Risk-taking under Social Comparison

An analysis on the effect of social comparison on risk-taking behaviour in the investment banking industry

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Amir Reza Rezvani

from

Germany

Approved on the application of

Prof. Dr. Tami Dinh

and

Prof. Dr. Dirk Schäfer

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- Dr. Viktor E. Frankl

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List of abbreviations

Approx.	Approximately
BCBS	Basel Committee on Banking Supervision
bn	Billion(s)
CDO	Collateralised debt obligations
CDS	Credit default swaps
CEO	Chief Executive Officer
CF	FCA Controlled Functions
CFA	Chartered Financial Analyst
CFO	Chief Financial Officer
CG	Corporate governance
CIB	Corporate and Investment Bank
CIMA	Certified Investment Management Analyst
DACH	Acronym for Germany (D), Austria (A) and Switzerland (CH)
DCM	Debt capital markets
DF	Degrees of freedom
DNA	Deoxyribonucleic acid
e.g.	Exempli gratia (Latin for: for example)
ECM	Equity capital markets
et al.	et alii, et aliae, et alia (Latin for: and others)
etc.	Et cetera (Latin)
EU	European Union
EUR	Euro (currency)
excl.	Excluding
FCA	Financial Conduct Authority

FCIC	Financial Crisis Inquiry Committee
Fig.	Figure
FSB	Financial Stability Board
FY	Financial year
G20	Group of Twenty
GDP	Gross domestic product
GFC	Global Financial Crisis
GLBA	Gramm-Leach-Bliley Act
H	Hypothesis (e.g., H1 for Hypothesis 1)
i.e.	Id est (Latin for: that is)
IBD	Investment Banking Division
IMF	International Monetary Fund
Incl.	Including
IPO	Initial public offering
IT	Information technology
k	Thousand(s)
LevFin	Leverage Finance (department within Investment Banking)
m	Million(s)
M&A	Merger and acquisition
MBO	Mortgage-Backed Securities
MD	Managing Director
MNPI	Material Non-Public Information
N/A	Not applicable
OTC	Over-the-counter
P&L	Profit and loss statement (i.e., income statement)
RQ	Research question

RSU	Restricted stock (option) unit
SEC	Securities and Exchange Commission
TARP	Troubled Asset Relief Program
UK	United Kingdom
US	United States
USD	US Dollars (currency)
VP	Vice President

Abstract

This dissertation studies the impact of social comparison on risk-taking behaviour in the investment banking industry. This research addresses the need to study systemic flaws within the financial sector by focusing on the multifaceted relationships among investment banking professionals.

The global financial crisis (GFC) in 2008 has been substantially linked to excessive risk-taking and short-sightedness of investment banking professionals due to inappropriate compensation practices and unhealthy competitive behaviours. It has increased the consideration of the public, practitioners, and scholars towards the impacts of pay-for-performance compensation schemes on the risk propensity of decision-makers in the financial industries. Subsequent to the crisis, political and regulatory bodies required financial institutions (e.g., investment banks) to defer bonus payments over time, discouraging executives from maximising their current pay at the expense of long-term value creation of the institution as well as aligning executives and shareholders' long-term interests. Despite regulatory efforts, decisions in real life are usually not made in social isolation and risk-taking behaviour can be influenced by the social context as individuals are not only concerned about their financial gains but also about their social gains and losses relative to their peers.

The empirical analyses are based on a primary dataset of 222 investment banking professionals from predominantly major bulge bracket banks. The results show that risk-taking behaviour is lower among investment banking professionals who, in real-life, work under a deferred bonus regime rather than those who receive immediate bonus pay. In addition, the results show that social loss triggers risk-taking behaviour among investment banking professionals.

The findings of this research contribute to the existing notion of Prospect Theory by extending insights from the private to the social domain. This study derived first-hand practical implication by collecting data from a real-life work setting at bulge bracket investment banks. The insights gained from this research are of strategic importance for investment banks determining their remuneration schemes and human capital strategy but also for regulatory bodies, governments, and other policy setters who establish directives to protect societal interests and the general public.

Zusammenfassung

Diese Dissertation untersucht Effekte sozialer Vergleichsprozesse auf das Risikoverhalten in der Investmentbanking-Branche. Die Studie hebt auf die Notwendigkeit ab, systemische Mängel innerhalb des Finanzsektors zu untersuchen, indem sie sich auf die vielfältigen Beziehungen zwischen Investmentbanking-Fachleuten konzentriert.

Die globale Finanzkrise im Jahr 2008 wurde substanziell mit der exzessiven Risikobereitschaft und Kurzsichtigkeit von Investmentbanking-Fachleuten aufgrund von unangemessenen Vergütungspraktiken und dysfunktionalem Wettbewerbsverhalten in Verbindung gebracht. Sie hat die Aufmerksamkeit der Öffentlichkeit, der Fachleute und der Wissenschaftler auf die Auswirkungen von Pay-for-Performance-Systemen auf die Risikoneigung von Entscheidungsträgern in Finanzinstituten erhöht.

Im Anschluss an die Krise verlangten politische und aufsichtsrechtliche Instanzen von den Finanzinstituten, Bonuszahlungen zeitlich zu verschieben, um Führungskräfte davon abzuhalten, ihre aktuelle Vergütung auf Kosten der langfristigen Wertschöpfung des Instituts zu maximieren, und um die langfristigen Interessen von Führungskräften und Aktionären in Einklang zu bringen. Ungeachtet der regulatorischen Bemühungen, werden Entscheidungen im realen Leben kaum jemals in sozialer Isolation getroffen. Das Risikoverhalten kann durch den sozialen Kontext beeinflusst werden, da Individuen nicht nur auf ihre finanziellen Gewinne bedacht sind, sondern auch auf ihre sozialen Gewinne und Verluste im Vergleich zu ihren jeweiligen Mitmenschen.

Die empirischen Analysen basieren auf einem Primärdatensatz von 222 Investmentbanking-Fachleuten, die hauptsächlich aus großen Bulge Bracket-Banken stammen. Die Ergebnisse zeigen, dass die Risikofreudigkeit unter Investmentbanking-Fachleuten, die in der Realität unter einem aufgeschobenen Bonussystem arbeiten, geringer ist als unter denen, die sofortige Bonuszahlungen

erhalten. Darüber hinaus zeigen die Ergebnisse, dass sozialer Verlust das Risikoverhalten signifikant beeinflusst.

Die Ergebnisse dieser Studie tragen zum bestehenden Konzept der Prospekttheorie (Neue Erwartungstheorie) bei, indem Einsichten aus dem privaten auf den sozialen Bereich erstreckt werden. Darüber hinaus wurden in dieser Studie praktische Implikationen aus erster Hand abgeleitet, indem Daten aus einem realen Arbeitsumfeld bei Bulge Bracket-Banken gesammelt wurden. Die aus dieser Untersuchung gewonnenen Erkenntnisse sind von strategischer Bedeutung für Investmentbanken, die ihre Vergütungssysteme und ihre Humankapitalstrategie festlegen, aber auch für Aufsichtsbehörden, Regierungen und andere politische Entscheidungsträger: Instanzen, die Richtlinien zum Schutz der Interessen der Allgemeinheit festlegen.

to

my parents
Simin and Dariosh Rezvani

my country of birth
Iran

my home
Köln

1. Introduction

The global financial crisis (GFC) in 2008 has been associated with excessive risk-taking and short-sightedness in the financial sector (i.e., investment banking industry) allegedly caused by, amongst other factors, inappropriate compensation practices (Blinder, 2009; Bebchuck and Spamann, 2009).

Consequently, political and regulatory bodies in the United States and the European Union have responded with directives and principles on how to regulate executive compensation.[1] In their directive 2010/76/EU the European Parliament requires financial institutions in Europe to defer bonus payments over time with the goal of discouraging executives from maximising their current pay at the expense of the long-term value creation of the institution as well as aligning executives and shareholders' long-term interests. The GFC increased the consideration of the general public, practitioners and scholars towards the impacts of pay-for-performance systems (e.g., bonus payments) on the risk propensity of decision-makers working at financial institutions (Hartmann and Slapnicar, 2014).

Despite substantial efforts of national and international regulatory bodies, we know very little about the effects of deferred bonus schemes in the real-life setting (e.g., investment banking industry), that is, to what extent have deferred bonus schemes altered an investment banker's risk-taking behaviour? Real-life decisions are rarely made in social isolation, and the risk-taking propensity of executives can be influenced by their social context. Executives are not only concerned about their own monetary and ranking outcome, but also their outcome relative to their respective peers (Gamba and Manzoni, 2014).

The objective of this study is to (1) analyse whether investment banking professionals that are subject to deferred bonus schemes exhibit a lower risk-

[1] See the memorandum "Interagency Guidance on Sound Incentive Compensation Policies" by the U.S. Department of the Treasury and the European Union Commission proposal COM (2009)

taking behaviour than those who operate under an immediate bonus scheme and (2) examine whether social comparison has a direct impact on risk-taking behaviour or influences the impact of deferred compensation schemes on risk-taking behaviour (i.e., moderating the relationship). This research aims to contribute to the existing notion of Prospect Theory by extending insights from the private to the social domain. In line with Prospect Theory, this research expects that executives experience a social loss when their performance ranking is lower than that of their referent group. The resulting sense of loss could increase the willingness to adopt risk-seeking behaviour to catch up with their referent group.

Furthermore, this study contributes to the fields of Social Comparison Theory and Social Decision Theory. This study strives to derive first-hand practical implications by collecting data from real-life working professionals at bulge bracket investment banks. The insights gained from this research are not only of strategic importance for investment banks determining their remuneration schemes, but also for regulatory bodies, governments and other policy setters, which establish directives to protect the interests of the general public.

This study carries out two complementing research methodology techniques. First, primary data collection through an experimental survey questionnaire will be conducted with a sample consisting purely of front-office investment banking professionals within bulge bracket banks who are facing daily investment decisions as part of their roles. Second and complementary to the first method, semi-structured expert interviews with senior investment banking professionals who assume leadership positions in their respective organisations will be conducted to share with them the findings from the experimental survey questionnaire with the intention to obtain a qualitative assessment on the quantitative findings from executives that have a long-lasting experience. The interviews can provide insights and implications for academia and practitioners as well as to fuel future research.

1.1 Research problem setting

Traditional remuneration schemes primarily include financial performance measures, such as accounting profit (Bushman and Smith, 2001). Next to the (fixed) annual base salary a (variable) bonus component tied to accounting measures (e.g., operating profit) is paid out at the end of each financial year.

Such a compensation scheme is intentionally designed to motivate executives to maximise company profit in the current period. Traditional remuneration schemes can provide executives and employees with incentives to take imprudent risks to meet their immediate earning targets, securing their bonus for the period, which can prove to be inconsistent with the long-term goals of the organisation (Ittner et al., 1997). A central concern is that traditional bonus systems may trigger dysfunctional risk-taking behaviour of decision-makers as they are designed to reward positive performance more than penalising negative performance (Chen et al., 2006; Sanders and Hambrick, 2007).

The new pay-for-performance policies that have been suggested and implemented by bank authorities and regulators at the global level (Steward, 2009; CRD 3/2010/76/EU) primarily aim to mitigate managements' tendency towards excessive risk-taking (Hartmann and Slapnicar, 2014). However, the risk-taking inclinations of executives may be increased, rather than lowered, if compensation systems result in negative framing, such as no immediate bonus pay-outs, penalties, and clawbacks (Thaler, 1981; Barberis et al., 2006).

Risk-taking propensity of executives can further be influenced by their social context, as executives are not only concerned about their own monetary and ranking outcome, but also their outcome relative to their respective peers (Gamba and Manzoni, 2014). This is especially true since real-life decisions are barely made in isolation of social factors (i.e., professional traders can witness their colleagues and monitor their monetary outcomes).

Despite a large body of existing research documenting the omnipresent tendency of individuals to engage in social comparisons with their social referents and the effects these social comparisons have on individual behaviour, social context in the realm of decision-making under risk has been broadly ignored and, therefore, empirical research to date is limited. In the context of investment banking, it remains unclear whether (a) deferred bonus payments can curb the risk-taking behaviour of investment banking professionals, and whether (b) a potential reduction in risk-taking behaviour through deferred bonus payments can diminish under the negative framing caused by social comparison, as executives can engage in higher risk-taking behaviour if their ranking falls below that of their co-workers'.

1.2 General research status

In the aftermath of the GFC, deferred bonus schemes have become increasingly popular as a mechanism to encourage and support long-term thinking and orientation of executives. Compensation deferrals in the form of equity-based payments are already in practice and have been examined by scholars (Jensen and Murphy, 2004). Studies investigating the impact of equity-based compensation systems on risk-taking have conveyed inconsistent results. Some scholars found increased levels of risk-taking (Jensen and Meckling, 1976; Sanders, 2001), whereas others found no impact on risk-taking (Fahlenbrach and Stultz, 2010) or even mitigation of risk-taking behaviour (Martin et al., 2013). Cassidy (2002) and Madrick (2003) elaborated on the alleged role of stock-based compensation in earlier corporate scandals. Moreover, Dittmann and Maug (2007) labelled equity-based bonus schemes as defective and inefficient incentives due to their asymmetric option-like structure. None of these preceding studies (primarily focusing on ex-ante investment incentives) consider risk preferences and decision-making with regard to how social comparison affects individual decision processes.

It may occur that the social condition of the decision-maker and his/her propensity toward social gains and social losses affect his/her attitude towards risk-taking (Gamba and Manzoni, 2014). This implies that executives facing a disadvantageous social condition (e.g.; social loss: lower ranking or earnings compared to their co-workers) are willing to embrace more risks than executives with an advantageous social condition (social gain: higher ranking or earnings compared to their co-workers) as they are determined by the motivation to catch up with their social referents. In their research, Lazear and Rosen (1981) found a positive relationship between an increasing compensation gap in hierarchical levels and greater risk-taking by senior executives as they compete against each other to obtain larger rewards at the top of the managerial hierarchy.

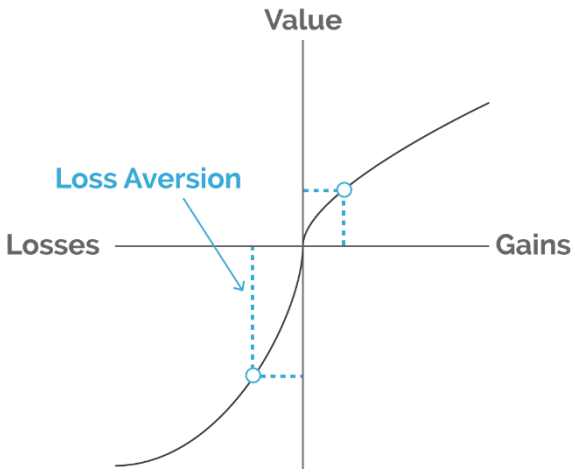
In Prospect Theory, Kahneman and Tversky (1979) suggest that decision-makers recognise potential outcomes as gains or losses relative to the reference point, which is known as a psychologically derived benchmark. Based on Prospect Theory, the reference point is considered a focal point for risk preferences, which renders the definition of the reference point of critical importance in decision-making situations. The authors propose that the reference point usually resembles the decision-maker's current situation (i.e., status quo) and can also be affected by norms, aspirations, expectations, as well as social comparisons (Tversky and Kahneman, 1991).

In a private setting, individuals have different risk attitudes, which is a function of the positive variation with respect to a certain individual reference point (e.g., goal, status quo etc.). Correspondingly, in a social environment it may occur that individuals have different risk attitudes depending on the distinctions with regard to a social reference point (e.g., the rank outcome of the reference group). Thus, receiving a lower final ranking or bonus payment than the reference group implies that the manager experiences a loss, namely a social loss. This study expects that the social loss setting may induce consequences to the risk-taking behaviour of an

investment banking professional, given that an individual wants to avoid finding him-/herself in the social loss domain.

Literature shows that loss aversion is a determining property of reference dependence (Linde and Sonnemans, 2012). Moreover, loss aversion is further present with regard to peer rankings or earnings and constitutes a substantial feature of several significant theories. Prospect Theory demonstrates that losses have twice the hedonic impact on a person's well-being than the gain of an equivalent amount. This is illustrated in Figure 1 whereby the value function has a steeper trajectory for losses than for gains indicating that the perceived value of losses outweighs the value of gains (Kahneman and Tversky 1979).

Figure 1.
Value function in Prospect Theory



This figure illustrates the basic curvature of the utility function proposed in Prospect Theory. Source: Kahneman and Tversky, 1979.

Similarly, in their inequity aversion model, Fehr and Schmidt (1999) propose that the impact of relative monetary outcome on an individual's utility function is more substantial when peers earn more than when they earn less in comparison to another individual. The scholars demonstrate that an individual shows loss aversion in social comparisons, that is, negative divergence from the social referent has a larger hedonic impact than positive divergence. This social loss

aversion detected with regard to the referent's monetary outcome indicates that social reference point plays a similar role to individual reference points.

This triggers the discussion of whether one can further witness similar risk-taking behaviours by an individual around a social reference point as predicted by Prospect Theory, that is, concavity above the social reference point (i.e., gain domain) and convexity below the social reference point (i.e., loss domain).

Under uncertainty, scholars have established that an individual tends to be risk-seeking when finding himself/herself in a loss domain and risk-averse when in a gain domain. Furthermore, mental accounting researchers propose that individuals adopt risk-seeking behaviours if they are given the opportunity to unwind their loss and potentially turn it into a gain (break-even effect). By earning less than the referent peers, a manager is likely to find himself/herself in a social loss domain and the resulting sense of loss could increase their willingness to adopt risk-seeking behaviours to catch up with their peers.

The risk-seeking behaviour stemming from social comparison as described above could influence the impact that deferred compensation schemes intend to have on investment bankers' risk-taking behaviour. If a banker scores less than their social referent point, it can trigger higher risk-taking behaviour, which ultimately mitigates the risk-reducing magnitude of bonus deferral instruments.

Excessive risk-taking behaviour of executives can pose severe consequences for the financial stability of the firm, its employees and to the larger economy. Prior literature demonstrates that the financial outcome of a social reference group influences an individual's propensity towards risk. To date, it is unclear how a comparison to a social reference benchmark influences managerial risk-taking. To close this knowledge gap, this research intends to investigate the direct impact of social comparison on risk-taking behaviour, as well as the moderating impact of social comparison on the relationship between investment banking professionals

that operate under different bonus schemes and their risk-taking behaviour, resulting in the following main research question:

Does social comparison increase risk-taking behaviour, decreasing the risk-reducing propensity deferred bonus schemes have on investment banking professionals? To examine this research question comprehensively, this research question is broken into two granular sub-research questions summarised in Table 1 below.

Table 1.
Overview of Research Questions

Sub-RQ1:	*To what extent does the risk-taking behaviour of investment banking professionals within different ranks that operate under different compensation schemes differ from each other?*
Sub-RQ2:	*To what extent does social comparison influence the risk-taking behaviour of Investment Banking Analysts, Associates and Vice Presidents?*

The table provides an overview of the sub-research questions in this dissertation. Source: Author.

This dissertation contributes to the existing literature by providing new insights on the influence of corporate policies on financial experts. Moreover, the empirical study at hand reveals more details on the relationship between variable compensation and managerial risk-taking in investment banking.

In addition, this study derives its insights from a unique hand-collected data set, which includes compensation data provided by 222 investment banking professionals from the most renowned financial institutions globally. This is, to the best of the author's knowledge, the largest data sample on investment banking professionals' compensation that has been collected first-hand.

In contrast to several studies on executive compensation in the financial industries where the focus of the research was on the C-level management, this study examines the junior to mid-rank levels within the investment banking industries, aiming to shed light on structural dysfunctionalities that could be mitigated from an earlier carrier stage to avoid the potential build-up of organisational debt.

1.3 Dissertation structure and outline

The following presents the outline of this dissertation (see Figure 2).

Section 1 introduces the topic of this doctoral dissertation, elaborating on the general research status and research problem setting which forms the point of departure for the development of the research question. Further, this section defines the academic and practical contributions that this dissertation project aspires to make.

Section 2 sets the contextual background of the research setting by introducing the fundamental and theoretical foundation on which this dissertation is based. Specifically, it defines the investment banking setting, and the inherent agency problem within the industry, followed by an elaboration on their contributing role to the GFC in 2008 and the resulting public perception of investment banks.

Section 3 provides the theoretical foundation for risk-taking in the investment banking context. In particular, monetary compensation and competition and their relations to risk-taking will be discussed. As a result, underlying elements of bonus schemes and human capital considerations in investment banks will be presented.

Section 4 introduces the theoretical centrepiece of this dissertation, namely the social comparison theorem, actively bridging the theory and the realm of Prospect Theory that allows the development of the relevant hypothesis in the investment banking research setting.

Section 5 provides a recap of the literature review and presents the relevant hypotheses of this dissertation.

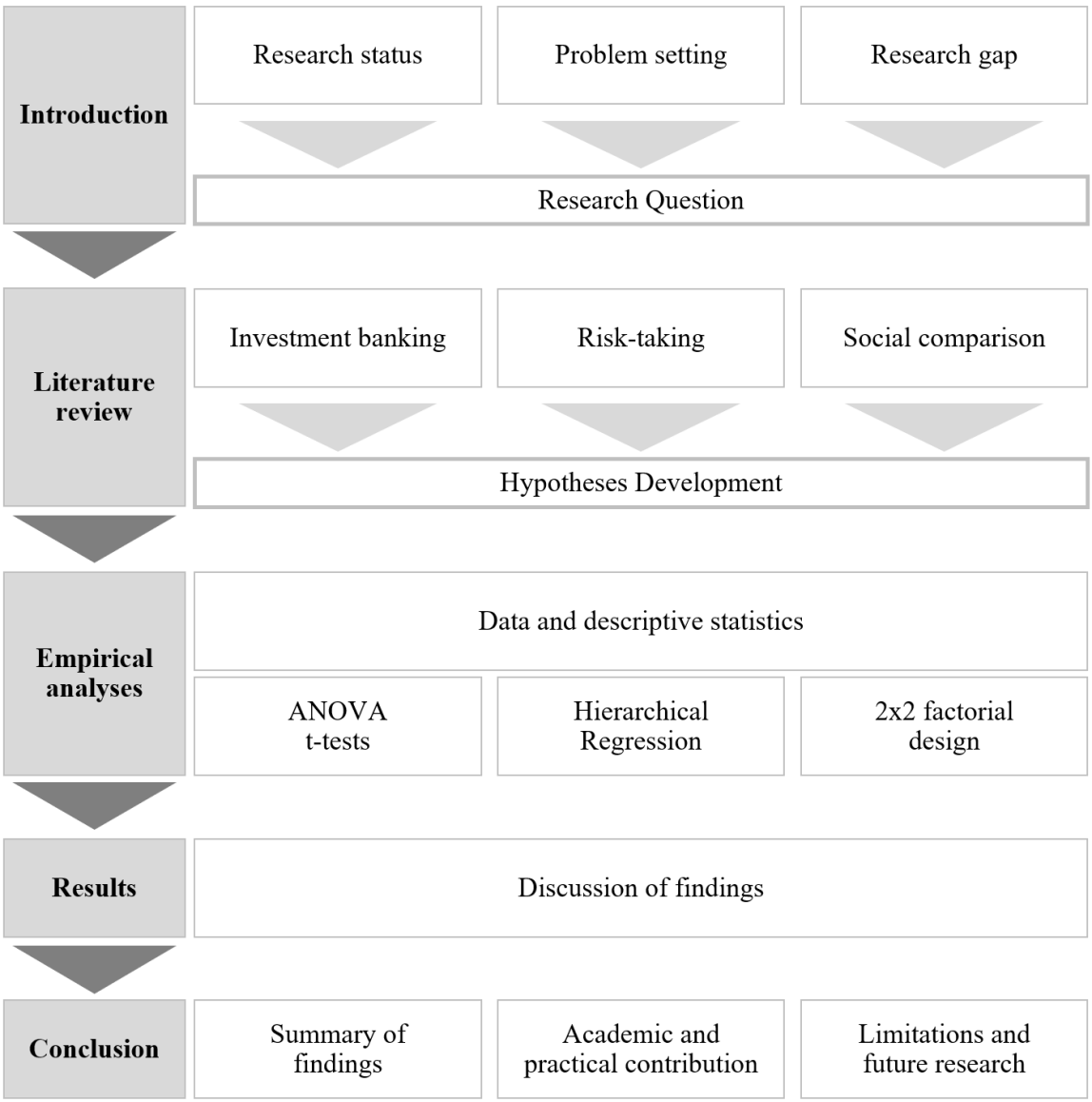
Section 6 describes the research design and approach for the empirical research that is being performed in this dissertation, explaining data collection,

methodological approach and the unit of analysis in conjunction with the construction validity framework.

Section 7 represents the analytical centrepiece of this dissertation from which the empirical results will be derived. The main dataset along with descriptive statistics and the results of the various analyses techniques are outlined in this section.

Section 8 summarises the findings of this dissertation and compares the empirical results to the discussion presented during the literature review. Furthermore, it outlines the academic and practical contribution and presents limitations and suggestions for future research.

Figure 2.
Structural outline of this dissertation



This figure illustrates the structure of this dissertation. Source: Author.

2. Fundamental and theoretical foundation

This section establishes a theoretical foundation of the investment banking sector as it constitutes the primary sector of focus throughout this dissertation. It elaborates on the scale and scope of firms within the industry including historical derivation of core activities and practices alongside the relevant theoretical grounding. Furthermore, this section expounds the notions of risk-taking, human capital, and remuneration structures in the context of the industry.

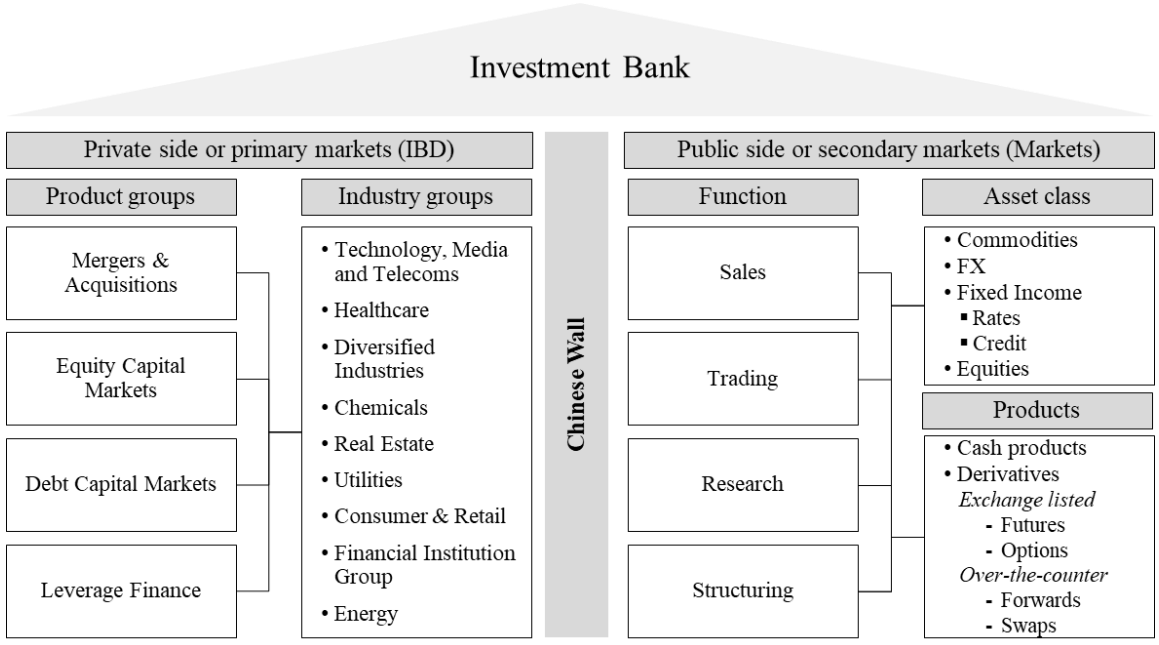
2.1 Definition and role of investment banks

An investment bank is classified as a financial services company or financial institution. Its clientele is diverse and predominantly comprises public and private corporations, other financial institutions (i.e., institutional investors), wealthy individuals, as well as governments. The main role of an investment bank includes core activities such as providing corporate finance advisory, raising funds from capital markets, brokering sales and trading transactions, as well as the structuring and sale of tailored financial products (Wise, 2006). Henceforth, throughout this dissertation, an investment bank's activities are referred to as 'investment banking', which is used as the comprehensive term. Further, not all investment banks offer the full spectrum of products and services. Bulge bracket investment banks (e.g., Goldman Sachs, J.P. Morgan, Bank of America Merrill Lynch, etc.) provide full-service, offering advice and financing solutions to their clients, whereas boutique investment banks (e.g., Greenhill, Lazard, Evercore, etc.) often specialise in one particular product, sector, or service (Gutmann, 2013).

Structurally, investment bank activities are separated into two sides, namely the private and public sides, also respectively known as primary and secondary markets (see Figure 3). The private side, often referred to as the 'Investment Banking Division (IBD)', encompasses industry and product groups that have access to private client information, which is of strictly confidential nature and

referred to as ‘Material Non-Public Information (MNPI)’, ‘inside information’, or ‘non-public price-sensitive information’. It is widely acknowledged that MNPI, which is classified as information that has not been dispersed to the general public, can substantially affect the market value or trading of a security, as market participants could get an unfair advantage in the marketplace through illegal insider training (Lane, 2011). Under its 10b-5 rule, the Securities and Exchange Act of 1934 prohibits illegal insider trading, that is, engaging in securities transactions that stipulate a breach of fiduciary duty, trust or confidence, while in possession of MNPI about a particular security. Some examples of MNPI may include the launch of a take-over acquisition bid, initial public offering, private placement, or stock buybacks.

Figure 3.
Illustrative divisional split of an investment bank



This figure illustrates the structural divisions of investment banks into the private and public sides with the respective lines of business. Source: Author.

The public side in an investment bank is regularly referred to as ‘Markets’ and comprises all functions, activities, and transactions with regard to public securities that fall within the realm of financial markets (Lott et al. 2013). These securities

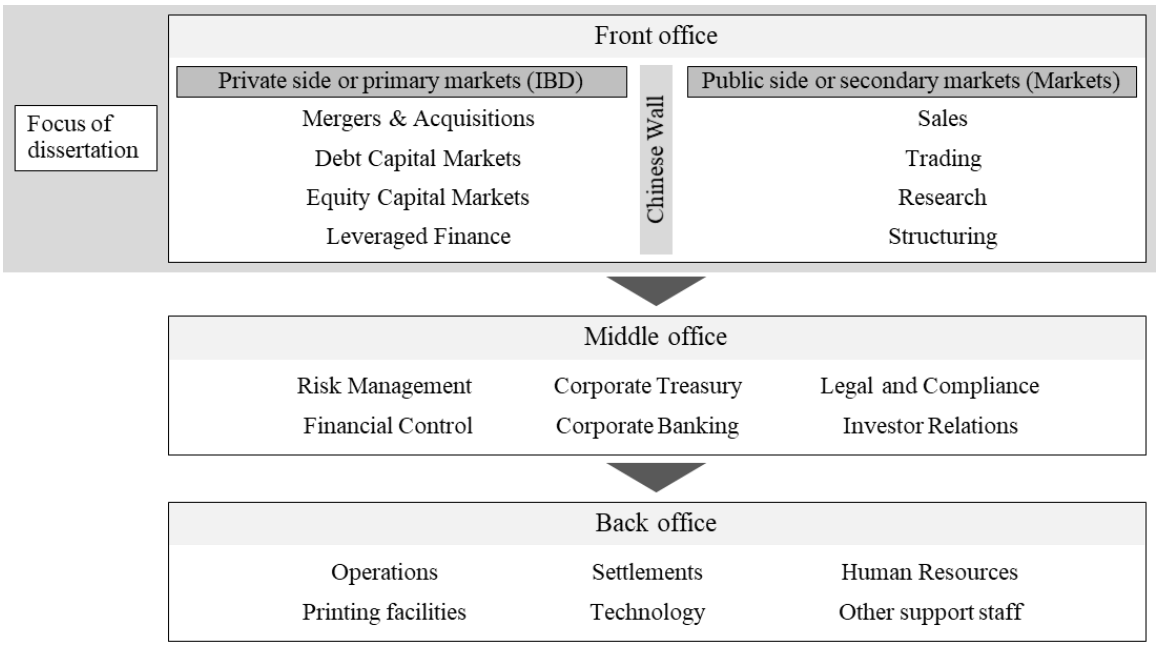
relate to a variety of ‘micro’ and ‘macro’ assets. Micro assets include securities related to a particular company, industry, or sector (e.g., company stocks or corporate bonds), whereas macro encompasses securities that are directly impacted by macroeconomic measures, such as central bank actions, politics, domestic and foreign policies, and international trade (e.g., foreign currencies, commodities, interest rates, or government bonds). Although private and public side employees of an investment bank both work in the same building, it is strictly prohibited that public side employees gain access to private information, as they could theoretically take advantage of that information in public markets (Gutmann, 2013).

The separation of primary and secondary markets is performed by and effectively holds firm through an investment bank’s information barrier or ‘Chinese Wall’ - a terminology commonly used (though broadly regarded as politically incorrect) to describe the virtual and physical barriers designed to prevent departments or individuals within the same organisation from exchanging publicly sensitive information. The term gained in popularity after the stock market crash in 1929, after which the US Congress enacted the Glass–Steagall Act of 1933 that ultimately separated the activities of commercial and investment banks (Cassis et al., 2016). Its main purpose is to prohibit the exchange of MNPI, which could cause conflicts of interest. The ethical concept of the Chinese Wall increased in significance within the financial services industry and became more critical post enactment of the Gramm-Leach-Bliley Act (GLBA), a bi-partisan regulation passed by US congress in 1999 (Cassis et al., 2016). To facilitate an effective separation and safeguard insider information, private and public sides of investments banks are often located on different floors within the same organisational building, where access is electronically regulated through employee badges, granting authorised personnel entrance to their relevant work floors.

Operationally, the activities of an investment bank are segregated into front office, middle office, and back-office activities (see Figure 4). Front office roles are considered 'client-facing' or 'revenue-generating', whereas middle office has the sole purpose of supporting or complementing front office activities (Gutmann, 2013).

Back-office functions largely focus on the non-banking operational activities and are often offshored to other low-wage locations (e.g., Mumbai, Bangalore, or Buenos Aires) due to the admin heavy nature of the tasks involved (e.g., processing trading activities, payroll, or information technology).

Figure 4.
Illustrative office constellation in an investment bank



This figure displays the core office layers in an investment bank and highlights the area of focus of this dissertation, namely the front office. Source: Author.

This dissertation focuses exclusively on front office investment banking professionals. These are individuals who are in frequent client contact and who generate fees (i.e., revenue) for the bank. They actively market the bank's products to its client base, seeking new client relationships as well as maintaining the incumbent client base. Most importantly, these individuals have obtained the

required mandatory regulatory approvals to pursue their role in advising clients on investment activities and decision-making that bears an implied level of risk, which can be elevated to achieve greater returns.

