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ON THE IMPACT OF DIVIDEND PAYMENTS ON STOCK PRICES – AN EMPIRICAL ANALYSIS OF THE GERMAN STOCK MARKET

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Abstract:

This paper examines the relation between dividend payments and stock prices of all firms in the German prime standard DAX 30 in the time period from 2012 to 2019. The irrelevance theory introduced by Miller and Modigliani states that dividend payments must not have an impact on stock prices in a perfect market. In contrast, the signaling theory and the dividend puzzle indicate that dividend payments are likely to have a profound impact on the stock price. According to our findings the ex-dividend decrease of stock prices was significantly smaller than the dividend payment. Nevertheless, the results support the impact of the dividend payment on the share price. Firstly, the existence of the ex-dividend markdown is a proof that dividend payments cause share price losses. Secondly, the study explains in particular that high dividend payments result in high share prices over the examined period. Thirdly, our analysis demonstrates a positive correlation between the dividend and the stock price development according to the signaling theory. Considering the above-mentioned results, we can conclude that the share price of a company is highly affected by the decision making of the company regarding the dividend policy.

Key words: Payout Policy, Dividend Payments, Stock Price, Market Efficiency

1. Introduction

Miller & Modigliani (1961) analyze the connection between the dividend payment policy and the company value. The focal point of interest was the optimal dividend payment policy in order to maximize the company value. Thereby, the perfect market conditions were assumed to be based on rational behavior of investors and certain payment flows. The authors elaborate that the dividend payment policy cannot have an impact on the company value. In consequence, the dividend payment results in cash outflow of the company and, therefore, in a reduced stock price due to the decreased company value. Thus, companies cannot pursue an optimal dividend payment policy.

Within the Dividend Irrelevance Theory, Gordon (1959) reveals that future dividend payments and their growth are primarily achieved by retaining profits. As a result, the discount factor for future cash outflows increases and consequently demonstrates the uncertainty of future cash outflows. Gordon argues in his work entitled 'The Bird in the Hand Theory' that investors favor certain dividend payments over uncertain future dividend payments. Kahnemann & Tversky (1979) find comparable results in their 'Prospect Theory' stating that the sum of uncertain events is significantly less weighted compared to the sum of certain events. Divergent to the 'Irrelevance Theory' investors should highly favor dividend payments above stock price gains provoked by retained profits.

However, Miller & Modigliani dispute that the risk rises over time, whereas the discount factor remains constant over the period. Bhattacharya (1979) rejects Gordon's explanations as well and questions the superiority of dividend payments over stock price gains. Assuming that the investor reinvests the dividend payment at the same risk instead of consuming it, Easterbrook (1984) dismisses the 'The Bird in the Hand Theory'.

The 'Dividend Puzzle' develops further explanations of the 'Irrelevance Theory' under behavioral-economical and financial-psychological aspects. The term 'Dividend Puzzle' already references to the paradox situation in which practice investors rank dividend payment higher than no payment. Resulting from this paradox, higher dividend payments reward companies with higher stock prices. However, with the help of logical derivation, an investor should be indifferent towards the payment of a dividend and the accumulation of capital in the company (Nguyen & Schüßler, 2013 and Black, 1996).

The research by Woolridge (1983) explores the relation between stock dividends and stock prices. Under the assumption that the stock price drops on the day following the stock dividend declaration by the theoretical ex-dividend markdown, the actual and theoretical ex-dividend markdown is comparable. Therefore, Woolridge examined all companies both listed at the New York Stock Exchange in 1964 and having paid a stock dividend. It was ascertained that the actual stock prices were significantly higher than the hypothetically calculated prices, demonstrating a lower actual ex-dividend markdown.

Another study by Majanga (2015) investigated how the stock price and various variables, especially the dividend payment in the Malawian stock market, related to each other. His research focused on thirteen Malawian companies with data from the official financial statements. As a result of his investigation, Majanga cites a strong correlation between the stock price and the dividend payment. He concludes his work by recommending an increase in the dividend payment in order to increase the market price of a company, caused by a constant growth in stock demand.

