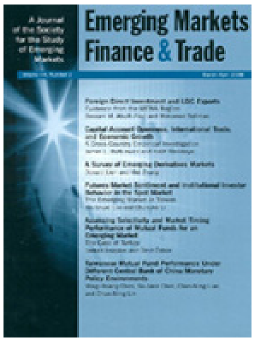

Emerging Markets Finance and Trade

ISSN: 1540-496X (Print) 1558-0938 (Online) Journal homepage: http://www.tandfonline.com/loi/mree20

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Emerging Markets Finance & Trade, 1–11, 2018

ISSN: 1540-496X print/1558-0938 online
DOI: https://doi.org/10.1080/1540496X.2018.1433031

The Cross-Section of Expected Stock Returns: New Evidence from an Emerging Market

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ABSTRACT: Over 300 factors have been found to explain the cross-section of expected stock returns. Empirical studies also show that findings from multifactor asset-pricing models have not been consistent in an emerging market. Using DuPont analysis and a residual income valuation model for 284 nonfinancial companies on Ho Chi Minh Stock Exchange during the period 2008–2014, findings suggest that the return on equity and its change are informative for stock returns in Vietnam. In addition, the level of capital turnover, financial cost ratio (FCR), and changes in capital and in the FCR contain incremental explanatory power for stock returns.

KEY WORDS: asset pricing, DuPont analysis, residual income valuation, stock returns, Vietnam

JEL Codes: G11, G12

Estimating a return on equity (ROE) is an extremely complicated task. Although for decades researchers and practitioners have been looking for contributory factors in explaining the relationship between risks and expected returns, they have not yet reached a consensus. On the basis of the theories by Markowitz (1952) and Tobin (1958), the first capital asset-pricing model (CAPM), proposed by Lintner (1965) and Sharpe (1964), plays a key role in finance literature that attempts to price capital assets. The CAPM theory attracts a great deal of attention among researchers worldwide and has gained another well-known name, the single-factor asset-pricing model. Almost immediately after the introduction of the model in 1964–1965, empiricists began to test this theory for its implications. Although some of the typical results support the validity of the CAPM (Fama and MacBeth 1973; Jensen, Black, and Scholes 1972), others offer critiques of it (Basu 1977; Basu 1983; Bhandari 1988).

Later studies by Fama and French (1992, 1993)) propose an alternative model, called the Fama–French three-factor model (FF3F) by adding size and the book-to-market ratio to the original CAPM. The works by Fama and French sparked one of the most intense debates in the history of finance and have attracted a great deal of scholarly attention over the past two decades. Hundreds of quantitative studies have been conducted worldwide over various time periods and contexts that try to improve the model (Gaunt 2004; O'Brien, Brailsford, and Gaunt 2010). Many studies conclude that the factors considered in the FF3F model are insignificant or do not have the expected sign.

In addition, in October 2013, the Nobel Memorial Prize in economic science was awarded to Eugene Fama for his work on market efficiency. Recently, Fama and his colleague, Kenneth French, introduced a new model, called the Fama–French five-factor model, to better explain the ROE in the US stock market (Fama and French 2015). This five-factor model is an augmented version of the three-factor model, adding profitability (Novy-Marx 2013) and investment trends (Aharoni, Grundy, and Zeng 2013) into the three-factor model.

A fundamental question challenging academia, policymakers, and practitioners is whether the single-factor CAPM is still valid for the purpose of estimating expected ROE. The answer to this

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question is far from complete. More and more explanatory factors (more than 300 factors as of December 2014) have been found in the flurry of recent literature. For example, Harvey, Liu, and Zhu (2016) report that 315 factors have been identified in the top-ranked journals and high-quality working papers. In a similar manner, Green, Hand, and Zhang (2013) identify 330 factors that have been utilized for the same purpose.

