Earning-to-Price, Dividend-to-Price, Firm Growth and Stock Returns

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ABSTRACT

Cooper, Gulen and Schill (2005) examine the cross-sectional relation between firm asset growth and subsequent stock returns over the period 1963-2003. They conclude that sorting US stocks on previous year asset growth rates is superior over other determinants of cross-sectional stock returns, such as: book-to-market, firm capitalization, momentum, amongst others.

In this paper, I use the one-factor and the multi-factor models to investigate the ability of earnings-to-price, dividend-to-price, previous year asset growth rates, and retained-earnings-to-total-asset to explain the cross-sectional stock returns over the period 1980-2000. Inconsistent with Cooper et al. (2005), I conclude that sorting Jordanian firms on previous year asset growth rates is not superior over earnings-to-price and dividend-to-price. Overall, the dividend-to-price strategy appears to be the best strategy that helps in predicting the cross-section of Jordanian stock returns.

JEL classification: G15

Keywords: Contrarian strategies, earnings-to-price, dividend-to-price, firm growth, emerging market returns, Fama and French Model, Multi-factor model.

1. INTRODUCTION

It is becoming popular in the finance literature that "value" stocks are those that have low price relative to some measures of their fundamental value, whereas "glamour" stocks are those that have high price relative to some measure of their fundamental value. A considerable body of research finds that value stocks outperform glamour stocks (e.g. Fama and French, 1993, 1996, 1998; Gregory, Harris, Michou, 2001; Gregory, Saleh, Tucker, 2006; Danial and Titman, 1997; LaPorta, 1996; Cai, 1997; amongst others).

Fama and French (1998) argue that the value-glamour strategies are international evidence. They investigate the performance of value-glamour strategies for 13 developed markets as well as for 16 emerging markets. Whilst they confirm the superiority of value strategies in 12 out of 13 developed markets, they hesitate to conclude that value premium in emerging markets is reliably positive since they use a short sample period and that emerging market returns suffer from high stock volatility. Saleh (2006) investigates the ability of book-to-market equity and size to explain the cross-sectional stock returns using data from Amman Stock Exchange (ASE) over the period 1980-2000 and concludes that the value-glamour strategy does not work in ASE.

In this paper, I examine the performance of the value-glamour strategies based on two measures, earnings-to-price and dividend-to-price. The results show that value stocks outperform glamour stocks. Momentum and stock volatility have been found to be the most important

factors that help in explaining the difference in returns between high and low earnings-to-price stocks. For the dividend-to-price strategy, the results provide strong evidence that the illiquidity effect and stock volatility are the most important factors that explain the difference in returns between high and low dividend-to-price stocks.

In order to shed further light on the effect of firm growth rate on stock returns, I sort stocks based on two measures of growth. First, following Cooper, et al. (2005), I use the previous year firm total asset growth rate (hereafter, TAG) as a measure of growth. The results show that low TAG firms outperform high TAG firms. However, inconsistent with Cooper, et al. (2005), the results show that the TAG strategy is not superior over other determinants of cross-sectional stock returns.

To test the effect of how increases in growth are financed (e.g. retained earnings), I use the retained-earnings-to-total-asset ratio (hereafter, RE/TA) as a second measure of growth. The results show that low RE/TA stocks outperform high RE/TA stocks.

Overall, I find that the D/P strategy is superior over other strategies in explaining the cross-sectional stock returns for ASE.

2. LITERATURE REVIEW

Previous empirical studies have found out that book-to-market equity, firm size, earnings-to-price ratio, dividend-to-price ratio, cash flow yield and fundamental value to price ratio can predict the cross sectional pattern of stock returns. Banz (1981) finds that small firms outperform large firms. Fama and French (1992, 1993, 1996) find that book-to-market equity and firm size have a significant effect in explaining stock returns. For example, Fama and French (1992) document that stocks with high book-to-market equity have greater size-adjusted returns than low book-to-market stocks. Lakonishok, Shleifer and Vishny (1994), Cai (1997), Gregory, Harris and Michou (2001), Dissanaike (2002), Strong and Xu (1997), Gregory, Saleh, and Tucker (2006), amongst others have confirmed the same results.

Two main explanations have been offered. The first one is the risk explanation in which Fama and French argue that high book-to-market stocks earn excess returns compared to low book-to-market stocks because they are considered to be riskier in some aspects. However, Lakonishok, Shleifer, and Vishny (1994) argue in favor of mispricing explanation in which they argue that high book-to-market stocks outperform low book-to-market stocks because investor overpriced low book-to-market stocks whilst they underpriced high book-to-market stocks. Recent papers supporting the mispricing argument include Gregory, Saleh and Tucker (2006), Gregory, Harris and Michou (2003), and Bartov and Lee (2002), amongst others.

Saleh (2006) investigates the ability of book-to-market equity and size to explain the cross-sectional stock returns using data from ASE over the period 1980-2000. In particular, he seeks to solve the main two shortcuts raised by Fama and French (1998) concerning emerging market returns, the sample period and stock volatility. He finds that the value-glamour strategy does not work in ASE and that small stocks deliver higher returns than large stocks. Consistent with Fama and French's (1998) prediction, he concludes that stock volatility helps in explaining the difference in returns between value stocks and glamour stocks. Moreover, his results assert that stock volatility should be modeled as a risk factor.

A number of studies have developed theoretical models that link investment decisions, the riskiness of assets, and expected returns (e.g. Berk, Green, and Naik, 1999 and Carlson, Fisher and Giammarino, 2004). Furthermore, Cooper, Gulen and Schill (2005) illustrate that events associated with asset expansion (contraction) tend to be followed by periods of abnormally low (high) returns. Their results for the US over the period 1963-2003 confirm a strong negative asset growth effect in the cross-section of stock returns. Anderson and Garcia-Feijoo (2004) and Titman, Wei and Xie (2004) find that firms that increase capital investment experience decreased future returns. Lakonishok, Shleifer and Vishny (1994) use the average five-year growth rates in sales and find that firms with high growth rates under-perform firms compared to low growth rates.

3. DATA AND RESEARCH METHODOLOGY

The empirical analysis of this paper uses monthly returns and annual accounting data over the period 1980-2000. I use 3-month Treasury bill rates and monthly returns on ASE value-weighted index as proxies for risk free rate and market returns, respectively. To be included in the sample for year *t*, companies must have data for E/P, D/P, TAG or RE/TA recorded in December of year *t-1*, and at least one return observation for the 12 months from April of year *t* to March of yea *t+1*. Further, the sample data includes all non-financial dead and alive firms. Companies with negative E/P are excluded. The proceeds from a stock that de-lists during the holding period are distributed among other stocks in the portfolio according to their value (equally)-weighted in the case of the value (equally)-weighted analysis.

In order to investigate the performance of high Earnings-To-Price (E/P), Dividend-To-Price (D/P), previous year Total Asset Growth rate (TAG)[1], and Retained-Earnings-To-Total-Asset (RE/TA) stocks against low E/P, D/P, TAG, and RE/TA stocks, I conduct a portfolio analysis approach. For each year stocks are sorted based on their E/P, D/P, TAG, or RE/TA. Thus, portfolios of stocks are formed annually in April[2]. To insure that the accounting data is available to investors before returns are recorded, I allow for a four-month lag between the measurements of accounting and return data.

Next, for each portfolio, I compute raw and value weighted returns for: (1) three-month period, (2) six-month period, (3) one-year period, (4) two-year period, (5) three-year period, (4) four-year period, and (6) five-year period. Thus, the simple average returns over the five-year period are calculated. Furthermore, I calculate the average cumulative three-year and five-year returns with annual compounding.

