DIVIDEND EFFECT ON SHARE PRICE

Chapter 2 Literature review

This chapter is to discuss theories concerning dividend policies. They include the dividend growth model, different theories in explaining the relationship between dividend payment and share price, and empirical research evidence on the relationship between EPS and share price, as well as, between dividend payment and share price.

2.1. A brief overview of the below discussion

The following discussion shall try to use existing literature to discuss whether dividend payment of an equity security is positively related to share price. As to be discussed in Section 2.2, because of the dividend growth model and the proposition of capital asset pricing model (CAPM) and efficient market hypothesis (EMH), dividend payment shall be positively related to share price. Also, rapid dividend growth shall lead to higher share price than slow dividend growth.

However, the discussion does not end here. Another popular method to estimate the intrinsic value of an equity security is discount cash flow (DCF) model using either free cash flow to the firm (FCFF) or free cash flow to equity (FCFE) approach. DCF model implies that the intrinsic value is not simply dependent on dividend payment. Instead, it should be dependent on the present value of FCFF or FCFE. For those firms which do not have high dividend payout ratio or do not pay dividends, this is not only a more appropriate valuation method, but also defeats the validity of DDM. Therefore, for such equity securities, dividend payment may have weak or no relationship to share price.

Such relationship is further complicated by theories of behavioral finance. For example, the signaling effect posits corporate managers may tend to pay smooth and consistent dividend because it signals a better earning prospect. Besides, some investors, because of lower level of self-control, prospect theory and avoidance of regret, prefer stock that pays dividends for passive income. However, some investors do not prefer dividends because it reduces internal resources available for reinvestment in profitable opportunities and dampen the share price. Besides, in countries such as China and USA, dividend payments are taxed which leads to less preference from investors to receive dividends. Therefore, there are both sides of arguments that support or against dividend payments. Ultimately, the direction and

strength of relationship between dividend payment and share price are not that straightforward. This motivates the researcher to conduct this empirical study in Hong Kong to address this relationship.

2.2. Dividend growth model (point to a relationship between dividend payment and share price)

Dividend growth model (DDM) is one of the income approaches in valuing equity securities. No matter it is a single stage or multi-stage model, it relies on the following formula in calculating the equity securities' intrinsic value (Bodie, Kane & Marcus, 2019):

$$V_0 = \frac{D_0(1+g)}{1+k} + \frac{D_0(1+g)^2}{(1+k)^2} + \frac{D_0(1+g)^3}{(1+k)^3} + \frac{D_0(1+g)^4}{(1+k)^4} + \cdots$$

Where: D_0 is the dividend payment at year 0,

$D_0(1+g)$ is the first-year dividend payment,

g is the constant growth rate of dividend,

k is the discount rate, typically the return rate predicted by the capital asset pricing model (CAPM).

Formula 1 Constant growth DDM

The above formula is also called constant-growth DDM. As an explanation of the formula, it assumes that the intrinsic value of an equity security is first-year dividend payment divided by (1+k), adding the second-year dividend payment divided by $(1+k)^2$, then adding the third-year dividend payment divided by $(1+k)^3$,etcetera. Without adding the number of years for the present value of dividend payment to perpetuity, this constant-growth DDM can be simplified as (Bodie, Kane & Marcus, 2019):

$$V_0 = \frac{D_0(1+g)}{1+k} = \frac{D_1}{k-g}$$

Where: D_1 is the first-year dividend payment.

Formula 2 Constant dividend growth model in perpetuity

The constant dividend growth payment implies that increase in dividend payment leads to increase in estimated intrinsic value of equity securities.

In normal time without irrational exuberance in the equity market, the estimated intrinsic value of equity securities shall approximate to the share price (Shiller, 2015).

This proposition is supported by two major finance theories. They are the capital asset pricing model (CAPM) (Sharpe, 1964) and the efficient market hypothesis (EMH) (Fama, 1970).

CAPM posits that the expected return of a security shall fit into the following formula:

$$R_i = r_f + \beta(r_m - r_f)$$

Where r_f is the risk-free return rate,
r_m the market return rate, and
β is beta which represents the volatility of market.

Formula 3 CAPM formula

The R_i shall conform with the return rate predicted by CAPM over time with little deviation. As mentioned in Formula 1, k should normally be the rate of CAPM. Therefore, the intrinsic value predicted by Formula 1 and Formula 2 shall be the value that conform with the return rate predicted by CAPM. Therefore, the intrinsic value of an equity security shall approximate to the share price over time.

Besides, EMH states that, in semi-strong form market efficiency and strong form market efficiency, all available historical and public information shall be reflected in the stock price rapidly in an unbiased estimate of underlying value (Fama, 1970). Therefore, under EMH, information about dividend payment in time 0 and the estimated growth rate shall be reflected efficiently in the share price. The estimated intrinsic value of equity securities shall approximate to the share price.