In recent years, Vietnam has been considered one of the most dynamic emerging economies in East Asia. After 30 years of economic and political reforms under the comprehensive economic reform, *Doi Moi* policy, the country has experienced rapid economic growth, averaging 6.4% since the 2000s. The stock market was established in 1998 with the introduction of the Ho Chi Minh Stock Exchange (HOSE) and has experienced significant expansion. In 2000, HOSE had only two stocks on trade, and their total market capitalization was USD 44.23 million, comprised 0.28 percent of Vietnam's gross domestic product (GDP). By the end of 2014, the HOSE, one of two stock exchanges in the country, had 305 listed stocks, with a total market capitalization of USD 46.07 billion, accounting for over 80% of total market capitalization in Vietnam's stock market. Table 1 illustrates the growth of the HOSE in the 2008–2014 period.

Recent studies by Vo and Mai (2014a, 2014b) conclude that findings from the multifactor asset-pricing model were not consistent in Vietnam and thus advise using caution in using the model for policymaking there. Even though various studies have explored Vietnam in this context, no study has been able to identify which factor can explain expected returns in the country, if new factors added by Fama and French to their model are unable to do so.

DuPont analysis is a financial model that decomposes profitability into various financial components. Then, by analyzing these components, equity analysts and market participants can understand better the source of profitability. As such, this study attempts to examine the usefulness of DuPont components decomposed from the ROE to predict future profitability and expected stock returns in Vietnam. Using data from 284 listed companies on the HOSE during the 2008–2014 period, the feasible generalized least-squares (FGLS) regression results show that not only the level of DuPont components but also the changes in these components possess predictive information on future changes in profitability and expected stock returns.

Literature Review

Capital Asset-Pricing Model

The CAPM, introduced by Lintner (1965) and Sharpe (1964), describes the relationship between expected returns and risks. In this model, the expected return on a security (an asset) is given by Equation (1) as follows:

$$E(r_i) = r_f + \beta_i\left[E\left(r_m - r_f\right)\right] \tag{1}$$

Table 1. GDP and the HOSE, 2008–2014.

	2008	2011	2014
GDP growth (annual %)	5.66	6.24	5.98
Market capitalization of listed domestic companies (% of GDP)	9.56	15.92	24.74
Market capitalization of listed domestic companies (current US$)	9.48	21.57	46.07
Listed domestic companies, total	162	294	305
Stocks traded, total value (% of GDP)	7.12	5.53	11.71

Source: World Bank Open Data.

where $E(r_i)$ represents the expected returns on security i, r_f is the risk-free rate, r_m is the expected returns on the market portfolio, and $\beta_i = \frac{Cor[r_i, r_m]}{Var[r_m]}$ is the beta coefficient for security i.

β_i is defined as a measurement of profitability volatility, and therefore it is considered a measurement of a stock's risks. Assuming that the capital market is efficient and nonsystemic risk can be completely reduced through diversification, returns on a security are affected only by its systemic risk. The higher the beta coefficient, the riskier the security is. Therefore, investors tend to require a higher return to compensate for the higher risk (or higher beta). Generally, the market beta is estimated using various approaches including ordinary least squares, least absolute deviations, and quantile regression (Pham and Vo 2018; Vo and Pham 2017).

Empirical Evidence on Asset-Pricing Models

Ever since its introduction in 1964–1965 by Lintner (1965) and Sharpe (1964), CAPM theory has been tested by empiricists for its implications. The works of Fama and MacBeth (1973) and Jensen, Black, and Scholes (1972) were the first of many empirical tests that support the validity of the CAPM theory. According to the CAPM, the market beta is the unique factor that matters in variations in expected returns across stocks, and other variables should add nothing to its explanatory power. Moreover, expected stock returns and the market beta should have a linear relationship.

By investigating both the cross-sectional and time-series approaches, Jensen, Black, and Scholes (1972) prove that the intercepts from those regressions of expected market returns equal zero. Fama and MacBeth (1973) add two new explanatory variables to the regression equation, which are the square of market beta and the variance of the residual. However, neither of these variables is useful in explaining stock return.

The earliest study that obtains a different result from the CAPM is by Basu (1977), who discovered that there is a difference in expected returns related to the earnings/price (*E*/*P*) ratio. Stocks with a high *E*/*P* ratio could generate significantly higher expected returns than stocks with a low *E*/*P* ratio. In a later study, Basu (1983) finds that stocks with low market capitalization, on average, have higher expected returns than those with high market capitalization. Rosenberg, Reid, and Lanstein (1985) provide evidence that stocks with a high book-to-market ratio have higher expected returns than those with a low book-to-market ratio. Bhandari (1988) oppose the CAPM theory, showing that stocks with higher leverage tend to have average expected returns.