Prior to engaging with any client, these professionals need to seek authorisation from the Financial Conduct Authority (FCA) to pursue a controlled function for an authorised firm. Controlled functions (CF) are code names assigned to different functions within the financial services industries and relate to activities of a regulated firm. These functions are detailed in section 59 of the Financial Services and Markets Act. The FCA (equivalent to Bundesanstalt für Finanzdienstleistungsaufsicht 'Bafin' in Germany, i.e., Federal Financial Supervisory Authority) is an independently operating financial regulatory body in the United Kingdom which is financed through fees that are being charged to the members of the financial services industry (FCA, 2016). The FCA regulates firms in the financial industries that provide any kind of financial services to clients and its core mandate is to maintain the integrity of the national financial markets. As per the FCA (2016), "approved persons that perform controlled functions for an authorised firm usually have significant influence over the firm's regulatory conduct."[2] Therefore, each single front-office employee is required to obtain an FCA approval prior to joining an investment bank in a full-time capacity. Approvals need to be obtained through successfully passing examinations on different subject matters (e.g., derivatives, securities, regulations, etc.) that will assess if an individual has the necessary competencies and understanding of investment instruments. Without the regulatory approval from the FCA, no individual can commence a front-office career in an investment bank. As such, professionals need to obtain the status of CF30, that is, an FCA approved individual who has obtained the governing authorisation to perform the customer function. These include, but are not limited to, activities of advising on investments; providing advice to clients in relation to corporate finance business;

[2] www.fca.org.uk/firms/approved-persons/controlled-functions

acting as principal or as agent and facilitating deals in investments; working as an investment manager and taking on the relevant duties; and acting as a 'bidder's agent' in relation to bidding in emissions auctions. This study only focuses on front-offices investment banking professionals who are FCA approved, which mitigates material variations and heterogeneity in financial literacy among participants, and subsequently the need to control for each participant's educational background.

2.2 Public perception of investment banks

More than a decade after the GFC ended, the financial services industry remains to experience a lack of trust from society. The reputation of financial services firms, specifically investment banks, was materially damaged during the GFC. The confidence of society in the integrity of the financial system has decreased as the costs of moral hazard faced by agents (i.e., investment banks) are borne by shareholders, taxpayers, and society at large (Murray et al., 2017). Society lost faith in the industry's key constituents.

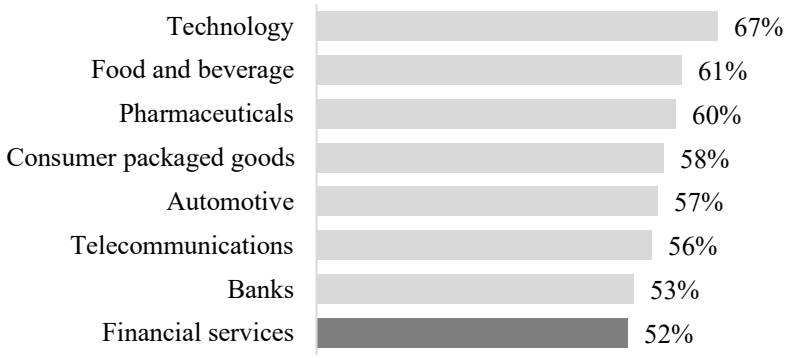
Further, Murray et al., (2017) describe that one element contributing to the mistrust of society towards investment banks is the damage that was caused by design and dissemination of new, synthetically-derived financial products (i.e., credit default swaps (CDS), collateralised debt obligations (CDO), and similar mortgage securities), that were poorly understood by regulators and market players, but ultimately imposed an enormous systemic risk for society.

Better Markets, a non-profit organisation that aims to promote public interest in the financial markets to achieve stronger financial regulations, has conducted a nationwide survey in the US, which revealed that a clear majority of Americans believe that the stock market is gerrymandered, and that financial institutions on Wall Street harm average citizens as these big institutions behave in ways that are injurious to society (Puzzanghera, 2014). Alzola (2012) argues that societal

expectations of political equality and consent are undermined by the corporate lobbying framework. Moreover, Ferguson (2012) presents the still to-date prevalent notion that the financial services industry is morally challenged.

Similarly, a study by the CFA Institute, performed in collaboration with the public relations firm Edelman, found that banks and financial services are the sectors that are trusted least within the investor community, according to the 2013 Edelman Trust Barometer (see Figure 5). The low level of trust is a testimony of the lack of confidence the public has against the financial services industry, fuelled by the misconduct during the financial crisis involving money laundering scandals, fraudulent trading activities, rate manipulations, and insider trading.

Figure 5.
Investor trust study



This figure illustrates the outcome of the Investor Trust Study in 2013 where participants were asked if they trust the above industries to do the right thing. Source: CFA Institute and Edelman, 2013.

In their study results, Bennett and Kottasz (2011) demonstrate an overall dissatisfaction with the banking industry after the inception of the crisis as banks were largely associated with the execution of wildly speculative transactions combined with moral misconduct. The perceptual value the sample respondents assigned to the perceived levels of the banking sectors' reliability, competence, and respect for the law, deteriorated considerably in the years subsequent of the crisis.

Further, Bennett and Kottasz (2011) suggest that the perception or attitude towards the banking industry depends on multiple factors, such as the following.

(1) A person's prior perceptions of the banking industry – Grunwald and Hempelmann (2010) suggest that prior reputations of firms or organisations determine and shape the public perceptions of corporate responsibility in case a harmful crisis arises, in particular ascriptions of blame tend to be more prevalent among individuals with lower levels of prior perceptions of an organisation's reputation (He and Baruch, 2010).

(2) The personal impact of the crisis – individuals who suffered a personal loss as a result of the GFC have, in all likelihood, paid closer attention to its course and content matter than individuals who were barely impacted by it and witnessed the crisis from a mere observer perspective (Gritten, 2011).

(3) Knowledge of the crisis – public discourse significantly affects public perceptions of economic events (Leisner and Drori, 2005), including reports from mass media coverage (Carroll and McCoombs, 2003), politicians' statements, conversations with peers, as well as being exposed to headlines (Samu and Krishnan, 2010).

(4) Anger at the banks' behaviour – this occurs as a result of suffering a financial loss due to the crisis (i.e., deterioration of financial assets) in combination with subsequent embracement of negative stereotypes (Bodenhausen et al., 1994).

(5) Attributions of responsibility for the crisis – the nature of attribution comprises assigning a cause to an incident and deriving causal inferences in relation to the entities involved (Puccinelli et al., 2009), and leads to the attribution of intrinsic misbehaviours and weaknesses in the banking industry (Boin, 2004).

(6) Political orientation – an individual's political position can be a significant indicator of one's attitudes towards economic issues (Adams et al., 2010). Liberalism or conservatism frequently serves as a predictor of an individual's

fundamental attitudes regarding economic philosophies and capitalism (Conover and Feldman, 1981). For instance, politically conservative individuals will show a tendency to be more trusting towards the banking industry (McCloskey and Zaller, 1984).

(7) Moralistic trust – an individual who believes in the goodwill of others may treat entities as trustworthy based on the fundamental belief that people and organisations are moral, and therefore, forming expectations of truthful behaviour (Seligman, 1997).

The perception or the attitude of the public or society towards the banking industry is of great significance due to multiple reasons. Various scholars suggest that actual behaviour and behavioural intentions are both affected by the attitude towards business (Puccinelli et al., 2009; Einwiller et al., 2010). Behaviour addresses multiple dimensions, such as inclination of shareholders to acquire equity within the banking sector (Ryan and Buchholtz, 2001), and purchasing decisions of consumers related to financial services products (Jayawardhena, 2004). A substantial strand of research proposes that an individual's attitude towards economic events is affected by several socio-demographic influences and psychological traits (Leiser et al., 2010). Hence, managers in the banking industry need to be cognisant of such traits and factors, and how they impact attitudes, allowing measures for ameliorating the public's perception of the integrity of the banking industry to be realised (Walsh et al., 2009). Moreover, such awareness will allow industry managers within the banking sector to correspond and interact in a more effective manner with politicians and officials at the government and on regulatory committees (Bravo et al., 2009).

2.3 Investment banks' role during the GFC in 2008

The GFC in 2008 was a phenomenon of such great magnitude that it has reshaped the entire financial sector. The International Monetary Fund (IMF) estimates that the crisis resulted in losses of financial wealth of more than $2.7 trillion in the United States, and an additional $1.4 trillion in the rest of the world. Not only are the GFC and the investment banking sector both subjects of considerable public concern; moreover, an array of academic literature and debates on the GFC, from an economic and systemic point of view, have been published in great magnitude over the past few years (see excerpt in Table 2). However, prior research foci have been exclusively on the financial and (socio-) economic nature of the crisis, and academia has largely ignored the examination of individual participants that work for the organisations involved in the crisis, which, in turn, would have provided a deeper and more granular level of understanding. To emphasise the importance of the research environment at hand, one needs to comprehend the scope of market participants' involvements, and the role investment banks played during the GFC in 2008.

Table 2.
List of publications on the GFC in 2008

Author	Publication
by academic scholars in (behavioural) economics	
George a. Akerlof & Robert A. Shiller (2009)	Animal spirits: How human psychology drives the economy, and why it matters for global capitalism
Alan S. Blinder (2013)	After the music stopped: The financial crisis, the response, and the work ahead
Ross Garnaut & David Llewellyn-Smith (2009)	The great crash of 2008
Gary B. Gorton (2010)	Slapped by the invisible hand: the panic of 2007
Simon Johnson & James Kwak (2011)	13 Bankers: The Wall Street takeover and the next financial meltdown
Raghuram Rajan (2010)	Fault lines: how hidden fractures still threaten the world economy
Carmen M. Reinhart & Kenneth S. Rogoff (2009)	This time is different: Eight centuries of financial folly
Nouriel Roubini & Stephen Mihm (2010)	Crisis economics: A crash course in the future of finance
Robert J. Shiller (2008)	The subprime solution: How today's global financial crisis happened and what to do about it
Joseph E. Stiglitz (2010)	Freefall: America, free markets, and the sinking of the world economy
John B. Taylor (2009)	Getting off track: How government actions and interventions caused, prolonged and worsened the financial crisis
by financial journalists	
John Cassidy (2009)	How markets fail: The logic of economic calamities
William D. Cohan (2009)	House of cards: A tale of hubris and wretched excess on Wall Street
Greg Farrell (2010)	Crash of the titans: Greed, hubris, the fall of Merrill Lynch, and the near-collapse of Bank of America
Michael Lewis (2010)	The big short: Inside the doomsday machine
Roger Lowenstein (2010)	The end of Wall Street
Bethany McLean & Joe Nocera (2010)	All the devils are here: The hidden history of the financial crisis
Gretchen Morgenson & Joshua Rosner (2011)	Reckless endangerment: How outsized ambition, greed, and corruption led to economic Armageddon
Andrew Ross Sorkin (2009)	Too big to fail: The inside story of how Wall Street and Washington fought to save the financial system from crisis-and themselves

This table provides a select (non-exhaustive) overview of academic and best-selling publications on the causes and implications of the GFC. Source: Page (2014)

For the sake of discussion, it is helpful to distinguish between the various factors leading to the GFC (Table 3), as outlined by the Financial Crisis Inquiry Commission (FCIC), and the chain of securitisation (Figure 6). An overarching theme is the lack of regulations that facilitated inadequate underwriting standards in relation to the issuance of unstable subprime mortgages (Sengupta and Noeth, 2010), as well as the creation of complex over-the-counter (OTC) financial

derivatives products that were sold to institutional investors and traded among banks with no regulatory oversight.

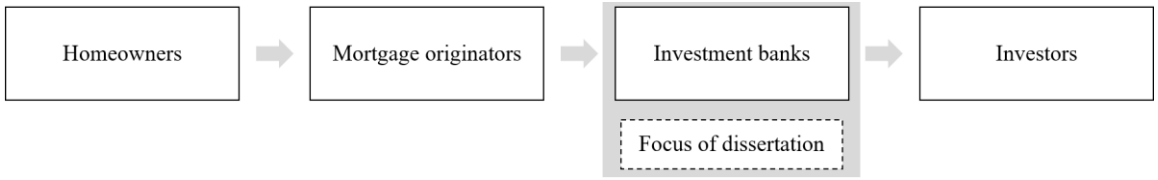
Table 3.
An abbreviated list of factors leading to the GFC in 2008

Factor	Primary originator
Inadequate regulation of subprime mortgage	Mortgage originators
Inadequate regulation of derivative financial products	Investment banks
Inadequate regulation of the rating agencies	Credit ratings agencies
Leverage	Investment banks
Low interest rates	Federal Reserve System of the United States
Government housing policy	Federal government of the United States

This table provides a non-exhaustive list of factors that accumulatively caused the outbreak of the GFC in 2008. Based on Page, 2014, and adapted by Author.

This is being cascaded by credit rating agencies issuing unjustifiably high credit ratings for the Collateral Debt Obligations (CDO) on the Mortgage-Backed Securities (MBO) investment banks pooled together. Moreover, these erroneous issuance ratings in turn fuelled the investor demand for CDOs (Change, 2010).

Figure 6.
Securitisation food chain and key exogenous entities



This figure illustrates the exogenous entities that contributed either directly or indirectly to the outbreak of the GFC in 2008. Source: Murray et al., 2017.

The ethics realm has published a substantial strand of research which identifies the protagonists or 'players' during the GFC, including commercial banks (Soltani, 2014), rating agencies (Scalet and Kelly, 2012), the business media (Chakravartty and Schiller, 2010), and even graduate business school education (Huhn, 2013). To date, however, research has barely focused on the actual

'players' in investment banks. This dissertation remains agnostic and impartial with regard to the causation of the crisis, acknowledging that the public and the private sectors both substantially contributed to the development and manifestation of the crisis as we know it. However, the clear focus of this research is on a micro-level analysis of the private sector (i.e., investment banks). Further, this research is not taking a retrospective stance towards the GFC by analysing past behaviour of groups of individuals but intends to gain implications from today's status quo for organisations and policy setters, allowing for appropriate measures to be introduced and existing ones to be recalibrated, if required.

2.4 Agency problem in investment banks

Agency Theory, the theoretical foundation elaborating the principal-agent problem, describes the relationship between a principal and the agent as one where the agent (i.e., investment banker) is hired by the principal (i.e., owner or shareholder) to act on the principal's behalf (Jensen and Meckling, 1976). The nature of this relationship bears the potential for conflicts of interest due to misaligned incentives and information asymmetry (Messier et al., 2006). In the investment banking industry, a predominant factor that leads to the principal-agent problem includes dysfunctional compensation schemes resulting in the tendency to focus on short-term earnings performance.

Dembe and Boden (2000) describe moral hazard as the condition in which a person or an organisation is more inclined to take risks, when the consequences may not be borne by the risk-taking body. In investment banks, moral hazard arises in existence of information asymmetry, a situation whereby one counterpart has more information in a transaction than the other party, and one counterpart is protected from the negative effects of the risk (Krugman, 2009). Within the framework of the GFC, a moral hazard occurs if an investment bank is cognisant of the fact that it is secured by a last resort lender (i.e., the government), and, thus,

participates in riskier investments since it has certainty that potential losses will be borne by another instance (Stiglitz, 2010).

In this construct, investment bankers serve as agents in a variety of roles, such as financial advisors, investment managers, brokers, traders, and dealers. The complex nature of the investment banking industry in combination with intertwined relationships creates a platform in which monitoring remains difficult. Thus, when there is a misalignment of interests and monitoring is problematic, the agent has the foundation to perform in ways that do not reflect the best interests of the principal. Moreover, in numerous transactions, risk embedded in marketed financial instruments shifts from one counterpart to another. This remarkable degree of interconnectedness, between idiosyncratic to financial markets and the investment banking sector, bears the latent potential for conflicts, and it can easily manifest itself in an actual crisis when a critical inflection point has been achieved, as witnessed during the recent GFC in 2008 (Barber, 2014).

Bank employees failing to act as agents for shareholders is one of the ascriptions triggering the GFC. Dysfunctional incentive mechanisms manifested in compensation contracts that stimulate misalignment of interest between bank employees and shareholders, promote myopic and selfish behaviours (Bebchuk and Spamann, 2010). Such behaviour has been extensively covered in media and addressed in a large strand of research. Shortly after the crisis, a large stream of research emerged addressing the inefficiencies of bonus mechanism, allowing bankers to participate in unlimited upside for the bonus pay with limited downside risk (Kirkpatrick, 2009). Similarly, former vice chairman of the Federal Reserve Alan Blinder describes how the compensation structures traders in investment banks and incentivises them to accept large risky positions, with downside potential and losses being absorbed by “other people’s money.” Further, Blinder (2009) refers to the government as the responsible body to eliminate compensation malpractices, soothing the alignment between employee and shareholder incentives.

Governments are facing the pressure of their responsibility to represent the interest of taxpayers and of the premise not to interfere with private industries. However, following governmental bailouts post GFC and the inception of the Troubled Asset Relief Program (TARP), whereby taxpayer money was used to stabilise institutions, a new principal-agent relationship has formed, namely that between bank managers and taxpayers.

3. Risk-taking in the context of investment banks

As pointed out earlier, in recent years, excessive risk-taking in the financial services industry has been emphasised as a main contributor to the GFC (FCIC, 2011; Dewatripont and Freixas, 2012). The difficult element that prevails is that risk-taking is deeply embedded in the very nature of an investment bank and defines its essential DNA. Grossman (2010) and Fleuriet (2008) both stress that commercial banks bilaterally manage deposits and loans for individuals and businesses, whereas investment banks engage in the trading of securities (i.e., stocks, bonds, and other liquid assets) as well as facilitate the primary capital raisings (i.e., underwriting equity or debt security issuances), that is, handling assets which have an implied level of risk and are also subject to market volatility. As such, investment banks bear a greater liquidity risk than commercial banks, because the latter can count on deposits in the event of a financial shock (Gatev and Strahan, 2006).

Because of the lack of regulation and oversight, investment banks evolved into one of the main driving factors and assumed a protagonist role in the emergence of the world financial and economic crises of 2008. Investment banks exercised immense flexibility during the last two decades prior to the actual recession, taking on extremely risky trades and investments with a clear focus on profit-making. The failure of regulatory bodies to monitor and govern numerous multinational corporations' actions displays structural flaws in the legal system, as well as in the laws and regulations applicable to financial sector firms (Nenovski et al., 2017).

In the economy, investment banks represent a specific type of company and their uniqueness becomes evident in the risk field. The risk level in investment banks' operations is significantly higher than in other sectors, primarily due to financial leverage, which is the most identifiable characteristic of bank balance sheets. Investment banks work almost solely on the basis of funds lent from investors,

which, despite the presence of contractual maturities, they are obligated to return at investors' request. This creates the full range of liquidity and market risk. Borrowed funds are invested in loans which embed different types of credit risks that are non-existent in other sectors. Furthermore, investments generate systemic risk, whereby the failure of a bank causes an increased likelihood of the failure of others, and the resulting collapse of several banks (especially in cases of larger bulge bracket institutions) may disrupt the functioning of the economy in its entirety (Adamowicz, 2018). Further, Bandt and Hartmann (2002) characterise systemic risk as the risk affecting all of the financial system. As such, ensuring the appropriate performance of banks' risk management system and restricting the occurrence of systemic risk is of vital interest not only for banks, but also for other businesses and private persons. Risk is a term that bears ambiguity and is often hard to define. It is interpreted differently in different fields of science, hence the development of one binding and universal definition remains difficult. All the activities of investment banks involve some form of risk. This research builds on the notion that investment banks must resolve business, investment, operational, market, and legal and compliance risk (Nenovski et al., 2017).

Figure 7a.
Investment banks' risk categories



This figure illustrates the interrelatedness of the different types of risk within an investment bank. Source: Nenovski et al., 2017.

Business risk refers to the outlook of the bank for achieving a lower operating profit than anticipated (Agranovich, 2015). This overarching conception of risk is driven by macro as well as micro-level drivers. The former can appear in the form of capital risk exposure, whereby the fair market value of the bank's capital drops and the bank's capital depreciates in value (Altunbas et al., 2000; Lepetit et al., 2008). The latter relates to internal turmoil, such as key-man related risk, conflict of interest on the basis of the agency problem, and the resulting reputational risk.

Investment risk relates to the likelihood of the bank encountering losses of certain investments on the basis of liquidity risk, insolvency risk, credit risk exposure, and market risk exposure (Brissimis et al., 2008; Lepetit et al., 2008, Athanasoglou et al., 2008; Fiordelisi and Molyneux, 2010).

Legal and compliance risk comprises the risk resulting from failure of adherence to binding rules and regulations. Post GFC in 2008, the financial services industry at large was subject to strict regulatory compliance. A strict regime of regulatory supervision is appointed in the aftermath of the financial crisis, serving as a preventive measure designed to detect fraudulence and financial misconduct, and thus, a potential financial collapse. As such, internal and external control audits are implemented at investment banks to ensure legal adherence.

Operational risk arises from several reasons, including but not limited to transaction and execution errors, unethical business practices, fraud, product failures, technical failures, employment discrimination, dysfunctional employee incentivisation, management bias, natural disasters, and terrorism (Cruz, 2002). Most investment banks have an elaborate understanding of investment risk, and often regard operational risk as the residual risk after accounting for investment risk (Strzelczak, 2008). Moreover, operational risk is not to be considered in isolation, as significant interdependencies exist with other risk categories. For example, purchasing an option involves credit risk related to the potential

counterparty default, market risk related to volatility fluctuations, and operational risk associated with the trader's mark-to-market valuation model. Strzelczak (2008) argues that as profit margins from traditional lending activities diminish over time (i.e., due to competition), investment banks are progressively securitising their loan portfolios, transferring the loan-related credit and market risk and retaining the operational risk. This results in an increase of operational risk when banks transition into a pure servicing agent (i.e., advisory role).

Figure 7b.
The increasing role of operational risk in financial services

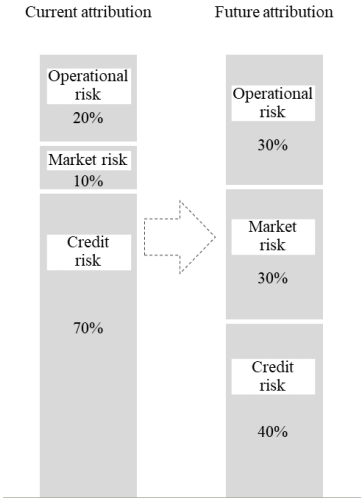
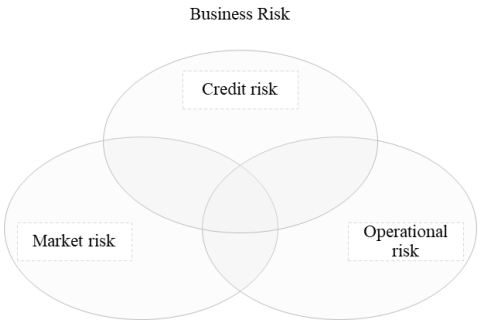


Figure 7c.
Investment banks' basic types of risk



This figure illustrates the evolution of risk compositions within an investment bank. Source: Strzelczak, 2008.

Finally, in business practice, the terms of risk and uncertainty are often used interchangeably, blended, but interpreted differently. Thus, irrespective of the concept, the risk and uncertainty phenomena must be intentionally restricted by responsible management in business organisations in order to prevent unintended risk-induced losses. This is especially important in investment banks, whose activity is centred around their essence and their nature in taking risks of a greater and different extent than in non-financial institutions. Although this dissertation measures risk in the form of investment risk, the inherent amount of potential dysfunctional risk that would need to be carried by the organisation as a result of

imprudent risk-taking due to ineffective incentive schemes or social comparison factors, would ultimately translate into operational risk for a bank that needs to be mitigated through more appropriate business practices.

3.1 Macro and micro mechanisms to curb systemic risk

Systemic risk in financial markets has become a significant problem since 2008, with the key concern being that the failure of a chain of many financial institutions could lead to a serious economic crisis (Lin et al., 2016). The multiple simultaneous defaults of large financial institutions (Huang et al., 2009) and the substantial, large-scale breakdown of financial intermediation resulting in significant economic and social costs are widely acknowledged core attributes of systemic risk. Further, it weakens the public confidence in the financial system.

> *"It was tilted heavily toward ex ante market discipline, which proved to be elusive until it was too late. […] It also relied too little on official oversight, which failed to foresee the build-up of systematically significant imbalances and weaknesses"* (Schinasi and Truman, 2010, p. 9).

Many regulatory bodies take various steps to ensure that work is performed in compliance with established rules and regulations, in order to mitigate the risks and to deter fraud. The GFC in 2008 reaffirmed the need for both prudential supervision and macroeconomic policy. As such, the financial system requires a prudential policy which consists of two dimensions, that is, the one directed at the individual banks and the other at the financial system at large (Hannoun, 2010). The Basel Committee on Banking Supervision (BCBS) issued Basel II regulatory accord from 2001 to 2004, in order to establish an international standard to preserve overall economic stability. The Basel III regulatory accord merged these two dimensions by upholding both Basel II and the macro-prudential policy (Miele and Sales, 2011). Basel III reforms and supports financial institutions'

solvency and establishes post-crisis prevention strategies, strengthening Basel II by providing macro-prudential supervision to preserve financial stability and regulate systemic risk. With their reform, the BCBS outlines a holistic plan for reforming banking regulation to promote resilience in the banking sector and strengthen its capacity to withstand financial and economic shocks (see Table 4).

Table 4.
Resolutions to mitigate future crises.

Factor
Enhance the quality of Tier 1 capital
Ensure sufficient capital charges for trading books of banks
Reinforce the risk management and disclosure practices of banks
Complement risk-weighted measures with a leverage ratio
Mitigate counterparty credit risk raised by OTC derivatives
Minimise systemic risk
Elimination of regulatory arbitration opportunities
Enhancement of compensation mechanisms for managers
Guarantee greater overall transparency

This table provides a list of preventive actions and initiatives directed at mitigating the causes of the outbreak of the GFC in 2008 and going forward. Miele and Sales, 2011.

Investment banks operate in a strict regulatory climate. The post-crisis regulatory landscape is substantially different from a balanced economic era and is materially characterised by the economic trauma witnessed during the GFC.

Prior to the GFC, the core emphasis had lain in governance and organisation structure, policies, and procedures, whereas post GFC, this was extended to extensive risk controls, governance, and compliance management, in conjunction with enhanced internal audit processes (Lintner and Lincoln, 2016). With respect to issues relating to corporate culture, the identification of the fundamental principles on which banks work was the key feature, which, post crisis, was extended to promote internalising values within the organisation through sustainable and consistent hiring efforts, social events, and mentoring programmes across the ranks. In view of this, the design and regulation of

remuneration schemes and practices have been reviewed and modified to mitigate hazardous behaviour of managers.

3.2 Compensation schemes and risk-taking

The subsequent section describes the current state of research on the relationship between compensation schemes and managerial risk-taking. The inherent nature of the bonus compensation dilemma within the principal agent domain whereby manager incentive compensation is considered an important tool for overcoming potential agency problems by aligning the interests of the agent (manager) with those of the principal (shareholder) and to mitigate operational risk.

3.2.1 Sector related excessive risk-taking

In the aftermath of the GFC in 2008, policymakers, regulators, and bank supervisory authorities argued that the risk-taking incentive rooted in banking organisations' executive compensation policies was among the main drivers that contributed to the formation of the crisis (Kirkpatrick, 2009; BCBS, 2010; Board of Governors of the Federal Reserve System, 2009b). The failure to provide a regulatory framework in which institutions can operate sustainably led to the alleged dysfunction of traditional compensation schemes among financial institutions, which in turn caused a material increase in managerial risk-taking and ultimately leading to the crisis (Bebchuk and Spamann, 2010; Board of Governors of the Federal Reserve System, 2010). In addition, the financial crisis has exposed the distinct adverse effects on global financial stability, economic growth, and social well-being of excessive bank risk-taking and systemic risk. Risk-taking incentives and implications stemming from bonus compensation packages are expected to be more significant at banks than at non-financial corporates (Mehran et al., 2011) given the tremendous systemic impact large banks (e.g., bulge bracket) have on the economy and society. Further, given that compensation policies for bankers are typically structured to minimise agency conflicts and

maximise shareholder value, the incentives created by banker compensation may stimulate excessive risk-taking in the banking industry (Chen et al. 2006; Bebchuk et al., 2010).

Today's banking world consists of implicit governmental bail-out guarantees and a prevalent "too-big-to-fail" doctrine. Given the traumatic experience of taxpayers, risk shifting-mechanisms become an even more relevant topic.

> *"[…] some institutions are more vital than others. Allowing major financial institutions to fail would be typically much more damaging to the overall financial system than allowing similar-sized industrial or commercial firms to fail, so that size alone would not be a good criterion to use for a required intervention rule. The Too Big to Fail (TBTF) syndrome, however, also may cause excessive risk-taking behaviour by the major financial institutions, and this problem opens another can of worms."* (Grosse, 2017, p. 396)

3.2.2 Structural deficit of traditional bonus schemes

In the aftermath of the recent recession and the unprecedented government measures that followed, the compensation packages of executives and workers at investment banks have attracted significant scrutiny, and in some cases, outrage and resentment.

Standard compensation schemes reward investment bankers for achieving short-term results, although such results might subsequently get reversed as it turns out that they have not qualified as sustainable achievements, that is, not lasting in the long-term or even deteriorating. Such compensation schemes insulate bankers from long-term losses to the company, which are manifested as a result of their initial non-sustainable short-term actions. Such short-sighted pay incentives have further shielded bankers from losses towards other debtholders and capital

suppliers other than shareholders (Bebchuk, 2009). Technically, by embracing higher levels of risk, a banker can trigger a short-term growth in performance and pay, and then, escape the resulting effects of the risks assumed by moving jobs.

For the sake of discussion, assuming that decision-making is an allocation of risk on exactly two ends of a continuum (i.e., high or low risk) implies that an investment banker can perform either a high-risk strategy or a low-risk strategy. The case of a high-risk strategy (for example, waiving inferior second-rate loans into a CDO pool or committing to high volatility and standard deviation scenarios) can likely result in a short-term increase in bank performance, but in the long run, it can often result in lower levels of bank performance or even result in a loss. On the other hand, a low-risk strategy (for example, excluding inferior second-rate loans from a CDO pool or not committing to high volatility and standard deviation scenarios) can initially result in lower bank performance in the short-term, but in the long run, it can often result in higher levels of bank performance and more robust long-term earnings.

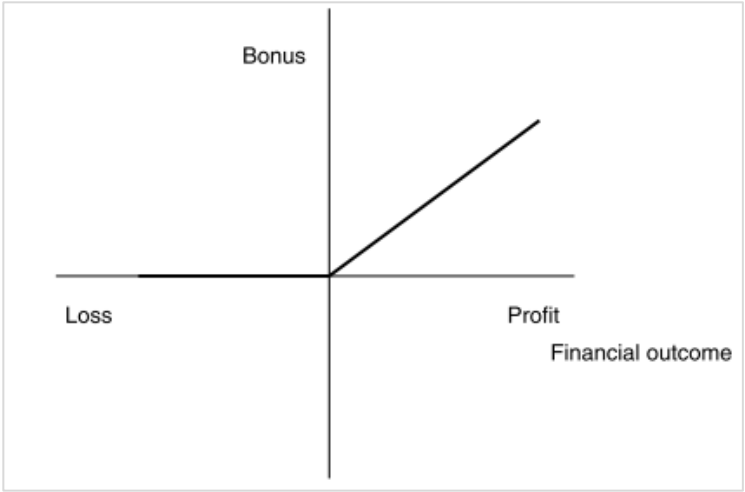
Following the GFC in 2008, academia, regulatory bodies, and practitioners found themselves in continuous debates regarding the (dys-)functionality of (traditional) compensation schemes. While several studies found no supporting evidence that compensation impacted investment banks' firm performance during the GFC, others determined various connections between banker compensation and investment banks' risk-taking behaviour. In the meantime, incentive systems that are preferentially skewed toward rewarding short-term success (e.g., via bonuses) may motivate managers to take opportunities that will improve immediate profitability but endanger future financial health.

Intrinsically, bonus schemes are designed to motivate managers to maximise shareholder value. However, traditional remuneration schemes, which imply an immediate bonus pay-out upon completion of the fiscal year, are accused of causing short-termism among managers, also known as managerial myopia.

Hereby, managers are blamed for focusing on short-term accounting results rather than on the company's long-term financial health and sustainable earnings quality (Levinthal and March, 1993).

The central problem is around the fact that traditional bonus schemes are designed in a way that allows managers to capture all the upside potential from positive company performance but protects them from any potential downside. Figure 8 illustrates the call option-like structure of traditional schemes whereby a manager bonus is floored at zero whilst their gains can be theoretically limitless. Chen et al. (2006) propose that the asymmetry in the treatment of gains and losses incentivises managers to raise dysfunctional risk-seeking behaviour.

Figure 8.
Traditional bonus scheme.



This illustration demonstrates the call option-like pay-out model of a traditional compensation scheme. Source: Hartman and Slapnicar, 2014.

This problem is also reflected in findings from Cuomo (2009) showing that overall compensation levels during the recent financial crisis did not vary despite the losses incurred (see Figure 8.).

Figure 9.
Wall Street bonuses and profits ($ billions)



This illustration demonstrates bonus compensation evolution at the time of the GFC in 2008. Office of New York State Comptroller; New York Stock Exchange.

Although the Board of Directors is legally tasked with ensuring that the company functions in the interests of its shareholders, the Board of Directors is usually appointed by the CEO and can represent its interests in that regard. For a variety of reasons, including insufficient awareness of complex products and risk assessments and perverse incentives created by their own pay schemes, CEOs have failed to correct the excessive risk-inducing elements of compensation frameworks (Bolchover, 2009).

Even though some systems are effective at aligning executives with shareholders, their reliance on equity may have a negative effect on the security of creditors and the viability of the business. In the end, for debtholders (i.e., banks, bondholders, depositors, and deposit insurers), what is good for shareholders is often detrimental to them. A compensation arrangement should balance the interests of shareholders and managers, but that does not guarantee that it is intended to eliminate any counterproductive actions that managers may be tempted to participate in. In reality, one by-product of shareholder-optimal reward systems is

that they can generate an opportunity to take undue risk, a risk so high that it can jeopardise the bank's stability.

The conventional justification for the design of intentional compensation structures is that management incentives are compatible with those of shareholders. The executives of a corporation are responsible for enforcing the policies of its board of directors – those representing the shareholders of the firm. While several managers hold significant sums of equity in the businesses they run, the issue of the agency problem is still omnipresent.

