Pontifícia Universidade Católica
do Rio de Janeiro

Kaian Arantes Oliveira

Value Premium and Growth Expectations

Dissertação de Mestrado

Thesis presented to the Programa de Pós–graduação em Economia da PUC-Rio in partial fulfillment of the requirements for the degree of Mestre em Economia .

Advisor: Prof. Ruy Monteiro Ribeiro

Rio de Janeiro
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Abstract

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Value stocks tend to have higher returns on average. Their performance is particularly stronger when the value spread, defined by differences in B/M ratios, between value and growth stocks is wider. In this paper, we show that this predictability becomes even stronger when we account for the spread in growth, measured by short-term expectations, long-term expectations, and past growth. We use analyst expectations on individual firm´s earnings to construct a range of proxies for earnings growth expectations. We find that adding the growth spread greatly increases the predictive power also in out-of-sample tests.

Keywords

Return Predictability; Growth Expectations; Value Spread;

Resumo

Oliveira, Kaian Arantes; Ribeiro, Ruy Monteiro. **Prêmio de Valor e Expectativas de Crescimento**. Rio de Janeiro, 2019. 43p. Dissertação de Mestrado – Departamento de Economia, Pontifícia Universidade Católica do Rio de Janeiro.

As ações de valor tendem a ter retornos mais altos, em média. Seu desempenho é particularmente mais forte quando o spread de valor, definido pelas diferenças nos índices B/M, entre ações de valor e crescimento é maior. Neste artigo, mostramos que essa previsibilidade se torna ainda mais forte quando contabilizamos o spread no crescimento, medido pelas expectativas de curto prazo, expectativas de longo prazo e crescimento passado. Utilizamos as expectativas dos analistas com relação ao lucro de cada empresa para construir uma série de proxies para as expectativas de crescimento de lucros. Concluímos que adicionar a razão de crescimento aumenta muito o poder preditivo também em testes fora da amostra.

Palavras-chave

Previsibilidade de Retorno; Expectativa de Crescimento; Razão de Valor;

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1
Introduction

The value premium is one of the most studied patterns in the asset pricing literature since the work of Basu (1977). This pattern has been popularized with its inclusion as one of the factors in Fama and French (1993) model. At the same time, a long literature has searched for explanations based on both rational (e.g., Petkova and Zhang (2005),Fama and French (2006) and Fama and French (1995)) and behavioral (e.g., Lakonishok et al. (1994), Daniel et al. (1998) and others) arguments for this pattern. Also, value strategies has been one of the core strategies in the financial industry for decades Graham et al. (1934). For the same reason, the pattern in returns is also widely researched by practitioners in search of profitable strategies (Kao and Shumaker (1999), Wang (2005) , Arnott et al. (1992)).

Many papers have also studied whether the return in value-based strategies is predictable by the spread in valuations and also the spreads in growth or profitability. In the case of growth or profitability spreads, existing research has considered both forward-looking measures using analysts expectations or past balance sheet numbers. Cohen et al. (2003) show that the expected return on a value strategy is higher at times when the value spread is higher (measured as the spread in the log book-to-market ratio between value and growth stocks). Vuolteenaho (1999) show that the expected return on the value strategy could be explained by the value spread and the spread in past Return on Equity (RoE). Asness et al. (2000)[1] uses IBES analyst's estimates for long-term operation profit growth as a proxy for expected earnings growth and a composite measure of several valuation ratios to proxy for value. They find that both value and earnings growth spreads were important indicators to forecast future returns, in-sample, of a value strategy.

In this paper, we revisit the relation between the value premium and its predictability by value and growth spreads, considering a range of measures for growth spreads. We also consider the possibility that short-term and long-term analysts forecasts are biased and may extrapolate past growth. We analyze in-sample and out-of-sample forecasting tests that account for the persistence

[1]Using Gordon growth model Asness et al. (2000) argue that the expected return of a value strategy can be approximately represented as $E(R_{value} - R_{growth}) = (E/P_{value} - E/P_{growth}) - (g_{growth} - g_{value})$.

of predictors. In addition, we consider value strategies that incorporate the information on all measures of growth spreads, using double-sorted portfolios. If growth spreads can help us forecast the future performance of standard value strategies, it may also be useful in the cross-section when building value strategies that also use information on the cross-sectional difference in growth expectations or past growth. We also consider the relation to factors based on profitability measures.

Even though the results from the literature points out to great importance of the expected growth to predict returns and also to its huge influence on the changes of valuation ratio (Vuolteenaho (2002)). Overall, the main articles in the literature do not give due importance to growth expectations, with RoE being the most used proxy for future profitability despite some controversial evidence of its usefulness. Fama and French (1995) find that RoE could be a misguiding measure for future growth as they found that the growth portfolio has a drop on its average RoE during the 5-years following the period of portfolio formation, while the opposite happens for value portfolios. These facts raise some questions such as: Aren't analysts' forecasts of firm-level growth better proxies for the unobserved expected growth rather than past RoE? What is its contribution in forecasting the value premium? Do analysts' expectations accurately predict the realized growth or there exists a degree of extrapolation?

First, our results show that value return becomes more predictable when we consider analysts' expectations rather than past profitability variables. RoE has its in-sample significance subsumed in a multivariate predictive regression by our forward-looking growth spread measures. When it remains significant, it adds marginal improvement when explaining the variation in expected returns for value portfolios. Second, when combined with value spread, our growth spread measures help to explain 15.4%-60.7% of the in-sample variation on the 1-year to 5-year cumulative value-weight returns on the HML portfolio. Countering one of the main critics of the predictability literature this result is also supported by a good performance out-of-sample, having for some windows almost 30% of the out-of-sample R^2 when predicting annual value-weight return of the HML portfolio. Third, we find little, if any, evidence of extrapolation of past growth by analysts expectations, but we support the already known idea of overoptimistic expectations from analysts regarding the long term growth.

The remainder of this paper is organized as follows. In Section I we present a discussion on the literature of the return's source of the value premium and . Section II describes the data and variables. In Section III we present empirical findings, showing the results in-sample, out-of-sample.

Section IV we discuss the implications for the predictability of earnings growth. Section V concludes.

1.1 Understanding the value strategy

Fama and French (1993) and others (e.g., Petkova and Zhang (2005),Lettau and Wachter (2007)) argue in favor a risk-based explanation for the existence of the value premium, in other words, basically they argue that value stocks have higher betas on the HML factor, meaning that the extra returns come from bearing more risk. Contributing with this view Asness et al. (2013)[2] show that value premium is observed across assets and markets around the world, the authors find evidence suggesting a common global risk factor which value premium compensates for bearing it. Zhang (2005) presents a model with a neoclassical framework, rational expectations and competitive equilibrium and show that the value premium arises in this setup due to higher reversibility cost (higher costs in cutting than in expanding capital) and countercyclical price of risk of the value stock.

Countering the risk-based explanation Lakonishok et al. (1994) argue that the source of return has its explanation due to mispricing and behavioral bias. They find evidence in favor of what they call extrapolation, as agents tend to be overoptimistic about the future and tend to extrapolate good growth results in the past believing they will be repeated in the future. Therefore, their results indicates that the growth expectation are more linked to a biased adaptive model than a rational one. In addition, these authors question whether stock are fundamentally riskier and find no evidence of a risk based explanation.

The value strategy it is a natural way to exploit the value premium and consists in buying the value stock and, shorting the growth stock. Several valuation ratio have been used in the literature as proxy for value (e.g. E/P , S/P , C/P..) but in this article we will focus on the Book-to-Market ratio (BE/ME) to be consistent with a vast literature that use value spread as a predictor of the value minus growth portfolio return. The intuition to use the valuation spread as predictor comes from Gordon (1962) constant growth model, which states that (for some assumptions): $E(R) = D/P + E(g)$, so the expected return of a stock will depend on its valuation ratio and dividend growth. There is a lot of discussion on the difficult to use dividends data due to its potentially instability[3], so Vuolteenaho (1999) provide an alternative

[2] They also disentangle the relationship between value and momentum, finding an strong comovement of this two premiums across assets and markets.

[3] Da et al. (2014),Miller and Modigliani (1961)

identity that equates B/M with an infinite discounted sum of future stock returns and returns on book to equity.

Using the Vuoltenaho's idea, Cohen et al. (2003) developed an approach which an variance decomposition are used to motivate a forecasting model. If the book-to-market satisfy some conditions we have : $\theta_{t-1} = \sum_{j=0}^{\infty} \rho^j r_{t+j} + \sum_{j=0}^{\infty} \rho^j(-e_{t+j}) + \sum_{j=0}^{\infty} \rho^j \kappa_{t+j}$ [4] and after some steps we can motivate the following predictive regression:

$$R_t^{HML} = a + b(\theta_{t-1}^H - \theta_{t-1}^L) + c(e_{t-1}^H - e_{t-1}^L) + \epsilon_t \quad (1\text{-}1)$$

So the expected return on the value strategy should be explained by an proxy for value and another for expected growth. Thus equation (1-1) indicates that a high expected return can be a result of a wide value spread or growth spread, meaning that the value stocks are cheaper than usual or its expected growth are higher than usual, both relative to growth stocks. This can elucidate why it's possible to observe low or negative returns on value strategy even in periods of a wide value spread, showing that rely only on valuation ratio to forecast return could give us a misleading result.