Fama and French (1992) play an especially important role because they summarize all the studies done over the previous two decades related to asset-pricing models and combine them into one formula. In particular, they examine size, the book-to-market ratio, leverage, the *E*/*P* ratio, and market beta again. They conclude that (1) the effect of the *E*/*P* ratio on average expected returns is reflected completely in size and book-to-market factors and (2) the book-to-market ratio captures the role of leverage. With these interesting findings, Fama and French (1992) complete the FF3F model. Then, Fama and French (1993) expand their work with more testing variables and different methods and find even more support for their 1992 findings. Although their new model obtains some interesting results, many scholars disagree with it on the grounds that it lacks any theoretical basis (Kogan and Tian 2013; Vo 2015; Wang and Wu 2011). Black (1993) believes that Fama–French's findings are attributable only to luck because hundreds of explanatory variables for explaining expected stock returns have been tested every day. More importantly, findings obtained from the FF3F model are usually considered "data mining" (MacKinlay 1995). Although the later model is not as common as the FF3F model, the Carhart's four-factor model, which includes a new factor "momentum" into the three-factor model, receives the same critiques.

Subsequent literature that attempts to identify new predictive signals for expected returns have found even more factors. For example, Subrahmanyam (2010) find 50 factors; McLean and Pontiff (2016) identify 82 signals; and Green, Hand, and Zhang (2013) establish 330 firm-specific signals. In particular, Harvey, Liu, and Zhu (2016) report 315 factors and classify them into common and individual risk types (see Table S1, available online).

To explore these mixed and ambiguous FF3F model and Cahart's fourth-factor model results, Graham and Harvey (2001) conduct an interesting survey on 392 American CFOs (chief financial officers) on how their firms calculate the cost of equity capital. The survey shows that 73.5% of them use the original CAPM. Brounen, De Jong, and Koedijk (2004) carry out a similar study with 313 European CFOs, of whom 43% claim that they rely on the CAPM. In terms of practical application, according to Sudarsanam, Kaltenbronn, and Park (2011), regulators in Australia, Canada, Germany, New Zealand, the United States, and the UK still currently base their decisions primarily on the CAPM framework.

In Vietnam, studies have also been conducted to test the validity of multifactor models in general, but the results to date have been mixed. Vo and Mai (2014a) study the issue using a sample of 281 listed companies in the HOSE over the period 2007–2013. Employing a two-stage cross-sectional regression and five different portfolio construction methods, they conclude that (1) different methods of constructing portfolios lead to different results, both in value and in the significance of the coefficients; (2) market beta is the most important pricing factor in the three-factor model; and (3) High Minus Low (HML) seems to explain the average expected stock returns better than Small Minus Big (SMB). In addition, Vo and Mai (2014a) recommend that investors be more cautious about confirming values obtained with the FF3F model.

The Fama–French five-factor model has attracted particular attention from scholars and policy-makers. In this context, Vo and Mai (2014b) do pioneering work in applying this model to the Vietnamese market. Using a sample of 281 listed companies in the 2007–2013 period, they find that beta has the correct expected sign and is statistically significant. Moreover, regarding two factors in the three-factor model, while the value factor has strong explanatory ability with respect to expected stock returns, the size factor does not. With respect to the two added factors, the profitability factor can explain expected stock returns; however, the investment factor does not have the expected sign.

The DuPont Analysis

The DuPont analysis model was built by Donaldson Brown in 1918, when he was a financial executive at DuPont assigned to consider and understand the financial performance of General Motors, a car manufacturer whose acquisition by DuPont was under consideration. He found that multiplying the total asset turnover by the net profit margin yields a new ratio—that is, the return on assets (ROA). The finding that the ROA is affected by a profitability indicator (net profit margin) and an efficiency indicator (total asset turnover) led the DuPont method to become widely used in financial analysis at large corporations in the United States.

