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The Value Premium on the Danish Stock Market: 1950-2004*

By

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Abstract:
A number of influential studies have documented a considerable value premium for US stocks over long time periods (Fama and French (1992, 2008), Lakonishok et al. (1994)). Stocks with low price-earnings multiples, price-book values and other measures of value are reported to have given a higher mean return than stocks with high multiples and high asset growth (Cooper et al. (2008)). Outside the US, the evidence is more uncertain due to data shortages. On the basis of a unique data set that extends over more than half a century, this paper not only shows that there is a value premium in the Danish market but also that growth stocks only produce high earnings growth in the run-up to portfolio formation. Growth stocks are therefore likely to have disappointed investors. We therefore also estimate the proportion of the premium that can be explained by growth stocks' earnings disappointment.

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Introduction

A number of influential studies have documented a considerable value premium for US stocks over long time periods (Fama and French (1992 and 2008), Lakonishok, Shleifer and Vishny (1994)). Stocks with low price-earnings multiples, price-book values and other measures of value are reported to have given a higher mean return than stocks with high valuation ratios and high asset growth (Cooper, Gulen and Schill (2008)). Work by Basu (1997) and others have shown that the value dominance is also a feature of the early market history of the United States as noted also by Graham and Dodd (1934).

Notwithstanding that value stocks frequently outperform growth stocks there are of course time periods with a negative premium. The US value premium disappeared for example in the late 1990s. Chan et al. (2000) argue that this reflects that investors got too excited about growth stocks. Anticipating the bursting of the bubble, they predicted that the historic cross sectional return pattern would be reestablished.

Outside the US, the evidence on the value premium is more uncertain due to data shortages. With a few exceptions, the studies of European and Asian markets are based on data which at maximum only extends over two decades. And since the value premium is volatile this is rendering the evidence less robust.[1] There is therefore a need for more research in particular on European and Asian markets.

The purpose of this paper is to report evidence on the Danish value premium and in particular to investigate whether the premium is a long-term characteristic of the market or just a phenomenon that pops up now and then. To research this issue we have collected stock market and accounting data for more than half a century, that is, for the period 1950-2004. The results show that there is also a value premium in the Danish market though the premium is by no means a simple constant. The premium displays considerable volatility even across decades, which underscores the need for long samples in order to extract robust information. The appearance of the value

[1] Arshanapalli et al. (1998) find a value premium in the majority of the 17 non-US countries they look at over the period 1975-1995. Bauman et al. (2001) document a value premium for 6 Pacific Rim countries over 1986-1996. Brouwer et al. (1997) looked at France, Germany, the Netherlands, and the UK over the period 1982-1993 and also found evidence of a premium as did earlier work by Capaul et al. (1993), but their sample only included 10 years. Chan et al. (1991) find a value premium in Japan in the period 1971 to 1988. In a sample of 12 developed countries over a 20-year period, Fama and French (1998) also establish evidence of a premium in 11 out of the 12 countries. Moreover, they also find a premium in emerging market economies but the sample length is only 9 years. A UK study by Gregory et al. (2001) uses a data set that is longer than the norm, that is, their data runs over the period 1975-1998 and is also consistent with the existence of a premium. Dimson et al. (2003) is the clearest exception to the rule of short samples since their UK data extends over the period 1955-2001. They argue that in order to capture the value premium in the UK, traders have to pay particular attention to trading costs given that the majority of the value stocks are in the small cap segment. The present paper is the first one which analyzes Danish data. I am not aware of any extensive analysis of the other Nordic markets

premium in long time series outside the US also reduces the risk that the US value premium is sample specific and unlikely to recur in future returns (Black 1993)).

Following the presentation of the value premium we explore potential explanations of why we have a premium in the first place. This casts new light on the rivalry explanations offered in the literature, cf. below. Fama and French (1992, 1998) explain the premium by reference to risk. In their view value stocks are therefore more risky than growth stocks. Lakonishok et al. (1994) argue on the other hand that the premium reflects mispricing. They also provide evidence for the hypothesis that the market frequently gets too excited about growth stocks, which subsequently leads to a correction and therefore to a poor return performance, see also Dreman and Berry (1995) and La Porta et al. (1997). Although the bursting of the technology bubble in 2000 offered additional support for this view, it would be inappropriate to dismiss the risk explanation.[2] We therefore also examine the extent to which different risk measures can explain the premium.

Following this we address the alternative view that growth companies often disappoint investors. A first test of this hypothesis is to compare earnings growth before and after portfolio formation. If growth stocks have much higher earnings growth in the run-up to portfolio formation, there is a basis for arguing that growth stocks could have disappointed investors (Lakonishok et al. (1994)). The evidence presented in this paper shows that growth stocks over more than half a century have produced higher earnings prior to than after portfolio formation. We therefore take this hypothesis one step further by also estimating the proportion of the premium that can be explained by earnings disappointment. To this end we present an econometric model that explains the returns by the difference in earnings growth before and after portfolio formation. The results suggest that the decline in earnings growth following the formation of the growth portfolio is an important factor in explaining the low return on growth stocks and hence the value premium.