Therefore, the discussion DDM, CAPM and EMH implies the following:

- Dividend payment is positively related to the estimated intrinsic value of an equity security,
- The higher the growth of dividend payment, the greater the growth of the estimated intrinsic value of an equity security as implied by Formula 1 and Formula 2, and
- The estimated intrinsic value of an equity security is approximate to the share price because of CAPM and EMH.

2.3. DCF model---FCFE and FCFF (challenge the relationship)

The DCF model----FCFE and FCFF literally means the present value of free cash flow to equity and to the firm. As the formula implies, it measures the intrinsic value of an equity security through the estimation of the sum of free cash flow to

equity or the firm of each year in the future years of operations and discounted them back to the present value (Bodie, Kane & Marcus, 2019). The formula of FCFF and FCFE are as follows:

$$FCFF = EBIT(1 - t_c) + Depreciation - Capital\ expenditure - Increase\ in\ net\ working\ capital$$

Where:

EBIT=earnings before interest and taxes,

t_c=the corporate tax rate

Formula 4 FCFF formula

$$FCFE = FCFF - Interest\ expense\ x(1 - t_c) + Increase\ in\ net\ debt$$

Formula 5 FCFE formula

Thus, Intrinsic value of equity= $\sum_{t=1}^{T} \frac{FCFE_t}{(1+k_E)^t} + \frac{E_T}{(1+k_E)^T}$ $where\ E_T = \frac{FCFE_{T+1}}{k_E - g}$

Where:

k_E=Cost of equity

g=growth rate

Formula 6 Intrinsic value of equity formula

As shown in Formula 4, 5 and 6, intrinsic value of equity securities is the sum of FCFE over the years of operations divided by $1+k_E$ in each year of operation. E_T represents the terminal value of FCFE after the year of forecast, say five years. Besides, FCFE is a value which is depended on the FCFF and the subtraction of after-tax interest expenses and adding and increase in net debt (Bodie, Kane & Marcus, 2019).

In the DCF model of FCFE, the estimated intrinsic value of equity securities is depended on the free cash flow to the equity but not the dividend payments. This is especially suitable to apply in firms that plowback most of their free cash flow generated for future reinvestment with little dividend payment and those that plowback all their free cash flows generated for future reinvestment. Empirically, this is the practice of many companies which are in the stage of investment for future profitability and fast-growing firms such as software companies and internet services companies (Ross, Westerfield & Jaffe, 2013). In the dissertation, fast-growing industries such as health care and information technology industries are also included in the 100 firms' samples in this study. They normally do not pay dividends

management (the agent). Because of such information asymmetry, company's management makes use of regular and consistent dividend payments to signal that the company is operating well with good prospects. The share price of the underlying equity securities shall increase and benefit company's management executives in terms of more share-based remunerations (Bhattacharya, 2007; Miller & Rock, 1985; Hartmann-Wendels, 1987; Smith, 2009; Ross, Westerfield & Jaffe, 2013). Therefore, company's management executives are incentivized to use dividend payments as a tool to anchor or increase share price to "alleviate" the problem of information asymmetry.

As for conflict of interests, company's management (the agent) may only be interested in obtaining more remuneration instead of maximizing the shareholders' interests as the principal does. Similarly, the company management's executives shall spend companies' financial resources to pay dividends to support share price for more share-based remuneration for their own benefits. This is especially the case for companies with slower growth and less attractive investment projects (Hartmann-Wendels, 1987). Both reasons for principal-agency problem leads to the signaling effect of dividend payments (Miller & Rock, 1985; Hartmann-Wendels, 1987; Ross, Westerfield & Jaffe, 2013).

2.4.1.2. Empirical perspectives

There are many empirical evidences showing that signaling theory of dividend payments reflect the reality (Deeptee & Roshan, 2009). First, Asquith & Mullins (1983) analyzed 168 companies that either pay their first dividend in their corporate history or re-initiate dividend payments after a 10-year stop of dividend payments. They found that excess return of the underlying equity securities is positively related to the size of the initial dividend payment. Besides, subsequent increase in dividend payment may produce a greater positive impact on shareholders' wealth than initial payments (Asquith & Mullins, 1983). Second, Asquith & Mullins (1986) found that, on average, 1% increase in dividend yield of initial dividend leads to 1.45% increase in average initial return. Besides, subsequent 1% increases in dividend yield increase lead to 2.94% increase in average subsequent return to shareholders. This signifies that subsequent increase in dividend yield offers more return to shareholders than initial dividends. Therefore, dividend payment, no matter it is initial dividend or subsequent increase in dividends, offers additional return to investors in a proportion

of 1.45 and 2.94 depending on situations (Asquith & Mullins, 1986). This provides support for the signaling theory of dividend payment because initial dividend payment and subsequent increase in dividend payment signals better prospects of companies.

