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SCHOOL OF ECONOMICS AND MANAGEMENT

The OMXS Dividend Aristocrats

A multivariate regression and risk analysis

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Abstract

Dividends effect on stock prices and shareholders return is a disputed subject in finance. The purpose of this thesis is to expand on the existing research both the effect of dividends in general and on stocks on the Swedish market in particular. This thesis establishes an index of stocks with 5 or more years of dividend growth for at least the last 5 years on the Swedish market, by comparing this index to the entire Swedish stock market, we see there are bigger excess returns to be earned with these types of dividend growth stocks compared to the market. Using a multivariate regression model, it is however clear that the number of accumulated years of dividend growth, although significant, has a very marginal negative effect on stock excess return. The percentage increase of dividend per share from the previous year did not have a significant effect on the stock excess return. These two findings are shown both in years were the market had a negative excess return and, in the years when the market had positive excess returns.

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1. Introduction

The dividend or the distribution of profit to a company's shareholders, is arguably one of the more closely studied factors in financial economics. Dividend growth is a disputed topic for which some argue that it does not affect stock returns and others design entire investment strategies around it. These dividend growth investors believe dividend growth over time is a signal that the management of the company has a positive outlook on the future.

Most people, whether interested in finance and investing or not, have heard about the S&P 500. A stock index with 500 of some of the largest companies on the US market and one of the more commonly followed equity indexes in the world ("S&P 500", 2020). Not everyone might be as familiar with its subindex, The S&P 500 Dividend Aristocrats. This subindex is compromised by the companies in the larger S&P 500 index that for the past 25 years or more have increased their dividend payouts to their shareholders consecutively every year. This subindex has in many of the latest years experienced higher returns and lower volatility compared to its larger main index. ("S&P 500 Dividend Aristocrats", 2020)

The Swedish market index, The OMXS(PI) does not have a similar subindex targeting companies with consecutive yearly dividend growth as the S&P 500. If the swedish market had this subindex, would it outperform the more common larger index? If the subindex outperforms the "normal" index, is it possible to see a statistically significant effect of dividend growth on stock excess return?

The thesis statement is, therefore:

- Would a portfolio composed of only the companies on the Swedish stock market that have continuously increased their dividend every year during the past five years beat the market returns?
- Does the number of accumulated years of dividend growth, and or the percentage increase of dividend per share from the previous year have a statistically significant effect on the excess returns of these types of stocks with 5 or more years of continuously increased dividend every year?

First there will be a section on previous literature and empirical studies on the subject then the results of this thesis research is presented in two different sections. In section one there is a risk/reward analysis where this theoretical subindex of stocks on the Swedish market with consecutive yearly dividend growth will be compared to the overall market index (OMXS(PI)) over the 21st century (2000-2019). This subindex of securities will be referred to as The OMXS Dividend Aristocrats. The results of this risk/reward analysis is that this subindex (The OMXS Dividend Aristocrats) of stock have for the past 19 years outperformed the market every year in terms of excess returns, by a margin. In section two a multivariate regression analysis using panel data from the securities compromising The OMXS Dividend Aristocrats, this is to confirm if this dividend growth over several years significantly impacts the stock excess return, also accounting for other common variables. The purpose is to see if these big excess stock returns in the past 19 years are actually due to the dividend growth of these companies. The results are that this is not the case, of the two dividend factors used, the accumulated years of consecutive dividend growth and the percentage increase of dividend per share from the previous year only the accumulated years of consecutive dividend growth proved to be significant. The effect on excess return was however marginally negative. The thesis ends with a discussion about the results connecting to some of the previous research on the subject and a concluding statement.

2. Literature overview and theory

2.1. Gordon Growth model

According to the renowned economist Myron J Gordon in his article "Dividends, Earnings, and Stock Prices" (1952). The amount of dividend the company chooses to pay is literally the stream of revenue the investor receives. Gordon argues first that it is important for the price of the stock and needs to be accounted for when putting a value on the share and second that you as the investor are not only paying for the current amount of dividends but also for all expected future dividends. The second meaning implies that there are two factors to consider regarding dividends. The current yield and expected growth resulting in the famous Gordon Growth model.

$$P_0 = \frac{D}{k - g}$$

$P_0$is the value of the stock today
D is the next year's expected dividend per share
k is the discount rate
g is the expected growth rate of the dividend

2.2. Dividend policy

One of the first modern studies on dividend policy is that of John Lintner (1956) where he gathered empirical data on 28 companies, most of them in the industrial sector. After performing some statistical analysis, Lintner concluded that if the company's management increased their dividend payout, they must be certain that the earnings of the company had surely increased and that they were confident that the dividend increase would be sustainable over a longer period of time. Lintner means that the firms that increase their dividend must have inside knowledge of the performance of the company that would indicate a bright future. Otherwise, they would simply not increase the dividend.

Two years later (1958), Franco Modigliani and Merton H. Miller asked "what is the "cost of capital" to a firm…?" in their paper "The Cost of Capital, Corporation Finance and the Theory of Investment". Their main point regarding dividend and its supposed effect on the market is, if you assume that the market is efficient and that investors are rational, it is impossible to know the effect dividend has on stock prices (according to their model). Modigliani and Miller continue to argue that there is no easy way to examine the true effect of dividend payouts in an environment where dividend stabilization policy is so common. The only possible effect you can look at is the surface effect, the effect of dividends as a proxy measure for expected earnings over a long period of time.