Thus, I monitor the performance of high E/P, D/P, TAG or RE/TA stocks against the performance of low E/P, D/P, TAG or RE/TA stocks.

In addition to that and to investigate the difference in returns between high and low E/P, D/P, TAG or RE/TA stocks, I employ the Fama and French (1993) three-factor model as follows:

$$Rp - R_f = a_i + \beta(R_m - R_f) + s_i SMB + h_i HML + e_{i,t}$$

$$\dots(1)$$

Where, $R_p - R_f$ is the excess returns for individual portfolios[3], R_m is the monthly return of the ASE value-weighted index, R_f is the monthly 3-month Treasury bill rate. SMB (Small Minus Big) is the difference, each month, between the average of the returns on the three small-stock portfolios (S/L, S/M, and S/H) and the average of the returns on the three big-stock portfolios (B/L, B/M, and B/H). HML is the difference, each month, between the average of the returns on the two high-book-to-market portfolios (S/H and B/H) and the average of the returns on the two low-book-to-market portfolios (S/L and B/L). Following Fama and French (1993) the mimicking portfolios for the size (SMB) and book-to-market (HML) factors are constructed as follows. At the end of April of each year *t* stocks are allocated to two groups (big and small) based on whether their market value is above or below the median of the market. Moreover, stocks are allocated in an independent sort to three book-to-market groups (high, medium and low) based on the breakpoints for the top 30 percent, middle 40 percent and bottom 30 percent of the book-to-market values.

Previous studies have identified several factors that help in explaining the cross-sectional stock returns. These factors, among others, are illiquidity effect (e.g. Amihud and Mendelson, 1986), reversal and/or momentum effect (e.g. DeBondt and Thaler 1985, 1987, Carhart, 1997), leverage effect (e.g. Fama and French, 1992) and stock volatility effect (e.g. Zhang, 2005 and Saleh 2006). Therefore, I extend the three-factor model by testing whether these factors contribute in explaining the difference in returns between high and low E/P, D/P, TAG or RE/TA stocks. Thus, I employ the following two models:

$$Rp - R_f = a_i + \beta(R_m - R_f) + s_i SMB + h_i HML + l_i Z + e_{i,t}$$

$$\dots(2)$$

$$Rp - R_f = a_i + \beta(R_m - R_f) + s_i SMB + h_i HML + \sum_{t=1}^{4} l_i Z + e_{i,t}$$

(3)

Where Zt is the Loser-Minus-Winner (LMW) factor. LMW is the return difference between portfolios of past losers and past wi nners based upon returns over the past 12 months. High-Minus-Low-Stock-Volatility-Stock (HMLSTD) factor, Liquid-Minus-Illiquid-stocks (LMI) factor, or / and Leverage-Minus-Unleverage-Stocks (LMU) factor. To construct the HSVMLSV (LMI, LMU) factor, I do the following. At the end of April of each year t stocks are allocated to two groups (big and small) based on whether their market value is above or below the median of the market. Further, stocks are allocated in an independent sort to three stock volatility (trading-volume, leverage) groups (high, medium, and low) based on the breakpoints for the top 30%, middle 40%, and bottom 30% of the standard deviation of the past 12-month returns (trading-volume, total-asset-to-shareholders-equity) values. From the intersection of the two size groups (S and B) and the three trading-volume groups (L, M, H), six size-volatility (trading-volume, leverage) portfolios are constructed.

4.   EMPIRICAL RESULTS

4.1.   Raw and Value-Weighted Returns

Panels A and B of Table (1) present the equally and value weighted returns for portfolios formed based on E/P ratio, respectively. Panel A of Table (1) shows that high (low) E/P firms earn returns of 0.0734 (0.0377), 0.0671 (0.0150), 0.3939 (0.2194), 0.1713 (0.1779), 0.1755 (0.1661), 0.1795 (0.2009), and 0.1595 (0.1667) in the 3-month, 6-month, one-year, two-year, three-year, four-year, and five-year after portfolio formation. On average, high E/P stocks outperform low E/P stocks by 0.0297 over the five-year period. The difference in returns between high and low E/P stocks are 0.0357, 0.0521, 0.1745, -0.0066, 0.0094, -0.0214, and -0.0072 with t-statistics of 1.32, 1.43, 2.66, -0.18, 0.21, -0.51, and -0.23 for 3-month, 6-month, one-year, two-year, three-year, four-year, and five-year, respectively. The

cumulative difference in returns between high and low E/P stocks is 0.1923 and 0.2282 with t-statistics of 2.41 and 1.79 over the three-year and five-year period after portfolio formation, respectively. Panel B of Table 1 shows that high E/P stocks outperform low E/P stocks. The average difference in returns between high and low E/P stocks is 0.0303. Over the three (five)-year period after portfolio formation, the cumulative difference in returns between high and low E/P stocks is 0.0581 (0.1727) with a t-statistic of 0.37 (0.75).

Equally and value weighted returns for portfolios formed based on D/P ratio are reported on Panels A and B of Table (2), respectively. Panel A of Table (2) shows that high D/P stocks earn higher returns than low D/P stocks. On average, high D/P firms outperform low D/P firms by 0.0823 over the five-year period. The cumulative difference in returns over the three-year and five-year period after portfolio formation between high and low D/P firms is 0.4159 and 0.6276 with t-statistics of 3.52 and 2.92, respectively. The value-weighted results from Panel B of Table (2) confirm that size has an effect in explaining the difference in returns between high and low D/P stocks. For example, Panel B of Table (2) shows that the average difference in returns over the five-year period is 0.1406 compared to 0.0823 (Panel A of Table 2). Over the three (five)-year period, the cumulative difference in returns increases from 0.4139 and 0.6276 (Panel A of Table 2) to 0.5334 and 0.8982 with t-statistics of 2.04 and 2.37 (Panel B of Table 2), respectively.

Equally and value weighted returns for portfolios formed on previous year TAG rates are presented in Panels A and B of Table (3). The results from Panel A of Table 3 show that high TAG firms yield higher returns than low TAG firms in the first year of portfolio formation; 0.0211 with a t-statistic of 0.45. In the second-year and third-year of portfolio formation, the difference in returns between high and low TAG firms is –0.0093 and –0.0447 with t-statistics of -0.19 and -1.60, respectively. On average, the difference in return over the five-year period is 0.0020. The cumulative difference in returns between high and low TAG firms is 0.0008 and

0.0263 with t-statistics of 0.01 and 0.18 over the three-year and five-year period after portfolio formation, respectively. On average, the value-weighted results from Panel B of Table 3 show that low TAG firms outperform high TAG firms over the five-year period. The cumulative difference in returns over the three (five)-year period after portfolio formation is 0.0355 (-0.0240) with a statistic of 0.20 (-0.09). The above results appear to be inconsistence with Cooper et al. (2005) in which they conclude that sorting stocks based on previous year total asset growth rates is superior over other determinants of cross-sectional stock returns such as book-to-market, firm capitalization, and momentum. One explanation for that could be the quality of information in emerging markets is so low compared to that in the US.

Table 1: Returns for Portfolios Formed Based on E/P Ratios.

