



Dividend Yield and Stability versus Performance at the German Stock Market

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→ Introduction

⇒ Motivation

⇒ Objectives

→ Data Set

→ Methodology and Results

⇒ Dividend Yield versus Performance

⇒ Dividend Stability versus Risk

⇒ Total-Return-Dividend-Yield Function

→ Conclusion



- **Graham and Dodd (1934)**

“... the payment of a liberal portion of the earnings in dividends adds definitely to the attractiveness of a common stock ...”

- **Dividend-yield-based investment strategies**

- “Dogs of the Dow” (top ten strategy)
- “Small dogs” (low five depot)
- Examinations: Filbeck and Visscher (1997; U.K. stock market)
Kotkamp and Otte (2001; German stock market)
Visscher and Filbeck (2003; Canadian stock market)



Indices and Certificates

- **Dividend-yield-based indices**

- **Offered by index providers** (to be licensed as basis of investment products)

- Dow Jones and Dow Jones STOXX Select Dividend Indexes
- FTSE High Dividend Yield Index
- S&P Dividend Aristocrats index series
- MSCI High Dividend Yield Indices
- DivDAX

- **Developed by banks** (to serve as underlying assets of investment certificates)

- DB Deutschland Select Index and DB Global Dividendenstrategie Index
- SG Dividend Stars index family

- **Index certificates**

DivDAX is used as the underlying asset more than 16 times as much as all other strategy-based indices developed by Deutsche Börse together

➔ **Some interest of investors in high-dividend-yield stocks**

Objectives of Our Study



- **Relation between dividend yield and performance**
 - Relation between dividend yield and mean excess return
 - Relation between dividend yield and risk
 - Incorporation of diversification effects
 - Predictive power of dividend yields
- **Relation between dividend stability and risk**
- **Shape of the total-return-dividend-yield function**

Data Set



- **54 stocks from the German capital market**
 - 23 stocks from the DAX
 - 18 stocks from the MDAX
 - 13 stocks from the TecDAX (on December 29th, 2006)
- Observation period: **January 3rd, 2000 to December 29th, 2006**
- Computation of a **dividend yield** of each stock in each year based on:
 - (Cash) dividend payment of the stock
 - Unadjusted Xetra closing price of the stock on the day preceding the dividend payment
- Computation of the **performance** of each stock based on:
 - Time series of daily adjusted closing prices of the stock
 - Proxy of the German stock market: CDAX performance index
 - Proxy of the risk-free asset's return: EONIA



Regressions

Several cross-sectional two-variables linear regressions:

Independent variable: **mean dividend yield**

Different dependent variables:

(Traditional) performance measures

- Jensen's alpha
- Appraisal ratio
- Net selectivity
- Treynor ratio
- Sharpe ratio
- Information ratio

Mean excess returns

- Measured with respect to the risk-free asset's return
- Measured with respect to the market return

Risk measures

- Total risk (standard deviation of excess returns with respect to the risk-free asset's return)
- Tracking error (standard deviation of excess returns with respect to the market return)
- Beta coefficient
- Idiosyncratic risk



Incorporation of Diversification Effects

stocks ordered by their mean dividend yield
highest ← ————— → lowest

single stocks:

stock 1 stock 2 stock 3 stock 4 stock 5 stock 6 stock 7 stock 8 ...

two-stock portfolios:

stocks 1 and 2 stocks 3 and 4 stocks 5 and 6 stocks 7 and 8 ...

three-stock portfolios:

stocks 1, 2, and 3 stocks 4, 5, and 6 ...

four-stock portfolios:

stocks 1, 2, 3, and 4 stocks 5, 6, 7, and 8 ...

five-stock portfolios:

stocks 1, 2, 3, 4, and 5 ...

Frequency of portfolio composition adjustments: 1) Buy-and-hold
2) Daily-adjustment

Predictive Power of Dividend Yields



Anglo-American Literature:

Future returns regressed on current dividend yields using lagged variables (Fama and French (1988), Hodrick (1992), Nelson and Kim (1993), Goetzmann and Jorion (1993 and 1995))

Problem:

In Germany dividends are usually paid once a year instead of quarterly
⇒ Small data set

“Solution”:

Out-of-sample regressions:

Independent variable: mean dividend yield **from 2000 to 2002**

Dependent variable: mean excess return, risk measure, or performance measure **from 2003 to 2006**

Dividend Yield versus Mean Excess Return



Independent variable: mean dividend yield

Dependent variable: mean excess return

		Slope of the Regression Line (t-Value)				
		Single Stocks	Two-Stock Portfolios	Three-Stock Portfolios	Four-Stock Portfolios	Five-Stock Portfolios
In-Sample	Buy-and-Hold	-0.002942 (-0.555)	0.007880 (1.380)	0.008588 (1.459)	0.007409 (1.142)	0.005302 (0.725)
	Daily-Adjustment		-0.002738 (-0.482)	-0.004129 (-0.863)	-0.003453 (-0.704)	-0.004314 (-0.731)
Out-of-Sample	Buy-and-Hold	-0.002063 (-0.307)	0.009750 (1.729)*	0.009904 (1.457)	0.008017 (1.038)	0.009101 (1.025)
	Daily-Adjustment		0.011741 (2.014)*	0.010874 (1.725)	0.010159 (1.326)	0.011429 (1.415)