3.2.3 Deferred bonus compensation

In brief, a deferred bonus compensation refers to deferring a portion of an annual bonus over a period of usually three to five years, after which the executive will receive the deferred elements in either equity shares or cash considerations. The vesting of deferred bonus compensation elements is often subject to the achievement of performance metrics benchmarks. As deferred compensation indicates that part of the compensation of a banker in the current period relates to overdue compensation from previous periods, the current compensation of the manager should be positively related to previous results. Deferred bonus compensation is one of the three prominent suggested measures to enhance banks' oversight regulations to align the reward impact of the bonus with the times in which the effects of decisions become apparent (Hartmann and Slapnicar, 2015). The other two types involve clawback provisions, a contractual provision requiring investment banking professionals to return a bonus already paid by the bank, and the application of a bonus cap, limiting bonus pay to a maximum of 1.0 multiple of the annual base salary.

Similarly, Bhagat et al. (2014) also propose two alternative methods for formulating compensation contracts, namely deferred compensation and obligatory clawback provision, which come into force upon accounting restatements, and subsequent detection of financial losses. The focus of this

research is clearly assigned to investment bankers that fall under the first regime, that is, deferred bonus compensation, or more precisely, on deferred compensation and its implications for bank risk-taking. Deferred bonus schemes are purposefully designed to mitigate the effect of traditional compensation schemes, which can provide bankers with incentives to take excessive risks to meet their immediate earnings target and thereby securing their bonus for the period, but which can prove to be inconsistent with the long-term benefit of the organisation (Ittner et al., 1997).

Current literature emphasises predominantly the relationship between current pay and current performance (Lambert and Larcker, 1987), which assumes that the principal and agent contract is based on a one-off liquidation agreement. Banks and their managers, however, typically retain partnerships that stretch over several periods. Therefore, instead of a static one, the principal must formulate a dynamic reward system. In his theory, Lambert (1983) expands the notion of the agency theory from a single period to a multi-period framework. According to his model, the agency relationship holds for a certain defined period (T), and the production function is prone to alter over time, whereby both the principal as well as the agent are both discounting their respective utilities over time. Further, he constructed the optimum long-term contract, which considers that the reward of the agent depends on the agent's success in the current period as well as on the agent's successful performance in the previous periods (i.e., prior one year). This approach provides the principal with the option to mitigate risk stemming from the actions of the agent over a prolonged course of employment history.

Performance-pay incentives in investment banks are generally designed in form of variable cash-based (immediate) or variable equity-based (deferred) compensation. Principally, variable cash-based compensation is paid out after the completion of the fiscal year and upon achievement of certain performance-based targets based on annual accounting metrics (Murphy, 2000). In contrast, equity-based compensation generally granted to managers consists of stock options or as

restricted stock units (RSU). Both forms of equity-based compensation granted to managers are contingent to a vesting period in which managers are not allowed to sell stocks or exercise options. Overall, equity-based compensation intends to promote long-term incentives and are granted when performance criteria are met. The key differentiating element between stock options and RSUs is that there is no downside price protection for RSUs, whereas options are assigned a unique strike price. Theory and empirical studies propose that equity-based compensation is a measure that aligns managers' decisions with shareholder objectives. However, in real life, the effect of stock options and RSUs on managers' risk-taking behaviour is complex. The basic premise of issuing stock options or RSUs posits that it links executive wealth to the firm's market capitalisation and overall value, which helps to mitigate the conflict of interests between agents and principals (Morck et al., 1988; Fahlenbrach and Stulz, 2011).

If equity-based compensation increases, the manager's personal wealth portfolio will consist in a substantial extent of equity from the bank he manages, that is, the portfolio becomes less diversified. Thus, undiversified managers may become more reluctant to accept riskier projects (Smith and Stulz, 1985) to avoid the possibility of jeopardising their wealth portfolio, implying a negative relationship between equity-based compensation and managerial risk-taking (Ross, 2004). An increasing level of entrenchment is one reason for managerial risk aversion.

Furthermore, an increase in stock price implies that stock options are "in the money" and recognises a capital gain on the RSUs. Consequently, Prospect Theory will therefore suggest that a decision-maker will consider him-/herself to be in a gain domain. Concavity is the term used to describe a decision-maker's individual utility function under uncertainty resulting in an increase in risk aversion (Kahneman and Tversky, 1979).

To date, academia provides little to no empirical evidence on the dynamic response of pay-for-performance (Bell and van Reenen, 2014). Scholars (Boschen

and Smith, 1995) demonstrate that the low sensitivity of pay-for-performance described by Jensen and Murphy (1990) is simply the result of merely considering the response of pay to performance in the current period. However, previous studies indicate that the overall pay-for-performance sensitivity can increase by more than eight times if the firm's past performance is also taken into consideration. Ex-post observations provide empirical results showing that past performance provides indications of the manager's ability and discover that current compensation is positively correlated to the firm's historical performance (Banker et al., 2013).

As outlined above, deferred compensation schemes in the form of equity-based payment are already in practice and have been examined by scholars (Jensen and Murphy, 2004). So far, research studies attempting to investigate the effect of equity-based compensation on risk-taking report contradictory and inconsistent findings.

Similar to Sanders (2001), in one of their earlier studies, Jensen and Meckling (1976) determine increased levels of risk-taking, whereas other scholars find no impact on risk-taking behaviour (Fahlenbrach and Stultz, 2010), or even mitigating impact on risk-taking (Martin et al., 2013). Moreover, the alleged role of stock-based compensation in earlier corporate scandals is elaborated on in depth by Cassidy (2002) and Madrick (2003). In a similar vein, Dittmann and Maug (2007) characterise equity-based bonus schemes as defective and inefficient incentive methods, given their asymmetric option-like structure. Preceding studies (primarily focusing on ex- ante investment incentives) consider risk-taking behaviours of actual managers that fall under a deferred compensation scheme vis-à-vis managers who operate under an immediate compensation scheme.

3.2.4 Policy makers and bonus regulation post GFC

In 2009, G20 Finance-Ministers and Governors called for a set of granular and globally applicable standards on compensation structures including substantially

increased disclosure and transparency in the banking sector. In response to the request, they established the Financial Stability Board (FSB) and subsequently published their FSB Principles for "Sound Compensation Practices," which focus on four areas. First, implementation of variable compensation mechanisms that reward long-term financial success rather than focusing on short-term risk-taking. Second, the deployment of claw-back provisions that posit the revocation of variable payments if management decisions prove to be wrong in the future. Third, bonus payment structures being primarily composed of stock options rather than cash incentives to link management's equity and wealth to the firm's stock price. Fourth, imposing a cap on the proportion of variable compensation to overall total amount of compensation received. In reaction to the fourth principle, the European Parliament and Council have decided with their European Capital Requirements Directive (CRD IV, 2013) that annual bonuses for European bank managers must not exceed their annual fixed salary, and in exceptional cases, the amount of bonus compensation may reach a maximum multiple of twice the fixed salary. In this vein, the principles posit that more than 50% of the bonus compensation should be in the form of equity-based compensation of which 40% to 60% should be deferred for a minimum period of three years subject to a vesting schedule.

> *"Many firms are using deferral arrangements to adjust for risk, but they are taking a "one-size-fits-all" approach and are not tailoring these deferral arrangements according to the type or duration of risk [...]"* (Federal Reserve, 2011)

In 2011, mandatory rules for deferred compensation were published by the Federal Deposit Insurance Corporation in the United States and stipulated that the requirement for implementation of deferred compensation for managers in financial institutions with total assets was in excess of one billion dollars (Federal Register, 2011).

Recently, final guidance on performance incentives was provided collectively by the four main federal bank regulatory agencies, namely the Office of the Comptroller of the Currency (OCC), the Federal Reserve, the Federal Deposit Insurance Corporation (FDIC), and the Office of Thrift Supervision (OTS). The purpose of the guidance is to avoid two kinds of bank behaviour: chasing short-term gains at the detriment of the organisation's long-term financial wellbeing and taking imprudent or unnecessary risks that could jeopardise the organisation's safety and soundness.

Overall, while the regulatory regulations vary in the meaning of the pay components and the sums to be deferred, they all comply with the general principle that it is not instantly payable but withheld for later periods and that a certain percentage of the compensation will be received over a specified time. The deferred part, such as stock compensation and cash bonus, mostly refers to the variable element. While research exists on the effects of equity-based compensation, there is no empirical data on the consequences of non-equity compensation, such as cash bonus compensation (Hagendorff and Vallascas, 2012).

3.3 Competition and risk-taking

The fierce competition is one key characteristic in which the investment banking industry distinguishes itself from other industries. Owing to the unique position of banks in the financial system, competition in investment banking varies substantially from other sectors of the economy. To understand motives of bankers, it is essential to understand the underlying competitive dynamics prevalent in the investment banking industry and how the level of competition is impacting the business as well as the risks to which these banks are exposed.

Given the discretionary nature of the investment banking industry, existing academic literature cannot shed more light onto the competition and the impact

on risk-taking levels inside investment banks. Prior literature predominantly focuses on the commercial banking industry and generally neglects the investment banks although they play a crucial role in creating and expanding the GFC.

It is therefore of considerable significance for policy makers to gain insights on the processes through which banks can improve their risk-exposure to find timely and successful measures to make the system less vulnerable.

3.3.1 Between-firm competition

The deregulation process carried out in most developing countries' banking industries during the 1990s was rooted in the belief that promoting competition and growing banking productivity were the path forward for better quality of supply and economic development (Molyneux et al., 1994).

More banking competition is supposed to improve productivity, drive innovation, and enhance global competitiveness. In comparison, numerous studies show, in fact, that the perception that rivalry is unambiguously positive is more simplistic in banking than in other sectors (Claessens and Laeven, 2004). In general, the empirical literature on the relationship between bank competition and risk is well established for commercial banks and is being largely applied to the investment banking industry (Casu et al., 2012; Dick and Hannan, 2010). The theoretical perspectives predominantly describe two interpretations. The ‘competitiveness-fragility’ suggests that competitiveness contributes to further fragility and posits that in uncompetitive economies, banks gain monopoly resulting in higher earnings, capital levels, and charter prices (Allen and Gale, 2004). This leaves them well-equipped to survive demand or supply-side shocks and disincentivises excessive risk-taking. In contrast, the 'competition-stability' viewpoint advocates against less competition, arguing that only a few banks' immense market influence will allow them to, for example, increase the interest rate on loans ensuring greater price stability (DeNicolò and Lucchetta, 2009). This will negatively affect

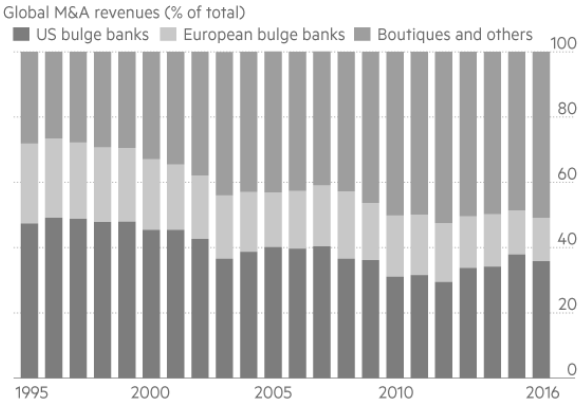
businesses with risky projects and have a detrimental effect on the financial system's stability.

However, existing theories propose that this relationship might not be so straightforward, and that higher competition will change the essence of banking and drive banks to become more or less partnership-oriented (Boot and Thakor, 2010). There exist only a handful of studies on the topic, despite the significance of the investment banking industry and the possible cost to society in the event of insolvency, as seen in the recent global crisis. Usually, the emphasis is either on the success of investment banks (Mamatzakis and Bermpei, 2014), or the investment banking relationship-lending (Boot and Thakor, 2000).

Overall, the investment banking industry is subject to fierce competition, and the competitiveness often constitutes several elements including fees, analyst recommendations, market making abilities, capital market capabilities, and overall reputation (Ellis et al., 2011).

Investment banks are ever more driven by profit maximising purposes, and many banks have developed as large full-service institutions (i.e., bulge bracket banks) to counteract a declining trajectory of commissions generated from traditional securities business by seeking new avenues for revenue. As such, greater product and services diversification result in the pursuit of greater risk-taking activities and exposure, i.e., proprietary trading as well as the design and marketing of complex financial securities (Altunbas et al., 2009). Furthermore, the industry experiences increased external competitive pressures and is being disrupted through the emergence of new technology offerings (i.e., Fintech), or increased penetration from boutique investment banks that are capturing a larger wallet share of generated revenues. For example, boutique investment banks capture half of the merger and acquisition (M&A) deals, which has nearly doubled since the 90s.

Figure 10.
Boutique investment banks market share



This chart demonstrates the evolution of market share of boutique investment banks. Financial Times, https://www.ft.com/content/23221ff8-de2c-11e6-86ac-f253db7791c6.

3.3.2 Within-firm competition and tournament

From the very outset, investment banks have a clear hiring policy. Their mandate consists of recruiting the brightest minds that encompass the highest levels of cognitive capacity paired with unparalleled intellectual curiosity. Intellectual capital is the foundation on which investment bank products and services are built. Thus, investment banks' graduate recruitment programmes only consider applications from the best students from designated target universities' respective annual cohorts. The natural tendency of such calibre of students to preserve their rank as best-performer among their peers, combined with the structural operating framework of investment banking, creates an incomparable and dynamic competitive culture, e.g., in form of a rank-order tournament.

> *"Culture can be a very complex issue as it involves behaviours and attitudes. But efforts should be made by financial institutions and by supervisors to understand an institution's culture and how it affects safety and soundness. While various definitions of culture exist, supervisors are focusing on the institution's norms, attitudes, and behaviours related to risk awareness, risk-taking,*

> *and risk management or the institution's risk culture."* (Financial Stability Board, 2014).

Lazear and Rosen (1981), who model rank-order tournaments, are commonly credited with the first formal theoretical model of tournaments, where the payment of an agent depends only on the rank of his or her performance. In particular, the primary drivers of excessive risk-taking in established financial markets are described as bonus schemes and tournament incentives (Rajan, 2006; Bebchuk and Spamann, 2010).

Incentives for tournaments are determined by two main components. The first and more apparent aspect involves salary and other material benefits that rely on performance and create 'monetary incentives' that are rank-dependent to outperform others. 'Non-monetary incentives' to outperform peers comprise the second and less apparent component. This second component is referred to as 'rank incentives' and offers utility to individuals who find themselves at the top of the ranking and disutility to those ranked at the bottom, and as such incorporates comparative performance preferences (Barankay, 2015). Rank incentives and the resulting performance preferences are fuelled by the need to obtain a positive self-image (Bénabou and Tirole, 2006), or are driven by public status concerns (Frank, 1985).

Rank incentives in tournaments play an imperative, visible role. In the financial services industry, the obvious cornerstones of a strong culture of relative success assessment and social competitiveness are ratings and awards. Prestigious distinctions in many areas of investment banking are awarded each year (e.g., including but not limited to 'Bank of the Year', 'Fund Manager of the Year' or 'Analyst of the Year') during Gala night events and elaborate ceremonies.

3.3.3 Investment banking culture and recruitment

Purposely, this study's investigative focus lies on the junior to mid investment banker population, embracing the role bandwidth of Analysts, Associates, and Vice Presidents who joined the organisation post GFC. Therefore, to establish a comprehensive understanding of the profile that is being examined in greater detail, it is important to recognise the motivations for joining an investment bank, but also to consider the recruiting processes and selection of investment bankers directly from universities.

The recruitment practices applied to select candidates for incoming Analyst and Associate classes at investment banks are more interesting from a sociological point of view than simply from the practices that are being deployed. Traditionally, investment banks hire directly and almost exclusively from a select group of 'target universities' that are widely considered as elite schools. Human Resources managers at investment banks often target their recruitment efforts to graduate students directly on-campus by attending career fairs or organising case study workshops. As prestigious elite organisations like investment banks predominantly recruit students who are already attending prestigious universities that have a reputation for a standard of excellence among their graduates (Ho, 2005). Kipping (2011) proposes that investment banks convey their recruits a sense of elitism, which strengthens the self-image of graduates and subsequently creates a culture of professionalism within the graduate cohort.

> *"[…] elite schools and firms have a symbiotic relationship, providing one another with valuable resources. Elite universities supply EPS (Elite Professional Services) firms with the workers they need to do business. In turn…by hiring large quantities of their graduates at high salaries, firms enhance schools' employment statistics, national rankings, and alumni donations."*
> (Rivera, 2016, p. 271)

Further, in his research Kipping (2011) introduces the notion of a 'closure' mechanism that becomes eminent in professional advisory roles (i.e., management consulting, investment banking, etc.), which partially replaces universal qualifying examinations. Moreover, it is founded on the symbolic and social capital, which professional advisory workers acquire during their tenure at an elite firm. This 'closure' mechanism has a cascading effect, whereby the less prestigious firms are seeking individuals from elite firms that provide their own professionals with a higher symbolic and social capital.

However, from a sociological standpoint, the uplift in social status for the individual has already occurred upon admittance to an elite university and is not necessarily dependent on his or her recruitment into an investment bank. Though investment banks market themselves as some of the most exquisite and selective organisations globally, high calibre graduates are targeted and invited by organisations with a similar grade of prestige in their self-perceptual value, such as top-tier management consulting firms. Consequently, investment banks need to broaden their extrinsic offerings beyond prestige and other extrinsic values (Roose, 2014).

Certainly, extrinsic motivation such as monetary compensation plays a significant element for recent graduates that are planning to enter the labour market, considering that investment banks' salaries are substantially above the median compensation for university graduates. In particular, the variable part of the total compensation, which makes the overall salary proposition very attractive for graduates (Axelson and Bond, 2009), had been disproportionally high prior to the GFC in 2008. However, a level of redundancy applies to the compensation argument similar to the already encountered-for prestige factor. An exception is posed by the Anglo-Saxon graduate community who are often facing heavy debt upon finalising their studies. Furthermore, given the extraordinarily high number of daily and weekly working hours of an Analyst, the compensation on an hourly basis is no longer exceptionally high. As such, Roose (2014) concludes in his

study that the monetary aspect is not necessarily the main motive to join an investment bank.

In his study, a rather novel category of graduates arose that Roose identified as the 'Gunners', referring to those that are intrinsically motivated by the eagerness and the culture of investment banking. The cultural element is a vital aspect, which is difficult to tangibly measure or even capture, but simultaneously represents a core differentiating factor (Alvesson, 2001).

The exhibition of a solid and distinct organisational culture in investment banks allows human resources managers and recruiters to recruit for and grant a selection preference to candidates that resemble the organisational identity most significantly, that is, favouring those candidates whose personal culture mimics or overlaps with that of the investment bank to the highest extent possible (Herriot and Scott–Jackson, 2002). From an individual's standpoint, Alvesson (2001) suggests that one constructs one's self-image initially and then seeks an organisation that resembles that image the closest. Prior to joining an investment bank, graduates acquaint themselves with the organisation through information from third-party sources who establish stories and myths around the culture of the investment banking industry (e.g., media, alumni, and acquaintances). Often, the narrative about the investment banker 'prototype' is shaped by the external view of the public perception of individuals who belong to that group (Hogg, 2000). Organisational identification may even occur without any personal exchange and may still make a material influence on the conduct and affection of an individual towards an organisation (Ashforth and Mael, 1989).

Ashforth et al. (2008) suggest that once Analysts join the banking organisation in full-time capacity, they vigorously identify themselves with the omnipresent culture, the organisation, and the overall investment banking industry after having completed the transition to the 'in-group'. This cultural self-concept is central for

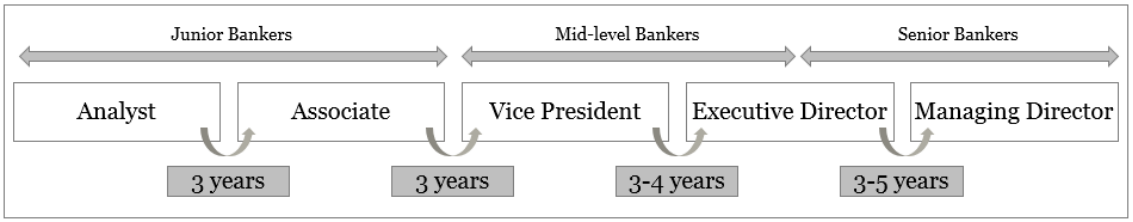
the individual junior banker as well as for the investment bank. However, exactly this self-concept has been criticised during and after the GFC in 2008.

The literature review and the derived clarifications on motives and cultures establish a significant foundation for this study as to avoid self-selection biases with the investigated sample.

3.3.4 Career progression and responsibilities

In a military-like fashion, investment banks classically entail strict rank hierarchies of job titles and career progressions. The career progression from junior to senior banker occurs through the career ladder or hierarchy of a typical investment banking setup and follows the progression order of Analyst, Associate, Vice President, Executive Director, and finally, Managing Director (see Figure 11). Occasionally, some investment banks slightly deviate from this hierarchy structure, and some other firms, in particular some non-U.S. banks, incorporate an equivalent five-tiered structure, but apply different names for each position rather than the standard classifications, such as Analyst, Associate Director, Director, Executive Director, and Managing Director.

Figure 11.
Career trajectory in investment banking



This figure illustrates the career progress in conjunction with the number of years elapsing progressing from Analyst to Managing Director. Source: Author.

Analysts. This group comprises the most junior rank level of investment bankers. Typically, these are individuals who join directly upon completion of their undergraduate degree. Prior to joining on a full-time basis, Analysts have usually

already completed a full-time summer internship during the penultimate year of their (under-)graduate degree, and subject to the receipt of a final job offer upon completion of the summer internship, they re-join the same department within the investment bank once they conclude their last year of university. Analyst cohorts are typically categorised into class years (e.g., class of 2015, 2016, and 2017) and as the years go by, they are referred to as first-year, second-year, or third-year Analysts (Lott et al. 2013). Often, Analyst programmes are fixed-term graduate programmes that are contracted for a period of two to three years. Thereafter, top-performing Analysts are offered the promotion to Associate level. Analysts' main tasks consist of creating analysis, presentations, and other documents, as well as coping with a series of administrative tasks that are transaction-related. Financial literacy with regard to Accounting and Corporate Finance are often helpful but are not a prerequisite for Analysts per se (Gutmann, 2013). The reason they are hired is based on their potential rather than on substantial existing and extensive skill levels or relationships, in contrast to the prerequisites for a professional (experienced) hire. Most applicants do not know much about the technical elements of the job until they are being interviewed, especially in the Anglo-Saxon regions, where the subject or the major of an undergraduate degree does not play a central role in the selection of applicants, and where many have completed non-business or non-finance related degrees, such as liberal arts or engineering majors. As such, in these regions, hiring is based on the merit of intellectual capacity and curiosity. In continental Europe however, Analysts are usually expected to have accomplished related internships in conjunction with a business- or economic-related undergraduate or master's degree.

In the work that Investment Banking Analysts do, precision is important, so they need to pay careful attention to information. To analyse data efficiently, they need strong analytical skills. To ensure that they have the appropriate information, which allows them to draw educated conclusions about investment opportunities, they will need to have strong research skills. When looking for ways to enhance a

client's portfolio, problem-solving skills are essential. It is an important aspect of the job to present results to business leaders, so good communication skills are a must. Analysts evaluate investment opportunities and the output of their analyses is used to make proposals and recommendations to clients on possible investments. As most Analysts have very few customer interactions, analytical skills, work ethic and attention to detail typically surpass individual skills (Gutmann, 2013).

Associates. These are individuals who have either been promoted upon completion of their Analyst programme or who have been directly recruited from a renowned MBA programme (Lott et al. 2013). The Associate track typically spans over three years before being promoted to Vice President. Like Analysts, Associates are categorised into cohorts with regard to their year of entry. The primary responsibilities of an Associate are two-fold. The first relates to performing the actual analytical work and the second role is that of supervising and controlling an Analyst's work output prior to sharing it with higher ranked bankers where they serve as discussion materials. The Associate is directly accountable for ensuring that the work of the Analyst is accurate, correct, and adheres closely to a standard of excellence (Gutmann, 2013).

The Associate role in investment banking requires profound analytical skills. They must be capable of researching and assessing financial data and turning it into a strategy for clients. To guide clients through an investing process, including introducing and describing investment choices, Associates will require robust communication skills. Analytical abilities are, of course, important, but less so than at the level of the Analyst. Strong communication and management skills are more vital at this stage of the career ladder, as Associates are simultaneously required to manage Analysts and meet the expectations of senior bankers regarding the scope and timing of deliverables (Gutmann, 2013). For an Analyst, a good Associate is someone who is not only strong on technical levels, but someone who can answer theoretical and practical questions as well as act as a

mentor and teacher. Well-respected Associates take responsibility for failures, help shield the Analyst from a senior banker's criticism, and given unreasonable requests, may even fight back at times.

Vice Presidents. The Vice President's primary role is that of a project manager during marketing pitches and live transactions. In general, investment bankers spend approximately three years in the role of Vice President before being promoted to Executive Director, but depending on performance, it can vary by a year or two. The Vice President's job is the most junior role among senior bankers and is always the conduit between the senior banker (i.e., Managing Director) and the junior bankers (i.e., Analysts and Associates), and usually has the most regular client interaction during a transaction (Lott et al. 2013). The Vice President is responsible for all work output whilst supervising and directing the junior bankers. However, the Vice President usually does not perform the actual analytical work or preparation of materials, but takes lead in strategizing and formulating approaches, possible solutions, and alternatives catering to the client's needs (Gutmann, 2013). On live deals, the Vice President is usually the banker who manages the deal process. At this level, bankers start to shape valuable client relationships and begin to play a role in client development and marketing.

Executive Directors. Often, Executive Directors find themselves in either the role of project manager, like a Vice President, or assuming a client-relationship-building role, like Managing Directors (Lott et al. 2013). This is contingent to the skill level, experience, and competence of the Executive Director, as well as the structure of the investment bank, the transaction, and the constellation of the other investment bankers involved.

Usually, bankers serve three to four years in the position of Executive Director before being promoted to Managing Director, a promotion that is mostly focused on the banker demonstrating the ability to manage customer relationships, sell the products and services of the bank, and effectively generate new business. A strong

Executive Director will hold much of the skills expected of a Vice President and Managing Director, considering the dichotomy of positions. The Executive Director is also regarded as an upcoming Managing Director from the viewpoint of the company and is usually judged accordingly.

Managing Directors. The position of the Managing Director is the most senior rank as an investment banker. The prime responsibility of this role comprises client development (Gutmann, 2013). Typically, the Managing Director is the banker who maintains senior-level (C-Level) relationships with the CEO, CFO, Head of Corporate Development, and often the board of directors of a corporation or institution (Wise, 2006).

The Managing Director (MD) is most often accountable for a group of existing and prospective clients, and for heading marketing activities. Once the investment bank is engaged in a live transaction, the MD plays mostly a small role, and becomes involved only when problems occur during the transaction and in high-level discussions (Lott et al. 2013). Some Managing Directors also have greater administrative roles in addition to marketing, client-relationship, and transaction-execution duties. More seasoned Managing Directors are frequently elected to head (or co-head) their specific product or sector division, particularly at the bulge bracket banks. Managing Directors are further responsible for establishing and estimating the budget and profit and loss (P&L) of their group, making decisions on recruiting and firing, setting compensation levels, and agreeing on promotions. Managing Directors also appear to have strong effects on their group's team culture.

After reviewing the various ranks within the investment banking setup, it remains useful to shed some light on the team dynamics and the formation of deal teams during marketing activities and live transactions. Regardless of the nature of the project (i.e., marketing pitch or live transaction), a deal team is formed at the very outset. Typically, a deal team consists of four bankers – namely, an Analyst, an

Associate, a Vice President or Executive Director, and a Managing Director (Gutmann, 2013). Depending on the scale, scope, and transaction size, larger deal teams can be formed with multiple bankers staffed at any given level. As opposed to collegial team cultures in industrial corporations or early venture firms, the investment banking deal team is consistently hierarchical, that is, the conventional notion of a team that bears attributes of collectivism and equality does not apply in the investment banking context. The reporting hierarchy and chain of command are efficiently streamlined whereby the Analyst reports to the Associate, the Associate reports to the Vice President or Executive Director, who then ultimately reports to the Managing Director (Wise, 2006).

Lastly, it is important not to confuse a profession's title with the rank title. For example, in Equity Research, Managing Directors are also referred to as Analysts. This is because the profession is called 'Equity Analyst' (i.e., a dedicated professional who analyses listed equity securities).

3.3.5 Pay-for-performance compensation structure

The compensation of an investment banker consists of a fixed portion (i.e., base salary) and variable portion (i.e., bonus compensation). In addition, new Analysts and Associates that join a bank's graduate programme receive a signing bonus. This is the standard compensation construct from the very outset of an investment banking career and this structure holds for all ranks, from Analyst to Managing Director. Nonetheless, the base salary trajectory, the bonus-to-base ratio of the total compensation, and the cash-to-equity ratio of the variable compensation can vary in magnitude (in absolute and relative terms) across firms, ranks, divisions, products, and asset classes. However, it is noteworthy to mention that bonus payments can reach up to 200% of the fixed compensation during the junior years in investment banking. The actual magnitude of the bonus payment depends foremost on the individual performance level, but also on the company and the team-wide performance result during a fiscal year. The application of performance

compensation has increased continuously over the past decades (Murphy, 2012) and is an essential element of the compensation model at investment banks. Bonus payments are designed to attract human capital and to motivate them to perform at their best. Consequently, working towards receiving the highest bonus pay possible is regarded as the ultimate annual target for each investment banker individually.

The base salary at investment banks follows a linear trajectory and tops out at the Managing Director level, at which the base salary adapts a concave curvature. The base salary is fairly constant among all bulge bracket investment banks (Table 5) with little to no deviation. Further, the base salaries in investment banking are substantially higher than in other non-financial industries (Philippon and Reshef, 2009). This is due to the skill composition of the workforce that differs across industries. Compared to other sectors, disparities in skill matter most in financial services (Kampkötter, 2012). Based on tournament theory (Lazear and Rosen, 1981), employees compete for rank promotions within the firm, whereby corresponding pay raise in conjunction with the promotion represents the winner's prize.

Table 5.
Analyst and Associate base compensation 2019

LEVEL	Analyst 1		Analyst 2		Analyst 3		Associate 0/1		Associate 1/2		Associate 2/3		Associate 3/4	
BANK	17/18	18/19	17/18	18/19	17/18	18/19	17/18	18/19	17/18	18/19	17/18	18/19	17/18	18/19
JP Morgan	£50K	£50K	£55K	£55K	£60K	£60K	£80K	£90K	£90K	£90K	£105K	£105K	£120K	£120K
Goldman Sachs	£50K	£50K	£60K	£60K	£60K	N/A	£80K	£80K	£91K	£91K	£106K	£106K	£122K	£122K
Morgan Stanley	£50K	£50K	£55K	£55K	£60K	N/A	£80K	£80K	£98K	£98K	£111K	£111K	£123K	£123K
BAML	£50K	£50K	£55K	£55K	£60K	N/A	£80K	£90K	£90K	£90K	£105K	£105K	£120K	£120K
CITI	£50K	£50K	£55K	£55K	£60K	£60K	£80K	£80K	£90K	£90K	£105K	£105K	£120K	£120K
Barclays	£50K	£50K	£55K	£55K	£60K	£60K	N/A	N/A	£90K	£90K	£105K	£105K	£115K	£115K
Deutsche Bank	£50K	£50K	£55K	£55K	£60K	N/A	N/A	N/A	£90K	£90K	£105K	£105K	£120K	£120K
Credit Suisse	£50K	£50K	£55K	£55K	£60K	£60K	£80K	£80K	£90K	£90K	£105K	£105K	£120K	£120K
UBS	£50K	£50K	£55K	£58K	£62K	£62K	N/A	N/A	£95K	£95K	£110K	£110K	£122K	£122K

This table illustrates the base salary (in Pound Sterling) progression among junior investment bankers. Source: Arkesden Compensation Report 2018/19

The variable compensation (i.e., bonus compensation) is a discretionary and significant component of the total compensation of an investment banker. Bonus schemes are typically installed in the form of a variable cash-based or variable equity-based compensation.

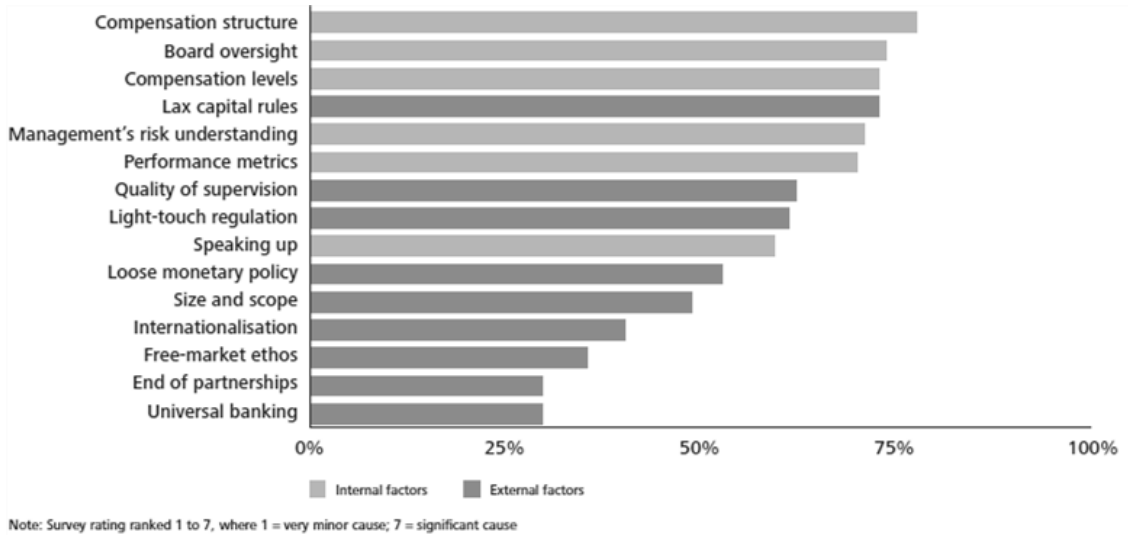
Cash-based bonus compensation is typically paid out as an annual cash incentive subject to the attainment of some performance-based goals obtained from previous accounting records (Murphy, 2000). Such bonus payments usually grow in a linear fashion and are correlated with bank performance. After reaching a certain threshold, the bonus payment is capped by a cumulative pay-out ratio (Smith and Stulz, 1985). In theory, it is proposed that cash bonuses are positively related to managerial risk-taking, as high risks are taken by bankers to meet short-term performance goals. This allows bankers to earn bonuses at the cost of a long-term productive effort (FSB, 2009; Hakenes and Schnabel, 2014).

Such short-termism becomes even more crucial for long-term investments or transactions when the outcome or anticipated performance is yet to be realised, given the inability and difficult nature of clawing back cash bonuses in case a banker's investment performance or advice turns out to be unsuccessful eventually. In the investment banking industry, the Analyst population typically falls under an (immediate) cash-based bonus compensation regime.

