NORTH-HOLLAND

Financial Services Review 9 (2000) 125–144

FINANCIAL SERVICES REVIEW

Market timing using strategists' and analysts' forecasts of S&P 500 earnings per share

Richard Chung[a], Lawrence Kryzanowski[b,*]

[a]*Faculty of Commerce, Concordia University, 1455 De Maisonneuve Blvd. West, Montreal, Quebec, Canada, H3G 1M8*
[b]*Ned Goodman Professor of Finance, Faculty of Commerce, Concordia University, 1455 De Maisonneuve Blvd. West, Montreal, Quebec, Canada, H3G 1M8*

Received 14 June 1999; received in revised form 2 August 2000; accepted 26 August 2000

Abstract

This paper examines the bias in and usefulness of top-down and bottom-up consensus forecasts of earnings per share for the S&P 500 Index provided by market strategists and analysts to I/B/E/S. These forecasts exhibit a significant optimism bias that decreases over the 12 months up to release of actual earnings per share. The bias is significantly more pronounced for the bottom-up forecasts of analysts. Unlike the findings for country timing, we demonstrate that a stock market timer using switching rules based on the consensus forecasts of S&P 500 earnings or the directional switch in the consensus or in the number of switchers cannot generate a free lunch. © 2000 Elsevier Science Inc. All rights reserved.

JEL classification: G10; G11; G14

Keywords: Market timing; Earnings forecasts; Performance

1. Introduction

Market timing is a money management style that attempts to add value by switching from equities to cash and vice versa based on signals typically generated by mathematical models. As noted by Benjamin Graham in *The Intelligent Investor* (1954), the current popularity of

* Corresponding author. Tel.: +1-514-848-2782; fax: +1-514-848-4500.
E-mail address: lkryzan@vax2.concordia.ca (L. Kryzanowski).

PII: S1057-0810(00)00061-5

a money management style depends on the performance of the market over the recent past. The belief in buy-and-hold investing (market timing) increases (decreases) in popularity and press coverage as the market progresses through a sustained bull market, and decreases (increases) in popularity and press coverage as the stock market progresses through a bear phase. To some extent, this also applies to academic research interest in market timing. Thus, the unresolved debate over whether or not market timing can generate superior risk-adjusted performance over a buy-and-hold all-equity strategy is likely to intensify once we leave the current bull phase of the equity market. Thus, most investment textbooks (e.g., Bodie, Kane & Marcus, 1999; Reilly & Brown, 2000) that are used to prepare a new generation of money managers devote significant space to active investment management, on how to measure timing performance, and on how successful mutual funds are in timing movements in the market or its volatility.

The academic community is divided on whether the investment community places too little or too much reliance on the earnings forecasts of analysts. Brown (1996) argues that the reliance is too little, Dreman and Berry (1995) argue that the reliance is too much. While no one appears to have formulated and tested methods for domestic market timing using consensus forecasts of earnings per share, at least two studies examine methods for domestic or global asset allocation using consensus forecasts of earnings per share by analysts. Emanuelli and Pearson (1994) find that aggregate forecasts of earnings per share by analysts (a bottom-up approach) improves country selection (a top-down approach), and that the earnings-estimate revision ratio (an aggregate measure of changes in analysts' forecasts of earnings per share) enhances returns from international equity allocation over their studied 52-month test period. Similarly, Bercel (1994) finds that the forecast data of U.S. and non-U.S. analysts, as measured by changes in the forecasts of earnings per share by analysts and the number of analysts changing their forecasts, can be used to generate abnormal returns in seven international markets.

Our contribution is to test whether a market timing strategy using the signals based on the bottom-up consensus forecasts of earnings per share by analysts and the top-down consensus forecasts of earnings per share by market strategists for the S&P 500 generates superior investment performance. We also examine whether better market timing performance is achievable using the direction of these consensus forecast revisions by market strategists and analysts, or the directional net number of such forecasts revised up or down by market strategists and analysts. The latter switching rules are similar to those used by Emanuelli and Pearson (1994) and Bercel (1994) to obtain superior country timing investment performance.

Our research results in four major findings. First, we find a significant optimism bias in bottom-up and top-down forecasts of earnings per share by analysts for the S&P 500 index for the current fiscal year (FY1) and subsequent fiscal year (FY2). Second, we find that the optimism bias is significantly higher in the bottom-up forecasts compared to the top-down forecasts on average, and in each of the months approaching the month during each year in which I/B/E/S updates the actual earnings per share for the S&P 500 index. Third, we find that not only do these optimism biases decrease over the year but that the biases exhibit temporary reversal in January prior to the month during each year in which I/B/E/S updates the actual earnings per share for the S&P 500 index. Fourth, we demonstrate that a market timer using parsimonious switching rules based on the top-down (bottom-up) consensus

forecasts of earnings per share by market strategists (financial analysts) or various directional measures of forecast revisions cannot generate a free lunch or positive alpha (i.e., superior investment performance).

The next section addresses individual investor usage of market timing. The third section provides a review of the relevant literatures. The fourth section examines the bias in consensus top-down forecasts of earnings per share for the S&P 500 of market strategists and the bottom-up equivalents for financial analysts for each of the next two years. The fifth section discusses the data. The sixth and seventh sections evaluate the market timing performance of switching rules based on consensus forecasts of S&P 500 earnings per share and revisions thereof, respectively. We end with some concluding remarks.

2. Market timing and the individual investor

Market timers are fund managers, registered investment advisors, accounts, agents of record and other qualified persons who make market timing decisions and recommendations on behalf of individual investors, or effect such transactions on the instructions of individual investors. A market timer's goal is to improve risk-adjusted performance by reducing risk and/or enhancing return. Unlike other forms of active asset allocation, market timers are 100% invested in equities or in cash, or are long in one of these asset classes and short in the other.

Market timers manage considerable capital. To illustrate, the more than 200 members of the Society of Asset Allocators and Fund Timers, Inc. or SAAFTI manage an estimated $14 billion (http://www.saafti.com/Advisors/saafti/home.asp, July 24, 2000). Various service providers expend considerable resources to provide market-timing recommendations to individual investors, and to evaluate the performance of these recommendations. Three examples follow. First, *Hulbert Financial Digest* (see http://www.hulbertdigest.com/) calculates "timing-only" returns for investment newsletters. About one-half of the newsletters it monitors provide timing signals and have significant individual subscribers (according to an e-mail response from Mark Hulbert dated 20 July 2000). Second, *MoniResearch Newsletter* (see http://www.moniresearch.com/) tracks and measures the performance of client accounts of 100 timing-only money managers, including rydex funds, profund timers and mutual funds. Third, *Timer Digest* monitors over 100 of the leading market timing models, and provides commentary on the top funds based on their ranking of performance.