2.3. Dividend irrelevance theorem

After some comments and criticism, Modigliani and Miller (Dividend Policy, Growth, and the Valuation of Shares) returned to the subject in 1961, in their own words "to fill the existing gap in the theoretical literature on valuation". Arguing that the subject even though thoroughly investigated, there exists no consensus in the economic sphere regarding the effect of dividend on stock prices. In the paper, Modigliani and Miller examined the relation between the growth rate of dividend per share and the growth rate of profits and prices.

Modigliani and Miller formally argue that the dividend is irrelevant for the value of a share. The stock value will fall with the dividend payout, actually lowering the return of the stock (if the dividend payout is $1, the stock value will fall by $1 in simple terms). This is today commonly known as the dividend irrelevance theorem. Modigliani and Miller conclude that given a company's policy on investment, the dividend payout policy the management has decided on will not affect the current stock price nor the actual return to its shareholders. This conclusion is quite obvious they argue, as in an efficient economy there are no financial illusions.

2.4. Creating wealth with dividend growth

In the book “The best investment strategy: Creating wealth with dividend growth” (2006), hedge fund manager Howard Miller argues that the best and safest investment strategy you can follow is the “dividend growth investment strategy”. A strategy involving only investing in stocks that over the past years has consecutively increased its dividend each year compared to the previous year.

The theory behind dividend growth investing is that companies that have been able to reliably increase their dividend payments to their investors over consecutive years are signaling both their ability to generate cash flow but also that you as a shareholder can expect an increase of that cash flow in the future. It displays there is quantitative assurance from the management board and that they are confident in the company moving forward. This confidence justifies the share price premium. Furthermore, if you as a shareholder expect a growth in your dividend payout year after year, it puts pressure on the management to be more careful with their capital allocation, this will tend to yield outsized returns. Miller concludes that the interpretation is clear, companies that are making money are increasing their dividends. The companies are making enough money to not only run a thriving business but also to share their profits with the shareholders.

2.5. The Information Content of Dividends

In the empirical study "The Information Content of Dividends" (1973)
Ross Watts performed a regression-based analysis on future, current, and past earnings using dividends as an explanatory variable. All of Watts tests showed a positive correlation between changes in forthcoming earnings and unexpected dividend payouts. This evidence is in line with the dividend information hypothesis, also known as the dividend signaling hypothesis, which says that if a company increases its dividend payout, it must be a sign that the company is doing well. Watts states in his conclusion that these positive relationships between future earnings and changes in dividend are very small and in his own words trivial but the relationship exists.

A decade later, another empirical study was published that gave more credibility to the information hypothesis than other previous studies, showing that dividend payments had a much larger impact on excess returns compared to previous research. "The Impact of Initiating Dividend Payments on Shareholders' Wealth" by Paul Asquith and David W. Mullins, Jr (1983) looks at the effect of dividend policy on stockholders' wealth, analyzing 168 companies on the market. These companies were either just starting to pay out dividends to their shareholders or recently started paying it again after a long 10-year break. The empirical results of Asquith and Mullins Jr investigation exhibited larger positive excess returns than any other prior dividend study. In the study, 70 percent of the firms initiating their payouts, experienced a positive market reaction. The results did, however, also suggest that subsequent dividend increases may produce a larger positive impact on shareholder wealth compared to initiating a dividend policy. The authors' study results also suggest that other comparable studies on the subject underestimate the effect of a company's dividend increases over time on positive excess returns. Asquith and Mullins Jr's findings for both the initial and subsequent dividends were consistent with the view that dividends conveyed unique, valuable information to investors.

2.6. S&P 500 Dividend Aristocrats

The S&P 500 Dividend Aristocrats is an equity index on the American stock market, and it holds companies that have for the past 25 or more years, increased their dividends continuously every year, and are also part of the larger S&P 500 index. [1]("S&P 500 Dividend Aristocrats", 2020)

In a study by Albert Williams and Mitchell Miller (2013) on the subject, the S&P 500 Dividend Aristocrats outperformed the regular S&P 500 Index during recovery and recessionary periods. They found that the Aristocrats outperformed the standard index by 3.6% annually during the recovery period of 2001. During the 2008 recovery period, this difference was 4.59%. For the recession periods of 2001 and 2008, the difference was 29.88% and 23.71%, respectively.
They concluded that the S&P 500 Dividend Aristocrat index outperformed the S&P 500 index and that this was supporting evidence that stocks that payout dividends in general beat the overall market.

2.7. Dividend on the Warsaw stock Exchange

Looking at the impact of dividend increase per share and dividend increases over consecutive years, Darwin Li studied the polish equity market from 2005-2014 in his published thesis "Multi-Factor Model Analyzing Dividend Growth: A Metric for Stock Returns and Outperformance" (2015). Li was influenced by the S&P 500 Dividend Aristocrats and their power to beat the market, he looked at the companies on the Warsaw Stock exchange that for 10 years had continuously increased their dividend every year. Li concluded that these stocks often outperformed the market. With the "dividend growers" -as he called them- beating the market eight out of ten years during the period studied. Li then did a multivariate regression to see if dividend growth over time was connected to the excess return of the companies. His findings could be considered quite inconclusive with cumulative dividend growth in years

[1] They must also have a float adjusted market cap of 3 billion USD and 5 million USD average value traded every day for three months prior to the rebalancing ("S&P 500 Dividend Aristocrats", 2020)

having a slightly negative effect on excess return (-0.00195) but not considered statistically significant on a 95% significant level. The dividend per share percentage increase from the previous year appeared to have a positive effect on the excess return (although quite marginal) (0.0896) and was statistically significant. Li concludes his thesis by writing that his findings have contributed to the dividend irrelevance theorem and the efficient market hypothesis.