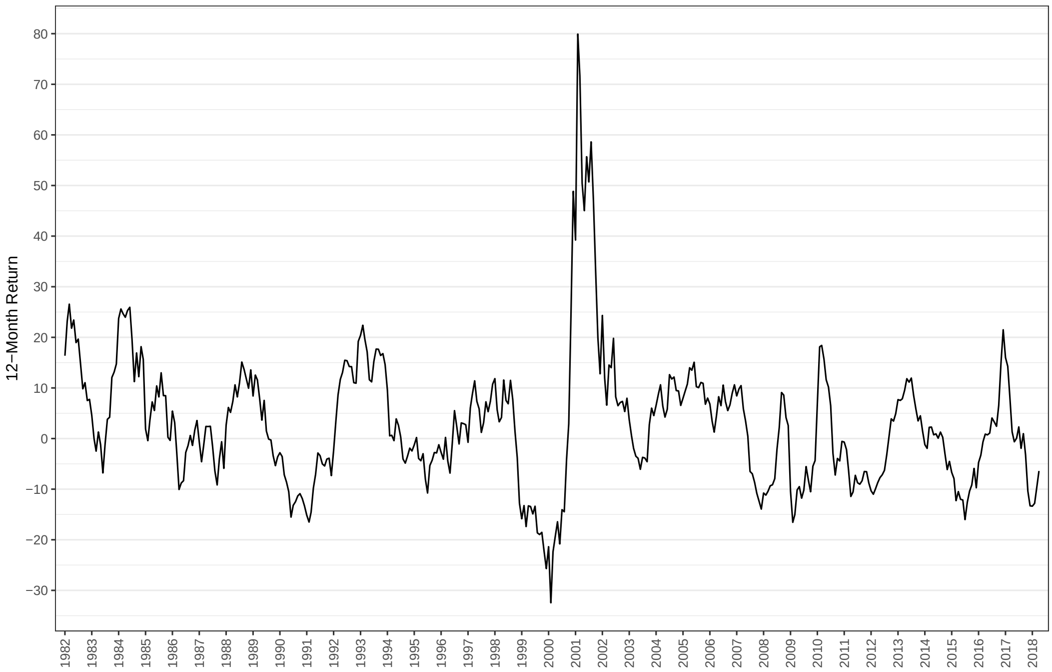


Figure 1.1: The graph show the rolling 12-month return portfolio of the value strategy based on the 3x2 sort from Fama and French (1993) where we buy the Value portfolio which is formed by Big and Small size stocks with High B/M and sell the Growth portfolio formed by Big and Small stocks with Low B/M

The value strategy are far from being riskless and it can be seen on the

[4]Where $\theta = log\frac{BE_t}{ME_t}$, $e_t = log(1 + \frac{\Delta BE_t + D_t}{BE_{t-1}}), r_t = log(1 + \frac{\Delta ME_t + D_t}{ME_{t-1}}) and \{\kappa, \rho\}$ are parameters

Figure 1.1, which presents the rolling 12-months of the return on the value minus growth portfolio from Jan-1982 to Dec-2017. The strategy presented several periods of negative returns but overall the average return of HML portfolio was 3.1% during our sample period. So a better understanding about the relationship between expected return, value and growth spread is important and could act as a risk reducer, possible increasing the profitability of the value strategy. The intuition developed above indicates that a high value spread can be offset by a high growth differential. Although the value stock is very cheap in relation to growth, we may have a growth differential balancing the upside on expected returns and, depending how sizeable it is, it could lead to a negative expected return.

2
Data

All our stock data come from merging three different databases. The Center for Research in Security Prices (CRSP) provide us monthly stock data containing price, returns and shares outstanding. From the Compustat, we extract all the necessary annual accounting information. Lastly, we use analyst earnings forecasts from IBES by Thompson Reuters. We consider stocks trading on NYSE, Amex and Nasdaq.

Our sample covers the period from Jan-1982 to Dec-2017. IBES data starts in 1976 with analyst earnings forecasts for shorter horizons of 1 up to 3 fiscal years. Since 1982, IBES also started collecting long-term growth estimates. We use the median of the analyst forecasts to alleviate possible biases from a very optimistic or pessimist analyst. For months without updated estimates, we use the last available but only up to six months' delay.

Usually, the analysts expectations are updated monthly , so as time passes the estimate can become more accurate and possibly biasing the estimate as the horizon of forecast become shorter. To handle with this problem we construct a measure of 12-month forward such as Li et al. (2013), so the forecasted earnings 12m ahead are $FE_{12m} = FE1 * \alpha + FE2 * (1 - \alpha)$ where α is the difference in months of the current period and the fiscal period end divided by 12; FE1 and FE2 are the forecasted earnings for the next first and second fiscal period. We also construct an 24-month forward measure in a way that $FE_{24m} = FE1 * \gamma + 0.5 * FE2 + FE3(1 - \gamma)$, where γ is the difference in months of the current period and the year-end divided by 24, if FE3 is missing we calculate it as $FE3 = FE2 * (FE2/FE1)$ [1]. The Long Term Growth estimate, which generally represents an expected annual increase in operating earnings over the firm's next full business cycle (3-5 years), is used to proxy for longer expected earnings growth. With these inputs, we construct the proxy for expected growth in several ways.

Using data from Compustat we construct the Book Equity as the stockholders' equity (seq) plus balance sheet deferred taxes and investment tax credits (txditc or txdb + itcb) minus the book value of preferred stocks

[1] In order to deal with possible data errors we restrict the forecasted earnings per share to be on a range [-1000,1000]

(pstkrv or pstkl or pstk). If shareholders' equity is not available we use common/ordinary total equity plus total Preferred stock capital (ceq + pstk) or total assets minus total liabilities (at - lt), following these order of preference. With the CRSP data, we calculate the Market Equity. We only use stocks that have BE>0 and last year BE >0 and BE/ME>0.1 [2]. All prices and shares outstanding used for the calculation of the Market Cap. are adjusted for stock's split.

We construct our book-to-market ratio in three manners. In the first method we follow Fama and French (1993). We calculate BE/ME as the book common equity for the fiscal year ending calendar year *t-1*, divided by the market equity at December of year *t-1*. Second, we use the market equity measured in May of year t as in Cohen et al. (2003). As we work with a monthly time series we also allow the market equity to vary monthly.

For the construction of the portfolios, we also follow the Fama and French methodology and create 6 value-weight portfolios formed on size and book-to-market. In June of each year t we form the portfolio and keep track of the post-sort return until May of year *t+1*. The HML (high minus low) return are the value-weighted of: $R^{HML} = (Small.High + Big.High)/2 - (Small.Low + Big.Low)/2$. One can argue that we could simply use the original Fama and French factors but due to the use of IBES data, we don't have the analyst estimates for all the stocks on NYSE/Amex/Nasdaq. To test our factor construction procedure we replicate the 3-FF factors using our sample and calculate the correlation between our factors. Even having different stocks samples we find that 98-99% of correlation with the original factors.

2.1 Predictive Variables

2.1.1 Value Spread

The Value Spread is defined as the log book-to-market of value stocks minus that of growth stocks. First, we compute the BE/ME of the value portfolio as the value-weighted BE/ME of the small and big stocks with high BE/ME, for the Growth portfolio we use the small and big stocks with low BE/ME. After computing the aggregated value weight we then apply log to differentiate. Although we use the Fama and French method for construction of the portfolios we use the three different BE/ME measures cited to construct our Value Spread. The BE/ME with ME truncated in December *t-1*, which we

[2] We use this restriction in to avoid likely data errors as in Cohen et al. (2003)

call *FF Values Spread*, with ME truncated in May we have *CPV Value Spread* and another with ME of the current end month *Current Value Spread*[3]. We test the predictive power of all Value spreads on the value-weight HML portfolio return. Even though we test all the value spreads we only report the results *Current* and *FF*, but the results for *CPV* can be found on the appendix.

2.1.2
Growth Spread

Most of the literature relies on the return on equity as a proxy for expected earnings and the main intuition is that this profitability measure is quite persistent, meaning that it could be a good predictor for future profitability. Although it seems reasonable at first glance, results from Fama and French (1995) show that following 5 years from formation period of 3x2 size-BE/ME portfolios the low-BE/ME ones present, on average, a decreasing RoE and the high-BM has an increase. This result implies that possibly by using past profitability we would be making a mistake in as the extrapolation in Lakonishok et al. (1994).

As our base case, we construct RoE as the earnings divided by last year's book equity. Then using the analyst expectations from IBES we construct several proxies for earnings growth. With the estimates for 12- and 24-months forward earnings per share and an measure of the expected long term growth we construct the following proxies for growth expectations:

– Expected RoE=$(EPs12M_t * shares_t)/Book.equity$: it is a measure of expected RoE, where we scale the expected earnings by the book equity of last fiscal year.