Contrary to (immediate) cash-based bonus, equity-based (deferred) bonus compensation, as the name suggests, is usually provided to the banker as stock options or as restricted stocks units (RSUs). Characteristically, both forms of equity-based compensation are granted subject to a vesting schedule and period where bankers are not allowed to exercise stock options or sell their stocks. Thereafter, they can liquidate only a certain proportion of their stocks or options each year. It is widely argued, both in theoretical and empirical work, that equity-based compensation strongly aligns management decisions with shareholder value-maximising targets in the long-term. The efficacy of risk-taking incentives from executive variable compensation is supposed to be high, particularly with regard-to the banking industry (Bolton et al., 2011; Mehran et al., 2011). In the investment banking industry, all ranks from Associates and above typically fall under an equity-based (deferred) bonus compensation regime.

For multiple decades, agency theory recognised the significance of performance-based compensation packages to ensure a sustainable interest alignment between agents and principals (Milgrom and Roberts, 1992). However, several scholars suggest that incumbent compensation structures have caused risk-taking behaviour in the investment banking industry, which has been materially attributed to the outbreak of the GFC in 2008 (Bebchuk et al., 2010; Chen et al., 2011). Investment banking culture and compensation governance reveal common structural flaws in the industry. In addition to external views and pressures, banks' compensation structures are the biggest cause of endogenous cultural problems (see Figure 12).

Figure 12.
Causes of cultural problems in the banking industry



This chart illustrates what bankers perceive as the main factors causing cultural problems in the banking industry. Source: The Deloitte Banking Survey, 2013.

4. Social Comparison

As outlined earlier, the GFC in 2008 was the outcome of actions perpetrated by financial markets participants. As per classical finance theorem, markets efficiency holds, and investors are rational decision-makers. The fields of behavioural finance, behavioural economics, and social psychology provide empirical arguments against the notion of rationalism and suggest that decision-making is subject to a variety of factors. One of the ubiquitous themes post GFC has been the lack of governance, both internal governance within Wall Street's large financial institutions, as well as external governance by regulatory bodies, and policy setters (Grosse, 2017).

Traditional bonus schemes, as outlined in chapter three, are known to foster a dysfunctional bonus culture among investment bankers and financial professionals, leading to excessive risk-taking behaviour. This is often recognised as one of the key causes of the GFC in 2008. A post-GFC *Financial Times* survey, polled risk and compliance officers at firms within the financial services industry and revealed that 72% of the survey respondents felt the bonus culture in the City of London was the key factor that resulted in "uncontrollable risk-taking." [3]

As outlined earlier, regulatory bodies in Europe and the United States designed and implemented monetary incentive schemes designated to curb imprudent risk-taking by investment bankers. These regulatory measures are established to primarily cap the variable component of investment bankers' compensation: their annually earned bonus payment. These policy measures have not yet been empirically proven in a real-life context with regard to their effectiveness in reducing undesirable risk-taking behaviour, they also consider sensitivity to monetary incentives as the sole factor that impacts risk-taking behaviour. Numerous research efforts in the field of asset pricing and macroeconomics literature describe social comparison as a key consideration in one's decision-

[3] Brooke Masters, "Bonus measures fail to reform risk takers," Financial Times, January 11, 2010.

making process. This presumes that individuals do not solely care about the absolute level of consumptions but also about their relative consumption against the cumulative consumption of society. This is also referred to as the 'Keeping up with the Joneses phenomenon' (Rauscher, 1992).

Social comparison and its relevance have been extensively described in a vast body of research stemming from the fields of social psychology and economics, which aims to explain human behaviour and decision-making. In social psychology literature, a social comparison theory by Festinger (1954) suggests that individuals assess their own opinions and capabilities by comparing them with the opinions and capabilities of other members in their social environment. The economic theory of the Leisure Class by Veblen (1899) suggests that individuals are concerned about comparison with other members of the equivalent community; noticeable consumption is a means to acquire and demonstrate social status. Furthermore, a recent study by Kirchler et al. (2016) demonstrates that financial professionals exhibit a stronger response to the display of their rank relative to their peers than to actual monetary incentives.

Thus, the efficacy of monetary policies, with respect to achieving a reduction in dysfunctional risk-taking, depends not only on an investment banker's drive towards financial incentives but also on relative pay or rank comparison with other employees. The aim of this dissertation is to introduce the social comparison theorem within the risk-taking realm and to investigate to what extent social context can impact the level of risk-taking among individuals in the financial industries, namely, front-office investment banking professionals.

4.1 Social Comparison Theory: theoretical foundation

Classic social comparison theory finds its roots in the theory of informal social communication (Festinger, 1950), which emphasises the relevance of others in the formulation of one's own opinions. In social comparison theory, Festinger added

the domain of abilities where he explained how individuals require the input from their environment to satisfy their own need to acquire knowledge about themselves. In other words, social comparison theory captures the phenomenon of individuals comparing themselves on different dimensions to other members of their social context. The information gained from such comparisons serves as an external standard against which individuals evaluate their own ability and status. Originally, Festinger based his social comparison theory on nine hypotheses (see Table 6), whereby the vast majority of studies that are based on social comparison theory have focused on comparisons of abilities, emotions, or personality traits (Wrightsman, 1960; Hackmiller, 1966; Wheeler, 1966).

Table 6.
Hypotheses of the theory of social comparison processes

No.	Hypothesis
I	There exists, in the human organism, a drive to evaluate his/her opinions and his/her abilities
II	To the extent that objective, non-social means are not available, people evaluate their opinions and abilities by comparison respectively with the opinions and abilities of others.
III	The tendency to compare oneself with some other specific person decreases as the difference between the latter's opinion or ability and one's own increases
IV	There is a unidirectional drive upward in the case of abilities which is largely absent in opinions.
V	There are non-social restraints which make it difficult or even impossible to change one's ability. These non-social restraints are largely absent for opinions.
VI	The cessation of comparison with others is accompanied by hostility or derogation to the extent that continued comparison with those persons implies unpleasant consequences.
VII	Any factors which increase the importance of some particular group as a comparison group for some particular opinion or ability will increase the pressure toward uniformity concerning that ability or opinion within that group.
VIII	If persons who are very divergent from one's own opinion or ability are perceived as different from oneself on attributes consistent with the divergence, the tendency to narrow the range of comparability becomes stronger.
IX	When there is a range of opinion or ability in a group, the relative strength of the three manifestations of pressures toward uniformity will be different for those who are close to the mode of the group than those who are distant from the mode. Specifically, those close to the mode of the group will have stronger tendencies to change the positions of others, relatively weaker tendencies to narrow the range of comparison, and much weaker tendencies to change their position compared to those who are distant from the mode of the group.

This table summarises the original hypothetical premises, which serve as a foundation in the field of social comparison theory. Source: Festinger, 1954.

Festinger explains that the main driver of social comparison is an individual's need for accurate self-evaluation. According to classic and recent research in social psychology, individuals are driven by a variety of reasons and motives to engage in social comparisons, which can be classified into three fundamental needs, namely (1) self-evaluation, (2) self-improvement, and (3) self-enhancement (Festinger, 1954; Wills, 1981).

Self-evaluation is considered an individual's motivation to establish that one's opinions and views are correct or convergent with their social environment. While self-evaluation is commonly regarded as the main motivational point of departure

for engaging in social comparisons, self-improvement, and self-enhancement are considered to be key drivers for engaging in upward social comparisons and downward social comparisons, respectively. The latter two forms are elaborated in greater granularity in the subsequent sections.

More recent studies suggest that social comparisons are often being carried out rather spontaneously and without the fundamental need for self-evaluation, self-improvement, or self-enhancement (e.g., Mussweiler et al., 2004). First, social psychology research provides evidence that social comparisons are a necessity for effective communication with others (Huttenlocher and Higgins, 1997; Schwarz, 1994). Particularly, it suggests that individuals use their partner's communications norms and standards as a reference to their comparison standards. This procedure facilitates the processing and the exchange of information considerably as information about dimensions, such as abilities and characteristics, are defined on a relative scale. Secondly, another significant motive to engage in social comparisons is derived from the social cognition principle of cognitive efficiency. As laid out by Taylor (1981), this principle defines individuals as 'cognitive misers', who are required to be mindful and efficient about the utilisation of their cognitive resources due to scarcity. Principally, comparisons allow a higher degree of efficiency, which leads to accelerated information processing and thus preservation of cognitive resources (Mussweiler and Epstude, 2006).

4.1.1 Self-evaluation and lateral comparisons

Based on classic social comparison theory, Festinger (1954) suggests that people choose comparison targets that predominantly reflect similar comparison standards to the comparer on the respective critical dimension (i.e., athletic ability, level of career success, etc.). Furthermore, selecting a similar comparison target results in high diagnostic levels for the individual's self-evaluation, allowing the individual to gain more accurate self-knowledge. Choosing dissimilar comparison targets would entail ambiguity exacerbating a like-for-like comparison.

In addition, it is important to acknowledge later academic findings that demonstrate that similarity on both the critical dimension (Wheeler, 1966) and on the related attributes (Suls et al., 1978; Zanna et al., 1975) is a key factor in deriving accurate self-evaluation.

4.1.2 Self-enhancement and downward comparison theory

Downward social comparison is the process where the comparison target is worse off than the comparer on a respective critical dimension. This process serves the human need for self-enhancement, that is, to maintain a positive self-view.

Similar to Wheeler (1966), Wills (1981) suggests in his theory of downward comparison that social comparisons are generally conducted with a tendency towards an upward target selection. However, if a comparer's self-esteem is threatened, the direction of comparison shifts downward, that is, comparison targets who are worse off than the comparer are selected. This phenomenon is largely regarded as an endeavour to restore self-esteem (Hakmiller, 1966). Accordingly, when an individual faces a failure or disappointment, downward comparison can create the impression of success when comparing oneself to others who are worse off. Further, Wills suggests that individuals with low self-esteem are particularly inclined towards downward social comparison in circumstances when self-esteem is threatened.

4.1.3 Self-improvement and upward comparison theory

As opposed to downward social comparison, upward social comparison is the process whereby the comparison target is better off than the comparer on the respective critical dimension. Comparisons with an upward standard serve the individual's need for self-improvement and provide information on how to achieve progression (Bandura, 1997).

The rank order paradigm introduced by Wheeler (1966) demonstrates that individuals are strongly inclined to compare themselves with an upward comparison target, especially with targets who are deemed as not too distant from the comparer. Furthermore, Wheeler provides support for Festinger's original "unidirectional drive upward," which has been recognised as a specific culture associated with the Western society, which emphasises achievements. Additionally, scholars provide evidence that individuals who are highly goal-driven and competitive are specifically inclined to engage in upward comparisons (Wheeler, 1966; Matthews and Siegel, 1983).

While there is a natural tendency for individuals to engage in comparison with upward standards, it can also impose a threat to the comparer. This notion is based on prior research, which describes that, on the one hand, upward social comparisons can have an inverse effect on the comparer when comparison targets are considered competitors. However, on the other hand, comparison targets are being perceived as inspirational and motivational when they are not considered competitors to the comparer (Brickman and Bulman, 1977). Although initially intended as a measure for self-improvement, upward comparison can have a demoralising effect on the comparer if the inferiority to the comparison target has been brought to light. In the same line of reasoning in which downward social comparison preserves or enhances one's self-esteem, upward social comparison might cause a deterioration of the comparer's self-view (Tesser, 1988).

4.2 Influence of Social Comparison on the self

An existing and emerging body of research in the realm of social comparison offers a material and empirical foundation for the several effects of social comparison on the individual (Corcoran et al., 2011).

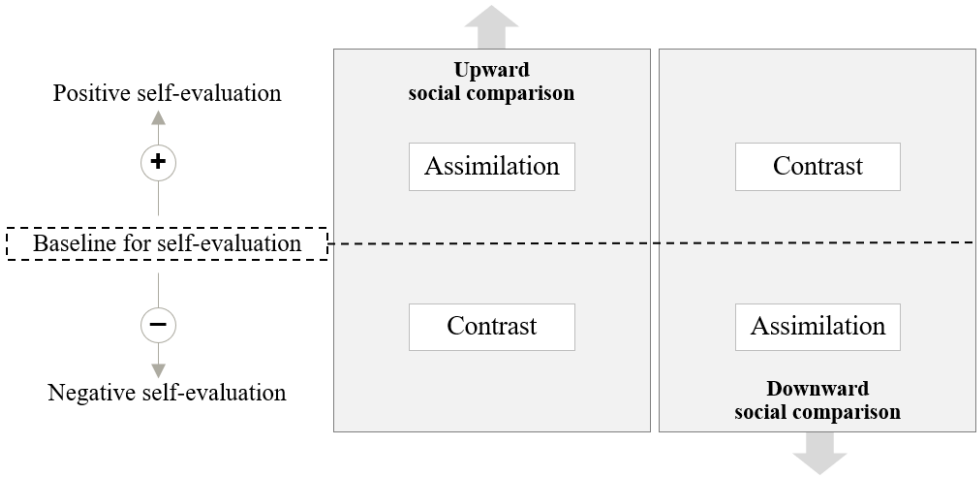
4.2.1 Assimilation and contrast

Wills' (1981) theory of downward social comparison, as described above, can be divided into two components. First, the author describes that individuals choose between conducting an upward or downward comparison selection. Second, the other component of this theory predicts the reaction of the individual post-comparison, specifically, whether social comparison leads to more assimilation or contrast.

Assimilation is defined as the condition in which an individual perceives similarity on a critical dimension with another comparison target. This perceived similarity causes the comparer's self-evaluation to shift towards the comparison standard, resulting in a more positive self-view post upward comparison and a more negative self-view post downward comparison (Collins, 2000). Wheeler and Suls (2007) suggest, in a technical way, that assimilation happens when individuals move their self-estimation closer to a target after the comparison, while contrast happens when individuals move their self-estimation away from the comparison target.

On the other hand, contrast represents the condition in which an individual perceives dissimilarity on a critical dimension with another comparison target. This, in turn, causes the comparer's self-evaluation to shift towards the comparison standard, resulting in a more negative self-view post upward comparison and a more positive self-view post downward comparison. In the same vein, Brown et al. (1992) provide empirical evidence demonstrating that contrast with an upward target causes similar effects on self-evaluation as assimilation with a downward target. Thus, the reverse applies to upward assimilation and downward contrast. Figure 13 illustrates contrast and assimilation reactions during a social comparison process.

Figure 13.
Assimilation and contrast continuum in social comparison



This figure illustrates the two-condition reaction of assimilation and contrast subsequent to upward and downward comparison: Based on Gerber et al., 2018, adapted by author.

4.2.2 The dark side of Social Comparison

Social comparison is deeply embedded in the human nature. Especially, in today's digital world, social comparison is as hyper-present as never before, which has material implications on an individual's happiness and mental health. In particular, the emergence of diverse social network services (e.g., Facebook, Instagram, LinkedIn, and others) provides abundant social comparison opportunities (Vogel et al., 2014).

While online comparisons remain an important area of study, this dissertation study focuses on social comparisons in the 'offline' context which evolves around in-person interactions with close others (e.g., co-workers, friends, family) rather than in the 'online' context where social network services provide the perfect platform for meticulous self-presentation (Rosenberg and Egbert, 2011). This dissertation investigates the negative effect social comparison can have in decision-making processes and provides a comprehensive overview of the roots of the implied negativity.

Classic social comparison theory suggests that individuals who frequently engage in social comparison are expected to feel happy once they are determined to be

superior to the ones to whom they compare themselves (Wills, 1981; Wood et al., 1985). However, a nascent body of research that elaborates on individual distinctions in social comparison approaches (Buunk and Gibbons, 2000) finds support that relates frequent social comparisons to negative affect (Lyubomirsky and Ross, 1997).

Festinger (1954) postulates that the need for an external standard to benchmark their own abilities or opinions against it is the main drive of individuals to engage in comparisons with others. In addition, a substantial stream of research demonstrates that individuals engage in social comparison for other purposes, such as coping mechanisms (Wood et al., 1985), to handle negative affect (Aspinwall and Taylor, 1993), or for self-enhancement (Wood et al., 1994). It is widely acknowledged that all people use social comparisons on a daily basis to serve several, of not all of these purposes (Wheeler and Miyake, 1992).

Scholars suggest that social comparisons can enhance an individual's well-being (Diener and Fujita, 1997), a state in which one is considered to be happy, experiencing numerous pleasures and few pains, with more positive and few negative emotions, resulting in being satisfied with one's life (Diener, 2000). As such, social comparison is conducted in a straightforward fashion, that is, an individual feels satisfied when he or she is better off than similar others and dissatisfied when worse off than similar others. As such, scholars determine a linear relationship between being better off than others and experiencing well-being (Kleinke and Miller, 1998).

Whilst social comparison can enhance well-being, it also works in the other direction, with a growing line of research suggesting that the well-being outcome is only of momentary nature and that recurrent social comparisons may in fact work to the contrary, that is, decrease an individual's well-being (White et al., 2006). This serves as both the causation and correlation of decreased well-being. Lyubomirsky and Ross (1997) state that unhappy people are found to be

individuals who engage in spontaneous and frequent social comparisons. In their study, both happy and sad participants were given the opportunity to compare themselves with a peer who was better or worse off than themselves on a certain dimension. They discovered that happy individuals became less affectively vulnerable to the social comparison data that was available; they were more indifferent or inattentive towards how well others were doing. In the same vein, scholars found supporting evidence that unhappy people, and those who show symptoms of mild depression (Swallow and Kuiper, 1992), engage more frequently in social comparisons (Giordano et al., 2000). Moreover, scholars propose that this tendency to search for social comparison benchmarks (i.e., comparison targets) can be associated with low self-esteem, depression and neuroticism (Gibbons and Buunk, 1999). In conclusion, individuals who frequently conduct social comparisons are not only expected to experience decreased well-being but are also more vulnerable to an affective response (i.e., causation and correlation).

Social comparisons are often made to reduce uncertainties about one's abilities and performance levels (among other socially defined traits), so individuals can obtain and rely on an external standard against which they can assess themselves (White et al., 2006). Individuals' drive to evaluate themselves, as described by Festinger (1954), renders the evaluative aspect problematic. For any individual to be able to compare oneself to an external standard, Langer (1992) suggests that one needs to be able to experience oneself objectively, versus subjectively, to create an accurate judgement. Moreover, Stapel and Tesser (2001) propose that objective self-awareness results in more regular social comparisons. Linking an individual's drive to engage in social comparisons with the negative affect described earlier has the potential to create chronic dissatisfaction (Vogel et al., 2014).

In addition, social comparisons can work in a reinforcing manner and prompt an individual to engage in more frequent comparisons, which creates a dependency-

cycle of social comparisons as individuals aspire to constantly renew their sense of well-being by beating external standards and considering themselves better off than others (Crocker, 2002; Kohn, 1980). Hence, individuals with a tendency to conduct social comparisons spontaneously are more likely to find themselves in an unhappy state of mind and being vulnerable to the affective consequences of those comparisons. This cycle of constant comparison to others results in being in a self-focused or self-centred state, which leads to subsequent unhappiness. Therefore, frequent social comparisons are tied to diminishing well-being and a wide range of destructive emotions and behaviours (White et al., 2006). A motive for this underlying behaviour is provided by Tice and Baumeister (1997) who propose that individuals make trade-offs by choosing destructive behaviours for short-term benefit (i.e., engaging in frequent social comparisons that may provide reassurance in the short-term), whilst ignoring the long-term costs that result from this kind of behaviour (reinforcement of a continuous need to benchmark themselves against an external standard). In today's world, such comparison standards are increasingly available through media and social network services, which significantly impact one's well-being and mental health. Research has shown that adolescents can develop addictions to social media and this is thought to impact approximately 5% of adolescents (with tendencies increasing) with greater potential for addiction than the consumption of alcohol or cigarettes (Hofmann et al., 2012).

4.3 Social Comparison in investment banking

The investment banking industry is characterised as a fast-paced, dynamic and stressful sector. The range of services which investment banks provide to their clients across sectors, products and markets are predominantly based on intellectual capital. Financial institution such as investment banks do not produce tangible goods but rather provide intangible services, like investment advice, to their clients with the goal of maximising shareholder and stakeholder value. Such

services require the combination of an above average cognitive ability, a high intelligence quotient, and emotional intelligence. Understandably, investment banks need to invest and build up the appropriate human capital to satisfy the daily demanding client requests whilst creating innovative out-of-the box solutions for them as well. This is achieved through hiring best-in-class graduates from leading universities across the globe. Working for an investment bank is regarded as physically and mentally demanding, investment banks make great efforts to secure the best graduates from each cohort by offering them very lucrative career opportunities, including a decent compensation package.

4.3.1 Psychology of competition: Social Comparison perspective

Competitions are omnipresent in the business world. Individuals seek to receive a rank promotion and corporations attempt to gain market share from competitors by being the first mover on new products, services and technologies. Similar dynamics apply in the social domain, where one strives to outperform others to achieve a sense of superiority towards other people in a diversity of situations, ranging from social circumstances to organisational sceneries and market transactions (Festinger, 1954; Podolny, 2005).

As opposed to research streams in the realm of psychology that address competition from multiple facets (Deutsch, 1949; Gardner, 1939), scholars in the field of social comparison have devoted relatively few efforts to this subject matter in recent decades. Over the years, workplace competition has been examined and researched in a multi-disciplinary approach, predominantly within the areas of economics, business, sociology, and political science (Axelrod, 1997; Porter, 1979).

The early prominence of the social comparison theory in relation to competitive behaviour, established by Festinger (1954), was followed by a large strand of research that primarily studied self-evaluation (Beach and Tesser, 2000; Tesser, 1988), ignoring its effects on competitive behaviour. In 1954, Festinger proposes

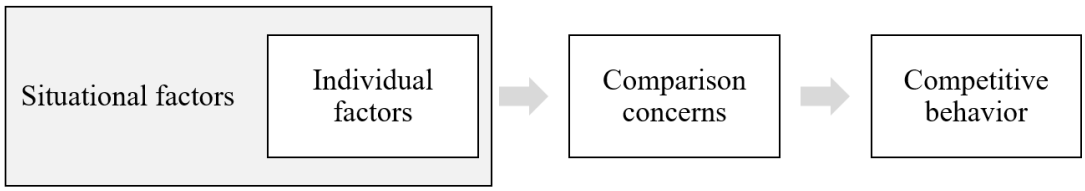
that competitiveness is considered as one manifestation of social comparison, as the social comparison process generates "competitive behaviour to protect one's superiority" (Festinger, 1954, p. 126). Thereby, individuals (i.e., actors) aim to reduce the perceived discrepancies between them and the other persons (i.e., targets). The desire to achieve a position of relative superiority is defined as comparison concerns (Garcia et al., 2013).

This dissertation draws upon and synthesizes early developments in social comparison theorem and integrates those with more recent ideas. This results in a consolidated manuscript that focuses on the psychological forces that result in social comparison and competitiveness.

4.3.2 Individual versus situational factors model

The social comparison model of competition posits that two principal groups of influences (i.e., individual factors, encompassed by situational factors) can jointly increase competitiveness by influencing the degree of comparison concerns (Garcia et al., 2013) (see Figure 14).

Figure 14.
Social Comparison of competition: Two-factor model



This figure illustrates the basic building blocks of the social comparison model of competition. Source: Garcia et al., 2013

The following will elaborate on findings from existing literature, applied to the industry context of this dissertation: investment banking.

Traditionally, academic literature emphasised three key variables within the individual factors that increase comparison concerns (Festinger, 1954; Suls and

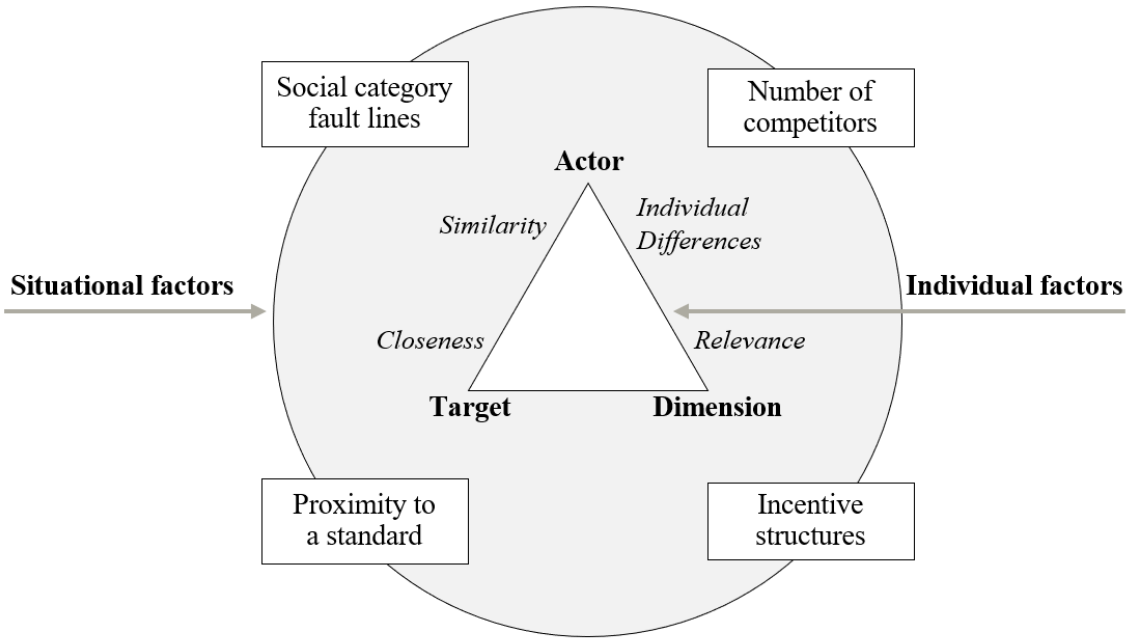
Tesser, 1988). First, comparison concerns increase with the actor's perceived *relevance* of a performance dimension (Tesser, 1988), as observed in performance in sports, salary, or academic cohorts and similar teams and cohort constellations that exist for junior investment bankers. The second variable refers to the degree of similarity to the target, implying that similar rivals (i.e., Analysts and Associate populations) exhibit greater comparison concerns than less similar ones (Goethals and Darley, 1977; Kilduff et al., 2010). Third, this variable addresses the relationship closeness to the target and implies that comparison concerns are more substantial when actor and target are close on an interpersonal level (e.g., a sibling, comrade, or a peer) (Tesser and Smith, 1980).

The triangle in Figure 15 exemplifies these three different individual factors, primarily differentiating between personal factors (i.e., individual differences and relevance) and relational factors (i.e., similarity and relationship closeness). The former (i.e., personal factors) refer to an actor's general inclination to conduct social comparison along with their uniquely individual perceptions of the dimension, whereas the latter (i.e., relational factors) refer to an actor's perceptions of their relationship to the target. In summation, individual factors are highly idiosyncratic to each actor and can vary even among comparably situated individuals.

Nevertheless, despite the significance of individual factors that have historically driven social comparison studies, recent studies reveal an important contribution to social comparison processes based on a new set of context-related situational factors. As distinct from individual factors, situational factors relate to the immediate social environment and thus can result in a more general impact on similarly positioned actors. Such situational factors include number of competitors, incentive structures, proximity to a standard, and social category fault lines (see Figure 15) (Garcia et al., 2013).

Incentive structures are situational variables that can influence the level of comparison concerns and thus competitiveness. Similar to Bazerman et al. (2001), Lawler (2003) suggests that "zero-sum" circumstances, wherein one person's gain is simultaneously another person's loss, bears a natural tendency to increase actors' comparison concerns and competitiveness. For example, observations in the classroom setting show that courses graded on a curve result in a higher degree of competitiveness amongst students than those graded on an absolute scale. This is similar to the setting where junior investment bankers operate, in which year-end performance review ranks are provided on a relative curve and dictate the amount of bonus pay each junior banker receives. The bonus allocation mimics the attributes of a 'zero-sum' situation. Yet in the absence of direct incentives, situational factors can still shape comparison concerns.

Figure 15.
Relationships within and between individual and situational factors



This figure illustrates the basic building blocks of the social comparison model of competition. Source: Garcia et al., 2013

Rankings are present in nearly every facet of life and throughout society. They represent a significant qualitative threshold, which is regarded as "proximity to a

standard," which can increase comparison concerns and lead to intensified competitiveness. This includes being ranked last place or close to a certain threshold point on a ranking (Poortvliet et al., 2009; Zink et al., 2008).

The third situational factor that represents a pervasive characteristic of competition is represented by the number of competitors. In social comparison, various studies show that the number of competitors is a significant situational factor. For instance, the intensity of competitive behaviour (i.e., in tournaments) increases as the number of competitors decreases (Boudreau et al., 2011; Ehrenberg and Bognanno, 1990).

Fourth, "social category fault lines" represent situational factors that increase comparison concerns and competitiveness (e.g., gender: female vs. male; educational institution: Harvard vs. Stanford University; nationalities: French vs. American; or companies: Goldman Sachs vs. J.P. Morgan). This is opposite to relative comparisons conducted in social category fault lines (e.g., Goldman Sachs vs. Goldman Sachs; Harvard vs. Harvard University; French vs. French; female vs. female). It is important to recognise that each person concurrently belongs to a number of non-exclusive social categories (e.g., male, banker, Evangelist, African American, Bostonian, etc.), to which they self-classify contingent on the situation (Turner et al., 1987).

The stable features that situational factors create in the competitive landscape are inclined to exert a more undeviating influence on comparably situated actors. It creates a show case to alleviate the criticism that the theory of social comparison might lack the required predictive capacity to play the focal role in the competitive landscape (Taylor et al., 1989; Arrowood, 1978). The recognised impacts of situational factors facilitate the prediction of situations that raise comparison concerns and thus competitiveness, which go beyond the distinctive impacts of long-incumbent individual factors. The situational factors described in academic

literature can be found in the investment banking set-up, making it an adequate scenery to investigate comparably situated actors.

4.3.3 Junior investment banker and target immediacy

Every year investment banks offer summer internship programmes, which play a vital role in their hiring efforts and are the primary source for recruiting talent. Upon successful completion of the internship, interns will most likely be offered a full-time position.

Like universities, every year banks present a new incoming analyst class, and the career trajectory plan exhibits similar traits to university structures. Analysts gradually proceed in their careers from 1st year Analyst to 2nd year Analyst to 3rd year Analyst and will then ultimately get promoted to Associates. Similarly, the associate career trajectory goes from 1st year to 3rd year before receiving their promotion and moving up to the position of Vice President. The Analyst and Associate roles in investment banks are generally considered the junior positions. In the junior years, Analysts' and Associates' performance are benchmarked and compared against each other. Subsequently, based on performance, a finite amount of the bonus pool is allocated to each junior banker.

Research in education demonstrates that even students in elite high schools have the tendency to compare themselves to their fellow high school students rather than to exogenous groups. This is known as the frog-pond effect (Davis, 1966; Huguet et al., 2009) implying that local information weighs more on self-evaluation than distant information (Zell and Alicke, 2010). In the same vein, Gerber et al. (2008) promote the view of target immediacy, that is, a comparison with a local target would have larger effects on the comparer than a comparison against a distant target.

Scholars suggest that the culture in Western society places a strong emphasis on achievements leading to a unidirectional drive upward (Festinger, 1954; Wheeler,

1966). Additionally, academics provide evidence that individuals who are highly goal-driven and competitive are often inclined to conduct upward comparisons (Matthews and Siegel, 1983; Wheeler, 1966). This dissertation reasons that junior investment bankers, namely Analysts and Associates, qualify as highly goal-driven and competitive individuals. Securing a job as a front-office Investment Banking Analyst reflects an exceptional educational and professional track record, as well as an intellectual curiosity, and ability.

It is noteworthy that even in ancient times individuals have been concerned about the income of others rather than purely being concerned about their own. As Confucius claimed in his analects, "People do not worry about poverty, but rather about the uneven distribution of wealth." Intuitively, most employees care about how their pay rate stacks up to that of their co-workers. In the context of investment banking, Analysts and Associates care about the bonus payments of their peers and compare their bonus compensation to their own.

Based on numerous studies that empirically provide evidence on the importance of social comparison for the prosperity of the individual, it becomes plausible that, when assessing the consequences of an investment decision, junior bankers do not solely care about their own monetary or investment performance ranking outcome, but instead care about their relative outcome in comparison to their peers.

4.4 Social Comparison in Prospect Theory

This dissertation builds the focal mechanism related to risky decision-making on Kahneman and Tversky's (1979) Prospect Theory, which finds its theoretical point of departure in Bernoulli's (1738) utility theory. Bernoulli assumes individuals to be rational decision-makers who are indifferent to reference points and framing of losses and gains. The assignment of a reference point as well as the notion of framing are key distinguishing elements in Kahneman and Tversky's

(1979) Prospect Theory. The authors propose that decision-makers acknowledge possible outcomes as either gains or losses relative to a reference point, which is a psychologically derived benchmark. Determination of the reference point is vital as it is considered the key force for risk preferences.

Tversky and Kahneman (1992) posit that the utility function solely determines risk aversion and risk seeking within expected utility theory. Following the premise of the original version of Prospect Theory, Tversky and Kahneman present that v has a concave curvature above the reference point ($v''(x) \leq 0, x \geq 0$) and has a convex curvature below the reference point ($v''(x) \geq 0, x \leq 0$). Further, they indicate that v, in fact, has steeper curvature for losses than for gains $v'(x) < v'(-x)$ for $x \geq 0$. The first two situations represent the principle of diminishing sensitivity, implying that the magnitude of change diminishes as a function of distance from the reference point. The final condition reflects the principle of loss aversion, in which the authors proposes that losses loom larger than similar gains (Tversky and Kahneman, 1992).

4.4.1 Social reference dependence

> *"[…] the reference state usually corresponds to the decision-maker's current position, but it can also be influenced by aspirations, expectations, norms, and social comparisons."* (Kahneman and Tversky, 1991, pp.1046–1047)

Kahneman and Tversky (1979) introduce the concept of the reference point (or reference dependence) and establish its importance when it comes to decision-making under uncertainty. Prospect Theory suggests that strategic decision-making and risk-taking below and above the reference points vary.

Their concept finds empirical support in the academic community (Thaler and Johnson, 1990; Rabin, 2000), however, most research focuses on the individual reference point and on the decision-makers themselves, largely ignoring the social

environment of the decision-maker. Especially, considering that real-life situations are ubiquitously impacted by social factors, Prospect Theory, on a standalone basis, fails to accommodate this notion and thus, comprises limitations in this regard.

Current research suggests that social comparison can be determined by means of a social reference point, which can be manipulated experimentally (Fox and Dayan, 2004; Hill and Buss, 2010; Linde and Sonnemans, 2012). These prior empirical studies focused on the influence of social reference point on risky decision-making and were predominantly directed at the field of economic decision-making (i.e., equity investment, salary, lottery etc.).