Hayashi & Jagannathan (1990) studied the Japanese stock market in terms of the stock price fluctuation on the ex-dividend date. Therefore, a total of 7,106 companies all listed at the Tokyo Stock Exchange have been observed between 1983 and 1987. The results of the study proved that the stock price dropped on average at the amount of the dividend payments. The presented study by Hayashi & Jagannathan will be used as a comparison for the present examination and will be referred to at a later time.

2. Hypothesis

Built on the presented theoretical and practical findings, the following alternative hypotheses are formulated:

H1: *There is interdependence between the dividend payment and the ex-dividend markdown.*

H1a: *There is interdependence between the dividend payment and the ex-dividend markdown on the ex-dividend date. The stock price of a company decreases by the amount of the dividend payment on the ex-dividend date.*

H1b: *There is interdependence between the dividend payment and the ex-dividend markdown on the ex-dividend date. The stock price of a company decreases by the amount of the dividend payment on the dividend-payment date.*

Motivated by the research of Miller & Modigliani (1961), this study analyzes the ex-dividend markdown caused by the declaration of the dividend payment at the annual general meeting. Given the previous evidence, it seems warranted to review if an investor is on equal terms regardless of the dividend payment policy of the respective company. This examination is of particular interest for investors, companies and also to monitor the fundamental market mechanisms. For private and institutional investors, it is of particular interest to maximize the yield, wherefore we expect this study to have an impact on the portfolio structure depending on the relevance or irrelevance of the dividend payment policy. These circumstances impact DAX companies to adapt their dividend payment policy.

H2: *There is interdependence between the level of the stock price and the amount of the dividend payment. Companies with higher stock prices have higher dividend payments compared to companies with lower stock prices.*

Besides the ex-dividend markdown dividends and stock prices show additional relations. As Majanga (2015) determines for the Malawian market, companies with higher stock prices have also higher dividend payments. Hence, we assume that the dividend payment policy is not entirely irrelevant to the development of the stock price. The dependency of the variables in the examination of Majanga is unclear. This study aims to provide a clear answer to that matter.

H3: *There is interdependence between the stock price gain of the following fiscal year and the dividend payment. The stock price gain is higher in case of a higher dividend payment compared to a lower dividend payment.*

In order to understand the downstream effects of dividend payments on the following fiscal year, it is beneficial to analyze this hypothesis. Especially concerning the signaling effects of dividend payments, positive stock price developments caused by increased dividend payments function as a positive market signal. Referring to the fundamental principles of supply and demand, positive market prospects regarding the economic development of companies enhance the demand for stocks and therefore lead to increasing stock prices over the boundaries of a fiscal year.

3. Methodology

This study will examine the German prime standard, DAX 30. To guarantee a substantial evaluation, the sample includes all DAX 30 companies that have been listed as of September, 30th 2019 and that have a data history of at least two years. The monitoring period covers seven years between 2012 and 2019, whereas, for the dividend payments, the fiscal years 2011 until 2018 are observed as the dividend payment is agreed on at the year-end reporting. The relevant data is received from various primary sources. The historical stock price development is extracted from the online presence of the Frankfurt Stock Exchange, the largest German stock exchange. Moreover, the company-specific dates for the general meeting, the ex-dividend date, and the dividend payment date are given. To statistically evaluate the alternate hypothesis, different figures will be generated in addition to the simple collection of data.

Focusing on the alternative hypothesis H1, on the one hand, the dividend payment (DIV) and, on the other hand, the ex-dividend markdown (DM) for the ex-dividend date (DMED) and the payment date (DMPD) are considered. The dividend payments can be used nominally, whereas the ex-dividend markdown figures will be calculated as price spread between the closing price of the declaration date (DD) and the opening price of the ex-dividend date (1) respectively the dividend payment date (2).

$$DM_{ED} = \text{opening price}_{ED} - \text{closing price}_{DD} \quad (1)$$

$$DM_{PD} = \text{closing price}_{PD} - \text{closing price}_{DD} \quad (2)$$

Regarding the alternative hypothesis H2 the figures dividend payment and stock price (SP) are required. As mentioned above, the dividend payment can be used nominally, whereas the stock price is defined as the closing price of the declaration date, which also can be used nominally.