– Expected Growth=$(EPs12M_t/Eps_t) - 1$: measure of growth where we compute the Forecasted Earnings per share scaled by the earnings per share.

– Expected Long Term Growth= $(LongTermGrowth_t)$:it is a measure of expected annual increase in operating earnings over the company's next full business cycle (between next 3-5 years).

With all these inputs our growth spread is then calculated in a similar way to the value spread. [4].

[3]The intuition to use the market capitalization from the current month comes from Asness and Frazzini (2013)

[4]The only difference is that we now use the logarithm of 1 plus the variable. This procedure was also used in Cohen et al. (2003) in order to avoid portfolios with negative earnings, which makes it impossible to use logarithm.

2.2 Descriptive statistics

Panel A of Table 2.1 presents the summary statistics for the time series of the value and growth spreads. In our sample, the value stocks were cheaper than the growth stocks 1.5 times on average. As expected the mean of all the growth spread variables are negative, suggesting that on average growth stocks were expected to have larger earnings growth in comparison with value. The expected growth spread is always negative in all the periods, meaning that even in the economic downturns the value stocks had a lower earnings growth than the growth stocks.

Table 2.1: Summary statics for Value and Growth spread
The table reports the summary statistics for Value and Growth spreads constructed in a value-weight and equally-weight manner.

Panel A : Value-weighted measures							
	Mean	Std. Dev.	Max	Min	5%	50%	95%
Value Spread FF	1.50	0.22	2.20	1.05	1.23	1.46	1.95
Value Spread Current	1.46	0.22	2.20	1.01	1.16	1.43	1.86
Value Spread CPV	1.46	0.21	2.18	1.03	1.18	1.43	1.83
RoE Spread	-0.16	0.08	-0.07	-0.50	-0.34	-0.15	-0.09
Expected RoE Spread	-0.19	0.06	-0.05	-0.33	-0.29	-0.19	-0.09
Expected Growth Spread	-0.05	0.31	1.23	-0.77	-0.46	-0.06	0.54
Expecte E/P Spread	-0.41	0.43	0.53	-1.34	-1.17	-0.37	0.21
LT Growth Spread	-0.05	0.02	0.02	-0.09	-0.08	-0.06	-0.02
Panel B : Equally-weighted							
	Mean	Std. Dev.	Max	Min	5%	50%	95%
Value Spread FF	1.55	0.22	2.18	1.05	1.21	1.51	1.97
Value Spread Current	1.48	0.23	2.18	0.69	1.15	1.44	1.89
Value Spread CPV	1.49	0.20	2.05	0.84	1.15	1.45	1.83
RoE Spread	-0.05	0.09	0.29	-0.20	-0.15	-0.07	0.12
Expected RoE Spread	-0.11	0.17	0.63	-0.59	-0.35	-0.13	0.15
Expected Growth Spread	-0.18	0.21	0.50	-0.63	-0.48	-0.21	0.19
Expected E/P Spread	-0.36	0.38	0.40	-2.76	-0.96	-0.33	0.18
LT Growth Spread	-0.07	0.02	-0.02	-0.11	-0.09	-0.07	-0.03

The change from 12-month forward expected earnings per share to 24 months did not make big changes to the variables. In the most of the case, the difference between the variables was meaningless. This result it is also supported by the correlation between the variables, for example, the expected RoE 12- and 24-month have 99.2% correlation and expected earnings to price 95.2%. Due to this in Section III we present the results using 12-month ahead analyst expectations and the results for 24-month will not be shown. Panel B presented the equally-weight statistics, in summary, all the variables remained almost equal, having no substantial difference.

Figure 2.1 shows the time-series variation of the current value spread and other two growth spread constructed from the analyst expectations, the horizontal line represents its mean and the shaded area are times when the forward 3-year return of the value strategy is negative.

One important thing is the huge break on long term growth and expected RoE series around the year 1999-2001 occur due to the "dot-com" bubble. The chart also shows the main results from Cohen et al. (2003) that the expected value premium is atypically high when the value spread is high - but we also add to this statement that the growth spread plays an important role too. For example from 1994 to late 1995 the value spread is very close to its average value, but growth spread has a big drop and the 1-year forward return of the value strategy was negative possible meaning the dominance of the growth expectation in this period.

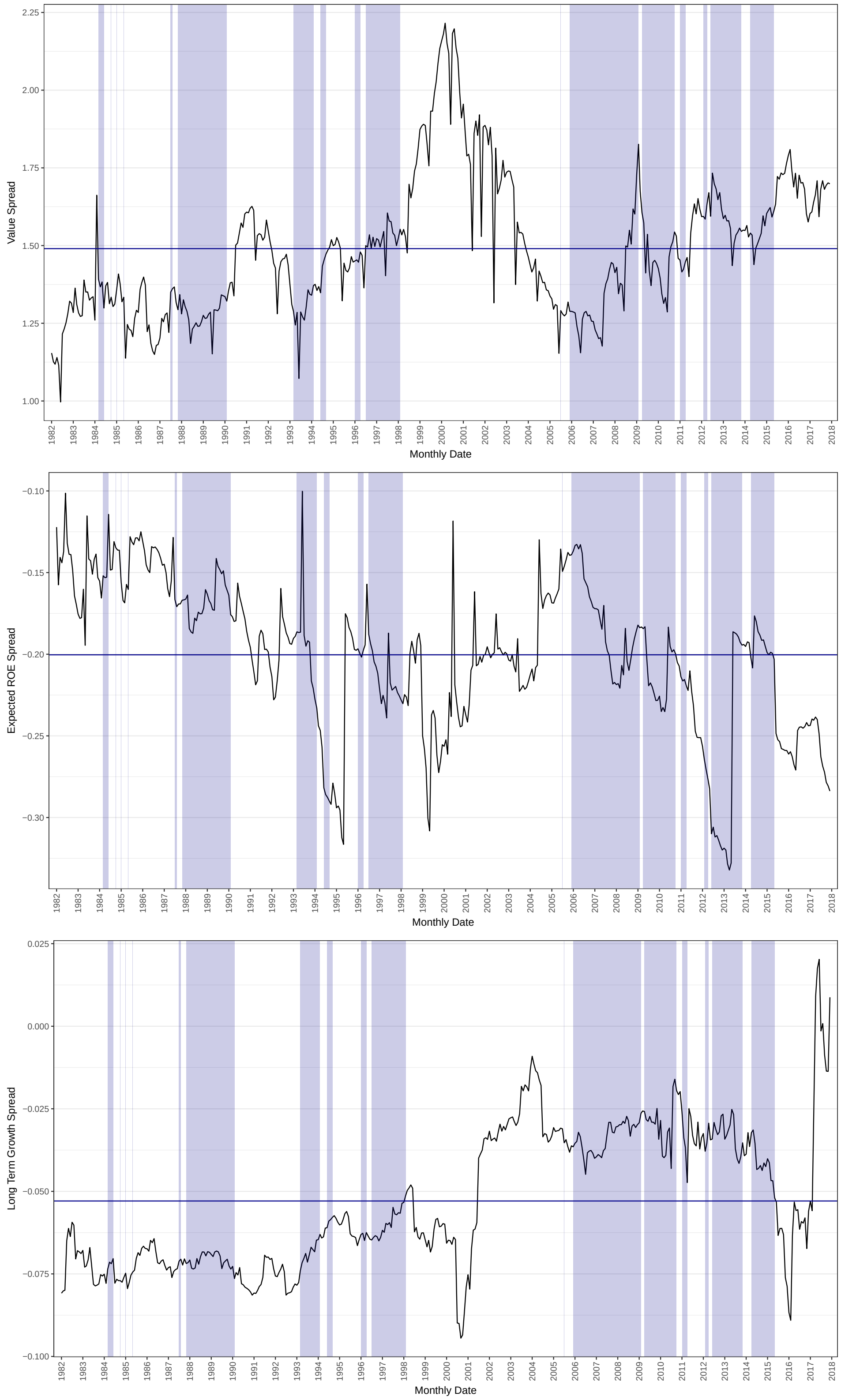


Figure 2.1: The chart shows the time series dynamics for Current Value Spread, Expected RoE and Expected Long Term Growth Spread respectively. Shaded areas represent periods of negative 3-year cumulative HML portfolio returns

3
Empirical Results

3.1
In-sample results

In this part we run a multi-period predictive regression defined as :

$$R^{HML}_{t+1\to t+h} = a + b_1 ValueSpread_t + \mathbf{B}GrowthSpread_t + \epsilon_{t+k} \qquad (3\text{-}1)$$

Where $ValueSpread_t$={FF Value Spread, CPV Value spread, Current Value Spread}; $GrowthSpread$ ={RoE Spread, Expected RoE Spread, Expected Growth and Long Term Growth } and $\mathbf{B}$ is a vector of betas as we allow more than one growth variable.

We compound the returns for $h = 12, 24, 36, 60, 120$ or in other words we try to predict the next 1, 2 ,3 ,5 and 10 years of cumulative return. Then $R^{HML}_{t+1\to t+k}$ is the compounded monthly return on the value-weight HML portfolio.