Xie and Lu (2014) propose that social reference points can be split into three categories, namely (1) social gain, (2) social loss, and (3) social neutralism. According to this, individuals tend to regard upward social comparison a social loss, whilst considering downward social comparison a social gain. As such, judgments and decisions vary because of such gains and losses. Muller and Fayant (2010) postulate that social loss can impose a threat on self-concept, which in turn can trigger mental behaviours with diverse consequences for decision-making (Hill and Buss, 2010).

In addition, Kahneman and Tversky (1979) present another behavioural consistency that demonstrates the gravity of reference dependence, namely the reflection effect. The scholars discovered that a gamble scenario, which is framed as either a gain or a loss by altering the opening endowment, bears a material impact on risk preferences.

For the gain domain they detect risk-averse behaviour, but for the loss domain risk-seeking behaviour is the dominant option. One of the more established examples of this impact is represented by Tversky and Kahneman's (1981) 'Asian disease' study, whereby participants demonstrate a preference for risk-averse

policies when outcomes are framed as gains (i.e., saving lives), and for risk-seeking policies when outcomes are framed as prevented losses (i.e., deaths).

The theoretical method frequently accepted by the literature (e.g., Gamba et al., 2017) stems from a standard reference-dependent utility function, which generally can be represented as follows:

$$v(x, s) = u(x) + g(x - s)$$

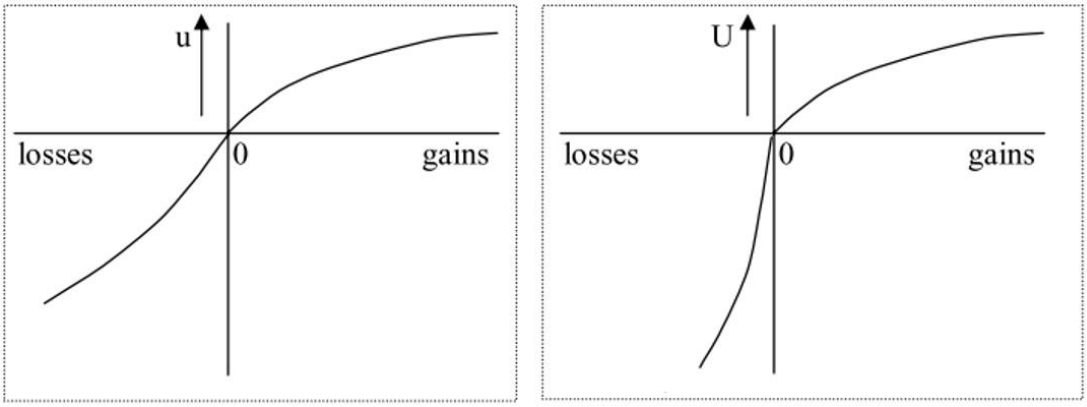
In this equation, $u(\cdot)$ stands for the private component and $g(\cdot)$ for the social component. In particular, $u(x)$ represents the individual's utility from the monetary outcome x, and s describes the outcome of a social referent. Thus, $g(x - s)$ represents the utility (or disutility) derived from the comparison of x (monetary outcome) with the outcome of s (social referent). This dissertation aims to understand how $g(x - s)$ influences the decision-maker's risk attitude by drawing from the concavity and convexity premises of the value function in Prospect Theory, which states that loss aversion is the greatest relevant idiosyncrasy of the notion of reference dependence, and directly incorporates it in the utility function by way of a kink around the reference point (Kahneman and Tversky, 1979).

4.4.2 Loss aversion

The underlying concept of loss aversion is contemporary with regard to peer earnings and constitutes an imperative element in numerous prominent theories. It represents the key empirical notion with regard to the difference between gains and losses. "Losses loom larger than gains" (Kahneman and Tversky, 1979, pp. 279) implying that individuals display a greater sensitivity towards losses than to gains. If an individual gains $50 on the third day and loses $50 on the fourth day, the grief about the loss outweighs the initial happiness. This is driven by the notion founded in Prospect Theory, which suggests that losses have twice the hedonic impact on a person's well-being than the gain of an equivalent amount. Loss aversion is illustrated in Figure 16 whereby the value function on the right-hand

side depicts a steeper curvature for losses than for gains, which indicates that the perceived value of losses outweighs the value of gains.

Figure 16.
Classic utility function vs. Prospect Theory's utility function



The figure on the right-hand side illustrates the hedonic impact of losses resulting in a convex curvature within the loss domain. Source: Kahneman and Tversky, 1979.

Furthermore, regarding the context of social comparison, Fehr and Schmidt (1999) propose that the effect of relative earnings on an individual's utility function is more substantial when peers have higher earnings than when they have lower earnings. This idea was shown in Fehr and Schmidt's inequity aversion model and establishes that an individual is loss averse in social comparisons. This information implies that negative deviations from the social referent are more compelling than positive deviations. This observable social loss aversion regarding the referent's earnings indicates that social reference point plays a similar role, as does individual reference points.

This dissertation focuses on the implications of social comparisons that display Prospect Theory characteristics such as concavity in the social gain domain (i.e., social loss aversion) and convexity in the social loss domain (i.e., risk-seeking). Further, this study intends to investigate risk-taking in decision-making by building on Prospect Theory (Kahneman and Tversky, 1979) and social comparison theory (Festinger, 1954) to promote a theoretical outline that provides

an integrated behavioural and socio-psychological theoretical interpretation of risk-taking.

4.4.3 Ranking orders in investment banks

The existing state of affairs (status quo) represents an agent's most common reference point when classifying outcomes as gains or losses (Kahneman, 2003). The status quo in rank-order tournaments among multiple participants is considered an individual's interim rank at the time of decision-making. According to social comparison theory, a participant compares him-/herself to his/her upward competitor, seeking to advance his/her status (i.e., gain rank), whilst seeking to protect his/her status (i.e., avoid rank loss) against his/her downward competitor. Studies demonstrate that risk-taking behaviour is most sensitive to the risk of losing rank vis-à-vis nearby ranked competitors (Bothner et al., 2007) versus competitors with more remote ranks and who are less likely to affect the individual's status quo. Latest data from studies in the laboratory and in the field indicate that, on average, rank incentives not only increase effort and performance levels among individuals (Tran and Zeckhauser, 2012; Delfgaauw et al., 2013), but also encourage unethical behaviour (Charness et al., 2014).

As outlined earlier, social comparison presents a central source of competitive behaviour in rank-order tournaments (Garcia at al., 2013). From an industry perspective, investment bankers are informally accused of comparing themselves with others in discussions about their investments and other successes, engaging in so called 'cheap talk' (Crawford, 1998), whereby they rank each other on a continuous basis. Not only do investment banks refer to 'league tables' that are regularly published by financial data service providers and act as a performance recognition tool among financial institutions based on a set of criteria (i.e., earning metrics), but Baum et al. (2005) further substantiate that while investment banks compare themselves with comparably-sized competitors, they also adopt different risk-taking strategies, depending on their performance vis-à-vis comparable

competitors. This is in line with the social comparison logic that such situations promote risk-taking because similarity enhances the psychological factors of competition, which explains that an individual's notions of self-worth is generally impacted by the results of competitive interactions with corresponding competitors.

In an industry which is known for its competitiveness and relative performance appraisal to take centre stage, it is surprising that no research exists demonstrating how competitiveness for rank impacts the actions of such professionals. This study aims to narrow the gap in this research by exploring the effect of rankings on the risk-taking of investment banking professionals in investment decisions.

4.4.4 Social Comparison and risk-taking behaviour

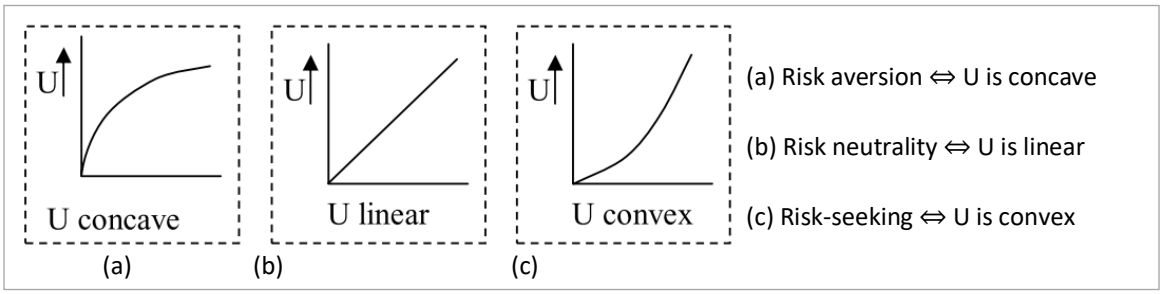
Similar to the phenomenon of upward contrast as described earlier in this chapter, the condition of a social loss imposes a threat to the self-view (Brickman and Bulman, 1977), leading to a sequence of mental behaviours containing diverse consequences for decision-making (Hill and Buss, 2010).

Schwerter (2013) provides empirical evidence on how risk attitudes alter if risky decisions lead to outcomes that could reverse social ranking. These findings imply that individuals are less risk-averse when finding themselves to be in a social loss domain, which is consistent with the notion of social loss aversion.

In recent years, academia has widely acknowledged the role of social comparison in individual decision-making. Studies propose that social comparison is conducted automatically, which impacts cognition at the neurological level. This in turn will have prevalent consequences for behaviour (Fliessbach et al., 2007). Wang et al. (2016) use social comparison as a rationalisation for the deterioration of asset prices, as evidenced during the Chinese stock market crash in 2015. Furthermore, scholars argue that a clear focus needs to be placed on how social

comparison involved in decision-making is manifested cognitively (Buunk and Gibbons, 2007).

Figure 17.
Utility function (U) curvature based on risk attitude



This figure illustrates the variation in curvature depending on different risk attitudes. Source: Kahneman and Tversky, 1979.

Gamba et al. (2017) argue that the social condition of the individual decision-maker (status) combined with the disposition towards social gains and social losses may impact one's attitude towards risk.

In a private setting, individuals have different risk attitudes, which is a function of the positive variation with respect to a certain individual reference point (i.e., goal, status quo, etc.). Correspondingly, in a social environment it may occur that individuals have different risk attitudes and this depends on the variations with regard to a social reference point (e.g., performance ranking or the monetary outcome of the reference group). Thus, receiving a lower performance ranking or salary than the reference group implies that the manager experiences a loss, namely a social loss. Consequently, Prospect Theory suggests that individuals facing a disadvantageous social condition (e.g., social loss: lower earnings compared to their co-worker) are willing to embrace more risks than individuals with an advantageous social condition (e.g., social gain: higher earnings compared to their co-worker) as they are determined by the motivation to catch up with their social referent.

Despite these observations, some scholars still conclude that social comparisons have no effect on risky choices (Rohde and Rohde, 2011). This dissertation aims to prove the meaningful impact that social comparison has in a real-life investment setting.

5. Development of hypotheses

Based on the theoretical literature review and concepts elaborated in sections 2 to 4, this section presents the hypotheses developed to investigate the two research questions of this dissertation.

5.1 Risk levels within ranks

The first research question aims to investigate to what extent the risk-taking behaviour of Investment Banking Analyst, Associates and Vice Presidents differ from each other.

Agency theory recognises the significance of performance-based compensation packages to ensure interest alignment between agents and principals (Milgrom and Roberts, 1992). Scholars suggest that compensation structures have caused risk-taking behaviour in the investment banking industry, which has been materially attributed to the outbreak of the GFC in 2008 (Bebchuk et al., 2010; Berndt et al., 2010).

As outlined earlier, performance-pay incentives in investment banks are generally designed in the form of variable cash-based (immediate) or variable equity-based (deferred) compensation, both of which are granted to the banker at the end of the fiscal year. Overall, equity-based compensation intends to promote long-term incentives and helps to mitigate the conflict of interests between managers and shareholders as they are linked to the market capitalisation of the firm and are also subject to a pre-defined vesting schedule (Morck et al., 1988; Fahlenbrach and Stulz, 2011). By contrast, cash-based bonus compensation is typically paid out as an annual cash incentive subject to the attainment of predetermined performance-based accounting metrics. Murphy (2000) proposes that cash bonuses are positively related to managerial risk-taking as high risks are taken by bankers to meet short-term performance goals. This allows bankers to earn bonuses at the

cost of a long-term productive effort (FSB, 2009; Hakenes and Schnabel, 2014). Such short-termism becomes even more crucial for long-term investments or transactions when the outcome or anticipated performance is yet to be realised, given the inability and difficult nature of clawing back cash bonuses in the case a banker's investment performance or advice turns out to be unsuccessful in the long term. The efficacy of risk-taking incentives from executive variable compensation is regarded as high, particularly in the banking industry (Bolton et al., 2011; Mehran et al., 2011).

With regard to the variable (i.e., bonus) payment regimes within the investment banking industry, Analysts fall under cash-based (immediate) bonus compensation regime, whereas all ranks from Associates and above typically fall under an equity-based (deferred) bonus compensation regime. Generally, as tenure or rank seniority increases, it results in a higher bonus-to-base ratio of the total compensation and a lower cash-to-equity ratio. As per the literature review, it is to be expected that investment banking professionals that are subject to a deferred bonus scheme generally exhibit lower risk-taking behaviour.

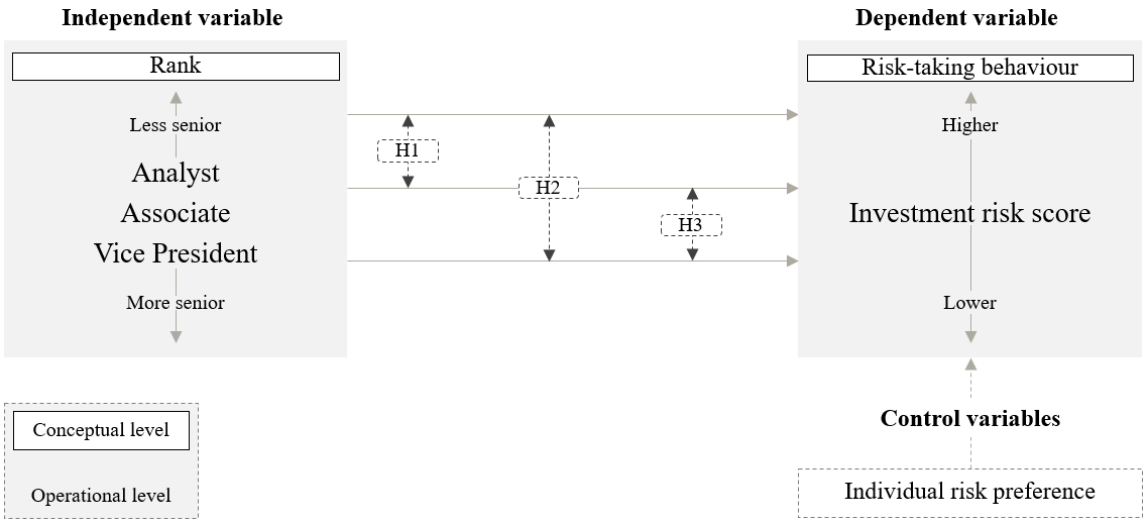
This results in the following set hypotheses to be tested:

H1: *Investment Banking Analysts are more risk-seeking than Investment Banking Associates*

H2: *Investment Banking Analysts are more risk-seeking than Investment Banking Vice Presidents*

H3: *Investment Banking Associates are more risk-seeking than Investment Banking Vice Presidents*

Figure 18.
Hypotheses framework for RQ1 (H1, H2 and H3)



This figure is an illustration of the validity framework for Hypotheses 1 to 3 based on Research Question 1. Source: Author

5.2 Social Comparison moderator

The second research question aims to investigate to what extent social comparison influences the risk-taking behaviour of Investment Banking Analysts and Associates and Vice Presidents.

As outlined in chapter 4, the status quo in rank-order tournaments among multiple participants is considered an individual's interim rank at the time of decision-making. According to social comparison theory, participants compare themselves to upward competitor, seeking to advance their status (i.e., gain rank), whilst seeking to protect their status (i.e., avoid rank loss) to their downward competitor. Prior academic findings demonstrate that risk-taking behaviour is most sensitive to the risk of losing rank vis-à-vis nearby ranked competitors (Bothner et al., 2007) versus competitors with more remote ranks that are less likely to affect the individual's status quo.

Similar to the phenomenon of upward contrast as described earlier in this chapter, the condition of a social loss imposes a threat to the self-view (Brickman and

Bulman, 1977), leading to a sequence of mental behaviours containing consequences for decision-making (Hill and Buss, 2010).

Individuals have different risk attitudes, described as a function of the positive variation with regard to a certain individual reference point. Thus, in a social environment it may occur that individuals have different risk attitudes depending on the variations with respect to a social reference point. Therefore, receiving a lower performance ranking or salary than the reference group implies the manager experiences a loss, namely a social loss. Accordingly, Prospect Theory suggests that individuals facing a disadvantageous social condition are willing to embrace more risks than individuals with an advantageous social condition as they are determined by the motivation to catch up with their social referent.

In the same vein, Schwerter (2013) provides empirical evidence on how risk attitudes alter if risky decisions lead to outcomes that can reverse social ranking. The findings imply that individuals are less risk-averse when finding themselves to be in a social loss domain, which is consistent with the notion of social loss aversion.

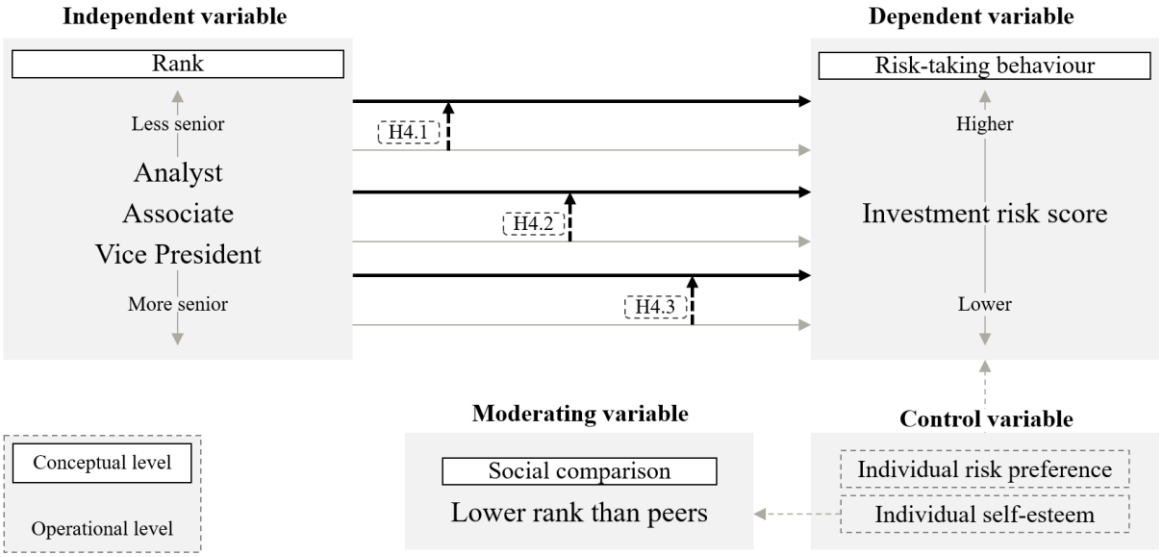
This results in the following set of hypotheses to be tested:

H4.1: *In a social loss domain (when experiencing a social loss due to a lower ranking than their social referents in the same rank), Investment Banking Analysts engage in increased risk-seeking behaviour.*

H4.2: *In a social loss domain (when experiencing a social loss due to a lower ranking than their social referents in the same rank), Investment Banking Associates engage in increased risk-seeking behaviour.*

H4.3: *In a social loss domain (when experiencing a social loss due to a lower ranking than their social referents in the same rank), Investment Banking Vice Presidents engage in increased risk-seeking behaviour.*

Figure 19.
Hypotheses framework for RQ2 (H4.1, H4.2 and H4.3)



This figure is an illustration of the validity framework for Hypotheses 4.1 to 4.3 based on Research Question 2. Source: Author

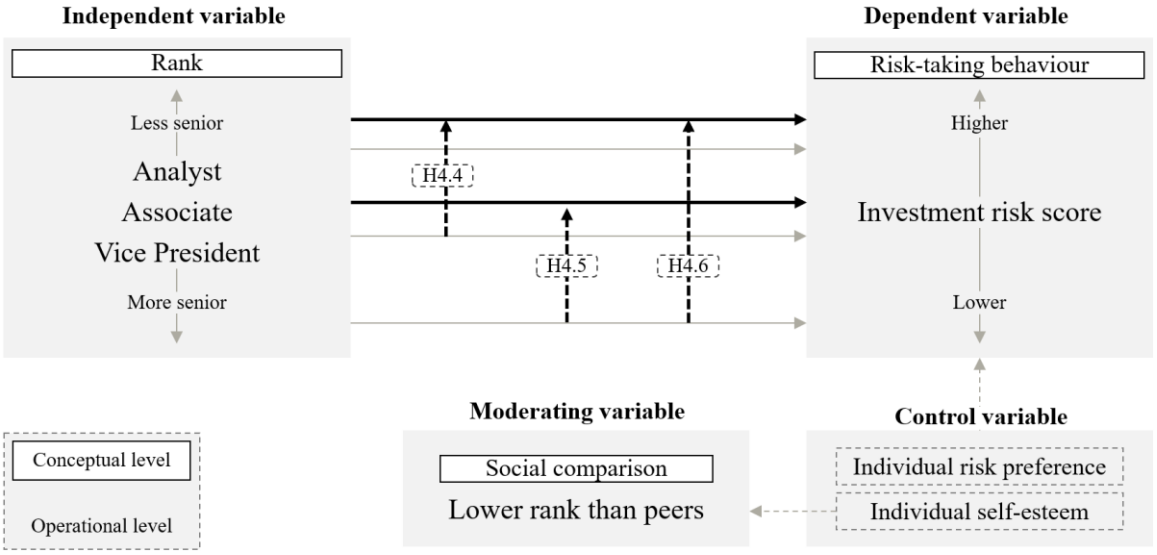
In addition to Hypotheses 4.1 to 4.3, this study predicts that social comparison will induce risk-seeking behaviour to such a meaningful extent that it reverses the risk-taking behaviour anticipated in H1 to H3. Thus, the following set hypotheses to be tested:

H4.4: *In a social loss domain (when experiencing a social loss due to a lower ranking than their social referents in the same rank), Investment Banking Associates engage in more risk-seeking behaviour than Investment Banking Analysts.*

H4.5: *In a social loss domain (when experiencing a social loss due to a lower ranking than their social referents in the same rank), Investment Banking Vice Presidents engage in more risk-seeking behaviour than Investment Banking Associates.*

H4.6: *In a social loss domain (when experiencing a social loss due to a lower ranking than their social referents in the same rank), Investment Banking Vice Presidents engage in more risk-seeking behaviour than Investment Banking Analysts.*

Figure 20.
Hypotheses framework for RQ2 (H4.4, H4.5 and H4.6)



This figure is an illustration of the validity framework for Hypotheses 4.4 to 4.6 based on Research Question 1. Source: Author

6. Research design and approach

This chapter introduces the research design and approach used to investigate the impact of social comparison on risk-taking levels among investment bankers. It elaborates on the research method, setting, sample and data collection procedure. This chapter serves as a preliminary stage to the empirical analysis in the subsequent chapter.

6.1 Survey research versus archival research

An empirical survey is classified as a common practice in the field of behavioural research that allows participating respondents to share their attitudes, beliefs, cognitions, and motivations under general conditions (Hageman, 2008). As such, it reflects the opinions and experiences of investment banking professionals under their regularly daily condition, at the time of data collection. Laboratory experiments constitute another prominent research method in the behavioural research realm, whereby participants' responses are observed in a controlled and experimental setting. Other commonly used experimental settings include experimental economics (i.e., opposing participants, such as buyers and sellers, engagement in an artificial market situation) and field experiments (i.e., observation of participants in their natural environment) (Hageman, 2008).

In contrast, archival research is based on historical articles including but not limited to scripts, journal articles, annual corporate publications (e.g., company presentations, capital market days, press releases, etc.) and company disclosures (e.g., reports or filings) (Smith, 2003). Such data can be retrieved from the original research (i.e., primary sources) or from accumulated or revised information in databases (i.e., secondary sources). While obtaining data from publicly available databases has been a common approach in the field of financial accounting for the past decades, it is less common for behavioural research. (Koonce and Mercer, 2005).

Though such databases enable large-scale studies, given that a significantly larger sample size is available, with increased predictive statistical power and external validity, they often rather serve as a raw proxy for a given measure as it remains difficult to harmonise data across the sample due to the obstacles that some data is outdated, incomplete, inconsistent with regard to classifications across databases, or even includes recording errors which require cross-checking to other databases and internal validity checks. Consequently, these obstacles can weaken the construct validity and increase measurement errors. Additionally, given the difficulty related to variable specification, variables may not be able to represent exact proxies for the latent theorised constructs (Hageman, 2008). Similarly, a variable can serve as proxy for multiple theories, thereby not allowing to analyse the relative importance of competing hypotheses (Gassen and Schwedler, 2010; Graham et al., 2005).

This study utilises a survey methodology to investigate the research questions at hand as it allows for inferences on theoretical constructs directly from the respondents' answers to the survey questions. This in turn makes it possible to discover and formulate generalisations and to describe the unexplained mental states of the examined population and to alleviate internal validity concerns (Groves et al., 1989; Groves et al., 2009).

The aim of explanatory survey research is to provide the researchers with a basis from which to draw causal inferences on the relationships between variables and to prove or disprove a theory after reviewing the deductive reasoning established in existing theories from prior literature. Selecting survey research as the data collection method bears multiple advantages. First, it allows the researcher to address the issues at hand in a more effective manner than traditional archival data research based on various sources. Specifically, in this study, a survey facilitates capturing the respondents' view on risk-taking and under the impact of social comparison. Second, it enables the elicitation of decision-making processes under the situational factors that junior investment banking professionals face on a

regular basis in the real world, which in turn helps in reducing external validity concerns frequently found in experimental settings (Gassen and Schwedler, 2010). Third, a survey allows the researcher to ask investment banking professionals detailed qualitative questions on the motives behind their actions, which allows to obtain a uniquely specific perspective on the trade-offs between investment decisions in the financial markets. In fact, the more complete and accurate the responses received through the survey are, the more precise and statistically powerful inferences can be drawn. Several methods exist to increase survey participation including but not limited to offering incentives, providing pre-notification, ensuring the anonymity of participants, creating personalisation, offering to gain social utility (i.e., applicable in the study at hand), appealing to the intention to support the researcher, and follow-ups post survey (Göritz, 2015). The survey elements relevant to data quantity include retention rate, response rate and completion rate. The retention rate refers to the survey participants who lasted until survey completion and did not drop out in between. Response rate refers to the share of participants who completed the survey out of all the invited recipients. The completion rate describes the share of participants who finished the survey out of all participants who launched the survey.

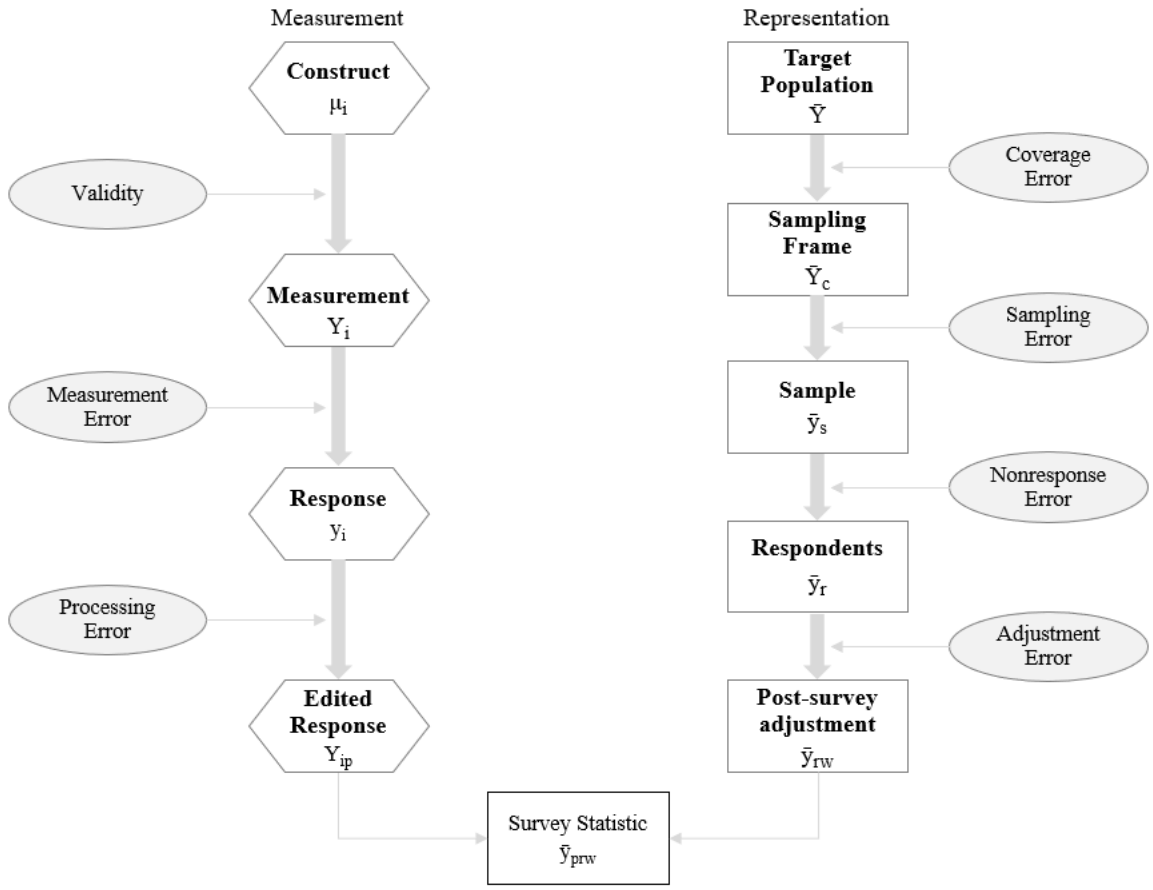
Survey elements with regard to data quality include, but are not limited to, item-nonresponses, completion time, disproportionate selection of endpoints or middle points, share of no-opinion responses as well as consistency and reliability responses. In addition, several potential errors can impact the measurement and representation dimensions of the survey statistics (see Figure 21).

The *measurement* dimension addresses validity and reliability elements with regard to the measurement of the underlying constructs and encompasses errors based on the interviewer's behaviours and characteristics, the respondents' behaviours and characteristics, as well as on survey instrument characteristics, survey mode, and processing errors (Groves et al., 2009).

Constructs reflect indirect measures of concepts that are abstract ideas not directly observable or measurable prior to operationalisation by means of variables and questions. The entirety of valid and reliable answers to the established construct denotes a measure for the concept (Smith, 2003).

Construct validity represents the adequacy of the measurement tools being utilised for data gathering to operationalise the constructs of interest (e.g., questionnaire items) and refers to the extent to which the measures capture what the researcher intends to measure. Without an adequate construct validity, there is no dependable foundation from which to derive the behaviours or attitudes that have been measured. As such, a lack of construct validity in survey methodology is linked to measurement errors (Biemer et al., 2004; Groves, 1989). There exists no technical test in statistics to check for construct validity since the fundamental concept is often an unobservable psychological construct. Thus, the discussion on construct validity is being held at the conceptual or theoretical level (Cornelius and Harrington, 2014; Groves et al., 2009).

Figure 21.
Survey life cycle



The figure side illustrates the errors within the measurement and representation area that can occur throughout the survey. Source: Groves et al., 2009.

Measurement errors are referred to as errors of observations, which reflect potential deviations from an underlying concept being examined and the responses provided to a survey question (Groves et al., 2009). Such an error potentially occurs on the back of multiple reasons, such as effects produced by the interviewer (e.g., level of skilfulness in asking the survey questions or recording the answer), the respondents themselves (e.g., no comprehension of the questions asked, no memory of prior answer or not demonstrating the willingness to provide truthful answers), the clarity and structure in the wording of questions, or due to the chosen data collection mode. The repercussions of measurement errors can result in answers being inaccurate, invalid and inconsistent with other answers in the sample (Bethlehem, 2009). In order to reduce or alleviate such measurement

errors, the execution of a robust pre-testing is required to confirm that the format of the survey is meaningful, transparent, and straightforward to interpret the questions posed. As described earlier, prior to the launch of the survey, feedback from field experts (i.e., practitioners) was collected during the pre-testing phase and subsequent feedback points were incorporated, accordingly.

Processing error within the measurement dimensions can also occur throughout the data processing stage of the survey evaluation (i.e., data entry into the statistical software).

The *representation dimension*, on the other hand, encompasses the relationship between the sample population, the sampling frame, as well as the opening versus the final respondents' sample including coverage error, sampling errors, non-response error and post-adjustment errors. *Coverage errors* refer to the condition that can occur if a sampling frame does not well represent the target population, resulting in over- or under-coverage, which means that respondents are included within the sample population although they do not belong to it or respondents of the target population in the study at hand are incorrectly not included in the sampling frame. In the present study, over-coverage does not represent a concern as the surveys are only distributed to respondents who meet the specific criteria laid out earlier (i.e., FCA approved front office investment banking professionals within certain ranks). Similarly, the study does not bear the risk of structural under-coverage, such as a potential digital divide, that is, structurally preventing respondents without internet access to take part in the survey (de Leeuw and Joop, 2015).

In a similar vein, inference problems can occur due to sampling errors, which refer to the fact that data is being collected from a subset of the entire population of interest instead of a complete census being conducted (i.e., no sampling errors will occur if one can observe the complete population). This can occur in the area of representation and addresses issues related to the construct validity of units as

different units under observation may embody different higher-order constructs due to variances in sampling target, sampling frame, and covered populations through self-selection errors (Groves et al., 2009). For completeness, it is noteworthy to mention that, given that the study at hand is surveying active real-time investment banking professionals, it remains difficult to have equal demographic representations across all investment banks with regard to gender, divisions surveyed, and other factors due to the idiosyncrasy of each bank.

Non-response errors occur when data is not gathered from respondents within the sample (e.g., they were not contacted, or respondents refused to provide their answers). Consequently, the error that results from that is in the form of bias, that is, non-respondents may have provided data that are materially different from those who did provide their responses (Groves and Couper, 1998).

Lastly, *post-adjustment errors* refer to errors that arise when weightings are being included to make sure that the final sample mimics the population under study as accurately as possible as well as to adjust for non-responses within subgroups (Dillman et al., 2014). Yet, a weighting exercise is nuanced and relies on information from additional data sources to define the weighting criteria for both respondents and non-respondents. Typically, survey weighting is performed on demographic data that is regularly available for the sample as well as the data sets. Nonetheless, it often remains difficult to conduct a weighting exercise accurately as it has the tendency to improve the results with regard to the representativeness of demographic attributes. However, it does not result in an enhanced representativeness of other characteristics that are not related to weighting and, as such, the success of weighting depends profoundly on the weighting characteristics used and how they contribute to other variables of interest.