In practice, timers use a variety of investment products to effect their timing strategies, including mutual funds (e.g., bull and bear funds designed to correlate positively and negatively with the major indices), variable annuities, equity baskets, exchange-traded index-linked securities (e.g., S&P 500 Depository Receipts or SPDRs, Worldwide Equity Benchmark Shares or WEBs or I shares, DJIA Depository Receipts or Diamonds and Nasdaq 100 Trust Units or QQQ), and futures on the national market indexes. A number of individual investors confine their timing decisions to their variable annuity and retirement savings plan accounts (i.e., self-directed IRA, 401K or Keogh accounts) to minimize the tax impact of effecting timing decisions. The practice of timing necessarily converts an unrealized capital gain into an immediate realized gain and an associated tax liability (Jeffrey & Arnott, 1993).

Market-timing using variable annuity accounts and mutual funds cause concern among the sponsors and managers of these plans due to their allegedly adverse effect on fund performance (Koco, 1995). The actions of market timers (short-term investors) allegedly drives up fund costs that are primarily borne by long-term unitholders. These costs include higher taxes, trade costs incurred to fund redemptions and to invest inflows, and larger cash balances to protect against unexpected large redemptions or as the result of unexpected large cash purchases of fund units. To alleviate these problems, many companies impose redemption fees, minimal holding periods and limits on transaction sizes by their unitholders or shareholders. Others (such as Rydex Series Trust, ProFund Advisors and Protomac Funds) have investment vehicles to cater to this active investment market. In May 2000, the Vanguard Group announced that it had filed with the SEC to offer exchange traded funds (so-called Viper shares) on five of its most prominent index funds (see http: www.saafti.com/Advisors/saafti/newsletter.asp?storyid=84623). These Viper shares, which are to be listed on the AMEX, offer investors advantages in terms of tax efficiencies, minimal expense ratios, and continuous trading possibilities with prices continuously marked-to-market and minimal trade impediments.

3. Literature survey

3.1. Bias in the forecasts by analysts and strategists

Numerous studies examine whether or not analysts produce unbiased forecasts of investment-relevant information such as earning per share (EPS), and whether or not analysts systematically underreact or overreact to new information. Brous (1992), Brous and Kini (1993), Francis and Philbrick (1993), Kang, O'Brien and Sivaramakrishnan (1994) and Dreman and Berry (1995) find that analysts normally produce upwardly biased forecasts of earnings per share. Harris (1999) finds a similar bias in the long-run forecasts of analysts. While DeBondt and Thaler (1990) find that analysts systematically overreact to new information, Ali, Klein and Rosenfeld (1992), Elliot, Philbrick and Wiedman (1995) and Teoh and Wong (1997) find evidence that suggests that analysts systematically underreact to new information.

Easterwood and Nutt (1999) report that the reaction of analysts depends upon the nature of the information that becomes available. Specifically, their evidence indicates that analysts underreact to new negative information, do not react in the absence of new information, and overreact to new positive information. They conclude that their results are consistent with the hypothesis that analysts are systematically optimistic in their interpretation of new information. Lin and McNichols (1998) report that the optimism of earnings forecasts by analysts depends upon their underwriting relationships. Lead and co-underwriter forecasts of earnings growth are significantly more favorable than those made by unaffiliated analysts. Das, Levine and Sivaramakrishnan (1998) find that analysts issue more optimistic forecasts for low predictability firms.

Chopra (1998) finds that the average consensus earnings per share growth forecasts made by analysts for the S&P 500 index over the 1985–1997 time period is almost twice the actual

growth rate, and is revised downward continuously over the course of the year. Chung and Kryzanowski (1999) examine the top-down forecast accuracy and divergence of market strategists for quarterly earnings per share forecasts for the S&P400 and S&P 500 indexes. They find that such forecasts are, on average, optimistically biased, and that the bias is positively related with both the number of market strategists reporting their forecasts to I/B/E/S each month, and the coefficient of variation of such forecasts.

3.2. Efficacy of market timing strategies and market timers

A number of papers calculate the required forecasting ability to successfully time the market or simulate the performance of investors with different forecasting abilities. Sharpe (1975) calculates that a market timer needs to be correct over 75% of the time to outperform a passive, all-equity portfolio. Clarke, Fit, Gerald, Berent and Statman (1989) use simulation to conclude that a market timer with even modest amounts of information who follows optimal decision rules can outperform a buy-and-hold investor. Beebower and Varikooty (1991) demonstrate that most of the common tests for detecting significant ability to generate excess returns of up to two percentage require assessment time periods well beyond human life expectancy. Shilling (1992) shows that being long in stocks during bull markets is not as profitable as being out of the market during bear markets even if an investor is not invested in many major bull markets. Reichenstein and Rich (1994) propose that some market timing is justified by the empirical evidence on the partial predictability of stock returns in the long-term. Bierman (1995) argues that market timing is an art and not a science, since economists need hindsight to identify market bubbles. Wagner (1997) finds that a timer could miss as much as 20% of the tops and bottoms of the S&P 500 over the 108 years since 1885 and still match the average performance of a buy-and-hold investor.

A number of papers report on the effectiveness of specific market timing strategies or market timers. Hardy (1990) concludes that regression forecasts using models with macro variables are so good that tactical asset allocation can improve the gross return/risk trade-off considerably, even for investment portfolios confined solely to domestic assets. Wagner, Shellans and Paul (1992) examine the performance of twenty-five investment advisors who performed market-timing services for clients and were monitored by the newsletter published by MoniResearch. For the period of October 1985 through the end of September 1990, they find that these advisors outperformed a buy-and-hold strategy. Brocato and Chandy (1994) argue that selection bias can easily produce the results reported by Wagner et al. (1992). Brocato and Chandy (1994) find that the average record of their twenty-five random timers is identical to the average record of the twenty-five real timers studied by Wagner et al. (1992).

Larsen and Wozniak (1994/95, 1995) find support over the 1977–1992 period for market timing in the real world based on results for a discrete timing regression model for market timing. Over the period studied by Brocato and Chandy (1994), Larsen and Wozniak (1994/95, 1995) find significantly superior results for their method of market timing compared to the randomization strategy of Brocato and Chandy for out-of-sample tests. Brocato and Chandy (1995) question the robustness of the conclusions of Larsen and Wozniak

(1994/95, 1995) to the imposition of realistic transaction costs and taxes to the market-timing results.

Reichenstein and Rich (1993) report that timing portfolios based on market risk premium display a stronger ability to time the market than those based on dividend yield and earnings-price ratio. Fuller and Kling (1994) find that the models studied by Fama and French (1989) are not reliable signal generators for market timing when trading costs, subperiods and consistency across models is considered. Prather and Bertin (1998) find performance that is superior to a passive buy-and-hold strategy for a market timing trading rule that uses the public information contained in discount rate changes to signal entry and exit into the stock market.

Breen, Glosten and Jagannathan (1989) find that a portfolio managed by the predictions of a three-year rolling regression of excess stock return on the one-month risk-free rate is worth an annual management fee of 2% of the value of the assets managed. Lee (1997) finds that the value added by market timing identified by Breen et al. (1989) is completely eroded by April 1989, and becomes negative when the studied time period includes observations after April 1989.

Copeland and Copeland (1999) test changes in the implied volatility of options on stock index futures as market-timing strategies for reallocating assets among portfolios of various sizes and styles. They conclude that market timing may be feasible at least for portfolio yield enhancement.