Panel A: Equally Weighted					Panel B: Value Weighted			
	Low	*P2*	High	VMG	Low	*P2*	High	VMG
M3	0.0377	0.0516	0.0734	0.0357 (1.32)	0.0458	0.0532	0.0854	0.0397 (0.72)
M6	0.0150	0.0232	0.0671	0.0521 (1.43)	0.0025	0.0189	0.0406	0.0380 (1.39)
R1	0.2194	0.2173	0.3939	0.1745 (2.66)	0.2112	0.1559	0.2782	0.0670 (0.62)
R2	0.1779	0.1853	0.1713	-0.0066 (-0.18)	0.2287	0.1159	0.1739	-0.0548 (-1.11)
R3	0.1661	0.1601	0.1755	0.0094 (0.21)	0.1958	0.0835	0.2007	0.0049 (0.07)
R4	0.2009	0.1254	0.1795	-0.0214 (-0.51)	0.1327	0.1191	0.1653	0.0325 (0.68)
R5	0.1667	0.1874	0.1595	-0.0072 (-0.23)	0.0808	0.1518	0.1824	0.1016 (2.13)
AR5	0.1862	0.1751	0.2159	0.0297	0.1698	0.1252	0.2001	0.0303
CR3	0.4649	0.5056	0.6572	0.1923 (2.41)	0.5002	0.3040	0.5583	0.0581 (0.37)
CR5	0.8122	0.8339	1.0403	0.2282 (1.79)	0.7676	0.4858	0.9403	0.1727 (0.75)

Note: Table-1 values represent mean 3-month, 6-month, one-to-five-year buy and hold returns for portfolios formed in April each year, based on earnings-to-price (E/P) ratios. The sample period is from 1980-2000. AR5 is the average return for R1 to R5. CR3 and CR5 are the three-year and five-year cumulative returns. VMG represents the difference between high E/P stocks and low E/P stocks. t ( ) is the t-statistics with standard errors calculated using White (1980).

Table 2: Returns for Portfolios Formed Based on D/P Ratios.

Panel A: Equally Weighted				Panel B: Value Weighted			
	Low	*P2*	High	VMG	Low	*P2*	High	VMG
M3	0.0229	0.0661	0.0679	0.0450	0.0559	0.0453	0.0941	0.0382
				(2.06)				(0.89)
M6	0.0051	0.0431	0.0736	0.0685	-0.0125	0.0307	0.0744	0.0869
				(2.34)				(1.99)
R1	0.1276	0.3281	0.3791	0.2516	0.1526	0.2009	0.4152	0.2625
				(3.01)				(1.75)
R2	0.1174	0.1660	0.2311	0.1137	0.1251	0.1217	0.2433	0.1182
				(2.27)				(1.55)
R3	0.1368	0.1917	0.1293	-0.0074	0.0775	0.1744	0.1813	0.1039
				(-0.15)				(1.41)
R4	0.1609	0.1544	0.1856	0.0247	0.0929	0.1409	0.2120	0.1191
				(0.41)				(2.59)
R5	0.1580	0.1750	0.1873	0.0293	0.0784	0.1875	0.1777	0.0993
				(0.63)				(2.27)
AR5	0.1401	0.2030	0.2225	0.0823	0.1053	0.1651	0.2459	0.1406
CR3	0.2959	0.6024	0.7119	0.4159	0.2905	0.4063	0.8240	0.5334
				(3.53)				(2.04)
CR5	0.5245	0.9667	1.1521	0.6276	0.4142	0.7007	1.3125	0.8982
				(2.92)				(2.37)

Note: Table-2 values represent mean 3-month, 6-month, one-to-five-year buy and hold returns for portfolios formed in April each year, based on dividend-to-price (D/P) ratios. The sample period is from 1980-2000. AR5 is the average return for R1 to R5. CR3 and CR5 are the three-year and five-year cumulative returns. VMG represents the difference between high D/P stocks and low D/P stocks.). t( ) is the t-statistics with standard errors calculated using White (1980).

Table 3: Returns for Portfolios Formed Based on Total Asset Growth Rate.

Panel A: Equally Weighted				Panel B: Value Weighted			
	Low	P2	*High*	*H-L*	Low	P2	*High*	*H-L*
M3	0.0368	0.0241	0.0471	0.0103	0.0678	0.0413	0.0413	-0.0265
				(0.46)				(-0.76)
M6	-0.0166	0.0234	0.0230	0.0396	-0.0154	0.0190	0.0222	0.0376
				(1.85)				(1.11)
R1	0.1811	0.1748	0.2022	0.0211	0.1468	0.1919	0.1709	0.0241
				(0.45)				(0.30)
R2	0.1876	0.1891	0.1784	-0.0093	0.1852	0.1854	0.1441	-0.0411
				(-0.19)				(-0.49)
R3	0.2242	0.2171	0.1794	-0.0447	0.1517	0.2024	0.1635	0.0118
				(-1.60)				(0.25)
R4	0.2220	0.1667	0.2472	0.0251	0.2253	0.1634	0.1807	-0.0446
				(0.57)				(-0.69)

R5	0.2355	0.1737	0.2530	0.0175 (0.36)	0.2300	0.1675	0.1367	-0.0933 (-1.52)
AR5	0.2101	0.1843	0.2120	0.0020	0.1878	0.1821	0.1592	-0.0286
CR3	0.4987	0.4720	0.4994	0.0008 (0.01)	0.3906	0.4755	0.4261	0.0355 (0.20)
CR5	0.9440	0.8762	0.9702	0.0263 (0.18)	0.7544	0.8750	0.7303	-0.0240 (-0.09)

Note: Table-3 values represent mean 3-month, 6-month, one-to-five-year buy and hold returns for portfolios formed in April each year, based on previous year total asset growth rates (TAG). The sample period is from 1980-2000. AR5 is the average return for R1 to R5. CR3 and CR5 are the three-year and five-year cumulative returns. H-L represents the difference between high TAG stocks and low TAG stocks.). t( ) is the t-statistics with standard errors calculated using White (1980).

However, sorting stocks based on RE/TA ratio gives stronger results. Panels A and B of Table (4) present the equally and value weighted returns for portfolios formed based on RE/TA ratio. Panel A of Table (4) shows that the difference in returns between high and low RE/TA stocks is 0.0022, -0.0711, -0.1071, -0.0715, and –0.0787 with t-statistics of 0.04, -1.73, -2.61, -1.81, and -1.51 in the first, second, third, fourth and fifth-year period after portfolio formation, respectively. Over the five-year period, the average difference in returns is –0.0652. The cumulative difference over three (five)-year period after portfolio formation is -0.1180 (-0.2977) with a t-statistic of -1.28 (-2.65).

The value-weighted results from Panel B of Table (4) show that low RE/TA stocks outperform high RE/TA stocks by 0.1001, 0.1648, 0.1425, 0.0461, and 0.0586 with t-statistics of -1.45, -2.27, -2.15, -0.82 and -0.83 in the first, second, third, fourth and fifth-year period after portfolio formation, respectively. On average, low RE/TA firms outperform high RE/TA firms by 0.1024 over the five-year period. The cumulative difference in returns is –0.3491 and –0.5789 with t-statistics of -2.23 and -2.75 over three-year and five-year period after portfolio formation.

4.2. The Fama and French Three-Factor Model

Panels A, B, C and D of Table (5) report the results of the Fama-French three-factor model for portfolios formed based on E/P, D/P, TAG, and RE/TA, respectively. The results confirm that the values of the intercept coefficient for the arbitrage portfolios (VMG) are not significant, 0.04, 0.012, 0.001 and –0.008 with *t-statistics* of 0.59, 1.54, 0.41 and –1.26, respectively. The beta coefficient values for the VMG portfolios are –0.16, 0.40, -0.14 and –0.07 with *t-statistics* of –0.52, 1.60, -0.66 and –0.27, respectively. These beta figures assert that high E/P, D/P, TAG or RE/TA stocks are not riskier than low E/P, D/P, TAG or RE/TA stocks[4]. The loading of SMB factor for the VMG portfolios is not significant, 0.08, 0.35, -0.01 and 0.25 with *t-statistics* of 0.19, 0.97, -0.08 and 0.89, respectively. The loading of HML factor for the VMG portfolios is also not significant, 0.29, 0.21, 0.12 and 0.11 with *t-statistics* of 0.73, 0.58, 1.04 and 0.89 for the E/P, D/P, TAG, and RE/TA strategies, respectively. The adjusted R^2 values are 0.020, 0.050, 0.003 and 0.052 for the VMG portfolios, respectively. This suggests that the three-factor model does not help us enough to explain the returns of the hedge portfolio. The above results are not consistent with Fama and French (1996) and Gregory, Harris and Michou (2001), amongst others. One explanation could be that returns of ASE as an emerging market have different characteristics than those of developed markets. For example, Fama and French (1998) illustrate that emerging market returns suffer from high volatility. Furthermore, most emerging markets suffer from infrequent trading (thin trading) problem. Therefore, the next section of this paper examines the effect of such factors as well as other factors that have been identified in previous studies as factors that help in explaining the cross-sectional stock returns.

