

What are the impacts of overconfidence bias on managerial performances and decision-making?

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Abstract

This research paper summarizes and analyses the findings from 34 studies that investigated the relationship between management, decision making and overconfidence, in other words it is a meta-analysis. In this correlation meta-analysis, we take a closer look at the ways in which three moderators affect the connection between decision-making and management. The notion of overconfidence itself, the method used to evaluate it, and the methods by which management and financial decisions were made were all factors. In this study, we found that the effect of overconfidence was moderate but significant effect on the processes associated with making and controlling financial decisions. Most overconfidence was shown to be associated with commerce, followed by inventiveness and investment. Overconfidence's indirect measures were found to have a greater effect than direct measurements.

Table of Contents

Introduction.....	2
Background:	2
Significance:.....	3
Research questions/ Hypotheses:	3
Scope of the study	3
Research Literature	4
Overconfidence:	4
Overconfidence Assessment:.....	5
Literature Search:	6
Selection and rejection criteria.....	6
Coding of Variables:.....	8
Size used for effectiveness:	9
Method of meta-analysis:.....	10
Results.....	11
Conclusion	12
References.....	14

Introduction

Background:

Overconfidence as a phenomenon was first discussed in psychological journals and books in the 1960s. Economists have studied the effects of overconfidence in commercial banking and financial markets, among other areas, for just the last several decades, largely because of the incorporation of psychological results into economic models (Grežo, 2020). Overconfidence has been linked to dangerous behaviours including overspending, bad trading judgements, and a lack of creativity and innovation, according to a number of high-quality academic research (Ancarani, Di Mauro and D'Urso, 2016). Soon after that, several writers shifted their focus from direct to indirect measures, such as proxies for overconfidence (Hilary and Hsu, 2016). Rather of gauging their level of overconfidence, some of them just invested or traded at excessive levels (Chen, Crossland and Luo, 2014). The concept of overconfidence has also been intertwined with and often misunderstood with similar concepts like optimism and a

sense of control (Costa et al., 2017). Due to inconsistencies in the definition of overconfidence, integrating data on overconfidence's effect on decision-making and the management of financial resources proved difficult.

Significance:

The purpose of this research is to explore the link between overconfidence and various levels of management, as well as its influence on management and decision making, and to give suggestions to businesses about decision making, as well as mentoring and coaching of prospective leaders.

Research questions/ Hypotheses:

H1: Overconfidence, in general, boosts trading activity.

H2: Overconfidence has a net beneficial impact on financial returns.

H3: Overconfidence, in general, boosts creative problem solving.

RQ1: How can various forms of overconfidence effect business activities like investing, creating new products, and making deals?

RQ2: To what extent can other measures of overconfidence influence business activities like trading, investing, and creative problem solving?

Scope of the study

In order to contribute to the existing body of knowledge, the purpose of this research is to investigate the influence that the overconfidence bias has on the management decision-making process at various levels of the organisational hierarchy. Recognizing the function of overconfidence in management decision-making is crucial since it has been demonstrated that this cognitive bias may influence investor behaviour. Academics have demonstrated the need for additional research on this subject by arguing that it would undoubtedly be critical information if one could somehow distinguish between people who are more or less burdened by behaviour abnormalities. This has demonstrated the necessity of further investigating this topic.

The purpose of the study was to get a better understanding of the overconfidence bias as well as the ways in which it influences management and decision-making at different organisational levels. There is a link between management rank and arrogance, and one probable reason for this association is managers' intrinsic intellect. With this information at hand, recommendations might be made to companies about decision-making as well as the mentoring and coaching of potential future leaders.

Research Literature

Overconfidence:

It is essential to have confidence in order to take measured risks, recognise when one needs assistance, and successfully share one's experience with others. On the other hand, managers may also be prone to display characteristics of hubris. Overconfidence may be defined as the tendency for a person to exaggerate their level of knowledge, abilities, and the accuracy of the information that they possess about themselves. The concept of "overconfidence," which was initially shown by Albert and Raffia in 1969, may be used to describe two distinct occurrences, as Bazerman and Moore (2009) have demonstrated (Grežo, 2020). To begin, most individuals have an overly optimistic view of their own capabilities. An excessive amount of self-confidence might lead us to reject or disregard pertinent facts or new points of view. It's also possible that managers overestimate the precision of their knowledge, which leads them to put an excessive amount of value in successful outcomes and contributes to overconfidence.