Generally, the DuPont model decomposes the profitability ratio into operational management ratios to explain and analyze a firm's ability to improve its returns. In its original version, the DuPont model analyzes the ROA as follows:

$$\begin{aligned} \text{ROA} &= \frac{\text{Netincome}}{\text{Totalassets}} = \frac{\text{Netincome}}{\text{Sale}} \times \frac{\text{Sale}}{\text{Totalassets}} \\ &= \text{Profit margin} \times \text{Asset turnover} \end{aligned} \quad (2)$$

As a result, maximizing the ROA is a common objective of companies. This original DuPont model retained an important role in financial analysis until the 1970s.

According to Gitman (2000), the widely accepted objectives of financial management changed over time. Maximizing the wealth of equity owners has become the most important goal of a company. Therefore, a more appropriate ratio on returns, that is, the ROE, replaced the ROA in the DuPont model. This led to the first adjustment in the DuPont model. Specifically, the ROE is decomposed as:

$$\text{ROE} = \frac{\text{Netincome}}{\text{Totalequity}} = \frac{\text{Netincome}}{\text{Sale}} \times \frac{\text{Sale}}{\text{Totalassets}} \times \frac{\text{Totalassets}}{\text{Totalequity}} \\ = \text{Profit margin} \times \text{Asset turnover} \times \text{Leverage} \quad (3)$$

As such, leverage is now the third concern of financial managers in addition to the profit margin and asset turnover. Thus, to improve operating efficiency, or to improve the ROE, firms have various choices in combining these three components.

Over time, other adjustments have been made in the DuPont model to achieve the most appropriate model to meet the needs of financial analysis. Typically, Nissim and Penman (2001) develop an adjusted version of the DuPont model to eliminate the effect of financial leverage and other factors that a firm's manager cannot control. In particular, they rearrange ROE algebraically and convert it into a ratio of the return on net operating assets (RNOA):

$$\text{ROE} = \text{RNOA} + [\text{FLEV} \times \text{SPREAD}] \quad (4)$$

where FLEV is financial leverage and SPREAD is the difference between the return on the firm's operations and borrowing costs.

Hawawini and Viallet (2010) introduce another adjusted DuPont model, in which the ROE is decomposed into five different components as follows:

$$\text{ROE} = \frac{\text{EAT}}{\text{Owners}'\text{equity}} = \frac{\text{EBIT}}{\text{Sales}} \times \frac{\text{Sales}}{\text{IC}} \times \frac{\text{EBT}}{\text{EBIT}} \times \frac{\text{IC}}{\text{Owners}'\text{equity}} \times \frac{\text{EAT}}{\text{EBT}} \quad (5)$$

where EAT is earnings after tax, EBT is earnings before tax, EBIT is earnings before interest and tax, and IC is invested capital.

In this formula, the ROE is affected by five components: (1) the operating profit margin (OPM; EBIT/sales); (2) the capital turnover (CT; sales/invested capital); (3) the financial cost ratio (FCR; EBT/EBIT); (4) the financial structure ratio (FSR; invested capital/equity); and (5) the tax–effect ratio (TER; EAT/EBT). Each ratio captures different effects on a firm's profitability in general and the ROE in particular. The OPM and CT reflect the influence of a firm's investing and operating decisions. The effect of a firm's financing policy is captured by the FCR and the FSR. The TER explains the effect of corporate taxation.

Many different approaches exist for valuating a stock or a company. The familiar dividend discount model (DDM), proposed by Gordon (1959), expresses the stock price as a function of the net present value of expected future dividends. Stemming from the assumption of clean-surplus accounting, the residual income valuation (RIV) describes stock prices in terms of accounting numbers in an algebraically equivalent model with DDM. This model is sometimes known as an Edwards–Bell–Ohlson (EBO) valuation equation because it originates from Edwards and Bell (1965) and Ohlson (1995). Accordingly, the stock price can be expressed as the following accounting equation:

$$P_t = B_t + \sum_{i=1}^{\infty} \frac{E_t[(ROE_{t+i} - r_e)B_{t+i-1}]}{(1 + r_e)^i} \quad (6)$$

where P_t is the current stock price, B_t is the book value at time t, E_t is expectations based on information available at time t, ROE_{t+i} is the returns on book equity for period $t + 1$, and r_e is the cost of equity capital.