4.3. The Multi-Factor Model

In this section I employ a multi-factor model to test whether it is superior over the Fama-French three-factor model in explaining the difference in returns between high and low E/P, D/P, TAG or RE/TA stocks.

4.3.1. E/P Strategy

Panel A of Table (6) shows the results after including the momentum effect as suggested by Carhart (1997). The value of the intercept coefficient for the VMG portfolio is 0.014 with a *t-statistic* of 2.23. The value of the beta coefficient is –0.05 with a *t-statistic* of –0.15.

The loading of SMB and HML factors for the VMG portfolio is not significant, -0.01 and 0.41 with *t-statistics* of –0.03 and 1.07, respectively. The loading of the LMW factor for the VMG portfolio is significant, 1.86 with a *t-statistic* of 3.23. The adjusted R² for the VMG portfolio increases from 0.02 (Panel A of Table 5) to 0.105. These results suggest that the LMW factor captures some variation in stock returns that is missed by the market, size and book-to-market equity. See Saleh (2006b) for an extensive investigation of the sensitivity of the duration of the formation period and the LMW effect.

Table 4: Returns for Portfolios Formed Based on Retained Earnings to Total Assets Ratios.

	Panel A: Equally Weighted				**Panel B: Value Weighted**			
	Low	**P2**	***High***	***H-L***	**Low**	**P2**	***High***	***H-L***
M3	0.0325	0.0406	0.0590	0.0265	0.0526	0.1110	0.0404	-0.0122
				(2.16)				(-0.55)
M6	0.0368	0.0250	0.0204	-0.0165	0.0089	-0.0141	0.0083	-0.0007
				(-0.63)				(-0.04)
R1	0.2345	0.2547	0.2367	0.0022	0.2393	0.2132	0.1392	-0.1001
				(0.04)				(-1.45)
R2	0.1945	0.1770	0.1234	-0.0711	0.2469	0.2622	0.0821	-0.1648
				(--1.73)				(-2.27)
R3	0.2110	0.1457	0.1039	-0.1071	0.2560	0.1216	0.1135	-0.1425
				(-2.61)				(-2.15)
R4	0.2160	0.1353	0.1445	-0.0715	0.1944	0.1316	0.1483	-0.0461
				(-1.81)				(-0.82)
R5	0.2156	0.1574	0.1369	-0.0787	0.2003	0.1061	0.1417	-0.0586
				(-1.51)				(-0.83)
AR5	0.2143	0.1740	0.1491	-0.0652	0.2274	0.1669	0.1250	-0.1024
CR3	0.5396	0.5065	0.4216	-0.1180	0.6378	0.5464	0.2887	-0.3491
				(-1.28)				(-2.23)
CR5	0.9704	0.8085	0.6727	-0.2977	1.0982	0.8167	0.5193	-0.5789
				(-2.65)				(-2.75)

Note: Table-4 values represent mean 3-month, 6-month, one-to-five-year buy and hold returns for portfolios formed in April each year, based on retained-earnings-to-total-asset (RE/TA) ratios. The sample period is from 1980-2000. AR5 is the average return for R1 to R5. CR3 and CR5 are the three-year and five-year cumulative returns. H-L represents the difference between high RE/TA stocks and low RE/TA stocks.). t( ) is the t-statistics with standard errors calculated using White (1980).

Table 5: The Fama and French Three-Factor Model

Panel A: E/P Strategy				
	Low E/P	**Medium**	**High E/P**	**VMG**
a	0.011	0.009	0.015	0.004
t(a)	1.99	3.13	2.76	0.59
β	0.84	0.84	0.68	-0.16
t(β)	3.84	8.06	2.91	-0.52
s	-0.33	-0.04	-0.25	0.08
t(s)	-0.94	-0.76	-1.71	0.19
h	-0.30	0.005	-0.01	0.29
t(h)	-0.88	0.09	-0.10	0.73
R^2	0.174	0.360	0.152	0.020
Panel B: D/P Strategy				
	Low D/P	**Medium**	**High D/P**	**VMG**
a	0.008	0.010	0.020	0.012
t(a)	1.53	3.46	3.79	1.54
β	0.51	0.81	0.91	0.40
t(β)	2.98	7.82	4.80	1.60
s	-0.50	0.01	-0.15	0.35
t(s)	-1.64	0.14	-1.31	0.97
h	-0.30	0.04	-0.09	0.21
t(h)	-0.99	1.07	-0.89	0.58
R^2	0.213	0.362	0.191	0.050
Panel C: Previous Year TA Growth Rate (TAG) Strategy				
	Low TAG	**Medium**	**High TAG**	**H-L**
a	0.010	0.011	0.011	0.001
t(a)	2.59	2.60	2.29	0.41
β	1.13	0.68	0.99	-0.14
t(β)	6.12	3.67	6.45	-0.66
s	-0.11	-0.42	-0.12	-0.01
t(s)	-1.01	-1.42	-1.34	-0.08
h	-0.02	-0.35	0.10	0.12
t(h)	-0.24	-1.33	1.36	1.04
R^2	0.377	0.259	0.251	0.003
Panel D: RE/TA Strategy				
	Low RE/TA	**Medium**	**High RE/TA**	**H-L**
a	0.014	0.011	0.006	-0.008
t(a)	2.83	2.18	1.34	-1.26
β	0.76	0.94	0.69	-0.07
t(β)	3.47	3.88	4.79	-0.27
s	-0.33	-0.06	-0.08	0.25
t(s)	-1.26	-0.42	-0.99	0.89
h	-0.18	-0.12	-0.07	0.11
t(h)	-0.70	-1.10	0.88	0.89
R^2	0.190	0.182	0.165	0.052

Note:
$$Rp - R_f = a_i + \beta(R_m - R_f) + s_i SMB + h_i HML + e_{i,t}$$

Where, $Rp - R_f$ is the individual portfolios return minus Treasury bill rate or the VMG (H-L) portfolio return. *SMB* (small minus big) is the difference, each month, between the average of the returns on the three small-stock portfolios (S/L, S/M, and S/H) and the average of the returns on the three big-stock portfolios (B/L, B/M, and B/H). HML is the difference, each month, between the average of the returns of the two high-book-to-market portfolios (S/H and B/H) and the average of the returns on the two low-book-to-market portfolios (S/L and B/L). t( ) is the t-statistics with standard errors calculated using White (1980). R^2 is adjusted for degree of freedom.

