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Article

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BANKING & FINANCE | REVIEW ARTICLE

A meta-analysis of risk taking and corporate performance

Puong My Thi Pham¹ and Binh Thanh Thi Dao^{1*}

Abstract: Risk-taking is a topic that has been studied for many years in finance under the famous slogan in the financial industry “Higher risk, higher return”. Nevertheless, empirical results have shown different scenarios. Using a sample of 56 researches with 406 studies covering millions of companies globally in the period from 2010 to 2020, this study applies a meta-analysis approach—a synthetic analysis approach to better understand the relationship between risk-taking and corporate return. Specifically, the studied risk-taking variables are: Leverage, Research and Development costs (R&D), and Firm Size; besides, the corporate return variables are Return on Assets (ROA), Return on Equity (ROE), Return on Sales (ROS), and Profit After Tax (PAT) standing for Accounting performance measures and Tobin’s Q and Market to Book Value (MBV) standing for Market performance measures. Finally, the results have shown that Leverage, R&D, and Size have decent impacts on corporate returns, both Accounting performance and Market

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Thi My Phuong Pham completed her Bachelor’s Degree in Accounting and Finance, Master’s Degree in Finance and Investment both from University of Exeter, United Kingdom. Puong had been an accomplished and results-driven financial analyst with 3 years of experience in banking and financial industry. Furthermore, Puong has been working as a Finance Lecturer at Hanoi University, Vietnam and Latrobe University, Hanoi Campus, Vietnam for the last 5 years. Puong has been doing researches on finance topics and has published articles relating to business failure, mutual funds in Vietnam and university governance in Vietnam. This research mainly focuses on giving the big picture of the relationship between risk-taking factors and corporate performance using meta-analysis, a synthesize approach which can be used in many different fields.

Binh Dao obtained her PhD in Credit Risk at University Paris Dauphine in 2005. Binh currently works at the Department of Finance, Hanoi University. Binh does research in Mathematical Economics, Banking Risks, Capital Structure and Corporate Governance. Her current project is ‘Capital Structure and Firm Efficiency’ and Meta-Analysis of Risks Taking.

PUBLIC INTEREST STATEMENT

The relationship between risks and returns has been continuously discussed in many different researches with different results – negative or positive or not significant impacts. Therefore, the research “A Meta-Analysis of Risk-taking and Corporate Performance” has summarized that relationship between risks and returns; specifically, between risk-taking factors of the firms and their corporate performance, using a sample of 56 researches with 406 studies covering companies globally. The research has clearly explained the methodology of using Meta-Analysis approach that can give an overview to the examined field and it can yield conclusive results even when individual studies are inconclusive. Generally, the findings have showed moderate results of how risk-taking factors influence to corporate returns.

performance. Despite having some limitations, the study has provided critical insights into the literature review and established a big picture of the relationship between risk-taking and corporate return.

Subjects: Corporate Finance; Financial Management; Risk Management

Keywords: Meta-analysis; risk-taking; performance; leverage; R&D; firm size

1. Introduction

Risk is inarguably an integral part of strategic management theory and empirics, which has been extensively studied in many researches using a variety of theoretical frameworks including the agency theory (Jensen & Meckling, 1976) and behavioral agency model (Wiseman & Gomez-Mejia, 1998). Furthermore, risk-taking at corporate level has been analyzed from different aspects such as the opportunity seeking (Hills et al., 1997) and the decision making (Busenitz, 1999). The debates regarding the most appropriate level of risk-taking and the influence this risk-taking has on corporate performance have varied (Hughes & Morgan, 2007; Zahra, 1993). Some have suggested that increasing risk-taking beyond a specific level might have moderate impacts on corporate performance (Miller & Friesen, 1982), while the others have argued that there are contingent rather than direct relationships between risk-taking and corporate performance (Lyon et al., 2000). In general, there have been a vast number of empirical studies in the literature world investigating the relationship between risk-taking and corporate performance. Nonetheless, how the benefits of risk-taking towards corporate performance can be best leveraged requires further exploration.

As a result, this research paper aims to analyze 56 researches with 406 studies on this topic in the period from 2010 to 2020 to give a general conclusion of the whole picture. With this goal, the meta-analysis is applied because meta-analysis allows us to clarify and synthesize the substantial number of existing empirical findings regarding risk.

The research first begins with an Introduction about the topic of the relationship between Risk-taking and Corporate performance. The second part is the Literature Review on Risk-taking factors and Meta-analysis; then the hypotheses are introduced. Subsequently, the third part of the research interprets the sample size and meta-analysis methodology, including meta-analysis HOMA and meta-analysis regression MARA. Then the results of the meta-analysis and meta-analysis regression are given and analyzed in part four. Lastly, part five presents the generally determined conclusion of the relationship between risk-taking and corporate performance.

2. Literature review and hypothesis development

2.1. Literature review on risk-taking factors

Risk can be defined as the likelihood of the outcome that we do not expect (Knechel, 2002). In finance, Damodaran (2012) defines risk more broadly; specifically, risk refers to the likelihood of receiving the return on an investment that is different from what we expected, not only the bad outcomes but also the good ones (Damodaran, 2012). Further, risks at the enterprise level may be viewed as the outcomes of a firm's corporate strategy differing from the firm's corporate objectives (Dickinson, 2001).

In taking a risk, the firm shows the willingness to change from a predictable situation to a situation where it can seize opportunities and make commitments; often when the outcome is highly unpredictable (Covin & Slevin, 1991; Miller & Friesen, 1982). Previous research has shown that changing the level of risk-taking may be detrimental to the corporate performance (Miller & Friesen, 1982), while others argued that contingent rather than direct relationships can be a more accurate explanation of corporate performance (Lyon et al., 2000). In either way, most research

findings have conclusively indicated that the relationship between risk-taking and corporate performance has been established.

According to Arrfelt et al. (2012), Research and Development investment (R&D) and the use of debt best and most unambiguously reflect the risk-taking in relation to corporate performance. They are strategic levers that firms use to achieve their goals reflecting increased risk-taking in the pursuit of such goals (Arrfelt et al., 2012). Also, the company size is considered to have huge impact on the corporate performance (Ravšelj & Aristovnik, 2020). Because a vast number of researches exploring the relationship between risk-taking and corporate performance have given different research findings and results, there needs a research as a whole picture on this aspect. Therefore, this research aims to review the influence of three risk-taking factors on corporate performance to generate an overall conclusion.

2.2. Literature review on meta-analysis

The term “meta-analysis” represents “the statistical analysis of a large collection of analysis results from individual studies for the purpose of integrating the findings” (Glass, 1976). More specifically, meta-analysis can be interpreted as the idea of combing and pooling research findings in many different disciplines by collecting the results of studies consistently and precisely (Hedges & Olkin, 1985). Previously, meta-analysis was mainly used in medical sciences; however, it is now a popular statistical technique to synthesize studies not only in medical sciences but also in educational and social sciences.

Indeed, among extant literature, a great amount of those has discovered and analyzed the impact of risk-taking on firm performance throughout the world. For example, how R&D affects the corporate performance has been mentioned in Lin et al. (2011), Xu & Jin (2016), and Ravšelj and Aristovnik (2020); or the influence of leverage on the firm performance in Margaritis and Psillaki (2010), González (2013), and Vithessonthi and Tongurai (2015b); or the relationship between company size and the corporate performance in Vithessonthi and Tongurai (2015a), Loo and Lau (2019), and Ravšelj and Aristovnik (2020).

The debate of what the most appropriate level of risk-taking is and what effect this activity has on firm performance has varied (Hughes & Morgan, 2007). That is the reason why this paper is inspired to execute a Meta-analysis on Risk-taking and Firm Performance. This research uses meta-analysis to examine the risk-taking in relation to corporate performance as a whole picture systematically.

Moreover, although there exists meta-analysis regarding impacts on the association between risk-taking and business value (Arrfelt et al., 2012), it recently solely covers 257 unique studies in the period from 1970 to 2010. As a result, this paper may yield a distinctive contribution to meta-analysis through investigating more current published papers in the period from 2010 to 2020.

2.3. Hypothesis development

The paper will analyze risk-taking in terms of three variables in relation to corporate performance; particularly, financial leverage (LEVERAGE), Research and Development investment (R&D), and size of the corporation (SIZE). As discussed previously, although the influence of these three variables on corporate performance may be dissimilar in different research findings; in this research, we will look at the whole picture. The first one refers to LEVERAGE, which is expected to negatively affect corporate performance because a higher level of debt requires a higher level of company resources to repay the debt, which eventually reduces the available funds for other investments (Nunes et al., 2009; Asimakopoulou et al., 2009). Following, R&D is the second risk-taking factor to be used in this research. Even though the influence of R&D varies from industries to industries, some researchers expect investment in R&D to be positively related to corporate performance (Arrfelt et al., 2012). Similar evidence can be found for Turkey companies (Ayaydin & Karaaslan, 2014; Kiraci et al., 2016) and Indian listed companies (Busru & Shanmugasundaram, 2017). Nevertheless, the findings of different empirical studies are inconclusive. The dominant belief in

the relation between R&D and corporate performance is that there should be no or even negative impact of R&D expenditures on current corporate performance, whereas the impact becomes positive in the future periods. This belief is supported in cases of Chinese and Japanese companies (Rao et al., 2013); French companies (Asthana & Zhang, 2006), and others (Cazavan-Jeny & Jeanjean, 2006; Usman et al., 2017; Vithessonthi & Racela, 2016). Last but not least, SIZE is usually expected to have a positive impact on the corporate performance as bigger companies can be able to use economies of scale, have facilitated or better access to capital markets and can create barriers to newly emerging companies (Nunes et al., 2009; Titman & Wessels, 1988). Yet, this risk-taking factor (SIZE) is considered to have a negative influence on market performance (Kim et al., 2018).

In Vietnam, many studies have analyzed the relationship between risk-taking and corporate performance. Using the percentile regression approach, Tran Thi Tuan Anh and colleagues (2017) showed that financial leverage has a negative impact on the performance of the business and the degree of impact is different in different regions and different percentiles. All other things being equal, financial leverage has a less negative effect on firms with low ROE and the increase of financial leverage will cause a higher decrease in ROE in firms with high percentile (Anh & Thuỳ, 2017). Also in the same study, firm size was determined to have a positive relationship with ROE on all percentiles (Anh & Thuỳ, 2017). However, firm size has a negative impact on market performance of the firms (measured by Tobin's Q) as proved in the study of listed companies on the Vietnamese stock market in the period between 2009 and 2015 (Phong & Thanh, 2017). The study also showed that financial leverage is positively correlated with corporate performance (Phong & Thanh, 2017).

On the other hand, R&D activities help businesses support and expand existing businesses, develop new businesses, improve competitive position, increase market share and increase sales. Given that, the impact of R&D on firm performance is of great interest, but recent studies have shown that it is still difficult to quantify (Sơn & Hạnh, 2011). Estimation results from the DEA model show that the technical efficiency of R&D in Binh Dinh furniture manufacturing and exporting enterprises is generally low and tends to decline (Sơn & Hạnh, 2011). However, researcher Nguyen Minh Ngoc also believes that R&D affects business results by both direct and indirect mechanisms, in which the direct mechanism is more important (Ngoc, 2016). On the other hand, using the regression analysis method, the investment in R&D activities (including increasing investment in R&D, increasing the staff working in R&D activities of the enterprise) has a positive impact on business results (Anh, 2020).

