Value Versus Growth in Dynamic Equity Investing

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Abstract

We develop an expected return measure from a dynamic equity valuation model. We entitle the portion of this measure that is easy to calculate with readily available financial market measures and does not require statistical estimation as *static growth expected return* (*SGER*). We use analysts' earnings forecasts as an *SGER* input to rank firms for portfolio inclusion. We find that portfolios of low *SGER* firms have negative excess returns − negative alphas − in a four factor conditional asset pricing model. The estimated alpha difference between high and low *SGER* portfolios is as great as 0.88% per month. Without generating abnormal returns for investors, we find that analysts make favorable stock recommendations and most optimistically forecast earnings for high *SGER* firms. Consistent with the dynamic model, returns increase with profitability to a greater extent for value compared to growth firms. We find little statistical or economic significance for earnings volatility beyond *SGER* for returns. This observation is consistent with *SGER* as a large portion of expected return from the dynamic model. We conclude that *SGER* on its own is a useful return measure for common share investing.

Keywords: Equity investing, portfolio management, analysts forecasts, stock recommendations.

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Abstract

We develop an expected return measure from a dynamic equity valuation model. We entitle the portion of this measure that is easy to calculate with readily available financial market measures and does not require statistical estimation as *static growth expected return* (*SGER*). We use analysts' earnings forecasts as an *SGER* input to rank firms for portfolio inclusion. We find that portfolios of low *SGER* firms have negative excess returns − negative alphas − in a four factor conditional asset pricing model. The estimated alpha difference between high and low *SGER* portfolios is as great as 0.88% per month. Without generating abnormal returns for investors, we find that analysts make favorable stock recommendations and most optimistically forecast earnings for high *SGER* firms. Consistent with the dynamic model, returns increase with profitability to a greater extent for value compared to growth firms. We find little statistical or economic significance for earnings volatility beyond *SGER* for returns. This observation is consistent with *SGER* as a large portion of expected return from the dynamic model. We conclude that *SGER* on its own is a useful return measure for common share investing.

1. Introduction

We develop an expected return measure from a dynamic equity valuation model as a guide for common equity investment. We show that expected return from Blazenko and Pavlov's (2009) model of an expanding business where managers have a dynamic option to suspend growth has two terms: one that is easy to calculate with readily available financial market measures and does not require statistical estimation and a component that depends on earnings volatility. We entitle the first portion as *static growth expected return* (*SGER*) because it arises not only from the dynamic model, but also from the static constant growth discounted dividend model. *SGER* is a large portion of expected return from the dynamic model and also changes with corporate profitability in a similar way. Consequently, we investigate *SGER* on its own as a return measure for common share investing.

Readily available financial measures, like, preferred share dividend yield, or bond yield, give investors in these securities an expected return proxy and a valuable investing guide. Along with a credit assessment, a financial analyst can compare rates across similar securities to make an informed investment decision. On the other hand, for common shares, expected return is more difficult to determine. A complete expected return measure, beyond dividend yield, requires a risk assessment that is more difficult than for preferred shares or bonds because of greater return variability. This variability obscures risk sources and their expected return impact. To structure the study of risk, the finance literature uses asset pricing models like the Capital Asset Pricing Model[1], the Arbitrage Pricing Theory of Ross (1976), or other factor models that include Fama and French (1992) and Carhart (1997). An analyst can estimate the parameters of these models for expected return guidance.

Rather than estimate parameters of an asset pricing model, there is a literature[2] that either calculates or estimates expected return from share prices and an equity valuation model. The purpose of these implicit expected returns is for the weighted average cost of capital and corporate capital budgeting or for corporate performance evaluation and value based

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[1] Sharpe (1964), Lintner (1965), Mossin (1966), and Treynor, develop the CAPM independently. A version of Treynor's unpublished manuscript edited by French (2002) is available at SSRN: http://ssrn.com/abstract=628187
[2] See, for example, Easton (2004, 2006), Easton, Taylor, Shroff, and Sougannis (2002), Gebhardt, Lee, Swaminathan (2001), and Gode and Mohanram (2003).

management with financial measures like residual income[3] or *EVA*®.[4] This objective requires that an expected equity return proxy be unbiased, and therefore, this literature often compares these measures against average realized equity returns. Because this standard is rather demanding, in a study of seven expected return proxies, Easton and Monahan (2005) find that in the entire cross-section of firms, these proxies are unreliable and none has a positive association with realized returns. Easton and Monahan do, however, find better reliability for low long-term consensus growth forecasts and/or high analyst forecast accuracy. Fama and French (2006) forecast returns with corporate profitability, Book/Market, and other corporate financial measures in several regression models. Their forecasts relate positively with realized returns.

The foundation of all asset pricing models is a positive relation between expected return and risk, but Haugen (1995) and Haugen and Barker (1996) report a negative relation. They conclude that either the financial literature misses major risk sources or that investors do not account for risk correctly. Consistent with the first explanation, Connor et. al (2007) argue that there may be many more factors than Fama and French (1992) and Carhart (1997) consider and that each factor may have only a modest return impact. On the other hand, the second explanation contradicts the Efficient Markets Hypothesis. Investors' risk/return calculus is possibly weak because of the complexity of measuring common share risk and expected return. In particular, there are no easily calculated financial market return measures that guide investors' risk/return analysis for common equities.

Of course, investors must exercise caution when estimating or calculating expected return for individual common shares. Fama and French (1997) stress the errors that arise from estimation of either the CAPM or APT for individual common shares. Financially fool-hardy results can arise from over reliance on simple financial models without critical application. That being said, both estimation and forecast errors diminish for portfolios compared to individual stocks. We investigate the value of *SGER* for common equity investing with a number of applications.

First, unlike the cost of capital literature we review above, not only does *SGER* not require statistical estimation, but also, realized returns and *SGER* relate positively to one another in

[3] Residual income is accounting earnings less book equity times the required equity return.

[4] *EVA* stands for Economic Value Added and is a registered Stern Stewart & Company trademark. The basic calculation for *EVA* is Net Operating Income less the dollar cost of capital, which is book assets multiplied by the cost of capital. See, Stewart (1991) for more on *EVA* and value management.

portfolios. Next, we use analysts' earnings forecasts as an *SGER* input to rank firms for portfolio inclusion. We find that portfolios of low *SGER* firms have negative excess returns − negative alphas − in a four factor conditional asset pricing model. The estimated alpha difference between high and low *SGER* portfolios is as great as 0.88% per month.

O'Brien et. al (2005), McNichols and O'Brien (1997), Diether et al. (2002), and Chan et. al (2007) argue that optimistic earnings forecasts arise from investment banking relations between analysts' firms and the companies that they analyze. Jegadeesh et al.(2004) show that analysts make favorable recommendations for glamour stocks − stocks with high momentum and/or growth characteristics. Only the first of these characteristics relates positively to expected return. Beyond glamour stocks and investment banking relations, we find that without generating abnormal returns for investors, analysts make favorable stock recommendations and most optimistically forecast earnings for high *SGER* firms. On net, analysts encourage high return stocks. We argue analysts' reputations are best served by enticing investors into high return stocks, even if returns are simply risk compensation.

The corporate determinants of market/book ratio are profitability and growth. Anderson and Garcia-Feijoo (2006) find that the Book/Market ratio relates to the recent growth in capital expenditure. Firms with low Book/Market (growth firms) have large past capital expenditures, which they interpret as firms that have exercised their growth options. They argue that this exercise reduces corporate risk. Consistent with this interpretation, they find low average returns for these firms. Garcia-Feijoo and Jorgensen (2007) show that degree of operating leverage is positively associated with Book/Market and is an important determinant of the value premium (the return to value minus the return to growth stocks).

We investigate profitability as a joint determinant of market/book and expected return. Growth firms (low Book/Market) have high profitability that "covers" the cost of growth capital expenditures over time. This coverage means that growth firms have lower risk than value firms (high Book/Market). Consistent with our dynamic model, returns increase with profitability to a greater extent for value compared to growth firms.

In the following section, we develop our expected return measure and discuss assumptions and caveats. We show that *SGER* is a large portion of expected return from our dynamic model.

Consistent with this result, in section 5, we find that volatility adds little economic or statistical significance for returns beyond *SGER*. In section 3, we report evidence that portfolios formed with this measure earn abnormal returns. In addition, we report evidence that analysts recommend and overly optimistically forecast EPS for high return (*SGER*) firms. In section 4, we investigate the relations between the value premium and the business cycle predicted by our dynamic model. Section 6 concludes with a summary, conclusion, and an agenda for future research.

2. Dynamic Financial Analysis

2.1. Expected Return

We use Blazenko and Pavlov's (2009) dynamic model of an expanding business where profit growth requires capital growth. They develop an expected return expression, $\omega(ROE)$, for common equity,

$$\omega(ROE) = \begin{cases} \dfrac{ROE - g + g\pi + \frac{1}{2}\pi''\sigma^2 ROE^2}{\pi}, & growth, \quad ROE \geq \xi^* \\ \dfrac{ROE + \frac{1}{2}\pi''\sigma^2 ROE^2}{\pi}, & suspend\ growth, \quad ROE < \xi^*, \end{cases} \tag{1}$$

where the real growth rate for earnings and capital is *g*, *ROE* is the return on equity that follows a non-growing[5] geometric Brownian motion with earnings volatility σ, ξ^* is the value maximizing expansion boundary in Equation (A3) of Appendix A, and $\pi(ROE)$ is market/book in Equation (A1).

The manager's expansion decision depends on profitability, *ROE*. When *ROE* exceeds the expansion boundary, ξ^*, the manager expands earnings at the rate *g* with capital growth at the rate g. When *ROE* is less than the expansion boundary, ξ^*, the manager suspends growth until profitability improves. To prevent arbitrage (see, Shackleton and Sødal 2005), the two branches

[5] If earnings growth at the rate g requires capital growth at the rate g, then *ROE* does not grow. Further, despite growth *g*, the corporate return on equity investment is *ROE* and not *ROE* plus growth. A static environment illustrates the point. Let X be earnings and B be equity investment, then, the IRR satisfies (X-g*B)/(IRR-g)-B=0, and, IRR=*ROE* without the growth factor g. For spontaneous profit growth (without capital investment), which is not the nature of the investment we study, the IRR satisfies X/(IRR-g)-B=0, and IRR=ROE+g.

of Equation (1) for expected return, $\omega(ROE)$, must equal at the expansion boundary, ξ^*. Along with smooth pasting, this equality means that market/book equals one at the expansion boundary, $\pi(\xi^*)=1$, and that the manager grows the business when market/book exceeds one, $\pi(ROE)\geq 1$. This representation of corporate investment is the dynamic equivalent of Tobin's (1969) *q* theory.

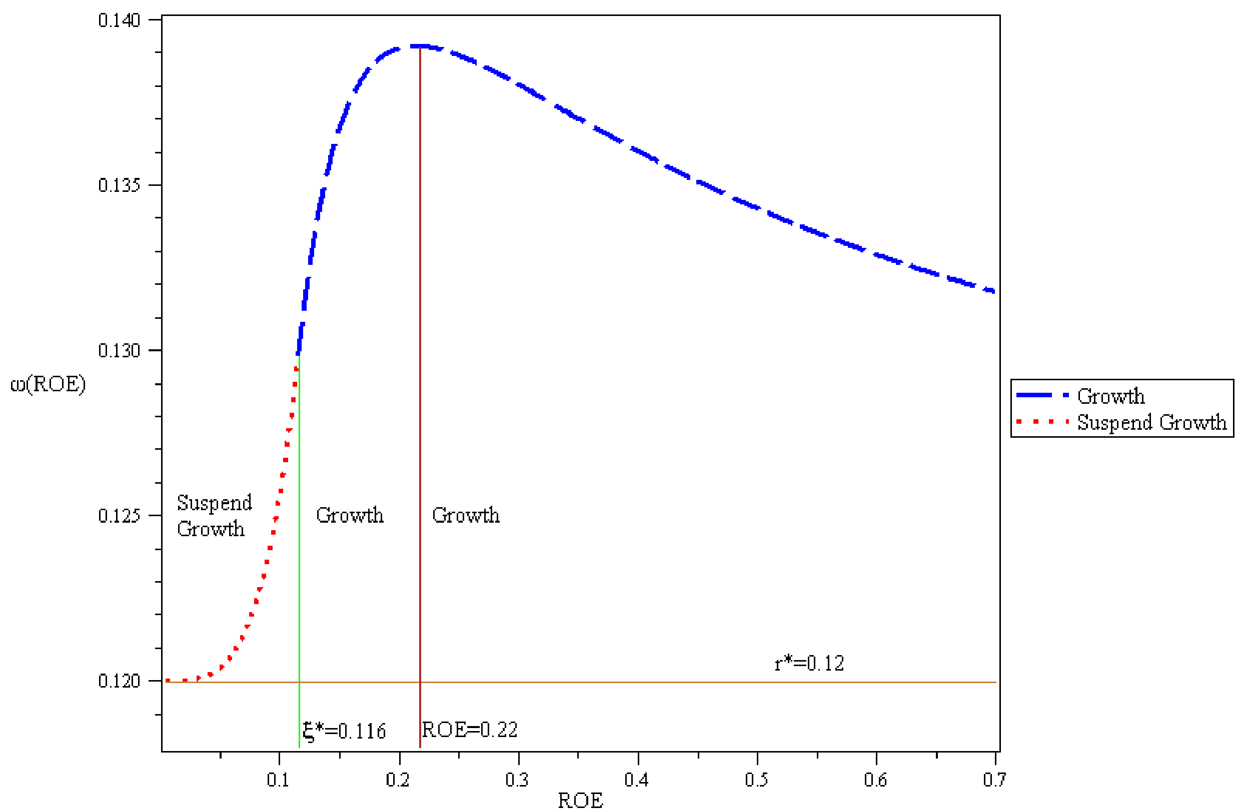
The upper branch of Equation (1) represents expected return for firms in the growth state. In the numerator, the first term (when positive), $ROE-g$, is dividend per dollar of equity investment. The second term, $g\pi$, is the contribution of capital to value. The third term, $\frac{1}{2}\pi''\sigma^2 ROE^2$, is value protection from the option to suspend growth, where π is market/book in the growth state. This term is positive given that $\pi(ROE)$ is a convex function of *ROE*. Expected return, $\omega(ROE)$, in the growth state, is the sum of these three terms scaled by market/book, $\pi(ROE)$.

The lower branch is expected return for firms that have suspended growth, $ROE<\xi^*$. The lower branch is the upper branch as a special case with a zero growth rate, *g*=0. Because the firm pays all earnings as dividends in the growth-suspension state, the first term, *ROE*, is dividend per dollar of equity investment. The second term, $\frac{1}{2}\pi''\sigma^2 ROE^2$, is expected capital gain from the growth option, where π is market/book in the growth-suspension state. This term is positive given that $\pi(ROE)$ is a convex function of *ROE*. Expected return, $\omega(ROE)$, in the growth-suspension state, is the sum of these two terms scaled by market/book, $\pi(ROE)$.

Figure 1

Expected Return, $\omega(ROE)$, versus Profitability, *ROE*,

and the Value Maximizing Expansion Boundary, ξ^*



Notes: Figure 1 plots expected return, $\omega(ROE)$, versus profitability, *ROE*, with earnings volatility, σ=0.2, real earnings growth, *g*=0.06, and a risk adjusted rate for a hypothetical permanent "growth-suspension" firm, *r**=0.12.

Figure 1 plots expected return $\omega(ROE)$ from Equation (1) versus profitability, *ROE*, for a numerical example. The difference between expected return for a hypothetical permanent "growth-suspension" business, r^*=0.12 and the riskless rate *r*=0.05 represents the primary source of business risk with a risk premium of 0.12−0.05=0.07. As the manager grows the business, streams of continuing capital expenditures for growth (which themselves grow), "lever" this business risk above 0.12 in Figure 1. In addition, investor expectations of this future risk, even when the firm has suspended growth, influence expected return. We refer to this enhanced business risk as "growth leverage." Because the manager's decision to grow or not depends upon *ROE*, profitability alters the prospects for growth leverage, which changes expected return, $\omega(ROE)$. Consequently, an important expected return determinant in Equation (1) is profitability.

When the firm is in the growth-suspension state (the left-most section of Figure 1), as profitability, *ROE*, approaches zero from the right, growth leverage disappears because the likelihood of returning to the growth state diminishes and becomes negligible. As the possibility of growth leverage diminishes expected return falls. When *ROE*=0, the likelihood of returning to the growth state is zero. With no possibility of growth leverage there is no growth induced risk. Return equals that of a "growth-suspension" firm, $\omega(ROE) = r^* = 0.12$. Note that in the left-most section of Figure 1, when *ROE* increases, risk increases because of increasing likelihood that at some future time *ROE* will cross the growth boundary, $\xi^* = 0.116$, where the firm begins growth and incurs growth leverage. Expected return $\omega(ROE)$ increases in anticipation of this risk.

Once profitability, *ROE*, crosses the expansion boundary, $ROE \geq \xi^*$=11.6%, the manager begins to grow the business with growth investments and the firm is in the growth state. As *ROE* increases, expected return, $\omega(ROE)$, continues to increase until *ROE*=0.22 in Figure 1. For $0.116 \leq ROE \leq 0.22$, profitability increases the likelihood of remaining in the growth state and continuing to incur growth leverage rather than fall back into the growth-suspension state without growth leverage. This increasing likelihood of incurring on-going growth leverage without reprieve increases risk, which increases expected return, $\omega(ROE)$. For $0 \leq ROE \leq 0.22$ in Figure 1, profitability, *ROE*, increases risk and expected return, $\omega(ROE)$.

When profitability is high, $ROE \geq 0.22$ in Figure 1, the likelihood of falling back into the growth-suspension state is modest, and therefore, this likelihood has little impact on risk. Rather, with increasing profitability, *ROE*, the firm is better able to "cover" growth expenditures, *g*, which the firm incurs with high likelihood and for long periods because the possibility of falling back to the growth-suspension state, *g*=0, is modest. Increasing ability to cover the costs of growth, g, decreases risk, and therefore, profitability, *ROE*, decreases risk and expected return, $\omega(ROE)$. For $ROE > 0.22$ in Figure 1, profitability, *ROE*, decreases risk and expected return, $\omega(ROE)$.

2.2 Static Growth Expected Return

The first portion of the upper branch of Equation (1) is,

$$\frac{ROE - g + g\pi}{\pi}. \tag{2}$$

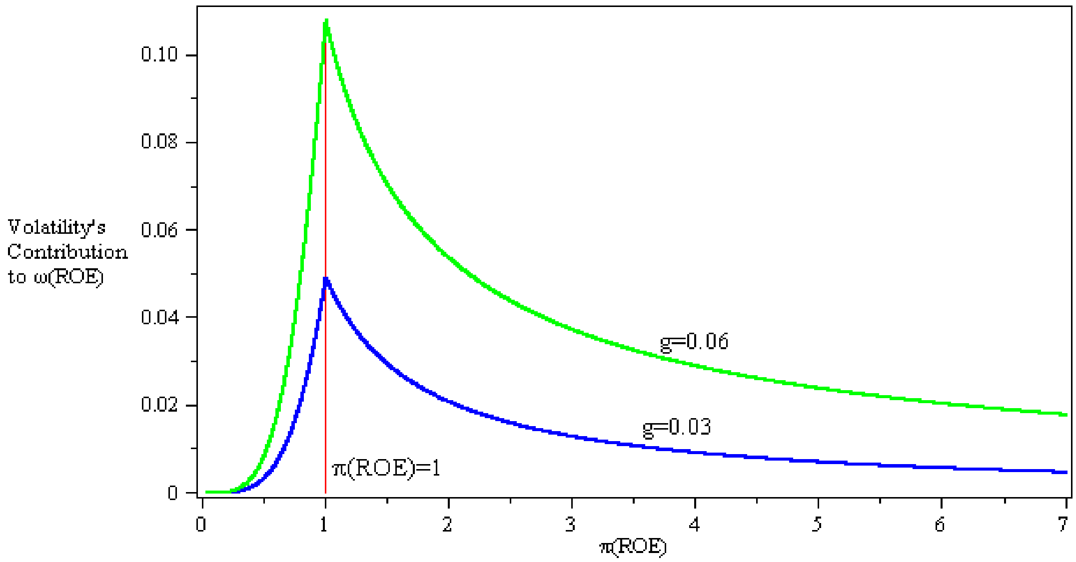
For dividend paying firms, *ROE-g* is dividend per dollar of equity investment. Dividend yield, *dy*, is *ROE-g* divided by market/book, $dy \equiv \frac{ROE - g}{\pi}$. Blazenko and Pavlov (2009) do not recognize, but, with a little algebra, we can rewrite equation (2) as,

$$SGER \equiv ROE + (1-\pi)dy. \tag{3}$$

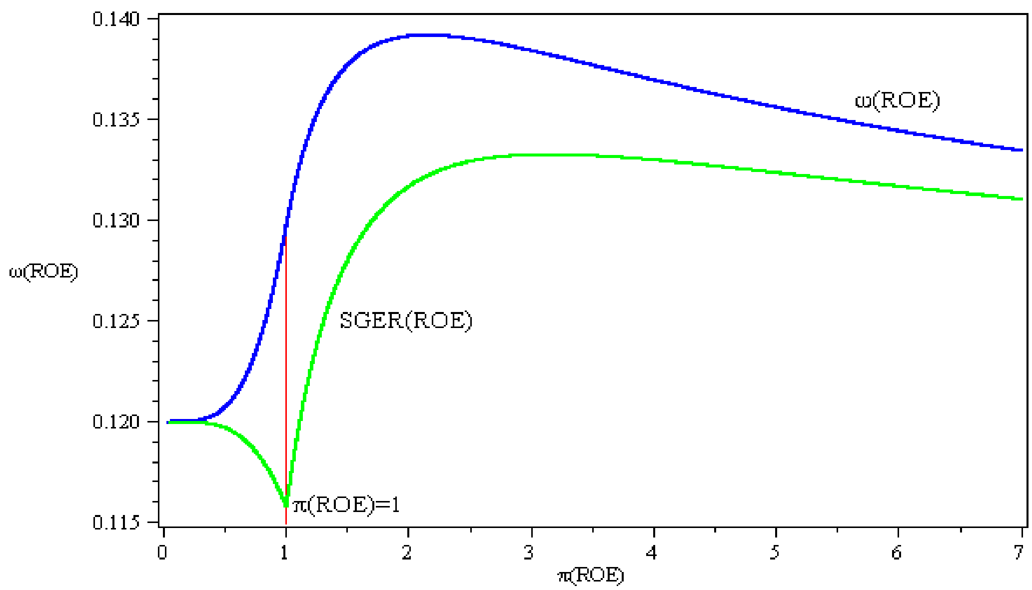
We refer to Equation (3) as *static growth expected return* (*SGER*), because it arises not only as a component of expected return, $\omega(ROE)$, in the dynamic model, but also as expected return from the static growth discounted dividend model − the *Gordon Growth Model* (see, Appendix B). While the form of these expressions is the same, it is important to recognize that they are different because share price in the first is from a dynamic model, whereas share price in the second, is from a static model. Note that the component terms of *SGER* are either readily available (that is, π and *dy*) or relatively easy to forecast, *ROE*. Further, growth *g* does not appear directly in Equation (3) other than through its impact on price, which determines market/book, π, and dividend yield, *dy*.