6.2 Methodological approach

Given the international scope of the investigated survey population, an online survey represents a feasible method for data collection (Gassen and Schwedler, 2010). On the one hand, it enables an enhanced outreach to a geographically more dispersed target audience, performing the data collection in a shorter frame and with less resources required as, for example, survey invitations are distributed via email (Sax et al., 2003) and as such, no logistical costs are incurred. Furthermore, online surveys are not only generally considered the most affordable or cost-efficient means of data collection (Parson., 2007), but also incur no cost for the researcher to code the data (Cobanoglu et al., 2001). Simultaneously, survey respondents have the freedom to respond at their leisure and are given the optionality to access the web-based survey through their mobile device (i.e., smartphone or tablets) from any geographic location they please. Dillman et al. (2014) concluded that these core features of web-based surveys reduce the threshold for less motivated participants and increase the general willingness to participate, resulting in a higher probability for survey completion, that is, reducing the magnitude of potential non-response errors. This, in particular, is of immense significance for the target sample of busy investment banking professionals who operate under time constraints and tight deadlines. An online survey, moreover, allows for a high degree of customisation, with respect to formalities (i.e., designs, formats, graphics, etc.) and structure (i.e., survey flow, design, randomisation of questions orders; or tailor or manipulate specific questions for a treatment group of participants). Though online surveys do not allow great extent of monitoring and surveillance during the answering process, researchers can more accurately examine the survey, that is, to detect the number of people who launched the survey, identify questions which took more time or resulted in a participant to abort the survey, or track the average completion time (Granello and Wheaton, 2004).

Technical barriers, on the other hand, such as firewall settings, can impose difficulties and ultimately result in no participation (i.e., survey invitation or access to online survey platform may be prohibited due to corporate cybersecurity measures) as a survey invitation may be erroneously categorised as a digital phishing attempt or spam email (Cornelius and Harrington, 2014). Although online surveys may reduce the effort barrier threshold for participants to take part in a survey, they also have the trait to lower response rates as they are deemed less personal than traditional bilaterally conducted surveys, such as face to face or phone surveys (Dillman et al., 2014). Additionally, online survey participation may be discouraged due to potential security concerns with regard to confidentiality (Sax et al., 2003), to which Lavrakas (2008) counters that the assurance of anonymity preservation is a bypass to alleviate such confidentiality and privacy concerns.

Given the prominence of survey methods and their vast circulation in commerce related settings, it has become increasingly difficult for prospective survey participants to assess the quality of a survey (Pfeffermann and Rao, 2010). The indirect endorsements through the author's academic institution (University of St. Gallen) and corporate managers at first-tier bulge bracket investment banks was perceived as a quality seal among participants, which in turn increased the response rate (Rochford and Venable, 1995). Finally, distributing an online survey requires limited coding or editing after post data collection, which in turn allows for post survey adjustments, mitigating coverage and non-response errors, for example data cleaning, and facilitates data analysis with software such as Excel and SPSS (Groves et al., 2009).

The hypotheses in this dissertation are derived from multi-disciplinary academic literature reviews and by means of deductive reasoning and studies of this nature are subject to empirical testing by means of a representative sample. The research question and the respective hypotheses proposed in this study will be tested on the

basis of quantitative data, and more particularly, by means of multiple linear regressions.

Despite all the advantages of the survey design laid out above, the mere performance of a static online survey will not be able to empirically capture the evidence or test the hypothesis as the moderating variable in this study introduces an element of manipulation. As such, this study will conduct an experiment via an experimental survey, which has progressively become a more prominent tool applied in studies across various disciplines such as sociology, political science, economics and psychology. The underlying premise of experimental surveys is that experimental studies do not inevitably have to be conducted in laboratory settings or in other highly controlled environments and represent a hybrid mode between a survey and an experimental research design. Deploying an experimental design in a survey research allows for scientific rigor combined with the access to a pool of large and representative samples. Experimental survey research designs, moreover, are a strong tool to study social norms and cognitive processes. In political science, for example, experiments that measure the impact of stimuli or inducements introduced in a survey on individuals' responses to questions in the same survey (i.e., experimental surveys) represent a central paradigm (Druckman et al., 2006), which leads to the publication of dozens of experimental surveys each year in political science journals (Hainmueller et al., 2014).

Specifically, building in an experiment in a survey can provide additional evidence of causal inference. Assigning respondents randomly to a treatment or to a control group enables the attribution of differences between the two groups to the applied treatment. As described earlier, the high degree of customisation that online surveys allow facilitates their modification to incorporate experimental manipulations. Thus, whereas one group of randomly selected respondents are exposed to one version of the questionnaire, other respondents can be exposed to an altered version of the experiment. The resulting differences in responses can

be ascribed to the elements that were altered. As opposed to the traditional social psychological experiments in laboratory settings, an experiment conducted via an experimental survey allows the researchers to study a representative sample of practitioners (i.e., investment banking professionals), which would typically be impossible to lure into a finite laboratory setting.

In addition to the experimental survey design, semi-structured interviews with senior investment banking professionals (Managing Directors and Country or Product Heads) will allow a more granular perspective on the analysis of results and will provide supplementary perspective and implications for both researchers and practitioners.

6.3 Design and data collection

This study plans to make use of two complementary methods:

1. An experiment via a web-based experimental survey: Primary data collection through the distribution of an experimental survey questionnaire. The target survey sample constitutes 222 respondents who are considered front-office investment bankers at bulge bracket investment banks that work across divisions and asset classes. In order to guarantee the consistency of information input, the sample exclusively focuses on FCA approved bankers and managers, thus excluding support function staff from departments such as Information Technology, Human Resources, Compliance, Treasury Services and other middle and back offices. The survey is self-administered, and the language of instruction is English. Respondents are given the choice to either access the questionnaire online via their computer or mobile device (i.e., smartphone or tablet with iOS or Android operating systems). The survey is being distributed bilaterally to each participant via email. The questionnaire is self-administered by the author whereby survey questions are derived from existing research and have been acknowledged and accepted by the academic community to measure

the desired variables. At the outset of the survey participants are being asked to complete demographic questions followed by a set of questions that were asked to establish control variables, that is, to assess an individual's general level of risk propensity and self-esteem. Thereafter, they are required to complete 10 investment questions, which allow the researcher to assign a risk score to each participant, allowing for a determination of each participant's level of risk-seeking. All participants are asked to respond to the same identical set of investment questions. The experimental element of the research requires the division of the sample respondents into a control or a treatment group, which is being performed on a random basis. What differentiates the survey procedure for both groups is the following: whereas the control group can complete all 10 investment questions one after the other, the treatment group receives a fictional ranking after the 5th investment question which indicates their level of performance in the form of a relative rank to their peers who took the same survey. Inducing a fictional rank order has the mere purpose of a manipulation mechanism. After observing their (fictional) rank, participants in the treatment group are asked to describe their position as either a loss or gain and complete 4 questions (on Likert-scale) about how they feel after viewing their ranking. Once this is completed, the treatment group can proceed to the next set of five investment questions, completing all 10 investment questions by the end of it. After that, the survey is concluded, and participants are thanked for their time and participation.

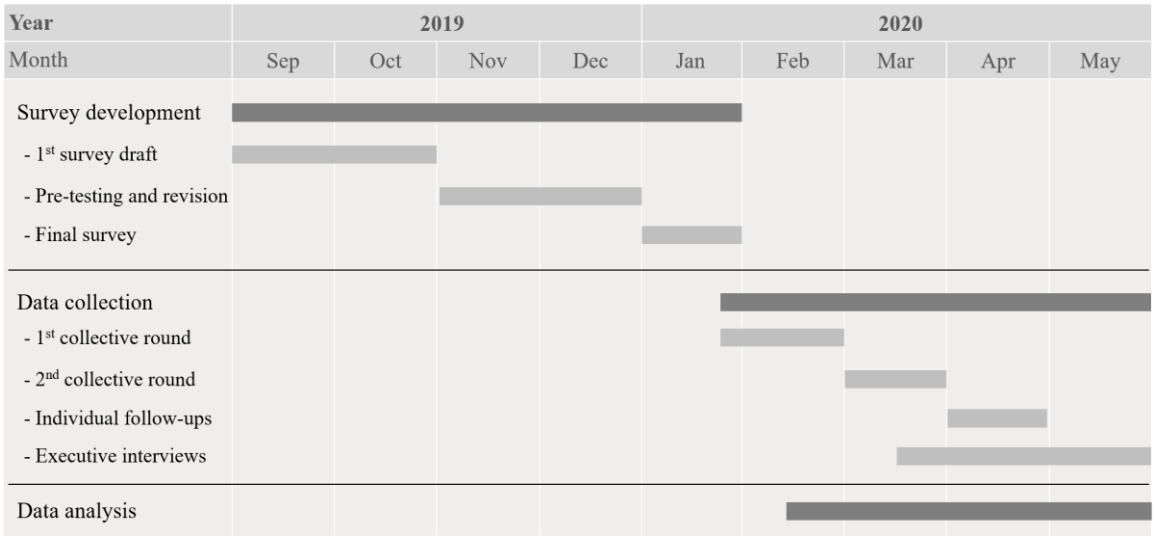
The survey is not limited to any time constraints and is expected to take approximately 10 minutes to complete. No questions can be skipped, that is, a response is required for each single question before being able to proceed to the next survey page or question, respectively.

2. Semi-structured interviews: Managing Directors were approached for semi-structured interviews to discuss the findings of the survey. Findings from the

questionnaire are analysed and conclusions drawn in line with the research findings. These interviews will contribute additional qualitative findings for (a) validation, (b) understanding the applicability of the findings from the survey and (c) discussing potential implications for business as well as future research requirements to advance the topic at large.

Data collection was performed over the course of four months for both survey data and semi-structured interviews (see Figure 22).

Figure 22.
Data collection timeline



This figure illustrates the timeline spanning survey development, primary data collection and data analysis. Source: Author

6.4 Unit of analysis

The sample population of interest in this study are front-office investment bankers from first- and second-tier bulge bracket investment banks and boutiques firms based in Europe. This research sample is novel and has no precedence in the literature.

6.4.1 Survey participants

Front-office investment banking professionals are those who perform a client-facing role. Front-office investment bankers are located on either side of the Chinese Wall, that is, on the private side as well as on the public side. They work in mergers & acquisitions, capital markets (Equity Capital Markets, Debt Capital Market, Ratings Advisory and Leveraged Finance), and sales, trading and research (across asset classes). The research excludes middle and back-office employees from departments such as Compliance, Human Resources, and Technology which are acting in a supportive capacity rather than generating revenue through origination of deals and client interaction.

Moreover, a front-office investment banking professional is a person who is approved by the Financial Conduct Authority (FCA) to pursue a controlled function for an authorised firm. Control functions are code names assigned to numerous functions within the financial services and activities by a regulated firm. These functions are detailed in section 59 of the Financial Services and Markets Act.

The FCA (equivalent to Bundesanstalt für Finanzdienstleistungsaufsicht "Bafin" in Germany, namely Federal Financial Supervisory Authority) is an independently operating financial regulatory body in the United Kingdom which is financed through fees that are being charged to the members of the financial services industry (FCA, 2016). The FCA regulates firms in the financial industries that provide any type of financial services to clients and maintains the integrity of the financial markets. As per the FCA (2016), "approved persons that perform controlled functions for an authorised firm usually have significant influence over the firm's regulatory conduct."[4] Therefore, each single front-office employee is required to obtain an FCA approval prior to joining an investment bank in a full-time capacity. Approvals will need to be obtained through examinations on

[4] www.fca.org.uk/firms/approved-persons/controlled-functions

different subject matters (e.g., derivatives, securities, regulations, etc.) that will assess if an individual has the necessary competence and understanding of certain investment instruments. Without the regulatory approval from the FCA no individual can commence a front-office career in investment banking.

For the purpose of this study, the FCA approval provides a common knowledge base across the entire survey sample. This facilitates the analysis as there is no further need to control for differences in the level of financial literacy among respondents.

To be precise, the sample consists of Analysts, Associates and Vice Presidents and the distinguishing key feature among those three groups is the remuneration scheme under which each group falls. Analyst bonus compensation is a pure cash-based bonus, which is paid out to the analyst population immediately upon the completion of a fiscal year. The associate population falls under a deferred payment regime indicating that a significant portion of their bonus compensation earned at the end of a fiscal year will be paid in deferred monetary instruments such as RSUs, which are subject to a vesting period.

6.4.2 Research setting

The research setting of the study at hand comprises multinational investment banks, predominantly bulge bracket banks but also leading boutique investment banks as illustrated in Figure 23.

Figure 23.
Investment bank tiering

Tier Group	Bank
Tier 1	JPMorgan, Goldman Sachs, Citi, Morgan Stanley, Bank of America Merrill Lynch
Tier 2	Deutsche Bank, Barclays, Credit Suisse, HSBC, UBS
Tier 3	Wells Fargo, Nomura, RBC, HSBC, Natixis, Banco Santander, Macquarie Group, Société Générale, Crédit Agricole, BNP Paribas
Elite Boutique	Lazard, Moelis, Perella Weinberg Partner, PJT, Centerview, Evercore, Greenhill, Rothschild, Houlihan Lokey, William Blair, Lincoln International, Piper Sandler, Jefferies

The figure side illustrates the tiering categories of investment banks at hand. Source: Author.

The term bulge bracket banks refers to the world's largest and most significant multinational investment banks. These banks traditionally offer both financing and advisory services (on the private side of the Chinese Wall) and market making, sales, trading and research capacities (on the public side of the Chinese Wall) covering all micro (e.g., equities, credit, etc.) and macro (commodities, currencies, interest rates, etc.) asset classes and products (cash products, futures, options, forwards, asset-backed, etc.). They are involved in the majority of large global capital movements and underwrite capital raises for large corporations and governments.

Investment banking is regarded as one of the most competitive industries in the world due to the fast-paced nature of financial markets. Investment banks operate with high levels of capital allocations and large-scale investments. The scale and scope of operations differentiate investment banks from other divisions, such as corporate banking, retail banking, private banking, wealth management and asset management. Investment banks are identified as one of the major participants causing the GFC in 2008 by taking on highly risky trades and investments. Disproportionately large bonus payments based on financial metrics performance caused executives to adopt risk-seeking behaviours. Managers engaged in myopic decision-making to maximise their bonus compensation by focusing on beneficial short-term results over long-term results.

6.4.3 Variables definition

In the subsequent section, an overview is given as to which variables are used to test the hypotheses in this study. Furthermore, a preliminary description is provided on the way those variables are operationalised.

Dependent variable: Risk-taking behaviour

The dependent variable in this study is the level of risk-taking that can be observed amongst participants. Risk-taking is operationalised by the selection of a risky investment. During the survey participants are provided with a set of investment tasks and given the options to decide between less to more risky choices for a given investment situation. Investment tasks stem from the asset management literature (e.g., Schwab, 2017; Vanguard, 2016). This study assures that all participants are considered FCA approved persons and, thus, have a profound knowledge about securities and asset classes, and are comfortable with generally accepted investment principles. They understand that every investment is subject to risk, fluctuations in the financial markets and other factors, such as asset quality as well as interest rates, credit and inflation risk.

Moreover, each investment decision is assigned to an underlying risk-score. The cumulative score taken together of all investment decisions will in conclusion categorise a participant's decisions as (1) Strongly risk-averse, (2) Somewhat risk-averse, (3) Somewhat risk-seeking, (4) Strongly risk-seeking.

Independent variable: Rank

Rank is denoted by three possible nominal values to be assigned to levels of categorical variables. Each variable embodies one category of the explanatory variable and is coded with "1" for Analyst ranks, "2" for Associate ranks, or "3" for Vice President ranks.

Independent / Moderating variable: Social Comparison

The focus of this PhD research is to examine how social comparison impacts the relationship between junior investment bankers that fall under different bonus schemes and risk-taking under social comparison. Hence, social comparison is used as the moderating variable in this study. Existing literature suggests that social comparison can be manipulated experimentally (Fox and Dayan, 2004; Hill and Buss, 2010) and this is achieved in this study through a hypothetical social reference point. Manipulation is achieved through the experimental survey proposed for this study whereby one group is exposed to the stimuli in form of a contextual work-related situation in which the participant finds him-/herself being disadvantageously treated compared to his/her peers, namely the social referent point. Specifically, participants in the manipulated group are then informed that they have ranked lower compared to peers in the same class. Participants, thereafter, are asked if and to what extent they feel a social gain or a social loss.

The dissertation at hand aims to contribute to the prevailing research gap on how social comparison can impact risk-taking levels among investment bankers. To close this knowledge gap, this research intends to investigate the impact on risk-taking under a straight-forward upward social comparison scenario. Prior literature suggests that ranking outcome of a social reference group influences an individual's propensity towards risk.

Control variables: individual risk preference and self-esteem

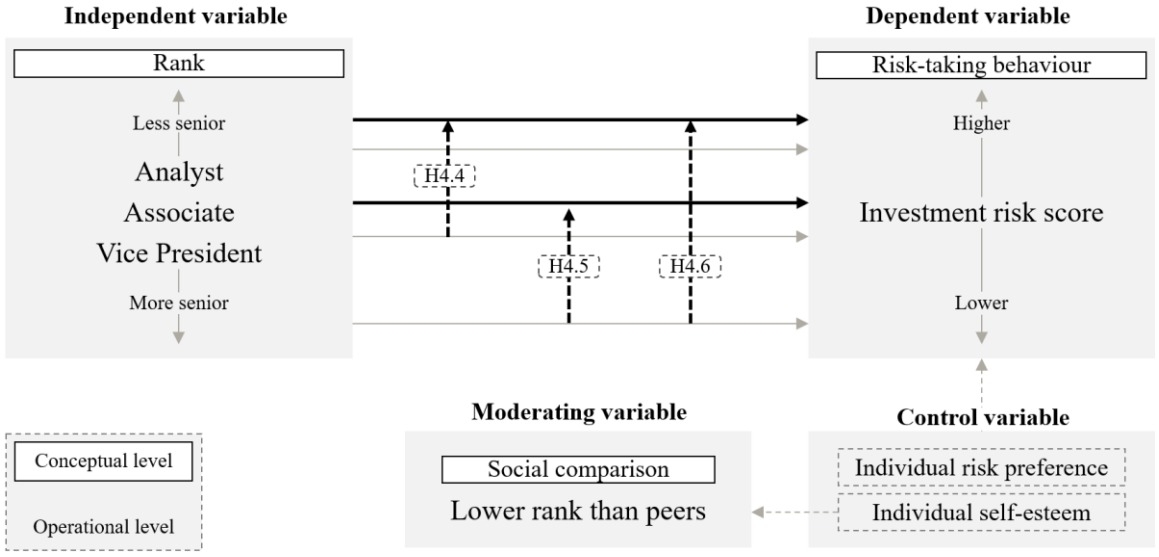
This study includes control variables to preclude ambiguous or confounding factors that could affect results. First, a baseline of the participant's self-evaluation is retrieved from a premeasure or control condition. The participant is neither exposed to an upward nor downward social comparison.

Each decision-maker will presumably have a different predisposition towards risk-taking. Sitkin and Pablo (1992) suggest that individual risk preference is a

material predictor of one's individual risk-taking behaviour. This study controls for individual risk preferences through the application of the tolerance for ambiguity (TFA) instrument established by MacDonald (1970). Hereby, respondents are asked to agree or disagree along eighteen statements expressing ambiguous situations. This instrument has been applied during previous studies (Gul, 1986; Hartmann, 2005; Hartmann and Slapnicar, 2012).

Further, the Rosenberg self-esteem scale (RSES) is used to control for the participants' level of self-esteem as it could impact the perception of social loss. Developed by Morris Rosenberg in 1965, RSES is a widely used dimension to measure self-esteem in psychology research (Blascovich and Tomaka, 1991).

Figure 24.
Predictive validity framework



This figure is an illustration of the validity framework for Hypotheses 4.4 to 4.6 based on Research Question 1. Source: Author

Table 7.
Summary of hypotheses

Sub-RQ1:	*To what extent does the risk-taking behaviour of investment banking professionals within different ranks that operate under different compensation schemes differ from each other?*
H_1:	Investment Banking Analysts are more risk-seeking than Investment Banking Associates
H_2:	Investment Banking Analysts are more risk-seeking than Investment Banking Vice Presidents
H_3:	Investment Banking Associates are more risk-seeking than Investment Banking Vice Presidents
Sub-RQ2:	*To what extent does social comparison influence the risk-taking behaviour of Investment Banking Analysts, Associates and Vice Presidents?*
H4.1:	In a social loss domain (when experiencing a social loss due to a lower ranking than their social referents in the same rank), Investment Banking Analysts engage in increased risk-seeking behaviour.
H4.2	In a social loss domain (when experiencing a social loss due to a lower ranking than their social referents in the same rank), Investment Banking Associates engage in increased risk-seeking behaviour.
H4.3	In a social loss domain (when experiencing a social loss due to a lower ranking than their social referents in the same rank), Investment Banking Vice Presidents engage in increased risk-seeking behaviour.
H4.4	In a social loss domain (when experiencing a social loss due to a lower ranking than their social referents in the same rank), Investment Banking Associates engage in more risk-seeking behaviour than Investment Banking Analysts.
H4.5	In a social loss domain (when experiencing a social loss due to a lower ranking than their social referents in the same rank), Investment Banking Vice Presidents engage in more risk-seeking behaviour than Investment Banking Associates.
H4.6	In a social loss domain (when experiencing a social loss due to a lower ranking than their social referents in the same rank), Investment Banking Vice Presidents engage in more risk-seeking behaviour than Investment Banking Analysts.

The table provides a summary of the variables construct in this dissertation. Source: Author.

Table 8.
Summary of variables

Variable	Construct	Author(s)	Statistical Measure
Independent variables			
Rank	• Ranking investment bank: - Analyst - Associate - Vice President	-	Nominal
Dependent variable			
Risk-taking behaviour	• Risk-score assessment determining participant's level of: - Risk aversion - Moderate risk aversion - Risk neutrality - Moderate risk-seeking - Risk-seeking	Schwab (2017) Vanguard (2016) Author	Ratio
Moderating variable			
Social comparison	• Framing • Inequity perception • General feelings • Decision determination	Fox and Dayan (2004) Hill and Buss (2010)	Ordinal Ratio
Control variables			
Education level, Broker license	• FCA approved person allowed to perform a customer function called 'FCA Designated Controlled Functions (CF30)' • Passed FCA exams in the areas of: - Securities - Derivatives - Regulations	Financial Conduct Authority (FCA) Register	Nominal
Self-Esteem	• Self-ideal discrepancy measure • Indexes of differential certainty and importance • Rosenberg self-esteem scale (RSES)	Pelham and Swann (1989) Rosenberg (1965)	Ordinal
Tolerance for Ambiguity (TFA)	• Seek out ambiguity • Enjoy ambiguity • Excel in the performance of ambiguous tasks	Rydell and Rosen (1966) MacDonald (1970) Gul (1986)	Ordinal

The table provides a summary of the variables construct in this dissertation. Source: Author.

7. Results and discussion

The first subset of hypotheses aims to analyse and answer the first research question proposed in this dissertation.

> *RQ1: To what extent does the risk-taking behaviour of investment banking professionals within different ranks that operate under different compensation schemes differ from each other?*

In the following section, the methodology and samples will be introduced, and the results of the performed analyses will be presented. In this dissertation, the hypotheses at hand will be tested by means of independent samples t-test (for all hypotheses), linear regression (for all hypotheses) and 2x2 factorial design (for all hypotheses, except H1 to H3). Furthermore, descriptive statistics will be performed, analysing the core dataset of this dissertation.

7.1 Descriptive statistics

The survey questionnaire was directly administered via email to 438 select participants in two attempts. Out of 438 survey links that were sent out, 15 bounced back due to delivery failures (see Table 9). The final sampling frame of 425 participants consists of 144 Analysts, 127 Associates, and 154 Vice Presidents. Out of the sampling frame of 425, a total of 351 individuals clicked on the survey link launching the questionnaire. Throughout the survey, a total of 129 participants dropped out (i.e., did not finish the survey) at different stages. This drop-out rate is not unusual given the fast-paced work environment and the high level of workers' responsiveness towards ad-hoc and erratically incoming signals and requests from internal contacts (i.e., supervisors, co-workers, other teams) and external stakeholders (clients, transaction counterparts, other market participants), which requires the bankers' undivided attention, rendering the survey as a low-priority item on their agenda, naturally. The survey ultimately yielded a total of

222 responses, consisting of 84 Analysts, 76 Associates, and 62 Vice Presidents, which represents a completion rate of 63 % and a response rate of 52%. Coleman (2007) suggested that email administered surveys often result in low response rates and that the rates can vary substantially for no specific reason. As such, the responses and the completion rates achieved in this research are more than satisfactory. It is noteworthy that the achieved high rates can potentially be attributed to the fact that the participants were able to look up the researcher's profile and given the researcher's professional track record and corporate and academic affiliations, the participants might have demonstrated a greater willingness to take part in the survey rather than disregarding the survey invitation or treating it as spam, which is often the case with anonymous requests. This was an insight gained through the rather qualitative semi-structured expert interviews with executives that were simultaneously conducted in conjunction with the survey data collection.

Table 9.
Sample size, completion and response rate

Initial sample size			**Final sample size (A)**		
Analysts	146	33%	Analysts	144	34%
Associates	130	30%	Associates	127	30%
Vice Presidents	162	37%	Vice Presidents	154	36%
Total	438	100%	Total	425	100%
Survey launched (B)			**Survey completed (C)**		
Analysts	138	39%	Analysts	84	38%
Associates	115	33%	Associates	76	34%
Vice Presidents	98	28%	Vice Presidents	62	28%
Total	351	100%	Total	222	100%
Completion rate: (C) / (B)			**Response rate: (C) / (A)**		
Analysts	61%		Analysts	58%	
Associates	66%		Associates	60%	
Vice Presidents	63%		Vice Presidents	40%	
Total	63%		Total	52%	

The table provides a summary of sample size, completion rate and response rate among the different ranks within the survey participants. Source: Author.

Most respondents who completed the survey were Analysts as they represent the largest population group by number in all investment banks. The nature of team and transaction staffing in combination with stringent career progression result in a pyramid-shaped organisational rank structure where on average for each Managing Director there are 2 Executive Directors, 5 Vice Presidents, 8 Associates and more than 10 Analysts. Following the same logic, this explains why the Associates were the second largest respondent group. Though the completion rate was somewhat similar across all three ranks, the response rate from the Vice Presidents was substantially lower than that from the Analysts and the Associates. This corresponds with the explanations above, namely that a research survey represents a low-priority item for higher-ranked Investment Banking professionals.

Furthermore, a demographic breakdown of the respondents is provided below in Table 10. Although the majority of respondents are male participants (71%), a nearly 30% percent female representation is quite satisfactory as it resembles a realistic share of the gender split within an investment bank. With regard to educational level, a clear majority of the respondents are in possession of a master's degree, which includes both a pre-experience master's degree (Master of Science, Master of Arts), which is commonly obtained in Europe prior to entering the labour market, and the post experience master's degree such as an MBA (Master of Business Administration) which is more common in North America. Most importantly, all respondents are in possession of a regulatory accreditation to pursue their profession as a front-office investment banking professional (e.g., controlled function for an authorised firm under the FCA). Given that the survey was primarily conducted by London based investment banking professionals, it is not surprising that most respondents are of European nationality. European offices predominantly encompassed the United Kingdom (London), followed by Germany (Frankfurt) and France (Paris).

Table 10.
Demographic breakdown of survey participants

Rank	Analysts	Associates	VPs	Total	%
Gender					
Male	52	54	51	157	71%
Female	32	22	11	65	29%
Total	84	76	62	222	100%
Education					
Bachelor	28	18	8	54	24%
Master's (incl. MBA)	56	58	53	167	75%
Doctorate	0	0	1	1	0%
Total	84	76	62	222	100%
Line of Business (LOB)					
Investment Banking	38	29	35	102	46%
Capital Markets	22	21	24	67	30%
Sales & Trading	24	26	3	53	24%
Total	84	76	62	222	100%

Nationality	
Europe	124
North America	32
Asia	42
Rest of World	24
Total	**222**

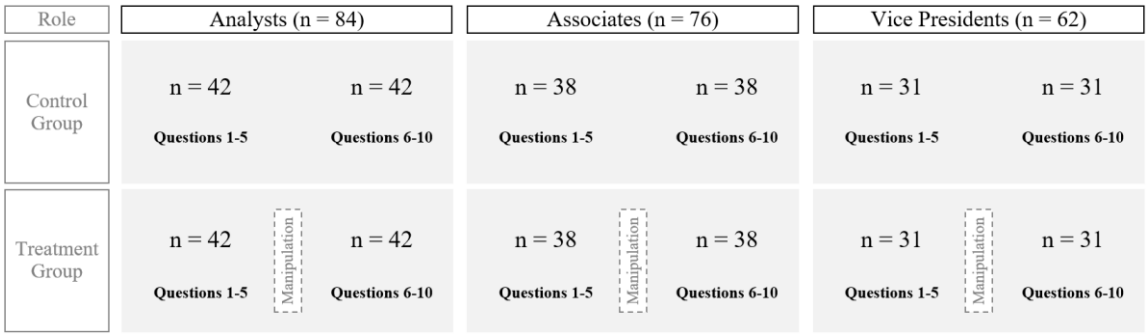
Office location	
Europe	179
North America	30
Asia	2
Rest of World	24
Total	**222**

The table provides a demographic summary of the survey participants. Source: Author.

The experimental component of the survey requires an appropriate sample size for the treatment and control groups to be able to conduct statistically viable analyses and to derive meaningful inferences. A breakdown of the respondents' division into control and treatment groups is shown in Figure 25. Within each rank, respondents are randomly assigned to either the control or the treatment group. Both groups within each rank are of equal size and both groups have to perform identical tasks, ranging from 1 to 10 investment questions that will ultimately yield a risk score for each participant upon completion of the last question. For each question, a participant can select one response only and choose between the least risky response (1) or any response up to and including the riskiest option (4).

Hence, the maximum risk score one participant can achieve is 40, implying that the participant has selected the response bearing the highest risk profile for each question. For example, a participant with a cumulative and final risk score of 38 is more risk-seeking than a participant whose risk score is 27. As outlined in Chapter 6, the distinctive feature between the control and the treatment groups is that participants in the treatment groups will be presented with a fictional ranking depicting the participants' individual performance compared to their peers after the completion of the first 5 questions, followed by 5 questions where participants can declare their situation as a loss or win upon viewing their ranking.

Figure 25.
Structural setup of participants in control and treatment groups



This figure illustrates the division of participants by rank into the control group and the treatment group and the introduction of the manipulation element in the survey. Source: Author

7.2 Methodology: Independent samples t-test

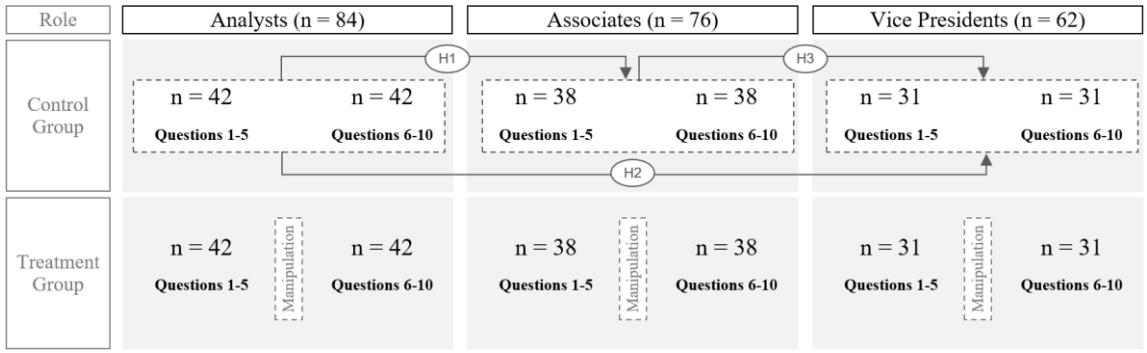
The first statistical test being performed to test Hypotheses 1 to 3 (H1, H2 and H3) is by way of an independent samples t-test. Hypotheses 1 and 3 will be examined by investigating the relationship between the control groups only as it excludes and deliberates manipulation (see Figure 26). The first hypothesis posits that Investment Banking Analysts are more risk-seeking than Investment Banking Associates, which results in the null hypothesis (H0) and alternative hypothesis (H1) of the independent samples t-test to be expressed as follows:

H_0: $\mu_1 = \mu_2$ ("the two population means are equal")

H_1: $\mu_1 \neq \mu_2$ ("the two population means are not equal")

where μ1 and μ2 are the group means for Analysts and Associates, respectively.

Figure 26.
Structural setup of participants to test Hypotheses 1 to 3



This figure illustrates the division of participants by rank into the control group and the treatment group and the introduction of the manipulation element in the survey. Source: Author

The Analysts group ($N = 42$) is associated with a risk score $M = 25.21$ ($SD = 4.40$). By comparison, the Associates group ($N = 38$) is associated with a numerically smaller risk score $M = 19.95$ ($SD = 3.62$). To test the hypothesis that Analysts are associated with statistically different risk-seeking behaviour than Associates, an independent samples t-test is performed. Further, the analysis of the independent samples t-test requires the assumption of homogeneity of variance to hold, that is, both groups have the same variance. The hypotheses for Levene's test are:

H_0: $\sigma_1^2 - \sigma_2^2 = 0$ (the population variances of Analysts and Associates are equal)

H_1: $\sigma_1^2 - \sigma_2^2 \neq 0$ (the population variances of Analysts and Associates are not equal)

The assumption of homogeneity of variance is tested and satisfied via Levene's F-test by testing the null hypothesis that the variance is equal across groups, $F(78) = 1.06$, $p = .308$. Moreover, the test is robust to the violations of homogeneity of variance due to the sample size of greater than 30 for both groups. The t-statistics

of the independent samples t-test is statistically significant $t(78) = 5.805$, $p = .000$. Thus, the Analysts were associated with a statistically significantly greater risk-seeking behaviour than the Associates. Consequently, we can reject the null hypothesis and conclude that Investment Banking Analysts are more risk-seeking than Investment Banking Associates. Table 11 and 12 summarise the descriptive statistics and the results of the independent samples t-test associated with risk-seeking behaviour as per H1.

Table 11.
Descriptive statistics associated with risk-seeking behaviour (H1)

Rank	N	Mean	Std. Deviation	Std. Error Mean
Analysts_Control	42	25.21	4.404	.679
Associates_Control	38	19.95	3.624	.588

Table 12.
Independent samples t-test (H1)

	Levene's Test for Equality of Variances		t-test for Equality of Means			
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
$\sigma_1^2 - \sigma_2^2 = 0$	1.055	.308	5.805	78	.000	5.267
$\sigma_1^2 - \sigma_2^2 \neq 0$			5.862	77.336	.000	5.267

The tables above provide the statistical results for testing H1. Source: Author.