3. Methodology and Data

3.1. Data

The data used in this study is collected from the Thomson Reuters DataStream. Thomson Reuters DataStream contains time-series data for 35 million financial instruments across 175 different countries and is updated daily. Information goes as far back as 1973.

The OMXS Dividend Aristocrats will consist of companies in the larger OMXS(PI) that for the past five years (2015-2019) have increased their dividend every year from the previous one with respect to inflation.

To find the companies that were going to be part of the OMXS Dividend Aristocrat index the first step was calculating the difference in dividends per share with respect to inflation from 2000-2019 for every company on the Swedish market, the OMXS(PI). If the company experienced a percentage increase in dividend payout per share every year from 2015-2019, the company made it into the index of The OMXS Dividend Aristocrats.
The data also accounted for off-setting one-time dividend payments and these did not influence the data. Looking at the companies individually, ranking them based on the number of years they had increased their dividend, 2019 and back. The findings are reported in table 1.

5 YEARS (2015-2019): BOLIDEN ORD SHS, STORA ENSO A, STORA ENSO R, CATELLA A, BUFAB, CATELLA B, CTT SYSTEMS, LIFCO B, LINDAB INTERNATIONAL
6 YEARS (2014-2019): BILIA A, LATOUR INVESTMENT B, PEAB B, ICA GRUPPEN, PLATZER FASTIGHETER HOLDING B
7 YEARS (2013-2019): FABEGE, KLOVERN A, PROACT GROUP, VITROLIFE
8 YEARS (2012-2019): AF POYRY B, CASTELLUM, HEBA FASTIGHETS B, HOLMEN A, NOLATO B, CONCENTRIC
9 YEARS (2011-2019): ADDTECH B, ASSA ABLOY B, INDUTRADE, INVESTOR B, KINDRED GROUP SDR, LOOMIS, LUNDBERGFORETAGEN B, NIBE INDUSTRIER B, OEM INTERNATIONAL B, , WALLENSTAM 'B', WIHLBORGS FASTIGHETER ,TRELLEBORG B

10 YEARS (2010-2019): SVENSKA CELLULOSA AKTIEBOLAGET SCA B, JM ,SKANDINAVISKA ENSKILDA BANKEN A, SKANDINAVISKA ENSKILDA BANKEN C ,VITEC SOFTWARE GROUP B
11 YEARS (2009-2019): NIBE INDUSTRIER B
14 YEARS (2006-2019): KINNEVIK B, KINNEVIK **A**
15 YEARS (2005-2019): BEIJER REF B
18 YEARS (2002-2019): HUFVUDSTADEN A
20 YEARS (2000-2019): ATRIUM LJUNGBERG B

Table 1: Companies in the OMXS Dividend Aristocrats "separated in" classes based on the number of years of consecutive dividend growth (2019 and back).

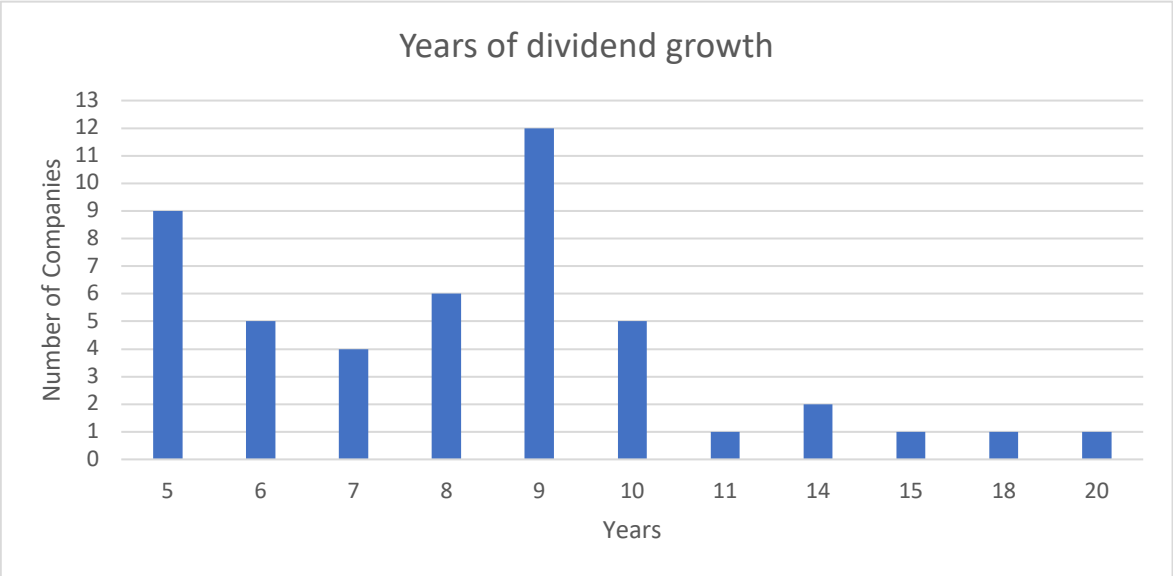

Figure 1: Companies and numbers of years of consecutive dividend growth. Total:47 companies

All analysis and regression use these companies excluding: Stora Enso A, Stora Enso R, Catella A, Bufab, Catella B, CTT systems, Lifco B, Lindab international and Castellum. This was due to problems with data gathering and or damaged and untrue data such as Castellum experiencing an excess return of 24318% in 2016. Removing these from the data, the index was left with 38 companies.