Figure 2

Panel A:Volatility's Contribution to Expected Return, $\omega(ROE)$



Panel B: *SGER* and Expected Return, $\omega(ROE)$



Notes: Panel A plots the fraction of expected return, $\omega(ROE)$, that arises from volatility. That is, $\frac{\frac{1}{2}\pi''\sigma^2 ROE^2}{\pi}$, from Equation (1) divided by expected return, $\omega(ROE)$. We plot this fraction with respect to market/book, $\pi(ROE)$, for two real earnings growth rates, *g*=0.03 and *g*=0.06. Earnings volatility is σ=0.2. The risk adjusted rate for a permanently "growth-suspension" firm is *r**=0.12. Panel B plots *SGER* and expected return, $\omega(ROE)$, versus market/book, $\pi(ROE)$, with σ=0.2, *g*=0.06, and *r**=0.12.

2.3 *SGER* as a Component of Expected Return

In this section, we show that *SGER* is a large portion of expected return, $\omega(ROE)$, from Equation (1) and the dynamic model. Panel A of Figure 2 plots volatility's contribution to expected return: $\frac{\frac{1}{2}\pi''\sigma^2 ROE^2}{\pi}$, from Equation (1) divided by expected return, $\omega(ROE)$. Volatility's contribution to expected return is highest where market/book equals one, $\pi(ROE)=1$. As profitability *ROE* increases or decreases and market/book changes from one, volatility's contribution to expected return, $\omega(ROE)$, decreases. Volatility's contribution to expected return, $\omega(ROE)$, is no more than 11% in Figure 2 when real growth is high, *g*=0.06. When real growth is more realistic, g=0.03, then, volatility's contribution to expected return, $\omega(ROE)$, is less than 5%. When market/book differs from one, volatility's contribution to expected return, $\omega(ROE)$, is even lesser.

Panel B of Figure 2 plots *SGER* and expected return, $\omega(ROE)$, versus market/book, $\pi(ROE)$. *SGER* is the portion of expected return from Equation (1) that does not include earnings volatility, σ, as a direct input. In the growth state, *SGER* behaves in a similar way as expected return, $\omega(ROE)$. *SGER* increases initially with market/book, $\pi(ROE)$, because increasing likelihood of incurring growth leverage for firms with low market/book, $\pi(ROE)$. *SGER* eventually decreases with market/book, $\pi(ROE)$, as firms cover the capital expenditure costs of growth with profitability, *ROE*, and growth leverage decreases.

This analysis indicates that *SGER* is a large portion of expected return, $\omega(ROE)$, and that changes in *SGER* are similar to changes in expected return, $\omega(ROE)$, with respect to profitability, *ROE* (at least for firms with $\pi(ROE)\geq 1$). In empirical testing later in this paper, our focus on *SGER* has the attraction that it is easy to calculate with readily available financial market measures and does not require statistical estimation. In Section 5, we find little statistical or economic significance for earnings volatility beyond *SGER* for returns. This observation is consistent with *SGER* as a large portion of expected return from the dynamic model. Consequently, we investigate *SGER* on its own as a return measure for common share investing.

In Equation (1) and Figure 1, it is difficult to empirically distinguish between firms that are growing and those that have suspended growth. In our empirical study in the next section, we focus on dividend paying stocks because they are more likely profitable, and therefore, more likely growth oriented on the upper branch of Equation (1) and in the right-most section of Figure 1. We report evidence later, that in fact, these firms are growth oriented.

2.4 Assumptions, Discussion, and Caveats

SGER in Equation (3) is forward *ROE* plus dividend yield times one minus market/book. The value "one" for market/book benchmarks those firms for which business return for shareholders, *ROE*, exceeds the value maximizing expansion boundary, ξ^*, and growth is an appropriate corporate objective for managers aiming to maximize shareholder wealth.

SGER in Equation (3) is not inconsistent with the standard view that expected return is a riskless rate plus a risk premium. The objective of much of the asset pricing literature in finance is to measure this risk premium. The riskless rate and the risk premium are implicit rather than explicit in *SGER*. They impact price, which determines market/book, π, in Equation (A1), and the dividend yield, *dy*, but not *SGER* directly.

SGER requires no statistical estimation of unknown model parameters that creates estimation risk. Sometimes, see, for example, Stowe, Robinson, Pinto, and McLeavey (2002, page 67), financial analysts estimate expected return with growth estimates based on average corporate growth, like, for example, sales growth. These averages use short time series averages to ensure that current corporate characteristics have not diverged significantly from the past. With small sample sizes, the likelihood that the growth estimate diverges from true value is great.

If we use an *EPS* forecast divided by *BPS* (book value per share) as a *ROE* forecast, then we presume that accounting returns are good economic return forecasts. They need not be. For example, if corporate managers choose inappropriate depreciation schedules, then both *EPS* and *BPS* mis-measure their corresponding economic counterparts. The net effect is to bias accounting returns relative to economic returns. There is a literature on the accuracy of accounting returns as economic return proxies.[6] In addition, we present evidence later that that accounting *ROE* overstates economic *ROE* for growth stocks and understates economic *ROE* for value stocks. Despite limitations, investors can profit from accounting returns if investment strategies formed with *SGER* earn abnormal returns.

There are many ways that an investor might forecast *ROE* in Equation (3). One possibility is to use consensus financial analysts' *EPS* forecasts relative to *BPS*. There is a large literature that finds that analysts forecast over-optimistically. Among others, O'Brien et. al (2005), McNichols and O'Brien (1997), Diether et al. (2002), and Chan et. al (2007) argue that biases arise from investment banking relations between analysts' firms and the companies that they analyze. Chan et. al (2007) report evidence that earnings surprises are more negative for value rather than growth stocks. An investor might account for such biases before using *SGER* in Equation (3). On the other hand, despite the fact that we ignore analyst forecast biases, in the following section we use *SGER* in Equation (3) to form portfolios that earn abnormal returns.

An attraction for application of the growth and expected return expressions on the right hand side of Equations (3) and (C3) in Appendix C is that they use terms that are easily forecast (*ROE*) or observable from a combination of stock market trading (share price and dividend yield) and financial reports (Book equity). Recognizing caveats that we discuss above and empirical tests in section 3 that help to identify growth common shares, an investor might use *SGER* in Equation (3) as an expected return guide. We need three financial measures: market/book, current dividend yield, and forward *ROE*. For publicly traded firms, the first two measures are easy to calculate or, because they are widely reported in the financial press, easily retrieved. There are many ways an investor might forecast *ROE* depending on how precise he/she wants to be and the amount of effort he/she is willing to expend. One possibility, readily available even to retail investors, is to retrieve Price/Forward Earnings and market/book from a financial website. For example, Yahoo!Finance, www.yahoofinance.com, reports these measures for many public companies. Forward earnings in the Price/Forward Earnings ratio is the consensus forecast of sell side financial analysts surveyed by Thomson Reuters for fiscal year-end earnings to be reported about one year hence. The ratio of market/book and Price/Forward Earnings is an *ROE*

[6] See, for example, Stauffer (1971), Fisher and McGowan (1983), Salamon (1985), Stark (2004), and Rajan and Soliman (2007).

forecast. With Equation (C4) that transforms current dividend yield into a forward dividend yield, an investor has all of the *SGER* terms in Equation (3) as an expected return guide.

All parameters on the right hand side of *SGER* in equation (3) are forward looking. *ROE* is forward looking because it is a forecast. Dividend yield and market/book are forward looking because they use share price. With share price, *SGER* incorporates information impounded in prices that anticipates future corporate performance. If this impounding is accurate and complete, if we have the correct asset pricing model for benchmarking, and if our *ROE* forecast is no more informative than that of the market, then it should not be possible to earn abnormal returns from investment strategies based on *SGER* in Equation (3). This is our null hypothesis for empirical testing that follows.

3. SGER Investing

3.1. Data

We retrieve test data for *SGER* investment strategies from the *COMUSTAT*, *CRSP*, and Thomson *I/B/E/S* databases.[7] *COMPUSTAT* is our source for book equity (*BVE*), reported earnings (*EPS*), and other corporate financial data. We measure *BVE* as Total Assets less Total Liabilities less Preferred Stock plus Deferred Taxes and Investment Tax Credits (from the *COMPUSTAT* quarterly file). *CRSP* is our source for dividends, split factors, shares outstanding, daily share price, and daily returns. Thomson *I/B/E/S* is our source for reported *EPS* and consensus analysts' *EPS* forecasts. Finally, we retrieve daily portfolio and risk-less rate data from Ken French's website[8] for benchmarking *SGER* based portfolios.

[7] *COMPUTSTAT* is a financial information product of Standard and Poor's, which is a division of the McGraw-Hill companies. We use the Merged Primary, Supplementary, Tertiary & Full Coverage Research Quarterly and Annual files that include both active and inactive companies, which do not suffer from survivor bias. *CRSP* stands for Center for Research in Security Prices: Graduate School of Business, University of Chicago. Thomson *I/B/E/S* is a financial information product of Thomson Reuters. The acronym *I/B/E/S* stands for Institutional Brokers Estimate System. We use the *I/B/E/S* summary statistics file and the actual data file, both of which are unadjusted for stock splits and stock dividends. We use *CRSP* daily cumulative stock factors to adjust for splits and stock dividends.

[8] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library

3.2. Portfolio Selection Criteria

We imposed a number of screens on firms for study inclusion. First, firms must have data from each of the *COMPUSTAT*, *CRSP*, and Thomson *I/B/E/S* databases, which constrains our study to US publicly traded companies. Second, because both market/book and forward *ROE* for *SGER* in Equation (3) entail division by *BVE*, we require that a common share have positive *BVE* from the latest reported quarterly/annual financial statements immediately prior to portfolio inclusion. Third, because the growth presumption is less likely for negative earnings firms, we require positive trailing twelve month earnings. Fourth, *SGER* in Equation (3) requires dividends, and therefore, we impose the requirement that firms have positive trailing twelve month dividends at the time of portfolio inclusion.

3.3. Corporate Performance Forecasting and Financial Measures

Thomson *I/B/E/S* updates current forecast data, as often as five times a trading day, on over twenty corporate financial measures, including annual and quarterly *EPS*, for both consensus and detailed analyst by analyst forecasts, on over 25,000 common shares worldwide. The Historical *I/B/E/S* database that we use reports a snapshot of these forecasts for the Thursday preceding the third Friday of the month, which *I/B/E/S* refers to as "Statistical Period" dates. Our testing rebalances portfolios at closing prices on Statistical Period dates.

We forecast *ROE* in three separate ways with three different median *I/B/E/S* analysts' *EPS* forecasts: for the first,[9] second, and third yet to be reported fiscal year-end annual *EPS* at a Statistical Period date.[10] Denote these median analysts' *EPS* forecasts as *EPS1*, *EPS2*, and *EPS3*. Our three *ROE* forecasts for a firm are *EPS1/BPS*, *EPS2/BPS*, and *EPS3/BPS*, where the earnings forecasts are at a Statistical Period date and *BVE* is from the most recently reported quarterly/annual financial statements prior to the Statistical Period date. *BPS* is *BVE* divided by shares outstanding at the Statistical Period date. Denote these *ROE* forecasts as *ROE1*, *ROE2*, and *ROE3* and *SGER* in Equation (3) calculated with these *ROE*s as *SGER1*, *SGER2*, and

[9] The calendar date of a fiscal year might precede a Statistical Period date because of normal reporting delays. The report date for actual *EPS* of a fiscal year is always after the statistical period date because when *I/B/E/S* reports an actual *EPS*, the *EPS2* forecast becomes the *EPS1* forecast and the former *EPS1* forecast disappears.

[10] *I/B/E/S* also reports consensus and detailed analyst annual EPS forecasts beyond three fiscal years hence, but reporting of these forecasts is unduly sparse to be included in our study.

SGER3, respectively. We make no claim that *ROE1*, *ROE2*, or *ROE3* are the best possible *ROE* forecasts. The simplicity of our *ROE* forecasts highlights the fact that we do not "snoop" the data for best fit measures that unlikely represent future returns as well. In the current paper, we opt for simplicity, but recognize that evidence we uncover may guide the search for better *ROE* forecasts both for *SGER* investment strategies and representing expected equity returns.

The first Statistical Period date, which begins the *I/B/E/S* database, is 1/15/1976. Common database coverage is up to August 2007 where the last Statistical Period date is 8/16/2007. Our test period for *SGER1* and *SGER2* is 31 years and 7 months, or equivalently, 379 months. Our test period is shorter for *SGER3* because *I/B/E/S* only begins reporting *EPS*3 – forecast earnings three unreported fiscal year-ends hence – at the 9/20/1984 Statistical Period date. Our test period for *SGER3* is between 9/20/1984 and 8/16/2007, which is 23 years, or equivalently, 276 months.

The forward dividend yield in Equation (3) is the current dividend yield − trailing twelve month dividends, which is dividend per share summed over dividend declaration dates for the 12 months prior to the Statistical Period date, adjusted by *CRSP* share factors for stock splits and stock dividends between the dividend declaration date and a Statistical Period date, divided by closing share price on the Statistical Period date − adjusted by Equation (C4) in the Appendix C. With this expression, because we use three separate *ROE* forecasts, there are three corresponding, forward dividend yields, *dy1*, *dy2*, and *dy3*, respectively.

Market/book in Equation (3) is the closing share price multiplied by shares outstanding, both on the Statistical Period date, divided by *BVE* from the most recently reported quarterly/annual financial statements prior to the Statistical Period date.

3.4. Descriptive Statistics and Portfolio Characteristics

For each monthly Statistical Period date from 1/15/1976 to 8/16/2007 we calculate *SGER* in Equation (3) for firms with positive trailing twelve month dividends, positive trailing twelve month earnings, and positive *BVE*.[11] Figure 1 depicts non-linearities in the relation between

[11] There are many ways that an investor might estimate growth in the growth discounted dividend model for expected return calculated as dividend yield plus growth. For example, analysts' one year forward EPS divided by realized annual EPS is a growth forecast. In testing numerous of these expected return measures we find none that overall outperforms *SGER* in investment strategies as a stock selection measure (results not reported). *SGER* has the

expected returns and profitability, *ROE*, that will likely obscure the relation between returns and profitability in the entire cross-section of firms. Therefore, for each Statistical Period date, we first sort firms into five Book/Market quintiles (b=1,2,3,4,5) and then for each Book/Market quintile into five *SGER* portfolios (k=1,2,3,4,5). This double sorting leads to twenty-five portfolios that we rebalance at each Statistical Period date over the 379 month test period. In addition, because we sort firms within Book/Market quintiles in three ways, with *SGER1*, *SGER2*, and *SGER3*, (j=1,2,3) we investigate 3×25=75 portfolios. Over our test periods, 379 months for *SGER1* and *SGER2* and 276 months for *SGER3*, the average numbers of stocks in the 25 portfolios is 44.5, 39.6, and 14.9 respectively.[12] The relatively small number of stocks in *SGER3* portfolios is because analyst annual *EPS* forecasts are sparser for three unreported fiscal years hence compared to one and two unreported fiscal years hence. Since the average number of stocks in *SGER1*, *SGER2*, and *SGER3* portfolios is not overly great, the portfolios in Table 1 and subsequent tables can be replicated by even retail investors, which increases the economic significance of our results.

Table 1 reports median market cap for the *SGER1*, *SGER2*, and *SGER3* portfolio sets. First, low Book/Market growth firms tend to be larger firms than high Book/Market value firms. Second, for any Book/Market quintile and for any *SGER* portfolio, market cap increases for *SGER3* compared to *SGER2* compared to *SGER1* portfolios. This increase reflects the fact that analysts more likely forecast *EPS* further in the future for larger compared to smaller firms. Last, within Book/Market quintiles there is no strong relation between *SGER* and market cap for any of the *SGER1*, *SGER2*, or *SGER3* portfolio sets.

Also in Table 1, we report the most common 1-digit SIC code and the percent of firms within a portfolio with that SIC code for each of the double sorted portfolios and for each of the three *SGER* portfolio sets. For reference purposes, for the overall sample of firms that satisfy our selection criteria, the percentage of firms in the 5 most common 1-digit SIC codes, 2000-2999, 3000-3999, 4000-4999, 5000-5999, and 6000-6999 are 19.83%, 20.94%, 13.75%, 8.69% and

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advantage that it is based on market measures − Market/Book and dividend yield − that incorporate the markets' assessment of future corporate performance.

[12] Table 4 gives the total number of observations in our sample for *SGER1*, *SGER2*, and *SGER3* portfolio sets as 421,752, 375,452, and 103,077, respectively. Because there 379 and 276 Statistical Period months for *SGER1*, *SGER2* and *SGER3* portfolios with 25 portfolios each, the average number of stocks in a portfolio is 421,752/(25×379)=44.5, 375,452/(25×379)=39.6, and 103,077/(25*276)=14.9, respectively.

27.25%, respectively.[13] The fractions in Table 1 do not vary markedly from these benchmarks, which indicates that our portfolios are not over-weight in particular industries compared to randomly selected portfolios. There is some evidence over our test period that a higher fraction of growth firms have 2000-2999 SIC codes and a higher fraction of value firms have 4000-4999 and 6000-6999 SIC codes compared to randomly selected portfolios.

Table 2 reports Market/Book, Current Dividend Yield, Forward *ROE*, and Implicit Growth. *M/B1*, *M/B2*, *M/B3* are median market/book ratios, *dy1*, *dy2*, *dy3* are median current dividend yields. In each case, the numbering 1, 2, 3 refers to portfolio sets *SGER1*, *SGER2*, and *SGER3*, respectively. Denote by $\overline{ROE}^{j}_{b,k}$, the median forward *ROE* for Book/Market quintile b=1,2,3,4,5, *SGER* portfolio k=1,2,3,4,5, for *SGER* measures j=1,2,3. Denote by $\bar{g}^{j}_{b,k}$, the median implicit growth for Book/Market quintile b=1,2,3,4,5, *SGER* portfolio k=1,2,3,4,5, for *SGER* measures j=1,2,3.

For low Book/Market growth stocks (b=1) in Table 2, market/book is, of course, high. Market/book is high for growth stocks because forward *ROE* and implicit growth are high. For high Book/Market value stocks (b=5), market/book is, of course, low. Market/Book is low because forward *ROE* and implicit growth are low for value stocks. Within any Book/Market quintile, for either growth stocks (b=1) at the top of Table 2 or for value stocks (b=5) at the bottom of Table 2, market/book tends to increase with *SGER* from low *SGER* portfolio (k=1) to high *SGER* portfolio (k=5). The reason for this increase is that *SGER* increases with forward *ROE* and more profitable firms have greater market/book.

For any Book/Market quintile (b=1,2,3,4,5) and for any *SGER* portfolio (k=1,2,3,4,5) portfolio, median forward *ROE*, $\overline{ROE}^{j}_{b,k}$,increases for *SGER3* (j=3) compared to *SGER2* (j=2) compared to *SGER1* (j=1) portfolio sets. That is, $\overline{ROE}^{3}_{b,k} > \overline{ROE}^{2}_{b,k} > \overline{ROE}^{1}_{b,k}$. These $\overline{ROE}s$ use *EPS* forecasts three, two, and the upcoming unreported fiscal year hence. $\overline{ROE}^{3}_{b,k}$ exceeds $\overline{ROE}^{2}_{b,k}$,

[13] SIC codes 2000-2999 are simple manufacturers, like, food products and textiles; 3000-3999 are manufacturers with more complex production processes, like, electronics, automobiles, and aircraft; 4000-4999 are transportation and telecommunications industries; 5000-5999 are retailers and wholesalers; 6000-6999 are financial firms.

which exceeds $\overline{ROE}^{1}_{b,k}$ because they use the same *BPS* denominator, but there is typically grow inherent in analysts' annual *EPS* forecasts further out in the future in the numerator.

Because firms tend to maintain dividends despite deteriorating financial conditions reflected by low share price and low forward *ROE*, the dividend yield of value stocks, at the bottom of Table 2, tends to exceed that of growth stocks, at the top of Table 2.

For high Book/Market quintile (*b*=5) and for each *SGER* ranked portfolio (*k*=1,2,3,4,5) median market/book is less than one, but implicit growth, $\overline{g}^{j}_{5,k}$,while lesser than that of low Book/Market quintile (*b*=1, growth stocks), $\overline{g}^{j}_{1,k}$, is, nonetheless, positive. Growth with market/book less than one is inconsistent with Blazenko and Pavlov's (2009) dynamic equity valuation model. This inconsistency arises, possibly, because as we discuss in the next section, forward accounting *ROE* is a downwardly biased measure of economic *ROE* and correspondingly, market/book is a downwardly biased measure of Tobin's (1969) *q*. See footnote 19 for a discussion of Tobin's *q*. Erikson and Whited (2000) and Gomes (2001) suggest measurement error in marginal *q* as the source of the empirical failure of marginal *q* to completely summarize all of the factors relevant to corporate investment decisions.

3.5. Realized Versus Expected Returns

We measure portfolio returns from a Statistical Period date, where we form a portfolio, to the following Statistical Period date, which is approximately a month later. Because Statistical Period dates are mid-month rather than month-end, we cannot use *CRSP* monthly returns. Instead, for firm *i*=1,2,…*N*, in portfolio *b*=1,2,3,4,5, *k*=1,2,3,4,5 for Statistical Period month *t*=1,2,…*TP*, where *TP* is the number of months in our test period,[14] we compound *CRSP* daily returns, $r_{i.t.\tau}$, τ =1,2,… T_t, where 1 is the trading day following the Statistical Period date for portfolio formation and T_t is the number of trading days in month *t* to the next Statistical Period date for portfolio rebalancing. Return for month *t*=1,2,…,*TP*, $R_{i,b,k}$ for firm *i*=1,2,…*N*, in portfolio *b*=1,2,3,4,5, *k*=1,2,3,4,5, between Statistical Period dates, is,

[14] TP is 379 for portfolio sets *SGER1* and *SGER2* and 276 for portfolio set *SGER3*.

$$R_{i,t,b,k} = \left[\prod_{\tau=1}^{T_t} (1 + r_{i,t,\tau,k,b}) \right] - 1$$

The equally weighted portfolio return in month *t* is $R_{t,b,k} = \frac{1}{N} \sum_{i=1}^{N} R_{i,t,b,k}$. Because *SGER* is an annual measure, we annualize realized monthly portfolio returns for comparison purposes. Annualized portfolio return over our test period is $\overline{R}_{b,k} = \left[\prod_{t=1}^{TP} \left(1 + R_{t,b,k}\right) \right]^{\frac{12}{TP}} - 1$.

Denote *SGER* for firm *i*=1,2,…,*N*, in portfolio *b*=1,2,3,4,5, *k*=1,2,3,4,5, for month t=1,2,…, TP , as $SGER_{i,t,b,k}$. Mean *SGER* for portfolio *k* is,

$$\overline{SGER}_{b,k} = \frac{1}{TP} \sum_{t=1}^{TP} \left(\frac{1}{N} \sum_{i=1}^{N} SGER_{i,t,b,k} \right)$$

Table 3 reports these returns, expected returns, and their difference, $\overline{R}^{j}_{b,k} - \overline{SGER}^{j}_{b,k}$, for portfolio sets *SGER1*, *SGER2*, and *SGER3*(*j*=1,2,3, respectively).