Due to the large number of studies (e.g., Ferson and Schadt, 1996; Kryzanowski, Lalancette & To 1997) that assess the market-timing ability of mutual fund managers in various countries, we only note herein due to journal space constraints that these studies predominantly report evidence of little or poor market-timing ability. A recent exception is the study by Busse (1999) who finds that market volatility timing (as opposed to market timing) has led to higher risk-adjusted returns. Graham and Harvey (1994, 1996, 1997) examine the performance of the asset-allocation strategies of 326 newsletters drawn from the *Hulbert Financial Digest* for the 1983–95 period. They find that the group appears not to possess any special information about the future direction of the market.

4. Data

We use the annual estimates of earnings per share for the current and subsequent fiscal year (FY1 and FY2) for the S&P 500 Index that are available from I/B/E/S on both a top-down and bottom-up basis. Our data set consists of 218 months of such annual forecasts over the period from January 1982 through February 2000.

Each top-down consensus forecast is the cross-sectional average of the individual forecasts of earnings per share for the S&P 500 made by market strategists each month. For the interested reader, I/B/E/S provides both quarterly and annual top-down consensus forecasts of earnings per share for FY1 through FY3 under the ticker symbol SAP5 on a regular basis. The bottom-up consensus forecasts of earnings per market-weight share are a weighted-average of the consensus forecasts of the earnings per share for each firm included in the S&P 500, where each weight is equal to the weight of that firm in calculating the stock price

index for the S&P 500. In other words, the bottom-up consensus forecast is a market-value weighted average of the consensus forecasts of earnings per share for each of the firms in the S&P 500 Index. For ease of exposition, we refer to this value as earnings per share throughout this paper. The bottom-up consensus forecasts of earnings per share are available from I/B/E/S on a regular basis but are not included in the data package commonly made available to researchers.

5. S&P 500 earnings forecasts and their biases

5.1. Expectations and methodology

The S&P 500 forecasts of earnings per share generated by both strategists and analysts studied herein are expected to display systematic optimism. As predominantly sell-side employees of brokerage and investment banking firms, these sell side professionals have economic incentives to promote stock purchase rather than to produce the most accurate forecasts (Womack, 1996; Carleton, Chen & Steiner, 1998). Das, Levine and Sivaramakrishnan (1998) assert that analysts may engage in deliberate optimism to obtain private information from firm management that can produce earnings forecasts that are substantially better than those produced from only using public information. Furthermore, the S&P 500 forecasts of analysts are expected to exhibit more systematic optimism than those of strategists because analysts unlike strategists derive part of their comparative advantage (expertise) from their superior access to the top management of the firms that they follow, and analysts do not want to jeopardize investment banking relationships between the firm they work for and the firm for which they are forecasting earnings (Womack, 1996). Many examples exist where such access has been adversely affected by a less than favorable report by an analyst (Pratt, 1993). In addition, the consensus bottom-up forecasts have a selection bias not present in the consensus top-down forecasts caused by analysts discontinuing the production of forecasts for firms that do not generate sufficient commission revenues for their employers or for which they are pessimistic.

The decimal forecast error in the average or consensus FY1 and FY2 forecasts of the earnings per share for the S&P 500 index are calculated monthly for the top-down forecasts made by market strategists and the bottom-up forecasts made by financial analysts. The forecast error in month t in the consensus forecast of the earnings per share for the S&P 500 index for fiscal year i (i = FY1 or FY2) for reporting group j (j = strategists or analysts) in month t, $FE_{ijt,}$ is given by:

$$FE_{ijt} = (F_{ijt}/A_{ijt}) - 1 \quad (1)$$

where F_{ijt} is the consensus forecast in month t of earnings per share for the S&P 500 index for fiscal year i for reporting group j; and A_{ijt} is the actual earnings per share for the S&P 500 index for fiscal year i that corresponds to the forecast made for fiscal year i by reporting group j in forecast month t.

In the I/B/E/S database, the top-down and bottom-up forecast horizons for FY1 and FY2 are moved forward by one year at the end of March and February, respectively, of each calendar year.

As noted in section two, the practice of market timing necessarily converts an unrealized capital gain into an immediate realized gain and an associated tax liability (Jeffrey & Arnott, 1993) unless the timing transactions are being incurred in a tax-deferred account. In the following tests, we ignore tax considerations. This turns out not to be an important omission since our tested market timing strategies do not outperform a passive portfolio with an equivalent average level of risk.

5.2. The results

The mean and median consensus forecasts of earnings per share in dollars for FY1 and FY2 for the top-down and bottom-up approaches are reported in the first two rows of numbers in Panel A of Table 1. Although not shown in the panel, both of the top-down consensus forecasts of the earnings per share are significantly lower than their bottom-up counterparts at the 0.05 level (the implied significance level from this point onwards unless noted otherwise). The mean and median forecast errors are reported in the last two rows, respectively, of Panel A of Table 1. The bottom-up forecasts of financial analysts exhibit a statistically significant mean optimism bias of 17.5% and 30.5% for FY1 and FY2, respectively. Such a bias is identified previously by Ali, Klein and Rosenfeld (1992), among others. In a similar but more muted vein, the top-down forecasts of market strategists exhibit a significant mean bias of 7.7% and 12.0% for FY1 and FY2, respectively. Although the median values are consistently lower, tests using the median values yield similar inferences.

Interestingly, all of these biases are considerably higher than the values reported in a previous version of this paper for the 167-month period from January 1982 through November 1995. Specifically, for this shorter time period, the mean optimism biases of analysts (strategists) are a significant 8.0% (insignificant −0.1%) for FY1, and a significant 19.2% (significant 3.5%) for FY2. The quite different results for the two time periods suggest that the optimistic biases of analysts and of strategists may vary across both calendar and relative time, and that this time-variation will not be reflected well in more parsimonious market-timing strategies without data snooping. These differences also suggest that the optimistic biases of analysts and of strategists may be positively related to the relative weight of bull market months in the time period studied. These are topics for future study.

The four series of average forecast errors of earnings per share relative to their respective annual switch months are reported in Panel B of Table 1. The top-down and bottom-up values are relative to the end of March and February, respectively (i.e., their switch month 0) because, as noted above, the year-end being forecasted is updated or advanced by one year on these dates in the I/B/E/S database. The numbers in this panel are all positive, which signifies optimism biases in the top-down and bottom-up FY1 average forecasts. These biases decrease over the year, as the switch month is approached (i.e., actual values of earnings per share become known). The optimism bias also decreases over the eleven (ten) months up to the first month prior to switch for the bottom-up (top-down) FY2 average

Table 1
Average consensus forecasts and forecast errors for the S&P 500 index

Measure for earnings per share	Statistic[c]	Top-down consensus forecast of earnings per share by strategists for fiscal year		Bottom-up consensus forecast of earnings per share by analysts for fiscal year	
		FY1[d]	FY2[d]	FY1	FY2
Panel A: Mean and median consensus forecasts and forecast errors of earnings per share for the S&P 500 Index					
Forecast[a]	Mean	25.97	28.38	28.53	33.49
	Median	23.03	25.93	25.78	30.31
Forecast error[b]	Mean	0.0770**	0.1199**	0.1746**	0.3053**
	Median	0.0672**	0.0953**	0.1441**	0.2301**