* indicates significance on the five percent level

→ no influence



Dividend Yield versus Risk

In-sample; buy-and-hold strategy

Independent variable: mean dividend yield

Dependent Variable	Slope of the Regression Line (t-Value)				
	Single Stocks	Two-Stock Portfolios	Three-Stock Portfolios	Four-Stock Portfolios	Five-Stock Portfolios
Total Risk	-0.712751 (-6.595)**	-0.324076 (-3.729)**	-0.362035 (-3.632)**	-0.313733 (-3.300)**	-0.181449 (-2.389)*
Tracking Error	-0.654053 (-5.982)**	-0.260078 (-3.584)**	-0.304929 (-3.492)**	-0.246938 (-3.161)**	-0.136899 (-2.255)*
Beta Coefficient	-16.16908 (-4.427)**	-10.75154 (-2.063)*	-11.00180 (-2.002)*	-10.24821 (-2.186)*	-5.901595 (-1.290)
Idiosyncratic Risk	-0.043642 (-4.938)**	-0.010018 (-3.791)**	-0.010842 (-3.167)**	-0.008025 (-2.965)**	-0.003719 (-2.417)*

(Similar results for the daily-adjustment strategy;

similar but weaker out-of-sample results)

* (**) indicates significance on the five (one) percent level

➔ negative influence

➔ influence decreases with an increasing degree of diversification



Dividend Yield versus Performance

In-sample; buy-and-hold strategy

Independent variable: mean dividend yield

Dependent Variable	Slope of the Regression Line (t-Value)				
	Single Stocks	Two-Stock Portfolios	Three-Stock Portfolios	Four-Stock Portfolios	Five-Stock Portfolios
Jensen's Alpha	-0.002493 (-0.468)	0.008178 (1.416)	0.008894 (-1.485)	0.007693 (-1.178)	0.005465 (0.739)
Appraisal Ratio	0.364583 (2.093)*	0.575094 (1.474)	0.045631 (0.105)	0.200545 (0.345)	0.344243 (0.528)
Net Selectivity	-0.001576 (-0.300)	0.008501 (1.478)	0.009282 (1.550)	0.008010 (1.223)	0.005649 (0.766)
Treynor Ratio	0.010233 (1.147)	0.014645 (1.615)	0.010164 (1.084)	0.009912 (1.097)	0.007219 (0.590)
Sharpe Ratio	0.306215 (1.681)*	0.592034 (1.790)*	0.551128 (1.599)	0.528052 (1.315)	0.457515 (0.845)
Information Ratio	0.285630 (1.498)	0.601011 (1.565)	0.700992 (1.869)*	0.698259 (1.394)	0.646779 (1.028)

(Similar results for the daily-adjustment strategy;

similar but stronger out-of-sample results)

➔ positive or no influence

* indicates significance on the five percent level

Dividend Stability versus Risk



First measure of dividend stability of a stock:

Standard deviation of the dividend yields of the stock (Gombola and Liu (1993), ap Gwilym, Morgan, and Thomas (2000))

Problem:

Observation period characterized by a high volatility of the stock market

⇒ Second measure of dividend stability of a stock:

Standard deviation of the dividend payments of the stock divided by their mean

	Slope of the Regression Line in Case of Single Stocks (t-Value)			
	Std. Dev. of Dividend Yields		Mean-Adjusted Std. Dev. of Dividend Payments	
	Incl. Zero-Dividend Stocks	Excl. Zero-Dividend Stocks	Incl. Zero-Dividend Stocks	Excl. Zero-Dividend Stocks
Total Risk	-0.493951 (-1.709)*	0.247985 (0.916)	0.005535 (1.213)	0.016815 (5.421)**
Tracking Error	-0.445754 (-1.584)	0.257375 (0.968)	0.005265 (1.189)	0.015863 (5.075)**
Beta Coefficient	-15.59739 (-1.852)*	0.070106 (0.008)	0.028571 (0.211)	0.269646 (2.095)*
Idiosyncratic Risk	-0.032419 (-1.525)	0.016189 (0.806)	0.000372 (1.111)	0.001113 (4.559)**

* (**) indicates significance on the five (one) percent level

Shape of the Total-Return-Dividend-Yield Function



- **Literature:**
 - Increasing total-return-dividend-yield function (Christie (1990)) partly due to tax effects
 - “U-shape” (Blume (1980), Keim (1985), Christie (1990), Morgan and Thomas (1998)) due to size and seasonal effects
- Partly **tax-induced penalty of dividend income** in contrast to capital gains in Germany ⇒ **increasing total-return-dividend-yield function expected**

Subset	Average Yearly Total Return	t-Value for the Difference between the Average Yearly Total Returns (dgf)		
		"Medium"	"Low"	"Zero"
"High"	12.28%	-0.330 (28)	0.001 (25)	-0.332 (5)
"Medium"	13.49%		0.262 (28)	-0.221 (17)
"Low"	12.28%			-0.322 (6)
"Zero"	16.02%			

Conclusion



- **Relation between dividend yield and performance**

- Dividend yield had a positive influence on a stock's performance in our data set.
- This was not due to a positive influence of dividend yield on mean excess return but to a negative influence on risk.
- The negative influence of dividend yield on risk seems to diminish with an increasing degree of diversification.
- The better performance of high-dividend-yield stocks should not necessarily be seen as a capital market anomaly since a higher total return (that we would expect to see due to the German taxation rules) is probably just offset by a lower risk.

- **Relation between dividend stability and risk**

- When we regarded dividend stability as the mean-adjusted standard deviation of the dividend payments of a stock and excluded zero-dividend stocks from consideration, dividend stability served as an indicator of a stock's risk.