Within each of the five Book/Market quintiles, realized annual average portfolio returns, $\overline{R}_{b,k}$ increase from the low *SGER* portfolio (*k*=1) to the high *SGER* portfolio (*k*=5). This increase is monotonic for *SGER1* (*j*=1) and *SGER2* (*j*=2) portfolios and almost monotonic for the *SGER3* (*j*=3) portfolio. Even for the *SGER3* portfolio, the high *SGER* portfolio (*k*=5), always has a greater average realized return than the low *SGER* portfolio (*k*=1). Realized returns strongly follow *SGER*, which gives us confidence that, despite application crudeness, there is economic content to *SGER*.

The object of our study is to determine whether we can use *SGER* to earn abnormal returns in investment strategies. However, we also have a secondary interest in how *SGER* represents realized returns. Bear in mind that our *SGER* application is guided by simplicity so that investors might use it rather than a best realized return representation. For readers who might be interested in *SGER* with closer correspondence to realized returns – possibly for cost of capital determination – fine tuning our crude *SGER* application is in order. We present evidence, when we compare Table 3 to Tables 6, 7, and 8 in section 3.9 below, that the best measure for abnormal returns is not necessarily best for realized return representation.

At the bottom right of Table 3, we average differences between realized and expected return, $\overline{R}_{b,k}^{j} - \overline{SGER}_{b,k}^{j}$, over the 25 portfolios for each portfolio set *SGER1*, *SGER2*, and *SGER3* (*j*=1,2,3, respectively). Notice that this average is over all portfolios, both growth and value. These averages are positive for *SGER1* and *SGER2* (4.2% and 1.9%, respectively), which means that *SGER1* and *SGER2* understate realized returns. On the other hand, the average difference between realized and expected returns is negative for *SGER3* portfolios (-1.4%), which means that *SGER3* overstates realized returns. One of the reasons that *SGER1* portfolios underestimate realized returns is that the annual *EPS* forecast in *ROE1* for the upcoming unreported fiscal year-end is on average about 6 months hence. On the other hand, Equation (3) for *SGER* requires a one year forward *ROE*. This discrepancy means that *ROE1* misses about 6 months of earnings growth. This explanation is not complete because *SGER2* portfolios also understate realized returns (but, not by as much as *SGER1* portfolios) and *ROE2* forecasts yearly earnings, *EPS2*, about 18 months hence. However, it does explain why *SGER1* portfolios under represent realized returns to greater extent than *SGER2* portfolios and equivalently, why *SGER2* portfolios under represent realized returns to a greater extent than *SGER3* portfolios. The least absolute difference between realized and expected returns, -1.4%, is for *SGER3* portfolios. Forecast *EPS* in the numerator of *ROE3* is for the third unreported fiscal year-end in the future, which averages about 30 months hence. Possibly 30 months leads to better long-term *ROE* forecasts because of short term profitability reversion documented by Fama and French (2000). One of the differences that we note between *SGER1*, *SGER2*, and *SGER3* portfolios is that firm size increases across these portfolios. Bias in *SGER* compared to realized returns might be related to biases in analysts' forecasts related to firm size.

There are differences between growth and value stocks in *SGER*'s representation of realized returns. For growth stocks at the top of Table 3, *SGER* tends to overstate realized returns. *SGER* is especially high for Book/Market quintile b=1 with growth forecasts that are unlikely sustainable indefinitely. This growth implies high growth leverage, which is particularly onerous in static modeling because not only can managers not suspend growth investments upon poor profitability, but also these expenditures grow over time. On the flip side, *SGER* is low compared to realized returns for value stocks in Book/Market quintile b=5. Despite the fact that Chan et. al (2007) report evidence that analysts' optimistic *EPS* forecasting is more pronounced for value compared to growth firms, in Table 3, *SGER under represents* realized returns for value stocks. Because *ROE* is low, growth prospects as measured by implicit growth are low, and therefore, growth leverage risk is low. These observations suggest the possibility that forward accounting *ROE* calculated with analysts' forecasts of future *EPS* understate economic *ROE* for value stocks and overstate economic *ROE* for growth stocks. Nonetheless, we illustrate that portfolios formed with *SGER* earn abnormal returns in section 3.9.

For any one of the *SGER* portfolios k=1,2,3,4,5, realized returns increase almost monotonically moving from the lowest Book/Market quintile b=1 (growth stocks), to the highest Book/Market quintile b=5 (value stocks). This increase, which is especially pronounced for *SGER1* and *SGER2* portfolio sets, is consistent with well documented evidence in the financial literature that value stocks offer higher returns than growth stocks.

3.6. Earnings Surprise and *SGER*

We measure earnings surprise for firm i=1,2,…,N, in portfolio b=1,2,3,4,5, k=1,2,3,4,5, for Statistical Period t,=1,2,…,TP, as,

$$\delta_{i,t,b,k} = \frac{IBES\ actual\ EPS_{i,t,b,k} - IBES\ \ forecast\ EPS_{i,t,b,k}}{COMPUSTAT\ \ TTM\ EPS_{i,t,b,k}} \tag{4}$$

where both *I/B/E/S* forecast *EPS* and *COMPUTSTAT* TTM *EPS* are at *I/B/E/S* Statistical Period dates. We use *CRSP* share factors to adjust *I/B/E/S* actual *EPS* for stock splits and stock dividends between the *I/B/E/S* Statistical Period date and the *EPS* report date to make it comparable to *I/B/E/S* forecast *EPS*. Because either *I/B/E/S* actual *EPS* or *I/B/E/S* forecast *EPS* can be negative, to eliminate firm size effects, we normalize with neither, but, instead, with *COMPUSTAT TTM EPS*. *COMPUSTAT TTM EPS* is trailing twelve month earnings divided by the number of shares on the Statistical Period date. Because positive trailing twelve month earnings is a sample selection screen for our study, *COMPUSTAT TTM EPS* is strictly positive.

I/B/E/S begins reporting actual *EPS* starting in 1980 which is after the beginning of our study's test period. Further, forecasts near the end of our 2007 test period have not yet reported actual *EPS* in the *I/B/E/S* database. For the 25 *SGER1* and *SGER2* portfolios, we measure earnings surprise for 324 Statistical Period months. For the 25 *SGER3* portfolios we measure earnings surprise for 257 Statistical Period months. When *I/B/E/S* actual annual *EPS* is missing, it is often available in *COMPUSTAT*. However, we do not substitute *COMPUSTAT EPS*, because accounting conventions differ between *COMPUSTAT* and *I/B/E/S*, which means that *EPS* from these two sources are not comparable.[15] Occasionally, *I/B/E/S* has an actual *EPS*, but no report date. In addition, we eliminate observations with report dates earlier than or more than 365 days after the fiscal year end for the *EPS* forecast. Panel B of Table 4 gives an accounting of our original sample versus our earnings surprise sample.

Table 4 reports median earnings surprise, $\overline{\delta}^{j}_{b,k} = median(median(\delta_{i,t,b,k},\ i=1,2,\ldots,N),t=1,2,\ldots,TP)$, for each of the 25 *SGER* portfolios. We also report the number of earnings surprises for each portfolio, which is the sum over Statistical Periods of the number of stocks in the portfolio.

There are four interesting features of earnings surprises in Table 4. First, for the *SGER1* (j=1) portfolio, where the report date for actual *EPS* is about 6 months after the forecast at Statistical Period dates, earnings surprises are modest. The greatest earnings surprise is 3.4% in absolute value for the highest Book/Market quintile (b=5, value stocks) and the highest *SGER* portfolio (k=5). For growth stocks (Book/Market quintile b=1) earnings surprise is close to zero.

Second, as is commonly reported in the forecast literature, Table 4 indicates that analysts optimistically forecast *EPS*. Of the 75 portfolios in Table 4, median earnings surprise is non-negative for only a handful of *SGER1* growth portfolios, and then, only modestly positive. All *SGER2* and *SGER3* portfolios have strictly negative median earnings surprise.

Third, Table 4 has only weak evidence consistent with Chan et. al (2007) who report that earnings surprise is more negative for value compared to growth stocks. For *SGER1* (j=1) portfolios, earnings surprise is negative for the highest Book/Market quintile (b=5, value stocks)

[15] Analysts generally make earnings forecasts before discontinued operations and other extra-ordinary items, and therefore, *I/B/E/S* reports both actual and forecast *EPS* in this way. Since this convention is not standard, there can be discrepancies between *I/B/E/S* and other *EPS* sources.

and non-negative for the lowest Book/Market quintile (*b*=1, growth stocks). For *SGER2* (*j*=2) portfolios, clear patterns are hard to identify. However, for *SGER* ranked portfolios, *k*=1,2 and *k*=4,5 (but not *k*=3), earnings surprise is most negative across Book/Market quintiles for Book/Market quintile *b*=5 (value stocks). Contrary to this evidence, for *SGER* portfolio *k*=3, earnings surprise is most negative across Book/Market quintiles for Book/Market quintile *b*=3. Last, there is no discernible evidence for *SGER3* portfolios that earnings surprise is more negative for value stocks. For the five *SGER* ranked portfolios (*k*=1,2,3,4,5), earnings surprise is never most negative across Book/Market quintiles for the highest Book/Market quintile (*b*=5, value stocks). The further out the *EPS* forecast, the weaker is evidence that earnings surprise is more negative for value compared to growth stocks.

Fourth, at least for *SGER2* (*j*=2) and *SGER3* (*j*=3) portfolios, where analysts' *EPS* forecasts are on average about 18 and 30 months hence, there is a strong relation between earnings surprise and *SGER* within Book/Market quintiles. This relation is close to monotonic for *SGER2* (*j*=2) portfolios and strictly monotonic for *SGER3* (*j*=3) portfolios. For *SGER3* (*j*=3) portfolios, earnings surprise is more that 40% in absolute value for highest *SGER* portfolio (*k*=5) for Book/Market quintiles *b*=2, 3, 4, and 5. Highest *SGER* portfolio (*k*=5) for *SGER2* (*j*=2) portfolios has the most negative median earnings surprise for all Book/Market quintiles *b*=1, 2, 3, 4, 5. These results indicate that for relatively longer rather than short-term forecasts, for value and growth stocks, analysts are most optimistic for high expected return firms.

However, this optimism is not to the detriment of investors. Table 3 confirms a positive relation between realized and expected returns. So, expected and realized returns are high when analysts' forecasts are most optimistic. While optimistic analysts' forecasts are not to the detriment of investors, they are also not to the great advantage of investors either. In the next section, in our search for abnormal returns, we present evidence that high returns for high *SGER* portfolios are not abnormal, but risk compensation. If optimistic analysts' forecasts are neither to the detriment nor benefit of investors, they may be self-serving. This optimistic forecasting is only feasible for longer rather than short-term forecasts, because over the short-term, high realized returns are unlikely. As a consequence, short-term forecasts are quite accurate, like those reported in Table 4 for *SGER1* (*j*=1) portfolios.

3.7. Analysts' Recommendations

Table 5 reports, for each of the 25 portfolios (b=1,2,3,4,5, k=1,2,3,4,5), for *SGER1* (j=1), *SGER2* (j=2), and *SGER3* (j=3) portfolios, analysts' mean consensus recommendation,

$$\overline{Recom}_{b,k}^{j} = \frac{1}{379}\left[\sum_{t=1}^{379}\left[\frac{1}{N}\sum_{i=1}^{N} Recom_{i,t,b,k}^{j}\right]\right],$$

where $Recom_{i,t,b,k}$ is analysts' consensus recommendation,[16] obtained from *I/B/E/S Recommendations Summary Statistics File,* for firm i=1,2,…,N, in month t=1,2,…,379, for portfolio b=1,2,3,4,5, k=1,2,3,4,5, where the 25 portfolios are formed by sorting all firms at a statistical period date by Book/Market into 5 quintiles and then for each quintile into 5 portfolios by *SGER1* (j=1),*SGER2* (j=2), and *SGER3* (j=3) separately.

Consistent with Jegadeesh et al.(2004), Table 5 shows that analysts make favorable recommendations for growth stocks (low Book/Market) compared to value stocks (high Book/Market). For *SGER* measures j=1,2,3 mean recommendations are lower (favorable) for growth (b=1) compared to value firms(b=5), $\overline{\text{Recom}}_{5,k}^{j} > \overline{\text{Recom}}_{1,k}^{j}$ for j=1,2,3 and k=1,2,3,4,5. However, consistent with Chan et. al (2007), Table 4 reports that for *SGER1* and *SGER2* portfolios, analysts make optimistic earnings forecasts for value stocks (b=5) compared to growth stocks (b=1). It is puzzling that analysts make favorable recommendations for stocks (growth) for which they forecast earnings least optimistically.

Table 5 shows that within each Book/Market quintile, analysts make favorable recommendations for high *SGER* portfolios (k=5) relative low *SGER* portfolios (k=1) for *SGER1* (j=1),*SGER2* (j=2), and *SGER3* (j=3) portfolios. The F-statistic for the differences between mean recommendations among the *SGER* portfolios within each Book/Market quintile are all significant for *SGER1* (j=1),*SGER2* (j=2), and *SGER3* (j=3) portfolios at the p=0.000 level.

The evidence in Tables 4 and 5 is that analysts make favorable stock recommendations and most optimistically forecast earnings for high *SGER* firms.

[16] Recommendation Scales are: 1=Strong Buy, 2=Buy, 3=Hold, 4=Underperform, and 5=Sell.

3.8. Normal Returns

The positive association between realized returns and *SGER* in Table 3 may be risk compensation and does not assure abnormal returns for investment strategies based on *SGER*. We test for these abnormal returns in this section.

We use a conditional four factor asset pricing model to represent normal returns. Fama and French (1992) suggest a Book/Market factor, a size factor, and a market factor. The Book/Market factor is the return difference between portfolios of high Book/Market (value) and low Book/Market (growth) firms. The economic rationale for a Book/Market factor is that it represents distressed companies that have had poor operating performance in the recent past and that, therefore, have higher than normal leverage. Reinganum (1981, 1983) and Banz (1981) report evidence that small firms have great investment risk with higher returns than can be explained by financial models of the time. Fama and French's (1992) size factor is the return difference between portfolios of small and large cap firms. The CAPM justifies a market factor, which we measure with an index that represents the market portfolio less a risk-free interest rate. Jegadeesh and Titman (1993) report evidence that momentum investment strategies that take long (short) positions in stocks that have had good (poor) share price performance in the recent past earn higher returns than can be explained by financial models of the time. Following, Carhart (1997), Eckbo, Masulius, and Norlio (2000), and Jedadeesh (2000), we include a momentum factor − the return difference between portfolios of "winners" and "losers."

Unconditional asset pricing models, like, Fama and French (1992) and Carhart (1997), presume that expected return and factor loadings are constant over time. However, Ferson and Harvey (1991) present evidence that betas are time varying. Since our sample period is over 31 years for *SGER1* and *SGER2*, and 23 years for *SGER3*, it makes sense to allow for time-variation in the conditional factor loadings. Following Ferson and Harvey (1999), we specify the factor loadings as a linear function of information variables: aggregate dividend yield and the risk-free rate.

From Ken French's website, we download daily returns for the six Fama and French (1993) size and B/M portfolios used to calculate their *SMB* and *HML* portfolios (value-weighted portfolios formed on size and then book/market) and the six size and momentum portfolios (value-weighted portfolios formed on size and return from twelve months prior to one month prior).

We compound daily returns for the riskless rates, for the *CRSP* value weighted portfolio, for the six size-*B/M* portfolios, and for the six size-momentum portfolios between *I/B/E/S* Statistical Period dates. Following the methodology on Ken French's website, we create monthly *SMB*, *HML*, *MOM* risk factors, and the market risk premium that we use to benchmark *SGER* portfolios.

We risk-adjust the 25 Book/Market and *SGER* sorted portfolios with four risk factors in the regression model:

$$R_{b,k,t} - R_{f,t} = \alpha_{b,k} + s_{b,k} SMB_t + h_{b,k} HML_t + m_{b,k} MOM_t + \beta_{b,k}(R_{M,t} - R_{f,t}) + \varepsilon_{b,k,t},$$

$$b=1,2,3,4,5, \quad k=1,2,3,4,5, \quad t = 1,2,\ldots, \mathrm{TP} \qquad (5)$$

$$\begin{aligned}
s_{b,k} &= s_{0,b,k} + s_{1,b,k} DY_{t-1} + s_{2,b,k} R_{f,t} \\
h_{b,k} &= h_{0,b,k} + h_{1,b,k} DY_{t-1} + h_{2,b,k} R_{f,t} \\
m_{b,k} &= m_{0,b,k} + m_{1,m,k} DY_{t-1} + m_{2,b,k} R_{f,t} \\
\beta_{b,k} &= \beta_{0,b,k} + \beta_{1,b,k} DY_{t-1} + \beta_{2,b,k} R_{f,t}
\end{aligned}$$

$$b=1,2,3,4,5, \quad k=1,2,3,4,5, \quad t =1,2,\ldots.\ TP \qquad (6)$$

where $R_{b,k,t}$ denotes the return on portfolio b=1,2,3,4,5, k=1,2,3,4,5, in month t = 1,2,…,TP , $R_{f,t}$, is the riskless rate, DY_{t-1} is the CRSP value-weighted index dividend yield lagged one period, $R_{M,t}$, the return on the market portfolio, is the return on the *CRSP* value weighted index of common stocks in month t, measured between Statistical Period dates by compounding daily *CRSP* value weighted returns, SMB_t and HML_t are the small-minus-big and high-minus-low Fama-French factors, and MOM_t is the momentum factor in month t. The monthly riskless rate, $R_{f,t}$, is the compounded simple daily rate, downloaded from the website of Ken French, that, over the trading days between statistical period dates, compounds to a 1-month TBill rate.

Substituting (6) into (5) for $s_{b,k}$, $h_{b,k}$, $m_{b,k}$, and $\beta_{b,k}$, yields the conditional four-factor model. We test our 25 Book/Market and *SGER* sorted portfolios (b=1,2,3,4,5, k=1,2,3,4,5) on the conditional four-factor model. Tables 6, 7, and 8 report the estimation of regression (5) and (6) for portfolios formed with Book/Market and then *SGER1* (j=1), *SGER2* (j=2), and *SGER3* (j=3), respectively.

3.9. Abnormal Returns

We now turn to abnormal return evidence – non-zero alphas – for the portfolios formed with *SGER1* (j=1), *SGER2* (j=2), and *SGER3* (j=3), in Tables 6, 7, and 8, respectively. The evidence is very strong in Tables 6 and 7 and weaker in Table 8.

We begin with *SGER1* (j=1) and *SGER2*(j=2) portfolios in Tables 6 and 7. In each of these Tables, for each Book/Market quintile, $\hat{\alpha}$ for lowest *SGER* portfolios (k=1 and 2) is always negative, always statistically significant, and generally significant at the one percent level. On the other hand, $\hat{\alpha}$ for middle *SGER* portfolio (k=3) is always negative, but sometimes statistically significant and sometimes not. Finally, $\hat{\alpha}$ for highest *SGER* portfolios (k=4, and 5) is sometimes positive and sometimes negative, but generally not statistically significant at conventional levels. In both Tables 6 and 7, for each Book/Market quintile, b= 1, 2, 3, 4, and 5, Hansen's J-statistic[17] rejects the null hypothesis of alpha equality for the five portfolios within a Book/Market quintile. Further, within Book/Market quintiles, these alpha estimates, $\hat{\alpha}$, increase from most negative for lowest *SGER* portfolio (k=1) to least negative or slightly positive for highest *SGER* portfolio (k=5).

A monotonic relation between $\hat{\alpha}$ and *SGER*, negative and statistically significant $\hat{\alpha}$ estimates for lowest *SGER* portfolio (k=1), and insignificant $\hat{\alpha}$ estimates for highest *SGER* portfolio (k=5) suggest that investors might use *SGER* as a stock selection measure with some benefit. In particular, negative $\hat{\alpha}$ for lowest *SGER* portfolio (k=1) suggests that the best investor use of *SGER* is to identify stocks not to hold or to short in their portfolios. In particular, it appears that investors might use long/short investment strategies to some advantage. Insignificant $\hat{\alpha}_5$ indicates that high realized returns for highest *SGER* portfolio (k=5) within Book/Market quintiles (b=1,2,3,4,5), is not abnormal but risk compensation. Returns are high because risk is high. Investors can reduce this risk and add positive abnormal return to their portfolios by shorting lowest *SGER* portfolio (k=1). We discussed some evidence in Table 1 that portfolio k=5 (high *SGER*) for Book/Market quintiles 3, 4, and 5 (value stocks) are over-weight financial

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[17] Following the methodology in Cochrane (2001, pp. 201-264), TP times the J statistic is χ^2 distributed under the hypothesis that intercepts equal one another, $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = \alpha$, with degrees of freedom equal to the number of over-identifying restrictions minus one in the GMM (Generalized Method of Moments) estimation. See Hansen (1982) for the original development of the J statistic. For the GRS test, Gibbons, Ross, and Shanken (1989), p-values (unreported) are lower than for Hansen's J in Tables 6, 7, and 8.

institutions, SIC codes 6000-6999. An investor can reduce this industry risk, while at the same time add abnormal return, by ensuring that he/she shorts financial institutions from portfolio 1 (low *SGER*) from the corresponding Book/Market quintile.

While useful for both, there is evidence in Tables 6 and 7 that *SGER* is a better stock selection measure for value compared to growth stocks. For Book/Market quintiles 4 and 5 (value stocks) the estimated alpha difference between portfolio k=5 (high *SGER* portfolios) and portfolio k=1 (low *SGER* portfolios) is greater than for Book/Market quintiles b=1 and b=2 (growth stocks). The greatest estimated alpha difference, $\hat{\alpha}_5 - \hat{\alpha}_1$, is 0.88% per month for Book/Market quintile b=4 in Table 6 and 0.68% per month for Book/Market quintile b=5 in Table 7. These alpha differences represent the potential increase in a value investor's average monthly portfolio returns from holding high *SGER* and avoiding low *SGER* stocks. As is the case with any investment study, we cannot distinguish whether these results arise from market inefficiency or risk mis-measurement in the asset pricing model we use for testing.

Table 8 for *SGER3* (j=3) portfolios, adds weakly to the evidence that *SGER* identifies abnormal returns. The evidence in Table 8 is possibly weaker than Tables 6 and 7, for a number of reasons. First, the test period for *SGER3* (j=3) portfolios, 276 months, is shorter than for *SGER1* (j=1) and *SGER2* (j=2) portfolios, 379 months. Second, there are fewer stocks in *SGER3* (j=3) portfolios (on average, 14.9 stocks) compared to *SGER1* (j=1) and *SGER2* (j=2) portfolios (on average, 44.5 and 39.8 stocks, respectively). Both these portfolio characteristics reduce the likelihood of uncovering statistically significant results for *SGER3* (j=3) portfolios. Third, the consensus analyst annual *EPS* forecast for *ROE3* in *SGER3* is for 3 unreported fiscal years hence, approximately 30 months in the future. The shorter term forecasts in *ROE1* and *ROE2* are possibly more informative for uncovering abnormal returns.