One of the main criticism regarding the predictability literature is the possibility of in-sample data mining, so to deal with this problem we do a bootstrap procedure(Kelly and Pruitt (2013), Welch and Goyal (2007)). For each of our predictive variables, we calculate the mean, standard deviation and autocorrelation coefficient and simulate 1000 AR(1) series matching these "moments". Then for each simulated series, we estimate (3-1) in-sample and also calculate the out-of-sample R^2. This procedure allows us to see if these random predictive variable, which should be orthogonal to returns, better predicts HML portfolio return than our value and growth spreads. So with all the results, we report the p-value for the coefficients, in-sample and out-of-sample R^2 calculated using the distribution of the simulated data. The use of these test statistics gives robustness to our results and eliminates any concern of possible data mining.

3.1.1
Value spread

First, we will test only the value spread as a predictor to further confirm the relationship already stated by the literature and visualized in Figure 2.1.

In other words, we would expect that higher value spreads are associated with higher expected returns, implying a positive coefficient on our univariate regression.

Table 3.1: HML portfolio univariate return predictability, Jan-1982 to Dec-2017.
The table reports the OLS regressions predicting the HML portfolio returns. The monthly returns of the HML portfolio are formed using Fama and French (1993) methodology. The value spread is defined as the difference of the log book-to-market of value stocks(high BE/ME) minus log of growth stocks (low BE/ME) and the book-to-market are formed using ME from December *t-1* (FF) and the respective monthly ME (Current). The standard errors are adjusted using Newey and West (1987) correction with the respective lag. Besides this, we also present an alternative test statistic obtained from the comparison against our simulated data. All the returns are cumulative monthly returns and annualized.

	Value Spread FF						Value Spread Current					
	Constant	Value Spread	p(NW)	p(Sim)	R^2	p-value	Constant	Value Spread	p(NW)	p(Sim)	R^2	p-value
1-year	-0.219	0.161	0.148	0.033	0.072	0.048	-0.255	0.189	0.140	0.011	0.101	0.013
	(0.161)	(0.111)					(0.182)	(0.128)				
2-year	-0.181	0.138*	0.095	0.050	0.105	0.061	-0.244*	0.183**	0.033	0.004	0.190	0.005
	(0.120)	(0.082)					(0.126)	(0.086)				
3-year	-0.158**	0.120**	0.028	0.035	0.165	0.031	-0.201**	0.152***	0.010	0.003	0.265	0.005
	(0.080)	(0.055)					(0.086)	(0.059)				
4-year	-0.159**	0.120**	0.011	0.01	0.258	0.01	-0.195***	0.148***	0.002	0.003	0.387	0.002
	(0.069)	(0.047)					(0.068)	(0.046)				
5-year	-0.159**	0.121***	0.007	0.007	0.293	0.008	-0.191***	0.145***	0.001	0.001	0.425	<0.001
	(0.064)	(0.045)					(0.063)	(0.043)				
10-year	-0.037**	0.039***	<0.001	0.133	0.130	0.134	-0.057***	0.054***	<0.001	0.0265	0.250	0.029
	(0.017)	(0.011)					(0.018)	(0.010)				

Table 3.1 report results for the predictive regression of the value spread (FF and Current) on HML portfolio return. Our results confirm those found in the literature, basically, it supports the idea of high-value premium when the value spread is high. The value spread explain almost 10% of the variation in sample of the HML return, which is in line with results obtained in Cohen et al. (2003) and Zhang (2005), in-sample R^2 of 8.8% and 10.8% respectively. For mid/long horizons as 2-5 years we see a monotone increase in the R^2 and a big drop for 10-year, probably to change in the relationship of the variables through time. Table 3.1 also shows that using the Newey and West (1987) standard errors the coefficients are not significant at 5% for the 1-year horizon, but the p-value calculated from the simulated data present different results and show that for all horizons the value spread is significant. Even having similar summary statistics - shown in Table 2.1 - the FF and Current value spread have distinct results with great superiority of the Current measure, meaning that when we update the market capitalization on the book-to-market ratio it helps to improve the predictive power of value spread.

3.1.2
Value and Growth spread

The previous results confirmed what was already found in the literature, now we want to test whether growth spread also plays a fundamental role in explaining the expected return of the value strategy. We combine in a multivariate regression both value and growth spread, using the several measures we constructed. We also want to test if the variables constructed from the expectations of the analysts present superior results when compared to the RoE, which is usually the variable used as a proxy for earnings growth. From the derivation done initially, we should expect a positive coefficient for the growth spread, implying that such as an observed for the value spread an increase in the growth spread should also be observed in periods of higher value premium .

Table 3.2: HML portfolio bivariate return predictability, Jan-1982 to Dec-2017.
The table reports the OLS regressions of the value and the growth spread predicting the Fama French HML portfolio returns. The value spread is defined as the difference of the log book-to-market of value stocks(high BE/ME) minus log of growth stocks (low BE/ME) and the book-to-market are formed using ME from the respective monthly (Current). The growth spread is formed in several ways using log 1 plus proxy for the growth of value portfolio minus log 1 plus proxy for the expected growth of growth portfolio. RoE is calculated as the earnings divided by the last years BE. All the expected measures use the analyst's expectations from IBES, the Expected RoE and Expected Growth use the 12m-forward expected earnings divided by last years BE and earnings of year t, respectively. The long term growth is the annual growth expected for the stocks' operating profit over the next business cycle (the period between 3-5 years). The standard errors are adjusted using Newey and West (1987) correction with the respective lag. Besides this, we also present an alternative test statistic obtained from the comparison against our simulated data All the returns are cumulative monthly returns and annualized.

	Y= 1 Year cumulative return								
	Constant	Value Spread Currrent	p(NW)	p(Sim)	Growth Spread	p(NW)	p(Sim)	Adjusted R^2	p-value
RoE	-0.251	0.228*	0.086	0.007	0.346**	0.045	0.098	0.140	0.002
	(0.165)	(0.132)			(0.172)				
Expected Roe	-0.245	0.300*	0.051	0.001	0.874**	0.024	0.057	0.154	<0.001
	(0.164)	(0.153)			(0.384)				
Expected Growth	-0.255	0.188	0.141	0.016	-0.018	0.536	0.724	0.098	0.002
	(0.182)	(0.128)			(0.029)				
Expected LT Growth	-0.355*	0.201*	0.096	0.006	-1.529*	0.059	0.017	0.150	<0.001
	(0.200)	(0.121)			(0.809)				

Table 3.2 shows the predictability regression result for the 1-year cumulative HML portfolio. The results confirm the initial intuition that the growth spread would play a fundamental role in explaining the return variation. RoE and Expected RoE are both significant at 5% and have positive coefficients, indicating that an increase in these variables is associated with periods of higher expected return. Expected Growth presented no significance and seems to not be a good predictor of the Value Premium. Expected Long Term Growth is significant at 10% but it has a negative sign which could indicate the possibility of extrapolation Lakonishok et al. (1994), and we investigate it further in session IV. Comparing with the last Table 3.1, we see that the introduction of the expected RoE , RoE and Expected Long Term Growth increase the adjusted R^2, meaning that these variables helped explain the time variation in

the HML return[1].

Table 3.3: HML portfolio bivariate return predictability, Jan-1982 to Dec-2017.
The table reports the OLS regressions of the value and the growth spread predicting the HML portfolio returns. The monthly returns of the HML portfolio follow Fama and French (1993) methodology. The value spread is defined as the difference of the log book-to-market of value stocks(high BE/ME) minus log of growth stocks (low BE/ME) and the book-to-market are formed using ME from the respective monthly (Current). The growth spread is formed in several ways using log 1 plus the variable of value portfolio minus log 1 plus the variable of a growth portfolio. RoE is calculated as the earnings divided by the last years BE. The Expected RoE is the 12m-forward expected earnings divided by last year's BE. The long term growth is the annual growth expected for the stocks' operating profit over the next business cycle (the period between 3-5 years). The standard errors are adjusted using Newey and West (1987) correction with the respective lag. Besides this, we also present an alternative test statistic obtained from the comparison against our simulated data. All the returns are cumulative monthly returns and annualized.