All of these hypotheses are summarized in Table 1 and will be analyzed in this research.

3. Sampling and Methodology

3.1. Sampling

To provide comprehensive coverage of risk research, we initially gathered 130 published papers with risk-specific search terms; including terms like risk-taking, firm risk, risky behaviors and corporate performance, from different sources such as Science Direct, Research Gate, Wiley

Table 1. Hypotheses of risk-taking factors' impact on corporate performance

Number	Hypothesis
H1	Leverage negatively affects corporate performance
H2	R&D negatively affects corporate performance
H3a	Size positively affects accounting performance
H3b	Size negatively affects market performance

Table 2. Variable Definition and Measurements

No.	Predictor	Symbol	Measurement
I. Dependent Variables			
1	Accounting Performance	ACC	Return on Equity (ROE)
			Return on Assets (ROA)
			Return on Sales (ROS)
			Profit after Tax (PAT)
2	Market performance	MKT	Tobin's Q
			Market-to-Book value (MBV)
II. Independent Variables			
3	Leverage	LEVERAGE	Total Liabilities/Total Assets
4	Research and development	R&D	The R&D Expenses
			The R&D Intensity
5	Board Size	SIZE	The Natural Logarithm of Total Assets

Online Library and Emerald Insights. However, some researches have been filtered out as they provide insignificant results and/or unrelated findings within the scope of this paper. In the end, 56 published researches of all industries except finance are thus collected with a total of 406 studies covering millions of companies globally from 2010 to 2020.

3.1.1. Dependent Variables

The paper analyses on two main business performance forms which are accounting-based performance and market performance. Accounting-based performance can be measured by proxy such as Return on Assets (ROA), Return on Equity (ROE), Return on Sales (ROS), and Profit After Tax (PAT). For market performance, Tobin's Q and Market to Book Value (MBV) are used as proxy. Five aspects of corporate performance are used as dependent variables in this paper and will be described in more details in Table 2.

3.1.2. Independent Variables

As noted earlier, we focused on three of the most commonly studied unique types of risk-taking choices made by firms: leverage, R&D investment and size as the explanatory variables. In which, R&D investment are measured by R&D Expenses and R&D Intensity.

3.2. Methodology Overview

As mentioned previously in the literature review, meta-analysis synthesizes, aggregates and analyzes research findings of various studies to generate a more systematic result (DerSimonian & Laird, 1986; Hunter & Schmidt, 1990). Indeed, meta-analysis gives an overview to the examined field and it can yield conclusive results even when individual studies are inconclusive (Lee, 2018). The main difference in meta-analysis that make this technique be able to synthesize distinguished results is that a common indicator is calculated, which is called Effect Size (denoted as ES). Furthermore, meta-analysis can also analyze which factor may affect the metric of ES through meta-regression.

In this research, both meta-analysis *Hedges and Olkin Meta-Analysis (HOMA)* and meta-regression *Meta-Analytical Regression Analysis (MARA)* procedures will be implemented and analyzed in order to generate the conclusion of the relationship between risk-taking and corporate performance.

3.2.1. Hedges and Olkin Meta-Analysis (HOMA)

A major advantage of meta-analysis is that it produces a precise estimate of the ES, with considerably increased statistical power (Lee, 2018). ES is said to be “a quantitative measure of the magnitude of some phenomenon that is used for the purpose of addressing a question of interest” (Cheung, 2015). By definition, ES represents the different size between two categories. Straightforwardly, in meta-analysis, ES standardizes different empirical papers’ quantitative results into a general benchmark to compare them together and thus achieve more systematic conclusions.

Consistent with other meta-analyses in strategic management, this research uses Hedges and Olkin Meta-Analysis (HOMA; Hedges & Olkin, 1985) to conduct meta-analytic view. First, partial correlation is computed using Copper and Hedges’ technique to compute correlation from *t Student* according to Formula (1; Cooper & Hedges, 1993). Second, based on HOMA’s methodology to transform the computed partial correlation into equivalent ES (or Fisher Z_r Score) according to Formula (2; Hedges & Olkin, 1985). Finally, Hedges and Olkin stated that it was better in application to weight the ES according to distinguished studies’ characteristics; consequently, the research paper calculates the weighted ES (or \bar{Z}_r), taking into account the weight factor according to Formula (3; Hedges & Olkin, 1985).

$$r = \sqrt{\frac{t^2}{t^2 + df}} \quad (1)$$

$$Z_{r_i} = \frac{1}{2} \ln \left(\frac{1 + r_i}{1 - r_i} \right) \quad (2)$$

$$\bar{Z}_r = \frac{\sum_1^k w_i Z_i}{\sum_1^k w_i} \quad (3)$$

In Formula (3), there is a weight factor w_i which means the weight of the study i^{th} in accordance with its Z_r . Particularly, the weight factor shows how much a study contributes to the whole sample as compared to the others.

In order to compute the weight factor w_i , two models are usually considered in meta-analysis: **fixed effect model (FEM)** and **random effect model (REM)**. They are basically different due to their assumption on heterogeneity issue among studies. In details, whereas fixed model supposes that studies are homogenous, the random model assumes that heterogeneity may exist in sample size and thus, two models will lead to distinguished method to produce the weight factor.

Specifically, the first method of **FEM** assumes no heterogeneity in the sample size; thereby, the weight is believed to experience solely the inner-study error, which is the random error within a study—variance or SE^2 . Based on HOMA, the weight factor in FEM is generated from the inverse of inner-study’s variance v_i as demonstrated in Formula (4) and (5) (Hedges & Olkin, 1985).

$$w_i = \frac{1}{v_i} \quad (4)$$

$$v_i = Se_i^2 \text{ or } \sigma^2 \quad (5)$$

On the other hand, **REM** supposes the existence of heterogeneity within the sample size; in that case, not only the inner-study error but also the between-study error should be taken into consideration in meta-analysis. As a consequence, the weight factor in REM is measured by both the inner-study’s variance v_i and the between-study’s variance τ as given in Formula (6) (DerSimonian & Laird, 1986; Hedges & Olkin, 1985).

Table 3. Dummy Variable Definition

Dummy variables	Description
d_scopus	A dummy variable that takes value of 1 for the paper published in Scopus and 0 for Otherwise
d_listed	A dummy variable that takes value of 1 for the sample including listed companies and 0 for Otherwise
d_control	A dummy variable that takes value of 1 for the model including control variables and 0 for Otherwise

$$w_i = \frac{1}{v_i + \tau} \quad (6)$$

For both approaches, subsequent to compute ES, z test and confidence interval at 95% will be generated as demonstrated in Formulae (7) and (8), respectively.

$$ztest = \frac{\overline{ES}}{Se_{ES}} \quad (10)$$

$$CI_{95\%} = \overline{ES} \pm 1.96(Se_{ES}) \quad (11)$$

In this research paper, both method FEM and REM will be executed in order to investigate the possible differences and similarities; nevertheless, Hypothesis 1 to 3 is concluded solely based on REM due to its realistic assumption of the existences of heterogeneity in the sample size.

3.2.2. Meta-Analytical Regression Analysis (MARA)

While the normal meta-analysis provides a synthesized ES from various studies, meta-analysis regression can be applied to analyze factors influencing on the interested relation, which is also called moderator analysis. Thus, accompanied with HOMA procedure, this research paper will also proceed MARA.

In order to test moderating effects, three dummy variables are added into the regression as moderators. Details are given in Table 3—Dummy Variable Definition.

Due to the realistic assumption of the existence of heterogeneity in the sample size, as explained earlier, REM will be applied to proceed meta-analytical regression in this paper.

4. Results and Analysis

4.1. Descriptive statistics

4.1.1. Traditional Descriptive Analysis

To provide comprehensive coverage of the risk-taking factors, this research provides the traditional descriptive analysis of the three explanatory variables LEVERAGE, R&D and SIZE. As given in Table 4, the mean, median, first quantile, third quantile, and standard deviation of the overall sample as well as of individual explanatory variable are generated. Moreover, the number of research findings including “positive”, “negative”, and “not significant” is measured in the descriptive analysis.

This descriptive analysis may yet provide important details on the examined topic, it can also probably be biased, and hence, difficult to produce a general conclusion. The fact is that this research uses meta-analysis in analyzing and synthesizing and it may induce potential

Table 4. Descriptive Analysis

Descriptive analysis	Overall	LEVERAGE	R&D	SIZE
Mean	0.472	−0.432	1.725	0.495
1st quartile	−0.212	−0.489	−0.053	−0.022
Median	0.0005	−0.143	0.083	0.041
3rd quartile	0.168	−0.0008	2.117	0.199
Standard deviation	2.969	1.787	4.796	1.938
# positive coefficient	159	23	46	90
	39.16%	16.43%	46.94%	53.57%
# negative coefficient	165	84	34	47
	40.64%	60.00%	34.69%	27.98%
# not significant coefficient	82	33	18	31
	20.20%	23.57%	18.37%	18.45%
Total studies	406	140	98	168

Table 5. Descriptive analysis on effect size

		Number of studies	Mean	Standard Error
LEVERAGE	Partial correlation	140	−0.07939	0.20987
	ES	140	−0.08448	0.23099
R&D	Partial correlation	98	0.01962	0.18846
	ES	98	0.02162	0.20833
SIZE	Partial correlation	168	0.02464	0.20239
	ES	168	0.02626	0.23315

Table 6. HOMA results: risk-taking and accounting performance

Risk-taking	Effect size	[95% Conf. Interval]		Z Test (p value)	Chi Test (p value)
LEVERAGE	−0.106	−0.196	−0.016	−2.3 ** (0.0213)	4.8e+06 *** (0.0000)
R&D	−0.022	−0.032	−0.013	−4.56 *** (0.0000)	3.0e+05 *** (0.0000)
SIZE	0.093	0.027	0.159	2.77 *** (0.0055)	3.0e+05 *** (0.0000)

*** Significant at 1% level. ** Significant at 5% level.

heterogeneity within the sample size. Thus, in this research, another descriptive on ES is conducted in order to deliver more reliable results.

4.1.2. Descriptive Analysis on Effect Size

Different from the traditional descriptive analysis, this descriptive analysis specifically analyzed the Partial Correlation and ES of each individual explanatory variable. The details of number of studies, mean and standard error of each components are demonstrated in Table 5.

Table 7. HOMA results: risk-taking and market performance

Risk-taking	Effect size	[95% Conf. Interval]		Z Test (p value)	Chi Test (p value)
LEVERAGE	-0.184	-0.185	-0.183	-665.74*** (0.0000)	2.2e+0.6*** (0.0000)
R&D	0.031	0.006	0.057	2.38 ** (0.0171)	1.2e+05*** (0.0000)
SIZE	-0.341	-0.341	-0.341	-2134 *** (0.0000)	4.4e+05 *** (0.0000)

*** Significant at 1% level. ** Significant at 5% level.

Table 8. HOMA results: FEM and REM

	Accounting performance		Market performance	
	FEM	REM	FEM	REM
LEVERAGE	-	-	-	-
R&D	-	-	+	+
SIZE	+	+	-	-

4.2. HOMA Results

As noted earlier, although both **Fixed Effect Model (FEM)** and **REM** are executed, but only REM will be used to give conclusion about the relationship between three risk-taking factors and firm performance. Data of the meta-analytic mean (or ES) are proceeded together with its 95% confidence interval and z-test result. Due to the possibly existence of heterogeneity problems among studies, a significance test of the homogeneity of the individual ESs is performed using a Chi-squared test (similar to the test for homogeneous variance in ANOVA).