In Table 8, for each Book/Market quintile, $\hat{\alpha}$ for lowest *SGER* portfolio (k=1,2) is always negative. On the other hand, $\hat{\alpha}$ for middle and high *SGER* portfolios (k=3,4, and 5) is sometimes positive and sometimes negative, but never statistically significant at conventional levels. For each Book/Market quintile, b=1, 2, 3, 4, 5, Hansen's J-statistic fails to reject the null hypothesis of alpha equality for portfolios within Book/Market quintiles. Last, within Book/Market quintiles, alpha estimates, $\hat{\alpha}$, tend to increase from most negative for lowest

SGER portfolio (k=1) to least negative for highest *SGER* portfolio (k=5). For each Book/Market quintile, $\hat{\alpha}_1$, is always more negative than $\hat{\alpha}_5$.

SGER in Table 3 forecasts some very high per annum returns for the lowest Book/Market quintile (b=1, growth stocks) and highest *SGER* portfolio (k=5). However, the $\hat{\alpha}$ estimate for this portfolio is statistically insignificant in each of Tables 6, 7, and 8, which means that high realized returns are risk compensation. There are also exceptionally high realized returns in Table 3 for the highest Book/Market quintile (b=5, value stocks) and highest *SGER* portfolio (k=4, and 5). For these portfolios as well, the alpha estimates are statistically insignificant in Tables 6, 7, and 8, which means again that realized returns are risk compensation.

4. Profitability Growth, and the Value Premium

4.1. The Value Premium

In this section, we investigate return differences between growth and value firms. There are two corporate determinants of market/book: profitability and growth. We investigate the impact of profitability on risk and return for growth versus value firms.

The dynamic model in section 2 indicates that as profitability (*ROE*) increases, risk can either increase or decrease. Low profitability firms (value firms in the left-most section of Panel A of Figure 3) have either suspended growth or are at risk of suspending growth. Increasing profitability increases the likelihood of incurring ongoing growth leverage, which increases risk and expected return. Value firms have not yet covered the expected costs of growth investment with current profitability (*ROE*), and therefore, value firms have high expected returns, $\omega(ROE)$. On the other hand, profitability (*ROE*) reduces risk for high profitability firms (the right-most section of Panel A of Figure 3). For these firms (growth firms), high profitability covers the costs of grow, which reduces growth leverage risk and decreases expected return. Consequently, growth firms have low expected returns, $\omega(ROE)$. Greater return for value compared to growth firms is the value premium.

Our dynamic model from section 2, depicted in Figures 1 and 4, is consistent with a value premium, but it does not guarantee a value premium. For example, if profitability, *ROE*, of both value and growth firms is lower than depicted in Figure 3, then because the return to value stocks decreases, but the return to growth stocks increases, then the value premium falls and can even reverse and become negative.

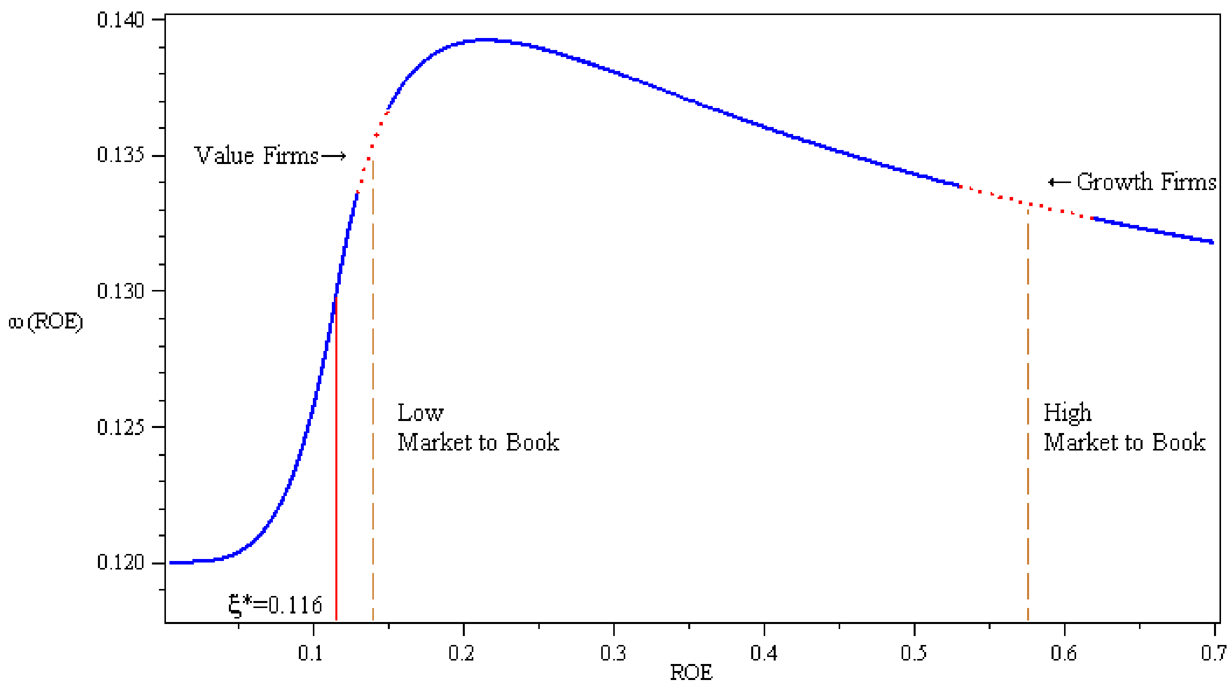
In Table 3, value firms (low market/book) have high realized average returns compared to growth firms (high market/book). For *SGER* measures j=1,2,3 average portfolio returns are lower for growth compared to value firms, $\overline{R}^{j}_{5,k} > \overline{R}^{j}_{1,k}$ j=1,2,3 and k=1,2,3,4,5 (low *SGER* to high *SGER*).[18] This value premium is consistent with higher profitability, *ROE*, for growth stocks compared to value stocks. In Table 2, for *SGER* measures j=1,2,3 median forward *ROE*s are higher for growth compared to value firms, $\overline{ROE}^{j}_{5,k} > \overline{ROE}^{j}_{1,k}$ j=1,2,3 and k=1,2,3,4,5 (low *SGER* to high *SGER*). Profitability measured by forward *ROE* is greater for growth than value firms.

4.2. Profitability, Growth, and the Value Premium

The discussion above indicates that as profitability (*ROE*) increases, risk can either increase or decrease. It increases for value stocks but it decreases for growth stocks. However, holding market/book constant (value versus growth), profitability increases return. In Table 2, for each of the *SGER* measures j=1,2,3, within any Book/Market quintile b=1,2,3,4,5, median forward *ROE* ($\overline{ROE}^{j}_{b,k}$) increases with respect to *SGER* portfolio k=1,2,3,4,5 (low *SGER* to high *SGER*). In addition, in Table 3, for each of the *SGER* measures j=1,2,3, within any Book/Market quintile b=1,2,3,4,5, realized average portfolio returns $\overline{R}^{j}_{b,k}$ increase with respect to *SGER* portfolio k=1,2,3,4,5, (low *SGER* to high *SGER*). Panel B of Figure 4 plots this relation between return, $\overline{R}^{j}_{b,k}$, k=1,2,3,4,5, and profitability, $\overline{ROE}^{j}_{b,k}$, k=1,2,3,4,5, for growth (b=1) and value stocks (b=5) for portfolios sorted by *SGER1*, j=1. For both value (b=5) and growth (b=1) portfolios, return increases with profitability. That is, $\overline{R}^{1}_{5,k}$ increases with $\overline{ROE}^{1}_{5,k}$, k=1,2,3,4,5, and $\overline{R}^{1}_{1,k}$ increases with $\overline{ROE}^{1}_{1,k}$, k=1,2,3,4,5. Fama and French (2006) and Haugen and Barker (1996) report evidence that holding Book/Market constant, returns increase with profitability. However, they neither offer an explanation, nor do they compare value to growth firms.

[18] In Table 3, there is only one exception to the observation that value portfolios have higher realized returns than growth portfolios. That is, $\overline{R}^{3}_{5,1} = 0.118 < \overline{R}^{3}_{1,1} = 0.119$.

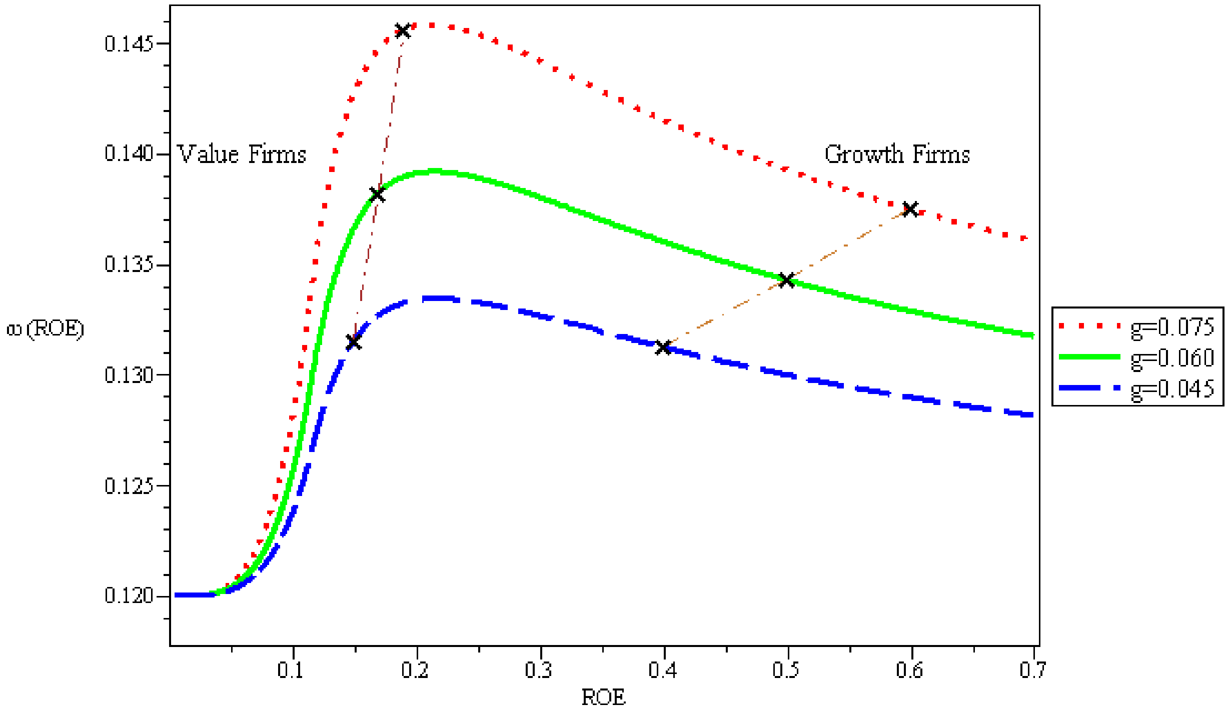
Figure 3 Expected Return and Value Premium



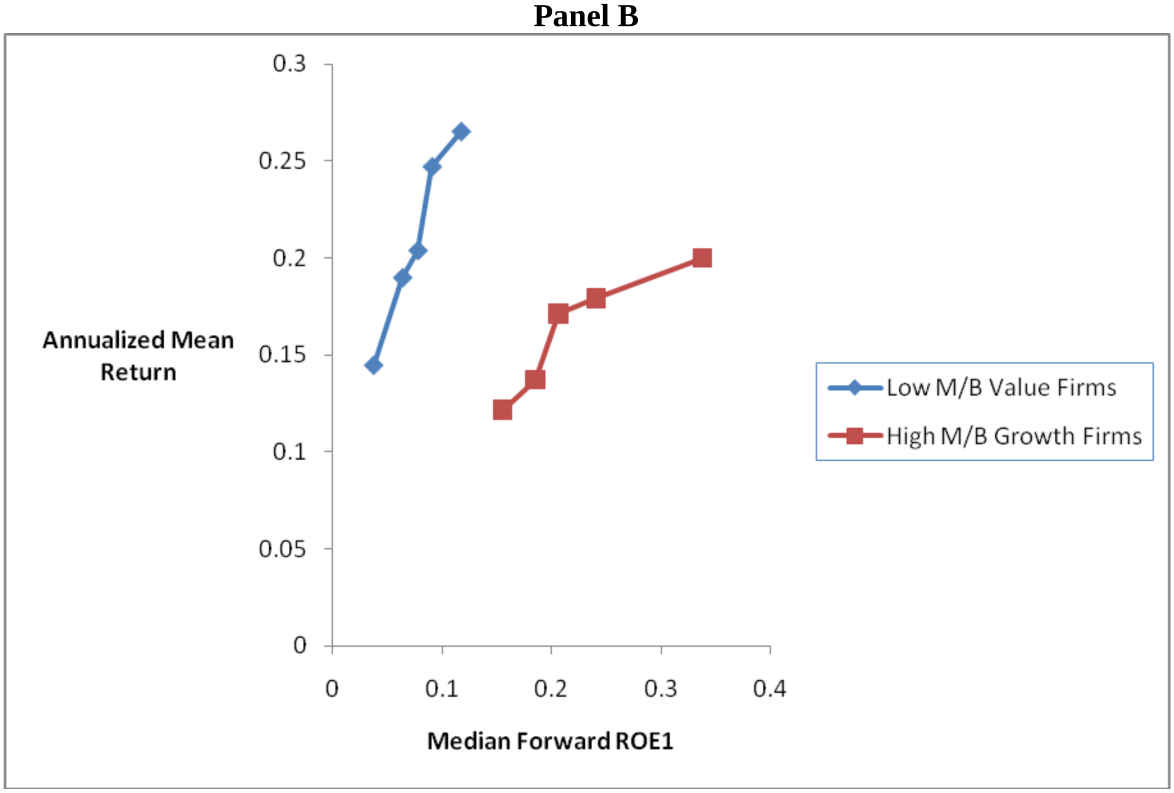
Notes: Figure 3 plots expected return, $\omega(ROE)$, versus profitability, *ROE*, with earnings volatility, σ=0.2, real earnings growth, *g*=0.06, and a risk adjusted rate for a hypothetical permanent "growth-suspension" firm, *r**=0.12.

Figure 4 Profitability, Growth, and the Value Premium

Panel A



Panel B



Notes: Figure 4 Panel A plots expected return, $\omega(ROE)$, versus profitability, *ROE*, for different real earnings growth, g=0.075, g=0.06, g=0.045, with earnings volatility, σ=0.2, and a risk adjusted rate for a permanent "growth-suspension" firm, r^*=0.12. Panel B plots the relation between annualized mean return, $\overline{R}^{1}_{b,k}$, k=1,2,3,4,5, from Table 3, and median profitability, $\overline{ROE}^{1}_{b,k}$, k=1,2,3,4,5, from Table 2, for growth (b=1) and value stocks (b=5) for portfolios sorted by *SGER1*.

Holding Book/Market constant, there are two forces that impact returns as profitability *ROE* increases with the result that returns increase with profitability. First, as we discuss above in section 4.1, in the dynamic model, holding maximum growth, *g*, constant, profitability, *ROE*, can either increase or decrease risk as represented in Figure 1. Profitability, *ROE*, increases risk for value stocks, but profitability decreases risk for growth stocks. Second, there is evidence in Table 2, that profitability increases growth. In Table 2, for each of the *SGER* measures *j*=1,2,3, within any Book/Market quintile *b*=1,2,3,4,5, median forward *ROE* ($\overline{ROE}_{b,k}^{j}$) increases and also implicit growth, $\overline{g}_{b,k}^{j}$, increases with respect to *SGER* portfolio *k*=1,2,3,4,5 (low *SGER* to high *SGER*). Because we use both analysts' earnings forecasts (for *ROE*) and market/book in $\overline{g}_{b,k}^{j}$, implicit growth is a combination of analysts' and the market's assessment of growth for firms in portfolio, *j*, *b*, *k*. However, we do have to use caution when using and interpreting this growth measure, because there is some evidence in Table 3 as we discuss in section 3.5 that accounting *ROE* calculated with analysts' earnings forecasts over states economic *ROE* for growth stocks and understates economic *ROE* for value stocks.

Panel A of Figure 4 plots expected return, $\omega(ROE)$, with respect to profitability, *ROE*, for different growth rates, *g*. For value firms (low market to book and low profitability), profitability, *ROE*, increases risk and expected return, $\omega(ROE)$, holding growth, *g*, constant (that is, on any one of the curves, *g*=0.045, *g*=0.06, or *g*=0.07). On the other hand, in addition, profitability increases growth, which Panel A of Figure 4 depicts as shifting upward to a higher growth curve. Higher growth, *g*, increases growth leverage risk for any level of profitability, *ROE*, which increases expected return, $\omega(ROE)$. For value firms, these two forces work together to increase expected return, $\omega(ROE)$. Because these two forces work together to increase return with profitability, the relationship depicted for value firms at the left most section of Panel A of Figure 4 between expected return, $\omega(ROE)$, and profitability, *ROE*, is steep compared to growth firms at the right most section. Empirically, Panel B of Figure 4 depicts this pronounced relation between returns and profitability for value portfolios in the left most curve.

For growth firms (high market to book and high profitability), profitability, *ROE*, decreases risk and expected return, $\omega(ROE)$, holding growth, *g*, constant (that is, on any one of the curves,

g=0.045, g=0.06, or g=0.075) in Panel A of Figure 4. On the other hand, in addition, profitability increases growth, which Panel A of Figure 4 depicts as shifting upward to a higher growth curve, which increases expected return, $\omega(ROE)$. For growth firms, these two forces work in opposite directions and therefore, either effect might dominate. Profitability, *ROE*, might either increase or decrease returns, $\omega(ROE)$, for growth firms. However, because these two forces work in opposite directions, regardless of whether it is positive or negative, we expect the relation between returns and profitability to be lesser for growth stocks compared to value stocks. In the right–most curve in Panel B of Figure 4, the empirical relation between returns and profitability is positive, but less steep for growth compared to value stocks. That is, the relation between $\overline{R}^{1}_{1,k}$ and $\overline{ROE}^{1}_{1,k}$, k=1,2,3,4,5 is weaker than is the relation between $\overline{R}^{1}_{5,k}$ and $\overline{ROE}^{1}_{5,k}$, k=1,2,3,4,5.

More formally, Table 9 reports the regression slopes of portfolio return on profitability, *ROE*. In each statistical period, we estimate a cross sectional regression of monthly stock return on forward *ROE* (separately for *ROE1*, *ROE2*, and *ROE3*) for each market/book quintile (b=1,2,3,4,5).

$$R_{i,t,b} = \gamma_{0,t,b} + \gamma_{1,t,b} ROE_{i,t,b} + u_{i,t,b},$$

where $R_{i,t,b}$ is the monthly return and $ROE_{i,t,b}$ is forward *ROE*, for firm i=1,2,...,N, in book/market quintile b=1,2,3,4,5, in statistical period t=1,2,...,TP, $u_{i,t,b}$ is an error term, $\gamma_{0,t,b}$ and $\gamma_{1,t,b}$ are intercept and slope coefficients.

For each Book/Market quintile (b=1,2,3,4,5), Table 9 reports the average of cross-sectional estimated slopes coefficients, $\overline{\gamma}_{1,b}$ in the regression of portfolio return on *ROE* over the 379 statistical periods for *SGER1* and *SGER2* portfolios (j=1,2) and 276 months for *SGER3* portfolios (j=3). Generally, the slope, $\overline{\gamma}_{1,b}$, increases monotonically with book/market (b=1,2,3,4,5) for *SGER1*, *SGER2*, and *SGER3* portfolios (j=1,2,3). All of the slopes, $\overline{\gamma}_{1,b}$, are positive with the exception of growth stocks (b=1) in *SGER3* portfolios. Holding book/market constant, the relation between returns and profitability is positive. The slope for value stocks

(b=5), $\bar{\gamma}_{1,5}$, are greater than growth stocks (b=1), $\bar{\gamma}_{1,1}$, for *SGER1*, *SGER2*, and *SGER3* portfolios (j=1,2,3). Statistical tests for slope differences between growth stocks (b=1) and value stocks (b=5), $\bar{\gamma}_{1,5} - \bar{\gamma}_{1,1}$, are all strongly significant for *SGER1*, *SGER2*, and *SGER3* portfolios (j=1,2,3). These results are consistent with our dynamic model and our discussion associated with Panel A of Figure 4. The positive relation between returns and profitability is stronger for value compared to growth stocks.

4.3. Limits to Growth

Both the static constant growth discounted dividend model in Appendix B (Williams 1938; Brealey, Myers, Allen 2006, chapter 4) and Blazenko and Pavlov's (2009) dynamic equity valuation model presume limits to growth. Appendix B for the static model and section 2 for the dynamic model, represent these limits with the growth parameter, g, which does not change with other corporate characteristic including profitability, *ROE*. Profitability does not enhance the maximum rate at which a firm can grow. Limited investment is consistent with convex investment adjustment costs (Hayashi 1982; Abel and Eberly 1994; Kogan 2004). Tobin (1969) also limits investment because, otherwise, businesses invest (or divest) until q equals unity.[19] There is evidence in Tables 2 and 3 of limits to growth, but there is also evidence of violations to this presumption.

The value premium in Table 3, lower returns to growth firms compared to value firms, is consistent with higher profitability for growth firms compared to value firms in Table 2 and growth firms better "covering" their growth investments with profitability. Risk and return are lower for growth firms. This better "covering" and reduced risk is consistent with limits to growth and a modest impact of profitability on corporate growth.

On the other hand, there is also evidence that profitability increases growth, which implies that growth is not strictly limited. In Table 2, within any Book/Market quintile, b=1,2,3,4,5, both forward *ROE*, $\overline{ROE}^{j}_{b,k}$, and implicit growth, $\bar{g}^{j}_{b,k}$, increase from low *SGER* portfolios to high *SGER* portfolios, k=1,2,3,4,5. Also, Panel B of Figure 4 show a positive relation between

[19] Tobin's q is asset value divided by replacement cost, which empiricists generally measure with accounting capital. Firms invest when q exceeds one because Tobin presumes that q represents both the average and marginal impact of investment on value. Hayashi (1982) distinguishes between average and marginal q.

profitability and return for both value stocks and growth stocks. Table 9 reports statistically significant evidence that the positive relation between profitability and return is stronger for value compared to growth firms. These results are consistent with our discussion of Panel A of Figure 4 that the positive relation between profitability and return for growth stocks is weaker than that for value stocks.

5. Expected Return versus Earnings Volatility

In standard option pricing theory, Galai and Masulis (1976), the expected return on a call option decreases with volatility. Volatility increases the expected payoff to option exercise relative to the expected cost of buying the underlying asset through the option contract. An increase in payoff relative to cost is a leverage (risk) reduction that decreases expected option return. Unlike Galai and Masulis (1976), we find that earnings volatility, σ, can increase or decrease expected return, $\omega(ROE)$. Figure 5 plots expected return, $\omega(ROE)$, and the expansion boundary, ξ^*, versus earnings volatility, σ. Holding profitability constant, *ROE*=0.105, and with a growth rate, *g*=0.06, expected return $\omega(ROE)$ increases with earnings volatility, σ, when volatility, σ, is small and market/book is less than one ($\pi < 1$). In Galai and Masulis (1976), volatility does not change the exercise price of the call option. However, in our dynamic equity valuation model, earnings volatility, σ, decreases the equivalent, the value maximizing expansion boundary, ξ^*. For an indefinite sequence of growth options that are undiminished by the exercise of any of these opportunities, the manager is relatively more concerned with upside earnings potential rather than downside earnings risk. While greater volatility increases both upside potential and downside risk, the manager focuses on greater upside potential. Increased value appeal of business expansion to the manager reduces the value maximizing expansion boundary, ξ^*. A lower expansion threshold means that the manager expands with investments that have more marginal profitability, *ROE*. Lower profitability means greater growth leverage risk, and therefore, in the leftmost section of Figure 5, expected return, $\omega(ROE)$, increases with earnings volatility, σ.

