

A Dividend Yield-based Trading Rule with Industry Data

by

Daryl Purdy

Bachelor of Mathematics – Honours Business Administration,
University of Waterloo (1994)

PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF BUSINESS ADMINISTRATION

GLOBAL ASSET AND WEALTH MANAGEMENT

In the Faculty
of
Business Administration

© Daryl Purdy 2004

SIMON FRASER UNIVERSITY

Fall 2004

All rights reserved. This work may not be
reproduced in whole or in part, by photocopy
or other means, without permission of the author.

Approval

Name: Daryl Purdy
Degree: Global Asset and Wealth Management MBA
Title of Project: A Dividend Yield-based Trading Rule with Industry Data
Examining Committee:

Dr. Robert R. Grauer
Professor – Senior Thesis Advisor

Dr. Andrey Pavlov
Associate Professor - Supervisor

Date Approved: December 8, 2004

SIMON FRASER UNIVERSITY



PARTIAL COPYRIGHT LICENCE

The author, whose copyright is declared on the title page of this work, has granted to Simon Fraser University the right to lend this thesis, project or extended essay to users of the Simon Fraser University Library, and to make partial or single copies only for such users or in response to a request from the library of any other university, or other educational institution, on its own behalf or for one of its users.

The author has further granted permission to Simon Fraser University to keep or make a digital copy for use in its circulating collection.

The author has further agreed that permission for multiple copying of this work for scholarly purposes may be granted by either the author or the Dean of Graduate Studies.

It is understood that copying or publication of this work for financial gain shall not be allowed without the author's written permission.

Permission for public performance, or limited permission for private scholarly use, of any multimedia materials forming part of this work, may have been granted by the author. This information may be found on the separately catalogued multimedia material and in the signed Partial Copyright Licence.

The original Partial Copyright Licence attesting to these terms, and signed by this author, may be found in the original bound copy of this work, retained in the Simon Fraser University Archive.

W. A. C. Bennett Library
Simon Fraser University
Burnaby, BC, Canada

Abstract

There is significant and ongoing debate regarding the power of dividend ratios to predict returns. Many papers statistically study the predictive ability of dividend yields using a broad market index, such as the S&P 500, both “in-sample” and “out-of-sample”. Another area of study tests the economic strength of using dividend ratios as a primary input to a trading model or rule, again using a broad market index. This paper examines the robustness of tests of a dividend trading rule using disaggregated data from 12 Industry sub-indices.

Dedication

To my family, near and far, and friends, old and new,

who have taught me much

and helped me to learn and grow.

Acknowledgements

I would like to acknowledge the patient support and guidance of Professors Dr. Rob Grauer, Dr. Andrey Pavlov and Dr. Peter Klein and my friends and colleagues in the Simon Fraser University Global Asset and Wealth Management MBA. It has been a privilege to work with you. Thank you and best of luck to each of you.

Table of Contents

Approval.....	ii
Abstract.....	iii
Dedication.....	iv
Acknowledgements.....	v
Table of Contents.....	vi
List of Figures and Tables.....	vii
Section I. Introduction.....	1
Section II. Data.....	9
Section III. Testing Methods.....	10
Section IV. Results.....	12
Section V. Summary & Conclusions.....	21
Reference List.....	23

List of Figures and Tables

Figure 1: Model Predicted Returns versus Actual Returns	20
Table 1: Regressions Using Dividend Price Ratio – 1927 to 1986	13
Table 2: Regressions Using Dividend Yields – 1927 to 1986.....	14
Table 3: Regressions Using Dividend Price Ratio – 1927 to 1996.....	16
Table 4: Regressions Using Dividend Yields – 1927 to 1996.....	17
Table 5: Results from the trading model from 1935 to 1986	18
Table 6: Results from the trading model from 1935 to 1996	19

Section I.

Introduction:

The return predictive capabilities of dividend ratios or yields have been well explored and continue to attract attention in the literature. Studies include the predictive abilities of dividend ratios or yields, statistical challenges with the aforementioned studies, the economic or investment significance of dividends and investment trading models based on dividend yields. There is significant debate in each area of study with respect to this topic. A review of a small sample of the literature follows.