	Constant	Value Spread Currrent	p(NW)	p(Sim)	Growth Spread	p(NW)	p(Sim)	Adjusted R^2	p-value
Panel A: RoE									
2-year	-0.240**	0.213***	0.007	<0.001	0.273**	0.027	0.101	0.242	<0.001
	(0.106)	(0.079)			(0.123)				
3-year	-0.200***	0.181***	<0.001	0.003	0.242***	0.001	0.047	0.347	<0.001
	(0.068)	(0.048)			(0.070)				
4-year	-0.192***	0.171***	<0.001	<0.001	0.229***	<0.001	0.087	0.454	<0.001
	(0.055)	(0.036)			(0.063)				
5-year	-0.187***	0.168***	<0.001	<0.001	0.224***	0.004	0.068	0.497	<0.001
	(0.049)	(0.035)			(0.078)				
Panel B: Expected RoE									
2-year	-0.233**	0.273***	0.002	<0.001	0.728***	0.001	0.036	0.268	<0.001
	(0.109)	(0.088)			(0.218)				
3-year	-0.191***	0.214***	<0.001	<0.001	0.515***	0.001	0.075	0.345	<0.001
	(0.073)	(0.051)			(0.1340)				
4-year	-0.187***	0.201***	<0.001	<0.001	0.447***	<0.001	0.03	0.482	<0.001
	(0.054)	(0.036)			(0.109)				
5-year	-0.181***	0.207***	<0.001	<0.001	0.515***	<0.001	0.011	0.566	<0.001
	(0.046)	(0.030)			(0.081)				
Panel C : Long Term Expected Growth									
2-year	0.326***	0.192***	0.009	0.003	-1.268**	0.048	0.017	0.260	<0.001
	(0.120)	(0.073)			(0.641)				
3-year	-0.271***	0.163***	<0.001	0.001	-1.024**	0.047	0.035	0.359	<0.001
	(0.073)	(0.044)			(0.513)				
4-year	-0.262***	0.157***	<0.001	<0.001	-0.986***	0.007	0.015	0.524	<0.001
	(0.047)	(0.031)			(0.361)				
5-year	-0.264***	0.155***	<0.001	<0.001	-1.078***	<0.001	0.005	0.607	<0.001
	(0.040)	(0.027)			(0.265)				

Repeating what we did in Table 3.2, we also test the predictive power of value and growth spread together for long horizons. Because we deal with short- and long-term expected variables, it is worth to understanding how the forecasting dynamics of these variables work when we vary the forecast horizon.

The Table 3.3 shows that all variables add information when compared to previous univariate regressions. We have, for example, an increase R^2 from

[1]From now on we will focus only on the variables that have shown significant and results for Expected Growth will be presented in the appendix.

19% to 26.8% with the inclusion of the expected RoE when predicting 2-year cumulative returns. Panel A presents forecasting results using RoE as growth spread. The adjusted R^2 range from 24.2% to 49.7% for 2-5 years and all significant. Panel B reports the results for expected RoE and its results are slightly better than those from RoE, having R^2 ranging from 26.8% to 56.6% for 2-5 years and also all coefficients significant. Panel C shows that Expected Long Term Growth greatly improves the R^2 in-sample when compared with the use o values spread alone, it also shows the coefficients are all significant at 5

In general, all variables have similar results, with some having greater R^2 depending on the forecasted horizon. This result leads us to question whether there are any of them that are more or less relevant or if there is some synergy between them. Intuitively we would think that the Expected RoE should be more informative on the short horizons while the expected long term growth would bring information about longer horizons. Another point to be tested is whether RoE would still is a forecast-relevant variable when confronted with the other two growth spreads.

Thus, Table 3.4 presents the results of the multivariate regression with 2 or more growth spreads for the horizons of 1,3 and 5 years of cumulative returns. It shows that the significance of the expected RoE is independent of the horizon or the presence of another growth spread, which demonstrates certain robustness of the variable. RoE and Expected Long Term growth appear to influence directly each other, so for longer horizons, RoE loses significance whereas for smaller horizons we have both become non-significant or only the expected long term not being significant.

Table 3.4: HML portfolio multivariate return predictability, Jan-1982 to Dec-2017. The table reports the OLS regressions of the value and the growth spread predicting the HML portfolio returns. The monthly returns of the HML portfolio are formed using Fama and French (1993) methodology. The value spread is defined as the difference of the log book-to-market of value stocks(high BE/ME)minus log of growth stocks (low BE/ME) and the book-to-market are formed using ME from the respective monthly (Current). The growth spread is formed in several ways using log 1 plus the variable of value portfolio minus log 1 plus the variable of growth portfolio. RoE is calculated as the earnings divided by the last years BE. The Expected RoE is the 12m-forward expected earnings divided by last year's BE. The long term growth is the annual growth expected for the stocks' operating profit over the next business cycle (the period between 3-5 years). The standard errors are adjusted using Newey and West(1987) correction with the respective lag. Besides this, we also present an alternative test statistic obtained from the comparison against our simulated data. All the returns are cumulative monthly returns and annualized

Panel A : 1 Year Cumulative Return

	Constant	Value Spread Currrent	p(NW)	p(Sim)	RoE	p(NW)	p(Sim)	Expec. RoE	p(NW)	p(Sim)	Expec. LT Growth	p(NW)	p(Sim)	Adjusted R^2	p-value
(1)	-0.243	0.316**	0.034	0.002	0.282*	0.081	0.179	0.760**	0.033	0.089				0.180	<0.001
	(0.153)	(0.149)			(0.161)			(0.356)							
(2)	-0.327*	0.222*	0.081	0.004	0.214	0.164	0.362				-1.136	0.139	0.038	0.161	<0.001
	(0.182)	(0.127)			(0.154)						(0.767)				
(3)	-0.328*	0.290**	0.039	0.002				0.720**	0.043	0.131	-1.233	0.103	0.016	0.186	<0.001
	(0.180)	(0.140)						(0.355)			(0.755)				
(4)	-0.305*	0.303**	0.034	<0.001	0.182	0.248	0.401	0.687**	0.049	0.131	-0.913	0.211	0.064	0.193	<0.001
	(0.166)	(0.143)			(0.157)			(0.349)			(0.729)				

Panel B : 3 Year Cumulative Return

	Constant	Value Spread Currrent	p(NW)	p(Sim)	RoE	p(NW)	p(Sim)	Expec. RoE	p(NW)	p(Sim)	Expec. LT Growth	p(NW)	p(Sim)	Adjusted R^2	p-value
(1)	-0.192***	0.226***	<0.001	<0.001	0.200***	<0.001	0.11	0.423***	<0.001	0.114				0.400	<0.001
	(0.062)	(0.041)			(0.057)			(0.101)							
(2)	-0.251***	0.178***	<0.001	<0.001	0.155***	0.01	0.277				-0.734	0.167	0.086	0.385	<0.001
	(0.063)	(0.042)			(0.060)						(0.531)				
(3)	-0.251***	0.209***	<0.001	0.002				0.400***	<0.001	0.165	-0.838*	0.073	0.045	0.405	<0.001
	(0.067)	(0.040)						(0.109)			(0.466)				
(4)	-0.235***	0.218***	<0.001	<0.001	0.134**	0.024	0.315	0.371***	<0.001	0.179	-0.600	0.234	0.101	0.424	<0.001
	(0.061)	(0.039)			(0.059)			(0.097)			(0.504)				

Panel C :5 Year Cumulative Return

	Constant	Value Spread Currrent	p(NW)	p(Sim)	Growth Spread	p(NW)	p(Sim)	Expec. RoE	p(NW)	p(Sim)	Expec. LT Growth	p(NW)	p(Sim)	Adjusted R^2	p-value
(1)	-0.180***	0.213***	<0.001	<0.001	0.140**	0.022	0.206	0.442***	<0.001	0.019				0.591	<0.001
	(0.040)	(0.028)			(0.061)			(0.092)							
(2)	-0.258***	0.159***	<0.001	<0.001	0.045	0.517	0.742				-1.003***	<0.001	0.008	0.609	<0.001
	(0.035)	(0.029)			(0.070)						(0.250)				
(3)	-0.244***	0.200***	<0.001	<0.001				0.388***	<0.001	0.031	-0.890***	<0.01	0.004	0.683	<0.001
	(0.033)	(0.023)						(0.087)			(0.194)				
(4)	-0.245***	0.199***	<0.001	<0.001	-0.013	0.827	0.929	0.392***	<0.001	0.022	-0.909***	<0.001	0.002	0.682	<0.001
	(0.030)	(0.025)			(0.059)			(0.083)			(0.213)				

3.2 Out-of-sample results

One of the major criticisms about the predictability literature is due to the possibility of data snooping. Welch and Goyal (2007) demonstrated that several predictors that were significant in-sample have poor out-of-sample results and with lower R^2 than forecasts based on historical averages. Thus to further test the predictive variables we estimate the regression (3-1) using data up to $t = k$ and calculate the fitted value for observation $k + 1$. We repeat this procedure up to $t = T - 1$, then calculate R^2 out-of-sample as follows:

$$R^2_{oos} = 1 - \frac{\sum_{i=k}^{T-1}(r_{i+1} - \hat{r}_{t+1})^2}{\sum_{i=k}^{T-1}(r_{i+1} - \bar{r}_{t+1})^2}$$

Table 3.5 reports the OOS R2 for a series of initial windows. It is clear that, with rare exceptions, the inclusion of the growth spread improves predictability outside the sample. This result confirms one of the initial hypotheses that the growth spread would play a key role in predicting the return on value strategy. It also shows that depending on the initial window a growth spread has better predictability out-of-sample, meaning the predictability becomes better or worse through time.

Table 3.5: Out-of-sample results.
The table reports the out-of-sample R2 of the OLS forecast for 1-year HML returns portfolio from Jan-1982 to Dec-2017. The predictor variables are the value spread and several growth spreads that had significance in-sample. Our out-of-sample procedure splits the sample into different periods, using windows until T and recursively forecast returns from T+1 until the end of the sample. We calculate the significance of our R^2 out-of-sample using simulated data as described in section III.

