



**Corporate performance, diversification and risk from a resource-based view:
Can it explain differences in profitability between small and medium-sized
firms?**

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Introduction and problem statement

- Diversification defined as process whereby different assets are distributed among different investment classes (Northcott, 2011)
- Small and medium-sized firms attempt to diversify their business in order to decrease **unrewarded risk** (Everett & Watson, 1998), because they do not hold an efficient portfolio and are exposed to systematic and unsystematic risk (Ross, Westerfield & Jaffe, 2013, pp. 355-456)
- Therefore, diversification is a measure to **reduce firm-specific** (unsystematic) **risk** (Aaker & Jacobson, 1987; Rumelt, 1982)
- Despite of several years in research the impact of diversification strategy on profitability, enterprise value and risk **cannot** be reliable explained

Relevance and aim of the study

Several motivations for the study supporting the relevance:

1. **No** clear empirical evidence **how** diversification affects profitability and company-specific risk (Erdorf et al., 2013)
2. Unknown evidence, which type of diversification shall be used to **best reduce company risk** (Dawley, Hoffman & Brockman, 2003; Ben-Zion & Shalit, 1975)
3. **No** clear empirical evidence how good **resource-based view** can explain diversification attempts of small and medium-sized firms

Aim of the study:

- Testing of research hypotheses grounded on the assumptions of resource-based view
- Testing whether resource-based view can explain diversification attempts of small and medium-sized firms
- Testing, which variables are most relevant to explain profitability of small and medium-sized firms

Methodology and research design

Selection of potential discriminating variables based on literature review

(Accounting ratios, age and size of the firm, variables measuring the degree of diversification, interaction variables coupling diversification type and age as well as size, squared age and size of the firm to determine non-linear behaviour, industry risk)



Sample selection

(focus on small- and medium-sized firms in Austria over a three-year-period (2013, 2014 & 2015), 619 observations for small companies and 476 observations for medium-sized firms within different industries,



Descriptive statistics and tests for differences

(using mean, median and standard deviation; test for differences to identify the most important differentiating variables as proposed by [Porath, 2011, p. 32](#) using U-test due to non-normally distributed data)



Correlation analyses

(check for redundancy of data and to avoid multicollinearity in accordance with [Afifi, May & Clark, 2003, p. 274](#); [Chan, 2006, p. 56](#) and [Klecka, 1980, p. 11](#))



Computation of linear regression functions

(in order to determine the most important variables and to capture the change in explained variance by adding additional variables into the base model; for all firms together and divided for small and medium-sized-firms)

Literature review (1/2)

- A differentiation must be made between **related** and **unrelated** diversification (Fitzroy, Hulbert & Ghobadian, 2012)
- Diversification as positioning strategy to **reduce** cash flow **variances** (Peacre & Michael, 2006)
- Studies showed that it is not known, which type of diversification should be used to reduce business risk (Dawley, Hoffman & Brockman, 2003; Ben-Zion & Shalit, 1975)
- A summary of past literature reveals that in some cases profitability can be increased, whereas in other studies this observations was not confirmed; similar aspects can be found in case of risk reduction
- These findings were confirmed by the study of Erdorf et al. (2013) who also reached the same conclusion; under their view there is **no clear answer** regarding the benefits of diversification on a firm´s value and that the discussions lead to controversial results

Literature review (2/3)