While not the first paper that looks at dividend ratios, Fama and French [1988] shows that while dividend yields have some marginal ability to predict returns over short time horizons, the power of dividend yields to forecast stock returns, measured by regression R^2 , increases with return horizon. The authors claim that regressions of dividend yield (D/P) can explain >25% of the variances of return horizons of two to four years and comment on the impact of autocorrelation and mean-reverting, i.e. temporary, components of stock prices. The Fama and French [1988] study has led to a great deal of debate in many areas of finance and statistics.

Campbell and Shiller [1988] cite Fama and French [1988] and, using a vector auto-regressive framework, find that a long moving average of real earnings helps to forecast future real dividends and that the ratio of an earnings variable to the current stock price has strong predictive ability for longer-term stock returns, serving to further link dividends (and information regarding future dividends and earnings) to future returns.

Hodrick [1992] attempts to address some of the controversy surrounding long-horizon return predictability that arise from questions of small sample bias and the low power of the statistical tests used by other authors. He studies the statistical properties of three methodologies used by previous authors (for example, Richardson and Smith [1991], Jagadeesh [1990] and Campbell and Shiller [1988]) in Monte Carlo experiments to identify the biases of each in order to clarify this part of the debate. He concludes that the vector auto-regressive method is most effective method for studying long-horizon return predictability. This conclusion serves to weaken the argument of Fama and French [1988].

In a similar manner to Fama and French [1988], Wilkie [1992] analyzes dividend yields versus monthly returns, for $k = 1$ to 120, for a share price index and a rolled-up index for the United Kingdom from 1923-1992 and finds that the correlation coefficient between stock performance and dividend yields increases with k up to $k = 76$. The implication of this is that a “1% difference in the dividend yield at the time of purchase of the share makes a difference of 0.2648 in the [performance] over 79 months....” Or alternatively, “about 4.1% a year compound for about six and a half years.”¹ thus supporting the notion that dividend yields have predictive power, particularly over long horizons.

On the other hand, Goetzmann and Jorion [1995] take a longer look at dividends in both the United States and the United Kingdom studying data from 1871-1992. They identify the challenges of survivor bias in long-run data and make the point that any displayed mean reversion in dividend yields that one could naturally expect will show itself in the form of return predictability. The authors employ a boot-strap method to

¹ Wilkie, A David (1993) Can Dividend Yields Predict Share Price Changes? *Proceedings of the 3rd AFIR Colloquium*, vol 1, page 341.

combat these problems and find little support for return predictability from dividend yields over the entire period combined however some sub-samples in either country show mild positive results but there is a possibility that these findings are based predominantly on brief, unusual time periods.

In an effort to further clarify the issue of return predictability via dividend yields, Wolf [2000] reviews a series of prominent papers on the topic. His literature review serves to identify the primary statistical challenges to the topic of dividend ratio and return predictability. Wolf suggests that studies like those such as Rozeff [1984], Campbell and Shiller [1988a], Fama and French [1988] and Hodrick [1992] among others, are weakened by various statistical problems including dependency and bias issues. Wolf then reviews Goetzmann and Jorion [1993], criticizing the boot-strap method used, stating that, "...their special approach is not shown to be backed up by theoretical properties"² and would need to be customized for other scenarios. Instead of this, Wolf utilizes a method called 'sub-sampling' which has been shown to, "give correct results under very weak conditions, including dependency and heteroscedasticity"³ as in the case of the study of return predictability from dividend yields. Wolf's paper lays out well the background for regressions of stock returns on dividend yields and various approaches, and the challenges of each, for making inferences including; the General Method of Moments (GMM), Vector Auto-regression (VAR), a Bootstrap approach and finally the Sub-sampling method. After his review and various tests of three post-war

² Wolf, Michael (2000) "Stock Returns and Dividend Yields Revisited: A New Way to Look at an Old Problem." *Journal of Business & Economic Statistics*, Vol 18, No 1, page 18

³ Wolf, Michael (2000) "Stock Returns and Dividend Yields Revisited: A New Way to Look at an Old Problem." *Journal of Business & Economic Statistics*, Vol 18, No 1, page 18

data-sets he concludes there is no convincing evidence for the predictability of stock returns.