Panel B: Mean consensus forecast errors of earnings per share for the S&P 500 Index relative to the month that I/B/E/S updates actual earnings per share for the S&P 500 Index in its database

Month relative to I/B/E/S update of actual earnings per share	Top-down consensus forecast of earnings per share by strategists for fiscal year		Bottom-up consensus forecast of earnings per share by analysts for fiscal year	
	FY1[d]	FY2[d]	FY1	FY2
−12	0.0884	0.1332	0.3020	0.4301
−11	0.0847	0.1302	0.2081	0.3508
−10	0.0944	0.1278	0.1995	0.3327
−9	0.0918	0.1272	0.2013	0.3156
−8	0.0915	0.1297	0.1904	0.3096
−7	0.0860	0.1309	0.1778	0.3020
−6	0.0786	0.1238	0.1670	0.2953
−5	0.0671	0.1164	0.1563	0.2863
−4	0.0584	0.1085	0.1413	0.2762
−3	0.0498	0.1009	0.1271	0.2622
−2	0.0454	0.1077	0.1177	0.2503
−1	0.1332	0.1052	0.1038	0.2506

Mean and median consensus forecasts and forecast errors of earnings per share for the S&P 500 made by strategists and analysts, and tests of their significance, are presented in panel A. Mean consensus forecast errors of earnings per share for the S&P 500 for the months prior to the month that I/B/E/S annually updates the actual annual earnings per share for the S&P 500 are reported (without testing for their significance) in panel B. Monthly forecasts are examined for the 218 month period from January 1982 through February 2000.

[a] Dollars of earnings per share for the S&P 500 index.

[b] Forecast error is equal to the [(Forecast earnings per share) ÷ (Actual earnings per share)] −1.

[c] Tests are conducted for forecast errors against zero.

[d] FY1 and FY2 refer to the current and subsequent fiscal years, respectively.

* and ** indicate significance at the 0.05 and 0.01 levels, respectively.

forecasts, and increases in the remaining month (two months) prior to the switch month of February (March). Whether or not the temporary increase in the optimism bias in January for both the top-down and bottom-up consensus forecasts of earnings per share for FY2 is related to the well-known January anomaly requires further study.

Table 2
Switching rules for classical market timing for various natural habitats[a]

Switch to:[c]	Natural habitat[b]			
	Stock[d]	Cash[d]	None[d]	None[e]
Cash if predicted S&P 500 return[f] is	Less than T-Bill return[f] minus 1%	Less than T-Bill return	Less than T-Bill return minus 1%	Less than T-Bill return
Stock if predicted S&P 500 return is	Greater than T-Bill return	Greater than T-Bill return plus 1%	Greater than T-Bill return plus 1%	Greater than T-Bill return

This table provides the switching rules used in market timing using the consensus earnings per share forecasts for the S&P 500 made by market strategists and financial analysts. The market timing is classical since the portfolio is either fully invested in equities or in cash. Transaction costs are ignored and are considered at a rate of 1% of asset value for each switch.

[a] Classical market timing refers to switching between cash and equities based on market expectations.

[b] The natural habitats are to remain in stock, in cash, and in neither (none).

[c] The switching rules compare the predicted return on the S&P 500 with the current return on T-Bills.

[d] Switching rule reflects a 1% transaction cost charge when moving away from this natural habitat.

[e] Switching rule reflects no transaction cost charge when moving away from this natural habitat.

[f] The return on equities is proxied by the return on the S&P 500 index and the return on cash is proxied by the return on T-Bills.

6. Tests of classical market timing strategies using consensus S&P 500 earnings forecasts

We now formulate and test several possible methods for market timing using strategists' top-down and/or analysts' bottom-up forecasts of earnings per share for the S&P 500 Index for FY1 and FY2 to generate average one-month expected returns. The market timing is classical because the switching rule is based on a comparison of the expected return on risky assets with that on risk-free assets. We begin with a discussion of our test procedures.

6.1. Test procedures

Unlike common practice in the literature (e.g., Lee, 1997; Wagner, 1997), we not only examine portfolio performance for investors whose natural or preferred habitats are to remain in stock (*STOCK*) or in cash (*CASH*) but also in neither (*NONE*). We assume a 1% transaction cost for all switches between all equity as proxied by the S&P 500 Index and all cash as proxied by 30-day T-Bills, and adjust the switching rules to account for the transaction cost when switches are away from the preferred habitat. Our switching cost is higher than the 0.5% rate used by Fuller and Kling (1994). For those investors without a natural habitat, the switching rules are examined with and without a transaction cost charge for any switch. The switching rules used are summarized in Table 2. All switches are based on a comparison of the *expected* one-month-hence return on equity with the current one-

month T-Bill rate, with or without an adjustment for transaction costs. As expected, the mean S&P 500 monthly return of 1.47% is substantially higher than the corresponding return of 0.50% for T-Bills over the studied period.

We test the predictive value of the top-down forecasts supplied by the strategists, the bottom-up forecasts supplied by the analysts, and both the top-down and bottom-up forecasts (switch if both screens are satisfied separately). For each of these three types of consensus forecasts, we use two different approaches for calculating the expected *average* one-month-hence return for the S&P, which is needed in the switching rules. Thus, our tests of the efficacy of market timing also depend upon the validity of these models in determining what prices will be in the future, and on the validity of using consensus forecasts of earnings as a proxy for the earnings expectations that will be reflected in stock prices at a future point in time.

The first or *current earnings-to-price (E/P)* approach calculates the predicted one-month return as the summation of the two components of expected total return (i.e., dividend yield plus capital gain return), after calculating each component's average monthly compound rate of return over the given forecast horizon. For example, for a forecast horizon of eight months, the average monthly compound rate of capital gain is equal to the eighth root of the holding period rate of capital gain. The capital gain component of total expected return uses the price predicted for the end of the forecast horizon. For example, using the top-down consensus forecast for FY1, the predicted or expected price of the S&P 500 at the end of the forecast horizon (i.e., the switch month of March) is obtained by multiplying the current month's consensus top-down forecast of earnings per share for the S&P 500 for FY1 by the *current price-to-earnings ratio* for the S&P 500. Alternatively, it is obtained by dividing this consensus forecast by the *current earnings-to-price ratio* that proxies for the market's current rate of capitalization of a dollar of current S&P 500 earnings. The dividend yield component of total expected return uses the average monthly compound rate that yields the current month's annual dividend yield.