Table 6: The Multi-Factor Model - E/P Strategy

Panel A: Including LMW Factor				
	Low E/P	**Medium**	**High E/P**	**VMG**
a	0.005	0.007	0.019	0.014
t(a)	1.04	2.66	3.12	2.23
β	0.83	0.85	0.78	-0.05
t(β)	3.72	7.57	2.89	-0.15
s	-0.25	0.01	-0.26	-0.01
t(s)	-0.75	0.18	-1.68	-0.03
h	-0.42	-0.03	0.002	0.41
t(h)	-1.23	-0.60	0.01	1.07
LMW	-1.08	-0.14	0.78	1.86
t(LMW)	-2.50	-0.42	2.04	3.23
R^2	0.258	0.433	0.177	0.105
Panel B: Including HMLSTD Factor				
	Low E/P	**Medium**	**High E/P**	**VMG**
a	0.008	0.009	0.015	0.007
t(a)	1.38	3.07	2.68	0.98
β	0.61	0.82	0.69	0.08
t(β)	2.16	7.85	2.76	0.19
s	-0.32	-0.04	-0.25	0.07
t(s)	-1.11	-0.74	-1.73	0.20
h	-0.17	0.02	-0.02	0.15
t(h)	-0.79	0.30	-0.18	0.55
HMLSTD	0.82	0.07	-0.07	0.89
t(HMLSTD)	2.02	1.05	-0.44	-1.86
R^2	0.313	0.362	0.150	0.135
Panel C: Including LMI Factor				
	Low E/P	**Medium**	**High E/P**	**VMG**
a	0.011	0.009	0.014	0.003
t(a)	1.97	3.06	2.69	0.58
β	0.88	0.75	0.66	-0.22
t(β)	4.23	7.81	2.69	-0.66
s	-0.29	-0.13	-0.26	0.03
t(s)	-0.98	-2.11	-2.08	0.08
h	-0.29	-0.02	-0.01	0.28
t(h)	-0.89	-0.32	-0.13	0.74
LMI	-0.09	0.21	0.03	0.12
t(LMI)	-0.44	3.49	0.32	0.54

R^2	0.173	0.404	0.149	0.020
Panel D: Including LMU Factor				
	Low E/P	**Medium**	**High E/P**	**VMG**
a	0.011	0.009	0.014	0.003
t(a)	2.00	3.16	2.83	0.59
β	0.80	0.82	0.62	-0.18
t(β)	3.39	8.20	3.01	-0.61
s	-0.37	-0.07	-0.30	0.07
t(s)	-1.01	-1.09	-2.06	0.14
h	-0.32	-0.01	-0.04	0.28
t(h)	-0.92	-0.11	-0.34	0.69
LMU	-0.21	-0.12	-0.30	-0.09
t(LMU)	-1.52	-2.43	-2.04	-0.36
R^2	0.188	0.382	0.213	0.020
Panel E: 7-Factor Model				
	Low E/P	**Medium**	**High E/P**	**VMG**
a	0.002	0.006	0.019	0.017
t(a)	0.38	2.69	3.17	2.39
β	0.70	0.75	0.78	0.08
t(β)	3.06	7.32	2.78	0.19
S	-0.07	-0.08	-0.28	-0.21
t(s)	-0.45	-1.38	-2.32	-0.99
H	-0.25	-0.06	-0.04	0.21
t(h)	-1.62	-1.11	-0.30	0.96
HMLSTD	0.98	-0.03	-0.09	-0.89
t(HMLSTD)	2.24	-0.60	-0.60	-2.01
LMI	-0.55	0.21	-0.12	0.43
t(LMI)	-1.65	2.80	-0.70	0.99
LMU	-0.31	-0.04	-0.36	-0.05
t(LMU)	-1.71	-0.62	-1.66	-0.15
LMW	-0.92	-0.17	0.57	1.49
t(LMW)	-1.70	-0.61	1.35	2.68
R^2	0.468	0.492	0.236	0.250

Note: $Rp - R_f = a_i + \beta(R_m - R_f) + s_i SMB + h_i HML + l_i Z + e_{i,t}$

$$Rp - R_f = a_i + \beta(R_m - R_f) + s_i SMB + h_i HML + \sum_{n=1}^{4} l_i Z + e_{i,t}$$

Where, $Rp - R_f$ is the individual portfolios return minus Treasury bill rate or the VMG portfolio return. *SMB* (small minus big) is the difference, each month, between the average of the returns on the three small-stock portfolios (S/L, S/M, and S/H) and the average of the returns on the three big-stock portfolios (B/L, B/M, and B/H). HML is the difference, each month, between the average of the returns of the two high-book-to-market portfolios (S/H and B/H) and the average of the returns on the two low-book-to-market portfolios (S/L and B/L). Z is the fourth factor depending on each Panel; these factors are LMW, HSVMLSV, LMI, and LMU. t( ) is the t-statistics with standard errors calculated using White (1980). R^2 is adjusted for degree of freedom.

Panel B of Table (6) reports the results after including the HMLSTD factor on the three-factor model. The HMLSTD factor loads negatively significant (at 10% level) for the VMG portfolio, 0.89 with a *t-statistic* of –1.86. The adjusted R² increases from 0.02 (Panel A of Table 5) to 0.135. This suggests that the HMLSTD factor captures some variation in stock returns over the three-factor model. Panels C and D of Table 6 illustrate that the LMI and LMU factors have no effect in explaining the returns of the VMG portfolio. Panel E of Table (6) presents the results of the 7-factor model. The results confirm that the LMW and HMLSTD factors are the most important factors that explain the difference in returns between high and low E/P stocks. The adjusted R² increases from 0.02 (Panel A of Table 5) to 0.250. However, the intercept value for the VMG portfolio loads positively significant, which suggests that the model fails to fully explain the returns of the VMG portfolio.

4.3.2.   D/P Strategy

Panel A of Table (7) shows that the intercept value of the VMG portfolio is 0.019 with a *t-statistic* of 2.17. The value of the beta coefficient for the VMG portfolio is 0.52 with a *t-statistic* of 1.83, which suggests that high D/P stocks exhibit higher risk than low D/P stocks. The loading of SMB, HML, and LMW factors is not significant. Thus, the inclusion of the LMW factor has little effect in explaining the difference in returns between high and low D/P stocks. The adjusted R² for the VMG portfolio increases from 0.050 (Panel B of Table 5) to 0.068.

Panel B of Table (7) shows that the HMLSTD factor has little effect in explaining the returns of the VMG portfolio. The adjusted R² increases from 0.050 (Panel A of Table 5) to 0.097. However, Panel C of Table (7) shows that the LMI factor captures some variation in stock returns that is missed by the three-factor model. The LMI factor loads positively significant for the VMG portfolio, 0.53 with a *t-statistic* of 2.43. The adjusted R² increases from 0.050 (Panel A of Table 5) to 0.106. The LMU factor does not help in explaining the difference in returns between high and low D/P stocks. The adjusted R²

decreases from 0.050 (Panel A of Table 5) to 0.047. Finally, Panel E of Table (7) reports the results of the 7-factor model. The HMLSTD (LMI) factor loads negatively (positively) significant, -0.93 (0.97) with a *t-statistic* of –2.07 (2.41). The adjusted R² increases from 0.050 (Panel A of Table 5) to 0.259. However, the 7-factor model does not explain all returns since the intercept value is 0.021 with a *t-statistic* of 2.45.

4.3.3.   TAG Strategy

Panel A of Table (8) shows that the intercept and beta coefficient values of the VMG portfolio are –0.003 and –0.22 with *t-statistics* of –0.25 and –0.93, respectively. The loading of SMB, HML and LMW factors for the VMG portfolio is not significant, 0.17, 0.05, and –0.87 with *t-statistics* of 1.19, 0.55, and –1.30, respectively. This result suggests that the LMW factor does not capture any variation in stock returns over the three-factor model. The adjusted R² for the VMG portfolio increases from 0.003 (Panel C of Table 5) to 0.029.