One would expect that with this thorough study and correction of statistical issues surrounding dividend ratio return predictability, and the resulting condemnation of the predictive power of dividend yields, that the debate is finished. However, Lewellen [2003] rekindles the debate claiming that the correction methods used in studies such as those reviewed and employed by Wolf can, “substantially [understate] the forecasting power of financial ratios”⁴ such as Dividend/Price or Dividend Yield. Lewellen finds the existence of strong evidence in favour of the predictive ability of dividend yields in shorter time horizons. And the door is open for further study.

Clearly, there is no definitive answer yet to the question of return predictability based on dividend yields.

In addition to studies pertaining to return predictability related to dividend yields are studies that look at the profitability of trading strategies related to dividend yields. (Ultimately, these studies comment indirectly, if not directly, on market efficiency.) These studies differ from fundamental analysis investment decisions using dividends as a factor such as the Dividend Discount Model. One of the more familiar dividend yield-based trading notions or strategies is the “Dogs of the Dow Strategy”. This strategy recommends that an individual invest at the beginning of each year in the 10 stocks of the DJIA with the highest dividend yield. This idea is based on the behavioural notion that investors overreact, over-selling stocks that fall out-of-favour and over-buying stocks that are in-favour. If a stock pays dividends then these periods of being over-sold (over-

⁴ Lewellen, Jonathan, 2001, “Predicting returns with financial ratios.” *Working Paper, MIT*. Page 2

bought) will lead to unusually high (low) dividend yields. People test these strategies hoping to identify advantageous times to buy or sell stocks based on their dividend yield.

McQueen, Shields and Thorley [2003] ask the question, "Does the 'Dow-10 Investment Strategy' Beat the Dow Statistically and Economically?" Analyzing data from 1946-1995, the authors find some sub-periods where the trading rule provides economically superior results. The strategy is faced with several challenges however. Like any trading model there is potential for taxation and trading-cost impacts to overall performance. Furthermore, for this specific strategy, the lack of diversification (should the individual invest their entire portfolio in these 10 stocks) adds significant risk that negatively impacts the risk-adjusted performance measure. Finally, the authors find that questions of data-mining persist. The authors are forced to conclude that the strategy beats the Dow-30 statistically but not likely economically.

The "Dow-10" concept has also been tested on markets outside the United States. A version of the strategy referred to as "Euro Dog" has been tested in European markets. Wisscher and Filbeck [2003] look at Dividend-Yield Strategies in the Canadian Stock Market. The strategy was applied to the Toronto 35 Index which has similar qualities to the Dow Jones Industrial Average. The study considers the performance of a portfolio made of the 10 highest dividend yielding of the Toronto 35 Index (as at July 31st) and compares the results versus the entire Toronto 35 Index as well as the broader Toronto 300 Index from 1987-1997 (the first 10 years of existence of the Toronto 35 Index). They find that the strategy generated superior risk-adjusted returns over the first 10 years of the life of the Toronto 35 Index.

While these two 'Dogs' theory seems to work, other studies based on dividend yield do not find similar results.

G. William Schwert [2003] surveyed a broad body of finance papers covering *Anomalies and Market Efficiency*. In this paper Schwert takes a look at dividend yields and stock returns. In his discussion of the topic, Schwert refers to Fama and French [1988] which suggests that aggregate dividend yields predict future returns. Schwert expands on the Fama and French [1988] study by extending the time period from 1927-1986 in Fama and French [1988] to 1872-2000. The equation of study is,

$$r(t,t+T) = a+bY(t) +e(t,t+T) \quad [1]$$

where $Y(t) = D(t)/P_{(t-1)}$, $P_{(t)}$ is the price at time t , $D(t)$ is the dividend for the year preceding t , and $r(t,t+T)$ is the continuously compounded nominal return from t to $t+T$. In his study, Schwert generates parameters for equation [1] using the data from 1927-1986 as well as for the prior and subsequent periods, 1872-1926 and 1987-2000. The statistics suggest a "much weaker relation between aggregate dividend yields and subsequent stock returns."⁵

Next, he runs a trading strategy of investing in short-term bonds, rather than stocks, when the dividend yield model predicts stock returns lower than interest rates, and investing in the market index otherwise. He concludes that the "out-of-sample prediction performance of this model would have been disastrous"⁶ because the trading model is vastly outperformed by the "Buy & Hold" investment strategy. The primary