This paper deals with long-term stock market strategies. However, it is worth mentioning that there is also another literature on weekly or monthly trading strategies. This literature often finds support for the momentum strategy and hence emphasizes the attractiveness of investing in shares that are on the way up disregarding their valuation ratios (Jegadeesh and Titman (1993)). A recent study of this phenomenon is Ree and Schmid (2007) who document a significant risk adjusted momentum effect in Swiss large cap stocks. Broadly speaking, the two strands of literature suggest that momentum strategies frequently make sense in the short term while value strategies tend to outperform in the long term.

[2] On this issue see Chan et al. (2000) and Shiller (2000).

The paper is in five sections. Section I outlines the data and the formation of the value and the growth portfolio. Section II presents the Danish value premium over the period 1950 to 2004. Section III discusses different risk explanations in the spirit of Lakonishok et al. (1994). Section IV then goes on to present econometric tests of the earnings disappointment hypothesis. Section V concludes.

I. Data and Portfolio Formation

In the absence of an official data source we have compiled the relevant accounting and stock market data. The sample covers the Danish large cap universe. Due to the moderate size of the market, these stocks account for a high proportion of the market's capitalization.[3]

The sample runs from 1950 to 2004. At the end of each year we select the 20 largest stocks (firms) by market capitalization. In case firms have two share classes, we only include the liquid B shares. This approach minimizes the risk that the premium could reflect liquidity differences. From 1989 and onwards the universe is essentially identical to the set of stocks that have entered the Blue Chip price index first introduced in 1989 and now labeled the OMX C-20.

Next we form value and growth portfolios on the basis of the stocks' P/E multiples. The value portfolio includes the 10 stocks with the lowest P/E, and the growth portfolio includes the 10 stocks with the highest P/E.[4] Following end-of-year portfolio formation, returns are calculated for the following year assuming a 1-year holding period. We later examine long-term buy and hold strategies.

Portfolios are formed on the basis of both current and trailing P/E multiples. Current P/E is defined as end-of-year P relative to reported earnings E over the year. Because investors at year-ends only know E for the first 9 months, this approach assumes that they were able to make a forecast of fourth quarter E. However, since this approach can be criticized for a look-ahead bias, we also consider the case where the portfolio formation is based on annual earnings in the preceding year. Given that annual earnings reports are available at the end of the first quarter, this approach can not be criticized for being informational too demanding, on the contrary.[5] However, even in that case we will see that there is a value premium.

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[3] Risager (2006) outlines returns and valuation trends from 1969 and onwards. This paper also describes the methodology underlying the calculations.

[4] The universe of stocks (and the two portfolios) is changing over time since we always work with the 20 largest companies.

[5] Prior to the 1990s, investors only received semi-annual and annual earnings reports making it harder to estimate current P/E ratios. This approach can therefore be criticized for being too demanding, whereas the trailing P/E approach is likely to demand too little from investors. The realistic benefits of forming e.g. value strategies is therefore likely to lie in between the returns associated with the two P/E sorting methods.

Because we report value-weighted returns we control for a potential size effect. As the returns take into account bankruptcies, the data is also free of survivor biases. We will later discuss the role of business failures since that turns out to be of some importance for the results in the early 1990s.

As in Lakonishok et al. (1994) and Fama and French (1998) it is only stocks with positive earnings that enter the portfolios.[6] If firms later produce poor returns due to negative earnings, return calculations take this into account.

II. Statistics on the Danish Value Premium

Table 1 shows that the mean value premium equals 5.7 percent when the portfolio formation is based on current P/E ratios. The premium declines to 4.2 percent when stocks are sorted on the basis of trailing P/E multiples. Thus, value investors benefit relative to growth investors from using the most up-to-date earnings information. This is by no means an obvious result. We return to this when we discuss the potential explanations of the premium.[7]

Table 1: Returns for Value, Growth and the Market: 1951 to 2004

	Low P/E (Current)	High P/E (Current)	Value Premium (Current)	Market	Low P/E (Trailing)	High P/E (Trailing)	Value Premium (Trailing)	Market
R1(Mean)	0.160	0.103	0.057	0.131	0.152	0.110	0.042	0.130
Std.	0.270	0.245	0.122	0.249	0.287	0.241	0.157	0.249
Std.Error	0.037	0.033	0.017	0.034	0.039	0.033	0.021	0.034
t(Mean)	4.36	3.10	3.44	3.86	3.87	3.34	1.95	3.80

R1 is the mean of the annual returns. Std. is the standard deviation of the returns. Std.Err. is the standard error of the mean. The conventional t-statistic is the R1 (Mean) relative to the Std.Err. There are 54 (53) observations when portfolios are formed on the basis of current (trailing) P/E ratios.