The concepts provided by Moore and Healy are taken into consideration by Hilton et al. (2011) as they discuss the three distinct forms of overconfidence. Overprecision is an overstated perception in one's own understanding, whereas overvaluation is an overstated belief of one's own capacity, and overplacement is an excessive belief in one's own situation within a group. In contrast, overconfidence is an extravagant belief in one's own ability to influence others. Each of these phrases describes a state in which a person has an exaggerated feeling of their own consciousness and confidence in their own capabilities. The result of overplacement is sometimes referred to as having a "better than average impact," which is a word that has been used to explain the phenomenon.

If investors are overconfident in their abilities, they will place more weight on their own personal data and less weight on statistics that are readily available to the public. In addition, Chuang and Lee (2006) utilise the findings of the study conducted by other academics to indicate that overconfident investors have a tendency to attribute market profits to the stock-picking abilities that they possess on their own. As a direct consequence of this, the threat is underestimated.

The propensity of managers to have an unhealthy amount of self-confidence is a significant problem in many industries. It has the ability to affect how managers make strategic choices, how traders behave in the financial markets, and how long it takes to carry out projects. This argument is widely employed in an attempt to explain the high rate of investment in endeavours like as mergers and acquisitions, despite the vast quantity of evidence indicating

that such endeavours are typically unsuccessful (Hilary and Hsu, 2016). When managers overstate the possible synergy advantages of a merger, they may be displaying an unhealthy level of overconfidence. It's possible that this is because the staff has an above-average amount of faith in the manager's ability as a leader. Research have revealed that when a firm already has a significant amount of cash on hand, overconfident CEOs are more likely to make questionable financial decisions about the company's investments.

Academics give a variety of case studies in order to show the repercussions of the overconfidence bias. According to Hunter et al. (2011), an enthusiastic CEO at Quaker Foods got carried away with their firm's success and ended up purchasing a product line that didn't fit in with the company's general aims or ideals. This was a mistake that the company ultimately paid for. As a direct result of this, Quaker Foods suffered financial losses and was ultimately had to shut down its operations (Hunter et al., 2011). McKenzie explains how having an excessive amount of faith in sales forecasts may have unforeseen impacts on the productivity of manufacturing. According to Hilton et al. (2011), businesses that are headed by persons who have exceptionally high levels of confidence are less profitable than businesses that are managed by individuals who have lower levels of confidence. This comes as a nice benefit (Zacharakis and Shepherd, 2011).

Overconfidence Assessment:

Overconfidence in various forms has been studied using a wide range of approaches. Miscalibration, as stated by Hilton et al. (2011), is medium-specific. This indicates that the overconfidence results may vary with the chosen test.

Researchers have explored the impacts of overconfidence by using an evaluation test called a confidence interval assessment test. An evaluation instrument that is often referenced was first published by Russo and Schoemaker in the year 1992. The participants were presented with a number of questions for which they were asked to provide upper and lower limits on an estimate. It was anticipated that the correct answer would, in the vast majority of cases, fall somewhere within those ranges. Suppose that 10% of the replies will not fall inside the parameters that were expected for them. At the core of the interval assessment is an analysis of what we know and what we don't know.

According to the findings of the investigation that Russo and Schoemaker carried out, fewer than one percent of the more than 2,000 individuals who participated in an examination consisting of 10 questions and had confidence intervals of 90 percent were not overconfident. According to this study, managers tend to have an unhealthy level of confidence (Costa et al., 2017).

Another kind of examination described by Cesarini(2006) and his colleagues is the frequency assessment exam, which is also often referred to as the probability estimation test. After the conclusion of the interval test, the participants were questioned on the proportion of their own replies that accurately represented the target value. In this section, we test managers to discover whether they believe they have performed better than their actual performance reveals (Van Zant and Moore, 2013). The frequency rating is a good indicator of the level of self-assurance shown by a manager.