The important role of the ROE in the performance of valuation models and residual income model is emphasized by Ohlson (1995). Combining this RIV approach and DuPont analysis, Soliman (2008) points out that DuPont components are used in evaluating the prospects of the firm by market participants. More specifically, he concludes that a positive relationship exists between expected stock returns and changes in asset turnover. Subsequently, Harvey, Liu, and Zhu (2016) report that changes in asset turnover are considered one of 315 signals that are predictive of expected returns. A similar research framework is employed by Chang, Chichernea, and HassabElnaby (2014) in analyzing the US health-care industry. However, these studies rely on the revised version of the DuPont model by Nissim and Penman (2001), in which RNOA is utilized and decomposed into the profit margin and asset turnover. Then, these components are added to the regression model to examine the effect on expected stock returns.

Data and Research Methodology

In the DuPont analysis, the ROE is equal to the product of the following five ratios:

$$\text{ROE} = \frac{\text{EAT}}{\text{Owners}'\text{equity}} = \frac{\text{EAT}}{\text{EBT}} \times \frac{\text{EBT}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{Sales}} \times \frac{\text{Sales}}{\text{IC}} \times \frac{\text{IC}}{\text{Owners}'\text{equity}}$$

Next, we examine the predictions of future ROE using DuPont components based on the papers mentioned above. Using a framework similar to that of Chang, Chichernea, and HassabElnaby (2014) and Soliman (2008), we replace the RNOA, together with asset turnover and profit margin, with the ROE and its related DuPont components. Thus, these first two tests are considered in following models.

Model 1:

$$\Delta ROE_{it+1} = \beta_o + \beta_1 ROE_{it} + \beta_2 \Delta Equity_{it} + \beta_3 OPM_{it} + \beta_4 CT_{it} + \beta_5 FCR_{it} + \beta_6 FSR_{it} + \beta_7 TER_{it} \quad (1)$$

Model 2:

$$\Delta ROE_{it+1} = \beta_o + \beta_1 ROE_{it} + \beta_2 \Delta Equity_{it} + \beta_3 \Delta OPM_{it} + \beta_4 \Delta CT_{it} + \beta_5 \Delta FCR_{it} + \beta_6 \Delta FSR_{it} + \beta_7 \Delta TER_{it} \quad (2)$$

Model 1 examines the explanatory power of DuPont components, while model 2 considers the predictive effects of these components' changes on the 1-year-ahead ROE.

Next, we follow Chang, Chichernea, and HassabElnaby (2014) and Soliman (2008) in employing the RIV approach to map the effect of the ROE and its components on expected stock returns. As such, expected stock returns are the dependent variable in the regression model. As reviewed above, while the level of DuPont components has no predictive value, the change in these components has explanatory power. In addition, Ohlson (1995) suggests that the ROE is an important factor in the valuation model. The change in the return indicator is also included in the regression model to check the incremental impact on expected stock returns (Chang, Chichernea, and HassabElnaby 2014; Soliman 2008). Therefore, the following two models are considered:

Model 3:

$$R_{it} = \beta_o + \beta_1 ROE_{it} + \beta_2 \Delta ROE_{it} + \beta_3 OPM_{it} + \beta_4 CT_{it} + \beta_5 FCR_{it} + \beta_6 FSR_{it} + \beta_7 TER_{it} + \beta_8 \Delta OPM_{it} + \beta_9 \Delta CT_{it} + \beta_{10} \Delta FCR_{it} + \beta_{11} \Delta FSR_{it} + \beta_{12} \Delta TER_{it} + \varepsilon_t \quad (3)$$

Model 4:

$$R_{i,t+1} = \beta_o + \beta_1 ROE_{it} + \beta_2 \Delta ROE_{it} + \beta_3 OPM_{it} + \beta_4 CT_{it} + \beta_5 FCR_{it} + \beta_6 FSR_{it} + \beta_7 TER_{it} + \beta_8 \Delta OPM_{it} + \beta_9 \Delta CT_{it} + \beta_{10} \Delta FCR_{it} + \beta_{11} \Delta FSR_{it} + \beta_{12} \Delta TER_{it} + \varepsilon_{t+1} \quad (4)$$

Model 3 attempts to examine the statistical relationship between information in the DuPont components and expected returns (Soliman 2008). The significance of the result will signify that these

Table 2. Variables definitions and measurements.