Furthermore, Michaely, Wornack & Thaler (1994) found that short run share price reactions to omission of dividend payment are greater than initiation of dividend payments (-7.0% vs +3.4% for three-day return). Besides, within 12 months after the announcement, there is a significant positive market-adjusted return for firms initiating dividends of +7.5% and a significant negative market-adjusted return for firms omitting dividend of -11.0% (Michaely, Wornack & Thaler, 1994). This evidence also shows that the market tends to react well and badly towards dividend initiation and omission, respectively. The omission of dividends tends to signal greater bad prospect than the initiation of dividend payments. This provides support for both positive and negative perspectives for dividend signaling theory of dividend payments. For newer empirical evidence, Hussainey et al (2011), based on the example of UK, suggested that dividend yield is positively related to share price changes. Karpavicius (2014) showed that permanent or even gradual increase in dividends, keeping the amount of dividend payments the same, lead to higher share prices. Therefore, evidence from early years and later years all support the signalling theory of dividend payments.

In another type of empirical evidence, Baker & Powell (1999), Baker et al (2011) and Brav et al (2005) consistently suggested that corporate managers view dividends should be consistent and permanent instead of reflecting temporary decrease or increase in profits. In other words, dividend payments should not be interrupted, and any increment should be in response to long-term increase in profits. Bulan & Hull (2013) found that temporary reduction in dividend payments is often rejected by corporate managers unless they are forced by creditors. This supports the fact that corporate managers as agents consider dividend signaling theory in making dividend payout decisions. They offer further support for the theory from the perspective directly from corporate managers.

2.4.1.3. Conclusion for this section

This section explains that signaling theory of dividend payments is well-documented and supported in both theoretical perspective and empirical

perspective. This provides support for the positively relationship between dividend payments and share price. The next section shall describe how bounded rationality leads to the positive relationship dividend payment and share price.

2.4.2. Investors' preference for dividend payments

Because of some cognitive bias and heuristics, investors prefer dividend payments more than stock selling to maintain daily expenses. There are three cognitive bias and heuristics contributing to this behavior. They are the need for immediate gratification (Thaler & Shefrin, 1981), prospect theory (Kahneman & Tversky, 1979), and avoidance of regret (Kahneman & Tversky, 1982). The way that these three cognitive biases and heuristics were discussed in Shefrin & Statman (1984).

In traditional investment theory, investors are assumed to be rational and make no preferences between dividends and capital. Both are treated the same as money. Therefore, in a context with no taxes and transaction costs, there is no differences between holding equity securities for dividend payments or for regular selling to maintain regular passive income for living (Shefrin & Statman, 1984). However, in the real world, the three cognitive biases and heuristics cause investors to prefer dividend payments than selling stocks regularly to maintain regular passive income. Therefore, it also explains why missing of dividend payments is detrimental to share price performance while initial dividend payments are beneficial to share price performance (Shefrin & Statman, 1984).

First, for the need for immediate gratification, it is assumed that a certain number of investors do not have the self-control enough to sell shares for their passive income regularly for their living. Interferences for such actions are mainly the psychological mood swings due to share price rising and dropping. Therefore, investors prefer something more "tangible" as dividend payments for immediate and regular gratifications (Shefrin & Statman, 1984).

Second, for prospect theory, Kahneman & Tversky (1979) and Shefrin & Statman (1984) asserts that when one stock purchase is expected to provide a $2 dividend while another stock purchase is expected to provide $10 capital gains. Investors will buy the stock separately to enjoy two "instances" of gains. In another example, while a capital of $16 will be incurred, $2 dividend will also be earned. Investors shall separately buy stocks in two "instances" to enjoy the "silver lining" of

of .715 to .977 (p<.01). The SPSS software automatically excluded the result of the relationship between EPS and ASP from the analysis, meaning that earning per share (EPS) does not fit the model and is not statistically significant in the stepwise regression model.

From all model 2 for each year from 2015 to 2019 in Table 2. Only the model 2 in 2016 and 2017 fit the stepwise regression model. Neither of 2015, 2018, and 2019 model fits the model. From Table 2, the adjusted R^2 of model 1 ranges from .492 to .953, meaning a moderate to high explanatory power of dividend to share price.

From the result, only H1b is satisfied.

4.1.2. Stepwise multiple regression for 52 property and construction companies from 2015 to 2019

This analysis shall verify the second hypothesis which is:

H2: There is a positive relationship among EPS and DPS with ASP among property and construction companies for each year from 2015 to 2019.

H2a: There is a positive relationship between EPS and ASP among property and construction companies for each year from 2015 to 2019.