	Panel A : R^2 Out of Sample				
	1 year cumulative return				
Spreads	Value Spread Current	V. Spread and Expec ROE	V. Spread and LT Growth	V. Spread,Expec ROE and LT Growth	V. Spread and ROE
Window					
T=150	0.073**	0.140***	0.133***	0.174***	0.096***
T=200	0.098***	0.157***	0.121***	0.165***	0.143***
T=250	0.021*	0.075***	-0.200	-0.150	0.171***
T=300	0.052**	0.108***	0.303***	0.254***	0.249***
T=350	-0.136	-0.253	0.117**	-0.105	0.163***
T=400	-0.140	0.082**	-0.033	0.190***	-0.126

There are criticisms regarding the selection of estimation windows, in a way that it can be crucial to whether or not to get a good out-of-sample R^2. To shield us from this type of criticism, the figure below shows $R^2$for all possible initial windows, giving robustness to the results found.

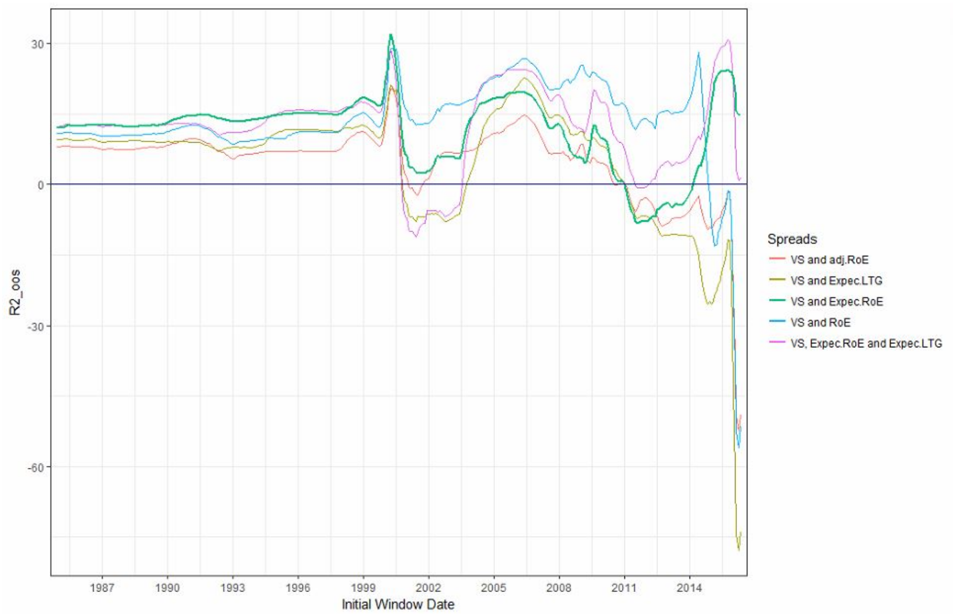


Figure 3.1: The graph shows all the R^2 out-of-sample for all window stock split for the following variables: (1) Value spread and adjusted RoE (no adding 1 to log of variable), (2) Value Spread and Expected Long Term Growth, (3) Value spread and Expected RoE, (4) Value Spread ad RoE and Value Spread, (5) Expected Roe and Expected Long Term Growth.

The above chart shows that for most of the windows the R^2 out-of-sample are positive when combining the value and growth spread variables. [2] . In summary, all the variables presented a positive R^2 most of the time suffering only around the 2000 bubble and the financial crises in 2008. All our findings points out to the robustness of our out-of-sample results.

3.3 Portfolios sorted on growth spread

If the growth spread actually predicts higher expected return, as our results have so far pointed out, we should expect portfolios that are ordered based on this ratio, in addition to the standard HML, should reflect higher returns. To test this hypothesis we, after creating the 3x2 size-value, select only stocks that are in the top 50th percentile for growth expectation, ie our new portfolios will buy *Big.High.HighEarnings* and *Small.High.HighEarnings* stocks and sell *Big.Low.LowEarnings* and *Small.Low.LowEarnings*.

Table 3.6: Portfolio profitability
The table shows the monthly average return annualized and Sharpe ratio of several portfolios for the period from Jan-1982 to Dec-2017. The monthly returns of the HML portfolio are formed using Fama and French (1993) methodology. Additionally to the 3x2 size-value portfolio we also do one more step sorting on the growth spread and selecting the top 50th percentile stock's for Expected RoE, RoE and Long Term Growth spreads. Then we buy the *Big.High.HighEarnings* and *Small.High.HighEarnings* stocks and sell *Big.Low.LowEarnings* and *Small.Low.LowEarnings*. The returns and the Sharpe ratio are annualized.

Sorts	Average Return	Sharpe Ratio
HML	2.6%	0.202
+ Expected RoE	4.8%	0.316
+ RoE	4.5%	0.257
+ Long Term Growth	1.8%	0.189

As foreseen, the Table 3.6 shows that portfolios with additional ordering in RoE and Expected RoE have a monthly annualized average return greater than HML portfolio, with 4.8% and 4.5% respectively. Also as pointed out by the in-sample results, a negative relationship is found between long term growth and realized returns, so that portfolios that buy stocks with high expectations of future growth and sell low ones have an average return of 1.8%, lower than HML portfolio.

The higher average return is also reflected in a higher Sharpe Ratio, so the portfolio also ordered in Expected RoE has a 56% higher Sharpe than HML and 23% RoE portfolio. This result demonstrates two points: firstly, using a

[2]We construct RoE and Adjusted RoE. The first one its the one used in all the previous regression it is calculated adding 1 to the variable and then log differentiating, the second we do not add 1. We also do it for our other growth spread variables but the results kept fairly the same.

proxy for growth effectively brings additional profitability to the strategy and secondly, using the expectation of analysts vis-à-vis past accounting data also acts to increase profitability even further.

4
Implication on the predictability of earnings growth

All the results presented so far support our idea of superiority from analysts' expectations when compared to past realized variables as a proxy for expected growth, however only the predictability of returns has been tested yet. So in this section, we investigate how growth expectations are formed and whether they help predict earnings growth so well as they predict returns. To do this we carry out a series of tests, first, we test if the operating profit growth of the previous 1-5 years of year t predict, respectively, the expected long term growth and the expected RoE. Thus we want to see if the analysts extrapolate past growth such as found in Lakonishok et al. (1994). After, we test if our growth spread predicts future operating profit growth, testing the accuracy of the analysts' forecasts and its capacity to predict future cash-flow. Finally, using the idea from Fama and French (1995) we test if our expected variables does reflect their realized analogous up to 5 years after all the portfolio formation periods, we do that in order to visualize if on average the analysts are predicting accurately the RoE and the operating profit growth realized of our 3x2 value-size formed portfolios.

Our first test presented in the following 4.1 attempts to see if analysts' long-term growth expectations can be explained by the past values of what they predict. As already mentioned the long-term variable represents an annualized growth of the next 3-5 years of the operating profit, thus our independent variables of the regression are the last 1-5 years of the growth of the operating profit [1]. Table 4.1 basically shows that the past operating profit does not do a good job of explaining the variation of analysts' expectations. Overall, only the coefficient for regression using the previous 1-year growth was significant at 10% while for larger periods all the estimate coefficients were insignificant and the models presented low relevance in terms of R^2. This result does not appear to indicate the presence of extrapolation of past growth into future growth. In non-tabulated results we find that most of the variation in expected long term growth is explained by its lag, being a very persistent variable indicating that

[1]We also used the earnings growth of previous years as independent variables, but different from what happens with the operating profit many portfolios have negative earnings after the aggregation which hinders its use.

Table 4.1: Predicting Expected Long Term Growth of HML portfolio from 1982 to 2017. The dependent variables are the Expected Long Term Growth of the value minus growth portfolio. The operating profit is calculated as Revenue (revt) minus Cost of Goods Sold (cogs) - Interest and Related Expense (xint) minus Selling, General and Administrative Expense (xsga). The past 1 to 5-year operating profit growth(annualized) from the value minus growth portfolio is our independents variables. The Expected Long term Growth variable is constructed using IBES analyst expectations. We report the p-values calculated from the simulated data. All the growth measures are annualized.

	y = Expected Long Term Growth					
	Constant	x	p-value	p(Sim)	Adjusted R^2	p-value
x= 1-year past Op. Profit Growth	0.074	0.027*	0.079	0.094	0.061	0.093
	(0.004)	(0.015)				
x= 2-year past Op. Profit Growth	0.074***	0.020	0.216	0.402	0.016	0.395
	(0.004)	(0.016)				
x= 3-year past Op. Profit Growth	0.074***	0.024	0.165	0.483	0.028	0.501
	(0.004)	(0.017)				
x= 4-year past Op. Profit Growth	0.074***	0.030	0.133	0.501	0.038	0.513
	(0.004)	(0.020)				
x= 5-year past Op. Profit Growth	0.074***	0.032	0.159	0.523	0.030	0.505
	(0.004)	(0.022)				

analysts take more into account their own past expectations than past realized values of the operating profit growth.