By asking respondents how many questions they thought their peers had correctly answered, Cesarini et al. (2006) employed the peer frequency assessment to prove that managers forecast the overconfidence of others. Hence, the researchers were able to conclude that managers often attempt to mitigate the overconfidence of their subordinates.

Literature Search:

Using the following strategies, we conducted a systematic search of the literature in an effort to identify studies that addressed the impact of overconfidence on financial decision-making and management. We first scoured a wide variety of digital libraries, including ProQuest, Web of Science, Scopus and Scimedirect . The following terms were utilised for this purpose in keyword analysis: Words like "overconfident," "optimistic," "miscalibrated," "underconfident," "self-confident," "overconfident," "overplacement," "overestimation," crop up when discussing the topic of exaggerated assurance; words like "invest," "purchase," "finance," "trading," "selling," "earning. As a second step, we manually searched the following journals: the Journal of Behavioral Finance, , the Journal of Small Business Economics, the Journal of Finance the Journal of Business Venturing the Journal of Corporate Finance and the Journal of Entrepreneurship Theory and Practice. In the end, we relied on Google Scholar to carry out an exhaustive search for scholarly articles that were suitable for our needs. The aforementioned databases and publications did not include any mention of the study in issue, and neither did any of the databases. We avoided the potential for academic research to be tainted by prejudice by using Google Scholar to hunt for unpublished articles, journal articles, dissertations, and reports. This helped us avoid the possibility of bias in academic research. At last, we got around to sending emails and checking out the Researchgate accounts of all of the authors whose work was unavailable to us. We requested a duplicate of the study as well as the data, however it was not provided.

Selection and rejection criteria

We found a total of 3594 studies after doing our search. We developed a set of criteria for which articles would make the cut as being the most applicable. Originally, the investigations

required both qualitative and quantitative research methods. Thus, we disregarded any studies that were either qualitative or theoretical in nature, as well as any case studies or financial reports. The second limitation of our investigation is that we didn't include any studies or reports of successful financial management or decision-making that showed no indications of overconfidence. Finally, papers were not included that did not provide enough information for a correlation meta-analysis. So, we only included papers that provided either a coefficient of correlation, a simple model of linear regression, or a multiple linear regression model. A total of 83 treatment effects drawn from 34 studies were produced by strictly following to these criteria. Table 1 summarises each study that satisfied inclusion criteria for this meta-analysis.

Table 1

Authors (year)	Type of FDM	Type of overconfidence	Country of origin	Published paper
Abreu & Mendes (2012)	trading	overestimation	Portugal	no
Aziz et al. (2016)	trading	overestimation	Egypt	yes
Ben-David et al. (2007)	I&E	overprecision	USA	no
Ben-David & Graham (2013)	I&E	overprecision	USA	no
Bias et al. (2005)	trading	overprecision	France, UK	yes
Cueva et al. (2017)	trading	overplacement	Spain	no
Deaves et al. (2009)	trading	overprecision, overplacement, char. proxy	Canada, Germany	yes
Glaser & Weber (2007)	I&E, trading	overprecision, overplacement	Germany	yes
Grinblatt & Keloharju (2009)	I&E, trading	overplacement	Finland	yes
Haarmans (n.d.)	R&D	beh. proxy	International	no
He et al. (2019)	I&E	overestimation	China	yes
Hirshleifer et al. (2012)	R&D	char. proxy, beh. proxy	International	yes
Cheley-Steeley et al. (2009)	trading	char. proxy	UK	no
Chen (2019)	R&D	overestimation	China	yes
Choi et al. (2018)	I&E	beh. proxy	USA	yes
Jiang et al. (2011)	I&E	overestimation, char. proxy	China	yes
Jouber (2013)	R&D	beh. proxy	USA	yes
Kangarlouei et al. (2013)	I&E	overestimation	Iran	yes
Kim et al. (2018)	R&D	char. proxy	USA	yes
Longjie & Anfeng (2017)	I&E	overestimation	China	yes