Panel B of Table (8) shows that the HMLSTD factor explains a little part of VMG portfolio returns. The coefficient value is 0.24 with a *t-statistic* of 1.87 and the adjusted R² increases from 0.003 (Panel C of Table 5) to 0.023. However, Panels C and D of Table (8) confirm that the LMI and LMU factors do not contribute in explaining the difference in returns between high and low TAG stocks. Panel E of Table (8) presents the results of the 7-factor model which show that low TAG stocks outperform high TAG stocks. The adjusted R² increases from 0.003 (Panel C of Table 5) to 0.104.

4.3.4.   RE/TA Strategy

The results from Panel A of Table (9) show that the intercept and beta coefficient values are –0.006 and –0.05 with *t-statistics* of –0.86 and –0.19, respectively. The loading of SMB, HML and LMW factors for the VMG portfolio is not significant. The adjusted R² for the VMG portfolio increases from 0.052 (Panel D of Table 5) to 0.061, which suggests that the LMW factor does not help in explaining the returns of the VMG portfolio.

Panel B of Table (9) confirms that the HMLSTD

factor explains a good portion of returns. The factor loads negatively significant, -0.75 with a *t-statistic* of –2.33. The adjusted R² increases from 0.052 (Panel D of Table 5) to 0.184. However, Panels B and C of Table (9) assert that the LMI and LMU factors do not contribute in explaining the returns of the VMG portfolio. Panel E of Table (9) shows that low RE/TA stocks outperform high RE/TA stocks and that the HMLSTD and LMI factors load significantly for the VMG portfolio. The adjusted R² increases from 0.052 (Panel D of Table 5) to 0.260.

4.4. 'Value' Investment Strategy and Efficient Market Hypothesis

The Efficient Market Hypothesis (EMH) says that asset prices fully reflect all available information. Thus, a central challenge to the EMH is the existence of stock market anomalies such as size effect, value effect, January effect and weekend effect. It seems that 'value' investors dispute the EMH in which they benefit from the discrepancies between stock prices and the underlying value of the asset. However, we should note that market efficiency does not require that the market price should be equal to intrinsic value at every point in time. This

means that errors in the market price should be unbiased, that is, prices can be greater than or less than intrinsic value as long as these deviations are random. This suggests that there is an equal chance that stocks are under or over priced at any point in time, and these deviations are uncorrelated with any observable variable. For example, in an efficient market, stocks with higher E/P ratios should be no more or less likely to under-priced than stocks with lower E/P ratios. Schwert (2002) argues that anomalies are empirical results that seem to be inconsistent with asset pricing theories. Such anomalies indicate either Markey inefficiency or inadequacies in the underlying asset pricing model. Schwert provides evidence suggesting that the size effect, the value effect, the weekend effect and the dividend yield effect seem to have weakened or disappeared after the papers that highlighted them were published. He argues that "if the anomalies existed in the sample period in which they were first identified, the activities of practitioners who implement strategies to take advantage of anomalous behavior can cause the anomalies to disappear (as research findings cause the market to become more efficient)".

Table 7: The Multi-Factor Model - D/P Strategy

Panel A: Including LMW Factor				
	Low D/P	**Medium**	**High D/P**	**VMG**
a	0.005	0.011	0.024	0.019
t(a)	1.01	3.62	3.54	2.17
β	0.54	0.83	1.06	0.52
t(β)	2.87	7.62	4.78	1.83
s	-0.47	0.02	-0.17	0.30
t(s)	-1.53	0.39	-1.44	0.81
h	-0.38	0.04	-0.09	0.29
t(h)	-1.22	0.89	-0.86	0.77
LMW	-0.08	0.08	0.73	0.81
t(LMW)	-0.22	0.30	1.46	1.21
R^2	0.240	0.372	0.226	0.068
Panel B: Including HMLSTD Factor				
	Low D/P	**Medium**	**High D/P**	**VMG**
a	0.005	0.009	0.020	0.015
t(a)	0.97	3.40	3.72	1.82
β	0.33	0.80	0.88	0.55

t(β)	1.46	7.69	4.33	1.69
s	-0.50	0.01	-0.15	0.35
t(s)	-1.96	0.15	-1.26	1.09
h	-0.20	0.05	-0.08	0.12
t(h)	-1.04	1.06	-0.70	0.47
HMLSTD	0.64	0.02	0.09	-0.55
t(HMLSTD)	1.74	0.36	0.62	-1.19
R^2	0.316	0.360	0.190	0.097
Panel C: Including LMI Factor				
	Low D/P	**Medium**	**High D/P**	**VMG**
a	0.008	0.009	0.020	0.012
t(a)	1.59	3.42	3.67	1.53
β	0.62	0.75	0.77	0.15
t(β)	4.13	7.65	3.79	0.58
s	-0.41	-0.05	-0.27	0.14
t(s)	-1.65	-0.92	-2.56	0.46
h	-0.27	0.03	-0.12	0.15
t(h)	-0.99	0.70	-1.26	0.47
LMI	-0.23	0.14	0.30	0.53
t(LMI)	-1.40	2.68	2.52	2.43
R^2	0.228	0.381	0.226	0.106
Panel D: Including LMU Factor				
	Low D/P	**Medium**	**High D/P**	**VMG**
a	0.007	0.009	0.020	0.013
t(a)	1.56	3.51	3.87	1.54
β	0.46	0.78	0.85	0.39
t(β)	2.52	7.97	5.41	1.65
s	-0.55	-0.02	-0.21	0.34
t(s)	-1.78	-0.36	-1.77	0.89
h	-0.32	0.03	-0.12	0.20
t(h)	-1.06	0.74	-1.16	0.56
LMU	-0.25	-0.14	-0.30	-0.05
t(LMU)	-2.32	-2.90	-2.54	-0.28
R^2	0.239	0.392	0.245	0.047
Panel E: 7-Factor Model				
	Low D/P	**Medium**	**High D/P**	**VMG**
a	0.002	0.011	0.023	0.021
t(a)	0.49	3.66	3.58	2.45
β	0.51	0.75	0.91	0.40
t(β)	2.59	7.22	3.95	1.27
S	-0.23	-0.05	-0.31	-0.08
t(s)	-1.72	-0.84	-2.58	-0.44
H	-0.21	0.02	-0.14	0.07
t(h)	-1.61	0.38	-1.23	0.35
HMLSTD	0.89	-0.01	-0.04	-0.93
t(HMLSTD)	2.43	-0.23	-0.33	-2.07
LMI	-0.76	0.11	0.21	0.97

t(LMI)	-2.69	1.79	1.04	2.41
LMU	-0.43	-0.09	-0.25	0.18
t(LMU)	-2.45	-1.41	-1.38	0.55
LMW	-0.03	0.03	0.59	-0.56
t(LMW)	-0.07	0.15	1.13	1.16
R^2	0.496	0.405	0.291	0.259

Note: $Rp - R_f = a_i + \beta(R_m - R_f) + s_i SMB + h_i HML + l_i Z + e_{i,t}$

$$Rp - R_f = a_i + \beta(R_m - R_f) + s_i SMB + h_i HML + \sum_{n=1}^{4} l_i Z + e_{i,t}$$

Where, $Rp - R_f$ is the individual portfolios return minus Treasury bill rate or the VMG portfolio return. *SMB* (small minus big) is the difference, each month, between the average of the returns on the three small-stock portfolios (S/L, S/M, and S/H) and the average of the returns on the three big-stock portfolios (B/L, B/M, and B/H). HML is the difference, each month, between the average of the returns of the two high-book-to-market portfolios (S/H and B/H) and the average of the returns on the two low-book-to-market portfolios (S/L and B/L). Z is the fourth factor depending on each Panel; these factors are LMW, HSVMLSV, LMI, and LMU. t( ) is the t-statistics with standard errors calculated using White (1980). R^2 is adjusted for degree of freedom.