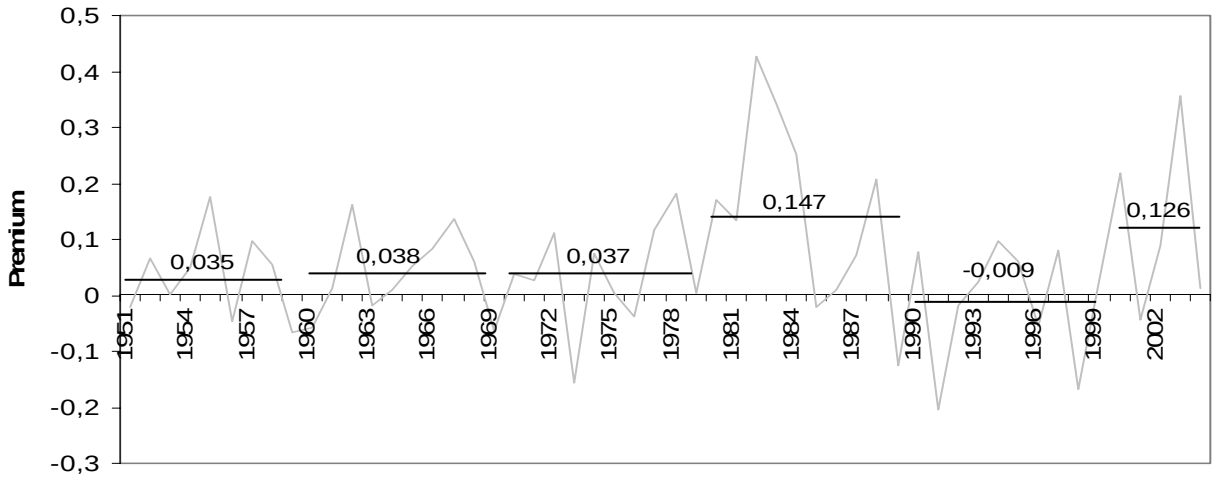
The premium based on current P/E multiples is displayed in Figure 1. As shown, the premium is positive and substantial in the majority of the 10-year periods. It is only in the 1990s that growth stocks produce a marginal higher return than value stocks. In this sense the premium looks like a stylized fact even though the premium is volatile. The highest premium is recorded in the 1980s. The 1980s are therefore the golden age for Danish value stocks. The lowest premium is in the 1990s with an annual mean at -0.9 percent. A banking sector crisis in the early 1990s and a strong investor appetite for growth stocks in the late 1990s are key explanations of the low premium

[6] This does not lead to any biases since the premium is an unbiased estimate of the return difference between large value and growth stocks that belong to the set of stocks with positive earnings.

[7] The Danish premium is higher than the average premium reported in Fama and French (1998, Table III, Col. 8). They find that the 12 country average equals 3.8 percent over the period 1975-95.

in this decade, see section III. Following the 1990s, the value premium recovers in the new millennium.[8]

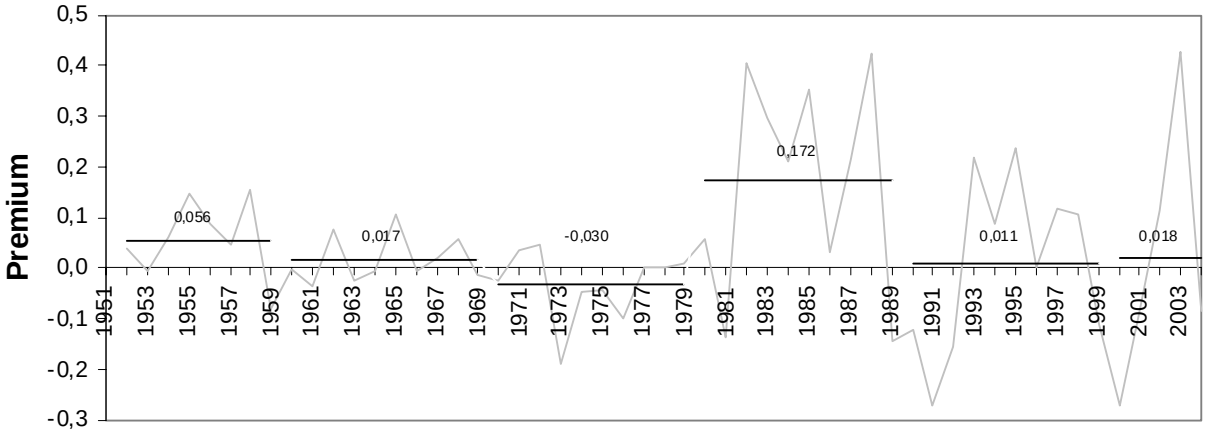
Figure 1: 1-Year and 10-Year Annualized Value Premium (Current P/E)



Based on current P/E ratios. The 10-Year premium (bold line) is the annualized premium per decade.

Sorting stocks on the basis of trailing P/E ratios produces the value premium in Figure 2. Broadly speaking, the behavior is similar to what we have seen. That said, two important differences stand out: First, in this case there is a small positive premium in the 1990s. Second, the 1970s are now characterized by a negative premium. This is also a decade with poor macroeconomic performance and two large

Figure 2: 1-Year and 10-Year Value Premium (Trailing P/E)



Value and growth portfolios are formed on the basis of stocks' trailing P/E ratios. The 10-Year premium (bold line) is the annualized premium per decade.

[8] This result also holds had we included 2005-07.

oil shocks. We later discuss whether and to what extent value stocks are more sensitive to business cycle fluctuations than growth stocks.

So far we have looked at 1-year holding periods. Table 2 shows that the value premium is also evident in the second and the third year after portfolio formation. Over a 3-year investment horizon, there is therefore no evidence that growth stocks eventually catch up and out perform value stocks.