For the examination of the alternative hypothesis H3 we oppose the dividend development (DIVD) as percentage development towards the prior year (3) and the overall development of the stock price (SPDV) as percentage development (4).

$$DIVD_t = \frac{\text{dividend payout}_t}{\text{dividend payout}_{t-1}} \quad (3)$$

$$SPDV_t = \frac{SP_t}{SP_{t-1}} \quad (4)$$

The collected data will be evaluated both graphically and arithmetically with the statistics program SPSS and Excel. To provide a reliable analysis it is necessary to test the normal distribution of the variables. This will be realized in SPSS by executing the Kolmogorov-Smirnov-Test (K-S-Test).

The context hypothesis will be tested by interference statistical analysis, which will be conducted with the correlation coefficient, according to Pearson. On top of the normal distribution, the Pearson ratio requires linearity as well as interval scaling as preconditions. The interval scaling may be presumed to be true, whereas the normal distribution and linearity have to be evaluated. Unless both requirements are fulfilled, a non-parametric test

must be pursued instead of the Pearson ratio. The statistical significance will be tested by a one-sample t-test.

4. Empirical Evaluation

4.1 Descriptive Evaluation

Within the scope of the descriptive evaluation, the beforehand defined variables dividend payment, dividend payment development, stock price development, ex-dividend markdown, and the stock price will be described regarding their mean (M), minimum, maximum, and standard deviation (SD). In addition to the description of the total sample, subsamples of five companies will be analyzed. Therefore, the companies Allianz, BASF, Deutsche Post, Beiersdorf, and Siemens were selected.

4.1.1 Total Sample

The figures of location and dispersion measures for the total sample are shown in table 1 on which will be referred to in this chapter. The number of valid datasets within the variable is represented by (N). Most of the variables include a total of 226 datasets, considering the missing 14 datasets result from shorter listing periods in DAX 30 compared to the observation period. It should be noted, that the company Linde AG will be excluded from this paper due to missing data explained by a merger. The variables DIVD and SPDV both cover 197 datasets, since the development of the variables can not be calculated in the first year of observation due to the missing numerator for the calculation. These variables will be described below in *Table 1*.

Table 1: Location and dispersion measures (total sample)

Variable	(N)	Location and dispersion measures			
		Minimum	Maximum	(M)	(SD)
DIV	226	.00	9.25	1.84	1.92
DIVD	197	-1.00	17.18	.148	1.24
SPDV	197	-.49	1.45	.11	.27
DM _{ED}	226	-9.03	3.55	-1.33	1.88
DM _{PD}	226	-12.52	3	-1.71	2.65
SP	226	6.49	250.80	74.72	53.53

4.1.2 Dividend Payment

The variable DIV takes 226 datasets varying between a minimum of .00 and a maximum of 9.25 into account. The mean amounts to $M = 1.84$, whereas the standard deviation is $SD = 1.92$. Considering the above mentioned companies in particular, it is obvious that all of the companies have paid a dividend throughout the observation period. *Table 2* shows the location and dispersion measures for the variable DIV.