Similar to H1, to test H2, an independent samples t-test is performed to determine that the Analysts are associated with statistically different risk-seeking behaviour than the Vice Presidents. As we know from H1, the Analysts group ($N = 42$) is associated with a risk score $M = 25.21$ ($SD = 4.40$). By comparison, the Vice Presidents group ($N = 31$) is associated with a numerically smaller risk score $M = 15.97$ ($SD = 3.51$). Additionally, the assumption of homogeneity of variance is tested and satisfied via Levene's F-test $F(71) = 1.67$, $p = .201$. Moreover, like for H1, the test is robust to the violations of homogeneity of variance due to the sample size of greater than 30 for both groups. The t-statistics of the independent samples t-test is statistically significant $t(71) = 9.644$, $p = .000$. Thus, the Analysts are associated with a statistically significantly greater risk-seeking behaviour than

the Vice Presidents. Consequently, we can reject the null hypothesis for H2 and conclude that Investment Banking Analysts are more risk-seeking than Investment Banking Vice Presidents. Table 13 and 14 summarise the descriptive statistics and the results of the independent samples t-test associated with risk-seeking behaviour as per H2.

Table 13.
Descriptive statistics associated with risk-seeking behaviour (H2)

Rank	N	Mean	Std. Deviation	Std. Error Mean
Analysts_Control	42	25.21	4.404	.679
VPs_Control	31	15.97	3.507	.630

Table 14.
Independent samples t-test (H2)

	Levene's Test for Equality of Variances		t-test for Equality of Means			
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
$\sigma_1^2 - \sigma_2^2 = 0$	1.671	.201	9.644	71	.000	9.247
$\sigma_1^2 - \sigma_2^2 \neq 0$			9.980	70.546	.000	9.247

The tables above provide the statistical results for testing H2. Source: Author.

In the same vein, as for both preceding hypotheses H1 and H2, an independent samples t-test is performed to determine that the Associates are associated with statistically different risk-seeking behaviour than the Vice Presidents. As we know from the prior hypotheses, the Associates group ($N = 38$) is associated with a risk score $M = 19.95$ ($SD = 3.62$). By comparison, the Vice Presidents group ($N = 31$) is associated with a numerically smaller risk score $M = 15.97$ ($SD = 3.51$). Additionally, the assumption of homogeneity of variance is tested and satisfied via Levene's F-test $F(67) = 0.19$, $p = .692$. Logically, as with H1 and H2, the test is robust to the violations of homogeneity of variance due to the sample size of greater than 30 for both groups. The t-statistics of the independent samples t-test is statistically significant $t(67) = 4.603$, $p = .000$. Thus, the Analysts are associated with a statistically significantly greater risk-seeking behaviour than the Vice Presidents. Consequently, we can reject the null hypothesis for H2 and conclude

that Investment Banking Associates are more risk-seeking than Investment Banking Vice Presidents. Tables 15 and 16 summarise the descriptive statistics and the results of the independent samples t-test associated with risk-seeking behaviour as per H3.

Table 15.
Descriptive statistics associated with risk-seeking behaviour (H3)

Rank	N	Mean	Std. Deviation	Std. Error Mean
Associates_Control	38	19.95	3.624	.588
VPs_Control	31	15.97	3.507	.630

Table 16.
Independent samples t-test (H3)

	Levene's Test for Equality of Variances		t-test for Equality of Means			
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
$\sigma_1^2 - \sigma_2^2 = 0$	.158	.692	4.603	67	.000	3.980
$\sigma_1^2 - \sigma_2^2 \neq 0$			4.619	65.024	.000	3.980

The tables above provide the statistical results for testing H3. Source: Author.

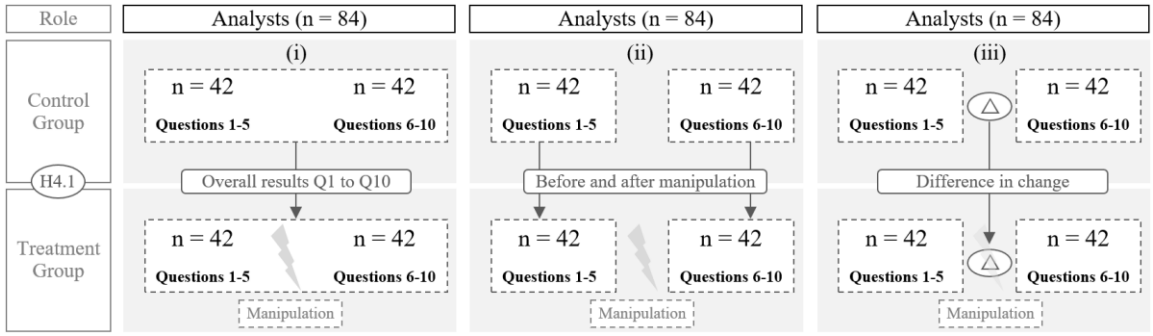
The next subset of hypotheses aims to analyse and answer the second research question proposed in this dissertation.

> *RQ2: To what extent does social comparison influence the risk-taking behaviour of Investment Banking Analysts, Associates and Vice Presidents?*

From Hypotheses 4.1 onwards, the element of manipulation will be introduced in the form of a fictional ranking order showing participants in the treatment group that their selections of responses have yielded an inferior outcome that resulted in a lower rank compared to their peers and, as such, the difference in the results between the control and the treatment group becomes relevant. In the first set of analyses, to test that the treatment group is associated with a statistically different risk-seeking behaviour than the control group, an independent samples t-test is performed. In the subsequent section of this chapter, the magnitude of the effect

of the manipulation element will be taken into consideration by means of a regression analysis and a 2x2 factorial design analysis. To ensure a representative like-for-like comparison between the control and the treatment group for H4.1, H4.2 and H4.3, each hypothesis will be looked at from three separate angles, that is (i) to what extent do the overall risk scores between the control and the treatment group differ, (ii) to what extent do the risk scores of the control and the treatment group differ prior to the introduction of the manipulation element and (iii) to what extent does the change in risk scores from the first set of questions to the second set of questions differ between the control and the treatment group (see Figure 27).

Figure 27.
Structural setup of participants to test Hypothesis 4.1



This figure illustrates the division of the Analysts into a control and a treatment group and the introduction of the manipulation element in the survey. Source: Author

Multiple independent samples t-tests were performed to determine that the treatment group is associated with a statistically different risk-seeking behaviour than the control group. In the overall comparison (i), the treatment group ($N = 42$) is associated with a risk score $M = 30.07$ ($SD = 3.98$). By comparison, the control group ($N = 42$) is associated with a numerically smaller risk score $M = 25.21$ ($SD = 4.40$). Additionally, the assumption of homogeneity of variance is tested and satisfied via Levene's F-test $F(82) = .802$, $p = .373$. Moreover, the test is robust to the violations of homogeneity of variance due to the sample size of greater than 30 for both groups. The t-statistics of the independent samples t-test is statistically

significant, $t(82) = 5.301$, $p = .000$. Thus, the treatment group is associated with a statistically significantly greater risk-seeking behaviour than the control group.

When comparing risk scores separately, that is, comparing the risk scores between the treatment and the control group before and after the manipulation (ii), we find that, before the manipulation, the treatment group ($N = 42$) is associated with a risk score $M = 13.90$ ($SD = 2.76$). Interestingly though, by comparison, the control group ($N = 42$) is associated with a numerically smaller risk score $M = 13.60$ ($SD = 2.89$), but the difference is not significant. The assumption of homogeneity of variance is tested and satisfied via Levene's F-test $F(82) = .765$, $p = .384$. The independent samples t-test is not associated with a statistically significant effect, $t(82) = .502$, $p = .617$. Thus, before the manipulation, the treatment group is not associated with a statistically significantly greater risk-seeking behaviour than the control group. When comparing risk scores between both groups after the introduction of the manipulation element, however, the treatment group ($N = 42$) is associated with a risk score $M = 15.95$ ($SD = 2.15$). By comparison, the control group ($N = 42$) is associated with a numerically smaller risk score $M = 11.64$ ($SD = 2.88$). After the manipulation, however, the treatment group is associated with a statistically significantly greater risk-seeking behaviour than the control group, the assumption of homogeneity of variance is violated and not satisfied via Levene's F-test $F(82) = 4.381$ and $p = .039$, which is marginally lower than $\alpha = 0.05$. The t-statistics of the independent samples t-test is statistically significant $t(82) = 7.771$, $p = .000$. Though there is no significant difference in the risk scores between the two groups prior to the manipulation, the treatment group is associated with a statistically significantly greater risk-seeking behaviour than the control group after the introduction of the manipulation element. The change in the risk score after the manipulation of the treatment group is significantly higher (iii).

Table 17.
Descriptive statistics associated with risk-seeking behaviour (H4.1)

(i) Overall comparison (Q1 to Q10)				
Rank	N	Mean	Std. Deviation	Std. Error Mean
Analysts_Control	42	25.21	4.404	.679
Analysts_Treat	42	30.07	3.984	.615
(ii) Before manipulation (Q1 to Q5)				
Rank	N	Mean	Std. Deviation	Std. Error Mean
Analysts_Control	42	13.60	2.889	.446
Analysts_Treat	42	13.90	2.757	.425
(ii) After manipulation (Q6 to Q10)				
Rank	N	Mean	Std. Deviation	Std. Error Mean
Analysts_Control	42	11.64	2.878	.446
Analysts_Treat	42	15.95	2.152	.425
(iii) Difference in change △ (Q1 to Q5) – (Q6 to Q10)				
Rank	N	Mean	Std. Deviation	Std. Error Mean
Analysts_Control	42	-2.07	3.665	.566
Analysts_Treat	42	2.10	2.809	.434

The tables above provide the descriptive statistics for H4.1. Source: Author.

Table 17 summarises the descriptive statistics and Table 18 the results of the independent samples t-test associated with risk-seeking behaviour as per H4.1.

Table 18.
Independent samples t-test (H4.1)

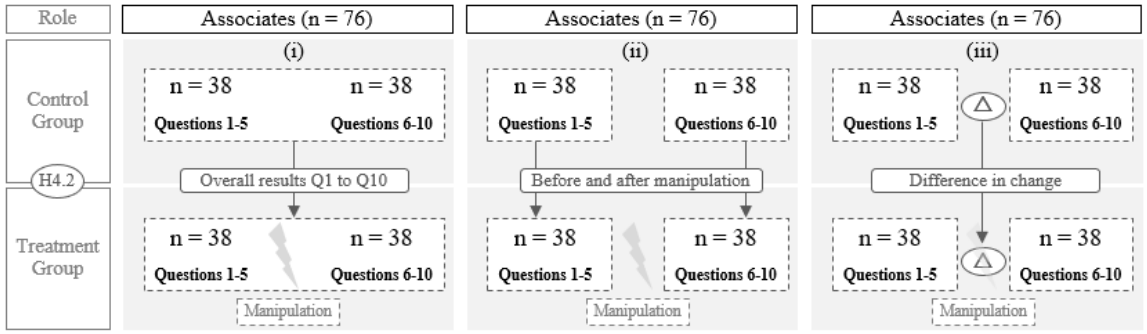
	Levene's Test for Equality of Variances		t-test for Equality of Means			
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference
(i) Overall comparison (Q1 to Q10)						
$\sigma_1^2 - \sigma_2^2 = 0$	.802	.373	-5.301	82	.000	-4.857
$\sigma_1^2 - \sigma_2^2 \neq 0$			-5.301	81.191	.000	-4.857
(ii) Before manipulation (Q1 to Q5)						
$\sigma_1^2 - \sigma_2^2 = 0$	.765	.384	-.502	82	.617	-.310
$\sigma_1^2 - \sigma_2^2 \neq 0$			-.502	81.822	.617	-.310
(ii) After manipulation (Q6 to Q10)						
$\sigma_1^2 - \sigma_2^2 = 0$	4.381	.039	-7.771	82	.000	-4.310
$\sigma_1^2 - \sigma_2^2 \neq 0$			-7.771	75.929	.000	-4.310
(iii) Difference in change △ (Q1 to Q5) – (Q6 to Q10)						
$\sigma_1^2 - \sigma_2^2 = 0$	2.086	.152	-5.847	82	.000	-4.167
$\sigma_1^2 - \sigma_2^2 \neq 0$			-5. 847	76.815	.000	-4.167

The tables above provide the statistical results for testing H4.1. Source: Author.

Consequently, we can reject the null hypothesis for H4.1 and conclude that when finding themselves in a social loss domain, that is, when experiencing a social loss due to a lower ranking than their social referents, Investment Banking Analysts engage in more risk-seeking behaviour.

When testing hypothesis 4.2 (see Figure 28), in the overall comparison (i), the treatment group (N = 38) is associated with a risk score M = 26.03 (SD = 4.28). By comparison, the control group (N = 38) is associated with a numerically smaller risk score M = 19.95 (SD = 3.62). Additionally, the assumption of homogeneity of variance is tested and satisfied via Levene's F-test $F(74)$ =2.369, p = .128. The t-statistics of the independent samples t-test is statistically significant $t(74) = 6.679$, p = .000. Thus, the treatment group is associated with a statistically significantly greater risk-seeking behaviour than the control group.

Figure 28.
Structural setup of participants to test Hypothesis 4.2



This figure illustrates the division of the Associates into a control and a treatment group and the introduction of the manipulation element in the survey. Source: Author

When comparing the risk scores between the treatment and the control group before and after the manipulation (ii), the treatment group (N = 38) is associated with a risk score M = 10.21 (SD = 2.66) before the manipulation. This holds true for the Analysts sample as well, though by comparison, the control group (N = 38) is associated with a numerically smaller risk score M = 9.68 (SD = 3.22). The difference is not significant. The assumption of homogeneity of variance is tested and satisfied via Levene's F-test $F(74)$ =1.945, p = .167. The independent samples t-test is not associated with a statistically significant effect, $t(74)$ = .776, p = .440. Thus, before the manipulation, the treatment group is not associated with a statistically significantly greater risk-seeking behaviour than the control group. When comparing the risk scores between the two groups after the introduction of the manipulation element, however, the treatment group (N = 38) is associated with a risk score M = 15.82 (SD = 2.72). By comparison, the control group (N = 38) is associated with a numerically smaller risk score M = 10.32 (SD = 2.26). After the manipulation, the treatment group is associated with a statistically significantly greater risk-seeking behaviour than the control group, the assumption of homogeneity of variance is satisfied via Levene's F-test $F(74)$ = 2.733 and p = .103. The t-statistics of the independent samples t-test is statistically significant $t(74)$ = 9.596, p = .000. Similar to the results of the Analysts group in hypothesis 4.1, though there is no significant difference in the risk scores between

the two groups prior to the manipulation, the treatment group is associated with a statistically significantly greater risk-seeking behaviour than the control group after the introduction of the manipulation element. Though both groups exhibit an increase in the risk score from the first to the second set of questions, the increase of the treatment group is statistically significantly higher (iii) than that of the control group.

Table 19.
Descriptive statistics associated with risk-seeking behaviour (H4.2)

	(i)	Overall comparison (Q1 to Q10)		
Rank	N	Mean	Std. Deviation	Std. Error Mean
Associates_Control	38	19.95	3.624	.588
Associates_Treat	38	26.03	4.284	.695
	(ii)	Before manipulation (Q1 to Q5)		
Rank	N	Mean	Std. Deviation	Std. Error Mean
Associates_Control	38	9.68	3.222	.523
Associates_Treat	38	10.21	2.663	.432
	(ii)	After manipulation (Q6 to Q10)		
Rank	N	Mean	Std. Deviation	Std. Error Mean
Associates_Control	38	10.32	2.255	.366
Associates_Treat	38	15.85	2.720	.441
	(iii)	Difference in change △ (Q1 to Q5) – (Q6 to Q10)		
Rank	N	Mean	Std. Deviation	Std. Error Mean
Associates_Control	38	0.63	4.271	.693
Associates_Treat	38	5.74	3.244	.526

The tables above provide the descriptive statistics for H4.2. Source: Author.

Table 19 summarises the descriptive statistics and Table 20 the results of the independent samples t-test associated with risk-seeking behaviour as per H4.2.

Consequently, we can reject the null hypothesis for H4.2 and conclude that when finding themselves in a social loss domain, that is, when experiencing a social loss due to a lower ranking than their social referents, Investment Banking Associates engage in more risk-seeking behaviour.

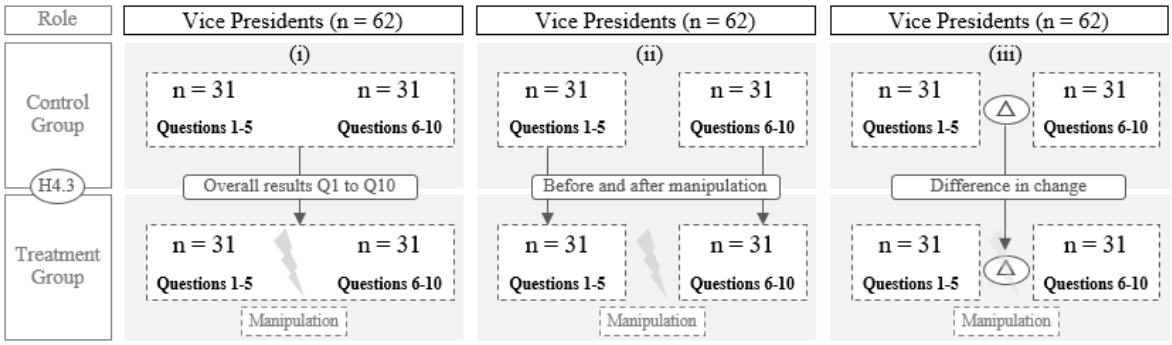
Table 20.
Independent samples t-test (H4.2)

	Levene's Test for Equality of Variances		t-test for Equality of Means			
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
(i) Overall comparison (Q1 to Q10)						
$\sigma_1^2 - \sigma_2^2 = 0$	2.369	.128	-6.679	74	.000	-6.079
$\sigma_1^2 - \sigma_2^2 \neq 0$			-6.679	72.021	.000	-6.079
(ii) Before manipulation (Q1 to Q5)						
$\sigma_1^2 - \sigma_2^2 = 0$	1.945	.167	-.776	74	-.440	-.526
$\sigma_1^2 - \sigma_2^2 \neq 0$			-.776	71.460	-.440	-.526
(ii) After manipulation (Q6 to Q10)						
$\sigma_1^2 - \sigma_2^2 = 0$	2.733	.103	-9.596	74	.000	-5.500
$\sigma_1^2 - \sigma_2^2 \neq 0$			-9.596	71.549	.000	-5.500
(iii) Difference in change △ (Q1 to Q5) – (Q6 to Q10)						
$\sigma_1^2 - \sigma_2^2 = 0$	2.572	.113	-5.868	74	.000	-5.105
$\sigma_1^2 - \sigma_2^2 \neq 0$			-5. 868	69.033	.000	-5.105

The tables above provide the statistical results for testing H4.2. Source: Author.

When testing hypothesis 4.3 (see Figure 29), in the overall comparison (i), the treatment group (N = 31) is associated with a risk score M = 23.68 (SD = 2.94). By comparison, the control group (N = 31) is associated with a numerically smaller risk score M = 15.97 (SD = 3.51). Additionally, the assumption of homogeneity of variance is tested and satisfied via Levene's F-test $F(60)$ =.691, p = .409. The t-statistics of the independent samples t-test is statistically significant $t(60) = 9.384$, p = .000. Thus, the treatment group is associated with a statistically significantly greater risk-seeking behaviour than the control group.

Figure 29.
Structural setup of participants to test Hypothesis 4.3



This figure illustrates the division of the Vice Presidents into a control and a treatment group and the introduction of the manipulation element in the survey. Source: Author

When comparing the risk scores between the treatment and the control group before and after the manipulation (ii), the treatment group (N = 31) is associated with a risk score M = 7.16 (SD = 2.38) before the manipulation. Similar to the Analysts and the Associates samples, though by comparison, the control group (N = 31) is associated with a numerically higher risk score M = 7.26 (SD = 2.38), the difference is not significant. The assumption of homogeneity of variance is tested and satisfied via Levene's F-test $F(60) = .038$, $p = .846$. The independent samples t-test is not associated with a statistically significant effect, $t(60) = .160$, $p = .873$. Thus, before the manipulation, the treatment group is not associated with a greater risk-seeking behaviour than the control group. However, when comparing the risk scores between the two groups after the introduction of the manipulation element, the treatment group (N = 31) is associated with a risk score M = 16.58 (SD = 2.41). By comparison, the control group (N = 31) is associated with a numerically smaller risk score M = 8.68 (SD = 2.74). After the manipulation, the treatment group is associated with a statistically significantly greater risk-seeking behaviour than the control group, the assumption of homogeneity of variance is satisfied via Levene's F-test $F(60) = .089$ and $p = .766$. The t-statistics of the independent samples t-test is statistically significant $t(60) = 12.076$, $p = .000$. Similar to the results of the Analysts and Associates samples in hypotheses 4.1 and 4.2, though there is no significant difference in the risk scores between the two groups prior

to the manipulation, the treatment group is associated with a statistically significantly greater risk-seeking behaviour than the control group after the introduction of the manipulation element. Though both groups exhibit an increase in the risk score from the first to the second set of questions, the increase of the treatment group is statistically significantly higher (iii) than that of the control group.

Table 21 summarises the descriptive statistics and Table 22 the results of the independent samples t-test associated with risk-seeking behaviour as per H4.2.

Consequently, we can reject the null hypothesis for H4.3 and conclude that when finding themselves in a social loss domain, that is, when experiencing a social loss due to a lower ranking than their social referents, Investment Banking Vice Presidents engage in more risk-seeking behaviour.

Table 21.
Descriptive statistics associated with risk-seeking behaviour (H4.3)

(i) Overall comparison (Q1 to Q10)				
Rank	N	Mean	Std. Deviation	Std. Error Mean
VPs_Control	31	15.97	3.507	.630
VPs_Treat	31	23.68	2.937	.527
(ii) Before manipulation (Q1 to Q5)				
Rank	N	Mean	Std. Deviation	Std. Error Mean
VPs_Control	31	7.26	2.380	.427
VPs_Treat	31	7.16	2.382	.428
(ii) After manipulation (Q6 to Q10)				
Rank	N	Mean	Std. Deviation	Std. Error Mean
VPs_Control	31	8.68	2.737	.492
VPs_Treat	31	16.58	2.405	.432
(iii) Difference in change △ (Q1 to Q5) – (Q6 to Q10)				
Rank	N	Mean	Std. Deviation	Std. Error Mean
VPs_Control	31	1.48	3.641	.654
VPs_Treat	31	9.45	3.576	.642

The tables above provide the descriptive statistics for H4.3. Source: Author.

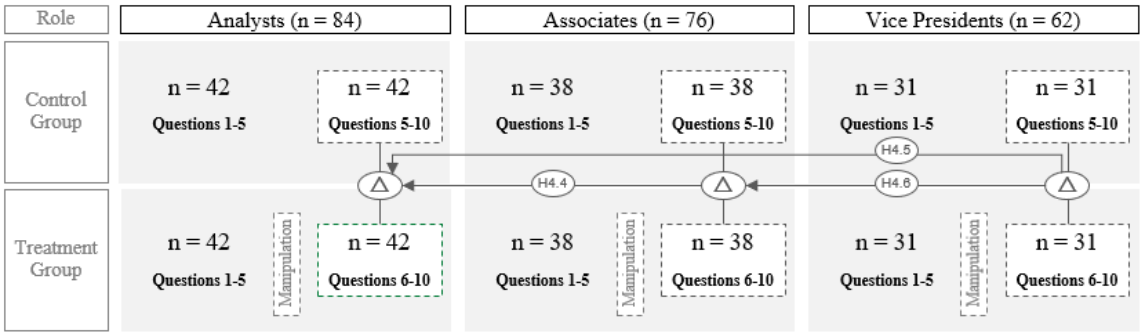
Table 22.
Independent samples t-test (H4.3)

	Levene's Test for Equality of Variances		t-test for Equality of Means			
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
(i) Overall comparison (Q1 to Q10)						
$\sigma_1^2 - \sigma_2^2 = 0$	.691	.409	-9.384	60	.000	-7.710
$\sigma_1^2 - \sigma_2^2 \neq 0$			-9.384	58.206	.000	-7.710
(ii) Before manipulation (Q1 to Q5)						
$\sigma_1^2 - \sigma_2^2 = 0$	.038	.846	.160	60	.873	.097
$\sigma_1^2 - \sigma_2^2 \neq 0$			.160	60.000	.873	.097
(ii) After manipulation (Q6 to Q10)						
$\sigma_1^2 - \sigma_2^2 = 0$	.089	.766	-12.076	60	.000	-7.903
$\sigma_1^2 - \sigma_2^2 \neq 0$			-12.076	59.024	.000	-7.903
(iii) Difference in change △ (Q1 to Q5) – (Q6 to Q10)						
$\sigma_1^2 - \sigma_2^2 = 0$	.348	.557	-8.692	60	.000	-7.968
$\sigma_1^2 - \sigma_2^2 \neq 0$			-8.692	59.981	.000	-7.968

The tables above provide the statistical results for testing H4.3. Source: Author.

For the testing of hypotheses H4.4, H4.5 and H4.6 the magnitude of change in the risk score between the treatment groups within each rank will be examined (see Figure 30).

Figure 30.
Structural setup of participants to test Hypotheses 4.4, 4.5 and 4.6



This figure illustrates the division of participants by rank into a control group and a treatment group and the introduction of the manipulation element in the survey. Source: Author

In H4.4, the Analysts treatment group (N = 42) is associated with a risk score change M = 2.10 (SD = 2.81). By comparison, the Associates treatment group (N = 38) is associated with a numerically greater risk score change M = 5.74 (SD =

3.24) after being exposed to the treatment or manipulation variable (i.e., fictive rank order table). The assumption of homogeneity of variance is tested and satisfied via Levene's F-test $F(78) = 1.38$, $p = .244$. The t-statistics of the independent samples t-test is statistically significant $t(78) = 5.341$, $p = .000$. Consequently, we can reject the null hypothesis for H4.4 and conclude that in a social loss domain (i.e., when experiencing a social loss due to a lower ranking than their social referents), Investment Banking Associates engage in more risk-seeking behaviour than Investment Banking Analysts.

Tables 23 and 24 summarise the descriptive statistics and the results of the independent samples t-test associated with risk-seeking behaviour as per H4.4.

Table 23.
Descriptive statistics associated with risk-seeking behaviour (H4.4)

Rank	N	Mean	Std. Deviation	Std. Error Mean
△ Analysts_Treat	42	2.10	2.809	.434
△ Associates_Treat	38	5.74	3.244	.526

Table 24.
Independent samples t-test (H4.4)

	Levene's Test for Equality of Variances		t-test for Equality of Means			
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
$\sigma_1^2 - \sigma_2^2 = 0$	1.380	.244	-5.380	78	.000	-3.642
$\sigma_1^2 - \sigma_2^2 \neq 0$			-5.541	73.649	.000	-3.642

The tables above provide the statistical results for testing H4.4. Source: Author.

In H4.5, the Analysts treatment group ($N = 42$) is associated with a risk score change $M = 2.10$ ($SD = 2.81$). By comparison, the Vice Presidents treatment group ($N = 31$) is associated with a numerically greater risk score change $M = 9.45$ ($SD = 3.58$) after being exposed to the treatment or manipulation variable (i.e., fictive rank order table). The assumption of homogeneity of variance is tested and satisfied via Levene's F-test $F(71) = 3.73$, $p = .057$. The t-statistics of the independent samples t-test is statistically significant $t(71) = 9.843$, $p = .000$.

Consequently, we can reject the null hypothesis for H4.5 and conclude that in a social loss domain (i.e., when experiencing a social loss due to a lower ranking than their social referents), Investment Banking Vice Presidents engage in more risk-seeking behaviour than Investment Banking Analysts.

Tables 25 and 26 summarise the descriptive statistics and the results of the independent samples t-test associated with risk-seeking behaviour as per H4.5.

Table 25.
Descriptive statistics associated with risk-seeking behaviour (H4.5)

Rank	N	Mean	Std. Deviation	Std. Error Mean
△ Analysts_Treat	42	2.10	2.809	.434
△ VPs_Treat	31	9.45	3.576	.642

Table 26.
Independent samples t-test (H4.5)

	Levene's Test for Equality of Variances		t-test for Equality of Means			
	F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference
$\sigma_1^2 - \sigma_2^2 = 0$	3.729	.057	-9.843	71	.000	-7.356
$\sigma_1^2 - \sigma_2^2 \neq 0$			-9.493	55.179	.000	-7.356

The tables above provide the statistical results for testing H4.5. Source: Author.

In H4.6, the Associates treatment group (N = 38) is associated with a risk score change M = 5.74 (SD = 3.24). By comparison, the Vice Presidents treatment group (N = 31) is associated with a numerically greater risk score change M = 9.45 (SD = 3.58), after being exposed to the treatment or manipulation variable (i.e., fictive rank order table). The assumption of homogeneity of variance is tested and satisfied via Levene's F-test $F(67)$ =.626, p = .432. The t-statistics of the independent samples t-test is statistically significant $t(67)$ = 4.519, p = .000. Consequently, we can reject the null hypothesis for H4.6 and conclude that in a social loss domain (i.e., when experiencing a social loss due to a lower ranking than their social referents), Investment Banking Vice Presidents engage in more risk-seeking behaviour than Investment Banking Associates.

Tables 27 and 28 summarise the descriptive statistics and the results of the independent samples t-test associated with risk-seeking behaviour as per H4.6.

Table 27.
Descriptive statistics associated with risk-seeking behaviour (H4.6)

Rank	N	Mean	Std. Deviation	Std. Error Mean
△ Associates_Treat	38	5.74	3.244	.526
△ VPs_Treat	31	9.45	3.576	.642

Table 28.
Independent samples t-test (H4.6)

	Levene's Test for Equality of Variances		t-test for Equality of Means			
	F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference
$\sigma_1^2 - \sigma_2^2 = 0$	.626	.432	-4.519	67	.000	-3.715
$\sigma_1^2 - \sigma_2^2 \neq 0$			-4.474	61.372	.000	-3.715

The tables above provide the statistical results for testing H4.6. Source: Author.

7.3 Methodology: Linear regression model

In addition to the independent samples t-test, the analyses in this dissertation are complemented by simple and multiple linear regressions. For Hypotheses 1 to 3 a simple linear regression is performed each time. A simple linear regression model is illustrated by the following equation:

$Y = \beta_0 + \beta_1 X_1 + \varepsilon.$

In such a model, a unit increase in the independent variable $X1$ causes an increase in the dependent variable Y by $\beta 1$. The linear regression analysis aims to model the relationship between two variables, the independent variable (rank) and the dependent variable (risk-taking behaviour) by applying a linear equation to the collected data. In statistics, linear regression is applied to determine if one or several independent variables (i.e., simple or multiple linear regression analyses) represent good predictors for a particular outcome in the form of a dependent variable, and if it allows to forecast an effect (Sirkin, 2006). In academic research,

R-squared measures represent a common metric that reflects the overall goodness of a linear regression model (Wooldridge, 2013).

The independent variables throughout all the hypotheses are nominally defined by dichotomous or categorical variables, that is, the explanatory independent variable (i.e., participant) is either classified as 0 (i.e., Rank 1) or 1 (i.e., Rank 2), which is similar to having gender as an independent variable with 0 (i.e., male) and 1 (i.e., female). The dependent variable is a ratio variable measured by the risk score indicating the degree of risk-taking behaviour. It follows that the following linear regression model for hypotheses 1 to 3 is illustrated by the following equation:

$$\text{Risk-taking} = \beta_0 + \beta_1 \text{Rank(Group)} + \varepsilon.$$

In H1, the simple linear regression that is carried out to test if the Investment Banking Analysts are more risk-seeking than the Investment Banking Associates indicates that the model explains 30.2% of the variance and that the model is significant, $F(1,78) = 33.70$, $p < .001$, which is also confirmed with a Pearson's correlation coefficient of -0.549. It can be concluded that rank difference significantly predicts risk-taking behaviour ($\beta_1 = -5.27$, $p < .001$).

In H2, the simple linear regression that is carried out to test if the Investment Banking Analysts are more risk-seeking than the Investment Banking Vice Presidents indicates that the model explains 56.7% of the variance and that the model is significant, $F(1,71) = 93.01$, $p < .001$, which is also confirmed with a Pearson's correlation coefficient of -0.753. It can be concluded that rank difference significantly predicts risk-taking behaviour ($\beta_1 = -9.25$, $p < .001$). The linear regression model for H2 has the highest predictive capacity amongst H1 to H3.

In H3, the simple linear regression that is carried out to test if the Investment Banking Associates are more risk-seeking than the Investment Banking Vice Presidents indicates that the model explains 24.0% of the variance and that the model is significant, $F(1,67) = 21.19$, $p < .001$, which is also confirmed with a

Pearson's correlation coefficient of -0.490. It can be concluded that rank difference significantly predicts risk-taking behaviour (β_1 = -3.98, p < .001). The linear regression model for H2 has the lowest predictive capacity amongst H1 to H3. The summary of the outputs for the regression analyses performed for H1 to H3 are summarised in Table 29.

Table 29.
Regression analyses output summary (H1 to H3)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
H1	.549[a]	.302	.293	4.052
H2	.753[a]	.567	.561	4.049
H3	.490[a]	.240	.229	3.572

a. Predictors: (Constant), Rank

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
H1	Regression	553.421	1	553.421	33.699	.000[b]
	Residual	1280.966	78	16.423		
	Total	1834.388	79			
H2	Regression	1524.920	1	1524.920	93.012	.000[b]
	Residual	1164.039	71	16.395		
	Total	2688.959	72			
H3	Regression	270.384	1	270.384	21.191	.000[b]
	Residual	854.862	67	12.759		
	Total	1125.246	68			

a. Dependent Variable: Risk-taking,

b. Predictors: (Constant), Rank

Coefficients[a]

Model		Unstandardised Coefficients		Standardised Coefficients		
		B	Std. Error	Beta	t	Sig.
H1	(Constant)	25.214	.625		40.323	.000
	Rank	-5.267	.907	-.549	-5.805	.000
H2	(Constant)	25.214	.625		40.357	.000
	Rank	-9.247	.959	-.753	-9.644	.000
H3	(Constant)	19.947	.579		34.424	.000
	Rank	-3.980	.864	-.490	-4.603	.000

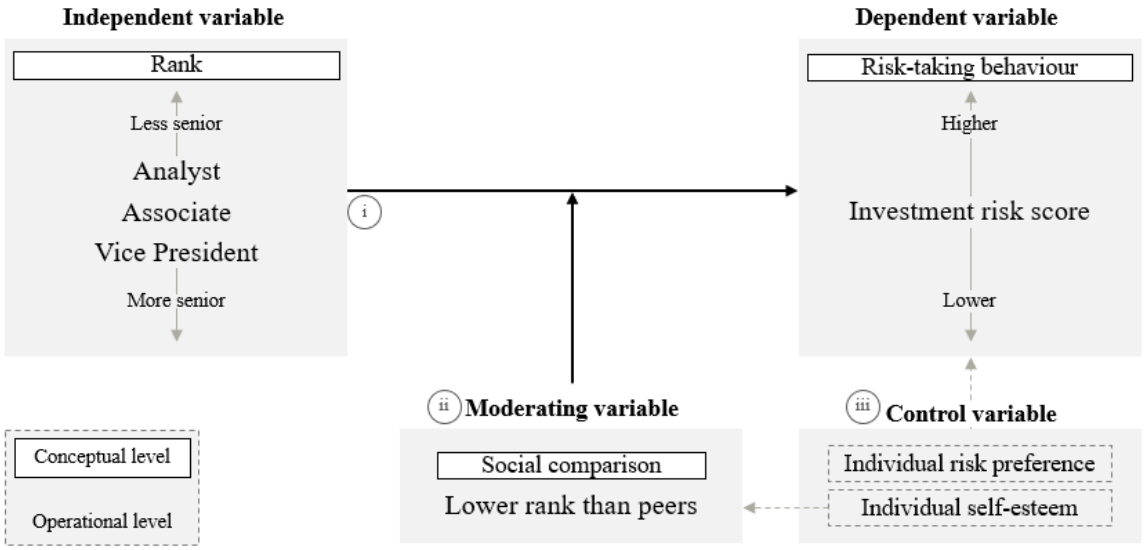
a. Dependent Variable: Risk-taking

The tables above provide the statistical results for testing H1 to H3. Source: Author.