Table 2: Returns for Buy and Hold Value and Growth Portfolios over longer Holding Periods

	Low P/E (Current)	High P/E (Current)	Value Premium (Current)	Low P/E (Trailing)	High P/E (Trailing)	Value Premium (Trailing)
R1	0.160	0.103	0.057	0.152	0.110	0.042
R2	0.146	0.087	0.059	0.135	0.095	0.040
R3	0.140	0.084	0.056	0.128	0.091	0.037
WT	912.9	61.6	Factor 14.8	469.9	85.2	Factor 5.5

Rt is the average geometric return when the holding period is t years. WT is the nominal wealth level in T=2004 from a one Dollar investment at the end of 1950 (current P/E case) or at the end of 1951 (Trailing P/E case), assuming annual rebalancing.

The value premium is important from an economic point of view. Table 2 shows that the cumulative wealth level in 2004 of investing in value stocks at the beginning of the sample period is 14.8 times the outcome of investing in growth stocks.[9] The premium is also statistically significant when stocks are sorted on the basis of current P/E multiples. In that case, the t-statistic equals 3.44. When stocks are sorted on the basis of trailing P/E ratios, the t-value equals 1.95, see Table 1.

Our sample includes both financial and non-financial firms whereas Fama and French (1992) and Lakonishok et al. (1994) only look at non-financial firms. However, Barber and Lyon (1997) later showed that the US value premium also exists for financial firms. When we exclude banks, the mean value premium equals 7.3 percent. In this case the two portfolios sometimes only include 7 stocks, which means that we should not draw strong conclusions from this finding.

Let us then turn to other characteristics of value stocks. The first thing to note is that value stocks pay more in dividends than growth stocks. In for example the trailing P/E case, the mean dividend yield is 1.0 percentage point higher on value stocks. Only in 12 out of 53 years do growth stocks produce a dividend yield that is at the

[9] Value generates 5.5 times more wealth when stocks are sorted using trailing P/E multiples.

same level or exceeds the dividend yield on value stocks. It should also be noted that the value premium cannot be traced to a size effect given that value stocks have on average a 6 percent higher market cap than growth stocks, see Table 3 below.

Finally, the value premium cannot be explained by transaction costs simply because the value strategy does not entail a higher number of transactions.[10] In the next section we discuss whether and to what extent the value premium can be explained by different risk factors. In the analysis of this issue we use the most conservative estimate of the premium, namely, the one based on trailing P/E multiples.

III. Are Value Strategies Riskier?

In order to answer this question we look at three different risk measures. We begin with the simplest indicator of risk, namely, the standard deviation of returns. Next we discuss risk in a CAPM sense. Finally, we ask whether value stocks are a poorer hedge against macroeconomic recessions.

As shown by Table 3, the value portfolio has the highest standard deviation but this does not necessarily translate into higher risk since the distributions are non-symmetric. Both portfolios exhibit excess kurtosis (fat tails).

Table 3: Statistics on the Value and Growth Portfolio and the Premium under Trailing P/E

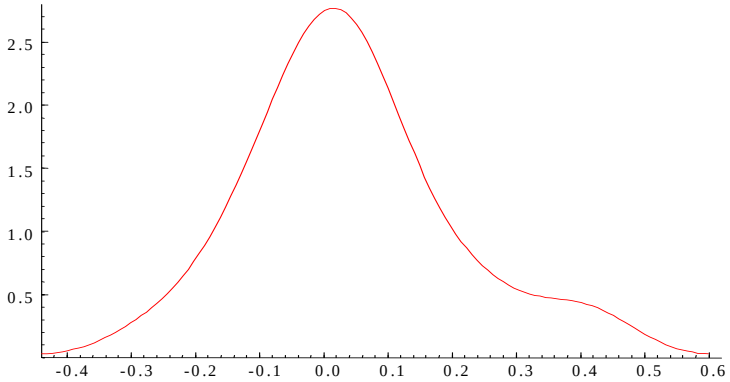
	Low P/E	High P/E	Premium
R1 (Mean)	0.152	0.110	0.042
Std.	0.287	0.241	0.157
Size[1)]	1.067	1.000	
Cov(portf, market)	0.069	0.057	
Skewness	1.655	1.436	0.602
Excess Kurtosis	3.113	3.504	0.443
Minimum	-0.224	-0.332	-0.272
Maximum	1.151	1.012	0.426
Normality $CHI^2(2)$	29.21 (0.000)	14.78 (0.001)	3.54 (0.170)

1) Defined as mean ratio of market cap of firms in the value portfolio relative to the growth portfolio.

[10] Note that this is different from the finding in Dimson et al. (2003). They identify a value premium in small caps with high trading costs. As noted this calls for a skillful approach to trading in order not to be swamped by trading costs . By construction, our sample consists only of large caps. The effect of trading costs is therefore the same on the two portfolios.

The extreme returns of the growth portfolio are, however, in particular in the negative range of the distribution. The table therefore also shows that the growth portfolio has produced the worst return over the sample period (equal to -33.2 percent). By contrast, the value portfolio has more upside risk. The value portfolio has therefore also produced the highest return (equal to 115.1 percent). Because the value portfolio has more upside risk, the value premium is also skewed to right as shown in Figure 3.

Figure 3: Density Value Premium



The growth portfolio's higher downside risk and the value portfolio's higher upside risk explain why the higher standard deviation of the value portfolio is not necessarily equivalent with higher risk in the economic sense.