More formally, the expected average monthly return for an investment at the beginning of month t in the S&P 500 index based on the expected realization of the consensus forecast of earnings per share for fiscal year i provided to I/B/E/S by reporting group j that is available at the beginning of month t, $R_{ijt,}$ is given by:

$$R_{ijt} = \left\{ \left[F_{ijt} \left(\frac{P_t}{A_t} \right) \left(\frac{1}{P_t} \right) \right]^{\frac{1}{s_{ij}}} - 1 \right\} + \left[(D_t)^{\frac{1}{12}} - 1 \right] \tag{2}$$

where F_{ijt} is the consensus forecast of earnings per share for the S&P 500 index for fiscal year i (i= FY1 or FY2) provided to I/B/E/S by reporting group j (j = strategist or analysts) that is available at the beginning of month t; P_t is the actual price or level of the S&P 500 index at the beginning of month t; and s_{ij} is the number of months from the beginning of month t

to the switch month that is relevant for fiscal year i for a forecast to I/B/E/S by reporting group j.

Cancelling out the P_t terms in Eq. (2) and rearranging (2) yields:

$$R_{ijt} = \left[\left(\frac{F_{ijt}}{A_t} \right)^{\frac{1}{s_{ij}}} - 1 \right] + \left[(D_t)^{\frac{1}{12}} - 1 \right] \tag{3}$$

Thus, the return estimated using the first approach is equivalent to that obtained using a Gordon valuation model, when the capital gain component of total expected return is estimated as the average monthly compound rate of change in the consensus forecast of earnings per share for FY1 (or FY2) for the current month when benchmarked against the most current actual earnings per share available at the beginning of that month. The equivalence of the approaches assumes that the dividend payout ratio remains constant.

The second or *premium* approach replaces the reciprocal of the *current earnings-to-price* in Eq. (2) with a premium-based earnings-to-price, which is calculated as the current risk-free rate plus the historical average premium of earnings-to-price over the return on one-month T-Bills. The historic premium is proxied by the most recent 36-month moving-average premium.

The metric proposed by Elton and Gruber (1991) is used to measure market timing ability for each portfolio. The proposed metric for month t is equal to the excess return on the portfolio for month t **minus** the excess return that would have been obtained on the portfolio in month t if the portfolio maintained its average actual beta at all points in time. More formally, the proposed metric, d_t, for month t is:

$$d_t = r_t - r_{\beta^* t} \tag{4}$$

where r_t is the excess return on the portfolio for month t, and $r_{\beta^* t}$ is the excess return that would have been obtained on the portfolio in month t if the portfolio maintained its average actual beta (represented by β^*) at all points in time. This average actual beta portfolio represents a buy-and-hold portfolio with a holding period equivalent to the time period studied, namely, 218 months or slightly over 18 years.

Each excess return for the portfolio is obtained by subtracting the T-bill rate from the portfolio's return. This metric correctly measures performance given market timing because additional information is used which is not available to an outside performance assessor. Namely, in addition to the time-series of returns for the risk-free and risky assets, we know and use the portfolio proportions at each point in time in measuring portfolio performance. For example, if a portfolio is invested in equities for 85% of the months, then we know that its average beta is 0.85.

6.2. Test results

The mean and median one-month forecast errors for the S&P 500 returns for the two return prediction methods using the two types of S&P 500 forecasts for the two fiscal years are presented in Table 3. As expected based on earlier results, the forecast returns are significantly higher for the bottom-up forecasts compared to the top-down forecasts. For the

Table 3
Average monthly return forecast errors for the S&P 500 index for various return prediction methods, forward earnings forecasts and forecaster type[a]

Return prediction method[b]	Statistic[c]	Top-down consensus forecasts of earnings per share by strategists for fiscal year		Bottom-up consensus forecasts of earnings per share by analysts for fiscal year	
		FY1	FY2	FY1	FY2
Current E/P	Mean	0.0206**	−0.0031	0.0407**	0.0056
	Median	0.0144**	−0.0023	0.0261**	0.0037
Premium	Mean	−0.0066	−0.0054	0.0154*	0.0036
	Median	−0.0019	−0.0040	0.0127*	0.0028

This table reports the mean and median monthly return forecast errors, and tests of their significance, for various combinations of return prediction method, fiscal year end and type of forecasters. The return prediction methods are the current earnings-to-price (E/P) and premium approaches. The fiscal year forecasts are for the next year (FY1) and the following year (FY2). The forecaster type is top-down for forecasts made by market strategists, and bottom-up for forecasts made by financial analysts.

[a] The forecast errors are equal to the predicted minus the actual return for the S&P 500 Index for each of the months from January 1982 through February 2000.

[b] The return prediction methods are the *current earnings-to-price or E/P* approach, and the *premium* approach. These two models are discussed at length in the body of this article.

[c] Tests are conducted to determine if the forecast errors are different from zero.

* and ** indicate significance at the 0.05 and 0.01 levels, respectively.

bottom-up forecasts, the forecasted returns are significant (and higher than actual) for only FY1 using both the *current E/P* and *premium* approaches. For the top-down forecasts, the forecasted returns are significant (and higher than actual) only for FY1 using the *current E/P* approach.

Four summary statistics for each set of 24 portfolios grouped by return prediction method are examined next. The portfolios within each set are differentiated by preferred habitat (four possibilities), type of consensus (three possibilities) and forecast horizon (two possibilities). The statistics include the mean and median performance metric, the number of switches, and the average beta over the 218-month period. We also emphasize the results for the lowest hurdle to the achievement of superior performance, that is, the case of an investor who has no preferred habitat and encounters no transaction costs in making switches.

The summary results for the portfolios using the *current E/P* and *premium* return prediction methods are presented in Panels A and B of Table 4, respectively. First, all of the mean performance metrics are not statistically significant, and all significant median performance metrics are negative. Thus, these test results are consistent with the notion of Sharpe (1975) that superior market timing is extremely difficult to achieve using the switching rules and signals tested to this point. Second, even for the lowest hurdle to performance represented by the last (right-most) column in both panels of Table 4, the mean performance is not significant. Thus, even when no transaction costs are incurred for switching between equities and cash or vice versa, the portfolios formed using our market timing strategies exhibit a

Table 4
Summary statistics for performance, risk and activity for portfolios actively managed using the current E/P return prediction and premium approaches and consensus earnings forecasts

Panel A: Various portfolio statistics for timing portfolios using current E/P return prediction approach

Type of consensus forecast of earnings per share used	Statistic[a]	Natural Habitat[e]			
		Stock[f]	Cash[f]	None[f]	None[g]
Consensus top-down forecasts of earnings per share for FY1 by strategists	Mean[b]	−0.0011	−0.0020	−0.0011	−0.0020
	Median[b]	−0.0017	−0.0041*	−0.0024	−0.0030
	# of switches[c]	8	9	6	10
	Beta[d]	0.940	0.830	0.890	0.890
Consensus top-down forecasts of earnings per share for FY2 by strategists	Mean	−0.0001	0.0003	0.0001	0.0011
	Median	0.0006	−0.0048**	0.0004	−0.0039*
	# of switches	2	8	2	18
	Beta	0.995	0.491	0.973	0.794
Consensus bottom-up forecasts of earnings per share for FY1 by analysts	Mean	−0.0006	−0.0009	−0.0007	−0.0006
	Median	−0.0001	−0.0007	−0.0005	−0.0003
	# of switches	4	5	4	4
	Beta	0.973	0.950	0.968	0.954
Consensus bottom-up forecasts of earnings per share for FY2 by analysts	Mean	−0.0001	0.0004	−0.0001	−0.0001
	Median	0.0006	0.0004	0.0006	0.0006
	# of switches	2	3	2	2
	Beta	0.995	0.977	0.995	0.995
Consensus top-down forecasts of strategists and bottom-up forecasts of analysts for earnings per share for FY1 (switches occur only if both screens are satisfied)	Mean	−0.0001	−0.0001	−0.0001	−0.0001
	Median	0.0006	−0.0011	0.0006	0.0006
	# of switches	2	1	2	2
	Beta	0.995	0.936	0.995	0.995
Consensus top-down forecasts of strategists and bottom-up forecasts of analysts for earnings per share for FY2 (switches occur only if both screens are satisfied)	Mean	−0.0001	−0.0001	−0.0001	−0.0001
	Median	0.0006	−0.0011	0.0006	0.0006
	# of switches	2	1	2	2
	Beta	0.995	0.936	0.995	0.995