On the other hand, when market/book is greater than one, $\pi \geq 1$, the fall in the value maximizing expansion boundary, ξ^*, with volatility, σ, is generally less pronounced than when market/book is less than one, $\pi < 1$. In this case, the Galai and Masulis (1976) effect tends to dominate, and therefore, for market/book greater than one, $\pi \geq 1$, the rightmost section of Figure 5, earnings volatility, σ, generally decreases expected return, $\omega(ROE)$. Notice, however, that these two forces appear to be rather balanced, and therefore, earnings volatility, σ, has only a modest impact on expected return, $\omega(ROE)$, for market/book greater then one, $\pi \geq 1$. Because our empirical testing focuses on firms with economic market/book greater than one, we expect that earnings volatility will have at best a modest impact on equity returns.

In Table 2, only value firms, *b*=5, have market/book less than one. As we discuss in section 3.5, the evidence in Table 3, is consistent with forward accounting *ROE*, calculated with analysts' forecast *EPS*, understates economic *ROE* for value firms and overstates economic *ROE* for growth firms. Forward accounting *ROE* understates economic *ROE* if accounting book equity overstates the equity capital required for growth. If accounting book equity overstates economic book equity, market to economic book equity is likely greater than one, even for Book/Market quintile *b*=5, value firms in Table 2. Table 2 also reports that, regardless of market/book, all firms have positive implicit growth rates, and therefore, are growth-oriented.

Recent literature documents a negative relation between past idiosyncratic return volatility and future returns (Ang et. al 2006, 2009). Barinov (2007) argues that high idiosyncratic volatility decreases the beta of growth options, which decreases expected return. Studies show that, as an earnings volatility measure, analysts' forecast dispersion has a negative relation with future returns. Han and Manry (2000) find that analysts' forecasts dispersion is negatively related to future *ROE* and future returns. They argue that firms anticipating good prospects are more willing to disclose information to analysts, which reduces forecast dispersion. Diether et. al (2002) report that stocks with higher dispersion earn lower future risk-adjusted returns than stocks with lower dispersion. They argue that because of analysts' optimism and short-sale constraints, high dispersion drives up the stock prices, which reduces expected return. Johnson (2004) suggests that analysts' forecast dispersion proxies for idiosyncratic uncertainty about the future cash flows of levered firms. Idiosyncratic risk increases the option value of equity, which decreases expected return. Sadma and Scherbina (2007) regard the high forecast dispersion associated lower stock returns as mispricing. They find that dispersion is negatively correlated with market liquidity. However, Avramov et. al (2009) show that dispersion effects are not significantly different for levered and unlevered firms and liquidity measures do not capture the dispersion effect. They suggest that the dispersion anomaly is more pronounced for financially distressed firms. We investigate the impact of volatility on expected return beyond market/book and *SGER*.

Table 10 reports the relation between returns and several measures of volatility, including, analysts' earnings forecast dispersion, daily return volatility, and earnings growth volatility. Analysts' earnings forecast dispersion is the standard deviation of analysts' *EPS* forecasts, $\sigma(EPS)$, for the fiscal period scaled by book value of equity per share (*BPS*). Denote by *DISP1* the analysts' earnings forecast dispersion for the first unreported fiscal year hence, $DISP1 \equiv \sigma(EPS1)/BPS$. Denote daily stock return volatility as $\sigma(R)$. Daily stock return volatility, $\sigma(R)$, is the standard deviation of daily returns for sixty days prior to the *I/B/E/S* Statistical Period date. Denote earnings growth volatility as $\sigma(E)$. Earnings volatility, $\sigma(E)$, is the standard deviation of *ROE* changes for the latest 5 fiscal years scaled by the most recently reported book value of equity (*BVE*),

$$\sigma(E) = \frac{\sigma(\Delta E)}{BVE}$$

For each Statistical Period date, we sort firms into Book/Market triplets (Low, Med, and High). Then, for each Book/Market triplet we sort firms into *SGER1* triplets (Low, Med, and High). Finally, we sort the firms within each of the nine Book/Market and *SGER1* sorts into three volatility portfolios (Low, Med, and High). This triple sorting leads to twenty-seven portfolios that we rebalance at each Statistical Period date over the 379 month test period. Because the first two sorts are common (Book/Market and *SGER1*), but we use three different volatility measures, *DISP1*, $\sigma(R)$, and $\sigma(E)$, as the third sorting key, we investigate $3\times 27 = 81$ portfolios over the 379 month test period.

We measure annualized mean portfolio returns within the statistical period τ =1,2,…,T (from a Statistical Period date, where we form a portfolio, to the following Statistical Period date, which is approximately a month later), average over firms *i*=1,2,…,N, and test period *t*=1,2,…,379, for volatility portfolios *v*=1,2,…,27,

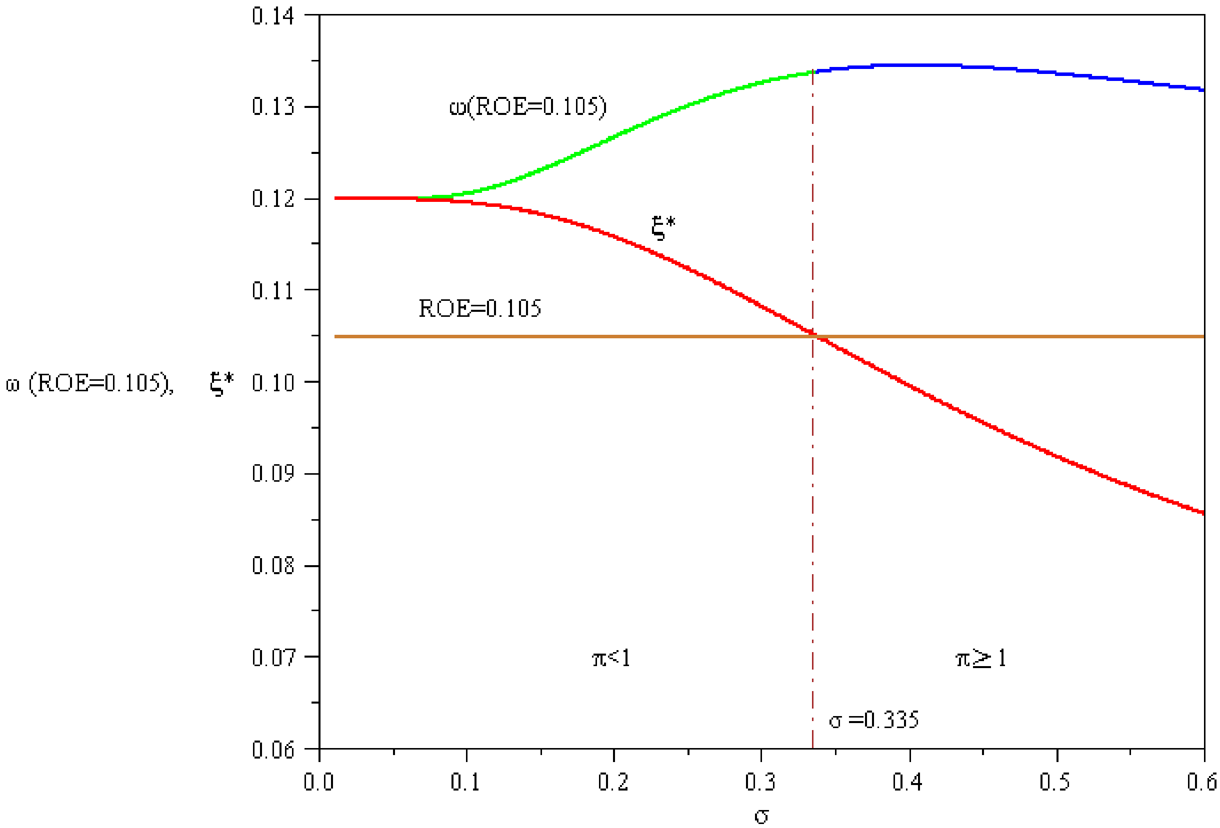
$$\overline{R}_v = \left[1 + \frac{1}{379}\sum_{t=1}^{379}\left[\frac{1}{N}\sum_{i=1}^{N}\left[\left[\prod_{\tau=1}^{T_t}(1+r_{i,t,\tau,v})\right]-1\right]\right]\right]^{12} - 1$$

where τ =1,2,…,T, i=1,2,…,N, t=1,2,…,379, v=1,2,…,27.

Table 10 reports the average monthly portfolio returns of 81 Book/Market, *SGER*1, and volatility sorted portfolios. Consistent with Han and Manry (2000), and Diether et. al (2002), within most Book/Market – *SGER1* sorts the relation between analysts' forecast dispersion (*DISP1*) and portfolio returns is negative. However, the F-statistics for the differences between mean returns among volatility portfolios (within each Book/Market –*SGER1* sort) are all insignificant, which suggests a weak relation. For the other volatility measures, $\sigma(R)$, and $\sigma(E)$, within most Book/Market – *SGER1* sorts the relation between volatility and portfolio return tends to be positive, but also statistically insignificant.

Consistent with our dynamic model and our analysis from section 2.4, Table 10 reveals at best only a weak relation between earnings volatility and equity returns. The evidence is so weak and inconsistent between volatility measures that we conclude that *SGER* on its own is a useful measure for common share investing.

Figure 5 Expected Return and Volatility



Notes: Figure 5 plots the expected return $\omega(ROE = 0.105)$ and value maximization expansion boundary, ξ^*, with respect to volatility, σ, with a real earnings growth, *g*=0.06, and a risk adjusted rate for a permanent "growth-suspension" firm, *r**=0.12.

6. Summary, Conclusion, Future Research

We develop an expected return measure from a dynamic equity valuation model. We entitle the portion of this measure that is easy to calculate with readily available financial market measures and does not require statistical estimation as static growth expected return (*SGER*). We use analysts' earnings forecasts as an *SGER* input to rank firms for portfolio inclusion. We find that portfolios of low *SGER* firms have negative excess returns − negative alphas − in a four factor conditional asset pricing model. The estimated alpha difference between high and low *SGER* portfolios is as great as 0.88% per month. Without generating abnormal returns for investors, we find that analysts make favorable stock recommendations and most optimistically forecast earnings for high *SGER* firms. Consistent with the dynamic model, holding Book/Market constant, returns increase with profitability to a greater extent for value compared to growth firms. We find little statistical or economic significance for earnings volatility beyond *SGER* for returns. This observation is consistent with *SGER* as a large portion of expected return from the dynamic model. We conclude that *SGER* on its own is a useful return measure for common share investing.

We began this paper by arguing that investors' risk/return calculus is weak because of lack of simple expected return proxies. Estimated factor coefficients like in Tables 6, 7, 8 help this calculus, but are incomplete because they do not include factor expected returns in the expectation of the right hand side of Equation (5). This absence means that the impact of factor coefficients on expected return is unclear and makes the application of empirical asset pricing models difficult. A high factor coefficient does not mean high risk if factor returns are low or other factor coefficients are modest. The relation between *SGER* as a complete expected return measure and estimated factor coefficients fills this gap and allows a comprehensive risk/return study. We hope that *SGER* and its descendants assist investors in their risk/return calculus.

Like any good empirical analysis, our study suggests avenues for future research. First, we report evidence that, while analysts optimistically forecast *EPS* in general, *SGER* based on these forecasts over-states realized returns for growth stocks and under-states realized returns for value stocks. A likely source of this bias is forward accounting *ROE*. If forward accounting *ROE* overstates economic *ROE* for growth firms, but understates economic *ROE* for value firms, then adjustments might improve the correspondence between *SGER* and realized returns.

Second, we report evidence that analysts most optimistically forecast *EPS* for high expected return firms. We conjecture that these forecasts are self-serving and for the purpose of persuading investors into stocks with the greatest potential for reputation enhancement of analysts. Why the possibility of unexpectedly low returns on high risk stocks does not dissuade analysts is a puzzle that requires investigation. This puzzle is possibly related to evidence from the mutual fund industry (Ippolito 1992) that the performance-flow relation is convex. Investors reward good fund performance with inflows disproportionately greater than they penalize poor fund performance with outflows. In our setting, analysts' reputation gain from winners may exceed their reputation loss from losers.

Third, an attraction of our expected return proxy is that it requires no estimation. Since mean-variance efficient portfolio weights are sensitive to estimation risk (see, for example, Chopra and Ziemba, 1993) our expected return proxy may be useful for optimal portfolio design. We investigate this issue in future research, which requires better corporate profitability forecasts than the crude ones we use in the current paper. However, results in the current paper will guide our search.

Fourth, the current paper investigates dividend paying stocks with positive forecast earnings. We are currently working on dynamic models of equity valuation for firms not currently paying dividends and who instead use earnings to finance growth. This presumption is consistent with the empirical observation in this paper that holding the Book/Market ratio constant profitability increases growth. Growth is not limited, as both the constant growth discounted dividend model of Williams (1938) and Blazenko and Pavlov's (2009) dynamic equity valuation model presume, but rather growth opportunities increase with profitability.

Table 1: Descriptive Statistics

Book/Market Quintile	*SGER* Quintile	Portfolio Ranking Measure: *SGER1*	*SGER2*	*SGER3*	Portfolio Ranking Measure: *SGER1*	*SGER2*	*SGER3*	Portfolio Ranking Measure: *SGER1*	*SGER2*	*SGER3*
		Median Market Cap (millions) $MVE^{1}_{b,k}$	$MVE^{2}_{b,k}$	$MVE^{3}_{b,k}$	Most Common 1-Digit SIC			Percent of Firms with Most Common 1-Digit SIC		
Lowest Book/Market b=1 Growth Stocks	Lowest *SGER* k=1	1091.8	1361.1	4364.4	2000	2000	2000	29.0	31.1	30.5
	k=2	1713.5	1820.5	5522.2	2000	2000	2000	32.8	33.2	32.5
	k=3	1517.2	1664.1	6774.7	2000	2000	2000	30.0	29.3	31.1
	k=4	1112.4	1248.0	6419.7	2000	2000	2000	28.3	28.2	34.1
	Highest *SGER* k=5	1097.3	1278.3	5908.5	3000	3000	2000	26.8	26.3	35.5
b=2	Lowest *SGER* k=1	782.9	989.5	3074.0	2000	2000	2000	24.1	27.3	28.5
	k=2	825.6	916.2	3000.5	2000	2000	2000	27.8	27.2	27.0
	k=3	689.5	855.7	3053.3	3000	3000	6000	25.6	26.2	26.5
	k=4	677.3	779.9	2984.2	6000	6000	3000	29.0	29.6	27.6
	Highest *SGER* k=5	483.4	574.4	2417.5	3000	3000	3000	30.3	31.6	31.3
b=3	Lowest *SGER* k=1	540.2	655.7	2128.1	3000	4000	4000	22.6	25.3	33.3
	k=2	486.2	565.2	2277.4	6000	6000	2000	25.8	28.9	26.2
	k=3	414.4	489.3	2329.5	6000	6000	6000	34.9	36.8	35.6
	k=4	425.5	519.3	2237.9	6000	6000	6000	45.2	45.8	44.7
	Highest *SGER* k=5	431.8	492.1	2231.1	6000	6000	6000	44.4	41.0	33.7
b=4	Lowest *SGER* k=1	377.0	536.5	1528.1	4000	4000	4000	21.3	32.6	48.2
	k=2	485.6	601.2	1986.7	4000	4000	4000	37.6	39.8	55.8
	k=3	361.1	431.2	1752.1	6000	6000	4000	32.2	34.6	29.9
	k=4	330.3	401.3	1979.9	6000	6000	6000	46.9	46.4	39.4
	Highest *SGER* k=5	355.8	429.8	1991.0	6000	6000	6000	54.5	52.4	46.1
Highest Book/Market b=5 Value Stocks	Lowest *SGER* k=1	190.7	248.8	1051.6	2000	6000	4000	24.1	23.2	34.7
	k=2	242.4	449.4	2020.4	4000	4000	4000	25.6	39.6	65.3
	k=3	372.8	515.4	2159.6	4000	4000	4000	40.5	42.7	60.1
	k=4	343.9	380.3	1547.1	4000	6000	4000	35.4	33.7	38.6
	Highest *SGER* k=5	254.3	320.4	1318.6	6000	6000	6000	53.5	54.9	44.4

Notes: $MVE^{j}_{i,t,b,k}$ is market value of equity for firm i=1,2,…,N, in month t=1,2,…,TP, for portfolio b=1,2,3,4,5, k=1,2,3,4,5, where the 25 portfolios are formed by sorting all firms at a statistical period date by Book/Market into 5 quintiles and then for each quintile into 5 portfolios by *SGER1* (j=1), *SGER2* (j=2), and *SGER3* (j=3), respectively. TP is 379 months (1/15/1976 to 8/16/2007) for *SGER1* and *SGER2* and 276 months (9/20/1984 to 8/18/2007) for *SGER3*. Table 1 reports $median(MVE_{i,t,b,k}, i=1,2,...,N, t=1,2,...,TP)$. The numbering 1,2, and 3 represents sorting by *SGER1*, *SGER2*, and *SGER3*. Our three *ROE* forecasts are *EPS1/BPS*, *EPS2/BPS*, and *EPS3/BPS*, where the earnings forecasts are at a Statistical Period date and *BVE* is from the most recently reported quarterly/annual financial statements prior to the Statistical Period date. *BPS* is *BVE* divided by the number of shares on each Statistical Period date. *SGER1*, *SGER2*, and *SGER3* represent Equation (3) calculated with *ROE1*, *ROE2*, and *ROE3*. *EPS1*, *EPS2*, and *EPS3 are I/B/E/S* consensus analysts *EPS* forecasts for the first unreported fiscal year, second unreported fiscal year, and third unreported fiscal year at a Statistical Period date.

Table 2: Portfolio Characteristics

		Median Market/Book, Dividend Yield, Forward *ROE*, Implicit Growth											
		Market/Book			Current Dividend Yield			Forward ROE			Implicit Growth		
Book/Market Quintile	*SGER* Quintile	M/B1	M/B2	M/B3	dy1	dy2	dy3	$\overline{ROE}^{1}_{b,k}$	$\overline{ROE}^{2}_{b,k}$	$\overline{ROE}^{3}_{b,k}$	$\bar{g}^{1}_{b,k}$	$\bar{g}^{2}_{b,k}$	$\bar{g}^{3}_{b,k}$
Lowest Book/Market b=1 Growth Stocks	Lowest *SGER* k=1	3.263	3.224	3.521	0.024	0.024	0.022	0.156	0.186	0.210	0.078	0.082	0.084
	k=2	3.284	3.304	3.678	0.018	0.017	0.015	0.185	0.215	0.247	0.120	0.122	0.124
	k=3	3.511	3.586	4.185	0.015	0.015	0.013	0.206	0.241	0.286	0.147	0.148	0.150
	k=4	3.894	3.971	4.901	0.014	0.013	0.012	0.240	0.283	0.349	0.177	0.177	0.180
	Highest *SGER* k=5	5.172	5.460	7.592	0.012	0.012	0.012	0.338	0.402	0.545	0.253	0.250	0.261
b=2	Lowest *SGER* k=1	2.088	2.113	2.364	0.027	0.028	0.029	0.109	0.133	0.140	0.051	0.053	0.044
	k=2	2.100	2.131	2.383	0.024	0.024	0.021	0.140	0.161	0.171	0.087	0.087	0.081
	k=3	2.135	2.170	2.423	0.022	0.022	0.019	0.156	0.178	0.193	0.105	0.105	0.101
	k=4	2.165	2.206	2.462	0.021	0.020	0.017	0.173	0.197	0.216	0.124	0.123	0.117
	Highest *SGER* k=5	2.217	2.265	2.491	0.018	0.017	0.014	0.208	0.235	0.259	0.160	0.157	0.145
b=3	Lowest *SGER* k=1	1.544	1.562	1.748	0.033	0.035	0.038	0.086	0.105	0.109	0.035	0.036	0.028
	k=2	1.547	1.575	1.762	0.029	0.029	0.025	0.115	0.132	0.137	0.068	0.068	0.059
	k=3	1.560	1.589	1.784	0.028	0.027	0.023	0.131	0.148	0.159	0.085	0.084	0.081
	k=4	1.572	1.602	1.791	0.028	0.026	0.021	0.147	0.164	0.179	0.101	0.101	0.097
	Highest *SGER* k=5	1.582	1.615	1.808	0.025	0.022	0.016	0.175	0.194	0.216	0.131	0.127	0.120
b=4	Lowest *SGER* k=1	1.170	1.186	1.328	0.035	0.040	0.048	0.068	0.084	0.088	0.024	0.022	0.018
	k=2	1.170	1.189	1.331	0.040	0.039	0.039	0.092	0.103	0.106	0.046	0.044	0.034
	k=3	1.179	1.205	1.355	0.034	0.032	0.029	0.105	0.119	0.124	0.065	0.064	0.057
	k=4	1.197	1.221	1.365	0.032	0.029	0.025	0.123	0.137	0.146	0.083	0.082	0.077
	Highest *SGER* k=5	1.211	1.237	1.371	0.029	0.027	0.020	0.151	0.166	0.183	0.111	0.108	0.103
Highest Book/Market b=5 Value Stocks	Lowest *SGER* k=1	0.698	0.689	0.788	0.029	0.029	0.031	0.037	0.051	0.055	0.015	0.018	0.015
	k=2	0.780	0.827	0.918	0.037	0.043	0.047	0.064	0.075	0.077	0.035	0.028	0.021
	k=3	0.835	0.845	0.928	0.049	0.048	0.045	0.078	0.086	0.088	0.039	0.035	0.027
	k=4	0.833	0.847	0.940	0.050	0.041	0.036	0.091	0.101	0.105	0.053	0.052	0.039
	Highest *SGER* k=5	0.839	0.877	0.999	0.042	0.037	0.025	0.117	0.128	0.140	0.082	0.078	0.069

Notes: $M/B_{i,t,b,k}$, $dy_{i,t,b,k}$, $\overline{ROE}^{j}_{b,k}$, and $\bar{g}^{j}_{b,k}$ are Market/Book, current dividend yield, forward *ROE*, and implicit growth (Equation (C3)), for firm i=1,2,…,N, in month t=1,2,…,TP, for portfolio b=1,2,3,4,5, k=1,2,3,4,5, where the 25 portfolios are formed by sorting all firms at a statistical period date by Book/Market into 5 quintiles and then for each quintile into 5 portfolios by *SGER1* (j=1), *SGER2* (j=2), and *SGER3* (j=3), respectively. TP is 379 months (1/15/1976 to 8/16/2007) for *SGER1* and *SGER2* and 276 months (9/20/1984 to 8/18/2007) for *SGER3*. Table 2 reports $median(M/B_{i,t,b,k},\ i=1,2,...,N,\ t=1,2,...,TP)$, $median(dy_{i,t,b,k},\ i=1,2,...,N,\ t=1,2,...,TP)$, $\overline{ROE}^{j}_{b,k} = median(ROE_{i,t,b,k},\ i=1,2,...,N,\ t=1,2,...,TP)$, and $\bar{g}^{j}_{b,k} = median(g_{i,t,b,k},\ i=1,2,...,N,\ t=1,2,...,TP)$. The numbering 1,2, and 3 represents sorting by *SGER1* (j=1), *SGER2* (j=2), and *SGER3* (j=3). Our three *ROE* forecasts are *EPS1/BPS*, *EPS2/BPS*, and *EPS3/BPS*, where the earnings forecasts are at a Statistical Period date and *BVE* is from the most recently reported quarterly/annual financial statements prior to the Statistical Period date. *BPS* is *BVE* divided by the number of shares on each Statistical Period date. *SGER1*, *SGER2*, and *SGER3* represent Equation (3) calculated with *ROE1*, *ROE2*, and *ROE3*. *EPS1*, *EPS2*, and *EPS3 are I/B/E/S* consensus analysts *EPS* forecasts for the first unreported fiscal year, second unreported fiscal year, and third unreported fiscal year at a Statistical Period date.