Table 8: The Multi-Factor Model - TAG Strategy

Panel A: Including LMW Factor				
	Low TAG	**Medium**	**High TAG**	**H-L**
a	0.013	0.006	0.010	-0.003
t(a)	3.00	1.61	2.17	-0.25
β	1.28	0.72	1.06	-0.22
t(β)	6.21	3.64	7.26	-0.93
s	-0.15	-0.31	0.02	0.17
t(s)	-1.16	-1.01	0.26	1.19
h	-0.03	-0.41	0.02	0.05
t(h)	-0.41	-1.47	0.39	0.55
LMW	0.55	-1.03	-0.32	-0.87
t(LMW)	1.42	-1.86	-0.69	-1.30
R^2	0.445	0.321	0.323	0.029
Panel B: Including HMLSTD Factor				
	Low TAG	**Medium**	**High TAG**	**H-L**
a	0.011	0.007	0.011	0.000
t(a)	2.54	1.67	2.21	0.24
β	1.17	0.41	0.95	-0.22
t(β)	5.56	2.04	6.38	-0.96
s	-0.11	-0.45	-0.13	-0.02
t(s)	-1.04	-2.03	-1.32	-0.14
h	-0.04	-0.22	0.12	0.16
t(h)	-0.40	-1.54	1.57	1.26
HMLSTD	-0.12	0.86	0.12	0.24
t(HMLSTD)	-1.11	2.99	1.50	1.87
R^2	0.382	0.476	0.255	0.023

Panel C: Including LMI Factor				
	Low TAG	**Medium**	**High TAG**	**H-L**
a	0.010	0.011	0.011	0.001
t(a)	2.52	2.44	2.15	0.37
β	1.15	0.57	0.90	-0.25
t(β)	5.32	3.42	5.44	-0.99
s	-0.10	-0.52	-0.20	-0.10
t(s)	-1.03	-1.99	-2.03	-0.74
h	-0.02	-0.37	0.09	0.11
t(h)	-0.21	-1.42	1.13	0.89
LMI	-0.03	0.19	0.15	0.18
t(LMI)	-0.38	1.18	1.70	1.36
R^2	0.375	0.268	0.261	0.015
Panel D: Including LMU Factor				
	Low TAG	**Medium**	**High TAG**	**H-L**
a	0.009	0.011	0.011	0.002
t(a)	2.69	2.54	2.24	0.42
β	1.00	0.59	0.89	-0.11
t(β)	8.14	3.12	5.97	-0.62
s	-0.20	-0.48	-0.19	0.01
t(s)	-1.54	-1.59	-1.94	0.05
h	-0.04	-0.36	0.09	0.13
t(h)	-0.48	-1.37	1.17	1.05
LMU	-0.32	-0.23	-0.24	0.08
t(LMU)	-2.27	-1.95	-3.35	0.45
R^2	0.464	0.280	0.291	0.003
Panel E: 7-Factor Model				
	Low TAG	**Medium**	**High TAG**	**H-L**
a	0.013	0.003	0.010	-0.003
t(a)	3.38	0.70	2.15	-0.20
β	1.24	0.38	0.91	-0.33
t(β)	6.95	1.85	6.44	-1.51
S	-0.18	-0.34	-0.07	0.11
t(s)	-1.78	-2.12	-1.05	0.84
H	-0.07	-0.28	0.02	0.09
t(h)	-0.85	-2.15	0.34	0.83
HMLSTD	-0.14	0.88	0.10	0.24
t(HMLSTD)	-1.64	2.57	1.10	2.26
LMI	-0.14	-0.20	0.10	0.24
t(LMI)	-1.10	-0.87	1.09	1.36
LMU	-0.38	-0.25	-0.09	0.29
t(LMU)	-2.19	-1.76	-1.48	1.44
LMW	0.28	-0.34	-0.14	-0.42
t(LMW)	1.06	-0.69	0.31	-0.71
R^2	0.550	0.560	0.344	0.104

Note: $Rp - R_f = a_i + \beta(R_m - R_f) + s_i SMB + h_i HML + l_i Z + e_{i,t}$

$$Rp - R_f = a_i + \beta(R_m - R_f) + s_i SMB + h_i HML + \sum_{n=1}^{4} l_i Z + e_{i,t}$$

Where, $Rp - R_f$ is the individual portfolios return minus Treasury bill rate or the H-L portfolio return. *SMB* (small minus big) is the difference, each month, between the average of the returns on the three small-stock portfolios (S/L, S/M, and S/H) and the average of the returns on the three big-stock portfolios (B/L, B/M, and B/H). HML is the difference, each month, between the average of the returns of the two high-book-to-market portfolios (S/H and B/H) and the average of the returns on the two low-book-to-market portfolios (S/L and B/L). Z is the fourth factor depending on each Panel; these factors are LMW, HSVMLSV, LMI, and LMU. t( ) is the t-statistics with standard errors calculated using White (1980). R^2 is adjusted for degree of freedom.

Table 9: The Multi-Factor Model ─ RE/TA Strategy

Panel A: Including LMW Factor				
	Low RE/TA	**Medium**	**High RE/TA**	**H-L**
a	0.011	0.010	0.005	-0.006
t(a)	2.37	1.85	1.22	-0.86
β	0.79	0.98	0.74	-0.05
t(β)	3.25	3.52	4.82	-0.19
s	-0.26	-0.08	-0.02	0.24
t(s)	-0.98	-0.51	-0.32	0.85
h	-0.28	-0.13	0.02	0.30
t(h)	-1.01	-1.09	0.36	0.99
LMW	-0.28	-0.13	-0.16	0.12
t(LMW)	-1.00	-0.38	-0.52	0.26
R^2	0.223	0.218	0.204	0.061
Panel B: Including HMLSTD Factor				
	Low RE/TA	**Medium**	**High RE/TA**	**H-L**
a	0.011	0.012	0.006	-0.005
t(a)	2.28	2.12	1.35	-0.94
β	0.55	0.96	0.69	0.14
t(β)	2.27	3.64	4.86	0.45
s	-0.32	-0.07	-0.08	0.24
t(s)	-1.60	-0.44	-1.00	1.13
h	-0.06	-0.14	0.07	0.13
t(h)	-0.42	-1.11	0.86	0.75
HMLSTD	0.74	-0.10	-0.01	-0.75
t(HMLSTD)	2.55	-0.56	-0.14	-2.33
R^2	0.354	0.181	0.162	0.184
Panel C: Including LMI Factor				
	Low RE/TA	**Medium**	**High RE/TA**	**H-L**
a	0.014	0.011	0.006	-0.008
t(a)	2.77	2.08	1.27	-1.25
β	0.75	0.87	0.64	-0.11
t(β)	3.69	3.29	4.58	-0.43
s	-0.34	-0.12	-0.12	0.22
t(s)	-1.54	-0.92	-1.56	0.92
h	-0.18	-0.14	0.06	0.24