Tables 6 and 7 show the relation of each explanatory variable to Accounting performance and Market performance.

4.2.1. Risk-taking and Firm Performance

Hypothesis 1 predicted that Leverage was negative related to corporate performance measured as Accounting performance and Market performance. As shown in Table 6, LEVERAGE was negatively correlated with Accounting performance at 1% level of significance (ES = -0.106; CI = [-0.196, -0.016]); also, as given in Table 7, the correlation between LEVERAGE and Market performance is negative (ES = -0.184; CI = [-0.185, -0.183]). Results from the meta-analysis supported the negative association between LEVERAGE and corporate performance, including Accounting performance and Market performance. Hence, Hypothesis 1 was supported.

Next, Hypothesis 2 stated that R&D investment was negatively related to corporate performance. As shown in Tables 6 and 7, R&D investment was negatively correlated with Accounting performance (ES = -0.022; CI = [-0.032, -0.013]; Table 6); nevertheless, it has a positive correlation with Market performance (ES = 0.031; CI = [0.006, 0.057], Table 7). Thus, Hypothesis 2 was partially supported.

Finally, Hypothesis 3a predicted SIZE to be positively related to Accounting performance and Hypothesis 3b predicted SIZE to be negatively related to Market performance. As shown in Table 6, SIZE was positively related to Accounting performance (ES = 0.093; CI = [0.027, 0.159]). As shown in Table 7, SIZE was negatively related to Market performance (ES = -0.341; CI = [-0.341, -0.341]). Hence, Hypothesis 3a and 3b were supported.

Table 9. MARA results: risk-taking and accounting performance

Risk-taking	LEVERAGE	R&D	SIZE
<i>d_scopus</i>	0.038 (0.479)	0.239*** (0.000)	0.008 (0.881)
<i>d_listed</i>	−0.004 (0.932)	0.052*** (−0.000)	0.097* (0.063)
<i>d_control</i>	−0.119 (0.127)	0.190*** (−0.000)	−0.068 (0.471)

P-value in parentheses.

*** Significant at 1% level **Significant at 5% level *Significant at 10% level.

Table 10. MARA results: risk-taking and market performance

Risk-taking	LEVERAGE	R&D	SIZE
<i>d_scopus</i>	0.148 (0.344)	0.003 (0.987)	0.008 (0.750)
<i>d_listed</i>	0.039 (0.743)	0.068*** (0.000)	−0.199*** (0.000)
<i>d_control</i>	0.007 (0.971)	−0.436 (0.244)	−0.109*** (0.001)

P-value in parentheses.

***Significant at 1% level. **Significant at 5% level. *Significant at 10% level.

Generally speaking, all the three risk-taking variables: Leverage, R&D and SIZE have significant impacts on corporate performance, both Accounting performance and Market performance.

4.2.2. Comparison of FEM and REM

As mentioned previously, both FEM and REM will be computed to investigate possible differences and similarities in the two methodologies. Table 8 demonstrated the results of both methodologies including the significant results as (+) for positive correlation or (−) for negative correlation and the insignificant results as (∼) at 5% level of significance.

Witness the consistency between FEM and REM's results in all three explanatory variables: LEVERAGE, R&D and SIZE; it is not quite difficult to give decisions based on both methodologies. The source of the differences between FEM and REM mainly due to the fact that not only FEM assumes there is no heterogeneity in the examined sample size while REM supposes oppositely; but also, FEM assumes that there is one true ES underlying all the studies in the meta-analysis, while REM supposes that the true ES could vary from study to study. Due to their differences in assumptions, the choice between FEM and REM cannot be fixed subjectively for all meta-analysis. Particularly, this research paper applies REM to give general determined conclusion to the relationship between risk-taking and corporate performance.

4.3. MARA Results—Moderating Effects

Moderator analysis play a considerable role in finding sources of heterogeneity as well as discover factors affecting the main studied relations.

As synthesized in Table 9, the dummy Listed companies show a significant impact on moderating the link between two explanatory variables and the corporate performance; as in specification, (+) positive link with R&D and SIZE at 1% and 5% significance, respectively; and no link with LEVERAGE. On the other hand, the dummy variable of Scopus research papers and the dummy variable of Control variables show non-significant effects on LEVERAGE and SIZE, while they show a positive link with R&D at 1% significance.

Table 10 describes the moderator variables in meta-regression with risk-taking and Market performance. Different from Table 9, the dummy Scopus papers shows no significant impact on all three explanatory variables, while the dummy Listed companies has significantly influences R&D and SIZE and the dummy Control variables only significantly affects SIZE.

In overall, different moderator variables have different impacts on the relation between specific explanatory variables and corporate performance.

5. Conclusion

In conclusion, meta-analysis has been used in this research paper to synthesize the relation between three variables: leverage, R&D and size of the companies, and corporate performance. The research applies both HOMA and MARA procedures to test the relation and any moderator variables that can influence on that examined relation.

Generally, Leverage has a negative impact on corporate performance, both Accounting performance and Market performance. R&D has a negative effect on Accounting performance; while has a positive influence on Market performance. Size, on one hand, has a positive influence on Accounting performance; on the other hand, has a negative influence on Market performance. Also, the meta-analysis regression shows that moderator variables have different effects on specific relation between risk-taking factors and corporate performance, both Accounting and Market performance.

Even though, there are several studies included in this meta-analysis (406 studies in 56 research papers to be specified), it is relatively small-scale compared to the huge number of research papers in the literature world. Therefore, researchers are recommended to conduct further examinations in order to give a wider view on the topic of the relation between risk-taking and corporate performance in term of meta-analysis research.

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APPENDICES

Accounting performance—LEVERAGE

No. of studies: 74

(1) Random Effect Model (REM)

Study	ES	[95% Conf. Interval]		% Weight
International Review of Economics and Finance	−0.008	−0.016	−0.001	1.5
International Review of Economics and Finance	−0.004	−0.007	−0.001	1.5
International Review of Economics and Finance	−0.009	−0.03	0.011	1.5
International Review of Economics and Finance	−0.025	−0.03	−0.021	1.5
International Review of Economics and Finance	−0.01	−0.045	0.025	1.49
International Review of Economics and Finance	−0.039	−0.054	−0.024	1.5
University of Vaasa	0.12	0.1	0.141	1.5
Research in International Business and Finance	−0.007	−0.205	0.191	1.4
Research in International Business and Finance	−0.06	−0.383	0.263	1.26
Research in International Business and Finance	−0.006	−2.538	2.526	0.12
Research in International Business and Finance	−0.048	−0.372	0.275	1.26
Research in International Business and Finance	−0.007	−2.323	2.31	0.14

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
Research in International Business and Finance	0.029	-0.68	0.739	0.78
Research in International Business and Finance	0.023	-0.859	0.905	0.62
Journal of Banking & Finance	0.089	0.046	0.132	1.49
Journal of Banking & Finance	0.064	0.051	0.078	1.5
Journal of Banking & Finance	0.107	0.07	0.145	1.49
The Sixth Annual Conference on Asia-Pacific Financial Markets	-0.166	-0.181	-0.152	1.5
The Sixth Annual Conference on Asia-Pacific Financial Markets	-0.174	-0.19	-0.158	1.5
Bank of Finland Research Discussion Paper	-0.048	-0.136	0.04	1.48
Sustainability	-0.386	-0.401	-0.371	1.5
Sustainability	-0.535	-0.549	-0.52	1.5
Sustainability	-0.348	-0.373	-0.323	1.5
Sustainability	-0.236	-0.263	-0.208	1.5
Sustainability	-0.13	-0.195	-0.066	1.49
Sustainability	-0.178	-0.207	-0.148	1.5
Sustainability	-0.242	-0.28	-0.205	1.49
Sustainability	-0.171	-0.254	-0.089	1.48
Sustainability	-0.172	-0.211	-0.133	1.49
Sustainability	-0.216	-0.257	-0.175	1.49
Sustainability	-0.047	-0.151	0.056	1.47
Sustainability	-0.19	-0.237	-0.143	1.49
Journal of Multinational Financial Management	-0.008	-0.184	0.169	1.42
Journal of Multinational Financial Management	-0.015	-0.182	0.151	1.43
Journal of Multinational Financial Management	-0.018	-0.182	0.147	1.43

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
Journal of Multinational Financial Management	-0.008	-0.192	0.177	1.41
Journal of Risk Finance	-0.186	-0.195	-0.176	1.5
Journal of Risk Finance	-0.136	-0.153	-0.118	1.5
Academy of Accounting and Financial Studies Journal	0.07	-0.061	0.2	1.45
Rivista Bancaria. Minerva Bancaria	-0.146	-0.147	-0.144	1.5
Rivista Bancaria. Minerva Bancaria	-0.05	-0.053	-0.047	1.5
Rivista Bancaria. Minerva Bancaria	-0.268	-0.269	-0.267	1.5
Rivista Bancaria. Minerva Bancaria	-0.565	-0.565	-0.565	1.5
International Journal of Academic Research in Economics and Management Sciences	-0.051	-0.056	-0.047	1.5
Research in International Business and Finance	0.081	0.026	0.136	1.49
Research in International Business and Finance	-0.025	-0.05	0.001	1.5
Vision: The Journal of Business Perspective	0.016	0.009	0.023	1.5
Vision: The Journal of Business Perspective	0.01	0.003	0.017	1.5
Journal of Corporate Finance	0.013	0.003	0.024	1.5
International Journal of Accounting and Financial Reporting	-0.734	-0.847	-0.62	1.46
International Journal of Accounting and Financial Reporting	-0.734	-0.83	-0.637	1.47

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
International Journal of Accounting and Financial Reporting	-0.294	-0.439	-0.149	1.44
International Journal of Accounting and Financial Reporting	-0.4	-0.579	-0.222	1.41
International Journal of Accounting and Financial Reporting	-0.274	-0.493	-0.054	1.38
International Journal of Accounting and Financial Reporting	-0.238	-0.497	0.022	1.33
International Journal of Accounting and Financial Reporting	-0.734	-0.946	-0.521	1.38
International Journal of Accounting and Financial Reporting	-0.734	-0.999	-0.468	1.33
International Journal of Accounting and Financial Reporting	0.508	0.085	0.931	1.13
Journal of Economics and International Finance	0.467	-2.175	3.108	0.11
Journal of Economics and International Finance	-0.116	-1.976	1.744	0.2
Journal of Economics and International Finance	-0.116	-0.89	0.657	0.72
KASBIT Business Journal	0.252	0.251	0.253	1.5
KASBIT Business Journal	0.539	0.525	0.553	1.5
KASBIT Business Journal	0.539	0.513	0.566	1.5
KASBIT Business Journal	0.352	0.125	0.58	1.37
Middle-East Journal of Scientific Research	-0.254	-0.643	0.135	1.17
Middle-East Journal of Scientific Research	0.06	-0.328	0.448	1.17

