic significance of the cyclical behavior of the expected value premium, we adopt a more formal VAR framework. The VAR contains one cyclical indicator and the expected *HML* return. Using the expected p5-1 return yields quantitatively similar results (not reported). We use two cyclical variables separately in the VAR: real investment growth and real consumption growth. The lag in the VAR is one, based on the Akaike information criterion.

The VAR specification for real investment growth, for example, is given by

$$\begin{bmatrix} g_{t+1}^{\mathrm{INV}} \\ X_t \end{bmatrix} = A \begin{bmatrix} g_t^{\mathrm{INV}} \\ X_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{t+1}^{g} \\ \varepsilon_t^{X} \end{bmatrix}, \tag{7}$$

where g_{t+1}^{INV} denotes the real investment growth from time t to $t+1$, and X_t is the expected *HML* return measured at the beginning of t. The timing in Eq. (7) allows shocks to contemporaneous real investment growth, g_t^{INV}, to impact the expected value premium at time t. The shocks also can affect the future expected value premium because of the autocorrelations of the variables in the system. The VAR system thus can help us gauge the magnitude of the impulse response of the expected value premium in the event of macroeconomic shocks.

The coefficients on real investment growth and real consumption growth in the expected *HML* return equation in the VAR are all significantly negative (untabulated). Fig. 3 plots the impulse response functions

Table 2
Lead-lag correlations between the expected *HML* return and business cycle indicators (1945–2005)

This table reports lead-lag correlations of the time series of the expected *HML* return with business cycle indicators. The list of cyclical indicators includes real investment growth (g^{INV}), real consumption growth (g^{CON}), default premium (DEF), and a recession dummy (Cycle). The row of numbers beneath each panel title indicates the number of leads and lags for the value premium. For example, the column below "−4" reports the correlations between the four-period-lag value premium and the current-period cyclical indicators, and the column below "4" reports the correlations between the four-period-lead value premium and the current-period cyclical indicators. Panel A reports the results for the full 1945–2005 sample, and Panel B reports the results for the 1963–2005 subsample. *p*-values testing zero correlations are reported in parentheses below the corresponding correlations.

	−4	−3	−2	−1	0	1	2	3	4
Panel A: 1945–2005									
g^{INV}	−0.10	0.26	0.21	−0.03	−0.27	−0.15	0.33	0.08	−0.03
	(0.45)	(0.04)	(0.11)	(0.85)	(0.04)	(0.27)	(0.01)	(0.54)	(0.82)
g^{CON}	0.03	0.19	0.18	−0.09	−0.48	−0.28	0.27	0.24	0.02
	(0.81)	(0.15)	(0.18)	(0.49)	(0.00)	(0.03)	(0.04)	(0.07)	(0.90)
DEF	0.04	−0.10	0.02	0.28	0.38	0.24	−0.24	−0.31	−0.05
	(0.74)	(0.45)	(0.91)	(0.03)	(0.00)	(0.06)	(0.07)	(0.02)	(0.70)
Cycle	−0.15	−0.14	−0.03	0.26	0.60	0.20	−0.41	−0.22	0.02
	(0.27)	(0.31)	(0.81)	(0.05)	(0.00)	(0.12)	(0.00)	(0.10)	(0.86)
Panel B: 1963–2005									
g^{INV}	0.00	0.37	0.18	−0.23	−0.51	−0.30	0.36	0.30	0.12
	(0.98)	(0.02)	(0.26)	(0.13)	(0.00)	(0.06)	(0.02)	(0.06)	(0.45)
g^{CON}	0.17	0.28	0.14	−0.24	−0.59	−0.41	0.23	0.39	0.08
	(0.28)	(0.07)	(0.38)	(0.12)	(0.00)	(0.01)	(0.15)	(0.01)	(0.63)
DEF	0.04	−0.15	0.04	0.38	0.46	0.25	−0.27	−0.40	−0.16
	(0.79)	(0.35)	(0.81)	(0.01)	(0.00)	(0.11)	(0.08)	(0.01)	(0.33)
Cycle	−0.21	−0.16	0.08	0.34	0.63	0.29	−0.38	−0.50	−0.17
	(0.17)	(0.32)	(0.60)	(0.03)	(0.00)	(0.06)	(0.02)	(0.00)	(0.30)