Malmendier & Tate (2005a)	I&E	beh. proxy	USA	no
Merkle (2017)	trading	overestimation, overprecision, overplacement	UK	yes
Michailova (2010)	trading	overprecision	Germany	no
Moez & Amina (2018)	I&E	char. proxy	USA	yes
Park et al. (2010)	trading	overprecision	South Korea	no
Park & Chung (2017)	I&E	beh. proxy	USA	yes
Verberne (2010)	I&E	beha. proxy	Netherlands	no
Wang et al. (2009)	I&E	overestimation	China	yes
Wang et al. (2016)	I&E	overestimation	China	yes
Wang et al. (2018)	R&D	overestimation	China	yes
Wong et al. (2017)	R&D	beh. proxy	USA	yes
Yang & Zhu (2016)	trading	overprecision, overplacement	China	yes
Yeoh & Wood (2011)	trading	overprecision, overplacement, char. proxy	UK	no
Zavertiaeva et al. (2018)	R&D	char. proxy	International	yes

Coding of Variables:

Every conceivable factor that might account for the wide variety of meta-analysis results was coded. Table 2 displays the definitions, codes, and frequency distributions for three related topics. Financial management, financial decision making, and managerial confidence all fall under this umbrella term. The following table provides a summary of all the studies that were reviewed. In keeping with the theoretical framework, the authors use a broad variety of overconfidence measures in their study. After categorising them, we split them up into five different sets. First, we have overestimation, overprecision, and overplacement, which correspond to the three primary operationalizations used in cognitive research. Any proxy measures that are grounded on an individual's actual behaviour or decisions fall under the fourth category of overconfidence. Longholder, Holder 67, and Net Buyer all fall into this category, as do those who give less weight to freshly obtained knowledge. The fifth kind of false assurance classifies proxies according to a person's characteristics. Included here are the CEO's age, tenure, public image, media coverage, relative pay, decision-making power, management authority, and the appearance of control they convey. The process of making financial judgements and managing funds was also operationalized in a number of different ways, as was the case with overconfidence. Based on their methods of operation, we categorised them as either traders, investors, or creators. The relative frequency of each of these classes is shown in Table 2. Our last step was to sort the primary studies by their degree of publishing (published vs. unpublished).

Table 2

Overconfidence	
Operationalization	Frequency
Overestimation	14
Overprecision	28
Overplacement	17
Behavioral proxies	12
Characteristic proxies	12
Financial decision-making	
Operationalization	Frequency
Trading	45
Investing	27
Innovativeness	8

Size used for effectiveness:

We used two indices to examine whether there is a correlation between self-assurance in leadership and the ability to make prudent financial choices. Pearson's product-moment correlation coefficient, sometimes shortened to *r*, was the statistic of choice for reporting correlations in multivariate regression in the original experiments (16 studies). We calculated the semipartial correlations *rsp* for the 18 research that only mentioned employing multiple regression models. These studies were included in our analysis. We considered these research in our overall body of work. It is advised that the semipartial correlation analysis be calculated rather than the multiple correlation coefficient when there are several factors included in the primary study. It is possible to determine the *rsp* index in a number of ways:

Equation 1

$$rsp = tf \sqrt{1 - RY^2} \sqrt{(n - p - 1)}$$

where *n* is the number of datasets, *p* is the number of variables, *tf* is the t-test result on the determination coefficient, and *RY*² is the sum of the squares of the average correlation. We did a correlational meta-analysis by first creating *rsp* indices for all of the original research (which comprised several models of regression) and then integrating this information with studies that produced *r* coefficients. We were able to do a meta-analysis based on correlational evidence because of this.