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
Journal of Economics and Finance	-0.026	-0.027	-0.024	1.5
Journal of Economics and Finance	0.132	0.13	0.133	1.5
Journal of Economics and Finance	-0.077	-0.078	-0.075	1.5
Review of Financial Economics	-0.126	-0.154	-0.097	1.5
Review of Financial Economics	-0.078	-0.105	-0.051	1.5
Review of Financial Economics	-0.196	-0.209	-0.183	1.5
Studii Financiare (Financial Studies)	-0.383	-0.454	-0.312	1.48
theta	-0.106	-0.197	-0.016	

(2) **Fixed Effect Model (FEM)**

Study	ES	[95% Conf. Interval]		% Weight
International Review of Economics and Finance	-0.008	-0.016	-0.001	0.06
International Review of Economics and Finance	-0.004	-0.007	-0.001	0.28
International Review of Economics and Finance	-0.009	-0.03	0.011	0.01
International Review of Economics and Finance	-0.025	-0.03	-0.021	0.17
International Review of Economics and Finance	-0.01	-0.045	0.025	0
International Review of Economics and Finance	-0.039	-0.054	-0.024	0.01
University of Vaasa	0.12	0.1	0.141	0.01

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
Research in International Business and Finance	-0.007	-0.205	0.191	0
Research in International Business and Finance	-0.06	-0.383	0.263	0
Research in International Business and Finance	-0.006	-2.538	2.526	0
Research in International Business and Finance	-0.048	-0.372	0.275	0
Research in International Business and Finance	-0.007	-2.323	2.31	0
Research in International Business and Finance	0.029	-0.68	0.739	0
Research in International Business and Finance	0.023	-0.859	0.905	0
Journal of Banking & Finance	0.089	0.046	0.132	0
Journal of Banking & Finance	0.064	0.051	0.078	0.02
Journal of Banking & Finance	0.107	0.07	0.145	0
The Sixth Annual Conference on Asia-Pacific Financial Markets	-0.166	-0.181	-0.152	0.02
The Sixth Annual Conference on Asia-Pacific Financial Markets	-0.174	-0.19	-0.158	0.01
Bank of Finland Research Discussion Paper	-0.048	-0.136	0.04	0
Sustainability	-0.386	-0.401	-0.371	0.01
Sustainability	-0.535	-0.549	-0.52	0.02
Sustainability	-0.348	-0.373	-0.323	0.01
Sustainability	-0.236	-0.263	-0.208	0
Sustainability	-0.13	-0.195	-0.066	0
Sustainability	-0.178	-0.207	-0.148	0

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
Sustainability	-0.242	-0.28	-0.205	0
Sustainability	-0.171	-0.254	-0.089	0
Sustainability	-0.172	-0.211	-0.133	0
Sustainability	-0.216	-0.257	-0.175	0
Sustainability	-0.047	-0.151	0.056	0
Sustainability	-0.19	-0.237	-0.143	0
Journal of Multinational Financial Management	-0.008	-0.184	0.169	0
Journal of Multinational Financial Management	-0.015	-0.182	0.151	0
Journal of Multinational Financial Management	-0.018	-0.182	0.147	0
Journal of Multinational Financial Management	-0.008	-0.192	0.177	0
Journal of Risk Finance	-0.186	-0.195	-0.176	0.04
Journal of Risk Finance	-0.136	-0.153	-0.118	0.01
Academy of Accounting and Financial Studies Journal	0.07	-0.061	0.2	0
Rivista Bancaria, Minerva Bancaria	-0.146	-0.147	-0.144	1.72
Rivista Bancaria, Minerva Bancaria	-0.05	-0.053	-0.047	0.33
Rivista Bancaria, Minerva Bancaria	-0.268	-0.269	-0.267	5.27
Rivista Bancaria, Minerva Bancaria	-0.565	-0.565	-0.565	84.26
International Journal of Academic Research in Economics and Management Sciences	-0.051	-0.056	-0.047	0.16
Research in International Business and Finance	0.081	0.026	0.136	0

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
Research in International Business and Finance	-0.025	-0.05	0.001	0
Vision: The Journal of Business Perspective	0.016	0.009	0.023	0.06
Vision: The Journal of Business Perspective	0.01	0.003	0.017	0.06
Journal of Corporate Finance	0.013	0.003	0.024	0.03
International Journal of Accounting and Financial Reporting	-0.734	-0.847	-0.62	0
International Journal of Accounting and Financial Reporting	-0.734	-0.83	-0.637	0
International Journal of Accounting and Financial Reporting	-0.294	-0.439	-0.149	0
International Journal of Accounting and Financial Reporting	-0.4	-0.579	-0.222	0
International Journal of Accounting and Financial Reporting	-0.274	-0.493	-0.054	0
International Journal of Accounting and Financial Reporting	-0.238	-0.497	0.022	0
International Journal of Accounting and Financial Reporting	-0.734	-0.946	-0.521	0
International Journal of Accounting and Financial Reporting	-0.734	-0.999	-0.468	0
International Journal of Accounting and Financial Reporting	0.508	0.085	0.931	0
Journal of Economics and International Finance	0.467	-2.175	3.108	0

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
Journal of Economics and International Finance	-0.116	-1.976	1.744	0
Journal of Economics and International Finance	-0.116	-0.89	0.657	0
KASBIT Business Journal	0.252	0.251	0.253	3.01
KASBIT Business Journal	0.539	0.525	0.553	0.02
KASBIT Business Journal	0.539	0.513	0.566	0
KASBIT Business Journal	0.352	0.125	0.58	0
Middle-East Journal of Scientific Research	-0.254	-0.643	0.135	0
Middle-East Journal of Scientific Research	0.06	-0.328	0.448	0
Journal of Economics and Finance	-0.026	-0.027	-0.024	1.32
Journal of Economics and Finance	0.132	0.13	0.133	1.72
Journal of Economics and Finance	-0.077	-0.078	-0.075	1.32
Review of Financial Economics	-0.126	-0.154	-0.097	0
Review of Financial Economics	-0.078	-0.105	-0.051	0
Review of Financial Economics	-0.196	-0.209	-0.183	0.02
Studii Financiare (Financial Studies)	-0.383	-0.454	-0.312	0
theta	-0.485	-0.485	-0.484	

(3) Random-effects Meta-Regression

_meta_es	Coef.	Std.	z	P> z 	[95% Conf. Interval]	
Scopus1	0.038008	0.053633	0.71	0.479	−0.0671108	0.1431268
Listed1	−0.0043457	0.0509552	−0.09	0.932	−0.1042161	0.0955247
Control1	−0.1199122	0.0786011	−1.53	0.127	−0.2739675	0.034143
_cons	−0.019796	0.0992816	−0.2	0.842	−0.2143844	0.1747925

Accounting performance—R&D

No. of studies: 51

(1) Random Effect Model (REM)

Study	ES	[95% Conf. Interval]		% Weight
PACIS 2011–15th Pacific Asia C	−0.059	−0.253	0.135	0.24
PACIS 2011–15th Pacific Asia C	−0.17	−0.312	−0.029	0.43
PACIS 2011–15th Pacific Asia C	−0.018	−0.904	0.868	0.01
PACIS 2011–15th Pacific Asia C	−0.562	−1.046	−0.078	0.04
PACIS 2011–15th Pacific Asia C	−0.289	−0.52	−0.058	0.17
PACIS 2011–15th Pacific Asia C	−0.124	−0.906	0.658	0.02
2nd Annual International Confere	−0.281	−0.464	−0.098	0.26
Journal of Advanced Management Science	0.346	−0.564	1.256	0.01
Journal of Advanced Management Science	0.312	−0.41	1.035	0.02
Journal of Advanced Management Science	0.205	−0.58	0.991	0.01
The Sixth Annual Conference on Asia-Pacific Financial Markets	0.036	0.03	0.041	6.39

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
The Sixth Annual Conference on Asia-Pacific Financial Markets	0.026	0.021	0.031	6.4
Sustainability	0.792	0.382	1.201	0.05
Sustainability	0.445	-0.057	0.947	0.04
Sustainability	0.781	0.354	1.208	0.05
Sustainability	-0.049	-0.258	0.16	0.2
Sustainability	0.016	-0.132	0.165	0.39
Sustainability	0.025	-0.172	0.223	0.23
Sustainability	0.12	-0.002	0.242	0.56
Sustainability	-0.067	-0.422	0.288	0.07
Sustainability	-0.058	-0.34	0.224	0.11
Sustainability	-0.055	-0.073	-0.038	5.34
Sustainability	-0.048	-0.087	-0.009	3.12
Sustainability	-0.057	-0.075	-0.04	5.34
Sustainability	-0.052	-0.071	-0.032	5.12
Sustainability	-0.039	-0.086	0.008	2.54
Sustainability	-0.053	-0.075	-0.032	4.9
Sustainability	-0.064	-0.1	-0.029	3.46
Sustainability	-0.062	-0.15	0.026	1
Sustainability	-0.042	-0.082	-0.003	3.12
Sustainability	-0.092	-0.439	0.255	0.08
Sustainability	-0.31	-0.42	-0.2	0.68
Sustainability	-0.092	-1.172	0.988	0.01
Journal of Corporate Finance	-0.013	-0.209	0.182	0.23
Review of Financial Economics	-0.071	-0.198	0.056	0.52
Review of Financial Economics	-0.026	-0.124	0.072	0.83
Review of Financial Economics	-0.051	-0.058	-0.044	6.3
Long Range Planning	0.082	0.003	0.16	1.22
Long Range Planning	0.097	0.039	0.156	1.89
Long Range Planning	0.122	0.063	0.181	1.89
Long Range Planning	0.093	0.034	0.151	1.89
Applied Economics Letters	-0.143	-0.143	-0.142	6.52

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
Applied Economics Letters	-0.164	-0.164	-0.164	6.52
Applied Economics Letters	-0.135	-0.135	-0.135	6.52
Applied Economics Letters	-0.047	-0.09	-0.005	2.87
Industry and Innovation	0.124	0.114	0.135	6.01
Industry and Innovation	0.231	0.223	0.238	6.28
Industry and Innovation	-0.31	-0.942	0.323	0.02
Industry and Innovation	-0.76	-1.41	-0.11	0.02
Industry and Innovation	-0.31	-0.806	0.186	0.04
Industry and Innovation	-0.204	-1.435	1.027	0.01
theta	-0.022	-0.032	-0.013	

(2) Fixed Effect Model (FEM)

Study	ES	[95% Conf. Interval]		% Weight
PACIS 2011–15th Pacific Asia C	-0.059	-0.253	0.135	0
PACIS 2011–15th Pacific Asia C	-0.17	-0.312	-0.029	0
PACIS 2011–15th Pacific Asia C	-0.018	-0.904	0.868	0
PACIS 2011–15th Pacific Asia C	-0.562	-1.046	-0.078	0
PACIS 2011–15th Pacific Asia C	-0.289	-0.52	-0.058	0
PACIS 2011–15th Pacific Asia C	-0.124	-0.906	0.658	0
2nd Annual International Confere	-0.281	-0.464	-0.098	0
Journal of Advanced Management Science	0.346	-0.564	1.256	0
Journal of Advanced Management Science	0.312	-0.41	1.035	0