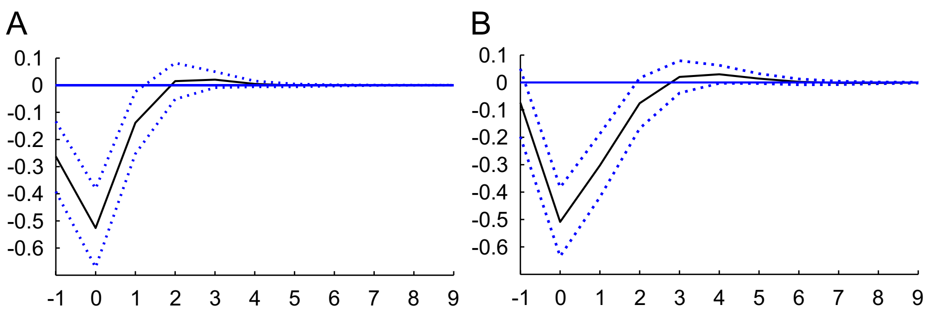

Fig. 3. Impulse response functions for the expected *HML* return in response to a positive one-standard deviation shock to real investment growth and to real consumption growth (1945–2005). This figure plots the impulse response functions (the solid lines) for the expected *HML* return in the presence of a positive one-standard deviation shock to real investment growth (Panel A) and to real consumption growth (Panel B). We also plot the two-standard error bands (the dotted lines). The lag in the VAR is one, based on the Akaike information criterion. The VAR specification for the real investment growth is: $\begin{bmatrix} g_{t+1}^{\mathrm{INV}} \\ X_t \end{bmatrix} = A\begin{bmatrix} g_t^{\mathrm{INV}} \\ X_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{t+1}^{g} \\ \varepsilon_t^{X} \end{bmatrix}$, where g_{t+1}^{INV} denotes the real investment growth from time t to $t+1$ and X_t is the expected *HML* return measured at the beginning of time t. The VAR specification allows shocks to real investment growth, g_t^{INV}, to impact the contemporaneous expected *HML* return. The shocks also affect future expected *HML* returns because of the autocorrelations of the variables. The VAR specification with the real consumption growth is similarly defined.

implied from the estimated VARs. From Panel A, a positive, one-standard deviation shock to real investment growth reduces the expected *HML* return by around 0.50% per annum. Panel B reports similar results using real consumption growth. The magnitude of the response is low relative to the magnitude of the expected value premium.

5. Interpretation

The new evidence presented in this paper adds to our understanding of the driving forces behind the value premium. Three different explanations coexist in the current literature. The first story says that the value premium results from rational variations of expected returns (e.g., Fama and French, 1993, 1996). The second story says that investor sentiment causes the high premium for value stocks (e.g., De Bondt and Thaler, 1985; Lakonishok, Shleifer, and Vishny, 1994). The third story argues that the value premium results spuriously from sample selection bias (e.g., Kothari, Shanken, and Sloan, 1995) and data snooping bias (e.g., MacKinlay, 1995; Conrad, Cooper, and Kaul, 2003).

The value premium is reliably positive ex-ante. This evidence lends support to Fama and French (1998) and Davis, Fama, and French (2000), who argue that the value premium is real and unlikely to be driven by statistical biases. This view is further buttressed by our evidence that the expected value premium has been stable over the last half century. While largely consistent with Schwert (2003), this evidence suggests that the low profitability of value strategies in the 1990s is more likely to reflect cyclical movements rather than permanent downward shifts in the expected value premium.

Our evidence does not rule out the mispricing story of De Bondt and Thaler (1985) and Lakonishok, Shleifer, and Vishny (1994). Our estimated dividend growth rates capture reinvested capital gains that can reflect the underpricing of value stocks and the overpricing of growth stocks.

The evidence that the expected value premium is countercyclical lends support to the view that value is riskier than growth in bad times when the price of risk is high (e.g., Jagannathan and Wang, 1996; Lettau and Ludvigson, 2001b; Zhang, 2005). However, the magnitude of the negative response in the expected HML return to a positive, one-standard deviation shock to real consumption growth is only about 0.50% per annum. This magnitude is less than one-tenth of the total magnitude of the expected value premium. This evidence lends support to Lewellen and Nagel (2006), who argue that the role of conditioning information in driving the value premium is limited and that unconditional drivers are potentially more important (e.g., Fama and French, 1993, 1996).

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