It is also worth to understand if the analyst's expectations predict cash flow, that is, we reverse the order and we present the expected long term growth as an independent variable and the operating profit growth realized from 1-5 years ahead as the variable to be predicted. Doing that we can test whether, in addition to the good predictability power over returns, analysts' expectations predict cash flow as well.

Unlike the previous Table 4.1, we have that Table 4.2 shows that long-term growth does a good job of predicting future growth. The coefficient is significant at least at 5% for all horizons 1-5 years forward, with an adjusted R^2 ranging from 10 % to 31.3% depending on the year. The spread of the expected long-term growth variable is negative across our sample with an average of -7%, indicating that throughout the period growth stocks were expected to have higher growth than value stocks. Combining this with the magnitude of the coefficient, the result of the table indicates that the analysts are being very optimistic about the future growth in a way that the greater the differential of growth predicted by them, the smaller is being effectively realized. These results support the idea that long-term analysts' expectations

Table 4.2: Predicting Operating Profit Growth of the HML portfolio from 1982 to 2017. The dependent variables are the last 1-5 years ahead of operating profit growth of the portfolios value minus growth. The operating profit is calculated as Revenue (revt) minus Cost of Goods Sold (cogs) - Interest and Related Expense (xint) minus Selling, General and Administrative Expense (xsga). The Expected Long term Growth is our independent variable and is constructed using IBES analyst expectations. We report the p-values calculated from the simulated data. All the growth measures are annualized.

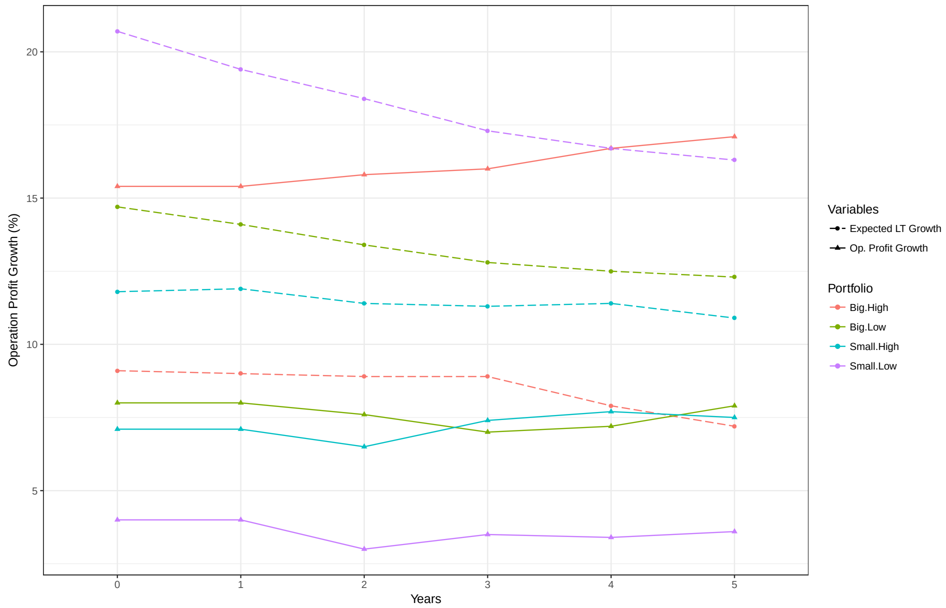
	x= Expected Long Term Growth					
	Constant	Expected LT Growth	p-value	p(Sim)	Adjusted R^2	p-value
y= 1-year ahead Op. Profit Growth	0.343**	4.244**	0.037	0.032	0.100	0.031
	(0.150)	(1.945)				
y= 2-year ahead Op. Profit Growtht	0.362***	4.558***	0.003	0.010	0.235	0.015
	(0.105)	(1.367)				
y= 3-year ahead Op. Profit Growth	0.392***	4.933***	<0.001	<0.001	0.313	0.002
	(0.097)	(1.251)				
y= 4-year ahead Op. Profit Growth	0.360***	4.428***	0.001	0.021	0.298	0.023
	(0.092)	(1.178)				
y= 5-year ahead Op. Profit Growth	0.277**	3.279**	0.018	0.152	0.152	0.177
	(0.103)	(1.297)				

are often overoptimistic, something already documented well in the literature.

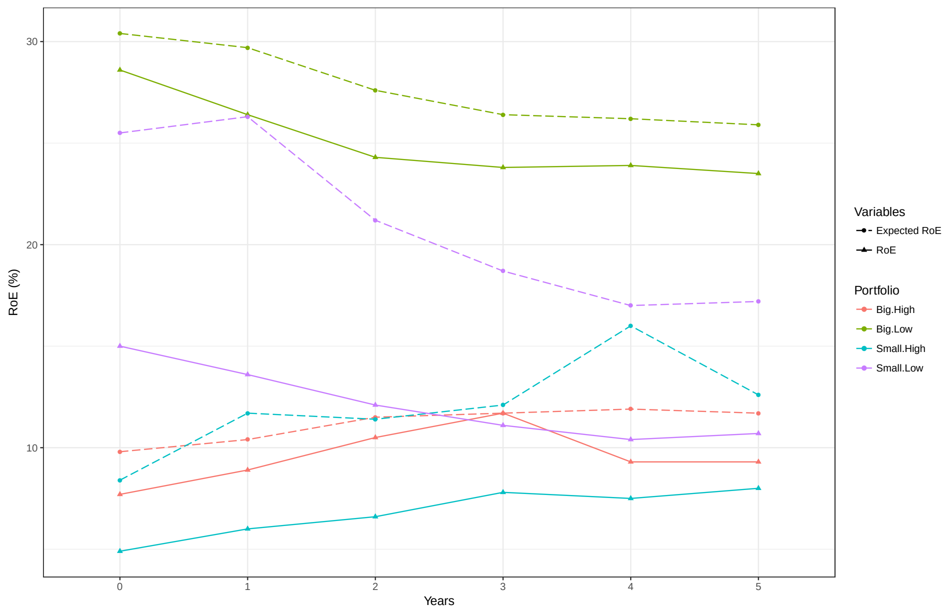
To further confirm the previous result, we performed another test, this time reproducing a, idea from Fama and French (1995). For each portfolio formation date - June of year t- we calculate the expected and realized variables for RoE and operating profit from year 1 through year 5 for the 3x2 value-size portfolios. With these series, we then take the average of the cross-section of each 5 years following the formation periods and compare if the expectations are in line with the realized accountant measure.

The Figure 4.1 presents the results of this procedure, basically, the chart (a) supports what was found in the previous table. They show that for the Small-High, Small-High, and Big-Low portfolios, analysts consistently predict, on average, long-term growth far above what is actually realized. Overall, long-term expectations are always quite biased about the future and are one source of the possible mispricing on the growth stocks. It is interesting to note that for the High-Big portfolio the situation reverses and the long-term growth achieved is consistently higher than predicted by analysts.

Unlike long-term expectations, an analyst's forecast for RoE 12-months ahead is much more accurate. The results also point to an upward trend, something well established, but much less than the overoptimism found over long-term growth. Chart (b) supports the idea that short-term analysts' expectations of earnings growth are a good predictor of earnings. Although it exists, the expected and realized RoE follows a similar dynamic over time.



(a)Operating Profit Growth



(b)Expected ROE

Figure 4.1: The graph (a) show the average expected long term growth and realized operating profit growth and (b) the average expected RoE and realized RoE for 1 to 5 years ahead every portfolio formation period.

Moreover, in both cases, the biggest mistake concerns the Small-Low portfolio, possible to a high growth extrapolation error. In summary, the existence of bias does not inhibit these variables from being used for forecasting; on the contrary, they present excellent results in predicting returns and also help to predict cash flow.

5
Conclusions

Using the intuition of Gordon's present value model with the derivation of Vuolteenaho (1999) it is possible to show that the expected return of the value strategy should be explained by a spread of the valuation ratio plus a spread of the expected growth differential. Thus, in this article, we explore this relationship and evaluate the predictability of the HML portfolio returns using several growth variables, horizons considering both in-sample and out-of-sample. Therefore we find favorable results to the use of growth spread as a predictor of returns mainly using measures of analysts' expectations. Regarding earnings predictability, the results found were somehow ambiguous, although we found that the analysts' long-term expectations seem to be very optimistic since there is a great divergence between the expected and the later realized, it was not possible to establish an extrapolation relation as well as in Lakonishok et al. (1994).

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A
Complementary tables

Table A.1: HML portfolio univariate return predictability, Jan-1982 to Dec-2017.
The table reports the OLS regressions predicting the HML portfolio returns. The monthly returns of the HML portfolio are formed using Fama and French (1993) methodology. The value spread is defined as the difference of the log book-to-market of value stocks(high BE/ME) minus log of growth stocks (low BE/ME) and the book-to-market are formed using ME from May of$t$ (CPV). The standard errors are adjusted using Newey and West (1987) correction with the respective lag. All the returns are cumulative monthly returns and annualized.