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
Journal of Advanced Management Science	0.205	-0.58	0.991	0
The Sixth Annual Conference on Asia-Pacific Financial Markets	0.036	0.03	0.041	0
The Sixth Annual Conference on Asia-Pacific Financial Markets	0.026	0.021	0.031	0
Sustainability	0.792	0.382	1.201	0
Sustainability	0.445	-0.057	0.947	0
Sustainability	0.781	0.354	1.208	0
Sustainability	-0.049	-0.258	0.16	0
Sustainability	0.016	-0.132	0.165	0
Sustainability	0.025	-0.172	0.223	0
Sustainability	0.12	-0.002	0.242	0
Sustainability	-0.067	-0.422	0.288	0
Sustainability	-0.058	-0.34	0.224	0
Sustainability	-0.055	-0.073	-0.038	0
Sustainability	-0.048	-0.087	-0.009	0
Sustainability	-0.057	-0.075	-0.04	0
Sustainability	-0.052	-0.071	-0.032	0
Sustainability	-0.039	-0.086	0.008	0
Sustainability	-0.053	-0.075	-0.032	0
Sustainability	-0.064	-0.1	-0.029	0
Sustainability	-0.062	-0.15	0.026	0
Sustainability	-0.042	-0.082	-0.003	0
Sustainability	-0.092	-0.439	0.255	0
Sustainability	-0.31	-0.42	-0.2	0
Sustainability	-0.092	-1.172	0.988	0
Journal of Corporate Finance	-0.013	-0.209	0.182	0
Review of Financial Economics	-0.071	-0.198	0.056	0
Review of Financial Economics	-0.026	-0.124	0.072	0
Review of Financial Economics	-0.051	-0.058	-0.044	0
Long Range Planning	0.082	0.003	0.16	0

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
Long Range Planning	0.097	0.039	0.156	0
Long Range Planning	0.122	0.063	0.181	0
Long Range Planning	0.093	0.034	0.151	0
Applied Economics Letters	-0.143	-0.143	-0.142	0.22
Applied Economics Letters	-0.164	-0.164	-0.164	99.48
Applied Economics Letters	-0.135	-0.135	-0.135	0.3
Applied Economics Letters	-0.047	-0.09	-0.005	0
Industry and Innovation	0.124	0.114	0.135	0
Industry and Innovation	0.231	0.223	0.238	0
Industry and Innovation	-0.31	-0.942	0.323	0
Industry and Innovation	-0.76	-1.41	-0.11	0
Industry and Innovation	-0.31	-0.806	0.186	0
Industry and Innovation	-0.204	-1.435	1.027	0
theta	-0.164	-0.164	-0.164	

(3) Random-effects Meta-Regression

_meta_es	Coef.	Std.	z	P> z 	[95% Conf. Interval]	
Scopus1	0.2397771	0.0437266	5.48	0.000000	0.1540746	0.3254796
Listed1	0.051821	0.0143749	3.6	0.000000	0.0236467	0.0799953
Control1	0.1900881	0.0019429	97.84	0.000000	0.18628	0.1938962
_cons	-0.3867597	0.04374	-8.84	0.000000	-0.4724886	-0.3010309

Accounting performance—SIZE

No. of studies: 89

(1) Random Effect Model (REM)

Study	ES	[95% Conf. Interval]		% Weight
Asian Social Science	0.368	−0.008	0.743	1.01
PACIS 2011–15th Pacific Asia C	−0.018	−0.079	0.043	1.49
PACIS 2011–15th Pacific Asia C	−0.015	−0.07	0.04	1.49
PACIS 2011–15th Pacific Asia C	0.052	−0.107	0.21	1.39
PACIS 2011–15th Pacific Asia C	−0.039	−0.15	0.073	1.45
PACIS 2011–15th Pacific Asia C	−0.171	−0.214	−0.128	1.5
PACIS 2011–15th Pacific Asia C	−0.079	−0.234	0.076	1.39
University of Vaasa	0.088	0.077	0.099	1.51
British Accounting Review	0.183	−0.836	1.201	0.33
British Accounting Review	0.23	−0.833	1.293	0.31
Research in International Business and Finance	0.008	−0.088	0.104	1.46
Research in International Business and Finance	0.048	−0.03	0.127	1.48
Research in International Business and Finance	0.005	−0.554	0.563	0.72
Research in International Business and Finance	0.048	−0.017	0.113	1.49
Research in International Business and Finance	0.006	−0.559	0.57	0.71
Research in International Business and Finance	−0.021	−0.123	0.081	1.46
Research in International Business and Finance	−0.013	−0.172	0.145	1.39

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
Journal of Advanced Management Science	0.008	-0.038	0.055	1.5
Journal of Advanced Management Science	0.048	0.016	0.081	1.5
Journal of Advanced Management Science	0.025	-0.006	0.056	1.5
The Sixth Annual Conference on Asia-Pacific Financial Markets	-0.039	-0.042	-0.035	1.51
Bank of Finland Research Discussion Paper	0.044	0.033	0.055	1.51
Sustainability	0.286	0.282	0.29	1.51
Sustainability	0.028	0.025	0.032	1.51
Sustainability	0.354	0.339	0.369	1.51
Sustainability	0.062	0.052	0.072	1.51
Sustainability	0.06	0.037	0.084	1.51
Sustainability	0.148	0.136	0.16	1.51
Sustainability	0.062	0.048	0.075	1.51
Sustainability	0.073	0.044	0.103	1.5
Sustainability	0.163	0.149	0.177	1.51
Sustainability	0.06	0.044	0.076	1.51
Sustainability	0.04	0	0.079	1.5
Sustainability	0.175	0.157	0.193	1.51
Sustainability	0.047	0.017	0.076	1.5
Sustainability	0.095	0.079	0.111	1.51
Sustainability	0.105	0.063	0.146	1.5
Journal of Risk Finance	0.061	0.059	0.063	1.51
Journal of Risk Finance	0.264	0.254	0.274	1.51
Academy of Accounting and Financial Studies Journal	0.108	-1.685	1.901	0.12
Management Science Letters	0.035	-0.251	0.32	1.18
Management Science Letters	0.034	-0.255	0.324	1.17

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
Management Science Letters	0.034	-0.257	0.326	1.16
Management Science Letters	0.035	-0.256	0.325	1.17
Management Science Letters	0.035	-0.555	0.624	0.68
Management Science Letters	0.034	-0.569	0.638	0.66
Management Science Letters	0.035	-0.279	0.348	1.12
Management Science Letters	0.035	-0.713	0.783	0.51
Management Science Letters	0.035	-0.549	0.618	0.69
Management Science Letters	0.035	-0.553	0.623	0.68
Management Science Letters	0.035	-0.553	0.623	0.68
Management Science Letters	0.035	-0.547	0.617	0.69
Management Science Letters	0.035	-1.11	1.18	0.27
Management Science Letters	0.035	-1.091	1.16	0.28
Management Science Letters	0.035	-0.876	0.945	0.39
Management Science Letters	0.035	-1.572	1.641	0.15
Rivista Bancaria. Minerva Bancaria	0.139	0.121	0.157	1.51
Rivista Bancaria. Minerva Bancaria	0.037	-0.061	0.135	1.46
Rivista Bancaria. Minerva Bancaria	0.259	0.242	0.275	1.51
Rivista Bancaria. Minerva Bancaria	1.451	1.445	1.456	1.51
International Journal of Academic Research in Economics and Management Sciences	0.045	0.026	0.063	1.51
Research in International Business and Finance	-0.066	-0.086	-0.046	1.51
Research in International Business and Finance	-0.093	-0.101	-0.085	1.51

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
Vision: The Journal of Business Perspective	-0.128	-1.307	1.051	0.26
Vision: The Journal of Business Perspective	-0.11	-1.141	0.921	0.32
Asian Journal of Business and Management Sciences	-0.975	-1.573	-0.377	0.67
Journal of Corporate Finance	0.013	0.005	0.022	1.51
International Journal of Accounting and Financial Reporting	0.058	-1.855	1.97	0.11
International Journal of Accounting and Financial Reporting	0.398	-3.818	4.614	0.02
International Journal of Accounting and Financial Reporting	0.223	-4.032	4.479	0.02
Journal of Economics and International Finance	0.129	-0.945	1.203	0.3
KASBIT Business Journal	0.21	0.199	0.221	1.51
KASBIT Business Journal	-0.032	-0.171	0.106	1.41
KASBIT Business Journal	0.407	0.397	0.418	1.51
KASBIT Business Journal	0.023	-0.116	0.162	1.41
Journal of Business Venturing	-0.06	-0.062	-0.058	1.51
Journal of Economics and Finance	0.47	0.462	0.478	1.51
Journal of Economics and Finance	0.308	0.297	0.319	1.51
Journal of Economics and Finance	0.16	0.103	0.217	1.49
Review of Financial Economics	0.047	0.043	0.05	1.51
Review of Financial Economics	-0.008	-0.011	-0.005	1.51

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
Review of Financial Economics	-0.122	-0.126	-0.119	1.51
Studii Financiare (Financial Studies)	0.019	0.003	0.035	1.51
Industry and Innovation	0.344	0.307	0.381	1.5
Industry and Innovation	0.388	0.353	0.424	1.5
Industry and Innovation	0.27	-5.604	6.144	0.01
Industry and Innovation	0.295	-5.358	5.947	0.01
Industry and Innovation	0.151	-5.789	6.092	0.01
Industry and Innovation	0.183	-5.878	6.243	0.01
theta	0.093	0.027	0.159	

(2) **Fixed Effect Model (FEM)**

Study	ES	[95% Conf. Interval]		% Weight
Asian Social Science	0.368	-0.008	0.743	0
PACIS 2011-15th Pacific Asia C	-0.018	-0.079	0.043	0.02
PACIS 2011-15th Pacific Asia C	-0.015	-0.07	0.04	0.03
PACIS 2011-15th Pacific Asia C	0.052	-0.107	0.21	0
PACIS 2011-15th Pacific Asia C	-0.039	-0.15	0.073	0.01
PACIS 2011-15th Pacific Asia C	-0.171	-0.214	-0.128	0.05
PACIS 2011-15th Pacific Asia C	-0.079	-0.234	0.076	0
University of Vaasa	0.088	0.077	0.099	0.67
British Accounting Review	0.183	-0.836	1.201	0
British Accounting Review	0.23	-0.833	1.293	0
Research in International Business and Finance	0.008	-0.088	0.104	0.01

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
Research in International Business and Finance	0.048	-0.03	0.127	0.01
Research in International Business and Finance	0.005	-0.554	0.563	0
Research in International Business and Finance	0.048	-0.017	0.113	0.02
Research in International Business and Finance	0.006	-0.559	0.57	0
Research in International Business and Finance	-0.021	-0.123	0.081	0.01
Research in International Business and Finance	-0.013	-0.172	0.145	0
Journal of Advanced Management Science	0.008	-0.038	0.055	0.04
Journal of Advanced Management Science	0.048	0.016	0.081	0.08
Journal of Advanced Management Science	0.025	-0.006	0.056	0.09
The Sixth Annual Conference on Asia-Pacific Financial Markets	-0.039	-0.042	-0.035	8.3
Bank of Finland Research Discussion Paper	0.044	0.033	0.055	0.77
Sustainability	0.286	0.282	0.29	4.78
Sustainability	0.028	0.025	0.032	6.61
Sustainability	0.354	0.339	0.369	0.38
Sustainability	0.062	0.052	0.072	0.9
Sustainability	0.06	0.037	0.084	0.16
Sustainability	0.148	0.136	0.16	0.62
Sustainability	0.062	0.048	0.075	0.46
Sustainability	0.073	0.044	0.103	0.1