Excerpt from the literature review an summary in a table

Authors	Main topics	Definition of diversification	Definition of performance	Effect of diversification on corporate performance	Effect of diversification on risk
Bettis (1981)	Analysis of performance differences between related and unrelated diversified firms for 49 companies for the period 1973-1977.	based on dummy variables 0 and 1 to determine related-linked, related-constrained and unrelated diversification strategy	ROA defined as net income after tax but before extraordinary items to total assets	Related diversification displayed a positive while unrelated diversification displayed a negative moderating effect on internationalization performance; unrelated diversifiers performed worse when compared to non-diversified firms	An increase in the level of diversification does not result in a decrease of fluctuation in returns and hence does not reduce risk
Michel & Shaked (1984)	Analysis of diversification affecting corporate performance using 51 firms from the Fortune 250 for the years 1975 and 1981	based on Rumelt's (1974) diversification categories	Performance measured by Sharpe-measure, Treynor-measure and Jensen-measure	Unrelated diversifiers displayed significantly superior performance when compared to related diversifiers	unrelated diversification allows the generation of superior risk-return profiles when compared to related diversification
Bettis & Mahajan (1985)	Analysis of risk/return performance on related and unrelated diversified firms, consisting of a sample of 80 companies from Fortune 500 list for the period 1973-1977.	based on Rumelt's (1974) diversification categories	ROA defined as the net income after taxes but before extraordinary items to total assets	Related diversification displayed a positive while unrelated diversification displayed a negative moderating effect on internationalization performance; unrelated diversifiers performed worse when compared to non-diversified firms	different diversification strategies can lead to similar risk; unrelated diversification does not lead to a favourable risk-return profile; related diversification does not guarantee a favourable risk-return profile
Grant et al. (1986)	Analysis of product and multinational diversification on profitability for 305 British manufacturing firms for the period 1968-1984.	based on index of product diversity and index of multinational diversity	ROA defined as operating profit before interest and tax divided by net tangible assets	No evidence that diversification leads to increase profitability; no significant differences in performance were observed between related and unrelated diversifiers	Detected a positive relationship between risk and diversification; financial risk acted as an incentive for diversification
Paul (1986)	Analysis of what type of diversification strategy produces superior long-term financial performance for 28 Indian firms for the years 1962-1981	based on relationship between sales of related/unrelated products and aggregate sales	Defined as gross profit before depreciation, interest and tax to capital employed and a percentage of net profit to net worth	Companies with unrelated business displayed the poorest performance; a fully unrelated diversified firm's performance seen to be worse than non-diversified firm's on average	Unrelated diversification displayed the highest level of variability in return on capital employed

Theoretical framework: Resource-based view

- This view seems suitable to explain diversification attempts of companies (Chatterjee & Wernerfelt, 1991)
- RBV explains differences in performance of companies by differences in **efficiency**, individual firm's **resources** and its **capabilities** (Foss, Knudsen & Montgomery, 1995; Lenox, Rockart & Lewin, 2011); this is the key of competitive advantage (Grant, 1996) leading to superior returns (Deb, 2009)
- Companies having sufficient resources can **exploit** them for diversification and generate additional income (Aleson & Escuer, 2002; Wernerfelt, 1984)
- The view predicts that a.) it is easier for **larger companies** to engage into diversification (Chen et al. 2014) and b.) that **related diversification** leads to superior performance (Amit & Livnat, 1989; Turner, 2005; Wan et al. 2011)

Development of hypotheses

H1: Small firms have a significantly lower profitability when compared to medium-sized firms.

[size is a variable affecting firm performance; based on [Hamelin \(2013\)](#) firm specific-risk is higher for small companies compared to bigger companies]

H2: For medium-sized firms, related diversification makes a significantly higher contribution to corporate performance when compared to unrelated diversification.

[based on [Chen et al. \(2014\)](#) already existing capabilities and resources can be used with additional efforts; this should be beneficial for higher returns ([Iacobucci & Rosa, 2005](#); [Turner, 2005](#); [Wan et al., 2010](#))]

H3a: Diversification has a significant positive effect on profitability for medium-sized firms.

H3b: Diversification has no significant effect on profitability for small firms.

[based on [Aleson & Escuer \(2002\)](#) companies can exploit their resources to generate additional income; this exploitation is only possible, when a certain level of unique resources is available and this is coupled with firm size ([Holder & Zhao, 2015](#); [Peteraf, 1993](#))]

H4: There is a non-linear relationship between company size and profitability.