Panel B: Various portfolio statistics for timing portfolios using premium return prediction approach

Type of consensus forecast of earnings per share used	Statistic[a]	Natural Habitat[a]			
		Stock[f]	Cash[f]	None[f]	None[g]
Consensus top-down forecasts of earnings per share for FY1 by strategists	Mean[b]	0.0003	0	0.0002	−0.0002
	Median[b]	−0.0059**	−0.0050*	−0.0051**	−0.0055**
	# of switches[c]	11	6	7	13
	Beta[d]	0.560	0.467	0.478	0.528
Consensus top-down forecasts of earnings per share for FY2 by strategists	Mean	0.0013	−0.0004	0.0011	0.0011
	Median	−0.0016	−0.0047**	−0.0038	−0.0064**
	# of switches	5	4	3	11
	Beta	0.830	0.451	0.808	0.632
Consensus bottom-up forecasts of earnings per share for FY1 by analysts	Mean	0.0006	0.0010	0.0008	0.0017
	Median	−0.0074*	−0.0060**	−0.0064**	−0.0067**
	# of switches	16	9	10	18
	Beta	0.720	0.577	0.621	0.654

(continued on next page)

Table 4 *(continued)*

Consensus bottom-up forecasts of earnings per share for FY2 by analysts	Mean	0.0001	0.0012	0.0001	0.0002
	Median	0.0025	−0.0016	0.0025	0.0008
	# of switches	0	4	0	6
	Beta	1	0.824	1	0.973
Consensus top-down forecasts of strategists and bottom-up forecasts of analysts for earnings per share for FY1 (switches occur only if both screens are satisfied)	Mean	0.0001	0.0018	0.0001	0.0010
	Median	0.0025	−0.0015	0.0025	−0.0014
	# of switches	0	4	0	3
	Beta	1	0.819	1	0.868
Consensus top-down forecasts of strategists and bottom-up forecasts of analysts for earnings per share for FY2 (switches occur only if both screens are satisfied)	Mean	0.0001	−0.0001	0.0001	0.0010
	Median	0.0025	−0.0011	0.0025	−0.0014
	# of switches	0	1	0	3
	Beta	1	0.936	1	0.868

Panel A provides the mean and median differential performance (and tests of their significance), average beta and number of switches for the portfolios that are actively managed using the current earnings-to-price (current E/P) return prediction approach and the consensus forecasts for earnings per share for the S&P 500 index for fiscal year FY1 (FY2) made by either strategists or analysts. Panel B provides the same information except that the premium return prediction approach is used.

[a] Tests are conducted to determine if the mean and median performance metrics are significantly different from zero.

[b] The mean and median market timing performance metric for month t is equal to the (excess return on the portfolio for month t)-(the excess return that would have been obtained on the portfolio in month t if the portfolio maintained its average actual beta at all points in time).

[c] The number of switches is the number of switches from equity to cash or vice versa.

[d] The average beta is the mean beta over the 218 month period for the current E/P return prediction approach, and over a 182 month period for the premium return prediction approach where the first three years are lost in calculating the return premium.

[e] The preferred habitats are stock, cash and neither (or none).

[f] Switching rule reflects a transaction cost charge of 1% when moving away from this preferred habitat.

[g] Switching rule reflects no transaction cost charge when moving away from this preferred habitat.

"*" and "**" indicate significance at the 0.05 and 0.01 levels, respectively.

performance that is not significantly different than a passive buy-and-hold strategy. Third, both models result in a low rate of switching between an all-equity and an all-T-bill portfolio. Specifically, only 2 of the 24 portfolios based on signals from the *current E/P* model have 10 or more switches, and only 6 of the 24 portfolios based on signals from the *premium* model have 10 or more switches. The maximum number of switches is 18 for both signal-switching approaches. This still represents an average holding period of slightly less than a year (i.e., 218 months divided by 19). Fourth, all of the portfolios are invested in equities for more than 63% of the months, where 63% is the proportion of the months for which the returns on the S&P 500 Index exceed the returns on T-Bills for the 218 month period we study herein. This is easily seen if one recalls that the proportion of the months each portfolio is invested in equities is equal to its beta.

Table 5
Proportion of periods classified by directional consensus and the directional number of signals

Measure of revisions of earnings per share by strategists or analysts	Direction of revisions in earnings per share for the month	Top-down consensus forecasts of earnings per share by strategists for Fiscal Year		Bottom-up consensus forecasts of earnings per share by analysts for Fiscal Year	
		FY1	FY2	FY1	FY2
Directional consensus	Up	0.40	0.48	0.26	0.28
Directional consensus[a]	Down	0.57	0.48	0.72	0.71
Directional number[b]	Up	0.33	0.39		
Directional number[b]	Down	0.56	0.44		

This table reports the proportion of periods classified by directional consensus and by directional number for fiscal years FY1 and FY2 for consensus forecasts by strategists and analysts. The directional consensus signal is based on the directional change (up or down) in the consensus forecast of earnings per share for the S&P 500 index. The directional number signal is based on the number of forecasts increased by strategists minus the number of forecasts decreased by strategists for earnings per share for the S&P 500 index for each month t.

[a] The directional consensus is up (down) when the consensus forecasts of earnings per share are revised up (down) for this month compared to last month by strategists for top-down forecasts or by analysts for bottom-up forecasts.

[b] The directional number is up (down) when the number of strategists revising their top-down forecasts of earnings per share upwards this month exceeds (is less than) the number revising them downwards.

7. Tests of market timing strategies using consensus S&P 500 earnings forecast revisions

We now test market timing performance using switching rules based on the direction of consensus forecast revisions and in the directional net number of forecasts revised up and down. The first switching rule, *directional consensus*, favors equity when the consensus forecast of earnings per share is revised up for this month compared to last, and vice versa if it is lowered. Thus, for an upward directional consensus signal, the portfolio switches to equity if it is already in cash, and remains in equity if it is already in equity. Similarly, for a downward directional consensus signal, the portfolio switches to cash if it is already in equity, and remains in cash if it is already in cash. The second switching rule, *directional number*, favors equity when the number of strategists revising their top-down forecasts of earnings per share upward this month exceeds the number revising them downwards, and vice versa if the number of revisions upwards is less than the number downwards. Thus, for an upward directional number signal, the portfolio switches to equity if it is already in cash, and remains in equity if it is already in equity. Similarly, for a downward directional number signal, the portfolio switches to cash if it is already in equity, and remains in cash if it is already in cash. The second switching rule is not implemented using the analyst bottom-up forecasts because the data for doing such are not available.