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
Sustainability	0.163	0.149	0.177	0.46
Sustainability	0.06	0.044	0.076	0.35
Sustainability	0.04	0	0.079	0.06
Sustainability	0.175	0.157	0.193	0.28
Sustainability	0.047	0.017	0.076	0.1
Sustainability	0.095	0.079	0.111	0.35
Sustainability	0.105	0.063	0.146	0.05
Journal of Risk Finance	0.061	0.059	0.063	15.55
Journal of Risk Finance	0.264	0.254	0.274	0.8
Academy of Accounting and Financial Studies Journal	0.108	-1.685	1.901	0
Management Science Letters	0.035	-0.251	0.32	0
Management Science Letters	0.034	-0.255	0.324	0
Management Science Letters	0.034	-0.257	0.326	0
Management Science Letters	0.035	-0.256	0.325	0
Management Science Letters	0.035	-0.555	0.624	0
Management Science Letters	0.034	-0.569	0.638	0
Management Science Letters	0.035	-0.279	0.348	0
Management Science Letters	0.035	-0.713	0.783	0
Management Science Letters	0.035	-0.549	0.618	0
Management Science Letters	0.035	-0.553	0.623	0
Management Science Letters	0.035	-0.553	0.623	0
Management Science Letters	0.035	-0.547	0.617	0
Management Science Letters	0.035	-1.11	1.18	0
Management Science Letters	0.035	-1.091	1.16	0
Management Science Letters	0.035	-0.876	0.945	0

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
Management Science Letters	0.035	-1.572	1.641	0
Rivista Bancaria. Minerva Bancaria	0.139	0.121	0.157	0.25
Rivista Bancaria. Minerva Bancaria	0.037	-0.061	0.135	0.01
Rivista Bancaria. Minerva Bancaria	0.259	0.242	0.275	0.33
Rivista Bancaria. Minerva Bancaria	1.451	1.445	1.456	2.66
International Journal of Academic Research in Economics and Management Sciences	0.045	0.026	0.063	0.25
Research in International Business and Finance	-0.066	-0.086	-0.046	0.22
Research in International Business and Finance	-0.093	-0.101	-0.085	1.4
Vision: The Journal of Business Perspective	-0.128	-1.307	1.051	0
Vision: The Journal of Business Perspective	-0.11	-1.141	0.921	0
Asian Journal of Business and Management Sciences	-0.975	-1.573	-0.377	0
Journal of Corporate Finance	0.013	0.005	0.022	1.09
International Journal of Accounting and Financial Reporting	0.058	-1.855	1.97	0
International Journal of Accounting and Financial Reporting	0.398	-3.818	4.614	0
International Journal of Accounting and Financial Reporting	0.223	-4.032	4.479	0
Journal of Economics and International Finance	0.129	-0.945	1.203	0

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
KASBIT Business Journal	0.21	0.199	0.221	0.68
KASBIT Business Journal	-0.032	-0.171	0.106	0
KASBIT Business Journal	0.407	0.397	0.418	0.75
KASBIT Business Journal	0.023	-0.116	0.162	0
Journal of Business Venturing	-0.06	-0.062	-0.058	22.39
Journal of Economics and Finance	0.47	0.462	0.478	1.4
Journal of Economics and Finance	0.308	0.297	0.319	0.69
Journal of Economics and Finance	0.16	0.103	0.217	0.03
Review of Financial Economics	0.047	0.043	0.05	7.23
Review of Financial Economics	-0.008	-0.011	-0.005	10.42
Review of Financial Economics	-0.122	-0.126	-0.119	7.58
Studii Financiare (Financial Studies)	0.019	0.003	0.035	0.35
Industry and Innovation	0.344	0.307	0.381	0.06
Industry and Innovation	0.388	0.353	0.424	0.07
Industry and Innovation	0.27	-5.604	6.144	0
Industry and Innovation	0.295	-5.358	5.947	0
Industry and Innovation	0.151	-5.789	6.092	0
Industry and Innovation	0.183	-5.878	6.243	0
theta	0.062	0.061	0.063	

(3) Random-effects Meta-Regression

_meta_es	Coef.	Std.	z	P> z	[95% Conf. Interval]	
Scopus1	0.0081786	0.0545479	0.15	0.881	−0.0987332	0.1150905
Listed1	0.0973831	0.0522965	1.86	0.063	−0.0051161	0.1998824
Control1	−0.0678067	0.0940402	−0.72	0.471	−0.252122	0.1165087
_cons	0.1081205	0.1064262	1.02	0.31	−0.1004711	0.3167121

Market performance—LEVERAGE

No. of studies: 66

(1) Random Effect Model (REM)

Study	ES	[95% Conf. Interval]		% Weight
University of Vaasa	0.178	0.013	0.344	0
British Accounting Review	−0.053	−0.059	−0.048	0.91
British Accounting Review	0.045	0.029	0.061	0.11
The Sixth Annual Conference on Asia-Pacific Financial Markets	−0.072	−0.253	0.11	0
The Sixth Annual Conference on Asia-Pacific Financial Markets	−0.075	−0.296	0.147	0
Bank of Finland Research Discussion Paper	−0.157	−0.269	−0.044	0
Sustainability	−0.053	−0.251	0.144	0
Sustainability	−0.011	−0.242	0.22	0
Sustainability	−0.006	−0.34	0.328	0
Sustainability	−0.031	−0.345	0.283	0
Sustainability	−0.037	−0.416	0.341	0
Sustainability	0.056	−0.35	0.463	0
Sustainability	−0.039	−0.285	0.206	0
Sustainability	0.006	−0.281	0.293	0
Sustainability	0.036	−0.477	0.549	0
Investment Management and Financial Innovations · May 2018	0.6	0.536	0.664	0.01

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
Investment Management and Financial Innovations · May 2018	−0.328	−0.401	−0.254	0.01
Academy of Accounting and Financial Studies Journal	−0.044	−0.073	−0.015	0.03
Knowledge and Process Management	−0.42	−0.725	−0.116	0
Rivista Bancaria. Minerva Bancaria	−0.092	−0.095	−0.089	2.98
Rivista Bancaria. Minerva Bancaria	−0.488	−0.489	−0.487	47.76
Jurnal Pengurusan	−0.026	−0.074	0.022	0.01
Vision: The Journal of Business Perspective	0.014	0.01	0.018	1.76
Vision: The Journal of Business Perspective	0.02	0.012	0.028	0.43
Journal of Academy of Marketing Science	−0.044	−0.356	0.269	0
Journal of Corporate Finance	−0.013	−0.078	0.052	0.01
International Journal of Accounting and Financial Reporting	−0.734	−0.736	−0.731	6.08
International Journal of Accounting and Financial Reporting	−0.734	−0.738	−0.73	1.88
International Journal of Accounting and Financial Reporting	0.359	0.358	0.36	31.78
The Journal of Hospitality Financial Management	−0.126	−0.167	−0.085	0.02
Journal of Economics and International Finance	−0.122	−0.393	0.149	0
International Journal of Applied Business and Economic Research	0.205	0.182	0.228	0.06

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
Journal of Economics and Finance	-0.223	-0.238	-0.208	0.13
Journal of Economics and Finance	-0.126	-0.135	-0.117	0.35
Journal of Economics and Finance	-0.017	-0.026	-0.007	0.32
Review of Financial Economics	-0.062	-0.577	0.453	0
Review of Financial Economics	-0.054	-0.601	0.494	0
Review of Financial Economics	-0.115	-0.366	0.136	0
Review of Financial Economics	-0.087	-0.303	0.129	0
Review of Financial Economics	0.218	0.138	0.299	0
Review of Financial Economics	0.252	0.176	0.328	0.01
Review of Financial Economics	-0.056	-0.172	0.061	0
Review of Financial Economics	0.019	-0.042	0.08	0.01
Studii Financiare (Financial Studies)	-0.165	-0.973	0.642	0
Studii Financiare (Financial Studies)	0.005	-1.585	1.594	0
International Review of Economics and Finance	-0.116	-0.184	-0.049	0.01
International Review of Economics and Finance	-0.132	-0.268	0.004	0
International Review of Economics and Finance	-0.113	-0.191	-0.036	0
International Review of Economics and Finance	-0.134	-0.25	-0.019	0
International Review of Economics and Finance	-0.107	-0.221	0.007	0

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
International Review of Economics and Finance	-0.132	-0.264	0	0
International Review of Economics and Finance	-0.113	-0.192	-0.035	0
International Review of Economics and Finance	-0.134	-0.275	0.007	0
International Review of Economics and Finance	-0.074	-0.191	0.044	0
International Review of Economics and Finance	-0.095	-0.209	0.019	0
International Review of Economics and Finance	-0.122	-0.214	-0.03	0
International Review of Economics and Finance	-0.057	-0.199	0.085	0
International Review of Economics and Finance	-0.041	-0.518	0.437	0
International Review of Economics and Finance	-0.045	-0.237	0.147	0
Accounting and Finance	-0.019	-0.949	0.912	0
Accounting and Finance	-0.033	-1.65	1.583	0
The Journal of Technology Transfer	-0.391	-2.993	2.21	0
International Journal of Economics and Financial Issues	-0.127	-0.954	0.7	0
Pacific-Basin Finance Journal	-0.027	-14.676	14.622	0
North American Journal of Economics and Finance	-0.188	-0.529	0.153	0

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
Business Strategy and the Environment	-0.054	-0.056	-0.052	5.31
theta	-0.184	-0.185	-0.183	

(2) Fixed Effect Model (FEM)

Study	ES	[95% Conf. Interval]		% Weight
University of Vaasa	0.178	0.013	0.344	0
British Accounting Review	-0.053	-0.059	-0.048	0.91
British Accounting Review	0.045	0.029	0.061	0.11
The Sixth Annual Conference on Asia-Pacific Financial Markets	-0.072	-0.253	0.11	0
The Sixth Annual Conference on Asia-Pacific Financial Markets	-0.075	-0.296	0.147	0
Bank of Finland Research Discussion Paper	-0.157	-0.269	-0.044	0
Sustainability	-0.053	-0.251	0.144	0
Sustainability	-0.011	-0.242	0.22	0
Sustainability	-0.006	-0.34	0.328	0
Sustainability	-0.031	-0.345	0.283	0
Sustainability	-0.037	-0.416	0.341	0
Sustainability	0.056	-0.35	0.463	0
Sustainability	-0.039	-0.285	0.206	0
Sustainability	0.006	-0.281	0.293	0
Sustainability	0.036	-0.477	0.549	0
Investment Management and Financial Innovations · May 2018	0.6	0.536	0.664	0.01
Investment Management and Financial Innovations · May 2018	-0.328	-0.401	-0.254	0.01