H5: There is a non-linear relationship between company age and profitability.

[based on [Nunes et al. \(2010\)](#), [Qian et al. \(2008\)](#) and [Vannoni \(2000\)](#) non-linear relationships between profitability and certain control variables were found]

Definitions and sample description

Industry	2013			2014			2015		
	Small firms	Medium-sized firms	IND_RISK	Small firms	Medium-sized firms	IND_RISK	Small firms	Medium-sized firms	IND_RISK
A	3	1	-	2	1	+	1	1	+
B, C	55	55	+	16	18	+	17	19	+
D, E	7	7	+	5	4	-	3	5	+
F	36	21	-	27	11	-	21	12	-
G	92	73	-	34	39	+	26	30	+
H	29	12	-	9	8	+	9	6	+
I	5	17	+	5	4	+	4	6	+
J	17	9	+	10	7	+	10	6	+
L	13	5	+	7	3	+	10	2	+
M, N	66	28	+	32	18	+	24	19	+
P, Q	7	8	+	3	4	+	2	5	+
R, S	7	6	-	1	3	+	4	3	-
Total	337	242		151	120		131	114	

The industry classes were based on the Austrian ÖNACE 2008 codes and contain: A = Agriculture, forestry and fishing, B = Mining and quarrying, C = Manufacturing, D = Electricity, gas, steam and air condition supply, E = water supply, sewerage, waste management and remediation activities, F = Construction, G = Wholesale and retail trade and repair of motor vehicles and motorcycles, H = Transporting and storage, I = Accommodation and food service activities, J = Information and communication, L = Real estate activities, M = Professional, scientific and technical activities, N = Administrative and support service activities, P = Education, Q = Human health and social work activities, R = Arts, entertainment and recreation, and S = Other services activities. The figures show the numbers of companies which were taken into the sample per observation year. For the variable IND_RISK a "+" or ("-") denotes that the respective industry contributed to an increase (decrease) in GDP for the respective year and therefore displays a lower (or higher) risk (Altman et al., 2008, p. 229).

Variables of the study

Variable Type	Variable Code	Variable Name	Computation	Description	Source
Dependent variables	ROA	Return on Assets	EBITDA/Total Assets	Profitability of the firm based on EBITDA	Degryse, de Goeij & Kapert (2012); Graves & Shan (2014)
Control variables	AGE	Age of the firm	ln(age of the firm)	Age measured as the years from foundation until the end of the year of the financial statement	Graves & Shan (2014); Chen et al. (2014)
	SIZE	Size of the firm	ln(total assets)	Size measured as the natural logarithm of yearly total assets.	Dawley, Hoffman & Brockman (2003); Colak (2010)
Independent variables	LEV	Leverage	Total Debt/Total Assets	Measures the debt-ratio of the firm	Graves and Shan (2014); Chen et al. (2014)
	INT_ASS	Intangible Assets	Intangible Assets/Total Assets	Measures the growth opportunities of the company.	Degryse, de Goeij & Kapert (2012); Holder and Zhao (2015)
	REL_DIV	Related diversification	0 = if the company is not displaying related diversification; 1 = otherwise	Company extends its actual portfolio with similar services or products	Chen et al. (2014)
	UNREL_DIV	Unrelated diversification	0 = if the company is not displaying unrelated diversification; 1 = otherwise	Company includes new services or products not related to the existing portfolio	Chen et al. (2014)
	DIV	Diversification type	0 = if the company is not diversified; 1 = if the company is diversified	Describes whether the firm is diversified or non-diversified	Dawley, Hoffman & Brockman (2003)
Interaction variables	DIV_TYPE x AGE	Interaction between diversification and age	Variable DIV multiplied by the age of the firm	Interaction effect between diversification type and company age.	-
	DIV_TYPE x SIZE	Interaction between diversification and size	Variable DIV multiplied by the size of the firm	Interaction effect between diversification type and company size.	Dawley, Hoffman & Brockman (2003)
Non-linear variables	AGE ²	Square of AGE	(ln(age of the firm)) ²	Square of the age of the firm	-
	SIZE ²	Square of SIZE	(ln(total assets)) ²	Square of the size of the firm	Nunes et al. (2010); Qian et al. (2008); Vannoni (2000)
Macroeconomic variables	IND_RISK	Industry risk	- 1 = if the industry of the firm provided a negative contribution to the gross value added of the economy; 1 = otherwise	Proxy for the insolvency rate of an industry	Altman et al. (2008)