Table 3: Realized Portfolio Returns, Expected Portfolio Returns, and Realized Minus Expected Portfolio Returns

Book/Market Quintile	*SGER* Quintile	Average Portfolio Returns $\overline{R}^{1}_{b,k}$	$\overline{R}^{2}_{b,k}$	$\overline{R}^{3}_{b,k}$	Expected Portfolio Returns, $\overline{SGER}^{1}_{b,k}$	$\overline{SGER}^{2}_{b,k}$	$\overline{SGER}^{3}_{b,k}$	Realized less Expected Returns, $\overline{R}^{1}_{b,k}-\overline{SGER}^{1}_{b,k}$	$\overline{R}^{2}_{b,k}-\overline{SGER}^{2}_{b,k}$	$\overline{R}^{3}_{b,k}-\overline{SGER}^{3}_{b,k}$
Lowest Book/Market b=1 Growth Stocks	Lowest *SGER* k=1	0.100	0.092	0.119	0.083	0.114	0.142	0.017	-0.022	-0.023
	k=2	0.115	0.117	0.137	0.142	0.171	0.200	-0.026	-0.054	-0.063
	k=3	0.151	0.146	0.141	0.166	0.198	0.236	-0.014	-0.053	-0.095
	k=4	0.156	0.163	0.153	0.196	0.235	0.288	-0.040	-0.072	-0.134
	Highest *SGER* k=5	0.173	0.169	0.137	0.321	0.384	0.509	-0.147	-0.215	-0.373
b=2	Lowest *SGER* k=1	0.104	0.094	0.106	0.072	0.095	0.099	0.032	0.000	0.007
	k=2	0.114	0.114	0.167	0.114	0.135	0.144	0.001	-0.021	0.024
	k=3	0.148	0.145	0.157	0.131	0.153	0.167	0.016	-0.008	-0.010
	k=4	0.168	0.171	0.117	0.150	0.173	0.192	0.018	-0.002	-0.075
	Highest *SGER* k=5	0.197	0.194	0.157	0.194	0.222	0.251	0.002	-0.029	-0.094
b=3	Lowest *SGER* k=1	0.114	0.108	0.134	0.066	0.085	0.084	0.048	0.024	0.050
	k=2	0.129	0.139	0.100	0.100	0.117	0.120	0.029	0.022	-0.021
	k=3	0.167	0.170	0.163	0.117	0.134	0.143	0.050	0.036	0.021
	k=4	0.203	0.202	0.202	0.134	0.152	0.166	0.070	0.050	0.035
	Highest *SGER* k=5	0.237	0.231	0.160	0.171	0.190	0.219	0.066	0.041	-0.059
b=4	Lowest *SGER* k=1	0.105	0.115	0.114	0.060	0.077	0.073	0.045	0.037	0.041
	k=2	0.146	0.139	0.147	0.089	0.102	0.099	0.057	0.038	0.048
	k=3	0.165	0.174	0.180	0.104	0.117	0.117	0.061	0.057	0.063
	k=4	0.219	0.220	0.179	0.120	0.135	0.140	0.099	0.085	0.039
	Highest *SGER* k=5	0.267	0.245	0.173	0.155	0.170	0.191	0.112	0.074	-0.018
Highest Book/Market b=5 Value Stocks	Lowest *SGER* k=1	0.134	0.132	0.118	0.047	0.062	0.062	0.088	0.069	0.056
	k=2	0.186	0.178	0.143	0.076	0.088	0.086	0.110	0.091	0.057
	k=3	0.195	0.194	0.158	0.090	0.100	0.098	0.104	0.094	0.060
	k=4	0.241	0.234	0.159	0.104	0.115	0.114	0.137	0.120	0.045
	Highest *SGER* k=5	0.258	0.253	0.224	0.137	0.147	0.155	0.121	0.106	0.069
Average over 25 portfolios								0.042	0.019	-0.014

Notes: We measure portfolio returns from a Statistical Period date, where we form a portfolio, to the following Statistical Period date. Monthly return between Statistical Period dates, is, $R^{j}_{i,t,b,k}=\left[\prod_{\tau=1}^{T_t}(1+r^{j}_{i,t,\tau,k,b})\right]-1$, where $r_{i,t,\tau,k,b}$ are CRSP daily returns. Annualized mean portfolio return is $\overline{R}^{j}_{b,k}=\left[\prod_{t=1}^{TP}\left(1+R^{j}_{t,b,k}\right)\right]^{\frac{12}{TP}}-1$, where TP is the number of months in the test period. Annual portfolio expected return is $\overline{SGER}^{j}_{b,k}=\frac{1}{TP}\sum_{t=1}^{TP}\left(\frac{1}{N}\sum_{i=1}^{N}SGER^{j}_{i,t,b,k}\right)$, where $SGER_{i,t,b,k}$ is *SGER* for firm *i*=1,2,…,N, month *t*=1,2,…, TP, in portfolio *b*=1,2,3,4,5, *k*=1,2,3,4,5. Table 3 reports returns, expected returns, and their difference, $\overline{R}^{j}_{b,k}-\overline{SGER}^{j}_{b,k}$, for 25 Book/Market and *SGER* portfolios formed with the expected returns *SGER1* (*j*=1), *SGER2* (*j*=2), and *SGER3*(*j*=3), respectively. See notes to Table 1 for the *SGER1*, *SGER2*, and *SGER3*calculations.

Table 4

Panel A: Earnings Surprises

Book/Market Quintile	*SGER* Quintile	*SGER1*: Median *EPS* Surprise (Actual EPS-Forecast EPS) /TTM EPS $\bar{\delta}^{1}_{b,k}$	*SGER1*: Earning Surprises: # Observations	*SGER2*: Median *EPS* Surprise (Actual EPS-Forecast EPS) /TTM EPS $\bar{\delta}^{2}_{b,k}$	*SGER2*: Earning Surprises: # Observations	*SGER3*: Median *EPS* Surprise (Actual EPS-Forecast EPS) /TTM EPS $\bar{\delta}^{3}_{b,k}$	*SGER3*: Earning Surprises: # Observations
Lowest Book/Market b=1 Growth Stocks	Lowest *SGER* k=1	0.000	12451	-0.036	11466	-0.076	4179
	k=2	0.000	12837	-0.043	11907	-0.105	4453
	k=3	0.000	12765	-0.032	11874	-0.118	4439
	k=4	0.003	12662	-0.049	11786	-0.130	4423
	Highest *SGER* k=5	0.002	12322	-0.075	11182	-0.160	4149
b=2	Lowest *SGER* k=1	-0.007	12267	-0.063	10988	-0.071	2971
	k=2	0.000	12495	-0.039	11141	-0.085	3230
	k=3	0.000	12606	-0.045	11288	-0.128	3207
	k=4	-0.004	12616	-0.070	11225	-0.210	3183
	Highest *SGER* k=5	-0.003	12393	-0.133	11030	-0.424	3116
b=3	Lowest *SGER* k=1	-0.013	12158	-0.064	10583	-0.046	2459
	k=2	-0.001	12518	-0.066	10771	-0.125	2616
	k=3	-0.003	12441	-0.073	10636	-0.169	2591
	k=4	0.000	12369	-0.049	10697	-0.192	2541
	Highest *SGER* k=5	-0.004	12325	-0.108	10556	-0.488	2532
b=4	Lowest *SGER* k=1	-0.022	12022	-0.049	10128	-0.017	2376
	k=2	-0.004	12379	-0.055	10501	-0.076	2525
	k=3	-0.009	12467	-0.068	10390	-0.143	2499
	k=4	-0.005	12224	-0.074	10378	-0.146	2484
	Highest *SGER* k=5	-0.003	12093	-0.094	10119	-0.452	2407
Highest Book/Market b=5 Value Stocks	Lowest *SGER* k=1	-0.029	11994	-0.088	9946	-0.041	2436
	k=2	-0.017	12292	-0.066	10222	-0.060	2702
	k=3	-0.013	12346	-0.055	10226	-0.078	2646
	k=4	-0.015	12304	-0.123	10086	-0.162	2646
	Highest *SGER* k=5	-0.034	11985	-0.185	9717	-0.460	2410
Total			309331		268843		75220

Panel B: Observations

	SGER1	*SGER2*	*SGER3*
Original sample	421752	375452	103077
Missing *IBES* report date and/or actual *EPS*	105454	93984	21493
Incorrect Report dates (see notes)	383	372	82
Missing *CRSP* share factors	6584	12253	6282
Total	309331	268843	75220

Notes: *I/B/E/S* begins reporting actual *EPS* in 1980 which is after the beginning of the test period for our study. Further, forecasts near the end of our 2007 test period have not yet reported on the *I/B/E/S* database. For the 25 *SGER1* and *SGER2* portfolio sets, we measure earnings surprise for 324 Statistical Period months. For the 25 *SGER3* portfolios we measure earnings surprise for 257 Statistical Period months. Occasionally, *I/B/E/S* has an actual *EPS*, but no report date. In addition, we eliminate observations with report dates earlier than or more than 365 days after the fiscal year end for the *EPS* forecast. The accounting for our original sample, versus, the sample we use for earnings surprises is given in panel B. Equation (4) measures earnings surprise, $\delta^{j}_{i,t,b,k}$, for firm i=1,2,…,N, in portfolio b=1,2,3,4,5, k=1,2,3,4,5,for Statistical Period t,=1,2,…,TP. Table 4 reports median earnings surprise, $\bar{\delta}^{j}_{b,k} = median(median(\delta_{i,t,b,k}, i=1,2,...,N), t=1,2,...,TP)$ for each of the 25 *SGER* portfolios.

Table 5 Analysts' Recommendations

Book/Market Quintile	*SGER* Quintile	*SGER1* Mean Recommendation $\overline{Recom}_{b,k}^{1}$	*SGER1* F Stat (p-value)	*SGER2* Mean Recommendation $\overline{Recom}_{b,k}^{2}$	*SGER2* F Stat (p-value)	*SGER3* Mean Recommendation $\overline{Recom}_{b,k}^{3}$	*SGER3* F Stat (p-value)
Lowest Book/Market b=1 Growth Stocks	Lowest *SGER* k=1	2.332	42.923	2.356	57.227	2.353	36.767
	k=2	2.233	(0.000)	2.236	(0.000)	2.210	(0.000)
	k=3	2.143		2.135		2.150	
	k=4	2.102		2.093		2.116	
	Highest *SGER* k=5	2.128		2.114		2.169	
b=2	Lowest *SGER* k=1	2.372	77.492	2.408	118.068	2.402	67.060
	k=2	2.356	(0.000)	2.374	(0.000)	2.329	(0.000)
	k=3	2.306		2.278		2.262	
	k=4	2.201		2.196		2.209	
	Highest *SGER* k=5	2.124		2.086		2.124	
b=3	Lowest *SGER* k=1	2.403	66.049	2.437	104.075	2.407	43.340
	k=2	2.401	(0.000)	2.425	(0.000)	2.370	(0.000)
	k=3	2.361		2.347		2.307	
	k=4	2.273		2.252		2.243	
	Highest *SGER* k=5	2.140		2.090		2.143	
b=4	Lowest *SGER* k=1	2.478	132.596	2.527	164.940	2.483	51.627
	k=2	2.487	(0.000)	2.469	(0.000)	2.417	(0.000)
	k=3	2.348		2.346		2.332	
	k=4	2.253		2.252		2.247	
	Highest *SGER* k=5	2.156		2.117		2.178	
Highest Book/Market b=5 Value Stocks	Lowest *SGER* k=1	2.515	46.679	2.530	111.512	2.548	31.633
	k=2	2.483	(0.000)	2.568	(0.000)	2.585	(0.000)
	k=3	2.506		2.532		2.532	
	k=4	2.449		2.398		2.489	
	Highest *SGER* k=5	2.308		2.253		2.331	

Notes: Recommendation Scales are: 1=Strong Buy, 2=Buy, 3=Hold, 4=Underperform, and 5=Sell. $Recom_{i,t,b,k}$ is the analysts' consensus recommendation for firm i=1,2,…,N, in month t=1,2,…,379, for portfolio b=1,2,3,4,5, k=1,2,3,4,5, where the 25 portfolios are formed by sorting all firms at a statistical period date by Book/Market into 5 quintiles and then for each quintile into 5 portfolios by *SGER*. Table 5 reports mean recommendation $\overline{Recom}_{b,k}^{j} = \frac{1}{379}\left[\sum_{t=1}^{379}\left[\frac{1}{N}\sum_{i=1}^{N} Recom_{i,t,b,k}^{j}\right]\right]$ for each of the 25 *SGER* portfolios formed with the expected returns *SGER1* (j=1), *SGER2* (j=2), and *SGER3*(j=3), respectively. The F-Statistic tests for differences between mean recommendations among *SGER1* portfolios within each Book/Market quintile, p-value underlies F-Stat.

Table 6 Abnormal Returns, *SGER*1 Ranking

$$R_{b,k,t}-R_{f,t}=\alpha_{b,k}+s_{b,k}SMB_t+h_{b,k}HML_t+m_{b,k}MOM_t+\beta_{b,k}(R_{M,t}-R_{f,t})+\varepsilon_{b,k,t},$$

$$s_{b,k}=s_{0,b,k}+s_{1,b,k}DY_{t-1}+s_{2,b,k}R_{f,t}$$

$$h_{b,k}=h_{0,b,k}+h_{1,b,k}DY_{t-1}+h_{2,b,k}R_{f,t}$$

$$m_{b,k}=m_{0,b,k}+m_{1,m,k}DY_{t-1}+m_{2,b,k}R_{f,t}$$

$$\beta_{b,k}=\beta_{0,b,k}+\beta_{1,b,k}DY_{t-1}+\beta_{2,b,k}R_{f,t}$$

b=1,2,3,4,5, k=1,2,3,4,5, t =1,2,…, TP

Book/ Market Quintile	*SGER*1 Quintile	α	$s_{0,b,k}$	$h_{0,b,k}$	$m_{0,b,k}$	$\beta_{0,b,k}$	$s_{1,b,k}$	$h_{1,b,k}$	$m_{1,b,k}$	$\beta_{1,b,k}$	$s_{2,b,k}$	$h_{2,b,k}$	$m_{2,b,k}$	$\beta_{2,b,k}$	Adjusted R^2	Hansen's J
	Lowest *SGER*1	**-0.0032**	**-0.01**	**0.60**	**-0.09**	**0.27**	**34.16**	**-117.74**	**41.15**	**153.90**	**15.60**	**-40.45**	**10.84**	**39.00**	**0.86**	
	k=1	*-3.09*	*-0.14*	*6.46*	*-1.85*	*2.91*	*1.24*	*-3.65*	*2.13*	*5.16*	*0.92*	*-2.47*	*1.07*	*2.22*		
Lowest	*k*=2	**-0.0021**	**-0.15**	**0.45**	**-0.04**	**0.46**	**73.41**	**-154.75**	**14.02**	**135.20**	**2.03**	**5.06**	**13.05**	**17.80**	**0.85**	
Book/Market		*-2.01*	*-1.75*	*4.79*	*-0.70*	*4.98*	*2.63*	*-4.74*	*0.72*	*4.48*	*0.12*	*0.31*	*1.28*	*1.00*		
b=1	*k*=3	**-0.0006**	**-0.04**	**0.42**	**0.03**	**0.60**	**33.91**	**-189.92**	**23.53**	**165.47**	**17.42**	**42.45**	**-6.42**	**-27.93**	**0.85**	**12.93**
		-0.50	*-0.39*	*4.20*	*0.56*	*6.13*	*1.15*	*-5.50*	*1.14*	*5.19*	*0.96*	*2.42*	*-0.59*	*-1.49*		0.01160
Growth	*k*=4	**0.0006**	**0.00**	**0.32**	**-0.07**	**0.66**	**38.88**	**-175.79**	**78.40**	**176.57**	**15.88**	**29.46**	**-12.45**	**-17.89**	**0.88**	
		0.59	*0.00*	*3.45*	*-1.33*	*7.11*	*1.39*	*-5.38*	*4.02*	*5.85*	*0.92*	*1.78*	*-1.22*	*-1.01*		
	Highest *SGER*1	**0.0011**	**-0.09**	**0.53**	**0.02**	**0.58**	**141.82**	**-234.64**	**58.38**	**228.86**	**6.00**	**16.42**	**-20.97**	**-2.48**	**0.85**	
	k=5	*0.83*	*-0.79*	*4.45*	*0.31*	*4.99*	*4.01*	*-5.67*	*2.36*	*5.99*	*0.28*	*0.78*	*-1.62*	*-0.11*		
	Lowest *SGER*1	**-0.0048**	**0.09**	**0.88**	**-0.04**	**-0.06**	**30.31**	**-159.94**	**-24.16**	**169.78**	**38.11**	**-18.65**	**14.94**	**40.71**	**0.83**	
	k=1	*-4.09*	*0.91*	*8.52*	*-0.79*	*-0.55*	*0.98*	*-4.44*	*-1.12*	*5.10*	*2.01*	*-1.02*	*1.33*	*2.08*		
	k=2	**-0.0044**	**0.13**	**0.71**	**-0.02**	**0.09**	**13.40**	**-109.62**	**46.38**	**114.76**	**14.80**	**-5.17**	**-19.21**	**37.57**	**0.86**	
		-4.39	*1.60*	*8.01*	*-0.40*	*1.05*	*0.51*	*-3.54*	*2.51*	*4.01*	*0.91*	*-0.33*	*-1.98*	*2.23*		
b=2	*k*=3	**-0.0016**	**0.10**	**0.72**	**-0.06**	**0.12**	**24.39**	**-149.64**	**64.61**	**125.23**	**28.65**	**9.17**	**-24.71**	**30.58**	**0.82**	**14.78**
		-1.34	*1.02*	*6.85*	*-1.03*	*1.12*	*0.78*	*-4.08*	*2.95*	*3.69*	*1.48*	*0.49*	*-2.15*	*1.53*		0.00518
	k=4	**-0.0013**	**0.21**	**0.75**	**-0.05**	**0.19**	**32.64**	**-170.78**	**65.38**	**143.82**	**15.77**	**26.56**	**-31.90**	**16.17**	**0.84**	
		-1.07	*2.03*	*6.87*	*-0.88*	*1.76*	*1.00*	*-4.47*	*2.87*	*4.07*	*0.78*	*1.37*	*-2.67*	*0.78*		
	Highest *SGER*1	**0.0006**	**0.36**	**1.00**	**-0.07**	**0.12**	**62.11**	**-192.75**	**84.49**	**175.83**	**13.10**	**-18.26**	**-45.89**	**41.96**	**0.87**	
	k=5	*0.46*	*3.29*	*8.74*	*-1.04*	*1.07*	*1.82*	*-4.82*	*3.54*	*4.76*	*0.62*	*-0.90*	*-3.66*	*1.93*		

(Continued)