⁵ Schwert, G. William, "Anomalies and Market Efficiency." In George M. Constantinides, Milton Harris and Rene Stultz, editors: *Handbook in the Economics of Finance*, Amsterdam: Elsevier Science B.V. (2003). page 952

⁶ Schwert, G. William, "Anomalies and Market Efficiency." In George M. Constantinides, Milton Harris and Rene Stultz, editors: *Handbook in the Economics of Finance*, Amsterdam: Elsevier Science B.V. (2003), page 956.

period of out-performance comes during the 1990's when the model invests in T-bills at a time that the market advances strongly. Schwert agrees however, that a model which simply proportionally reduced or increased the weighting of equities in a portfolio could have better results. These results seem damning to the usefulness of dividend yields however the debate will not stop here. There is a fundamental challenge with the method used for the trading strategy. The problem is this, Schwert uses parameters obtained from 1927-1986 to test a trading model from 1872-2000. Any investor alive using this model from 1872-1986 would not have access to the data from 1927-1986, thus calling into question the validity of the conclusions.

Grauer [2000, 2004], tests the predictability of returns by combining Industry Rotation, risk-free rates, dividend yields and a discrete-time power utility portfolio selection model that outperforms the market sizably. [Note: Grauer's review of this body of literature is thorough and well designed to provide the reader with an understanding of the chronology of the debate surrounding return predictability.] Grauer forecasts returns for all industries simultaneously and uses an optimizer to identify the optimal

The majority of the papers pertaining to Predicting Returns analyze the issue from the perspective of dividend yields and returns of a broad market index however Grauer 2004 begins looking at industries thereby initiating an interesting new debate in the field. It is possible that the questionability and marginality of past findings has something to do with the nature of broad market indices and related dividend ratios. While diversification through investing in a broad market index serves to smooth volatility of returns it also smooths the volatility of any ratios taken from the index. In any index there are companies in sectors that respond differently to business cycles and economic factors. The difference in response could be a difference in magnitude, timing or direction. Given this logical argument it seems reasonable to run tests of dividend return

predictability on sectors (and even individual companies) as well as the broad market index for comparison. One would expect to find sectors where the tests generate stronger statistics than those found at the broad market index level, as well as sectors that generate weaker statistics than those found at the broad market index level.

While it appears that Schwert was trying illustrate that the Fama and French [1988] findings wouldn't work in or out of sample in a simple manner, the methodology must be revisited. This paper then asks the following questions without endeavouring to comment on the topic of market efficiency:

1. What results would one find when using the Fama and French [1998] method applied to industries?
2. Would the trading model posited by Schwert (corrected) fare better or worse using data from industries rather than the broad index?

These two questions outline the innovation of this paper namely; using out of sample testing of the Schwert trading model as well as testing dividend ratios on industry data. The rest of the paper is organized as follows; Section II outlines the source of the data and the machinations to generate index and industry dividend yields, Section III provides a description of the basic regressions and trading model, Section IV presents discussion of the findings and Section V ends the paper with a summary of key points, any conclusions and suggestions for additional testing.

Section II.

Data:

The data for this study come from several sources. Monthly stock return data comes from the Center for Research in Security Prices. (add as a footnote here... special thanks to Rob Grauer for providing data for this study) Dividend yields are generated in the same manner as Fama and French [1988]. The method for selecting and generating returns on industries is detailed in Grauer, Hakansson and Shen [1990]. 30-day US T-bill returns comes from IDEAS/ENCORR Ibbotson 30-Day T-Bill Returns.⁷

⁷ Many thanks to Professor Robert R. Grauer for supplying the data for testing.

Section III.

Testing Methods:

There are two series of tests completed. First I run basic OLS regressions to determine parameters and statistical significance on the Index (as in Fama and French [1988] and Schwert [2003]) then on Industries. With the regressions run I then test the trading model on the market index as in Schwert and next on industries.

Statistical tests are run first on the Value-weight CRSP Index and then on twelve industries using data from 1926-1986. The industries are: Petroleum, Financials, Consumer Durables, Basic Industries, Food & Tobacco, Construction, Capital Goods, Transportation, Utilities, Textiles and Trade, Services, Leisure. The monthly index and industry returns are regressed first against annualized rolling Dividend/Price ratios and then on Dividend Yields using equation [1] above:

$$r(t,t+T) = a + bY(t) + e(t,t+T) \quad [1]$$

Where $Y(t)$ is either the Dividend Ratio (the annualized dividend divided by the price at time t) or Dividend Yield (the annualized dividend divided by the price at time $t-1$). Note: Whereas Fama and French [1988] and Schwert use continuously compounded returns I have used arithmetic returns for simplicity. Given the relative frequency of the data, the difference between simple arithmetic returns and continuously compounded returns should be minimal.