In order to find out whether value stocks are more risky we reconstruct the return distributions, assuming that the right side is a mirror image of the left side (we remove the higher upside risk associated in particular with the value portfolio). In this case, the standard deviation for the value portfolio equals 19.2 percent compared to 17.8 percent for the growth portfolio. Hence, the value portfolio is a bit more risky, but this difference in standard deviation explains at maximum only one fifth of the value premium.[11]

The value portfolio's higher upside risk is further illustrated in Table 4. The table shows that the value portfolio generally outperformed in the good years of the market. The out performance is considerable from an economic point of view.

[11] The mean stock market return divided by the standard deviation is around 0.5 in the 20th century (Nielsen and Risager (2001)), which is in line with estimates for other markets. With a difference in adjusted standard deviations that equals 1.4 percent, the higher volatility can explain about 0.7 percentage points of the premium, that is, less than one fifth.

Table 4: Value Premium in the best stock market years[1)]

	Year	Premium
The best year	1972	0.046
The 2nd best year	1983	0.298
The 3rd best year	1988	0.425
The 4th best year	1997	0.118
The 5th best year	1975	-0.044
Average of 2 best years		0.172
Average of 5 best years		0.169
Average of 10 best years		0.143
Average of 15 best years		0.082

1) Using the Trailing P/E method

Table 5: Value Premium in the worst stock market years[1)]

	Year	Premium
The worst year	1984	0.212
The 2nd worst year	2002	0.112
The 3rd worst year	1986	0.032
The 4th worst year	1974	-0.047
The 5th worst year	1992	-0.157
Average of 2 worst years		0.162
Average of 5 worst years		0.030
Average of 10 worst years		0.029
Average of 15 worst years		0.013

1) Using the Trailing P/E method

In order for the value portfolio to be significantly riskier than the growth portfolio, the value portfolio will have to under perform in states of the world that are considered to be particularly bad. We consider first a CAPM inspired risk measure, that is, we look at the performance in extreme down markets. Table 5 shows that value stocks strongly out performed in the worst bear market, which is in 1984 (with a market return equal to -24.4 percent). In 1984, the value premium equals 21.2 percent. Value stocks also out performed in the second worst year and in the third worst year. In the fourth and fifth worst stock market years, growth stocks did better than value stocks. It turns out that value stocks have done better than growth stocks in 6 out of the 10 worst years and in 9 out of the 15 worst years. Moreover, the mean value premium equals 2.9 percent in the 10 worst years, and equals 1.3 percent in the 15 worst years. In other words, in times of poorly performing stock markets it is hard to argue that the value portfolio is more risky than the growth portfolio. It is actually the other way round.

For completeness we also briefly report the beta associated with the value and the growth portfolio. The betas for the value and growth portfolios equal 1.11 and 0.92, respectively.[12] With a typical estimate of the equity premium around 3 to 5 percent (Nielsen and Risager (2001)), the small difference in betas cannot explain the value premium. We obtain a similar result when we broaden the market portfolio to include a large number of small caps as in Nielsen and Risager (2001), which is not

[12] Estimated by using the covariances in Table 3 and the variance of the market return in Table 1.

surprising given that small caps have little weight in the market return.[13] The failure of the CAPM to explain the value premium parallels the findings in Fama and French (1992) who summarize their research by noting that "our tests do not support the most basic prediction of the CAPM model, that average stock returns are positively related to market betas."

If value stocks under perform in other bad states of the world in which the marginal utility of wealth is high, one could still argue that the premium primarily is a reward for risk. We therefore first identify the times when value stocks under perform growth stocks. We then check whether these periods are recessions or otherwise bad states of the economy in which the marginal utility of wealth is high.

Column 1 in Table 6 identifies the time periods in which the value premium is negative and column 2 records the average magnitude of the under performance. Column 3 characterizes the state of the macro economy and column 4 presents the average real GDP growth as an indicator of the macroeconomic performance. Similar results are obtained when we look at private consumption.

The results for the 1950s and the 1960s show that value stocks under perform when the economy is doing exceptionally well. In the first two decades of the sample period there is therefore no support to the risk based explanation.

The story is different in the 1970s and in the 1980s. The negative value premium now coincides with a distressed and poorly performing macro economy. That is certainly the case around the first OPEC shock and in the aftermath of the second OPEC shock. Moreover, value stocks also strongly under perform in the early 1990s where growth is weak albeit still in positive territory. The slowing of the economy in the early 1990s is essentially due to a Danish austerity package, including a strong tax incentive to increase private savings in order to tackle a growing current account deficit (Andersen et al. (1999)). That led to a severe banking crisis and because banks entered the value portfolio in the early 1990s, this is important in explaining the negative premium in this time period.

[13] In passing, it should be noted that for the CAPM to be able to explain the value premium, the difference between the betas would have to be as large as one, disregarding the tendency for the value portfolio to have more upside risk than the growth portfolio.