To more closely examine the relationship between accumulated years of consecutive dividend growth and excess returns, another subindex of The OMXS Dividend Aristocrats was composed. In this index, only the companies with 10 or more years of consecutive dividend

growth get a place (minimum 2010-2019). This index will be referred to as The OMXS Dividend Aristocrats 10+.
This index is in this study to further evaluate if these extra years of consecutive dividend growth give the variable more or less significance and to be able to compare it more closely to the similar study looking at the Polish equity market by Darwin Li (2015) that used 10 years as its bar of entry for the data sample.
All excess returns (in excess of the risk-free rate) are inflation-adjusted and account for the dividend in this paper. All variables are annually measured. To measure the risk-free rate, 10-year government bonds were used.

3.2. Delimitations

The choice to put the bar of entry for the index at 5 years of consecutive dividend growth is due to the lack of companies with many years of consecutive years of dividend growth in Sweden compared to the US. With the bar of entry set at 5 years, the sample remains reasonably big.

The period is set to the 21st century, this is also due to few companies having a very long history of dividend growth over consecutive years (see figure 1), with this thesis finding only one company with 20+ years of consecutive dividend growth (ATRIUM LJUNGBERG B). The period is also chosen due to the financial crisis of the early 2000s (dotcom bubble) and 2008 that is incorporated in the period. This is to see if there is any difference in the results looking only at the years when the market is negative. There will be a regression done only on the years when the market experienced negative excess returns. This is done to test if the number of accumulated years of consecutive dividend increase plays an even bigger role when the market is down as Williams and Miller (2013) found in their study on the US market.

To clarify the delimitations further, for the Risk Reward analysis there will only be stocks from the original sample of 38 companies that has been on the Swedish market for the entire time period. This brings the number down to 26 stocks, the stocks used will be displayed in the risk reward section. The Regression uses all of the 38 companies as its sample.

3.3. Risk reward analysis

Now that a Swedish equivalent to The S&P 500 Dividend Aristocrat index has been established, what would have happened if an investor were to have invested in this index (equally weighted) in the year 1999? What excess return would he or she had gotten compared to the market every year from 2000 to 2019?

What would the expected excess return, volatility and Sharpe ratio be for the entire period? The stocks used as a sample are the only ones with complete data during the entire period (1999-2019) of measurement (no rebalancing) so stocks that for instance first got on the market in 2011 such as Concentric AB will not be included in the portfolio. The portfolio risk/reward measurements are calculated assuming no possibility of short sales. Using matrix algebra, we calculate both the expected excess return and the portfolio variance, thereby being able to compute the Sharpe ratio.

3.4. Regression

To test if the number of accumulated years of consecutive dividend increase affects the excess return of the stock, there will be a multivariate regression performed in GRETL. To estimate the effect of dividend growth as a variable it will be split up into two sub-variables. The accumulated years of consecutive dividend growth and the percentage increase of dividend per share from the previous year. This is done to separate between the effect of the actual numerical increase and the more abstract implications that the advocates for dividend growth investing strategies such as Howard Miller (2006) proclaims that the companies that are increasing their dividends payouts to their shareholders over several consecutive years are signaling.

Other than these two, there will be three control variables. First, the OMXS(PI)s excess return is used to control for the state of the overall stock market. It would be reasonable to assume that if the market as a whole has a “good” year with high excess returns, so should the OMXS Dividend Aristocrats. Second, the year-end revenue of the company and third, the return of invested capital. These are chosen to account for the company’s growth while also considering

the effectiveness of how they use the capital to produce further growth. These two variables were also significant in the regression of Li (2010).

Regression

$$E[R_{i,t}] - Rf_{i,t} = \alpha + \beta(S_{i,t}) + \beta_2(ROIC_{i,t}) + \beta_3(OMXSE_{r,t}) + \beta_4(DGY_{i,t}) + \beta_5(DGP_{i,t})$$

$E[R_{i,t}] - Rf_{i,t}$:Return is the stock's annual return in excess of the risk-free rate

α: is an unknown constant

$S_{i,t}$ is the annual fiscal year-end revenue for company i in year t (in millions of SEK)

$ROIC_{i,t}$ is the return on invested capital for company i in year t

$OMXSE_{r,t}$ is the excess return of the market in year t

$DGY_{i,t}$ is the number of years of dividend growth for company i in year t

$DGP_{i,t}$ is the annual percent increase in dividend per share for company i in year t

Several regressions will be performed with some including lagged variables. Both the dividend increase per share (DGP) and the number of years of accumulated dividend growth over consecutive years (DGY) will be lagged by one year in some of the regressions, this is due to the dividend usually increasing annually, they will be denoted by DGP_1 and DGY_1 respectively. This is done to see if the change in these two variables in one year affects the excess return in the coming year. More precisely to see if the dividend increase per share and the number of years of accumulated dividend growth over consecutive years impact future excess returns.

There will be three different regression tables. In order, one looking at the OMXS Dividend Aristocrats, one for the OMXS Dividend Aristocrats 10+ and one looking only at the years when the market had a negative excess return. The regressions performed on only the years when the market had a negative annual excess return (2000,2001,2002,2003,2007,2008,2011,2012,2015,2016,2017,2018) is to see if the findings of Williams and Miller (2013) can also be seen on the Swedish market. The findings being that the S&P 500 Dividend Aristocrats outperformed the market during recession and recovery periods.