For the trading model, we use an iterative process to generate parameters from 96 consecutive observations and use those parameters in equation [1] to predict the

Expected Return for the 97th observation. This Expected Return is compared with the Risk-Free Return for the 97th period. If the Expected Return is greater than the Risk-Free Return the model invests in equities (either the market index or the industry-based index depending on what we are testing), otherwise the model invests in the 30-day T-bill.

Section IV.

Results:

As previously mention, the purpose of this study was to answer the following questions:

- 1) What results would one find when using the Fama and French [1998] method applied to industries?
- 2) Would the trading model posited by Schwert fare better or worse using data from industries rather than the broad index?

Let us begin with question 1: What results would one find when using the Fama and French [1998] method applied to industries? **Table 1** shows the results of regressions of returns versus the dividend/price ratio ($D/P_{(t)}$) for the index as well as for 12 industries from 1927 to 1986. In this time period, for the index, neither parameters A, nor B are statistically significant.

As was mentioned, it is reasonable to expect the results for some industries to be stronger than those of the index while other industries display weaker results. **Table 1** shows three industries with statistically significant B's; Petroleum, Utilities and Services. Honourable mention goes to Financials and Consumer Durables.

Table 1: Regressions Using Dividend Price Ratio – 1927 to 1986

720 observations from 1927 to 1986 – for each Industry is the results of regressing the Industry and Market Returns against Industry Dividend Price Ratios using equation [1] from above

Industry	D/P _(t)				
	A	t-stat	B	t-stat	r-square (%)
Market Index	0.00	-0.58	0.31	1.98	0.54
Petroleum	-0.01	-1.36	0.52	2.60	0.93
<i>Financials</i>	0.00	-0.41	0.28	1.93	0.52
<i>Consumer Durables</i>	0.00	-0.30	0.28	1.92	0.51
Basic Industries	0.00	0.37	0.17	1.05	0.15
Food/Tobacco	0.00	0.02	0.20	1.62	0.37
Construction	0.01	1.20	0.00	0.01	0.00
Capital Goods	0.01	1.08	0.13	0.98	0.13
Transportation	0.00	-0.30	0.23	1.66	0.38
Utilities	-0.01	-0.97	0.25	2.47	0.84
Textile & Trade	0.00	0.70	0.13	0.95	0.12
Services	0.00	-0.41	0.37	2.21	0.68
Leisure	0.01	2.40	-0.05	-0.50	0.03

Table 2: Regressions Using Dividend Yields – 1927 to 1986

720 observations from 1927 to 1986 – for each Industry is the results of regressing the Industry and Market Returns against Industry Dividend Yields using equation [1] from above

Industry	D/P _(t-1)				
	A	t-stat	B	t-stat	r-square (%)
Market Index	-0.01	-1.50	0.46	2.91	1.16
Petroleum	-0.01	-1.46	0.55	2.69	0.99
Financials	-0.01	-1.12	0.40	2.66	0.98
Consumer Durables	-0.01	-1.68	0.50	3.36	1.55
Basic Industries	0.00	-0.52	0.33	1.94	0.52
Food/Tobacco	0.00	-0.57	0.28	2.22	0.68
Construction	0.00	0.22	0.17	1.01	0.14
Capital Goods	0.00	0.35	0.23	1.74	0.42
Transportation	-0.01	-1.93	0.50	3.36	1.55
Utilities	-0.01	-1.63	0.33	3.16	1.37
Textile & Trade	0.00	-0.03	0.23	1.70	0.40
Services	0.00	0.13	0.26	1.59	0.35
Leisure	0.01	1.45	0.06	0.56	0.04

Using the Dividend Yield (D/P_(t-1)) (**Table 2**) generally provides stronger results (consistent with Schwert [2003] and Fama and French [1988]). B's are significant for the Index and six of the twelve industries; Petroleum, Financials, Consumer Durables, Food & Tobacco, Transportation and Utilities. T-stats for three of the six industries are stronger than that for the index. This finding of some industries that display stronger results than the index while others display weaker results is consistent with our expectation previously described in Section A.