Table 6: The Value Premium and the Macro Economy.[14]

Years with a Negative Premium	Average Annual Premium	Performance of the Economy	GDP Growth
1953: 1 year	**-0.004**	Strong GDP growth.	**1953:**0.061
1959-61: 3 consecutive years	**-0.040**	In this period growth is strong. The mean growth rate at 0.066 exceeds the average/trend growth rate at 0.038 over the period 1950 to 1970.	**1959:** 0.081 **1960:** 0.061 **1961:** 0.056 **Mean:**0.066
1963-64: 2 consecutive years	**-0.015**	Recession in 1963. Strong rebound of the economy in 1964. Mean growth is above trend.	**1963**:-0.011 **1964:** 0.110 **Mean:**0.050
1969-70: 2 consecutive years	**-0.018**	Growth is upbeat in 1969 but is slowing in 1970. Mean growth above trend.	**1969:** 0.063 **1970:** 0.020 **Mean:**0.042
1973-76: 4 consecutive years	**-0.094**	Weak economy. Recession in 1974 and in 1975. A hike in the oil price and in wages is key explanatory factors. Low mean growth.	**1973:** 0.042 **1974**:-0.004 **1975**:-0.020 **1976:** 0.058 **Mean:**0.019
1981: 1 year	**-0.137**	Recession. Sharp fall in GDP.	**1981**:-0.020
1989-92: 4 consecutive years	**-0.174**	Weak economy following an austerity package in 1986/87, incl. a sharp rise in (after tax) interest rates. Financial sector crisis. Mean growth rate below trend.	**1989:** 0.009 **1990:** 0.011 **1991:** 0.005 **1992**:-0.001 **Mean:**0.006
1999-01: 3 consecutive years	**-0.157**	Strong macro performance. Mean GDP growth above trend growth.	**1999:** 0.029 **2000:** 0.035 **2001:** 0.018 **Mean:**0.028
2004: 1 year	**-0.084**	Recovery of the economy.	**2004:** 0.017

The value premium again turns negative from 1999 to 2001. This time the under performance is an international phenomenon.[15] In these years, the macro economy is doing well with growth above the estimated long-term trend. Finally, the premium is also negative in 2004, which is a year with a healthy recovery of the economy.

In sum, there are 9 time periods with a negative value premium. In 3 instances, the negative premium coincides with a bad state of the macro economy (around the first

[14] Source: Adam Databank, Statistics Denmark.
[15] Chan et al. (2000) explains the negative premium for the US by a change in investor sentiment rather than by a change in underlying fundamentals simply because growth stocks did not post superior earnings growth.

and the second OPEC shock and in the early 1990s). In the other 6 instances the macro economy is doing well. In other words, one can not argue that value stocks systematically under perform when growth is weak.[16]

The above analysis focused on the extent to which a negative premium coincides with a weak macro economy. Now we turn this around and ask whether recessions coincide with a negative premium? Over the sample period 1950-2004, GDP growth is negative in 8 years.[17] In 5 of these years the value premium is also negative. However, the mean of the premium in the 8 recession years is positive and equal to 1.0 percent. In other words, value stocks have not been a poorer hedge against recessions. We obtain similar results when we look at fluctuations in private consumption and industrial production (not shown). These results are similar to the ones for the US (Lakonishok et al. (1994)).

IV. Do High P/E Stocks often Disappoint Investors?

This section shows that Danish growth stocks tend to have better earnings performance before than after portfolio formation, which is also a feature of US data (Lakonishok et al. (1994)). Next we extend the literature by estimating the extent to which this can explain the under performance of growth stocks.

Table 7 summarizes the evidence on earnings growth for the two portfolios. To explain the results consider first the 3-year window. Earnings growth 3 years before portfolio formation is the geometric average annual earnings growth rate 3 years before formation. Earnings growth rates are overlapping for efficiency reasons, but the spirit of the results is the same in the case of non-overlapping data. Earnings growth 3-year after formation is defined analogously to ex-ante earnings growth.

Earnings growth 3-year ahead of portfolio formation equals 10.0 percent for the value portfolio, whereas earnings growth after formation is roughly the same though a bit higher. The picture is different for the growth portfolio. Earnings growth is much higher prior to than after portfolio formation. Table 7 shows that the decline in earnings growth equals 8.7 percentage points.

[16] Another way to look at this is to note that the premium is negative in 21 years. In 13 of these years, the macro economy is doing very well. Thus, the under performance of value stocks is not particularly related to downturns.
[17] Real GDP is falling in 1955, 1963, 1974, 1975, 1980, 1981, 1992, and in 1993. In 1963, 1974, 1975, 1981, and in 1992, the value premium is negative.

Table 7: Average Earnings Growth Before & After Portfolio Formation, 1950-2004[1)]

3 Years Before & 3 Years After		
	Before	**After**
Low P/E	0.100 (0.205)	0.117 (0.222)
High P/E	0.154 (0.147)	0.067 (0.159)
2 Years Before & 2 Years After		
	Before	**After**
Low P/E	0.136 (0.283)	0.094 (0.434)
High P/E	0.181 (0.292)	0.074 (0.173)
1 Year Before & 1 Year After		
	Before	**After**
Low P/E	0.064 (0.702)	0.278 (0.865)
High P/E	0.431 (0.635)	0.123 (0.357)

1) Earnings growth rates are geometric rates and numbers in brackets are standard deviations.