The proportions of the periods classified by *directional consensus* and *directional number* are presented in Table 5. Given the forecast revision patterns identified in section five, it is not surprising that the proportion of down periods almost always exceeds that for up periods. Four summary statistics for the portfolios using the *directional consensus* and *directional number* switching rules are presented in Table 6. Compared to the findings reported in the

Table 6
Summary statistics for performance, risk and activity for portfolios actively managed using the directional consensus and directional number signals for market timing

Type of forecast of earnings per share used	Statistic[a]	Switching rule based on	
		Directional consensus[e]	Directional number[f]
Top-down forecasts of earnings per share for FY1 by strategists	Mean[b]	−0.0039	−0.0020
	Median[b]	−0.0043**	−0.0032**
	# of switches[c]	57	31
	Beta[d]	0.393	0.369
Top-down forecasts of earnings per share for FY2 by strategists	Mean	−0.0057**	−0.0034
	Median	−0.0055**	−0.0048**
	# of switches	83	47
	Beta	0.471	0.456
Bottom-up forecasts of earnings per share for FY1 by analysts	Mean	−0.0025**	
	Median	−0.0031**	
	# of switches	56	
	Beta	0.257	
Bottom-up forecasts for earnings per share for FY2 by analysts	Mean	−0.0042	
	Median	−0.0036**	
	# of switches	62	
	Beta	0.282	
Top-down forecasts of earnings per share by strategists and bottom-up forecasts of earnings per share by analysts for FY1 (switches occur only if both screens are satisfied)	Mean	−0.0007	
	Median	−0.0022**	
	# of switches	11	
	Beta	0.214	
Top-down forecasts of earnings per share by strategists and bottom-up forecasts of earnings per share by analysts for FY2 (switches occur only if both screens are satisfied)	Mean	−0.0007	
	Median	−0.0022**	
	# of switches	11	
	Beta	0.214	

Panel A provides the mean and median differential performance (and tests of their significance), average beta and number of switches for the portfolios that are actively managed using the directional consensus and the directional number signals based on the earnings per share forecast for the S&P 500 index for fiscal years FY1 and FY2 by strategists and analysts. The directional consensus signal is based on the directional change (up or down) in the consensus forecast of earnings per share for the S&P 500 index. The directional number signal is based on the number of forecasts increased by strategists minus the number of forecasts decreased by strategists for earnings per share for the S&P 500 index for each month t.

[a] Tests are conducted to determine if the mean and median performance metrics are significantly different from zero.

[b] The mean and median market timing performance metrics for month t is equal to the (excess return on the portfolio for month t) - (the excess return that would have been obtained on the portfolio in month t if the portfolio maintained its average actual beta at all points in time).

[c] The number of switches is the number of switches from equity to cash or vice versa.

[d] The average beta is the mean beta over the 218 month period.

[e] The directional consensus switching rule favors equity when the consensus forecasts of earnings per share are revised up for this month compared to last month, and vice versa if it is lowered.

[f] The directional number switching rule favours equity when the number of strategists revising their top-down forecasts of earnings per share upwards this month exceeds the number revising them downwards, and vice versa if the number of revisions upwards is less than the number downwards. This signal is not available for analysts.

* and ** indicate significance at the 0.05 and 0.01 levels, respectively.

previous section, the portfolios exhibit substantially more switches, and are invested in equities in less than 50% of the 218 months. This low proportion on being in equities is probably due to the downward revision in consensus earnings per share in time relative to the switching month. Thus, not surprisingly, all of the median performance metrics are negative and significant, and all of the mean performance metrics are negative although only two are significant. Once again, superior timing performance is not achieved!

As a further test of robustness designed to reduce the influence of bull market months in our sample, we rerun all of the market timing tests reported in this section and the previous section using data for the shorter 167-month time period from January 1982 through November 1995. These results (unreported to conserve valuable journal space) are not materially different than those reported herein.

8. Concluding remarks

Our findings have at least three important implications for individual investors (and other investment professionals). First, they show that individual investors should use the less optimistically biased forecasts of market earnings that are provided by strategists and not those obtained by aggregating the bottom-up forecasts of analysts. Second, our findings suggest that individual investors could use the difference between bottom-up and top-down forecasts of market earnings to extract some information about the level of overoptimism in analyst forecasts. Third, our findings provide additional support for the warning by Sharpe (1975, p. 61) that only investors "with truly superior predictive ability should even attempt to time the market."

Although some authors demonstrate that only a modest amount of information can lead to superior investment performance, the required informational advantage does not appear to be obtainable from the switching rules tested herein. These rules are based on consensus forecasts of market earnings supplied by strategists or analysts or both, on the direction of consensus forecast revisions, and on the directional number of such forecasts revised up and down. Since we test the joint hypothesis that market timing is valuable and that it can be implemented using our timing signals and data inputs, whether or not the conclusions of this study are robust to the use of more refined switching rules using the same or similar data input remains for future study.

Acknowledgments

Financial support from FCAR (Fonds pour la formation de chercheurs et l'Aide à la Recherche) and SSHRC (Social Sciences and Humanities Research Council of Canada) are gratefully acknowledged. We appreciate the constructive comments received from the editor and two referees of this Review, and the analyst and strategist data supplied by I/B/E/S Inc. All remaining errors are the authors' responsibility.

References

Ali, A., Klein, A., & Rosenfeld, J. (1992). Analysts' use of information about permanent and transitory earnings components in forecasting annual EPS. *The Accounting Review, 30*(1), 183–198.

Beebower, G. L., & Varikooty, A. P. (1991). Measuring market timing strategies. *Financial Analysts Journal, 47*(6), 78–92.

Bercel, A. (1994). Consensus expectations and international equity returns. *Financial Analysts Journal, 50*(4), 76–80.

Bierman, H. Jr. (1995). Bubbles, theory, and market timing. *The Journal of Portfolio Management, 22*(1), 54–56.

Bodie, Z., Kane, A., & Marcus, A. J. (1999). *Investments* (Fourth edition). New York: Irwin McGraw Hill.

Breen, W., Glosten, L. R., & Jagannathan, R. (1989). Economic significance of predictable variations in stock index returns. *Journal of Finance, 44,* 1177–1189.

Brocato, J., & Chandy, P. R. (1994). Does market timing really work in the real world? *The Journal of Portfolio Management, 20*(2), 39–44.

Brocato, J., & Chandy, P. R. (1995). Market timing can work in the real world: Comment. *Journal of Portfolio Management, 21*(3), 82–84.

Brous, P. A. (1992). Common stock offerings and earnings expectations: A test of the release of unfavorable information. *Journal of Finance, 47,* 1517–1536.