Notice however for regressions using both the Dividend/Price Ratio and the Dividend Yield that the r-square numbers are very small which is consistent with the findings of Fama and French [1988] that suggests short-term r-squared numbers less than 5%.

While the first two tables show the results from 1927 to 1986 it is prudent to extend the time period to see how the results persist. **Tables 3 and 4** show the results of studies from 1927 to 1996. The results are quite similar to those of **Tables 1 and 2**. These findings again are generally consistent with Fama and French [1988] that short-horizon predictability is weak but existent.

Table 3: Regressions Using Dividend Price Ratio – 1927 to 1996

840 observations from 1927 to 1996 – for each Industry is the results of regressing the Industry and Market Returns against Industry Dividend Price Ratios using equation [1] from above

Industry	D/P _(t)				
	A	t-stat	B	t-stat	r-square (%)
Market Index	0.00	-1.45	0.24	2.83	0.38
Petroleum	-0.01	-1.36	0.52	2.60	0.95
Financials	0.00	-0.30	0.27	2.01	0.48
Consumer Durables	0.00	0.19	0.23	1.79	0.38
Basic Industries	0.01	0.75	0.14	0.95	0.11
Food/Tobacco	0.01	1.25	0.10	0.97	0.11
Construction	0.01	1.77	-0.01	-0.08	0.00
Capital Goods	0.01	1.23	0.13	1.08	0.14
Transportation	0.00	0.32	0.17	1.43	0.24
Utilities	-0.01	-0.98	0.25	2.61	0.81
Textile & Trade	0.01	1.04	0.11	0.94	0.11
Services	0.00	-0.01	0.32	2.19	0.57
Leisure	0.01	2.87	-0.06	-0.63	0.04

Table 4: Regressions Using Dividend Yields – 1927 to 1996

840 observations from 1927 to 1996 – for each Industry is the results of regressing the Industry and Market Returns against Industry Dividend Yields using equation [1] from above

Industry	D/P _(t-1)				
	A	t-stat	B	t-stat	r-square (%)
Market Index	-0.01	-0.98	0.37	2.69	0.86
Petroleum	-0.02	-1.60	0.56	2.96	1.03
Financials	-0.01	-1.08	0.39	2.80	0.93
Consumer Durables	-0.01	-1.13	0.41	3.17	1.19
Basic Industries	0.00	-0.11	0.28	1.81	0.39
Food/Tobacco	0.00	0.72	0.16	1.49	0.27
Construction	0.01	0.95	0.10	0.80	0.07
Capital Goods	0.00	0.49	0.23	1.85	0.41
Transportation	-0.01	-1.08	0.36	2.93	1.01
Utilities	-0.01	-1.66	0.32	3.32	1.30
Textile & Trade	0.00	0.32	0.21	1.70	0.35
Services	0.00	0.49	0.23	1.58	0.30
Leisure	0.01	1.92	0.05	0.46	0.02

After running the basic regressions we look to answer question 2: Would the trading model posited by Schwert fare better or worse using data from industries rather than the broad index?

Table 5 displays the results of using the trading model or the “Buy & Hold” approach from 1935 to 1986, starting with \$1 in 1935. For purposes of comparison, \$1 in the Risk-Free asset became \$6.56 for the same time period. The model outperforms

its "Buy and Hold" benchmark in 5 out of 26 tests (but only in 3 of 12 Industries). It is not apparent that this out-performance would persist after adjusting for taxation or transaction costs. Furthermore, the under-performance in most instances is sizable. In general, the findings are consistent with those of Schwert.