The hypothesis is that dividend increase per share and the number of years of accumulated dividend growth over consecutive years has a statistically significant effect on excess return as the risk-reward analysis shows that there is some factor that makes these stocks outperform the market. A significance level of 95% will be used to determine if a variable is significant.

The hypotheses are as follows:

H0: There is a statistically significant effect on stock excess return based on the dividend increase per share from the previous year for the company.

H0: There is a statistically significant effect on stock excess return based on the number of years of accumulated dividend growth over consecutive years for the company.

4. Results and analysis

4.1. Risk Reward Analysis OMXS dividend aristocrats, OMXS dividend aristocrats 10+ and year by year comparision

Risk Reward Analysis OMX dividend aristocrats

Using the OMXS Dividend Aristocrat index and combining an equally weighted portfolio of the stocks with complete and available data from 1999-2019. The stocks used are shown in the table below:

AF POYRY B	KINNEVIK A
ASSA ABLOY B	LATOUR INVESTMENT B
ATRIUM LJUNGBERG B	LUNDBERGFORETAGEN B
BEIJER REF B	NIBE INDUSTRIER B
BILIA A	NOLATO B
BOLIDEN ORD SHS	PEAB B
FABEGE	PROACT IT GROUP
HEBA FASTIGHETS B	SKANDINAVISKA ENSKILDA BANKEN A
HOLMEN A	SKANDINAVISKA ENSKILDA BANKEN C
HUFVUDSTADEN A	SVENSKA CELLULOSA AKTIEBOLAGET SCA B
INVESTOR B	TRELLEBORG B
JM	VITEC SOFTWARE GROUP B
KINNEVIK B	WALLENSTAM 'B

Table 2: Companies used to comprise the equally weighted OMXS Dividend Aristocrats index Portfolio.

Results compared to the market (OMXS(PI)) 2000-2019

	Expected excess return	Volatility	SD	Sharpe ratio
OMXS Dividend Aristocrats portfolio	22%	4%	20%	107%
Market (OMXS(PI))	5%	5%	24%	18%

Table 3: Equally weighted OMXS Dividend aristocrats vs Market 2000-2019

Risk Reward Analysis OMXS dividend aristocrats 10+

Looking at the stocks from the OMXS Dividend Aristocrats 10+ index, the results are similar over the same period. The table below (table 3) displays stocks in the equally weighted portfolio.

SVENSKA CELLULOSA AKTIEBOLAGET SCA	KINNEVIK B
JM	KINNEVIK A
SKANDINAVISKA ENSKILDA BANKEN A	BEIJER REF B
SKANDINAVISKA ENSKILDA BANKEN C	ATRIUM LJUNGBERG B
VITEC SOFTWARE GROUP B	

Table 4: Companies used to comprise the equally weighted OMXS Dividend Aristocrats 10+ index Portfolio.

Results compared to the market (OMXS(PI)) 2000-2019

	Expected excess return	Volatility	SD	Sharpe ratio
OMXS Dividend aristocrats 10+ Portfolio	27%	8%	28%	92%
Market (OMXS(PI))	5%	5%	24%	18%

Table 5: Equally weighted OMXS Dividend aristocrats 10+ vs Market 2000-2019

Excess return year by year

Comparing the three indexes every year from 2000 to 2019 these are the results looking only at the excess return.