t(h)	-0.74	-1.31	0.72	0.90
LMI	0.01	0.15	0.11	0.10
t(LMI)	0.09	1.42	1.46	0.58
R^2	0.186	0.188	0.170	0.050
Panel D: Including LMU Factor				
	Low RE/TA	**Medium**	**High RE/TA**	**H-L**
a	0.014	0.011	0.006	-0.008
t(a)	2.91	2.23	1.32	-1.26
β	0.71	0.86	0.66	-0.05
t(β)	3.33	4.04	4.55	-0.22
s	-0.38	-0.13	-0.11	0.27
t(s)	-1.41	-0.79	-1.32	0.92
h	-0.20	-0.16	0.05	0.25
t(h)	-0.78	-1.39	0.69	0.90
LMU	-0.24	-0.38	-0.17	0.07
t(LMU)	-2.52	-2.11	-2.98	0.75
R^2	0.218	0.265	0.190	0.050
Panel E: 7-Factor Model				
	Low RE/TA	**Medium**	**High RE/TA**	**H-L**
a	0.008	0.010	0.005	-0.003
t(a)	1.83	1.82	1.22	-0.52
β	0.64	0.93	0.68	0.04
t(β)	2.68	3.14	4.63	0.12
S	-0.13	-0.15	-0.09	0.04
t(s)	-1.19	-1.07	-1.67	0.38
H	-0.14	-0.17	-0.02	0.12
t(h)	-1.13	-1.39	-0.30	0.88
HMLSTD	0.83	-0.09	-0.11	-0.94
t(HMLSTD)	2.58	-0.57	-1.29	-2.72
LMI	-0.43	-0.01	0.11	0.54
t(LMI)	-1.77	-0.04	1.26	2.05
LMU	-0.34	-0.33	-0.13	0.21
t(LMU)	-2.36	-1.28	-1.58	1.29
LMW	-0.19	-0.33	-0.26	-0.07
t(LMW)	-0.61	-0.94	-0.88	-0.15
R^2	0.460	0.275	0.233	0.260

Note: $Rp - R_f = a_i + \beta(R_m - R_f) + s_i SMB + h_i HML + l_i Z + e_{i,t}$

$$Rp - R_f = a_i + \beta(R_m - R_f) + s_i SMB + h_i HML + \sum_{n=1}^{4} l_i Z + e_{i,t}$$

Where, $Rp - R_f$ is the individual portfolios return minus Treasury bill rate or the H-L portfolio return. *SMB* (small minus big) is the difference, each month, between the average of the returns on the three small-stock portfolios (S/L, S/M, and S/H) and the average of the returns on the three big-stock portfolios (B/L, B/M, and B/H). HML is the difference, each month, between the average of the returns of the two high-book-to-market portfolios (S/H and B/H) and the average of the returns on the two low-book-to-market portfolios (S/L and B/L). Z is the fourth factor depending on each Panel; these factors are LMW, HSVMLSV, LMI, and LMU. t( ) is the t-statistics with standard errors calculated using White (1980). R^2 is adjusted for degree of freedom.

5.   SUMMARY AND CONCLUSIONS

The main objective of this study was to investigate the performance of high Earnings-to-Price (E/P), Dividend-to-Price (D/P), previous year asset growth rates (TAG) and Retained-Earnings-to-Total-Asset (RE/TA) stocks against low E/P, D/P, TAG and RE/TA stocks. Therefore, this study undertakes a comprehensive examination of cross-sectional stock returns using data from Amman Stock Exchange over the period 1980-2000. Consistent with the evidence reported by Fama and French (1996, 1998) and Gregory, Harris, and Michou (2001) amongst others, high E/P and D/P stocks outperform low stocks. Furthermore, and consistent with Cooper et al. (2005), I find that low total asset growth firms outperform high total asset growth firms. However, this strategy is not superior over other determinants of cross-sectional stock returns such as earnings-to-price, dividend-to-price, firm capitalization, and book-to-market. Moreover, I find that low retained-earnings-to-total-asset stocks outperform high retained-earnings-to-total-asset stocks.

Inconsistent with the results provided by developed markets such as the UK and US, I find that the SMB and HML factors are not significant when we sort stocks based on E/P, D/P, TAG, or RE/TA. An important note here is that Saleh (2006) and Saleh (2006b) investigate the cross-sectional of stock returns based on size, book-to-market equity and momentum and find that the SMB and HML factors load significantly. These results may suggest that emerging market returns have different characteristics than those of developed market returns. Therefore, I control for momentum effect, illiquidity effect, leverage effect and stock volatility since these factors are found as factors that help in explaining some portion of the cross-sectional stock returns. The results show that stock volatility and momentum effect have a significant effect in explaining the difference in return between high and low E/P stocks. For D/P strategy, I find that stock volatility and illiquidity effect are the most important factors that explain the cross-sectional stock returns. Furthermore, the results show that sorting stocks on previous year total asset growth rates does not result in a superior strategy as suggested by Cooper et al. (2005). However, sorting stocks based on retained-earnings-to-total-asset yields to abnormal return, but it is not superior to E/P and D/P strategies. Overall, the D/P strategy is the best strategy that explains the cross-section of stock returns for Amman Stock Exchange. These results suggest that investors in Amman Stock Exchange are overly optimistic (pessimistic) about low (high) D/P stocks. Therefore, the stock market overpriced (under-priced) low (high) D/P stocks. Further, the stock market seems to weight dividends more than earnings, which supports the signal theory of divided.

NOTES

(1)   Following Cooper et al. (2005), I used the following formula: $TAG_t = \dfrac{TA_{t-1} - TA_{t-2}}{TA_{t-2}}$, where TA is total asset. Also note that E/P, D/P, and RE/TA are estimated by dividing earnings to price, dividends to price and retained earnings to total assets, respectively.

(2)   For each year, stocks are sorted in an ascending order into three portfolios based on their E/P, D/P, TAG or RE/TA values. Higher portfolio is assigned to a "value" portfolio, whilst lower portfolio is assigned to a "glamour" portfolio. Note that two approaches have been adopted in developing such portfolios; the equally weighted and the value-weighted, however, the approach-adopted does not influence the companies involved in such portfolio. Recall that in the equally weighted approach, portfolio return is calculated as: $Rp = \dfrac{\sum\limits_{t=1}^{N} Ri}{N}$, where N is the

number of companies included in the portfolio, whereas in the value-weighted approach, portfolio return is calculated as:

$$Rp = \sum_{t=1}^{N} Ri.Wi$$, where Wi is the weight of

company i.

(3) For the hedge portfolios, $R_p - R_f$ is replaced by monthly portfolio returns for VMG portfolios.

(4) However, note that the result is marginally significant in the case of D/P strategy.

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نسبة الأرباح إلى السعر، والتوزيعات إلى السعر، ونمو الشركة وعوائد السهم

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ملخص

قام كل من (2005) Cooper, Gulen and Schill بدراسة العلاقة بين نمو أصول الشركة وعائد السهم المستقبلي خلال الفترة 1963–2003، وقد توصل الباحثون الى أن ترتيب الشركات (الأسهم) الأمريكية حسب معدل نمو أصولها للسنة السابقة يتفوق على المحددات الأخرى لعوائد الأسهم مثل القيمة الدفترية إلى السوقية (book-to-market)، وحجم الشركة (firm capitalization)، ومعدل عائد السهم خلال السنة السابقة (Momentum).

باستخدام نموذج المعامل الواحد ونموذج العوامل المتعددة هدفت هذه الدراسة الى التحقق من مقدرة كل من نسبة الأرباح الى السعر، والتوزيعات إلى السعر، ومعدل نمو أصول الشركة في السنة السابقة، ونسبة الأرباح المحتجزة الى إجمالي الأصول في شرح عوائد الأسهم خلال الفترة 1980–2000. وخلافا لما توصل إليه كل من Cooper, Gulen and Schill (2005) فقد استنتجت هذه الدراسة أن ترتيب الشركات الأردنية حسب معدل نمو أصولها في السنة السابقة لا يتفوق على ترتيبها حسب نسبة الأرباح الى السعر ونسبة التوزيعات الى السعر. وبشكل عام فان نسبة التوزيعات الى السعر أظهرت تفوقاً على باقي الاستراتيجيات المتبعة في هذه الدراسة.

الكلمات الدالة: نسبة الأرباح الى السعر، التوزيعات الى السعر، نمو الشركة، عوائد الأسهم للأسواق الناشئة، نموذج فاما وفرنش، نموذج العوامل المتعددة.

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