H2b: There is a positive relationship between DPS and ASP among property and construction companies for each year from 2015 to 2019.

Table 3 Stepwise analysis results for 52 property and construction stocks from 2015 to 2019

	2015 (β)	2016 (β)	2017(β)	2018 (β)	2019 (β)
Model 1					
-EPS	.928***	NF	NF	.977***	NF
-Dividend	NF	.918***	.949***	NF	.958***
Model 2					
-EPS	NF	.457*	NF	NF	NF
-Dividend	NF	.481**	NF	NF	NF
Adjusted R^2					
-Model 1	.858	.839	.899	.953	.916
-Model 2	N/A	.855	N/A	N/A	N/A

All five models are significant.
*Sig.<.05
**Sig<.01
***Sig<.001
NF: Not fit N/A: Not applicable Source: this study

From all model 1 for each year from 2015 to 2019 in Table 3, DPS is positively related to ASP significantly at a range of .918 to .958 (p<.01) in 2016, 2017 and 2019. For 2015 and 2018, EPS is positively related to ASP at a range of .928 to .977

technology companies for each year from 2015 to 2019.

Table 6 Stepwise analysis results for 19 technology stocks from 2015 to 2019

	2015 (β)	2016 (β)	2017(β)	2018 (β)	2019 (β)
Model 1					
-EPS	.861**	.865***	.930***	.910***	.933***
-Dividend	NF	NF	. NF	NF	NF
Model 2					
-EPS	1.440***	.1.247***	1.085***	1.096***	1.158***
-Dividend	-.667**	-.491**	-.256*	-.319**	-.354***
Adjusted R^2					
-Model 1	.726	.734	.857	.818	.862
-Model 2	.832	.824	.894	.883	.937

All five models are significant.
*Sig.<.05
**Sig<.01
***Sig<.001
NF: Not fit N/A: Not applicable Source: this study

From all model 1 for each year from 2015 to 2019 in Table 6, EPS is positively related to ASP significantly at a range of .861 to .933 (p<.01) in all five years. None of the years have DPS with significant relationship with ASP.

From all model 2 for each year from 2015 to 2019 in Table 6, all models in these five years fit the stepwise regression model significantly. In all five years, EPS is stronger than DPS in predicting ASP in model 2.

From Table 6, the adjusted R^2 of model 1 ranges from .726 to .862, meaning a high level of explanatory power. The adjusted R^2 of model 2 ranges from .824 to .937, meaning a high level of explanatory power.

From the result, only H5a are satisfied for all five years because only EPS is significantly positively related to ASP in model 2 while DPS is significantly negatively related to ASP in model 2.

4.2. Analysis of results and findings

This section is divided into analyses of results of stepwise regression analysis for each type of stocks and end with a summary of findings.

4.2.1. Analysis for financial stocks

The results of stepwise regression analysis as shown in section 4.1.1 shows that only H1b is satisfied, meaning that only DPS is significantly positively related to ASP. A possible explanation is that financial stocks in the sample are dominated by

model because the dividend ratio averages only 2.81% to 5.12% over the period, not a particularly stable dividend rate.

4.2.4. Analysis for consumer discretionary, consumer staples, and healthcare stocks

From Section 4.1.4, both H4a and H4b are satisfied for all five years because both EPS and DPS are significantly positively related to ASP. This class of stocks is characterized by a high growth of profitability, moderate amount of dividend payment with constant growth.

With a connection to literature review chapter, these class of stocks support both the relationship among EPS and dividend, as well as ASP in general. Therefore, this class of stock supports the investors' preference for dividend payments discussed in Section 2.4 while also supporting that share price is mainly determined by DCF model discussed in 2.3. However, it does not always satisfy the dividend growth model because the dividend ratio averages only 2.31% to 3.42% over the period, not a particularly high dividend rate.

4.2.5. Analysis for technology stocks

From Section 4.1.5, only H5a are satisfied for all five years from 2015 to 2019, meaning that only EPS is significantly positively related to ASP in both model 1 and model 2 while dividend is negatively related to ASP to ASP in model 2.

This can be explained by the nature of technology stock. In recent years, technology stocks such as Tencent (0700.HK), BYD electronic (0285.HK) and Sunevision (1686.HK) are fast growing companies and stocks. These stocks tend to pay low amount dividend payment to plow back most of the funds for reinvestment. Reinvestments in research and development and high-technology plants and equipment are important to their growth in stock price than dividend payment. Therefore, investors generally expect them to utilize their profit well for reinvestment for further growth opportunity. They thus do not have high expectation on their dividend payments. This explains the reason for a positive relationship between EPS and share price.

The negative relationship between dividend payment and ASP can be explained by a lack of preferences for investor for them to pay dividends which reduces their funds for growth opportunities.

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