Variable	Definition	Measurement	Unit
R_{it}	Stock returns	Compounded average monthly raw return over the 12 months beginning in the first month of the fiscal year and ending at the end of the fiscal year t	Percent
$R_{i,t+1}$	Future stock returns	Compounded average monthly raw return beginning 4 months after the end of the fiscal year t and ending at the end of the fiscal year $t + 1$	Percent
ROE_{it}	Return on equity	$\frac{\text{Earningsaftertax}}{\text{Owners' equity}}$	Percent
ΔROE_{it}	Change in return on equity	$ROE_{it} - ROE_{it-1}$	Percent
OPM_{it}	Operating profit margin	$\frac{\text{Earningsbeforeinterestandtax}}{\text{Sales}}$	Percent
CT_{it}	Capital turnover	$\frac{\text{Sales}}{\text{Investedcapital}}$	Percent
FCR_{it}	Financial cost ratio	$\frac{\text{Earningsbeforetax}}{\text{Earningsbeforeinterestandtax}}$	Percent
FSR_{it}	Financial structure ratio	$\frac{\text{Investedcapital}}{\text{Owners'equity}}$	Percent
TER_{it}	Tax–effect ratio	$\frac{\text{Earningsaftertax}}{\text{Earningsbeforetax}}$	Percent
ΔOPM_{it}	Change in operating profit margin	$OPM_{it} - OPM_{it-1}$	Percent
ΔCT_{it}	Change in capital turnover	$CT_{it} - CT_{it-1}$	Percent
ΔFCR_{it}	Change in financial cost ratio	$FCR_{it} - FCR_{it-1}$	Percent
ΔFSR_{it}	Change in financial structure ratio	$FSR_{it} - FSR_{it-1}$	Percent
ΔTER_{it}	Change in tax–effect ratio	$TER_{it} - TER_{it-1}$	Percent

DuPont components demonstrate some underlying events that are revealed in the stock price in addition to playing a role in forecasting future profitability.

Model 4 is constructed to investigate whether investors fully understand the time-series properties of expected returns. This hypothesis is based on the fact that sometimes investors do not recognize the future implications of current earnings or expected returns, so a trading strategy could take advantage of this and earn some abnormal expected returns. Variable definitions and measurements are summarized in Table 2.

All the current 284 nonfinancial companies listed on the HOSE are utilized to identify the explanatory factors of expected returns on the Vietnamese market (see Table S2, available online).

Results

Table 3 provides descriptive statistics information on important variables in this study.

First, these numbers reveal that this is an unbalanced panel dataset, with a few missing observations. In general, it includes approximately 1,400 firm-year observations. Second, the variation in these variables is substantial because the standard deviation is equal to or larger than the mean value. The minimum and maximum value also indicate a wide benchmark of variables.

The correlation matrix and the variance inflating factor (VIF) results find no considerable collinearity among the independent variables (see Table S3, available online). The maximum correlation value is 0.42 between ROE_t and OPM_t, which is quite low. In addition, the VIF figures verify that multicollinearity is likely not a significant problem in this study.

Next, we consider the problems of heteroskedasticity (HET) and autocorrelation (AR). According to Gujarati and Porter (2011), in the presence of HET, the usual ordinary least squares (OLS)

Table 3. Descriptive statistics.

Variable	Obs.	Mean	Std. Dev.	Min	Max
R_t	1403	0.3050	0.8022	−0.7658	3.7255
R_{t+1}	1354	0.2776	1.0017	−0.7739	5.8678
ROE_t	1403	0.1163	0.1274	−0.3782	0.4635
ΔROE_t	1403	−0.0157	0.1126	−0.4088	0.4130
OPM_t	1403	0.1587	0.1980	−0.3427	1.0866
CT_t	1403	0.7397	0.3858	−0.5642	2.2398
FCR_t	1403	2.0495	2.3839	0.0514	15.1739
FSR_t	1403	1.4321	0.9335	0.0948	4.9838
TER_t	1402	0.8167	0.1406	0.1654	1.1518
ΔOPM_t	1403	−0.0159	0.1834	−1.0356	0.7262
ΔCT_t	1403	−0.0488	1.1463	−5.3285	5.0309
ΔFCR_t	1403	−0.0203	0.5601	−2.7055	2.6586
ΔFSR_t	1403	0.0221	0.4555	−1.5120	1.7684
ΔTER_t	1400	−0.0004	0.1758	−0.6974	0.8469