Brous, P. A., & Kini, O. (1993). A reexamination of analysts earnings forecasts for takeover targets. *Journal of Financial Economics, 33,* 201–226.

Brown, L. D. (1996). Analyst forecasting errors and their implications for security analysis: An alternative perspective. *Financial Analysts Journal, 52,* 40–47.

Busse, J. A. (1999). Volatility timing in mutual funds: Evidence from daily returns. *The Review of Financial Studies, 12*(5), 1009–1041.

Carleton, W. T., Chen, C. R., & Steiner, T. L. (1998). Optimism biases among brokerage and non-brokerage firm's equity recommendations: Agency costs in the investment industry. *Financial Management, 27,* 17–30.

Chopra, V. K. (1998). Why so much error in analysts earning forecasts? *Financial Analysts Journal, 54*(6), 35–42.

Chung, R., & Kryzanowski, L. (1999). Accuracy of consensus expectations for top-down earnings per share forecasts for two S&P indexes. *Applied Financial Economics, 9,* 233–238.

Clarke, R. G., FitzGerald, M. T., Berent, P., & Statman, M. (1989). Market timing with imperfect information. *Financial Analysts Journal, 45*(6), 27–36.

Copeland, M. M., & Copeland, T. E. (1999). Market timing: Style and size rotation using the VIX. *Financial Analysts Journal, 55,* 73–81.

Das, S., Levine, C. B., & Sivaramakrishnan, K. (1998). Earnings predictability and bias in analysts' earnings forecasts. *The Accounting Review, 73*(2), 277–294.

DeBondt, W. F. M., & Thaler, R. M. (1990). Do security analysts overreact? *American Economic Review, 80,* 52–57.

Dreman, D. N., & Berry, M. A. (1995). Analyst forecasting errors and their implications for security analysis. *Financial Analysts Journal, 51*(3), 30–41.

Easterwood, J. C., & Nutt, S. R. (1999). Inefficiency in analysts' earnings forecasts: Systematic misreaction or systematic optimism? *The Journal of Finance, 54*(5), 1777–1797.

Elliott, J. A., Philbrick, D. R., & Wiedman, C. I. (1995). Evidence from archival data on the relation between security analysts' forecast errors and prior forecast revisions. *Contemporary Accounting Research, 11,* 919–938.

Elton, E. J., & Gruber, M. J. (1991). Differential information and timing ability. *Journal of Banking and Finance, 15*(1), 117–131.

Emanuelli, J. F., & Pearson, R. G. (1994). Using earnings estimates for global asset allocation. *Financial Analyst Journal, 50*(2), 60–72.

Francis, J., & Philbrick, D. R. (1993). Analysts' decisions as products of a multi-task environment. *Journal of Accounting Research, 31,* 216–230.

Fama, E. F., & French, K. R. (1989). Business conditions and expected returns on stocks and bonds. *Journal of Financial Economics, 25,* 23–49.

Ferson, W. E., & Schadt, R. W. (1996). Measuring fund strategy and performance in changing economic conditions. *Journal of Finance, 51*(2), 425–461.

Fuller, R. J., & Kling, J. L. (1994). Can regression-based models predict stock and bond returns? *The Journal of Portfolio Management, 20*(3), 56–63.

Graham, B. (1954). *The Intelligent Investor.* New York: Harper.

Graham, J. R., & Harvey, C. R. (1994). Market timing ability and volatility implied in investment newsletters' asset allocation recommendations. *Working paper, 5597.* National Bureau of Economic Research.

Graham, J. R., & Harvey, C. R. (1996). Market timing ability and volatility implied in investment newsletters' asset allocation recommendations. *Journal of Financial Economics, 42*(3), 397–422.

Graham, J. R., & Harvey, C. R. (1997). Grading the performance of market-timing newsletters. *Financial Analysts Journal, 53*(6), 54–66.

Hardy, D. C. (1990). Market timing and international diversification. *The Journal of Portfolio Management, 16*(4), 23–27.

Harris, R. D. F. (1999). The accuracy, bias and efficiency of analysts' long run earnings growth forecasts. *Journal of Business Finance and Accounting, 26,* 5/6, 725–755.

Jeffrey, R. H., & Arnott, R. D. (1993). Is your alpha big enough to cover its taxes? *The Journal of Portfolio Management, 19*(3), 15–25.

Kang, S-H., O'Brien, J., & Sivaramakrishnan, K. (1994). Analysts' interim earnings forecasts: Evidence on the forecasting process. *Journal of Accounting Research, 32,* 103–112.

Koco, L. (1995). Variable annuity market timing spurs guidelines, *National Underwriter,* January 23, 7 & 13.

Kryzanowski, L., Lalancette, S., & To, M. C. (1997). Performance attribution using an APT with prespecified macrofactors and time-varying risk premia and betas. *Journal of Financial and Quantitative Analysis, 32*(2), 183–204.

Larsen, G. A. Jr., & Wozniak, G. D. (1994/95). Market timing for active asset allocation: A discrete regression approach. *Journal of Applied Business Research, 11*(1), 125–143.

Larsen, G. A. Jr., & Wozniak, G. D. (1995). Market timing can work in the real world. *The Journal of Portfolio Management, 21*(3), 74–81.

Lee, W. (1997). Market timing and short-term interest rates. *The Journal of Portfolio Management, 23*(3), 35–46.

Lin, H.-W., & McNichols, M. F. (1998). Underwriting relationships, analysts' earnings forecasts and investment recommendations. *Journal of Accounting and Economics, 25*(1), 101–127.

Prather, L., & Bertin, W. J. (1998). The implication of discount rate changes for market timing. *Review of Financial Economics, 7*(1), 21–33.

Pratt, T. (1993). Wall Street's four-letter word. *Investment Dealer's Digest,* March, 29, 18–22.

Reichenstein, W., & Rich, S. P. (1993). Market timing for the individual investor: Using the predictability of long-horizon stock returns to enhance portfolio performance. *Financial Services Review, 3*(1), 29–43.

Reichenstein, W., & Rich, S. P. (1994). Predicting long-horizon stock returns: Evidence and implications. *Financial Analysts Journal, 50*(1), 73–76.

Reilly, F. R., & Brown, K. C. (2000). *Investment analysis and portfolio management* (Sixth edition). New York: The Dryden Press.

Sharpe, W. F. (1975). Likely gains from market timing. *Financial Analysts Journal, 31*(2), 60–69.

Shilling, A. G. (1992). Market timing: Better than a buy-hold strategy. *Financial Analysts Journal, 48*(2), 46–50.

Teoh, S. H., & Wong, T. (1997). Analysts' credulity about reported earnings as overoptimism in new equity issues, *Working Paper,* University of Michigan.

Wagner, J. C., Shellans, S., & Paul, R. (1992). Market timing works where it matters most . . . in the real world. *The Journal of Portfolio Management, 18*(4), 86–90.

Wagner, J. C. (1997). Why market timing works. *Journal of Investing, 6*(2), 78–81.

Womack, K. L. (1996). Do brokerage analysts' recommendations have investment value? *Journal of Finance, 51,* 137–167.