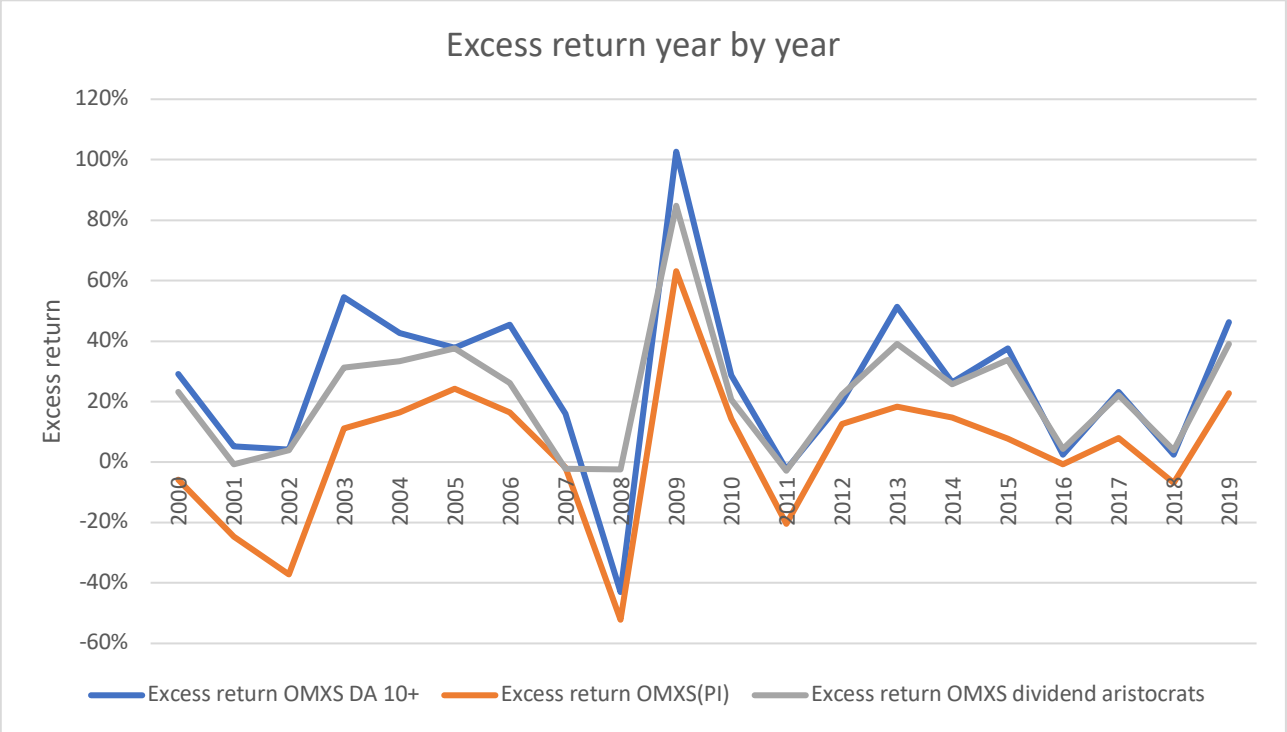

Figure 2: Excess return (return - risk-free rate) 2000-2019 OMXS Dividend Aristocrats vs OMXS Dividend Aristocrats 10+ vs OMXS(PI)

The OMXS Dividend Aristocrat equally weighted portfolio has outperformed the market for time period 2000-2019 by a non-trivial 17% (see table 3) in expected excess returns and the OMXS Dividend Aristocrats 10+ equally weighted portfolio did an even bigger expected return, with a difference of 22% (see table 4) compared to the market. Not only did both index portfolios beat the market looking at expected excess return, but the OMXS Dividend Aristocrats also had lower volatility (1.7% difference), even though being a much smaller sample of companies, which should impact diversification and in turn should have a negative effect on the volatility. The OMXS Dividend Aristocrats 10+ did underperform in relation to the market in this regard but considering the index is only composed of ten securities, the difference of 2.3% is arguably quite small.

Looking at the excess return year-by-year results, both the OMXS Dividend Aristocrat index and the OMXS Dividend Aristocrat index 10+ outperformed the market every year for the past 19 years by a non-trivial amount. The total (summation of all the years' excess returns) for the market being 80% and 443%, 530% for the OMXS Dividend Aristocrats and the OMXS Dividend Aristocrats 10+ respectively (see figure 2). This points to the fact that these companies outperform the market, and the question is if it is due to their dividend policies or something different. To determine this, we look at the regressions.

4.2. Regression OMXS Dividend Aristocrats, OMXS Dividend Aristocrats 10+ and OMXS Dividend Aristocrats during years were market had negative excess return

OMXS Dividend Aristocrats Regression

Summary Statistics OMXS Dividend Aristocrats (2000-2019)

Variable	Mean	Median	S.D.	Min	Max
Return	0.236	0.190	0.453	-0.777	4.82
ROIC	0.110	0.102	0.160	-1.96	1.78
OMXSreturn	0.0401	0.0954	0.242	-0.522	0.631
DGP	0.162	0.0929	0.462	-1.03	6.19
S	17.1	5.32	26.5	0.0377	129.
DGY	3.99	3.00	3.66	0.00	20.0

Table 6: Summary Statistics OMXS Dividend Aristocrats

Regression table OMXS Dividend Aristocrats (2000-2019)

Variable	Reg 1	Reg 2	Reg3	Reg 4	Reg 5
DGY	-0.00928 (−2.470)**	−0.00835861 (−2.177)**		−0.00824123 (−2.123)**	
DGY_1			−0.00888574 (−2.111)**		−0.00769531 (−1.835)*
DGP		−0.0325655 (−1.058)	−0.0567737 (−1.797)*		
DGP_1				−0.00953809 (−0.3124)	−0.0111372 (−0.3683)
S		−0.00104218 (−1.932)*	−0.000968187 (−1.790)*	−0.00108925 (−1.990)**	−0.00109954 (−1.996)**
ROIC		0.438819 (3.759) ***	0.467581 (4.013)***	0.455512 (3.897)***	0.444517 (3.804)***
OMXS Excess return	1.10110 (19.14)***	1.06997 (17.49)***	1.07187 (17.61)***	1.07569 (17.59)***	1.08598 (17.70)***
Const	0.213747 (10.42) ***	0.178077 (6.596)***	0.173006 (6.353)***	0.172294 (6.170)***	0.167717 (6.130)***
Observations	652	599	576	567	568
R-squared & Adjusted R-squared	0.3631 (0.36119)	0.381055 (0.375836)	0.395717 (0.390417)	0.395133 (0.389742)	0.394450 (0.389062)

Table 7: Regression table OMXS Dividend Aristocrats. Time period 2000-2019 Dependent variable: Excess return

T-statistic in brackets. Adjusted R-squared in brackets.