Main results (Part I)

Variables	EBITDA/TA						EBIT/TA					
	Model XI			Model XII			Model XI			Model XII		
	All	Small	Medium	All	Small	Medium	All	Small	Medium	All	Small	Medium
Const.	-3.722***	-5.655***	-10.953	-3.597***	-5.712***	-6.907	-3,857***	-5,832***	-10,490	-3,777***	-5,955***	-5,420
AGE	0.046**	0.047	0.037**	0.045*	0.053	0.034	0,031	0,032	0,026	0,032	0,038	0,028
SIZE	0.539***	0.854***	1.331	0.523***	0.864***	0.847	0,552***	0,874***	1,267	0,542***	0,893***	0,657
LEV	-0.252***	-0.336***	-0.061***	-0.263***	-0.354***	-0.060***	-0,264***	-0,354***	-0,057***	-0,273***	-0,370***	-0,054***
INT_TA	0.230*	0.163	0.132**	0.230**	0.143	0.141**	0,015	-0,012	-0,120*	0,017	-0,029	-0,113*
IND_RISK	-0.003	-0.006	-0.002	-0.004	-0.007	0.000	-0,006	-0,008	-0,008	-0,007	-0,009	-0,005
UNREL_DIV												
REL_DIV												
DIV	0.003	0.022	0.001	0.034	0.131	0.075	-0,012	0,001	-0,010	0,025	0,119	0,090
AGE ²	-0.009**	-0.006	-0.007**	-0.005	-0.003	-0.004	-0,007*	-0,006	-0,005*	-0,005	-0,003	-0,003
SIZE ²	-0.018***	-0.031***	-0.040	-0.018***	-0.031***	-0.026	-0,018***	-0,031***	-0,038	-0,018***	-0,032***	-0,020
DIVxAGE				-0.028*	-0.037	-0.021				-0,028*	-0,035	-0,019
DIVxSIZE				0.003	-0.001	-0.001				0,003	-0,001	-0,003
R ²	0.173	0.220	0.048	0.167	0.218	0.051	0,185	0,235	0,048	0,179	0,234	0,051
F statistic	28.436***	21.447***	2.954***	21.076***	16.389***	2.427***	30,758***	23,436***	2,929***	22,954***	18,011***	2,426***

Significance level: *p < .10 **p < .05 ***p < .01

- Much higher explanatory power of the regression models for small firms and all firms together (R²)
- Leverage as the most important variable to explain profitability; robust across different measures of profitability
- Size is relevant for small firms, whereas age is more relevant for medium-sized firms
- non-linear behaviour for size (small firms) and for age (medium-sized firms) observed
- Inconsistent sign of INT_TA, when using EBIT/TA, which is not in congruence with RBV

Main results (Part II)

Analyses for different types of diversification

The firms were categorized into related and unrelated diversifiers as well as non-diversified. This was one in order to detect potential statically significant differences between the three types of diversifiers. Here also a U-test was applied due to non-normally distributed data. Significance level: * $p < .05$ ** $p < .01$