estimators are only linear unbiased estimators as the variance of the coefficients are not at a minimum. Hence, the t test and F test are not reliable and lead to the false conclusion of rejecting the null hypothesis. Similarly, AR causes the t statistics to become larger than they should be. As such, the significance of estimated coefficients might be wrongly calculated. All the four models discussed above are therefore considered.

The diagnostic tests results (see Table S4, available online) indicate the existence of HET and AR in Models 3 and 4 but only HET in Models 1 and 2. Cameron and Trivedi (2009) and Wooldridge (2012) suggest a useful method to address these problems, namely, an FGLS regression.

The predictive ability of DuPont components on future changes in the ROE is presented in Table 4. Column (a) shows the results for the level of the ROE and changes in equity. Absolute levels of the DuPont components (i.e., OPM, CT, FCR, FSR, and TER) are in column (b). Consistent with expectations in the current framework, the level of the ROE is negatively significant. However,

Table 4. Predictive power of DuPont components on future change in ROE.

	Dependent variable: ΔROE_{t+1}		
	(a)	Model 1 (b)	Model 2 (c)
ROE_t	−0.3564***	−0.4525***	−0.4435***
$\Delta Equity_t$	0.0108***	0.0027	0.0190***
OPM_t		−0.0004	
CT_t		0.0032***	
FCR_t		0.0569***	
FSR_t		0.0068***	
TER_t		0.0162*	
ΔOPM_t			−0.0158
ΔCT_t			0.0015
ΔFCR_t			0.0358***
ΔFSR_t			0.0086**
ΔTER_t			−0.0274***
Intercept	0.0354***	−0.0236***	0.0409***

Note: Coefficients followed by *, **, and *** are significant at 10%, 5%, and 1%, respectively.

changes in equity do not seem to have a consistent effect on future changes in the ROE. In terms of DuPont components, only OPM does not have explanatory power in predicting future changes in the ROE. Other variables (CT, FCR, FSR, and TER) show a significantly positive association.

Additional information (if any) on changes in these components is in column (c) of Table 4. The results suggest that ΔFCR, ΔFSR, and ΔTER are informative in predicting 1-year-ahead changes in the ROE, while ΔOPM and ΔCT are not. As such, changes in FCR, FSR, and TER contain new information for predicting future changes in profitability, measured by the ROE. In particular, changes in FCR and FSR are positively correlated with future changes in profitability. In addition, changes in the TER have some negative signals with respect to predicting profitability. In terms of the economic meaning, improvements in FCR and FSR reflect the efficiency of debt utilization, which could lead to improvement in earnings.

Table 5 provides estimation results for Models 3 and 4 using FGLS regression to investigate the effect on expected stock returns. Specifically, Model 3 determines whether the ROE and changes in it, ΔROE, are useful for explaining variations across expected stock returns; and the ROE components decomposed by DuPont analysis are incrementally useful.

Given that the RIV suggests that the ROE is strongly related to expected stock returns, the regression results in Table 5, column (a), support the theory with the positive statistical significance of the ROE coefficient. Moreover, the coefficient of ΔROE is positive and significant at 1%, which indicates that the change in the ROE is informative about expected stock returns in addition to the value of the ROE.

When ROE components decomposed from DuPont analysis are added, the ROE and ΔROE retain statistical significance. In addition, Table 5, column (b), shows that some of the level of these DuPont components has additional power in describing the expected returns, such as CT, FCR, and FSR. In particular, while the correlation between CT and expected returns is negative, the FCR and the FSR are positive. The level of OPR and TER do not contribute any additional information.