$*$ $p < 0.05$, $**$ $p < 0.01$, $***$ $p < 0.001$

OMXS Dividend Aristocrats Regression 10+

Summary Statistics OMXS Dividend Aristocrats 10+ (2000-2019)

Variable	Mean	Median	S.D.	Min	Max
Return	0.237	0.137	0.466	-0.744	2.94
ROIC	0.102	0.0918	0.159	-0.550	1.78
OMXSreturn	0.0401	0.0954	0.242	-0.522	0.631
DGP	0.185	0.0931	0.628	-1.03	6.19
DGP_1	0.188	0.0906	0.645	-1.03	6.19
S	24.4	3.51	36.2	0.0822	129.
DGY	5.31	4.00	4.68	0.00	20.0
DGY_1	4.90	4.00	4.39	0.00	19.0

Table 8: Summary Statistics (OMXS Dividend Aristocrats 10+)

Regression table OMXS Dividend Aristocrats 10+ years (2000-2019)

Variable	Reg 1	Reg 2	Reg3	Reg 4	Reg 5
DGY	−0.0139003 (−2.591)**	−0.0160218 (−3.001) ***		−0.0141099 (−2.684)***	
DGY_1			−0.0146752 (−2.539)**		−0.0127337 (−2.247)**
DGP		−0.0503439 (−1.269)	−0.0575013 (−1.463)		
DGP_1				−0.00526178 (−0.1367)	−0.00320280 (−0.08253)
S		−0.00157889 (−2.263)**	−0.00144522 (−2.074)**	−0.00145226 (−2.140)**	−0.00140707 (−2.038)**
ROIC		0.512236 (3.246) ***	0.509973 (3.287)***	0.506753 (3.309)***	0.494200 (3.202)***
OMXS Excess return	1.13763 (10.99)***	1.07668 (10.23)***	1.06990 (10.31)***	1.04354 (10.19)***	1.05097 (10.18)***
Const	0.246037 (6.496)***	0.261800 (5.740)***	0.238954 (5.224)***	0.234964 (5.109)***	0.218762 (4.835)***
Observations	206	197	189	189	188
R-squared & Adjusted R-squared	0.378637 (0.372515)	0.435708 (0.420936)	0.446461 (0.431337)	0.447910 (0.432825)	0.442993 (0.427690)

Table 9: Regression table OMXS Dividend Aristocrats 10+. Dependent variable: Excess return

T-statistic in brackets. Adjusted R-squared in brackets.

$*$ $p < 0.05$, $**$ $p < 0.01$, $***$ $p < 0.001$

In all instances, there was a negative effect on excess returns and future excess return based on the number of years of accumulated dividend growth over consecutive years (DGY) with a minimum 95% significance level in all regressions. This means the H0 hypothesis cannot be rejected. There is an effect on the excess return of a stock looking at the number of years of accumulated dividend growth over consecutive years, however, this effect is arguably quite

small with a beta coefficient between -0.8% and -1% in the regular OMXS Dividend Aristocrats regressions (see table 6). The beta coefficient for DGY was between -1.7% and -1.3% in the OMXS Dividend Aristocrats 10+ regressions (see table 8).

For future excess returns the lagged DGY was significant at a 95% level for both the OMXS Dividend Aristocrats and the OMXS Dividend Aristocrats 10+ also a slightly negative but arguably trivial amount. The coefficient between −0.76% and −0.88% for the OMXS Dividend Aristocrats and between −1.46% and −1.27% for the OMXS Dividend Aristocrats 10+.

Dividend increase per share from the previous year (DGP) was never statically significant at a 95% level in any of the regressions for both indexes and neither was the lagged variable DGP_1 meaning dividend increase per share from the previous year has no statistically significant effect on excess return or future excess return. The beta coefficient for DGP was negative at between -3.25% and −5.67% in the OMXS Dividend Aristocrats and between −5.03% and −5.75% in the OMXS Dividend Aristocrats 10+. This means we can reject the H0 hypothesis, there is no statistically significant effect on the excess return of a stock based on the dividend increase per share from the previous year.

Regression for years in which the market, OMXS(PI) had a negative excess return (2000,2001,2002,2007,2008,2011,2016,2018)

Summary Statistics OMXS Dividend Aristocrats

(2000,2001,2002,2007,2008,2011,2016,2018)

Variable	Mean	Median	S.D.	Min	Max
Return	-0.0243	-0.0401	0.327	-0.777	1.95
ROIC	0.0818	0.0940	0.196	-1.96	0.890
OMXSreturn	-0.187	-0.137	0.174	-0.522	-0.00664
DGP	0.212	0.107	0.407	-1.03	2.97
DGP_1	0.225	0.120	0.436	-1.03	2.97
S	16.7	4.42	26.9	0.0377	129.
DGY	3.92	3.00	3.57	0.00	19.0
DGY_1	3.13	2.00	3.01	0.00	17.0

Table 10: Summary Statistics OMXS Dividend Aristocrats (2000,2001,2002,2007,2008,2011,2016,2018)

Regression table for only the years were the market had a negative excess return: OMXS Dividend Aristocrats (2000,2001,2002,2007,2008,2011,2016,2018)

Variable	Reg 1	Reg 2	Reg3	Reg 4	Reg 5
DGY	−0.0132556 (−2.901)**	−0.00889688 (−1.915)*		−0.00678660 (−1.464)	
DGY_1			−0.00713796 (−1.340)		−0.00769630 (−1.459)
DGP		0.0632052 (1.586)	0.0111786 (0.2637)		
DGP_1				−0.0490893 (−1.361)	−0.0506734 (−1.400)
S		−0.000829432 (−1.391)	−0.000502825 (−0.8591)	−0.000796954 (−1.354)	−0.000714727 (−1.168)
ROIC		0.263622 (1.900)*	0.340877 (2.552)**	0.345509 (2.580)**	0.343877 (2.561)**
OMXS Excess return	0.887043 (9.636)***	0.789897 (8.002)***	0.711160 (7.720)***	0.755237 (7.583)***	0.721956 (7.718)***
Const	0.185192 (5.883)***	0.115086 (2.788)***	0.0694803 (1.815)*	0.101836 (2.305)**	0.0894777** (2.278)**
Observations	249	227	198	197	196
R-squared & Adjusted R-squared	0.274631 (0.268734)	0.300938 (0.285122)	0.315941 (0.298127)	0.325362 (0.307701)	0.327152 (0.309445)

Table 11: Regression table OMXS Dividend Aristocrats for only years when the market (OMXS(PI)) had a negative excess return. Dependent variable: Excess return

T-statistic in brackets. Adjusted R-squared in brackets.