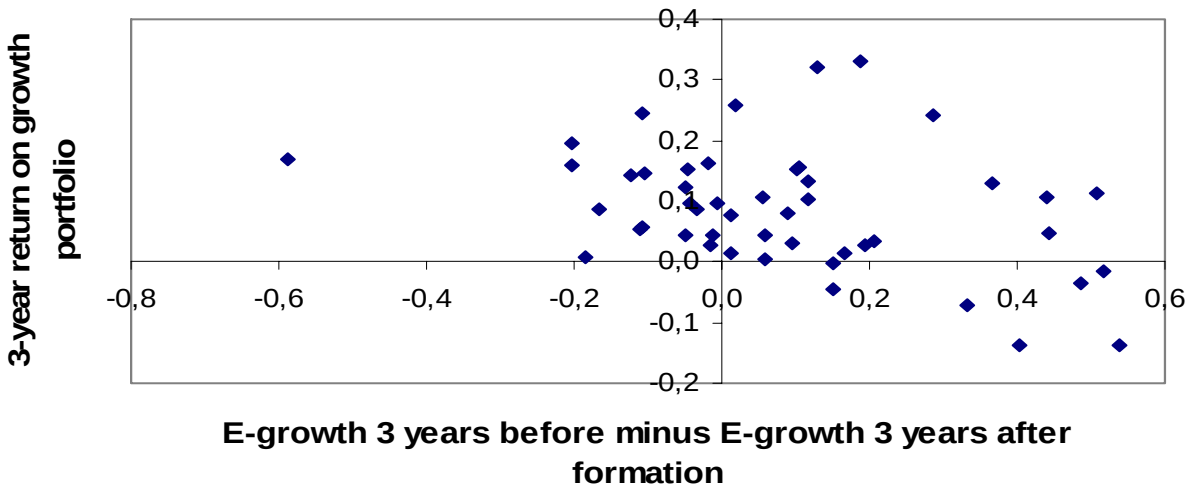
The results for the growth portfolio at the 2-year window are even stronger. However, in this case, the value portfolio has also lower earnings growth after portfolio formation though the difference is much smaller than for growth stocks.

At the 1-year window, the growth portfolio is associated with a huge decline in earnings growth after portfolio formation. The decline equals 30.8 percentage points and this decline is also statistically significant given that the t-statistic equals 2.50. The strong earnings growth prior to formation could have lured investors into buying growth stocks, which they may later regret due to the disappointing return performance. The picture is different for value stocks with low earnings growth prior to formation but high earnings growth after portfolio formation.[18]

[18] However, since the t-statistic of the earnings growth differential equals 1.13 one cannot say that value stocks have significantly better earnings performance after portfolio formation. The moderate t-statistic is essentially due to value stocks' high earnings volatility. The high earnings volatility of the value portfolio is likely to reflect the role of financial stocks, which often (but not always) appear in the value portfolio. These stocks are associated with large ups and downs in earnings due to - amongst other things - portfolio valuation effects.

Next we estimate the proportion of the premium that can be explained by the difference in earnings growth before and after portfolio formation.[19] To this end we assume first that there is a linear relationship between returns and the earnings growth difference. We begin by running a regression with the 3-year return from t to t+3 as the dependent variable and the corresponding 3-year earnings growth differential as the explanatory variable.[20] Figure 4 plots the data for the growth portfolio at the 3-year window. As will be confirmed below, low earnings growth after portfolio formation is associated with a low stock market return.

Figure 4: Earnings growth differential and returns for the growth portfolio



Because we work with overlapping data we use Newey-West estimates of standard errors in the regressions since overlapping data are likely to introduce serial correlation in the error term. For both the value and the growth portfolio we obtain the expected result. If earnings growth after portfolio formation is lower than earnings growth before formation returns tend to fall. The results are reported in Table 8, which shows that the coefficient to the earnings differential variable is in the

[19] Ideally, we should use the difference between expected and actual earnings growth. However, since data on expected earnings growth are not available over the long time horizon we work with, we have had to use the observed earnings differential between past and future earnings growth.

[20] The latter is defined as annualized earnings growth from t-3 to t minus annualized earnings growth from t to t+3.

same range for the two portfolios. Due to that we also present estimates based on pooling the data.[21] The pooled regression equation is given as,

3-year return$_{t,t+3}$ =

0.113 –0.126((3-year earnings growth)$_{t-3,t}$ – (3-year earnings growth)$_{t,t+3}$),
(0.0162) (0.0493)

$R^2 = 0.10$, $CHI^2 = 3.45$ (Pr = 0.179)

The estimation results show that the coefficient to the earnings differential variable is more than 2 standard errors away from zero and is therefore statistically significant.[22] We have also experimented with the squared and the cubic of the explanatory variable to catch potential non-linear effects, but these variables are highly insignificant and have therefore been taken out again. This is in line with the result that we can not reject the null hypothesis of homoscedasticity, see White's CHI^2 test statistic at 3.45.

Let us then estimate how much the 3-year earnings disappointment variable can explain of the mean value premium. To this end we note that the average 3-year earnings growth differential equals 8.7 percent for the growth portfolio (Table 7). And with a coefficient estimate at -0.126, the disappointing earnings performance has reduced the mean return on the growth portfolio by 1.10 percentage points. The good ex-post earnings growth performance of value stocks has led to an increase in the value portfolio's return by 0.21 percentage points. Altogether, 1.3 percentage points of the value premium or roughly 30 percent is explained by this model, see Table 8. The low R^2 of the equation tells us that the model is not good at explaining the return variability in general, but the model does have power in explaining differences in mean returns across value and growth portfolios. Regardless of whether we pool the data or not, results at the 3-year window suggest that the earnings disappointment variable can explain around 30 percent of the premium.