The regression model in Table 5, column (c), introduces full independent variables, which includes changes in DuPont components. The significance of the ROE, ΔROE, CT, and FCR remains. Moreover, most of the changes in DuPont components indicate the incremental explanatory power in explaining the expected returns except the change in the FSR. Specifically, the coefficients of

Table 5. Regression results.

	Model (3) Dependent variable: R_t			Model (4) Dependent variable: R_{t+1}		
	(a)	(b)	(c)	(d)	(e)	(f)
ROE_t	0.5714***	0.4184***	0.8724***	0.5261***	0.3376**	0.3045**
ΔROE_t	2.0913***	2.3439***	1.8914***	2.4781***	2.5413***	2.5762***
OPM_t		–0.0679	–0.2095***		0.0532	0.0355
CT_t		**–0.0161*** **	**–0.0143*** **		**–0.0020**	**0.0127** **
FCR_t		**0.2721*** **	**0.1200** **		**0.3822*** **	**0.3169*** **
FSR_t		0.0545***	0.0104		0.0426*	0.0253
TER_t		0.0817	–0.0958		0.0213	0.1411
ΔOPM_t			**0.8263*** **			0.2100
ΔCT_t			**–0.0502*** **			**–0.0911*** **
ΔFCR_t			**0.2698*** **			**0.1201** **
ΔFSR_t			–0.0456			0.0672
ΔTER_t			**0.3732*** **			0.1044
Intercept	0.2389***	–0.0461	0.2961***	0.1866***	–0.1682	–0.1534

Note: Coefficients followed by *, **, and *** are significant at 10%, 5%, and 1%, respectively.

ΔOPM_t, ΔFCR_t, and ΔTER_t are positively significant. They suggest a positive relationship between these changes and expected stock returns. The coefficient of ΔCT_t is negative and significant at 1%.

Overall, the results of Model 3 in Table 5 indicate that both the value and the change in DuPont components are incremental sources of explanatory power. In particular, relative to the stable effect of the ROE and changes in it, CT and the FCR seem to explain expected stock returns better than those with a negative relation to CT and positive relation to FCR do. Furthermore, four in five changes in DuPont components suggest a high correspondence with expected stock returns, except the change in FSR.

At the same time, Model 4 examines the effect of these factors on future expected returns. The same procedure is repeated as in Model 3 through three estimations in turn in columns (d), €, and (f), but the expected stock returns 1 year ahead, excluding the first 4 months, are used as the dependent variable. Because the average auditing time is about 4 months, this test could reveal the predictive power of accounting information related to future expected returns. Again, the statistical significance of ROE and ΔROE are unchanged in different estimations. This implies that the ROE and changes in it not only are able to explain the variation in expected stock returns but also have some predictive information for future expected returns. More important, investors appear to understand fully the future predictive power of the level of FCR, together with changes in CT and the FCR, because the correspondence between these variables and future abnormal expected stock returns are statistically significant.

Conclusion

More than 50 years has passed since the first capital asset-pricing model was developed by Lintner (1965) and Sharpe (1964). As soon as this CAPM was introduced, it sparked intense debates among academics, policymakers, and others as well as the construction of many theoretical models and the publication of hundreds of empirical papers. The findings from all these attempts are mixed, with both support and critique of the original model. The question of whether the single-factor CAPM is still valid for the purpose of estimating the expected ROE is still challenging for academia, policymakers, and practitioners. However, it is evident that the Sharpe–Lintner CAPM is still in use, as shown by recent theoretical and empirical evidence all around the world, especially among practitioners, firm managers, and policymakers (Brounen, De Jong, and Koedijk 2004; Graham and Harvey 2001; Sudarsanam, Kaltenbronn, and Park 2011).

Using more than 300 different factors that have been explored worldwide to explain the expected returns, this study attempts to identify the factors that can explain the expected stock returns in Vietnam. Using a combination of DuPont analysis and RIV approach, together with data from 284 nonfinancial companies listed on the HOSE, we suggest that the ROE and changes in it are informative to expected stock returns. Moreover, the levels of CT and the FCR, together with changes in capital and the FCR, have incremental explanatory powers for explaining expected returns.

Supplementary Material

Supplemental data for this article can be accessed here.

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