	Value Spread CPV			
	Constant	Value Spread	p(NW)	R^2
1-year	-0.232	0.174	0.153	0.070
	(0.172)	(0.122)		
2-year	-0.199	0.153*	0.089	0.109
	(0.129)	(0.090)		
3-year	-0.176**	0.135**	0.030	0.174
	(0.089)	(0.062)		
4-year	-0.183**	0.139***	0.007	0.290
	(0.073)	(0.051)		
5-year	-0.181***	0.138***	0.005	0.323
	(0.068)	(0.048)		
10-year	-0.056***	0.053***	<0.001	0.195
	(0.019)	(0.012)		

Table A.2: HML portfolio bivariate return predictability, Jan-1982 to Dec-2017.The table reports the OLS regressions of the value and the growth spread predicting the HML portfolio returns. The monthly returns of the HML portfolio are formed using Fama and French (1993) methodology. The value spread is defined as the difference of the log book-to-market of value stocks(high BE/ME)minus log of growth stocks (low BE/ME) and the book-to-market are formed using ME from the respective monthly (Current). The growth spread is formed in several ways using log 1 plus the variable of value portfolio minus log 1 plus the variable of growth portfolio. The expected growth and expected E/P use the 12m-forward expected earnings divided by earnings and price in t. The standard errors are adjusted using Newey and West (1987) correction with the respective lag. Besides this, we also present an alternative test statistic obtained from the comparison against our simulated data. All the returns are cumulative monthly returns and annualized.

Panel A: Expected Growth

	Constant	Value Spread Currrent	p(NW)	Growth Spread	p(NW)	Adjusted R^2
1-year	-0.260	0.191	0.146	-0.002	0.872	0.099
	(0.186)	(0.131)		(0.012)		
2-year	-0.255**	0.188**	0.026	-0.014	0.215	0.215
	(0.123)	(0.084)		(0.012)		
3-year	-0.215***	0.161***	0.004	-0.004	0.727	0.298
	(0.081)	(0.055)		(0.012)		
4-year	-0.205***	0.154***	<0.001	-0.001	0.859	0.417
	(0.064)	(0.044)		(0.007)		
5-year	-0.200***	0.151***	<0.001	-0.006*	0.098	0.458
	(0.060)	(0.041)		(0.004)		

Panel B: Expected E/P

	Constant	Value Spread Currrent	p(NW)	Growth Spread	p(NW)	Adjusted R^2
1-year	-0.263	0.197	0.122	0.008	0.844	0.097
	(0.180)	(0.127)		(0.038)		
2-year	-0.235*	0.175*	0.054	-0.007	0.824	0.187
	(0.130)	(0.091)		(0.033)		
3-year	-0.174*	0.127**	0.049	-0.022	0.306	0.278
	(0.091)	(0.064)		(0.022)		
4-year	-0.175**	0.129**	0.014	-0.016	0.404	0.397
	(0.072)	(0.052)		(0.019)		
5-year	-0.172***	0.128***	0.007	-0.015	0.351	0.434
	(0.065)	(0.047)		(0.016)		

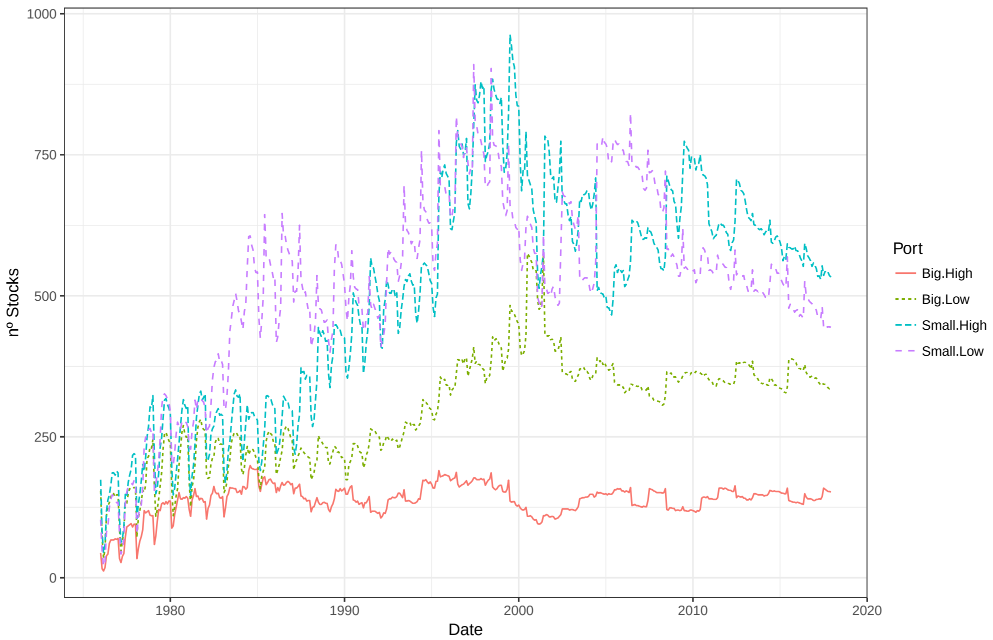

Figure A.1: The chart shows the number of stocks that made up portfolios over time

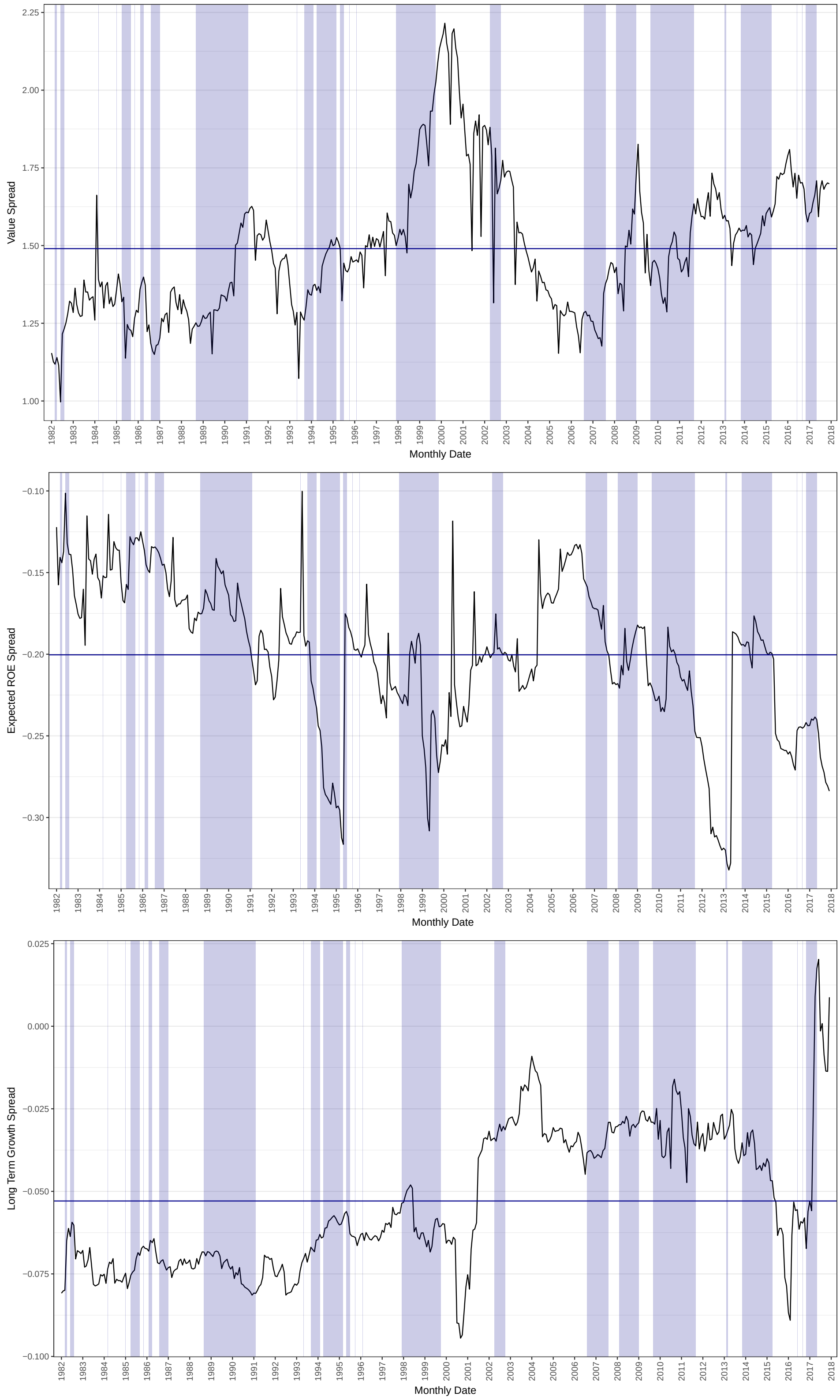

Figure A.2: The chart shows the time series dynamics for Value Spread Current, Expected RoE and Expected Long Term Growth Spread respectively. Shaded areas represent periods of negative 1 year cumulative HML portfolio returns