Table 6 - Continued

	Lowest *SGER*1 *k*=1	**-0.0042**	**0.10**	**0.90**	**0.05**	**-0.20**	**35.19**	**-153.07**	**-26.18**	**149.48**	**36.14**	**-12.87**	**-1.95**	**55.09**	**0.80**	
		-3.48	*0.99*	*8.41*	*0.94*	*-1.85*	*1.11*	*-4.11*	*-1.18*	*4.34*	*1.84*	*-0.68*	*-0.17*	*2.72*		
	k=2	**-0.0048**	**0.37**	**0.89**	**-0.03**	**-0.22**	**-29.71**	**-90.66**	**27.67**	**117.56**	**21.84**	**-5.10**	**-12.73**	**40.46**	**0.84**	
		-4.63	*4.26*	*9.65*	*-0.53*	*-2.41*	*-1.08*	*-2.83*	*1.44*	*3.97*	*1.29*	*-0.31*	*-1.27*	*2.32*		
b=3	*k*=3	**-0.0014**	**0.39**	**0.81**	**0.00**	**-0.08**	**7.30**	**-131.48**	**40.29**	**128.81**	**7.04**	**16.60**	**-32.84**	**20.38**	**0.85**	**23.55**
		-1.46	*4.70*	*9.18*	*-0.01*	*-0.88*	*0.28*	*-4.29*	*2.20*	*4.55*	*0.44*	*1.07*	*-3.42*	*1.22*		0.00010
	k=4	**0.0004**	**0.34**	**0.76**	**0.02**	**0.04**	**6.41**	**-121.07**	**40.21**	**129.24**	**23.45**	**28.42**	**-39.33**	**7.27**	**0.84**	
		0.34	*3.46*	*7.45*	*0.31*	*0.43*	*0.21*	*-3.38*	*1.88*	*3.91*	*1.25*	*1.57*	*-3.51*	*0.37*		
	Highest *SGER*1 *k*=5	**0.0022**	**0.44**	**0.90**	**0.12**	**0.01**	**4.28**	**-105.99**	**76.29**	**123.17**	**6.75**	**-5.82**	**-70.36**	**37.70**	**0.82**	
		1.63	*3.90*	*7.52*	*1.76*	*0.10*	*0.12*	*-2.53*	*3.05*	*3.19*	*0.31*	*-0.27*	*-5.37*	*1.66*		
	Lowest *SGER*1 *k*=1	**-0.0057**	**0.21**	**0.96**	**-0.06**	**-0.21**	**38.67**	**-66.09**	**-27.21**	**94.81**	**36.81**	**-38.02**	**1.89**	**54.74**	**0.83**	
		-5.21	*2.31*	*9.85*	*-1.18*	*-2.17*	*1.34*	*-1.95*	*-1.34*	*3.03*	*2.06*	*-2.21*	*0.18*	*2.97*		
	k=2	**-0.0032**	**0.22**	**0.85**	**0.05**	**-0.20**	**9.09**	**-57.87**	**-12.75**	**87.98**	**18.47**	**-13.62**	**-10.78**	**36.19**	**0.83**	
		-3.39	*2.81*	*10.09*	*1.14*	*-2.43*	*0.36*	*-1.96*	*-0.72*	*3.23*	*1.19*	*-0.91*	*-1.17*	*2.26*		
b=4	*k*=3	**-0.0022**	**0.39**	**0.81**	**-0.02**	**-0.09**	**-35.42**	**-102.76**	**52.11**	**102.52**	**19.59**	**19.86**	**-26.46**	**9.28**	**0.82**	**24.93**
		-2.13	*4.48*	*8.70*	*-0.48*	*-1.03*	*-1.28*	*-3.18*	*2.70*	*3.43*	*1.15*	*1.21*	*-2.62*	*0.53*		0.00005
	k=4	**0.0013**	**0.47**	**0.85**	**-0.03**	**-0.08**	**-29.65**	**-136.23**	**57.87**	**128.78**	**19.58**	**36.73**	**-43.67**	**-3.15**	**0.83**	
		1.21	*5.05*	*8.68*	*-0.55*	*-0.86*	*-1.01*	*-3.98*	*2.83*	*4.08*	*1.09*	*2.12*	*-4.08*	*-0.17*		
	Highest *SGER*1 *k*=5	**0.0031**	**0.49**	**1.03**	**0.05**	**0.05**	**-42.05**	**-116.56**	**86.73**	**68.07**	**32.98**	**20.55**	**-79.05**	**16.31**	**0.81**	
		2.13	*4.01*	*7.93*	*0.67*	*0.38*	*-1.09*	*-2.59*	*3.22*	*1.64*	*1.39*	*0.90*	*-5.60*	*0.67*		
	Lowest *SGER*1 *k*=1	**-0.0053**	**0.61**	**1.17**	**-0.19**	**-0.35**	**22.12**	**-82.12**	**3.24**	**83.66**	**29.54**	**-23.99**	**-11.46**	**49.46**	**0.85**	
		-4.47	*6.17*	*11.17*	*-3.24*	*-3.35*	*0.71*	*-2.25*	*0.15*	*2.48*	*1.54*	*-1.30*	*-1.00*	*2.49*		
Highest	*k*=2	**-0.0013**	**0.42**	**1.10**	**-0.07**	**-0.35**	**7.18**	**-18.87**	**-6.70**	**59.65**	**24.93**	**-41.80**	**-20.29**	**51.68**	**0.85**	
Book/Market		*-1.30*	*4.83*	*11.96*	*-1.35*	*-3.84*	*0.26*	*-0.59*	*-0.35*	*2.02*	*1.48*	*-2.58*	*-2.03*	*2.97*		
b=5	*k*=3	**-0.0003**	**0.40**	**1.02**	**-0.09**	**-0.36**	**-29.32**	**-33.76**	**-15.51**	**81.46**	**29.49**	**-18.54**	**-10.48**	**30.88**	**0.80**	**16.05**
		-0.30	*4.23*	*10.33*	*-1.72*	*-3.72*	*-0.99*	*-0.98*	*-0.75*	*2.56*	*1.62*	*-1.06*	*-0.97*	*1.65*		0.00295
Value	*k*=4	**0.0028**	**0.46**	**0.92**	**-0.04**	**-0.10**	**-74.95**	**-82.62**	**12.07**	**68.35**	**38.91**	**23.97**	**-33.39**	**-5.34**	**0.76**	
		2.17	*4.24*	*8.08*	*-0.70*	*-0.86*	*-2.20*	*-2.07*	*0.51*	*1.86*	*1.85*	*1.19*	*-2.68*	*-0.25*		
	Highest *SGER*1 *k*=5	**0.0018**	**0.70**	**1.06**	**-0.06**	**-0.02**	**-77.90**	**-68.22**	**24.59**	**56.32**	**27.64**	**13.57**	**-34.94**	**-4.19**	**0.73**	
		1.06	*4.80*	*6.94*	*-0.74*	*-0.15*	*-1.71*	*-1.28*	*0.77*	*1.14*	*0.98*	*0.50*	*-2.09*	*-0.14*		

Notes: $R_{t,m,k}$ denotes the return on portfolio b=1,2,3,4,5, k=1,2,3,4,5,in month t = 1,2,…, TP , $R_{f,t}$, the riskless rate, is the yield on a US Government 1-month Treasury bill, $R_{M,t}$, the return on the market portfolio, is the return on the *CRSP* value weighted index of common stocks in month t, SMB_t and HML_t are the small-minus-big and high-minus-low Fama-French factors, MOM_t is the momentum factor in month t, and DY_{t-1} is the CRSP value-weighted index dividend yield lagged one period. t-statistics underlie coefficient estimates and p-values underlie Hansen's J statistic.

Table 7 Abnormal Returns, *SGER*2 Ranking

$$R_{b,k,t}-R_{f,t}=\alpha_{b,k}+s_{b,k}SMB_t+h_{b,k}HML_t+m_{b,k}MOM_t+\beta_{b,k}(R_{M,t}-R_{f,t})+\varepsilon_{b,k,t},$$

$$s_{b,k}=s_{0,b,k}+s_{1,b,k}DY_{t-1}+s_{2,b,k}R_{f,t}$$

$$h_{b,k}=h_{0,b,k}+h_{1,b,k}DY_{t-1}+h_{2,b,k}R_{f,t}$$

$$m_{b,k}=m_{0,b,k}+m_{1,m,k}DY_{t-1}+m_{2,b,k}R_{f,t}$$

$$\beta_{b,k}=\beta_{0,b,k}+\beta_{1,b,k}DY_{t-1}+\beta_{2,b,k}R_{f,t}$$

b=1,2,3,4,5, k=1,2,3,4,5, t =1,2,…, TP

Book/ Market Quintile	*SGER*2 Quintile	α	$s_{0,b,k}$	$h_{0,b,k}$	$m_{0,b,k}$	$\beta_{0,b,k}$	$s_{1,b,k}$	$h_{1,b,k}$	$m_{1,b,k}$	$\beta_{1,b,k}$	$s_{2,b,k}$	$h_{2,b,k}$	$m_{2,b,k}$	$\beta_{2,b,k}$	Adjusted R^2	Hansen's J
Lowest Book/Market	Lowest	**-0.0036**	**-0.06**	**0.50**	**-0.08**	**0.33**	**43.44**	**-108.45**	**23.10**	**137.44**	**6.87**	**-23.34**	**12.54**	**28.17**	**0.86**	
	*SGER*2 k=1	*-3.62*	*-0.70*	*5.56*	*-1.55*	*3.76*	*1.63*	*-3.48*	*1.24*	*4.78*	*0.42*	*-1.48*	*1.29*	*1.67*		
	k=2	**-0.0027**	**-0.14**	**0.39**	**-0.02**	**0.55**	**64.71**	**-160.68**	**38.23**	**142.61**	**4.91**	**29.57**	**-2.81**	**-10.66**	**0.85**	
		-2.53	*-1.56*	*4.13*	*-0.46*	*5.98*	*2.32*	*-4.93*	*1.97*	*4.74*	*0.29*	*1.79*	*-0.28*	*-0.60*		
b=1	k=3	**-0.0001**	**-0.04**	**0.47**	**-0.05**	**0.51**	**28.04**	**-201.67**	**40.44**	**177.82**	**8.81**	**23.88**	**2.25**	**-3.01**	**0.85**	**17.52**
		-0.13	*-0.41*	*4.78*	*-0.93*	*5.17*	*0.95*	*-5.83*	*1.96*	*5.57*	*0.48*	*1.36*	*0.21*	*-0.16*		0.00153
Growth	k=4	**0.0011**	**-0.05**	**0.35**	**0.00**	**0.71**	**60.37**	**-160.54**	**57.87**	**173.13**	**16.37**	**13.62**	**-14.45**	**-19.37**	**0.87**	
		0.97	*-0.56*	*3.62*	*-0.03*	*7.41*	*2.10*	*-4.77*	*2.88*	*5.57*	*0.92*	*0.80*	*-1.37*	*-1.06*		
	Highest	**0.0006**	**-0.01**	**0.51**	**0.00**	**0.60**	**127.58**	**-225.81**	**60.50**	**224.50**	**-7.22**	**17.57**	**-16.50**	**-0.84**	**0.85**	
	*SGER*2 k=5	*0.44*	*-0.05*	*4.22*	*-0.06*	*4.99*	*3.54*	*-5.35*	*2.40*	*5.76*	*-0.32*	*0.82*	*-1.25*	*-0.04*		
	Lowest	**-0.0052**	**-0.01**	**0.78**	**0.01**	**0.00**	**38.08**	**-118.66**	**-24.86**	**147.05**	**37.12**	**-23.76**	**7.51**	**37.59**	**0.81**	
	*SGER*2 k=1	*-4.43*	*-0.08*	*7.52*	*0.16*	*0.01*	*1.23*	*-3.27*	*-1.15*	*4.39*	*1.95*	*-1.29*	*0.66*	*1.91*		
	k=2	**-0.0045**	**0.25**	**0.78**	**-0.11**	**0.05**	**-4.17**	**-126.78**	**57.78**	**116.93**	**-4.70**	**-6.31**	**-8.57**	**44.80**	**0.84**	
		-4.07	*2.70*	*7.93*	*-1.97*	*0.47*	*-0.14*	*-3.71*	*2.83*	*3.71*	*-0.26*	*-0.36*	*-0.80*	*2.42*		
b=2	k=3	**-0.0012**	**0.08**	**0.73**	**-0.07**	**0.14**	**9.03**	**-141.10**	**55.34**	**99.67**	**27.18**	**1.11**	**-23.70**	**45.98**	**0.85**	**15.40**
		-1.11	*0.89*	*7.43*	*-1.37*	*1.45*	*0.31*	*-4.15*	*2.72*	*3.17*	*1.52*	*0.06*	*-2.23*	*2.49*		0.00395
	k=4	**-0.0013**	**0.26**	**0.70**	**-0.04**	**0.19**	**40.77**	**-174.99**	**60.94**	**154.98**	**-4.35**	**38.21**	**-30.47**	**9.87**	**0.82**	
		-0.96	*2.34*	*5.92*	*-0.61*	*1.66*	*1.15*	*-4.23*	*2.47*	*4.05*	*-0.20*	*1.82*	*-2.35*	*0.44*		
	Highest	**0.0005**	**0.40**	**1.07**	**-0.06**	**0.11**	**25.44**	**-249.43**	**83.71**	**231.95**	**17.63**	**-9.44**	**-48.12**	**30.10**	**0.87**	
	*SGER*2 k=5	*0.41*	*3.63*	*9.15*	*-0.88*	*0.97*	*0.73*	*-6.09*	*3.43*	*6.14*	*0.82*	*-0.46*	*-3.76*	*1.35*		

(Continued)

Table 7 - Continued

	Lowest	-0.0044	0.03	0.89	0.03	-0.23	34.29	-135.55	11.67	149.87	29.42	-22.20	-8.86	53.39	0.77	
	SGER2 k=1	-3.63	0.34	8.23	0.53	-2.19	1.07	-3.61	0.52	4.32	1.49	-1.17	-0.75	2.62		
	k=2	-0.0034	0.40	0.82	0.01	-0.13	-15.58	-117.02	25.15	121.55	-3.70	5.15	-19.13	32.39	0.81	
		-3.13	4.37	8.57	0.20	-1.42	-0.54	-3.49	1.26	3.92	-0.21	0.30	-1.82	1.78		
b=3	k=3	-0.0016	0.39	0.78	0.00	0.01	2.43	-94.91	6.81	111.45	11.24	12.20	-22.71	13.00	0.85	14.88
		-1.59	4.45	8.46	0.06	0.07	0.09	-2.96	0.35	3.76	0.67	0.75	-2.26	0.75		0.00495
	k=4	0.0003	0.38	0.82	0.00	-0.03	-12.23	-120.89	63.23	127.88	17.40	23.00	-52.22	23.07	0.83	
		0.26	3.62	7.43	0.07	-0.25	-0.37	-3.13	2.74	3.58	0.86	1.17	-4.32	1.10		
	Highest	0.0023	0.43	0.97	0.14	0.02	13.64	-149.71	57.96	146.42	14.94	-5.52	-71.34	37.01	0.84	
	SGER2 k=5	1.67	3.77	8.08	2.07	0.18	0.38	-3.58	2.32	3.79	0.68	-0.26	-5.45	1.63		
	Lowest	-0.0046	0.12	0.86	0.04	-0.18	64.33	-55.30	-5.43	75.03	12.94	-33.87	-16.48	58.49	0.78	
	SGER2 k=1	-3.92	1.23	8.25	0.62	-1.80	2.08	-1.53	-0.25	2.24	0.68	-1.84	-1.45	2.97		
	k=2	-0.0036	0.27	0.83	-0.07	-0.21	-55.37	-60.10	16.11	83.39	24.64	-1.49	-2.12	29.52	0.81	
		-3.57	3.25	9.43	-1.38	-2.42	-2.11	-1.95	0.88	2.93	1.52	-0.10	-0.22	1.77		
b=4	k=3	-0.0015	0.34	0.71	-0.05	0.05	10.39	-56.34	38.19	75.17	6.27	15.45	-24.91	4.16	0.81	13.74
		-1.38	3.61	7.18	-0.95	0.51	0.35	-1.64	1.87	2.37	0.35	0.89	-2.32	0.22		0.00818
	k=4	0.0004	0.42	0.93	-0.01	-0.02	-47.47	-141.60	72.04	148.07	41.25	34.43	-49.78	-17.53	0.84	
		0.30	4.29	8.92	-0.21	-0.17	-1.53	-3.90	3.33	4.42	2.16	1.87	-4.38	-0.89		
	Highest	0.0019	0.70	1.19	0.06	-0.10	-63.87	-174.58	70.07	108.97	9.98	17.46	-82.01	34.56	0.81	
	SGER2 k=5	1.22	5.43	8.66	0.77	-0.71	-1.56	-3.65	2.46	2.47	0.40	0.72	-5.48	1.33		
	Lowest	-0.0057	0.56	1.17	-0.13	-0.42	31.77	-76.29	0.28	98.40	19.86	-23.69	-16.66	46.73	0.81	
	SGER2 k=1	-4.46	5.26	10.38	-2.12	-3.77	0.94	-1.93	0.01	2.70	0.96	-1.18	-1.35	2.18		
Highest	k=2	-0.0017	0.17	1.04	-0.13	-0.31	13.01	-8.08	14.10	47.94	53.38	-32.55	-17.94	46.73	0.80	
Book/Market		-1.45	1.70	9.91	-2.27	-3.01	0.42	-0.22	0.64	1.42	2.77	-1.75	-1.56	2.35		
b=5	k=3	-0.0006	0.30	0.93	-0.09	-0.26	-13.07	-44.23	10.30	78.14	22.93	1.84	-17.30	16.21	0.77	15.82
		-0.46	2.99	8.73	-1.61	-2.43	-0.41	-1.18	0.46	2.27	1.17	0.10	-1.48	0.80		0.00327
Value	k=4	0.0020	0.63	0.93	-0.18	-0.06	-99.92	-81.30	18.99	79.88	20.16	28.02	-20.43	-7.65	0.81	
		1.57	5.95	8.34	-2.97	-0.56	-3.00	-2.08	0.82	2.22	0.98	1.42	-1.67	-0.36		
	Highest	0.0011	0.82	1.20	-0.07	-0.05	-82.60	-69.95	31.30	48.98	25.19	-2.67	-44.01	9.41	0.74	
	SGER2 k=5	0.59	5.35	7.43	-0.77	-0.32	-1.71	-1.24	0.93	0.94	0.85	-0.09	-2.49	0.31		

Notes: $R_{t,m,k}$ denotes the return on portfolio b=1,2,3,4,5, k=1,2,3,4,5,in month t = 1,2,…, TP , $R_{f,t}$, the riskless rate, is the yield on a US Government 1-month Treasury bill, $R_{M,t}$, the return on the market portfolio, is the return on the *CRSP* value weighted index of common stocks in month t, SMB_t and HML_t are the small-minus-big and high-minus-low Fama-French factors, MOM_t is the momentum factor in month t, and DY_{t-1} is the CRSP value-weighted index dividend yield lagged one period. t-statistics underlie coefficient estimates and p-values underlie Hansen's J statistic.

Table 8 Abnormal Returns, SGER3 Ranking

$$R_{b,k,t} - R_{f,t} = \alpha_{b,k} + s_{b,k} SMB_t + h_{b,k} HML_t + m_{b,k} MOM_t + \beta_{b,k} (R_{M,t} - R_{f,t}) + \varepsilon_{b,k,t},$$

$$s_{b,k} = s_{0,b,k} + s_{1,b,k} DY_{t-1} + s_{2,b,k} R_{f,t}$$

$$h_{b,k} = h_{0,b,k} + h_{1,b,k} DY_{t-1} + h_{2,b,k} R_{f,t}$$

$$m_{b,k} = m_{0,b,k} + m_{1,m,k} DY_{t-1} + m_{2,b,k} R_{f,t}$$

$$\beta_{b,k} = \beta_{0,b,k} + \beta_{1,b,k} DY_{t-1} + \beta_{2,b,k} R_{f,t}$$

b=1,2,3,4,5, k=1,2,3,4,5, t =1,2,…, TP

Book/ Market Quintile	*SGER*3 Quintile	α	$s_{0,b,k}$	$h_{0,b,k}$	$m_{0,b,k}$	$\beta_{0,b,k}$	$s_{1,b,k}$	$h_{1,b,k}$	$m_{1,b,k}$	$\beta_{1,b,k}$	$s_{2,b,k}$	$h_{2,b,k}$	$m_{2,b,k}$	$\beta_{2,b,k}$	Adjusted R^2	Hansen's J
	Lowest	**-0.0018**	**-0.43**	**0.13**	**0.03**	**0.74**	**39.20**	**-229.45**	**54.71**	**356.36**	**69.26**	**106.72**	**-13.85**	**-150.02**	**0.74**	
	*SGER*3 *k*=1	*-1.17*	*-2.56*	*0.60*	*0.29*	*3.28*	*0.61*	*-2.65*	*1.15*	*4.07*	*1.92*	*2.39*	*-0.65*	*-3.17*		
Lowest	*k*=2	**-0.0012**	**0.14**	**0.23**	**-0.19**	**0.46**	**-16.68**	**-232.01**	**147.32**	**348.54**	**-48.85**	**71.38**	**-8.34**	**-55.66**	**0.80**	
Book/Market		*-0.82*	*0.91*	*1.18*	*-1.98*	*2.20*	*-0.28*	*-2.89*	*3.34*	*4.29*	*-1.46*	*1.72*	*-0.42*	*-1.27*		
b=1	*k*=3	**0.0005**	**0.19**	**0.19**	**-0.10**	**0.62**	**-97.30**	**-387.01**	**86.79**	**469.42**	**-40.91**	**122.56**	**-18.48**	**-107.90**	**0.81**	**2.78**
		0.31	*1.21*	*0.96*	*-0.97*	*2.91*	*-1.60*	*-4.74*	*1.94*	*5.68*	*-1.20*	*2.91*	*-0.93*	*-2.42*		0.59472
Growth	*k*=4	**0.0006**	**0.19**	**0.36**	**-0.05**	**0.57**	**-136.70**	**-428.77**	**-3.49**	**462.78**	**6.11**	**111.53**	**44.19**	**-98.15**	**0.78**	
		0.38	*1.08*	*1.61*	*-0.47*	*2.47*	*-2.04*	*-4.77*	*-0.07*	*5.09*	*0.16*	*2.41*	*2.01*	*-2.00*		
	Highest	**-0.0018**	**-0.09**	**0.34**	**0.08**	**0.56**	**-49.19**	**-499.91**	**16.76**	**668.17**	**50.44**	**168.21**	**-4.34**	**-170.89**	**0.77**	
	*SGER*3 *k*=5	*-0.91*	*-0.41*	*1.28*	*0.59*	*2.00*	*-0.62*	*-4.66*	*0.28*	*6.16*	*1.13*	*3.04*	*-0.17*	*-2.91*		
	Lowest	**-0.0015**	**-0.09**	**1.40**	**-0.22**	**-0.67**	**68.20**	**-471.63**	**113.14**	**588.05**	**-24.26**	**-101.68**	**20.04**	**64.70**	**0.55**	
	*SGER*3 *k*=1	*-0.72*	*-0.41*	*4.79*	*-1.49*	*-2.19*	*0.77*	*-3.98*	*1.74*	*4.91*	*-0.49*	*-1.67*	*0.69*	*1.00*		
	k=2	**-0.0003**	**0.09**	**0.77**	**-0.36**	**0.08**	**13.51**	**-394.28**	**130.42**	**442.93**	**28.58**	**79.08**	**49.08**	**-63.04**	**0.70**	
		-0.13	*0.41*	*2.95*	*-2.80*	*0.28*	*0.17*	*-3.71*	*2.24*	*4.12*	*0.65*	*1.44*	*1.89*	*-1.09*		
b=2	*k*=3	**-0.0001**	**-0.03**	**0.81**	**-0.01**	**-0.14**	**54.79**	**-276.81**	**-7.25**	**317.29**	**27.78**	**38.85**	**-18.52**	**46.89**	**0.78**	**2.15**
		-0.04	*-0.14*	*3.47*	*-0.08*	*-0.58*	*0.78*	*-2.91*	*-0.14*	*3.30*	*0.70*	*0.79*	*-0.80*	*0.90*		0.70839
	k=4	**-0.0025**	**0.13**	**0.78**	**0.06**	**0.12**	**11.11**	**-471.06**	**68.61**	**410.87**	**-2.31**	**124.79**	**-78.07**	**-44.24**	**0.77**	
		-1.40	*0.69*	*3.18*	*0.51*	*0.45*	*0.15*	*-4.73*	*1.26*	*4.08*	*-0.06*	*2.43*	*-3.21*	*-0.81*		
	Highest	**-0.0001**	**0.30**	**0.92**	**-0.05**	**-0.06**	**-2.19**	**-476.03**	**86.79**	**444.97**	**44.95**	**116.49**	**-70.47**	**4.87**	**0.77**	
	*SGER*3 *k*=5	*-0.04*	*1.28*	*3.09*	*-0.35*	*-0.19*	*-0.02*	*-3.95*	*1.31*	*3.65*	*0.89*	*1.87*	*-2.39*	*0.07*		

(Continued)