The results at the 1-year window are stronger, see Table 8. This is not surprising given that growth stocks produce a large decline in earnings growth after portfolio

[21] In the 3-year case, we have observations from 1953 to 2001, that is, 98 overlapping observations. However, in 3 cases the earnings growth variable is behaving in such an extreme manner that those 3 observations have been removed (this is when earnings e.g. move from a large negative number to a large positive number preventing a meaningful calculation of earnings growth). The regressions is therefore based on 95 pooled observations.

[22] Numbers in brackets are Newey-West standard errors. The bandwith is set to 4 (number of lags plus one), but results are not very sensitive to this assumption. The Newey-West standard errors are indeed higher than the OLS estimates.

formation at this horizon. The separate growth portfolio equation shows that the decline in earnings growth after portfolio formation explains as much as 66 percent of the value premium. When the data are pooled the results show that the earnings growth differential explains 79 percent of the value premium.

Table 8: Earnings Growth Before & After Portfolio Formation and the Value Premium

	Estimate of coefficient to earnings growth differential	Bandwidth	Newey-West standard error	Share of mean value premium explained by mean earnings growth differential[1)]
3-year window				
Pooled regression	-0.1255**	4	0.0493	0.31
Separate Growth estimation	-0.1615**	4	0.0711	0.33
Separate Value estimation	-0.0962	4	0.0579	
2-year window				
Pooled regression	-0.1086**	3	0.0402	0.14
Separate Growth estimation	-0.1483**	3	0.0515	0.31
Separate Value estimation	-0.0929*	3	0.0523	
1-year window				
Pooled regression	-0.0639**	2	0.0292	0.79
Separate Growth estimation	-0.0894**	2	0.0249	0.66
Separate Value estimation	-0.0498	2	0.0396	

****(*) Significant at the 5 (10) percent level**

[1)] These shares assume that the explanatory variable is significant at the 5% level (otherwise the contribution is set to zero).

The last result we want to point attention to is puzzling at first glance: Earlier we found that value investors benefit from using the most recent earnings data, see Table 1. Thus, when end-of-year P relative to current E are used for picking stocks, value investors obtain a higher return than when they use last year's E. But that is not the case for growth investors. They benefit from using outdated earnings information, that is, the return to the growth portfolio is higher in the trailing P/E case (11.0 percent) than in the current P/E case (10.3 percent). One explanation for this result is that growth investors who avoid picking the shares with the highest P/E multiples also avoid choosing those stocks that are associated with the biggest earnings and return disappointment.

V. Conclusions

There is an extensive literature that has documented the existence of a value premium not only for the United States but also for several other markets. Stocks with low price-earnings multiples, price-book values and other measures of value are reported to have given a higher mean return than growth stocks. However, since the results outside the United States are less robust due to at maximum two decades of data observations, there is a need for more research on European and Asian markets.

This paper has researched the extent to which there is a value premium also on the Danish market. To this end we have collected accounting and stock market data for the period 1950 to 2004. The long sample enables us to test whether the value premium is a stylized fact or just a phenomenon that pops up now and then. The paper has focused on value and growth portfolios formed on the basis of stocks' price-earnings multiples.

The results show that the value premium is positive in the majority of the 10-year periods though the premium displays considerable volatility even across decades. The mean annual premium is in the range 4.2 % to 5.7 % (depending on the nature of the portfolio selection methodology), but had we only worked with short sample periods like in Chan et al. (1991) and Fama and French (1998), the premium would have been much higher underscoring the point that we need long samples in order to be able to extract robust insights. The premium is statistically significant in spite of its volatility. That said, it should also be noted that the premium is under attack in the early 1990s, due to a banking crisis, and in the late 1990s, due to high investor appetite for growth stocks. In the new Millennium, the premium recovers to previous highs.

Why do we have a value premium? One potential explanation is that value stocks are more risky than growth stocks. To analyze this we focused on three different risk measures. The conclusion on the CAPM inspired risk analysis is that the value portfolio has out performed the growth portfolio in extreme down markets. Moreover, the value portfolio has also more upside risk than the growth portfolio. The CAPM model's lack of success in explaining the value premium parallels the findings for the US (Fama and French (1992)). The paper also looked into macroeconomic risk. If value stocks under perform in recessions in which the marginal utility of wealth is high one can still argue that the premium is a reward for risk. In the 8 recessions over the period 1950-2004, the value portfolio under performed in 5 of them. On average, the mean value premium remains, however, in positive territory. Hence, value portfolios are not a poorer hedge against sharp macroeconomic downturns. The only factor that really points to a risk explanation is the value portfolio's higher standard deviation, which is a feature also of US data. However, when we adjust for the value

portfolio's higher upside risk, the higher standard deviation appears to explain at maximum 20 percent of the premium. There could, however, be other aspects of risk that the annual data do not capture. This is therefore an issue that deserves more attention in future work.

The alternative view is that growth companies often disappoint the stock market simply because they cannot persistently deliver the expected high earnings growth. A first test of this idea is to compare earnings growth before and after portfolio formation. If growth stocks have much higher earnings growth in the run-up to portfolio formation, there is a basis for arguing that growth stocks could have disappointed investors (Lakonishok et al. (1994) and LaPorta et al. (1997)). It is interesting that this tendency has also played out for more than half a century in the Danish market. We have therefore extended the literature by also estimating the proportion of the value premium that can be explained by the difference in earnings growth before and after portfolio formation. The econometric results depend on the time horizon but suggest that growth stocks' earnings disappointment is a more important factor in explaining the value premium than risk though the latter also plays a role.

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