Table 5: Results from the trading model from 1935 to 1986

	Model with $D/P_{(t)}$ as predictor	Model with $D/P_{(t-1)}$ as predictor	Buy & Hold
<i>Market Index</i>	199.17	126.30	261.07
<i>Petroleum</i>	425.15	289.08	517.15
<i>Financials</i>	171.56	148.47	347.22
<i>Consumer Durables</i>	361.22	316.03	358.94
<i>Basic Industries</i>	134.37	167.63	239.09
<i>Food & Tobacco</i>	209.75	251.61	265.30
<i>Construction</i>	164.02	149.45	135.00
<i>Capital Goods</i>	108.87	195.01	295.91
<i>Transportation</i>	201.76	161.27	122.13
<i>Utilities</i>	114.79	153.27	204.43
<i>Textile & Trade</i>	213.60	188.61	216.56
<i>Services</i>	1,202.70	905.33	1,413.90
<i>Leisure</i>	173.02	100.99	444.86

Table 6 displays the results of using the trading model or the “Buy & Hold” approach from 1935 to 1996, starting with \$1 in 1935. For purposes of comparison, \$1 in the Risk-Free asset became \$11.16 for the same time period. The model outperforms its “Buy & Hold” benchmark in only 3 of 26 tests in only two industries. Again, it is not apparent that this out-performance would persist after adjusting for taxation or transaction costs. And again, the under-performance in most instances is sizable.

Table 6: Results from the trading model from 1935 to 1996

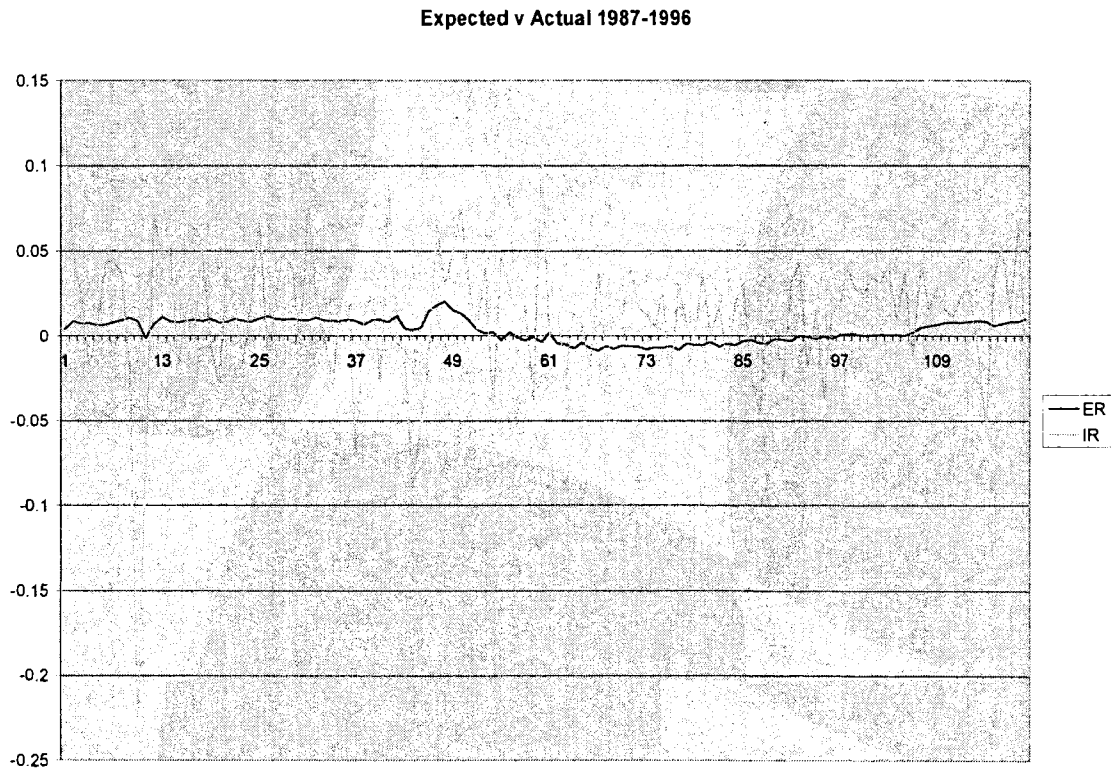
	Model with $D/P_{(t)}$ as predictor	Model with $D/P_{(t-1)}$ as predictor	Buy & Hold
Market Index	670.78	377.87	1,002.50
Petroleum	1076.60	946.48	1,991.80
Financials	632.43	566.74	1,354.30
Consumer Durables	901.68	797.30	1,430.50
Basic Industries	438.91	543.84	1,050.30
Food & Tobacco	1,331.20	1,596.80	1,683.70
Construction	646.95	624.76	564.36
Capital Goods	450.72	804.27	903.47
Transportation	511.63	313.11	322.61
Utilities	321.89	469.05	594.04
Textile & Trade	614.74	590.64	697.79
Services	3,790.50	2,446.30	4,882.80
Leisure	514.12	272.29	1,578.80

The model's overall weakness is shown in that the results from the Dividend/Price Ratio are generally better than those from the Dividend Yield even though the statistics suggest that the Dividend/Price ratio has less predictive power. It appears that an investor could not gain real confidence from this model in any industry.