Method of meta-analysis:

To determine the middle value of a distribution of effects based on separate trials, we used a stripped-down variant of the parametric meta-analysis developed in 2004 by Hunter and Schmidt. To avoid bias, we did not account for measurement errors as each of the exogenous variables measures and almost all of the predictor variables measurements were objectively assessed in the original papers that we analysed (i.e., reliability was 1.00). This research determined the major influence that having an excessive amount of confidence has on decision-making and management by using a weighted mean correlation r . Research demonstrated that inflated self-assurance negatively impacted both fiscal management and choice making. We calculated the sample bias at the 95% level of confidence for the effect size to determine whether or not the primary impact was statistically significant. If the confidence interval for the major effect did not contain zero, then it was determined to have a significant statistical impact. We investigated if categories of financial decision making, managerial style, and overconfidence construct all influenced the relationship between these three indicators. The interplay among these three variables was the focus of our investigation. Our initial step in testing the moderator hypothesis was to investigate whether the reported effects held true across studies. In order to find potential moderators, we used 80 percent credible intervals. There was an assumption of uniformity in the effects since the credibility range did not include 0. We used subgroup analysis to check for statistically significant changes across moderator classes in the case that impact sizes varied considerably between groups. This kind of test is based on a similar principle as variance analysis (ANOVA). To assess whether the categorical moderator accounts for the differences in correlations observed across the three groups, we calculated Q-statistics, that are quite comparable to the significant determinants in the variances analysis test. When the moderator consisted of more than two types, such as an overconfident type or a decision making or a management type, we developed z-statistics, which are quite similar to t-tests, to assess the variations in general effects that existed between every pair of moderator groups. This enabled us to evaluate how different sets of moderators fared against one another.

We performed a file-drawer analysis to look for evidence of publication bias (Rosenthal, 1979). For this reason, we determined the minimum number of studies (the fail safe N) that must be conducted in order to rule out the possibility of an impact. The $5k + 10$ rule was selected as the criteria to use in determining the existence of publication bias. There may have been an effect of publication bias if the failsafe mechanism N is less than 5 times the amount of samples plus 10. To further examine the asymmetry of the funnel plot, we used the rank correlation test developed by Begg and Mazumdar (1994). The Q-statistics were used to

compare the treatment effects of studies that were released (n = 22) and those that were not (n = 11) in order to further analyse the possibility of publication bias.

Results

Table 3 displays the major analysis findings, based on 34 identified studies and 83 sample size. First, we confirmed our Null Hypothesis that having too much self-assurance has a negative impact on business administration and choice-making. Results showed that overconfidence has a favourable impact on management and decision making, with an effect size of $r = 0.045$ and a 95% confidence interval (CI) that does not contain zero.

Table 3

Variable	K	r	95% CI	Var.	80% CRI	Fail safe N (> 5k + 10)	Q
Overall effect							
Fixed	81	0.037	0.033 – 0.042	0.004	-0.036 – 0.126	6954 (yes)	-
Random	81	0.045	0.028 – 0.061				
Type of overconfidence measuring method							
Direct	57	0.020	0.014 – 0.027	0.002	-0.037 – 0.077	693 (yes)	4.444*
Indirect	24	0.052	0.046 – 0.058	0.005	-0.039 – 0.143	1552 (yes)	
Type of overconfidence construct							
Overestimation	14	0.015	0.005 – 0.024	0.003	-0.055 – 0.085	89 (yes)	4.476
Overprecision	26	0.010	-0.004 – 0.024	0.004	-0.070 – 0.090	0 (no)	
Overplacement	17	0.033	0.022 – 0.043	0.001	-0.007 – 0.073	141 (yes)	
Char. proxy	12	0.091	0.078 – 0.104	0.019	-0.085 – 0.267	374 (yes)	
Beh. proxy	12	0.042	0.035 – 0.048	0.001	0.002 – 0.082	390 (yes)	
Type of financial decision-making							
Trading	45	0.022	0.013 – 0.031	0.002	-0.035 – 0.079	64 (no)	12.822 **
Investing	27	0.051	0.045 – 0.056	0.004	-0.030 – 0.132	2321 (yes)	
Innovativeness	9	0.014	0.004 – 0.024	0.003	-0.056 – 0.084	59 (yes)	
Publication status							
Published	58	0.035	0.031 – 0.040	0.004	-0.046 – 0.116	3051 (yes)	0.574
Unpublished	23	0.055	0.041 – 0.069	0.003	-0.015 – 0.125	105 (no)	