Table 2: Location and dispersion measures (subsample)

DIV	(N)	Location and dispersion measures			
		Minimum	Maximum	(M)	(SD)
BASF	9	2.50	3.20	2.85	.24
Deutsche Post	9	.70	1.15	.91	.19
Beiersdorf	9	.70	.70	.70	.00
Siemens	9	3.00	3.80	3.36	.33
Allianz	9	4.50	9.00	6.63	1.68

For BASF we find a minimum of 2.50 and a maximum of 3.20, whereas the mean is 2.85. *Figure 1* indicates a constant growth in dividend payment for BASF. Deutsche Post shows overall growth in dividend payment with a minimum of .70 and a maximum of 1.15 even though the dividend payment stagnates in 2012, 2015, and 2018. The mean amounts to $M = .91$. For Beiersdorf the minimum, maximum, and mean stay steady at .70 caused by a constant dividend payment policy. As well as Deutsche Post and BASF, Siemens records overall dividend payment growth with a minimum of 3.00 and a maximum of 3.80, which leads to a mean of 3.36.

Allianz outranks the other companies showing a minimum of 4.50 and a maximum of 9.00, which indicates substantial growth. The mean equals $M = 6.63$, exceeding all the maximum values of the considered companies.

Figure 1: Dividend payment series

4.1.3 Dividend Development

As mentioned, the dividend development includes 197 datasets, which spread between a minimum of -1.00 and a maximum of 18.18. With a mean of $M = .15$ it can be reported that the average development of dividend payments is rather small, and the maximum value can be seen as an outlier. Precisely analyzing this outlier shows that this value derives from Volkswagen, which paid a dividend of .11 in 2015 and raised the

dividend payment to 2.00 in 2016. The standard deviation of the total sample amounts to SD = 1.24. For the subsample, the location and dispersion measures regarding the variable DIVD can be seen in *Table 3*.

Table 3: Location and dispersion measures dividend payment development (subsample)

DIVD	(N)	Location and dispersion measures			
		Minimum	Maximum	(M)	(SD)
BASF	8	.03	.04	.04	.01
Deutsche Post	8	.00	.24	.08	.09
Beiersdorf	8	.00	.00	.00	.00
Siemens	8	.00	.10	.03	.04
Allianz	8	.00	.29	.11	.10

With a minimum of .03 and a maximum of .04 combined with a mean of .04, BASF shows a steady increase in dividend payments. As already referred to before and in contrast to BASF, Deutsche Post was not able to increase the dividend payment annually. This is shown by a minimum of .00 and a maximum of .24, whereas the mean of $M = .08$ states an overall gain. The company Beiersdorf remains with a constant dividend payment policy, consequently all measures amount to .00. Siemens increases the dividend payment on average by $M = 0.30$ with a minimum of .00 and a maximum of .1. Similar to the previous companies, Allianz reports a minimum of .00, whereas the maximum of .29 again represents the highest percentage increase. Accordingly the mean amounts to $M = .11$.

4.1.4 Stock Price Development

The variable stock price development, likewise the dividend payment development, includes 197 datasets. A minimum of -.49 and a maximum of 1.45 reveal a mean of $M = .11$, showing a positive stock price development. Amounting to SD = .27 the standard deviation remains relatively small. Comparing the mean of the stock price development to the mean of the dividend payment development, amounting to .11 and .15, a comparable tendency can be noticed. Further information on the subsample is shown below in *Table 4*.

Table 4: Location and dispersion measures of stock price development (subsample)

SPDV	(N)	Location and dispersion measures			
		Minimum	Maximum	(M)	(SD)
BASF	8	-.19	.24	.03	.17
Deutsche Post	8	-.23	.39	.12	.23
Beiersdorf	8	-.02	.35	.09	.13
Siemens	8	-.17	.36	.05	.18
Allianz	8	-.09	.38	.15	.16

With a minimum of $-.19$ and a maximum of $.24$ the stock price of BASF evens out around the mean of $M = .03$. Deutsche Post records a minimum of $-.23$, a maximum of $.39$, and the resulting mean of $M = .13$. Beiersdorf shows the highest minimum of $-.02$ and a maximum of $.35$. On average, the stock price develops by $M = .09$ every year. The minimum and maximum of Siemens amount to $-.17$ and $.36$, displaying an overall development of $M = .05$. Allianz minimum of $-.09$ combined with the maximum of $.38$, lead to the strongest yearly development of $M = .15$.