Figure 1 presents further evidence of the weakness of this model. This chart shows the model-predicted return on the market index versus the actual return on the index. As you can see, the differences are often quite large. The sample provided is for the 10-year period from 1987 to 1996 and is typical of all 10-year periods in the test.

Figure 1: Model Predicted Returns versus Actual Returns

Monthly Expected Market Index Returns versus Actual Market Index Returns 1987 to 1996



Section V. Summary & Conclusions

Fama and French [1988] found dividend ratios to have predictive ability, particularly over longer time-horizons. Since then, research papers have served to either condemn or support these findings based on statistical methods or tests on additional data-sets. While this debate ebbs and flows, research has been conducting into the statistical and/or economic benefits of trading models based on Dividend Ratios (among other parameters). Results of this search are mixed with some papers finding support for the statistical and/or economic benefits while other authors find their Dividend Ratio-based models are less successful. While the results of this paper support some weak predictability using short-term observations, and mildly improved results in certain industries, there is little evidence that Schwert's simple trading model would be predictably economically profitable for the CRSP Index or various Industries. As these results differ from results found by Grauer [2003] and others, it appears that the economic results depend on the manner in which Dividend Ratios are factored into a trading model.

Additional study can be conducted in many areas pertaining to predictability and profitability of trading model profitability. It would be interesting to test dividend yield-based studies for stocks within industries that show statistically significant B's from these tests. One could extend the tests of this trading model to current data as well as to test different moving windows (more and less than 96 observations) both within the United States and elsewhere. Testing 'Convergence' trading models that look to trade off compatible stocks with dividend yields that are relatively high or low versus the Industry

Dividend Yield would be of interest. Lastly, alternative more advanced or creative, dividend yield-based trading strategies could be considered including buying signals related to deviation from the mean dividend yield.

Reference List

- Campbell, John Y., and Robert J. Shiller, (1988b), "The dividend-price ratio and expectations of future dividends and discount factors." *Review of Financial Studies*, 1, 195-228.
- Fama, Eugene F., and Kenneth R. French. (1988) "Dividend Yields and Expected Stock Returns." *Journal of Financial Economics*, 22 3-25.
- Goetzmann, W., and P. Jorion. (1995) "A Longer Look at Dividend Yields." *Journal of Business*, vol. 68, no. 4 (October):483–508.
- Grauer, Robert R. (2004) "On the Predictability of Stock Market Returns: Evidence from Industry-Rotation Strategies" *Working Paper*, Simon Fraser University
- Hodrick, Robert J. (1992) "Dividend Yields and Expected Stock Returns: Alternative Procedures for Inference and Measurement." *Review of Financial Studies*, 5, 357-386.
- Lewellen, Jonathan, (2001), "Predicting returns with financial ratios." *Working Paper*, MIT.
- McQueen, G., K. Shields, and S.R. Thorley. (1997). "Does the 'Dow-10 Investment Strategy' Beat the Dow Statistically and Economically?" *Financial Analysts Journal*, vol. 53, no. 4 (July/ August):66–72.
- Schwert, G. William, "Anomalies and Market Efficiency. (2003)"In George M. Constantinides, Milton Harris and Rene Stultz, editors: *Handbook in the Economics of Finance*, Amsterdam: Elsevier Science B.V., 939-972.
- Visscher, S. and G. Filbeck, (2003). "Dividend-Yield Strategies in the Canadian Stock Market." *Financial Analysts Journal*, (January/February):99–106.
- Wilkie, A David (1993) Can Dividend Yields Predict Share Price Changes? *Proceedings of the 3rd AFIR Colloquium*, vol 1, pp335-347.
- Wolf, Michael (2000) "Stock Returns and Dividend Yields Revisited: A New Way to Look at an Old Problem." *Journal of Business & Economic Statistics*, Vol 18, No 1, 18-31