We carried out a moderation study in order to determine if there are any bounds to the influence that overconfidence may have on management and decision-making responsibilities in the field of finance. To begin, we examined the range of the 80% credible intervals for all of the study's effects to determine the level of heterogeneity. Credibility interval for the main effect was large and included 0 (80% CRI = -0.036 - 0.126), indicating the presence of possible moderators $df = 80$; $Q = 795.4$; $I^2 = 89.94$; $p .001$. Thus, we used Q-statistics to assess the possible moderating effect of three qualitative moderators in the second phase. We came to the conclusion that the link between overconfidence, management, and decision-making differed based on the method that was used to evaluate the characteristic of hyperconfidence as well as the kind of financial choices that were being made. Credibility intervals for both overconfidence measurement strategies and financial decision-making management approaches contained zero, indicating the presence of additional moderators. Furthermore, the credibility intervals for the overconfidence measure techniques included the value zero. We were unable to find evidence of publishing history's moderating influence on

overconfidence, money management, or choice-making (see Table 3). To further investigate if there were any significant changes in effect size across distinct combinations of moderator groups, we used z-tests for both of the significant moderators (see Table 4). As a moderator of financial decision-making and management, characteristic proxies were shown to have the largest impact size, followed by behavioural proxies, overplacement, and overestimation. Overconfidence was most influential for investments and expenditures, followed by trade and R&D in terms of the kind of financial decision-making and managerial moderator, with a confidence interval that encompassed zero indicating that the impact was insignificant.

Table 4

Groups comparison	z-value	p-value
Type of overconfidence		
Behavioral proxy – Characteristic proxy	0.131	0.717
Behavioral proxy - Overestimation	0.313	0.576
Behavioral proxy - Overplacement	0.087	0.768
Behavioral proxy - Overprecision	3.958	0.047
Characteristic proxy - Overestimation	0.336	0.562
Characteristic proxy - Overplacement	0.213	0.645
Characteristic proxy - Overprecision	1.361	0.243
Overestimation - Overplacement	0.093	0.761
Overestimation - Overprecision	1.397	0.237
Type of financial decision-making		
Investing - Trading	12.575	<0.001
Investing – Innovativeness	1.251	0.263
Trading – Innovativeness	2.016	0.156

In order to render the observed overall impact inconsequential, a file drawer analysis revealed that we would need to include an additional $K = 6954$ studies having null effects. This indicated there was no publication bias when using the $5k + 10$ rule to the total impact size ($5 \times 81 + 10 = 415$). We discovered that three out of thirteen distributions (Table 3, column 7) fail to fulfil the $5k + 10$ condition when looking at the possibility of publishing bias in moderation findings. Due to this, caution is warranted when evaluating impact sizes. There was no indication of publication bias according to the rank correlation test performed by Begg and Mazumdar ($r = 0.076$; $p = 0.316$). Lastly, there were no statistically significant variations between the impacts of published as well as unpublished research in the supplemental Qstatistics analysis (see Table 3), indicating that publication status did not affect the conclusions of the study.

Conclusion

Behavioral economists have spent the better part of the past two decades digging into the ways in which overconfidence may affect trading and other financial choices. Overconfidence is often cited as one of the strongest and most important indicators of people's financial actions in the present research. Here, we synthesise data from 34 research

to evaluate the aggregate impact of overconfidence on three distinct types of financial judgements: trading, investing, and creativity. The results indicate a beneficial and statistically significant link among both management, decision making and overconfidence. This association favours those with higher levels of overconfidence. Thus, our findings are consistent with the widely held belief that self-assurance plays a decisive role in how people manage their money. The strength of the association, however, shows that overconfidence has little to no impact on economic judgement. Our data, on the other hand, imply that this impact is negligible and context-dependent when making financial choices. Importantly, the kind of overconfidence measurement tool was shown to affect the link between overconfidence, management and financial decision-making. The initial, direct measures had less of an impact on financial management and decision-making than the indirect ones. There would be even less of an impact of overconfidence on either trading or creativity if indirect metrics were left out of the analysis. The ramifications of these findings were varied. Following this abstract is a more in-depth discussion of our results, organised around how they add to overconfidence concept and may be used in the future, both in research and practise.



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