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
Academy of Accounting and Financial Studies Journal	-0.044	-0.073	-0.015	0.03
Knowledge and Process Management	-0.42	-0.725	-0.116	0
Rivista Bancaria. Minerva Bancaria	-0.092	-0.095	-0.089	2.98
Rivista Bancaria. Minerva Bancaria	-0.488	-0.489	-0.487	47.76
Jurnal Pengurusan	-0.026	-0.074	0.022	0.01
Vision: The Journal of Business Perspective	0.014	0.01	0.018	1.76
Vision: The Journal of Business Perspective	0.02	0.012	0.028	0.43
Journal of Academy of Marketing Science	-0.044	-0.356	0.269	0
Journal of Corporate Finance	-0.013	-0.078	0.052	0.01
International Journal of Accounting and Financial Reporting	-0.734	-0.736	-0.731	6.08
International Journal of Accounting and Financial Reporting	-0.734	-0.738	-0.73	1.88
International Journal of Accounting and Financial Reporting	0.359	0.358	0.36	31.78
The Journal of Hospitality Financial Management	-0.126	-0.167	-0.085	0.02
Journal of Economics and International Finance	-0.122	-0.393	0.149	0
International Journal of Applied Business and Economic Research	0.205	0.182	0.228	0.06
Journal of Economics and Finance	-0.223	-0.238	-0.208	0.13
Journal of Economics and Finance	-0.126	-0.135	-0.117	0.35

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
Journal of Economics and Finance	-0.017	-0.026	-0.007	0.32
Review of Financial Economics	-0.062	-0.577	0.453	0
Review of Financial Economics	-0.054	-0.601	0.494	0
Review of Financial Economics	-0.115	-0.366	0.136	0
Review of Financial Economics	-0.087	-0.303	0.129	0
Review of Financial Economics	0.218	0.138	0.299	0
Review of Financial Economics	0.252	0.176	0.328	0.01
Review of Financial Economics	-0.056	-0.172	0.061	0
Review of Financial Economics	0.019	-0.042	0.08	0.01
Studii Financiare (Financial Studies)	-0.165	-0.973	0.642	0
Studii Financiare (Financial Studies)	0.005	-1.585	1.594	0
International Review of Economics and Finance	-0.116	-0.184	-0.049	0.01
International Review of Economics and Finance	-0.132	-0.268	0.004	0
International Review of Economics and Finance	-0.113	-0.191	-0.036	0
International Review of Economics and Finance	-0.134	-0.25	-0.019	0
International Review of Economics and Finance	-0.107	-0.221	0.007	0
International Review of Economics and Finance	-0.132	-0.264	0	0
International Review of Economics and Finance	-0.113	-0.192	-0.035	0

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
International Review of Economics and Finance	-0.134	-0.275	0.007	0
International Review of Economics and Finance	-0.074	-0.191	0.044	0
International Review of Economics and Finance	-0.095	-0.209	0.019	0
International Review of Economics and Finance	-0.122	-0.214	-0.03	0
International Review of Economics and Finance	-0.057	-0.199	0.085	0
International Review of Economics and Finance	-0.041	-0.518	0.437	0
International Review of Economics and Finance	-0.045	-0.237	0.147	0
Accounting and Finance	-0.019	-0.949	0.912	0
Accounting and Finance	-0.033	-1.65	1.583	0
The Journal of Technology Transfer	-0.391	-2.993	2.21	0
International Journal of Economics and Financial Issues	-0.127	-0.954	0.7	0
Pacific-Basin Finance Journal	-0.027	-14.676	14.622	0
North American Journal of Economics and Finance	-0.188	-0.529	0.153	0
Business Strategy and the Environment	-0.054	-0.056	-0.052	
theta	-0.184	-0.185	-0.183	

(3) Random-effects Meta-Regression

_meta_es	Coef.	Std.	z	P> z 	[95% Conf. Interval]	
Scopus1	0.1476756	0.1561315	0.95	0.344	−0.1583366	0.4536878
Listed1	0.039947	0.1217236	0.33	0.743	−0.1986269	0.2785209
Control1	0.0070413	0.1966135	0.04	0.971	−0.3783141	0.3923967
_cons	−0.2205774	0.2832825	−0.78	0.436	−0.7758008	0.3346461

Market performance—R&D

No. of studies: 47

(1) Random Effect Model (REM)

Study	ES	[95% Conf. Interval]		% Weight
Journal of Business, Economics and Finance	0.598	−0.274	1.47	0.09
Journal of Business, Economics and Finance	0.471	−0.448	1.391	0.08
Journal of Academy of Marketing Science	0.094	−0.851	1.039	0.07
The Sixth Annual Conference on Asia-Pacific Financial Markets	0.066	−0.012	0.144	5.85
The Sixth Annual Conference on Asia-Pacific Financial Markets	0.058	−0.021	0.137	5.79
Sustainability	0.027	−10.912	10.966	0
Sustainability	0.051	−9.028	9.129	0
Sustainability	0.04	−8.67	8.749	0
Sustainability	−0.038	−17.097	17.02	0
Sustainability	0.034	−14.271	14.34	0
Sustainability	0.046	−9.299	9.391	0
Sustainability	0.057	−14.537	14.65	0
Sustainability	0.056	−12.587	12.699	0
Sustainability	0.037	−8.096	8.171	0
Journal of Corporate Finance	0.013	−0.273	0.299	0.76

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
The Journal of Hospitality Financial Management	-0.123	-0.262	0.016	2.71
Review of Financial Economics	0.095	-0.906	1.097	0.07
Review of Financial Economics	0.099	-1.86	2.058	0.02
Review of Financial Economics	0.001	-1.284	1.287	0.04
Review of Financial Economics	0.236	-0.455	0.927	0.14
Review of Financial Economics	0.052	0.051	0.052	12.75
Review of Financial Economics	0.003	0.003	0.003	12.75
Review of Financial Economics	0.058	0.058	0.059	12.75
Review of Financial Economics	-0.052	-0.298	0.195	1.01
Information Systems Research	0.1	-0.214	0.414	0.64
Information Systems Research	0.1	-0.028	0.227	3.09
Information Systems Research	0.121	0.063	0.18	7.69
Information Systems Research	0.099	-0.047	0.244	2.52
International Review of Economics and Finance	0.088	-0.231	0.408	0.62
International Review of Economics and Finance	0.001	-1.575	1.577	0.03
International Review of Economics and Finance	0.096	-0.236	0.427	0.58
International Review of Economics and Finance	0.088	-0.428	0.605	0.24
International Review of Economics and Finance	0.098	-0.419	0.616	0.24

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
International Review of Economics and Finance	0.019	-1.817	1.856	0.02
International Review of Economics and Finance	0.097	-0.237	0.431	0.57
International Review of Economics and Finance	0.006	-1.747	1.758	0.02
International Review of Economics and Finance	0.095	-0.235	0.425	0.58
International Review of Economics and Finance	0.025	-1.521	1.571	0.03
International Review of Economics and Finance	0.099	-0.277	0.475	0.45
International Review of Economics and Finance	0.02	-1.987	2.026	0.02
International Review of Economics and Finance	0.018	-2.644	2.68	0.01
Industry and Innovation	-0.167	-0.212	-0.121	9.15
Industry and Innovation	-0.078	-0.158	0.002	5.75
Research Policy	0.034	-0.337	0.405	0.46
Accounting and Finance	0.038	-3.89	3.966	0
Accounting and Finance	0.061	-5.502	5.624	0
Business Strategy and the Environment	0.105	0.092	0.117	12.4
theta	0.031	0.006	0.057	

(2) Fixed Effect Model (FEM)

Study	ES	[95% Conf. Interval]		% Weight
Journal of Business, Economics and Finance	0.598	-0.274	1.47	0
Journal of Business, Economics and Finance	0.471	-0.448	1.391	0
Journal of Academy of Marketing Science	0.094	-0.851	1.039	0
The Sixth Annual Conference on Asia-Pacific Financial Markets	0.066	-0.012	0.144	0
The Sixth Annual Conference on Asia-Pacific Financial Markets	0.058	-0.021	0.137	0
Sustainability	0.027	-10.912	10.966	0
Sustainability	0.051	-9.028	9.129	0
Sustainability	0.04	-8.67	8.749	0
Sustainability	-0.038	-17.097	17.02	0
Sustainability	0.034	-14.271	14.34	0
Sustainability	0.046	-9.299	9.391	0
Sustainability	0.057	-14.537	14.65	0
Sustainability	0.056	-12.587	12.699	0
Sustainability	0.037	-8.096	8.171	0
Journal of Corporate Finance	0.013	-0.273	0.299	0
The Journal of Hospitality Financial Management	-0.123	-0.262	0.016	0
Review of Financial Economics	0.095	-0.906	1.097	0
Review of Financial Economics	0.099	-1.86	2.058	0
Review of Financial Economics	0.001	-1.284	1.287	0
Review of Financial Economics	0.236	-0.455	0.927	0
Review of Financial Economics	0.052	0.051	0.052	0.02
Review of Financial Economics	0.003	0.003	0.003	99.95
Review of Financial Economics	0.058	0.058	0.059	0.03

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
Review of Financial Economics	-0.052	-0.298	0.195	0
Information Systems Research	0.1	-0.214	0.414	0
Information Systems Research	0.1	-0.028	0.227	0
Information Systems Research	0.121	0.063	0.18	0
Information Systems Research	0.099	-0.047	0.244	0
International Review of Economics and Finance	0.088	-0.231	0.408	0
International Review of Economics and Finance	0.001	-1.575	1.577	0
International Review of Economics and Finance	0.096	-0.236	0.427	0
International Review of Economics and Finance	0.088	-0.428	0.605	0
International Review of Economics and Finance	0.098	-0.419	0.616	0
International Review of Economics and Finance	0.019	-1.817	1.856	0
International Review of Economics and Finance	0.097	-0.237	0.431	0
International Review of Economics and Finance	0.006	-1.747	1.758	0
International Review of Economics and Finance	0.095	-0.235	0.425	0
International Review of Economics and Finance	0.025	-1.521	1.571	0

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
International Review of Economics and Finance	0.099	-0.277	0.475	0
International Review of Economics and Finance	0.02	-1.987	2.026	0
International Review of Economics and Finance	0.018	-2.644	2.68	0
Industry and Innovation	-0.167	-0.212	-0.121	0
Industry and Innovation	-0.078	-0.158	0.002	0
Research Policy	0.034	-0.337	0.405	0
Accounting and Finance	0.038	-3.89	3.966	0
Accounting and Finance	0.061	-5.502	5.624	0
Business Strategy and the Environment	0.105	0.092	0.117	0
theta	0.003	0.003	0.003	

(3) Random-effects Meta-Regression

_meta_es	Coef.	Std.	z	P> z	[95% Conf. Interval]	
Scopus1	0.0031373	0.189305	0.02	0.987	-0.3678936	0.3741683
Listed1	0.0679312	0.0061564	11.03	0	0.0558649	0.0799975
Control1	-0.4360946	0.374245	-1.17	0.244	-1.169601	0.2974121
_cons	0.4701095	0.3228365	1.46	0.145	-0.1626384	1.102857

Market performance—SIZE

No. of studies: 79

(1) Random Effect Model (REM)