On a more detailed level of the presented companies, the comparison of stock price and dividend payment development provides further insights. It is noteworthy that the stock prices partly show negative developments; however, the dividend payment either remains constant or most likely increases. Regarding the maximum figures, the stock price development reports significantly higher figures compared to relatively small figures for the dividend payment development. In contrast to the total sample, the subsample, with the exception of BASF, shows higher stock price developments compared to the dividend payment development.

4.1.5 Ex-dividend markdown - ex-dividend date

The ex-dividend markdown at the ex-dividend date includes 226 datasets. The variable amounts to -9.03 , whereas the maximum of 3.55 shows that even stock price gains come along with dividend payments. On average, the ex-dividend markdown is $M = -1.33$ accompanied with a standard deviation of $SD = 1.88$. *Table 5* represents the measures for the subsample.

Table 5: Location and dispersion measures of ex-dividend markdown at the ex-dividend date (subsample)

DM(ED)	(N)	Location and dispersion measures			
		Minimum	Maximum	(M)	(SD)
BASF	9	-4.37	-2.30	-2.88	.69
Deutsche Post	9	-1.20	-.69	-.89	.18
Beiersdorf	9	-1.42	.19	-.79	.47
Siemens	9	-2.25	3.45	-.170	1.71
Allianz	9	-7.76	.75	-1.74	3.37

The company BASF shows a minimum of -4.37 and a maximum of -2.30 , which indicates an ex-dividend markdown for every year of the observation period. The mean of $M = 2.88$ is the highest in the subsample. Deutsche Post aswell records an ex-dividend markdown for every year, expressed by a minimum of -1.20 and a maximum of $-.69$. Overall the stock price drops by $M = -.79$. Beiersdorf exhibit a minimum of -1.42 and a maximum of $.19$. Hence, the stock price reacts in atleast one period with a positive development, the mean of $M = -.79$ indicates an outlier. A minimum of -2.25 and a maximum of 3.45 for Siemens lead to a mean of $M = -.17$. This indicates that Siemens

stock price responds little to dividend payments. Allianz shows a minimum of -7.76, a maximum of .75, and a mean of $M = -1.74$.

4.1.6 Ex-Dividend Markdown

According to the previous chapter, the variable ex-dividend markdown at the pay date assembles of 226 datasets. An overall minimum of -12.52 and a maximum of 3.00 imply that the ex-dividend markdown at the pay date is larger compared to the ex-dividend date. That is also reflected in the fact that the mean amounts to $M = -1.71$. The figures for the subsample of the variable $DM(PD)$ are listed in *Table 6*.

Table 6: Location and dispersion measures of ex-dividend markdown at the dividend pay date (subsample)

DM(PD)	(N)	Location and dispersion measures			
		Minimum	Maximum	(M)	(SD)
BASF	9	-5.77	-.36	-2.87	2.17
Deutsche Post	9	-1.90	-.11	-1.03	.54
Beiersdorf	9	-1.28	1.58	.41	1.07
Siemens	9	-9.12	1.38	-4.15	3.75
Allianz	9	-10.43	2.11	-3.80	4.16

As stated previously, a minimum of -5.77 and a maximum of -.36 show overall negative values for BASF. However, the mean $M = -2.87$ matches the figure for the ex-dividend date. Deutsche Post registers a minimum of -1.90, a maximum of -.11 and, therefore, a mean of $M = -1.03$. The only company with a positive mean exceeding to $M = .41$ is Beiersdorf, so that the maximum of 1.58 outweighs the minimum of -1.28. In comparison to the variable $DM(ED)$ Siemens listed a rather high minimum of -9.12, whereas the maximum is at 1.38. The mean amounts to $M = -4.15$. Both the smallest minimum -10.43 and the highest maximum 2.11, are registered for Allianz. The mean is $M = -3.80$.