Medium-sized firms

Variable	Descriptive statistics				Tests for differences				
	Non-diversified (n = 202)		Unrelated diversifiers (n = 149)		Related diversifiers (n = 125)		Non-diversified vs. Unrelated	Non-diversified vs. Related	Related vs. Unrelated
	Mean	Median	Mean	Median	Mean	Median	p-value	p-value	p-value
EBITDA_TA	0.100	0.077	0.119	0.104	0.089	0.072	0.043*	0.565	0.006**
EBIT_TA	0.060	0.043	0.059	0.038	0.049	0.036	0.823	0.478	0.851
AGE	2.747	2.743	3.090	3.147	3.368	3.421	0.000**	0.000**	0.006**
SIZE	16.727	16.682	16.767	16.753	16.726	16.685	0.289	0.969	0.311
LEV	0.643	0.697	0.637	0.648	0.587	0.628	0.435	0.021*	0.269
INT_TA	0.028	0.002	0.029	0.002	0.014	0.002	0.333	0.609	0.146

Small firms

Variable	Descriptive statistics				Tests for differences				
	Non-diversified (n = 305)		Unrelated diversifiers (n = 119)		Related diversifiers (n = 195)		Non-diversified vs. Unrelated	Non-diversified vs. Related	Related vs. Unrelated
	Mean	Median	Mean	Median	Mean	Median	p-value	p-value	p-value
EBITDA_TA	0,045	0,071	0,095	0,116	0,103	0,104	0,007**	0,005**	0,545
EBIT_TA	0,002	0,039	0,023	0,052	0,049	0,051	0,158	0,069	0,963
AGE	2,512	2,665	2,657	2,541	3,038	3,129	0,284	0,000**	0,007**
SIZE	13,771	14,315	14,657	15,410	15,081	15,500	0,000**	0,000**	0,150
LEV	0,710	0,724	0,727	0,715	0,699	0,705	0,814	0,456	0,334
INT_TA	0,018	0,000	0,032	0,001	0,014	0,002	0,006**	0,000**	0,039*

Final conclusions (1/2)

EBITDA/TA as dependent variable:

- For small companies **profitability** increases significantly with **size**; for **small companies** a non-linear negative and significant behaviour can be found; results remain robust, when using EBIT/TA
- For **medium-sized firms** **profitability** increases significantly with **age** (always when no interaction terms are included), but showed a non-linear negative and significant behaviour; non-linear behaviour remains robust, when using EBIT/TA as profitability measure (but age not significant any more)
- **Leverage** (risk) is an important driver for profitability; **higher leverage** induces **lower profitability**; this results is robust also when EBIT/TA is used (Cai & Ghosh, 2003; Drobetz & Wanzenried, 2006; Titman & Wessels, 1988)
- **Unrelated diversification** leads to significantly **higher** profitability for medium-sized firms, whereas **related diversification** significantly rather provides **lower** profitability (Michel & Shaked, 1984; Hoskisson, 1987); the results are not robust, when using EBIT/TA

Final conclusions (2/2)

EBITDA/TA as dependent variable:

- The risk of the industry was not significant at all; the **industry** a firm is operating in does **not** have an **impact** on profitability of a single firm; this is in congruence to [Spanos et al. \(2004\)](#) who stated that success is more dependent on firm-level conditions than on industry conditions; the result is robust for EBIT/TA
- Diversification **does not** necessarily lead to **improved profitability** or **lower risk**; it depends on how profitability is measured; this explains, why in prior studies different results were obtained concerning this topic
- Only some results are **in congruence** with RBV (see results from hypotheses testing)

Summary:

For small firms it does not matter, which type of diversification they engage. In both situations they can obtain higher profitability compared to non-diversified ones. However, there is no significant reduction in risk visible (only small differences). When growing to a medium-sized firm, unrelated diversification may be favoured as it can enable higher profitability. Here also no significant reduction in risk is visible (also only small differences).