Table 8- Continued

	Lowest	**-0.0009**	**0.25**	**1.54**	**-0.05**	**-0.72**	**-281.88**	**-584.18**	**-11.40**	**538.84**	**84.77**	**26.84**	**21.80**	**-10.34**	**0.50**	
	SGER3 *k*=1	*-0.41*	*1.03*	*5.10*	*-0.31*	*-2.26*	*-3.09*	*-4.76*	*-0.17*	*4.34*	*1.66*	*0.42*	*0.73*	*-0.15*		
	k=2	**-0.0034**	**0.41**	**1.65**	**-0.23**	**-0.86**	**-200.38**	**-447.24**	**73.25**	**425.72**	**-8.23**	**-103.48**	**32.86**	**121.07**	**0.58**	
		-1.69	*1.87*	*6.01*	*-1.69*	*-2.96*	*-2.41*	*-4.01*	*1.20*	*3.77*	*-0.18*	*-1.80*	*1.20*	*1.98*		
b=3	*k*=3	**-0.0023**	**-0.07**	**1.02**	**-0.05**	**-0.10**	**-6.21**	**-174.56**	**-27.41**	**240.56**	**107.44**	**15.19**	**29.84**	**-10.97**	**0.66**	**5.60**
		-1.06	*-0.29*	*3.53*	*-0.36*	*-0.31*	*-0.07*	*-1.48*	*-0.42*	*2.02*	*2.18*	*0.25*	*1.03*	*-0.17*		0.23075
	k=4	**0.0022**	**0.21**	**0.65**	**-0.01**	**0.20**	**17.91**	**-267.14**	**95.66**	**214.83**	**24.43**	**115.19**	**-69.97**	**-37.06**	**0.72**	
		1.13	*0.99*	*2.46*	*-0.11*	*0.70*	*0.22*	*-2.47*	*1.61*	*1.96*	*0.54*	*2.06*	*-2.64*	*-0.63*		
	Highest	**-0.0002**	**0.24**	**0.80**	**0.11**	**0.26**	**-86.25**	**-395.76**	**21.71**	**312.75**	**117.21**	**167.89**	**-91.36**	**-83.15**	**0.67**	
	SGER3 *k*=5	*-0.09*	*0.83*	*2.19*	*0.61*	*0.68*	*-0.78*	*-2.66*	*0.27*	*2.08*	*1.89*	*2.19*	*-2.51*	*-1.02*		
	Lowest	**-0.0013**	**-0.07**	**1.15**	**-0.01**	**-0.40**	**-141.99**	**-306.52**	**10.74**	**340.77**	**65.79**	**-49.52**	**-6.50**	**51.23**	**0.50**	
	SGER3 *k*=1	*-0.57*	*-0.28*	*3.74*	*-0.08*	*-1.24*	*-1.52*	*-2.45*	*0.16*	*2.69*	*1.26*	*-0.77*	*-0.21*	*0.75*		
	k=2	**-0.0007**	**0.33**	**1.00**	**-0.17**	**-0.17**	**-170.62**	**-228.25**	**10.58**	**203.20**	**-21.11**	**-13.39**	**27.79**	**19.69**	**0.57**	
		-0.37	*1.58*	*3.78*	*-1.32*	*-0.62*	*-2.13*	*-2.12*	*0.18*	*1.86*	*-0.47*	*-0.24*	*1.05*	*0.33*		
b=4	*k*=3	**0.0014**	**0.58**	**0.92**	**-0.21**	**-0.10**	**-118.24**	**-363.53**	**111.84**	**310.00**	**-58.83**	**59.87**	**-14.58**	**-21.24**	**0.61**	**0.99**
		0.71	*2.65*	*3.33*	*-1.55*	*-0.33*	*-1.42*	*-3.24*	*1.81*	*2.73*	*-1.26*	*1.03*	*-0.53*	*-0.35*		0.91169
	k=4	**0.0002**	**0.66**	**1.16**	**-0.04**	**-0.19**	**-173.79**	**-231.62**	**23.78**	**130.74**	**0.78**	**-1.94**	**-29.46**	**80.19**	**0.66**	
		0.09	*2.69*	*3.73*	*-0.25*	*-0.59*	*-1.85*	*-1.84*	*0.34*	*1.02*	*0.01*	*-0.03*	*-0.95*	*1.16*		
	Highest	**0.0007**	**0.65**	**1.65**	**0.00**	**-0.85**	**-60.19**	**-408.68**	**87.35**	**449.72**	**13.27**	**-34.46**	**-105.79**	**106.92**	**0.68**	
	SGER3 *k*=5	*0.27*	*2.36*	*4.74*	*0.02*	*-2.32*	*-0.57*	*-2.89*	*1.12*	*3.14*	*0.22*	*-0.47*	*-3.06*	*1.38*		
	Lowest	**-0.0031**	**0.61**	**0.96**	**-0.19**	**-0.07**	**-150.92**	**-24.18**	**91.77**	**58.49**	**1.41**	**-61.24**	**-30.81**	**31.64**	**0.58**	
	SGER3 *k*=1	*-1.43*	*2.64*	*3.27*	*-1.28*	*-0.23*	*-1.71*	*-0.20*	*1.41*	*0.49*	*0.03*	*-1.00*	*-1.06*	*0.49*		
Highest	*k*=2	**-0.0008**	**0.12**	**1.29**	**-0.26**	**-0.69**	**-127.56**	**-152.92**	**118.62**	**247.93**	**29.31**	**-92.50**	**-21.51**	**104.89**	**0.55**	
Book/Market		*-0.36*	*0.52*	*4.33*	*-1.76*	*-2.22*	*-1.42*	*-1.26*	*1.79*	*2.03*	*0.58*	*-1.48*	*-0.73*	*1.59*		
b=5	*k*=3	**-0.0011**	**0.43**	**1.43**	**-0.29**	**-0.73**	**-158.29**	**-168.01**	**68.65**	**222.93**	**-4.29**	**-112.50**	**31.67**	**133.44**	**0.57**	**1.62**
		-0.53	*1.83*	*4.82*	*-1.99*	*-2.34*	*-1.77*	*-1.40*	*1.04*	*1.83*	*-0.09*	*-1.81*	*1.08*	*2.03*		0.80543
Value	*k*=4	**0.0004**	**0.58**	**1.32**	**-0.14**	**-0.56**	**-174.68**	**-207.79**	**0.21**	**186.67**	**46.93**	**-11.54**	**-37.75**	**52.64**	**0.55**	
		0.15	*2.11*	*3.83*	*-0.83*	*-1.54*	*-1.68*	*-1.49*	*0.00*	*1.32*	*0.80*	*-0.16*	*-1.10*	*0.69*		
	Highest	**0.0006**	**0.65**	**2.05**	**-0.19**	**-0.92**	**-203.15**	**-382.41**	**65.32**	**470.85**	**136.37**	**-26.21**	**-45.38**	**36.75**	**0.63**	
	SGER3 *k*=5	*0.19*	*1.89*	*4.71*	*-0.86*	*-2.01*	*-1.54*	*-2.16*	*0.67*	*2.63*	*1.84*	*-0.29*	*-1.05*	*0.38*		

Notes: $R_{t,m,k}$ denotes the return on portfolio b=1,2,3,4,5, k=1,2,3,4,5,in month t = 1,2,…, TP , $R_{f,t}$, the riskless rate, is the yield on a US Government 1-month Treasury bill, $R_{M,t}$, the return on the market portfolio, is the return on the *CRSP* value weighted index of common stocks in month t, SMB_t and HML_t are the small-minus-big and high-minus-low Fama-French factors, MOM_t is the momentum factor in month t, and DY_{t-1} is the CRSP value-weighted index dividend yield lagged one period. t-statistics underlie coefficient estimates and p-values underlie Hansen's J statistic.

Table 9 Fama-MacBeth Regression of Portfolio Return on Profitability, *ROE*

$$R_{i,t,b} = \gamma_{0,t,b} + \gamma_{1,t,b} ROE_{i,t,b} + u_{i,t,b}$$

Book To Market Quintile	*TP*	$\bar{\gamma}_{0,b}$	S.E. ($\bar{\gamma}_{0,b}$)	$\bar{\gamma}_{1,b}$	S.E. ($\bar{\gamma}_{1,b}$)	t-Statistic for $\bar{\gamma}_{1,5} - \bar{\gamma}_{1,1}$
			SGER1 Portfolios			
Growth *b*=1	379	0.0105	0.0025	0.0076	0.0031	5.519
b=2	379	0.0035	0.0024	0.0582	0.0102	(0.000)
b=3	379	0.0037	0.0024	0.0805	0.0130	
b=4	379	0.0016	0.0021	0.1206	0.0151	
Value *b*=5	379	0.0092	0.0024	0.0940	0.0154	
			SGER2 Portfolios			
Growth *b*=1	379	0.0097	0.0024	0.0092	0.0028	5.192
b=2	379	0.0019	0.0023	0.0591	0.0108	(0.000)
b=3	379	0.0014	0.0024	0.0871	0.0145	
b=4	379	0.0023	0.0021	0.1020	0.0181	
Value *b*=5	379	0.0069	0.0024	0.1037	0.0180	
			SGER3 Portfolios			
Growth *b*=1	276	0.0124	0.0027	-0.0009	0.0030	3.185
b=2	276	0.0090	0.0034	0.0184	0.0161	(0.002)
b=3	276	0.0063	0.0033	0.0427	0.0207	
b=4	276	0.0049	0.0034	0.0706	0.0266	
Value *b*=5	276	0.0044	0.0033	0.1034	0.0326	

Notes: Table 9 reports the parameter estimates from Fama-MacBeth (1973) regression of portfolio return on profitability, *ROE*. In each statistical period, we estimate a cross sectional regression of monthly stock return on forward *ROE* (separately for *ROE1*, *ROE2*, and *ROE3*) for each market/book quintile (*b*=1,2,3,4,5), $R_{i,t,b} = \gamma_{0,t,b} + \gamma_{1,t,b} ROE_{i,t,b} + u_{i,t,b}$, where $R_{i,t,b}$ is the monthly return and $ROE_{i,t,b}$ is forward *ROE*, for firm *i*=1,2,...,N, within book/market quintile *b*=1,2,3,4,5, in statistical period *t*=1,2,...,*TP*, and $u_{i,t,b}$ is an error term . $\bar{\gamma}_{0,b}$ and S.E.($\bar{\gamma}_{0,b}$) are average and standard error of intercept estimates, $\gamma_{0,t,b}$, and $\bar{\gamma}_{1,b}$ and S.E.($\bar{\gamma}_{1,b}$) are average and standard error of intercept estimates, $\gamma_{1,t,b}$, over 379 statistical periods for *SGER1* and *SGER2* portfolios and 276 statistical periods for *SGER3* portfolios. *SGER1*, *SGER2*, and *SGER3* represent portfolios with forward *ROE* (*ROE1*, *ROE2*, and *ROE3*) calculated from *I/B/E/S* consensus analysts *EPS* forecasts (*EPS1*, *EPS2*, and *EPS3*) for the first, second, and third unreported fiscal year at a Statistical Period date. t-statistic tests for difference in slopes, $\bar{\gamma}_{1,5} - \bar{\gamma}_{1,1}$, between value (*b*=5) and growth (*b*=1) stocks. p-value underlies t-statistic.

Table 10 Return and Volatility

Book to Market	$SGER1$	Volatility	Volatility Measure Analysts' Dispersion $\text{DISP1} \equiv \frac{\sigma(EPS1)}{BPS}$		Volatility Measure Returns Volatility $\sigma(R)$		Volatility Measure Earnings s Volatility $\frac{\sigma(\Delta E)}{BVE}$	
			Annualized Mean Return $\overline{R}_v$	F Stat (p-Value)	Annualized Mean Return $\overline{R}_v$	F Stat (p-Value)	Annualized Mean Return $\overline{R}_v$	F Stat (p-Value)
Low	Low	Low	0.1290	0.028	0.1310	0.058	0.1107	0.592
		Med	0.1304	(0.972)	0.1180	(0.944)	0.1168	(0.553)
		High	0.1207		0.1313		0.1554	
	Med	Low	0.1814	0.378	0.1582	0.004	0.1570	0.067
		Med	0.1493	(0.685)	0.1594	(0.996)	0.1486	(0.936)
		High	0.1429		0.1552		0.1658	
	High	Low	0.2132	0.266	0.1861	0.021	0.1927	0.026
		Med	0.1923	(0.766)	0.1948	(0.979)	0.1836	(0.974)
		High	0.1728		0.1972		0.1958	
Med	Low	Low	0.1292	0.022	0.1251	0.040	0.1091	0.275
		Med	0.1215	(0.978)	0.1180	(0.961)	0.1218	(0.760)
		High	0.1218		0.1300		0.1399	
	Med	Low	0.1870	0.129	0.1689	0.034	0.1751	0.078
		Med	0.1755	(0.879)	0.1790	(0.967)	0.1635	(0.925)
		High	0.1646		0.1791		0.1805	
	High	Low	0.2597	0.453	0.2276	0.265	0.2272	0.138
		Med	0.2314	(0.636)	0.2168	(0.767)	0.2204	(0.871)
		High	0.2081		0.2557		0.2479	
High	Low	Low	0.1714	0.245	0.1388	0.255	0.1453	0.051
		Med	0.1548	(0.783)	0.1721	(0.775)	0.1595	(0.950)
		High	0.1395		0.1556		0.1555	
	Med	Low	0.2199	0.253	0.1723	1.160	0.1930	0.107
		Med	0.2016	(0.776)	0.2021	(0.314)	0.2021	(0.899)
		High	0.1909		0.2390		0.2124	
	High	Low	0.2921	0.150	0.2508	0.294	0.2571	0.273
		Med	0.2712	(0.861)	0.2897	(0.745)	0.2649	(0.761)
		High	0.2631		0.2844		0.2949	

Notes: We measure portfolio returns from a Statistical Period date, where we form a portfolio, to the following Statistical Period date. Monthly return between Statistical Period dates, is, $R_{i,t,v} = \left[\left[\prod_{\tau=1}^{T_t}(1+r_{i,t,\tau,v}^{j})\right]-1\right]$, where $r_{i,t,\tau,v}$ is *CRSP* daily return within a Statistical Period $\tau=1,2,\ldots,T_t$ for firm i=1,2,…,N, month t=1,2,…,379, in portfolio v=1,2,…,27. The 27 portfolios (v=1,2,…,27) are formed by sorting all firms at a statistical period date by Book/Market into 3 triplets(Low, Med, and High), then for each triplet into 3 triplets (Low, Med, and High) by *SGER1*, and finally for each of the nine Book/Market and *SGER1* sorts by volatility measure into three portfolios (Low, Med, and High). Table 10 reports annualized mean portfolio return $\overline{R}_v = \left[\left[1+\left[\frac{1}{379}\sum_{t=1}^{379}\left[\frac{1}{N}\sum_{i=1}^{N}R_{i,t,v}\right]\right]\right]^{12}-1\right]$.

$\text{DISP1} \equiv \frac{\sigma(EPS1)}{BPS}$ is the analysts' earnings forecast dispersion for the first unreported fiscal year $\sigma(EPS1)$ scaled by the *BPS* from the most recently reported quarterly/annually financial statement prior to the statistical period. Return volatility, $\sigma(R)$, is the standard deviation of daily returns for sixty days prior to the *I/B/E/S* statistical period end. Earnings volatility, $\sigma(E)=\frac{\sigma(\Delta E)}{BVE}$, is the standard deviation of *ROE* changes for the latest 5 fiscal years scaled by the most recently reported book value of equity (*BVE*). The F-Statistic tests for differences between annualized mean returns among 3 volatility-sorted portfolios within each of the nine Book/Market and *SGER1* sorts. p-value underlies F-Stat.

APPENDIX A

Blazenko and Pavlov (2009) find market/book, $\pi(ROE)$, for the corporate investment environment described in section 2.1,

for $0 \le g < r^*$, $r^* \equiv r + \theta\sigma_{x,c}$, is

$$\pi(ROE) = \begin{cases} \dfrac{ROE}{r^* - g} + \dfrac{g\xi^*}{r^*(r^* - g)} \dfrac{(1-\alpha)}{(\alpha-\lambda)} \left(\dfrac{ROE}{\xi^*}\right)^{\lambda} - \dfrac{g}{(r-g)} \left(1 - \dfrac{\alpha}{(\alpha-\lambda)} \left(\dfrac{ROE}{\xi^*}\right)^{\lambda}\right), & growth,\ ROE \ge \xi^* \\ \dfrac{ROE}{r^*} + \dfrac{g\xi^*}{r^*(r^* - g)} \dfrac{(1-\lambda)}{(\alpha-\lambda)} \left(\dfrac{ROE}{\xi^*}\right)^{\alpha} - \dfrac{g}{(r-g)} \dfrac{\lambda}{(\lambda-\alpha)} \left(\dfrac{ROE}{\xi^*}\right)^{\alpha}, & suspend\ growth,\ ROE < \xi^* \end{cases}$$

(A1)

$$where, \quad \alpha \equiv \frac{1}{2} + \frac{\theta\sigma_{x,c}}{\sigma^2} + \sqrt{\frac{2r}{\sigma^2} + \left(\frac{1}{2} + \frac{\theta\sigma_{x,c}}{\sigma^2}\right)^2},$$

$$\lambda \equiv \frac{1}{2} + \frac{\theta\sigma_{x,c}}{\sigma^2} - \sqrt{\frac{2(r-g)}{\sigma^2} + \left(\frac{1}{2} + \frac{\theta\sigma_{x,c}}{\sigma^2}\right)^2}, \tag{A2}$$

$$\xi^* = r^* \times \left[\frac{r^* - g}{r - g}\right] \times \left[\frac{\alpha}{(\alpha - 1)}\right] \times \left[\frac{\lambda}{(\lambda - 1)}\right]. \tag{A3}$$

The parameter, θ, is constant relative risk aversion for a representative investor. The parameter $\sigma_{x,c}$ measures business risk of the common share and equals covariance of the log of ROE (equivalently the log of earnings) with the log of aggregate consumption in the economy. For expositional simplicity, we presume, $\theta\sigma_{x,c} > 0$, which means that risk premiums for equity ownership are positive. The parameter, *r*, is risk free rate. The risk adjusted rate for a permanent "growth-suspension" firm, $r^* \equiv r + \theta\sigma_{x,c}$, is risk free rate, *r*, plus risk premiums, $\theta\sigma_{x,c}$ for a permanent "growth-suspension" firm.

On the growth-suspension branch of Equation (A1), the first term is the value of a permanent growth-suspension firm. The second term (positive) is the expected incremental profit in the option to incur growth investment. The third term (negative) is the expected expansion cost if the manager expands the business sometime in the future when profitability exceeds the expansion boundary, $ROE \geq \xi^*$.

On the growth branch of Equation (A1), the first term is the value of a permanently growing firm. The second term (negative), is the expected profit foregone if profitability falls below expansion boundary, $ROE < \xi^*$, and the manager suspends growth. The third term (negative) is the expected cost of growth expenditures recognizing that the manager avoids these costs upon possible suspension of growth at times in the future.

Equation (A3) is the value maximizing expansion boundary, ξ^*. The first two terms, $r^* \times \left[\frac{r^* - g}{r - g}\right]$, are the expansion boundary for a hypothetical permanently growing firm. The third term, $\left[\frac{\alpha}{(\alpha - 1)}\right] > 1$, measures the delaying force of irreversible growth investments for firms that have suspended growth (see, Dixit and Pindyck 1994). The fourth term, $\left[\frac{\lambda}{(\lambda - 1)}\right] < 1$, measure a force that accelerates growth investment. With limits on investment, current investment increases the size and value of future growth investments upon stochastically improved profitability (see, Blazenko and Pavlov 2009). The product of the last two term, $\left[\frac{\alpha}{(\alpha - 1)}\right] \times \left[\frac{\lambda}{(\lambda - 1)}\right]$, is less than one. Because the manager has the option to incur or suspend growth indefinitely in the dynamic environment, the expansion boundary is lower than in the static setting.

APPENDIX B

In this appendix, we show that *SGER* in Equation (3) is an expected return from the static growth discounted dividend model − the *Gordon Growth Model*.

If forward dividend per share per annum is *D*, if *g* is the expected per annum dividend growth rate, and if *SGER* is expected per annum return, then share price, P_0, is,

$$P_0 = \frac{D}{SGER - g} \tag{B1}$$

Rearrange Equation (B1) to rewrite the forward dividend yield, *dy*, as, $dy \equiv \frac{D}{P_0} = SGER - g$.

Substitute (B2) into (B1) to write share price as forward dividend discounted, as a non-growing perpetuity, at the forward dividend yield,

$$P_0 = \frac{D}{dy} \tag{B3}$$

One way a firm can finance growth is to retain rather than pay earnings as dividends. Let *b* be the retention ratio,

$$b = \frac{EPS - D}{EPS}$$

where *EPS* is forward earnings per share per annum. The payout ratio is one minus retention,

$$1 - b = \frac{D}{EPS}$$

Rearrange this equation to express forward dividend *D* as the product of the payout ratio and forward earnings,

$$D = (1 - b) * EPS \tag{B4}$$

The return on business investment for shareholders, the forward rate of return on equity, *ROE*, is,

$$ROE = \frac{EPS}{BPS} \tag{B5}$$

where *BPS* is book equity per share. For earnings generation, *ROE* applies to both existing operations with in-place assets and growth investments. Equation (B5) indicates that every corporate investment or reinvestment generates cash earnings (expected) at a per annum non-growing rate. Dividend and *EPS* growth is not spontaneous, but arises from ongoing corporate investment.

Substitute Equations (B4) and (B5) into Equation (B3) and divide by book equity, *BPS*, to write market/book as,

$$\frac{P_0}{BPS} = \frac{(1\text{-}b) \times ROE}{dy} \tag{B6}$$

Market/book is the payout ratio times forward *ROE* divided by forward dividend yield. Simplify and rearrange Equation (B6),

$$\frac{P_0}{BPS}\ \mathrm{dy} = ROE\ - b \times ROE = ROE - g \tag{B7}$$

The second equality in Equation (B7) uses the "sustainable growth" relation,[20]

$$g = b \times ROE \tag{B8}$$

In the constant growth discounted dividend model, almost all corporate features grow at the sustainable growth rate, including, dividends, earnings, book equity, and ex-date share prices. Shareholders' wealth, however, grows faster than the sustainable rate because *SGER* is dividend yield plus growth, $SGER = dy + g$, and dividend yield is positive.

Rearrange Equation (B7),

$$g = ROE - \left(\frac{P_0}{BPS}\right)\mathrm{dy} \tag{B9}$$

Corporate growth is forward *ROE* minus market/book times dividend yield. Forward dividend yield, *dy*, in Equation (B9) is unobservable. However, current dividend yield − the current dollar rate of dividend payment per share per annum divided by share price − is observable. Equation (C4) in the appendix shows how to calculate a firm's forward dividend yield, *dy*, from forward *ROE*, market/book and current dividend yield, dy_0. We refer to Equation (B9) as implicit static growth because it is based the market's assessment of profitability, *ROE*.

Because expected return is dividend yield plus growth, and with Equation (B9),

$$SGER = ROE + \left(1 - \frac{P_0}{BPS}\right)dy \tag{B10}$$

[20] See Higgins (1974, 1977, 1981) for more on sustainable growth. This rate is "sustainable" because it is the rate that a firm grows without changing its fundamental ratios, like the debt to equity ratio.

Equation (B10) is expected return, *SGER*, in the static setting for a firm that, hypothetically, commits to permanent growth regardless of profitability, *ROE*.

Appendix C

In this Appendix, we show how to calculate the forward dividend yield from current dividend yield, dy_0. Forward dividend yield, *dy*, incorporating expected dividend growth over the upcoming year, is,

$$dy = dy_0 * (1+g) \tag{C1}$$

Substitute equation (C1) into Equation (C9),

$$g = ROE - \left(\frac{P_0}{BVE}\right)\mathrm{dy}_0(1+\mathrm{g}) \tag{C2}$$

Rearrange equation (C2) to find an expression for growth in terms of observable or easily forecast financial variables,

$$g = \frac{ROE - \left(\frac{P_0}{BVE}\right)\mathrm{dy}_0}{1+\left(\frac{P_0}{BVE}\right)\mathrm{dy}_0} \tag{C3}$$

Substitute equation (C3) into equation (C1) and rearrange,

$$dy = \left(\frac{1+ROE}{1+\left(\frac{P_0}{BVE}\right)\mathrm{dy}_0}\right) dy_0 \tag{C4}$$

Equation (C4) measures the forward dividend yield, *dy*, from the current dividend yield, dy_0, forward *ROE*, and market/book, $\left(\frac{P_0}{BVE}\right)$.

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