Besides BASF and Beiersdorf, the ex-dividend markdown at the pay date is substantially higher compared to the ex-dividend date. However, for BASF the difference between both figures is so small, which leads to the neglect of it. Analogous to the total sample, it can be said that the ex-dividend markdown is significantly higher at the dividend payment date.

4.1.7 Stock price

The variable stock price consists of 226 datasets, which extend from a minimum of 6.49 to a maximum of 250.80. In the observation period, the mean for all DAX 30 companies is at $M = 74.72$. As expected, the standard derivation is relatively high, amounting to $SD = 53.53$. *Table 7* shows the subsample for the variable SP.

BASF's stock price at the general meeting amounts to a minimum of 65.10 and a maximum of 89.70. The mean is found at $M = 75.48$. The rather low standard deviation of $SD = 9.46$ indicates relatively stable stock prices and, therefore, smaller volatility.

Deutsche Post shows a minimum of 47.57, a maximum of 112.96, and a mean of $M = 75.48$. The standard deviation is relatively high $SD = 23.31$. The stock price of Beiersdorf fluctuates between a minimum of 51.70 and a maximum of 92.48. The average stock price and the standard deviation amount to $M = 78.62$ and $SD = 14.15$. Siemens' stock price ranges from 78.60 to 121.76, resulting in a mean of $M = 98.71$ and a standard deviation of $SD = 15.51$. For every measured variable Allianz records the highest figures, in detail, minimum and maximum differ between 84.81 and 210.05. The average stock price amounts to $M = 150.84$, and the standard deviation $SD = 43.01$ indicates a large scale.

Table 7: Location and dispersion measures of stock prices (subsample)

SP	(N)	Location and dispersion measures			
		Minimum	Maximum	(M)	(SD)
BASF	9	65.10	89.69	79.07	9.46
Deutsche Post	9	47.57	112.96	75.48	23.31
Beiersdorf	9	51.70	92.48	78.61	14.15
Siemens	9	78.60	121.76	98.71	15.51
Allianz	9	84.81	210.05	150.84	43.01

While the stock prices for BASF, Deutsche Post, and Beiersdorf are close together, the average dividend payment for respective companies (BASF 2.85, Deutsche post .91, Beiersdorf .70) show great differences. This implies that the dividend payment and the stock price do not necessarily have an impact on one another. Nevertheless, significantly higher figures regarding the dividend payment and stock price for Siemens and Allianz require further analysis of correlation.

4.1.8 Summary Descriptive Statistics

Comparing the descriptive variables in the first step provides relevant conclusions. Considering the mean values for the variable DIV, DMED, and DMPD, it can be stated that the dividend payments are on average higher than the ex-dividend markdowns for both dates. Therefore, it is presumed that the ex-dividend markdown must not resemble the dividend payment. For the variable DIVD and SPDV it is assumed to verify a correlation, whereas the dividend payment development is on average higher compared to the stock price development. For BASF the average ex-dividend markdowns for both dates (DMED - 2.88, DAPD -2.87) and the dividend payment (2.85) are very close. The interference statistical analysis will provide further insights.

4.2 Interference statistical analysis

To test the first hypothesis, Kendall's rang correlation was used. The application of a non-parametric procedure is caused by the absence of normal distribution and linearity within the variables. *Table 8* shows the test results.

Table 8: Correlation DIV - DM(ED)

		DIV	DM _{ED}
DIV	correlation coefficient	1	-.51
	Sig. (1-sided)	-	.01
	(N)	226	226
DM _{ED}	correlation coefficient	-.51	1
	Sig. (1-sided)	.01	-
	(N)	226	226

Kendall's rang correlation shows a strong negative correlation ($r(226) = -.51$, $p < .05$) between the dividend payment and the ex-dividend markdown at the ex-dividend date. The correlation is negative due to the condition of the data as the dividend payment is a positive figure, and the markdown a negative figure. As part of the examination the t-test explains a significant effect ($t(226) = .01$, $p < .05$). Thus, the alternative hypothesis (H1a) is accepted, proving a (negative) correlation between the dividend payment and the ex-dividend markdown occurring in the period from the general meeting to the opening price at the ex-dividend date.