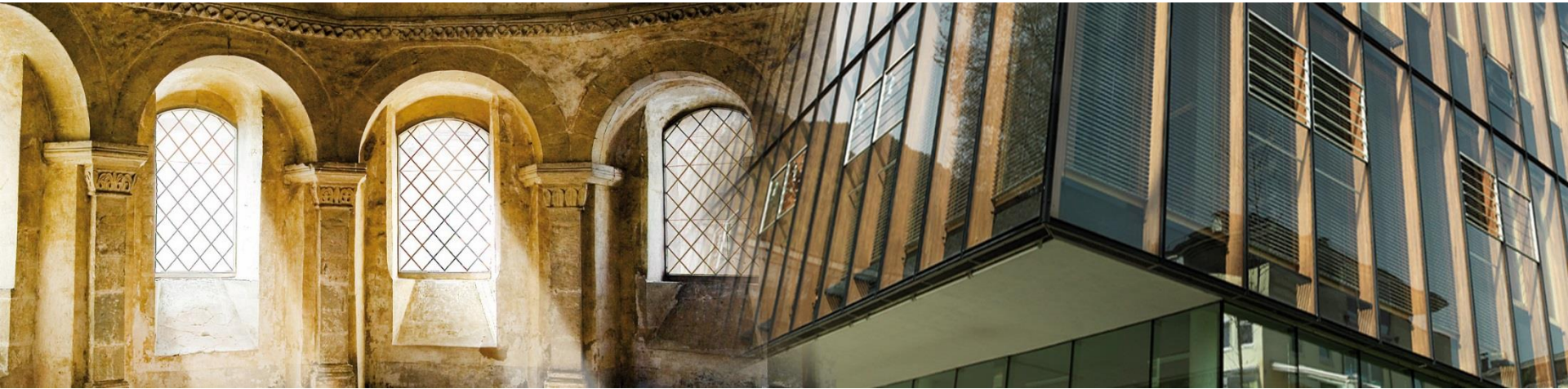
Hypotheses testing

Hypothesis	Result	Discussion
H1: Small firms have a significantly lower profitability when compared to medium-sized firms.	Rejected	Based on the U-test, there are no statistically significant differences in the profitability ratios between the two types of firms.
H2: For medium-sized firms, related diversification makes a significantly higher contribution to corporate performance when compared to unrelated diversification.	Rejected	Based on the U-test, there are significant differences in profitability between related and unrelated diversifiers. Unrelated diversifiers exhibited a higher profitability (measured using EBITDA) compared to related diversifiers and non-diversified firms. In the case of EBIT as a measure of profitability, no statistically significant differences were observed.
H3a: Diversification has a significant positive effect on profitability for medium-sized firms.	Rejected	Only unrelated diversification was significantly and positively contributing for higher profitability (measured using EBITDA). The hypotheses did not hold for related diversification (REL_DIV: significantly negative contribution) and diversification (DIV: insignificant contribution) generally. The results do not hold in robustness test, because in this case diversification generally was statistically insignificant.
H3b: Diversification has no significant effect on profitability for small firms.	Not rejected	The regressed independent variables measuring diversification were not statistically significant. The results hold also in the case of the robustness test, where profitability was measured using EBIT.
H4: There is a non-linear relationship between company size and profitability.	Not rejected	Based on the regression results (all firms together) the variable SIZE ² was significant, indicating that profitability decreases with company size. Specifically, non-linear behaviour between profitability and size is observable for small firms while remaining linear for medium-sized firms. The results are robust for both versions of profitability.
H5: There is a non-linear relationship between company age and profitability.	Not rejected	Based on the regression results (all firms together) the variable AGE ² was significant, indicating that profitability decreases with company age. Specifically, the relationship between profitability and age remains linear for small firms and then changes to a negative non-linear relationship for medium-sized firms. The results are robust for both versions of profitability.

Limitations of the study

- Even if 1,095 observations for a three year period were used – the **sample size** always remains a problem
- **Low degree of explained variances**, which means that some other not considered variables were more appropriate to explain the dependent variables
- **Non-normality** of data is influencing the estimation procedure of regression analysis

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