∗ p < 0.05, ∗∗ p < 0.01, ∗∗∗ p < 0.001

The OMXS Dividend Aristocrats equally weighted portfolio outperformed the market every year from 2000-2019. Only having four years when the portfolio had a negative excess return and The OMXS Dividend Aristocrats 10+ only having two years of negative excess return. The market, for comparison had 8 years (see figure 2). Looking at the regressions, however, there

is even less evidence that this difference is due to the number of years of accumulated dividend growth over consecutive years (DGY) or the dividend increase per share from the previous year (DGP). DGY is slightly negative between -0.66% and -1.32% but overall lower significance compared to the regressions were all years were included, 2000-2019 (see table 7). DGP was never significant as in the rest of the regression tables.

5. Discussion

These findings arguably bring more credibility to the dividend irrelevance theorem. The dividend does not seem to affect excess returns by an impactful amount and if it does, it is negative, as Modigliani and Miller theorized in 1961.

This is somewhat the same result shown in the study done by Darwin Li on the Polish market. Li (2010) also found a negative effect of the number of years of accumulated dividend growth over consecutive years on excess returns but with less significance than the variable had in this study. It is, however, not possible to directly compare the results, as Li used more variables in his regressions, many of them, however, not having a significant impact on excess returns. Li did also not account for inflation in his paper. It is important to note that Li found the dividend increase per share from the previous year to be significant and to have a positive effect on excess return.

Asquith and Mullins, Jr (1983) found that subsequent dividend increases may produce a larger positive impact on shareholder wealth compared to initiating a dividend policy. This is not in line with the results of this thesis. According to the data from the regressions performed on both the regular OMXS Dividend Aristocrat and the OMXS Dividend Aristocrat 10+, it would seem that subsequent dividend increases impact shareholders' wealth negatively.

It could be argued that due to the result of the risk/reward analysis regarding the nontrivial amount of excess return of the two OMXS Dividend Aristocrat indexes compared to the market index, that there should be some type of connection between these two variables.
There is a possibility that the effect of the number of years of accumulated dividend growth over consecutive years is hidden in a different unaccounted for factor. It could be argued that there could exist information in the two dividend growth variables that imply that other fundamental values will be affected in a way that positively impacts the excess return.

It looks like these types of stocks perform comparatively well when the market is down, often showing positive returns during the negative years. This is in line with what Williams and Miller (2013) showed when looking at the US market. These types of stocks should perform better than the market during recessions and recoveries. This is also true on the Swedish market

(see figure 2 or appendix table 12). However, when running regressions on only the years were the market had a negative excess return, the results were the same as the previous regressions. In these regressions done only on the years when the market had a negative excess return, the number of years of accumulated dividend growth over consecutive years variable had less statistical significance compared to looking at the entire time period (2000-2019) and was still always marginally negative.

6. Conclusion

The conclusion drawn from these results from the risk/reward analysis and regressions is that on the surface, dividend growth has no effect on a stocks excess return and if there is an effect it is most likely a small negative one. This applies to both the number of years of accumulated dividend growth over consecutive years and the dividend increase per share from the previous year. It is, however, shown in this paper that by investing in an index of these stocks there are potentially big excess returns to be earned compared to the overall market. The argument could be made that these dividend growth companies experience some change in another fundamental value that is connected to their dividend growth in some way and this in turn has a positive impact on excess returns. However, the test shows that the dividend irrelevance theorem is most likely the most accurate view of the dividend growth effect on stock excess return. There is further research to be done here. It could be interesting to look at more factors and analyze the companies in more detail to see if there is some other factor connecting them to one another other, then the dividend growth.

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Appendix

Year	Excess return OMXS Dividend Aristocrats 10+	Excess return OMXS(PI)	Excess return OMXS Dividend Aristocrats
2000	29%	-6%	23%
2001	5%	-25%	-1%
2002	4.1%	-37%	3.9%
2003	55%	11%	31%
2004	43%	16%	33%
2005	37.75%	24%	37.66%
2006	45%	16%	26%
2007	16%	-1.74%	-2.13%
2008	-43%	-52%	-2%
2009	103%	63%	85%
2010	29%	14%	21%
2011	-2.5%	-21%	-2.9%
2012	20%	13%	22%
2013	51%	18%	39%
2014	26.4%	15%	25.8%
2015	38%	8%	34%
2016	2%	-1%	4%
2017	23%	8%	22%
2018	2%	-7%	4%
2019	46%	23%	39%
Total	530%	80%	443%

Table 12: Excess return 2000-2019 OMXS Dividend Aristocrats vs OMXS Dividend Aristocrats 10+ vs OMXS(PI)(displayed in figure 2)