The second hypothesis (H1b) was also tested using Kendall's rang correlation due to the absence of normal distribution and linearity. *Table 9* presents the results.

Table 9: Correlation DIV - DM(PD)

		DIV	DM _{ED}
DIV	correlation coefficient	1	-.40
	Sig. (1-sided)	-	.01
	(N)	226	226
DM _{PD}	correlation coefficient	-.40	1
	Sig. (1-sided)	.01	-
	(N)	226	226

Once again, a negative correlation ($r(226) = -.40$, $p < .05$) between dividend payment and ex-dividend markdown at the pay date can be observed. The nature of data explains the negative result. The alternative hypothesis (H1b) is accepted due to a significant effect ($t(226) = .01$, $p < .05$) in the one-sided t-test. A (negative) correlation among the dividend payment and the ex-dividend markdown between the period from general meeting to the closing price at the payment date can be proven. The third hypothesis, alternative hypothesis 2, examines the correlation of the stock price and the level of dividend payment. Again, Kendall's rang correlation will be used.

Table 10: Correlation DIV - SP

		DIV	SP
DIV	correlation coefficient	1	.70
	Sig. (1-sided)	-	.01
	(N)	226	226
SP	correlation coefficient	.70	1
	Sig. (1-sided)	.01	-
	(N)	226	226

As listed in *Table 10*, we found a strong correlation ($r(226) = .70$, $p < .05$) between the level of stock prices and the level of dividend payments. Since both variables are greater than zero, the correlation is a positive number. The significance of the effect ($t(226) = .00$, $p < .05$) can be proven by the t-test. Therefore, the alternative hypothesis (H_2) is accepted. The alternative hypothesis 3 tests the correlation among the dividend payment development and the stock price development in the subsequent year. *Table 11* shows the statistical findings.

Table 11: Correlation DIVD -SPDV

		DIVD	SPDV
DIVD	correlation coefficient	1	.154
	Sig. (1-seitig)	-	.001
	(N)	197	197
SPDV	correlation coefficient	.154	1
	Sig. (1-seitig)	.001	-
	(N)	197	197

Kendall's rang correlation reports a weak positive correlation ($t(197) = .154$, $p < .05$) between the dividend payment development and the stock price development. This result is classified as significant due to the result ($t(197) = .001$, $p < .05$) of the t-test. The alternative hypothesis (H_3) proves the correlation between the mentioned variables and is accepted.

5. Discussion of Results

The findings regarding the ex-dividend markdown correspond mainly with those of Hashmi et al. (2012) on the Japanese market. Even though the stock price decreases on average by the amount of the dividend payment, as shown in the descriptive analysis, the actual effect on the stock price is less, evidenced by the correlation coefficient smaller than -1. Accordingly, it must be pointed out that the ex-dividend markdown does not affect the stock price to its full extent. Thereby, investors cannot be indifferent regarding the dividend payment policy of companies. The discrepancy between the ex-dividend markdown and

the dividend payment can be explained by different effects, for instance, taxation, transaction costs, tick size effects, or irrational behavior of market participants.

Barclay (1987) conducted examinations of ex-dividend markdown effects for the first time, whereas he analyzed the markdowns before and after the US tax reform. It was found that the introduction of the income tax reduced the ex-dividend markdown in the US market. These results are consistent with those in other markets, like Canada, Italy, or Sweden (Booth & Johnston, 1984; Michaely & Murgia, 1995). Elton and Gruber (1970) found an ex-dividend markdown of .72 after the introduction of income taxes, although previously, the ex-dividend markdown amounted to 1.00. In contrast to the reported findings, Frank and Jagannathan (1998) were not able to prove the impact of the tax rate on the ex-dividend markdown in Hong Kong. However, it is worth mentioning that despite the absence of taxation for both stock price gains and dividend payments, the ex-dividend markdown in Hong Kong is comparable to other markets.