Study	ES	[95% Conf. Interval]		% Weight
Journal of Business, Economics and Finance	0.115	0.109	0.121	0.3
University of Vaasa	0.06	0.026	0.093	0.01
British Accounting Review	−0.145	−0.187	−0.102	0.01
British Accounting Review	−0.148	−0.193	−0.104	0
The Sixth Annual Conference on Asia-Pacific Financial Markets	−0.028	−0.072	0.015	0.01
Bank of Finland Research Discussion Paper	0.001	−0.048	0.05	0
Sustainability	−0.371	−0.457	−0.284	0
Sustainability	−0.376	−0.551	−0.202	0
Sustainability	−0.141	−0.558	0.277	0
Sustainability	−0.304	−0.426	−0.182	0
Sustainability	−0.309	−0.572	−0.045	0
Sustainability	−0.179	−0.792	0.435	0
Sustainability	−0.42	−0.534	−0.306	0
Sustainability	−0.405	−0.631	−0.179	0
Sustainability	−0.154	−0.838	0.53	0
Investment Management and Financial Innovations · May 2018	−0.395	−0.438	−0.352	0.01
Investment Management and Financial Innovations · May 2018	0.543	0.437	0.649	0
Academy of Accounting and Financial Studies Journal	0.013	−0.29	0.316	0
Knowledge and Process Management	−0.504	−0.527	−0.482	0.02
Management Science Letters	0.035	0.015	0.054	0.03

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
Management Science Letters	0.035	0.015	0.054	0.02
Management Science Letters	0.035	0.015	0.054	0.02
Management Science Letters	0.035	0.015	0.055	0.02
Management Science Letters	0.035	-0.01	0.08	0
Management Science Letters	0.035	-0.011	0.08	0
Management Science Letters	0.035	0.006	0.064	0.01
Management Science Letters	0.035	-0.01	0.08	0
Rivista Bancaria. Minerva Bancaria	-0.059	-0.103	-0.014	0
Rivista Bancaria. Minerva Bancaria	0.108	0.083	0.133	0.02
Jurnal Pengurusan	-0.243	-0.38	-0.105	0
Vision: The Journal of Business Perspective	-0.115	-1.03	0.799	0
Vision: The Journal of Business Perspective	-0.117	-1.239	1.006	0
Journal of Corporate Finance	-0.013	-0.158	0.131	0
International Journal of Accounting and Financial Reporting	-0.734	-0.806	-0.662	0
The Journal of Hospitality Financial Management	0.305	0.291	0.319	0.05
Journal of Economics and International Finance	0.116	0.042	0.191	0
International Journal of Applied Business and Economic Research	0.015	-0.029	0.059	0.01
Journal of Economics and Finance	0.093	0.018	0.167	0
Journal of Economics and Finance	-0.117	-0.244	0.011	0

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
Journal of Economics and Finance	-0.416	-0.766	-0.066	0
Review of Financial Economics	0.056	-0.003	0.115	0
Review of Financial Economics	0.062	0.009	0.115	0
Review of Financial Economics	-0.165	-0.234	-0.097	0
Review of Financial Economics	0.155	0.126	0.184	0.01
Review of Financial Economics	-0.17	-0.174	-0.167	0.95
Review of Financial Economics	-0.162	-0.164	-0.159	1.23
Review of Financial Economics	-0.041	-0.047	-0.035	0.26
Review of Financial Economics	-0.18	-0.187	-0.172	0.16
Studii Financiare (Financial Studies)	-0.362	-0.676	-0.049	0
Studii Financiare (Financial Studies)	0.043	-0.623	0.71	0
Information Systems Research	0	-0.196	0.196	0
Information Systems Research	0.04	-0.114	0.195	0
International Review of Economics and Finance	0.21	0.205	0.216	0.33
International Review of Economics and Finance	0.293	0.28	0.305	0.06
International Review of Economics and Finance	0.193	0.187	0.199	0.26
International Review of Economics and Finance	0.264	0.254	0.274	0.1
International Review of Economics and Finance	0.174	0.165	0.182	0.14

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
International Review of Economics and Finance	0.286	0.274	0.298	0.06
International Review of Economics and Finance	0.194	0.188	0.2	0.26
International Review of Economics and Finance	0.3	0.288	0.313	0.06
International Review of Economics and Finance	0.193	0.187	0.199	0.26
International Review of Economics and Finance	0.245	0.236	0.255	0.1
International Review of Economics and Finance	0.204	0.196	0.212	0.17
International Review of Economics and Finance	0.046	0.018	0.074	0.01
International Review of Economics and Finance	0.074	0.021	0.128	0
International Review of Economics and Finance	0.044	0.013	0.075	0.01
Industry and Innovation	0.039	-0.318	0.397	0
Industry and Innovation	0.135	-0.177	0.446	0
Journal of Corporate Finance	-0.04	-0.11	0.03	0
Journal of Corporate Finance	-0.04	-0.047	-0.034	0.22
Research Policy	-0.029	-0.047	-0.01	0.03
Accounting and Finance	-0.092	-0.4	0.216	0
Accounting and Finance	-0.001	-3.366	3.364	0
The Journal of Technology Transfer	-0.378	-0.753	-0.003	0

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
Research Journal of Applied Sciences, Engineering and Technology	−0.232	−0.3	−0.163	0
Pacific-Basin Finance Journal	−0.048	−0.05	−0.046	2.55
North American Journal of Economics and Finance	−0.078	−0.109	−0.046	0.01
Business Strategy and the Environment	−0.337	−0.338	−0.337	28.36
Business Strategy and the Environment	−0.383	−0.383	−0.382	63.81
theta	−0.341	−0.341	−0.341	

(2) Fixed Effect Model (FEM)

Study	ES	[95% Conf. Interval]		% Weight
Journal of Business, Economics and Finance	0.115	0.109	0.121	0.3
University of Vaasa	0.06	0.026	0.093	0.01
British Accounting Review	−0.145	−0.187	−0.102	0.01
British Accounting Review	−0.148	−0.193	−0.104	0
The Sixth Annual Conference on Asia-Pacific Financial Markets	−0.028	−0.072	0.015	0.01
Bank of Finland Research Discussion Paper	0.001	−0.048	0.05	0
Sustainability	−0.371	−0.457	−0.284	0
Sustainability	−0.376	−0.551	−0.202	0
Sustainability	−0.141	−0.558	0.277	0
Sustainability	−0.304	−0.426	−0.182	0
Sustainability	−0.309	−0.572	−0.045	0
Sustainability	−0.179	−0.792	0.435	0
Sustainability	−0.42	−0.534	−0.306	0
Sustainability	−0.405	−0.631	−0.179	0

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
Sustainability	-0.154	-0.838	0.53	0
Investment Management and Financial Innovations · May 2018	-0.395	-0.438	-0.352	0.01
Investment Management and Financial Innovations · May 2018	0.543	0.437	0.649	0
Academy of Accounting and Financial Studies Journal	0.013	-0.29	0.316	0
Knowledge and Process Management	-0.504	-0.527	-0.482	0.02
Management Science Letters	0.035	0.015	0.054	0.03
Management Science Letters	0.035	0.015	0.054	0.02
Management Science Letters	0.035	0.015	0.054	0.02
Management Science Letters	0.035	0.015	0.055	0.02
Management Science Letters	0.035	-0.01	0.08	0
Management Science Letters	0.035	-0.011	0.08	0
Management Science Letters	0.035	0.006	0.064	0.01
Management Science Letters	0.035	-0.01	0.08	0
Rivista Bancaria. Minerva Bancaria	-0.059	-0.103	-0.014	0
Rivista Bancaria. Minerva Bancaria	0.108	0.083	0.133	0.02
Jurnal Pengurusan	-0.243	-0.38	-0.105	0
Vision: The Journal of Business Perspective	-0.115	-1.03	0.799	0
Vision: The Journal of Business Perspective	-0.117	-1.239	1.006	0
Journal of Corporate Finance	-0.013	-0.158	0.131	0

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
International Journal of Accounting and Financial Reporting	-0.734	-0.806	-0.662	0
The Journal of Hospitality Financial Management	0.305	0.291	0.319	0.05
Journal of Economics and International Finance	0.116	0.042	0.191	0
International Journal of Applied Business and Economic Research	0.015	-0.029	0.059	0.01
Journal of Economics and Finance	0.093	0.018	0.167	0
Journal of Economics and Finance	-0.117	-0.244	0.011	0
Journal of Economics and Finance	-0.416	-0.766	-0.066	0
Review of Financial Economics	0.056	-0.003	0.115	0
Review of Financial Economics	0.062	0.009	0.115	0
Review of Financial Economics	-0.165	-0.234	-0.097	0
Review of Financial Economics	0.155	0.126	0.184	0.01
Review of Financial Economics	-0.17	-0.174	-0.167	0.95
Review of Financial Economics	-0.162	-0.164	-0.159	1.23
Review of Financial Economics	-0.041	-0.047	-0.035	0.26
Review of Financial Economics	-0.18	-0.187	-0.172	0.16
Studii Financiare (Financial Studies)	-0.362	-0.676	-0.049	0
Studii Financiare (Financial Studies)	0.043	-0.623	0.71	0
Information Systems Research	0	-0.196	0.196	0
Information Systems Research	0.04	-0.114	0.195	0

(Continued)

Study	ES	[95% Conf. Interval]		% Weight
International Review of Economics and Finance	0.21	0.205	0.216	0.33
International Review of Economics and Finance	0.293	0.28	0.305	0.06
International Review of Economics and Finance	0.193	0.187	0.199	0.26
International Review of Economics and Finance	0.264	0.254	0.274	0.1
International Review of Economics and Finance	0.174	0.165	0.182	0.14
International Review of Economics and Finance	0.286	0.274	0.298	0.06
International Review of Economics and Finance	0.194	0.188	0.2	0.26
International Review of Economics and Finance	0.3	0.288	0.313	0.06
International Review of Economics and Finance	0.193	0.187	0.199	0.26
International Review of Economics and Finance	0.245	0.236	0.255	0.1
International Review of Economics and Finance	0.204	0.196	0.212	0.17
International Review of Economics and Finance	0.046	0.018	0.074	0.01
International Review of Economics and Finance	0.074	0.021	0.128	0

(Continued)

(Continued)				
Study	ES	[95% Conf. Interval]		% Weight
International Review of Economics and Finance	0.044	0.013	0.075	0.01
Industry and Innovation	0.039	-0.318	0.397	0
Industry and Innovation	0.135	-0.177	0.446	0
Journal of Corporate Finance	-0.04	-0.11	0.03	0
Journal of Corporate Finance	-0.04	-0.047	-0.034	0.22
Research Policy	-0.029	-0.047	-0.01	0.03
Accounting and Finance	-0.092	-0.4	0.216	0
Accounting and Finance	-0.001	-3.366	3.364	0
The Journal of Technology Transfer	-0.378	-0.753	-0.003	0
Research Journal of Applied Sciences, Engineering and Technology	-0.232	-0.3	-0.163	0
Pacific-Basin Finance Journal	-0.048	-0.05	-0.046	2.55
North American Journal of Economics and Finance	-0.078	-0.109	-0.046	0.01
Business Strategy and the Environment	-0.337	-0.338	-0.337	28.36
Business Strategy and the Environment	-0.383	-0.383	-0.382	63.81
theta	-0.341	-0.341	-0.341	

(3) Random-effects Meta-Regression

_meta_es	Coef.	Std.	z	P> z	[95% Conf. Interval]	
Scopus1	0.0084777	0.0265676	0.32	0.75	-0.0435938	0.0605492
Listed1	-0.1985512	0.0195557	-10.15	0	-0.2368797	-0.1602228
Control1	-0.1099238	0.032834	-3.35	0.001	-0.1742773	-0.0455703
_cons	0.1880745	0.0434749	4.33	0	0.1028651	0.2732838



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