On the one hand, particular market conditions cause this effect; on the other hand, it might be an indication for the irrelevance of taxation towards the ex-dividend markdown. Further, it appears that differences in taxation of stock price gains, respectively, dividend payments, impact the ex-dividend markdown due to a monetary benefit in one of the cases. For instance, an investor with a higher tax rate on dividend gains than on stock price gains will sell stocks before the dividend payment and immediately after the dividend payment rebuy the stocks. This proceeding also reinforces the ex-dividend markdown.

The so-called dividend capture can affect the ex-dividend markdown as well. Lakonishok and Vermaelen (1986) were able to show a significant increase in the trading volume for companies with high dividend payments around the ex-dividend date. As their study revealed, the authors conclude that arbitrage opportunities at the ex-dividend date profoundly impact the stock price and therefore lead to anomalies between the ex-dividend markdown and the dividend payment.

Several authors, like Bali and Hite (1998) as well as Frank and Jagannathan (1998), explain the discrepancy between the dividend payment and the ex-dividend markdown with the effects of the market microstructure. It has been argued that firstly price increments and secondly bid-ask-bounces cause the deviation. Price increments can be explained by the so-called tick sizes, which regulate the number of decimals in the stock pricing. According to this regulation, differing for every stock exchange, the theoretical and actual stock price deviates. Dubofsky (1992) proved the tick-size through the example of the New York Stock Exchange rule 118. Similar to the tick size, the bid-ask-bounce impacts the stock pricing. Thereby, buy and sell orders are performed alternately to either the ask price or the bid price, which leads to a negative autocorrelation impacting the stock price.

Another explanation is the leverage hypothesis introduced by French et al. (2005). It has been indicated that the stock prices fall off by a smaller amount caused by capital transfer related to the company's indebtedness. The option-price theory shows that long-term debt absorbs a part of the ex-dividend markdown, so that the market capitalization, expressed by the stock price, drops by a smaller amount. This effect has been analyzed throughout companies with and without long-term debt. It was determined that for

companies without long-time debt, the ex-dividend markdown on average exceeds the same amount as the dividend payment, whereas long-time debt reduces the ratio to 77 %.

Human behavior is often ignored in theoretical models. Within the scope of dividend payment policy, especially the company's managers that decide independently without running through monitoring mechanisms are of particular interest. In comparison to this is the investor who also independently evaluates and executes investments. On both sides, irrational behavior can have a high impact on the company value and, therefore, the stock price. Empirical evidence on distorting effects proves irrational behavior, which most likely has an unconscious impact on humans. Specific examples are overconfidence, excessive optimism, anchoring, and bounded rationality. Overconfident individuals overestimate their abilities as they believe to be better than they are. Excessive optimism is a condition of always expecting a positive outcome and ignoring negative developments.

Anchoring, on the other hand, defines an effect in which decisions made in the belief of conscious consideration are affected by unconscious environmental influences. Finally, the bounded rationality (Nguyen & Schüßler, 2013) has to be mentioned. This bias shows that decisions are believed to be rational, whereas the cognitive abilities of human beings, as well as the underlying information, are limited, and therefore most decisions are irrational.

The statistical evaluation proved a significant positive correlation between the dividend payment and the stock price of the respective company. Majanga (2015) supports this with the help of his studies on the Malawian market. He found a positive correlation of .799 among the variables stock price and dividend payment, assuming that the stock price level is a result of the level of the dividend payment. The author concludes that the stock price is affected by several factors. However, the dividend payment exerts the most significant impact.

The present study finds that the ex-dividend markdown is significantly smaller than the dividend payment. Still, the existence of an ex-dividend markdown triggered by the dividend payment was proven. Another finding is the correlation between the dividend payment and the share price, whereby in the observation period high dividend payments result in high stock prices. Thus, it can be argued that the increase of the shareholder value through the dividend payment leads to an increase in the stock price and, ultimately, the company value.

6. References

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