The regression analysis for Hypotheses 4.1 to 4.3 will be conducted in a threefold manner. First, a simple linear regression is conducted to measure the predictive capacity of the model towards the change in risk-taking behaviour after being exposed to the manipulation element. Second, a multiple regression is conducted

to determine the moderating effect of social comparison via a moderator analysis; and third, a sequential or hierarchical regression analysis is performed, which allows to control for individual risk preferences and individual self-esteem (i.e., the control variables) as per Figure 31 below.

Figure 31.
Structural setup of participants to test Hypotheses 4.1 to 4.6



This figure is an illustration of the validity framework for Hypotheses 4.4 to 4.6 based on Research Question 2. Source: Author

First, the simple linear regression (i) that is carried out to test if Investment Banking Analysts engage in more risk-seeking behaviour, when they find themselves in a social loss domain (i.e., when experiencing a social loss due to a lower ranking than their social referents), indicates that the model explains 29.4% of the variance and that the model is significant, $F(1,82) = 34.19$, $p < .001$, and significantly predicts risk-taking behaviour of Investment Banking Analysts.

Second, a multiple regression (ii) is performed to test the moderation effect of social comparison on the relationship between the independent and dependent variables, and is reflected in the following model:

$$\triangle \text{Risk-taking} = \beta_0 + \beta_1 \text{Rank} + \beta_1 \text{Rank x } \beta_2 \text{Social loss} + \varepsilon$$

Though the results indicate that the model explains 54.8% of the variance and that the model is significant, $F(3,80) = 32.36$, $p < .001$, the interaction effect of the moderator variable is insignificant ($p = .394$). When controlling for the moderator variable in a hierarchical regression, the R^2 change from Model 1 (which includes rank and social loss as explanatory indirect variables) to Model 2, which includes the moderator variable, is +0.4% in conjunction with a decrease of the adjusted R^2 from 53.3% to 53.1%, lowering the predictive capacity of the model. Social loss as an indirect variable is a significant predictor of the model at hand, whereas this does not apply for social loss as a moderator variable. The results further reveal that there is no multicollinearity in the data. Tests to see if the data meet the assumption of collinearity indicate that multicollinearity is not a concern (Rank, Tolerance = .81, VIF = 1.2; Social loss, Tolerance = .79, VIF = 1.26; Moderator, Tolerance = .98, VIF = 1.0) and that no predictor variables are too highly correlated with each other (< 0.7) as per correlation table.

Third, in order to obtain an unbiased estimate of the causal effect by using multiple regression, the last analysis performed in H4.1 is to ensure that the coefficient on the causal variable of interest does not suffer from omitted variable bias. To do this, control variables are added to the regression, such as the omitted causal variable.

Table 30.
Multiple regression analyses output summary (H4.1)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
H4.1	.740[a]	.548	.531	2.645	.548	32.360	3	80	.000

a. Predictors: (Constant), Moderator, Rank, Social loss

b. Dependent Variable: Risk total

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
H4.1	Regression	679.251	3	226.417	32.360	.000[b]
	Residual	559.737	80	6.997		
	Total	1238.988	83			

a. Dependent Variable: Risk total

b. Predictors: (Constant), Moderator, Rank, Social loss

Coefficients[a]

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.		
		B	Std. Error	Beta			Tolerance	VIF
H4.1	(Constant)	.132	.321		.411	.682		
	Rank	1.187	.323	.307	3.676	.000	.809	1.236
	Social loss	2.099	.326	.543	6.440	.000	.793	1.261
	Moderator	-.281	.328	-.065	-.856	.394	.976	1.024

The tables above provide the statistical results for testing H1 to H3. Source: Author.

This study controls for individual risk preferences through the tolerance for ambiguity (TFA) instrument established by MacDonald (1970), measuring each decision-maker's predisposition towards risk-taking as it is a material predictor of one's individual risk-taking behaviour (Sitkin and Pablo 1992). Individuals that perceive ambiguous situations as desirable, challenging and interesting, demonstrate sensation-seeking as well as risk-taking behaviour (McLain, 1993). McLain (2009) describes risk-taking propensity to be very similar to TFA, and, in experimental tasks, Levin and Hart (2007) propose that there is a steady

characteristic that is subject to risky decision-making and decision-making under ambiguity

Further, the Rosenberg self-esteem scale (RSES) is used to control for the participants' level of self-esteem, as low self-esteem can materially impact an individual's perception and inclination towards social loss.

To account for the control variables, an Analysis of Covariance (ANCOVA) is performed. First, the homogeneity of the assumptions is tested to determine that the covariate has an equal regression coefficient associated with both groups. As tested in section 7.1, the assumption of homogeneity of variance is tested and satisfied via Levene's F-test for H4.1 – H4.6. Moreover, the test is robust to the violations of homogeneity of variance due to the sample size being greater than 30 in all groups and subgroups.

As determined within the independent samples t-test and the regression analyses, the Analysts treatment group shows a significantly greater increase in their risk-taking behaviour compared to the control group.

When controlling for risk-taking propensity, the ANCOVA results show that the treatment group still demonstrates a statistically higher change in risk-taking behaviour compared to the control group ($p < .001$). At the outset of the survey, it is determined that there is no statistically significant difference for the means of the risk-taking propensity scores between the control group $M = 2.85$ ($SD = 0.30$), and the treatment group $M = 2.80$ ($SD = 0.32$), $p = .485$.

With regard to controlling for self-esteem, participants in the treatment group indicate in a statistically significant way that they perceive themselves in a social loss domain as compared to the control group. It is noteworthy that the risk-taking behaviour of both groups is at the same level in the first set (i.e., five questions in each set) of the investment questions and prior to the introduction of the manipulation element. The ANCOVA shows that when controlling for self-esteem, the treatment group still has a statistically higher sense of social loss ($p <$

.001). At the outset of the survey, it is determined that there is no statistically significant difference for the means of the self-esteem scores between the control group (M = 3.47, SD = 0.24) and the treatment group (M = 3.43, SD = 0.32), p = .466.

For H4.2, the simple linear regression (i) that is carried out to test if the Investment Banking Associates engage in more risk-seeking behaviour when they find themselves in a social loss domain (i.e., when experiencing a social loss due to a lower ranking than their social referents), indicates that the model explains 31.8% of the variance and that the model is significant, $F(1,74) = 34.44$, $p < .001$, and significantly predicts the risk-taking behaviour of the Investment Banking Associates.

The multiple regression (ii) that is performed to test the moderation effect of social comparison on the relationship between the independent and the dependent variable, indicates that the model explains 43.5% of the variance and that the model is significant, $F(3,72) = 32.36$, $p < .001$. The interaction effect of the moderator variable, however, is insignificant (p = .455). When controlling for the moderator variable in a hierarchical regression, the R^2 change from Model 1 (which includes rank and social loss as explanatory indirect variables) to Model 2, which includes the moderator variable, is +0.4% in conjunction with a marginal decrease of the adjusted R^2 from 41.5% to 41.2%, indicating that adding the moderator does not represent a significant predictor. As such, social loss as an indirect variable is a significant predictor of the model at hand, but this does not apply for social loss as a moderator variable.

Table 31.
Multiple regression analyses output summary (H4.2)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
H4.2	.660[a]	.435	.412	3.497	.435	18.494	3	72	.000

a. Predictors: (Constant), Moderator, Rank, Social loss

b. Dependent Variable: Risk total

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
H4.2	Regression	678.681	3	226.227	18.494	.000[b]
	Residual	880.740	72	12.232		
	Total	1559.421	75			

a. Dependent Variable: Risk total

b. Predictors: (Constant), Moderator, Rank, Social loss

Coefficients[a]

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.		
		B	Std. Error	Beta			Tolerance	VIF
H4.2	(Constant)	3.005	.467		6.441	.000		
	Rank	1.641	.470	.360	3.494	.001	.739	1.353
	Social loss	1.841	.475	.404	3.872	.000	.722	1.386
	Moderator	.359	.479	.068	.751	.455	.968	1.033

The tables above provide the statistical results for testing H4.2. Source: Author.

Further, the results reveal that there is no multicollinearity in the data at hand. Tests to see if the data meet the assumption of collinearity indicated that multicollinearity is not a concern (Rank, Tolerance = .74, VIF = 1.3; Social loss, Tolerance = .72, VIF = 1.26; Moderator, Tolerance = .97, VIF = 1.0), and that no predictor variables are too highly correlated (< 0.7) as per correlation table.

As determined within the independent samples t-test and the regression analyses, the Associates treatment group shows a significantly greater increase in their risk-taking behaviour compared to the control group.

The ANCOVA results show that when controlling for risk-taking propensity, the treatment group still demonstrates a statistically higher change in risk-taking behaviour compared to the control group ($p < .001$). At the outset of the survey, it is determined that there is no statistically significant difference for the means of the risk-taking propensity scores between the control group $M = 2.92$ ($SD = 0.33$) and the treatment group $M = 2.87$ ($SD = 0.38$), $p = .485$.

With regard to controlling for self-esteem, participants in the treatment group indicate in a statistically significant way that they perceived themselves in a social loss domain as compared to the control group. It is noteworthy that the risk-taking behaviour of both groups is at the same level in the first set of the investment questions and prior to the introduction of the manipulation element. The ANCOVA show that when controlling for self-esteem, the treatment group still has a statistically higher sense of social loss ($p < .001$). At the outset of the survey, it is determined that there is no statistically significant difference for the means of the self-esteem scores between the control group ($M = 3.41$, $SD = 0.33$) and the treatment group ($M = 3.37$, $SD = 0.30$), $p = .466$.

For H4.3, the simple linear regression (i) that is carried out to test if the Investment Banking Vice Presidents engage in more risk-seeking behaviour when they find themselves in a social loss domain (i.e., when experiencing a social loss due to a lower ranking than their social referents), indicates that the model explains 55.7% of the variance and that the model is significant, $F(1,60) = 75.56$, $p < .001$, and significantly predicts the risk-taking behaviour of the Investment Banking Vice Presidents.

The multiple regression (ii) that is performed to test the moderation effect of social comparison on the relationship between the independent and the dependent

variable indicates that the model explains 60.9% of the variance and that the model is significant, $F(3,58) = 30.17$, $p < .001$. Interestingly, whereas social loss in itself has no significant effect on the dependent variable ($p = .272$), the interaction effect of the moderator variable is significant ($p = .027$).

Table 32.
Multiple regression analyses output summary (H4.3)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
H4.3	.781[a]	.609	.589	3.448	.609	30.174	3	58	.781[a]

a. Predictors: (Constant), Moderator, Rank, Social loss

b. Dependent Variable: Risk total

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
H4.3	Regression	1076.007	3	358.669	30.174	.000[b]
	Residual	689.428	58	11.887		
	Total	1765.435	61			

a. Dependent Variable: Risk change

b. Predictors: (Constant), Moderator, Rank, Social loss

Coefficients[a]

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.		
		B	Std. Error	Beta			Tolerance	VIF
H4.3	(Constant)	4.795	.529		9.061	.000		
	Rank	4.348	.533	.808	8.152	.000	.685	1.460
	Social loss	-.601	.542	-.112	-1.109	.272	.664	1.505
	Moderator	1.237	.546	.190	2.266	.027	.957	1.045

The tables above provide the statistical results for testing H4.3. Source: Author.

When controlling for the moderator variable in a hierarchical regression, the R^2 change from Model 1 (which includes rank and social loss as explanatory indirect variables) to Model 2, which includes the moderator variable, is +3.5% in

conjunction with an increase of the adjusted R^2 from 56.1% to 58.9%, indicating that the moderator improves the predictive capacity of the model. Social loss as an indirect variable is not a significant predictor of the model at hand, but social loss as a moderator variable is a significant predictor. The results further reveal that there is no multicollinearity in the data at hand. Tests to see if the data meet the assumption of collinearity indicate that multicollinearity is not a concern (Rank, Tolerance = .69, VIF = 1.46; Social loss, Tolerance = .66, VIF = 1.51; Moderator, Tolerance = .96, VIF = 1.00) and that no predictor variables are too highly correlated (< 0.7) as per correlation table.

As determined within the independent samples t-test and the regression analyses, the Vice Presidents treatment group shows a significantly greater increase in their risk-taking behaviour compared to the control group.

The ANCOVA results show that when controlling for risk-taking propensity, the treatment group still demonstrates a statistically higher change in risk-taking behaviour compared to the control group ($p < .001$). At the outset of the survey, it is determined that there is no statistically significant difference for the means of the risk-taking propensity scores between the control group $M = 3.06$ ($SD = 0.34$) and the treatment group $M = 2.92$ ($SD = 0.34$), $p = .108$.

With regard to controlling for self-esteem, participants in the treatment group indicate in a statistically significant way that they perceive themselves in a social loss domain as compared to the control group. Noteworthy, the risk-taking behaviour of the two groups is at the same level in the first set of investment questions and prior to the introduction of the manipulation element. The ANCOVA shows that when controlling for self-esteem, the treatment group still has a statistically higher sense of social loss ($p < .001$). At the outset of the survey, it is determined that there is no statistically significant difference for the means of the self-esteem scores between the control group ($M = 3.44$, $SD = 0.28$) and the treatment group ($M = 3.52$, $SD = 0.29$), $p = .308$.

For H4.4, the simple linear regression (i) that is carried out to test if the Investment Banking Associates engage in more risk-seeking behaviour when they find themselves in a social loss domain (i.e., when experiencing a social loss due to a lower ranking than their social referents) than the Investment Banking Analysts that find themselves in a social loss domain, indicates that the model explains 27.1% of the variance and that the model is significant, $F(1,78) = 28.94$, $p < .001$.

The multiple regression (ii) that is performed to test the moderation effect of social comparison on the relationship between the independent and the dependent variable, indicates that the model explains 48.1% of the variance and that the model is significant, $F(3,76) = 23.45$, $p < .001$. The interaction effect of the moderator variable, however, is insignificant ($p = .608$). When controlling for the moderator variable in a hierarchical regression, the R^2 change from Model 1 (which includes rank and social loss as explanatory indirect variables) to Model 2, which includes the moderator variable, a marginal increase of 0.2% is found in conjunction with a decrease of the adjusted R^2 from 46.5% to 46.0, indicating that adding the moderator does not represent a significant predictor. As such, social loss as an indirect variable is a significant predictor of the model at hand, but this does not apply for social loss as a moderator variable. Further, the results reveal that there is no multicollinearity in the data at hand. Tests to see if the data meet the assumption of collinearity indicate that multicollinearity is not a concern (Rank, Tolerance = .99, VIF = 1.00; Social loss, Tolerance = .99, VIF = 1.01; Moderator, Tolerance = .99, VIF = 1.00) and that no predictor variables are too highly correlated (< 0.7) as per correlation table.

As determined within the independent samples t-test and the regression analyses, Analysts demonstrate higher risk-taking behaviour than Associates. Across all three ranks, the treatment groups exhibit higher risk-taking behaviour than their respective control groups. Interestingly, among the treatment groups, the Associates treatment group shows a significantly greater increase in their risk-taking behaviour compared to the Analysts treatment group.

The ANCOVA results show that when controlling for risk-taking propensity, the Associates treatment group still demonstrates a statistically higher change in risk-taking behaviour compared to the Analysts treatment group ($p < .001$). At the outset of the survey, it is determined that there is no statistically significant difference for the means of the risk-taking propensity scores between the Analysts treatment group $M = 2.81$ ($SD = 0.32$) and the Associates treatment group $M = 2.87$ ($SD = 0.38$), $p = .435$.

Table 33.
Multiple regression analyses output summary (H4.4)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
H4.4	.693[a]	.481	.460	2.584	.481	23.454	3	76	.000

a. Predictors: (Constant), Moderator, Rank, Social loss
b. Dependent Variable: Risk total

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
H4.4	Regression	469.945	3	156.648	23.454	.000[b]
	Residual	507.605	76	6.679		
	Total	977.550	79			

a. Dependent Variable: Risk change
b. Predictors: (Constant), Moderator, Rank, Social loss

Coefficients[a]

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.		
		B	Std. Error	Beta			Tolerance	VIF
H4.4	(Constant)	3.819	.289		13.209	.000		
	Rank	1.769	.291	.503	6.079	.000	.999	1.001
	Social loss	1.615	.291	.459	5.542	.000	.995	1.005
	Moderator	.151	.294	.043	.515	.608	.997	1.003

The tables above provide the statistical results for testing H4.4. Source: Author.

With regard to controlling for self-esteem, participants in the treatment group indicate in a statistically significant manner that they perceive themselves in a

social loss domain as compared to the control group. It is noteworthy that the risk-taking behaviour of both groups is at the same level in the first set of investment questions and prior to the introduction of the manipulation element. The ANCOVA shows that when controlling for self-esteem, the treatment group still has a statistically higher sense of social loss ($p < .001$). At the outset of the survey, it is determined that there is no statistically significant difference for the means of the self-esteem scores between the Analysts treatment group ($M = 3.42$, $SD = 0.32$) and the Associates treatment group ($M = 3.37$, $SD = 0.30$), $p = .452$.

For H4.5, the simple linear regression (i) that is carried out to test if the Investment Banking Vice Presidents engage in more risk-seeking behaviour when they find themselves in a social loss domain (i.e., when experiencing a social loss due to a lower ranking than their social referents) than the Investment Banking Associates that find themselves in a social loss domain, indicates that the model explains 23.4% of the variance and that the model is significant, $F(1,67) = 20.42$, $p < .001$.

The multiple regression (ii) that is performed to test the moderation effect of social comparison on the relationship between the independent and the dependent variable, indicates that the model explains 35.0% of the variance and that the model is significant, $F(3,65) = 11.66$, $p < .001$. The interaction effect of the moderator variable, however, is insignificant ($p = .128$). When controlling for the moderator variable in a hierarchical regression, the R^2 change from Model 1 (which includes rank and social loss as explanatory indirect variables) to Model 2, which includes the moderator variable, a marginal increase of 2.4% is found in conjunction with a decrease of the adjusted R^2 from 30.6% to 32.0%. Social loss as an indirect variable is a significant predictor of the model at hand, but this does not apply for social loss as a moderator variable. The results further reveal that there is no multicollinearity in the data at hand. Tests to see if the data meet the assumption of collinearity indicate that multicollinearity is not a concern (Rank, Tolerance = .99, VIF = 1.00; Social loss, Tolerance = .99, VIF = 1.00; Moderator,

Tolerance = .99, VIF = 1.00) and that no predictor variables are too highly correlated (< 0.7) as per correlation table.

As determined within the independent samples t-test and the regression analyses, the Associates demonstrate higher risk-taking behaviour than the Vice Presidents. Further, across all three ranks, the treatment groups exhibit higher risk-taking behaviour than the respective control groups. Interestingly, among treatment groups, the Vice Presidents treatment group shows a significantly greater increase in their risk-taking behaviour compared to the Associates treatment group.

Table 34.
Multiple regression analyses output summary (H4.5)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
H4.5	.592[b]	.350	.320	3.176	.024	2.381	1	65	.128

a. Predictors: (Constant), Moderator, Rank, Social loss

b. Dependent Variable: Risk total

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
H4.5	Regression	353.019	3	117.673	11.666	.000[b]
	Residual	655.619	65	10.086		
	Total	1008.638	68			

a. Dependent Variable: Risk change

b. Predictors: (Constant), Moderator, Rank, Social loss

Coefficients[a]

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.		
		B	Std. Error	Beta			Tolerance	VIF
H4.5	(Constant)	7.424	.383		19.408	.000		
	Rank	1.831	.385	.475	4.751	.000	.999	1.001
	Social loss	1.141	.386	.296	2.958	.004	.996	1.004
	Moderator	-.603	.391	-.155	-1.543	.128	.997	1.003

The tables above provide the statistical results for testing H4.5. Source: Author.

The ANCOVA results show that when controlling for risk-taking propensity, the Associates treatment group still demonstrates a statistically higher change in risk-taking behaviour compared to the Analysts treatment group ($p < .001$). At the outset of the survey, it is determined that there is no statistically significant difference for the means of the risk-taking propensity scores between the Associates treatment group $M = 2.87$ ($SD = 0.38$) and the Vice Presidents treatment group $M = 2.91$ ($SD = 0.34$), $p = .567$.

When controlling for self-esteem, participants in the treatment group indicate in a statistically significant manner that they perceive themselves in a social loss domain as compared to the control group. Noteworthy, the risk-taking behaviour of both groups is at the same level in the first set of investment questions and prior to the introduction of the manipulation element. The ANCOVA shows that when controlling for self-esteem, the treatment group still has a statistically higher sense of social loss ($p < .001$). At the outset of the survey, it is determined that there is no statistically significant difference for the means of the self-esteem scores between the Associates treatment group ($M = 3.37$, $SD = 0.30$) and the Vice Presidents treatment group ($M = 3.52$, $SD = 0.29$), $p = .052$.

For H4.6, the simple linear regression (i) that is carried out to test if the Investment Banking Vice Presidents engage in more risk-seeking behaviour when they find themselves in a social loss domain (i.e., when experiencing a social loss due to a lower ranking than their social referents) than the Investment Banking Analysts that find themselves in a social loss domain, indicates that the model explains 57.7% of the variance and that the model is significant, $F(1,71) = 96.88$, $p < .001$.

The multiple regression (ii) that is performed to test the moderation effect of social comparison on the relationship between the independent and the dependent variable, indicates that the model explains 63.8% of the variance and that the model is significant, $F(3,69) = 40.46$, $p < .001$. The interaction effect of the moderator variable, however, is insignificant ($p = .193$). When controlling for the moderator variable in a hierarchical regression, the R^2 change from Model 1

(which includes rank and social loss as explanatory indirect variables) to Model 2, which includes the moderator variable, a marginal increase of 0.9% is found in conjunction with an increase of the adjusted R^2 from 61.8% to 62.2. Social loss as an indirect variable is a significant predictor of the model at hand, but this does not apply for social loss as a moderator variable. The results further reveal that there is no multicollinearity in the data at hand. Tests to see if the data meet the assumption of collinearity indicate that multicollinearity is not a concern (Rank, Tolerance = .99, VIF = 1.00; Social loss, Tolerance = .98, VIF = 1.00; Moderator, Tolerance = .98, VIF = 1.00) and that no predictor variables are too highly correlated (< 0.7) as per correlation table.

Table 35.
Multiple regression analyses output summary (H4.6)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
H4.6	.798[b]	.638	.622	2.964	.009	1.730	1	69	.193

a. Predictors: (Constant), Moderator, Rank, Social loss

b. Dependent Variable: Risk total

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
H4.6	Regression	1066.338	3	355.446	40.461	.000[b]
	Residual	606.155	69	8.785		
	Total	1672.493	72			

a. Dependent Variable: Risk change

b. Predictors: (Constant), Moderator, Rank, Social loss

Coefficients[a]

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.		
		B	Std. Error	Beta			Tolerance	VIF
H4.6	(Constant)	5.250	.348		15.100	.000		
	Rank	3.601	.350	.747	10.283	.000	.995	1.005
	Social loss	1.045	.352	.217	2.968	.004	.984	1.016
	Moderator	-.474	.360	-.096	-1.315	.193	.988	1.012

The tables above provide the statistical results for testing H4.6. Source: Author.

As determined within the independent samples t-test and the regression analyses, the Analysts demonstrate higher risk-taking behaviour than the Vice Presidents. Across all three ranks, the treatment groups always exhibit a higher risk-taking behaviour than the respective control groups. Interestingly, among the treatment groups, the Vice Presidents treatment group shows a significantly greater increase in their risk-taking behaviour compared to the Associates treatment group.

The ANCOVA results show that when controlling for risk-taking propensity, the Associates treatment group still demonstrates a statistically higher change in risk-taking behaviour compared to the Analysts treatment group ($p < .001$). At the outset of the survey, it is determined that there is no statistically significant difference for the means of the risk-taking propensity scores between the Analysts treatment group $M = 2.81$ ($SD = 0.32$) and the Vice Presidents treatment group $M = 2.91$ ($SD = 0.34$), $p = .159$.

When controlling for self-esteem, participants in the treatment group indicate in a statistically significant manner that they perceive themselves in a social loss domain as compared to the control group. It is noteworthy that the risk-taking behaviour of both groups is at the same level in the first set of investment questions and prior to the introduction of the manipulation element. The ANCOVA shows that when controlling for self-esteem, the treatment group still has a statistically higher sense of social loss ($p < .001$). At the outset of the survey, it is determined that there is no statistically significant difference for the means of the self-esteem scores between the Analysts treatment group ($M = 3.43$, $SD = 0.32$) and the Vice Presidents treatment group ($M = 3.52$, $SD = 0.29$), $p = .191$.

7.4 Methodology: 2x2 factorial design

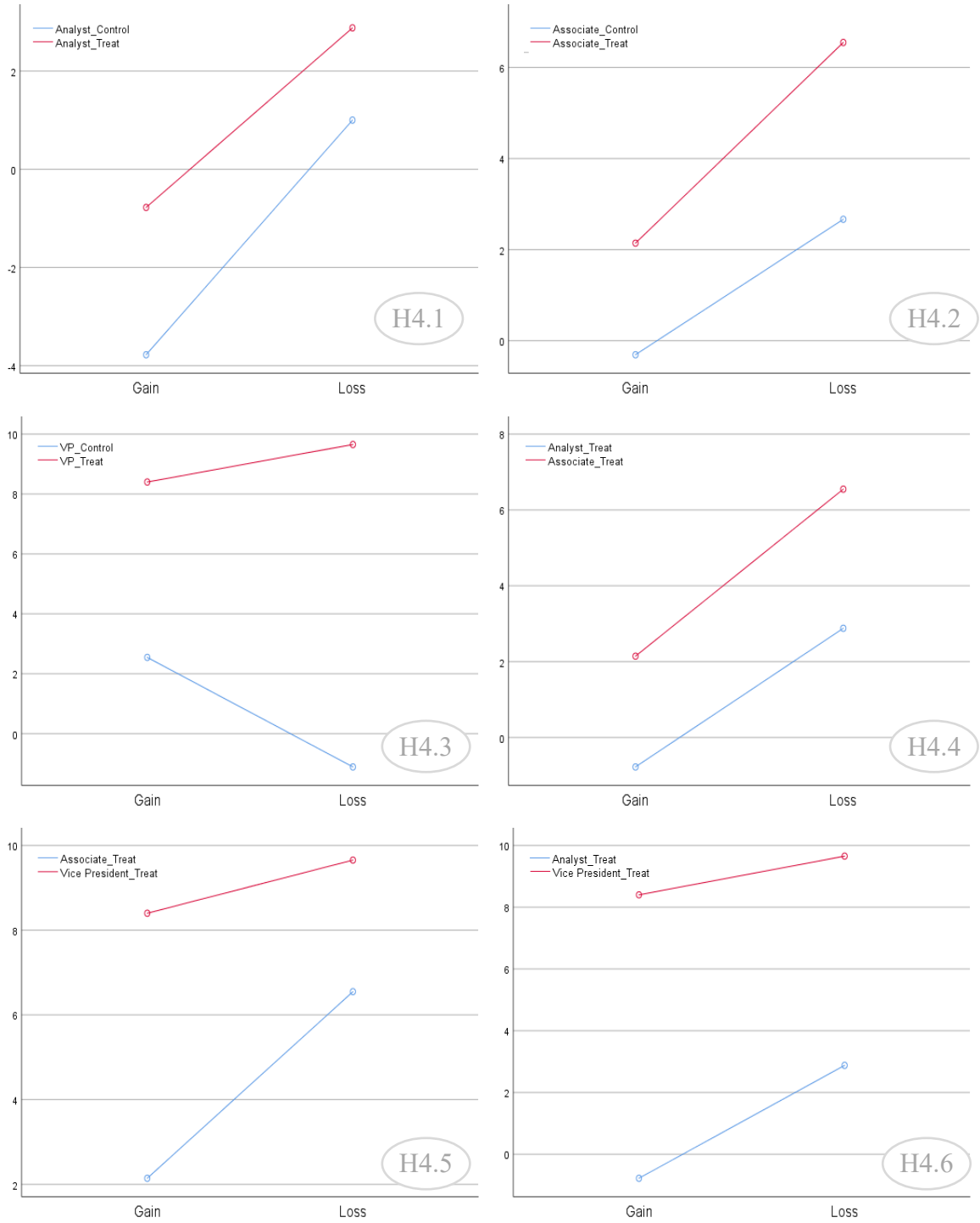
In addition to the analyses performed and discussed in section 7.2 and 7.3, a 2x2 factorial Anova is conducted to assess the effects of rank and social loss on the change in risk-taking behaviour. It shows that within ranks, all groups that have been exposed to the social loss manipulation element (i.e., treatment groups) have a significantly higher change in risk-taking behaviour than their respective control groups. The results further show that both the Analysts and the Associates who indicate that they have found themselves in a social loss domain regardless of their assignment to the treatment or to the control group, exhibit an increase in their risk-taking behaviour. Similarly, both groups show a decrease in their risk-taking behaviour when participants consider themselves to be in a social gain domain. The Vice Presidents control group, however, exhibits a decrease in their risk-taking behaviour when the participants perceive themselves to be in a social loss domain.

Social loss appears to have a stronger effect on the Analysts control group than on the respective treatment group, implying that individuals who have felt social loss without being exposed to the manipulation element (i.e., control group) show a higher increase in their risk-taking behaviour. This can potentially imply that an intrinsic feeling of social loss can have a stronger effect than one that is precipitated extrinsically in an ad-hoc manner (see Figure 32).

This tendency decreases when ascending the rank levels from Analysts to Vice Presidents within the control groups. Whereas the Associates' change in risk-taking behaviour has decreased or flattened (H1 vs. H2), the tendency for the Vice Presidents within the control group is inverted compared to the two subordinated ranks, that is, the Vice Presidents in the control group show a decrease in their risk-taking behaviour when they intrinsically feel a social loss.

The illustrations in Figure 32 depict and confirm the results and the statistical inferences previously described in sections 7.2 and 7.3.

Figure 32.
2x2 factorial plots: Change in risk-taking vs. social loss



The figure above provides illustrations of the change in risk-taking (y-axis) vs. social loss (x-axis) when testing H4.1 - H4.6. Source: Author.

7.5 Semi-structured expert interviews

In addition to the analyses performed and discussed in sections 7.2, 7.3, and 7.4, five expert interviews were conducted in conjunction with the experimental survey. These interviews allow to discuss the findings of the survey with seasoned practitioners from the investment banking industry and to obtain a qualitative validation and understanding of the applicability of the findings from the survey, as well as potential implications for the industry. Further, the interviews do shed some light on future research requirements to advance the topic at large.

The interview sample includes five managing directors (4 male and 1 female) who work for leading international bulge bracket investment banks across their European offices (Frankfurt, Paris, and London).

Table 36.
Overview of expert interviews

Interview no.	Date	Gender	Position	Division	Office
Interview #01	05 March 2020	Male	Managing Director	M&A	Frankfurt
Interview #02	06 March 2020	Male	Managing Director	Futures & Options	London
Interview #03	25 March 2020	Female	Managing Director	Sector coverage	Paris
Interview #04	26 March 2020	Male	Managing Director	Country IB coverage	London
Interview #05	28 April 2020	Male	Managing Director	Credit Sales & Trading	London

The table above summarises the sequence of expert interviews held and the profiles of the interviewees. Source: Author.

Further, the sample of interviewees stems from both sides of the Chines Wall (i.e., private and public markets) covering divisions such as IB sector coverage, M&A, and sales and trading. All interviews were conducted within a time window of 30 to 60 minutes and each interviewee received the same set of questions.

Prior to launching the interview, the research project is introduced to the interviewees, including the research scope, hypotheses and findings. Thereafter, a mutual confidentiality agreement and anonymity clause is explained and reiterated verbally, which is designed to protect the identity of the senior banker.

Table 37.
Questions used for the expert interviews

Questions
1. Could you please describe your role within your firm?
2. Can you please describe your personal career development until today?
3. What is your view on the findings on risk-taking behaviour across the three ranks of Analysts, Associates and Vice Presidents?
4. Do you believe deferred bonus schemes are effective instruments in your industry to curb dysfunctional risk-taking behaviour?
5. What is your view about the findings on social comparison across the three ranks of Analysts, Associates and Vice Presidents?
6. Do you witness social comparison in your daily life as an investment banker?
7. What is your view about this research?
8. Is it still fun to be a banker post GFC 2008?

The table above lists all the questions asked during the expert interviews. Source: Author.

With regard to the level of risk-taking behaviour between ranks (H1 to H3), all interviewees affirmatively attribute the findings H1 to H3, to the implementation of deferred bonus schemes, as outlined earlier, showing great satisfaction that the deferred bonus schemes trigger a reduced risk-taking behaviour among front office investment banking professionals.

> *"[…] It is very reassuring to see that deferred bonus programmes translate into the desired risk-taking behaviour and into the more mature banker profile that industry is hoping for. I am intrigued about even implementing deferred bonus schemes from the very first rank that is the Analyst position."* (Managing Director, Futures & Options, Male)

Furthermore, the interviewees jointly demonstrate concerns with regard to the significantly higher risk-taking behaviour of the Analyst population.

> *"I think it is quite alarming to see how little sensitive new incoming graduate investment banking professionals are towards risk-taking. This shows me that it might be wise to include deferred bonus schemes for Analysts, too. […]"* (Managing Director, Diversified Industries, Female)

> *"[…]I don't like seeing that Analysts are the least risk-averse of all, but I like seeing the progress and the awareness around risk-taking behaviour as you go up the ranks. I believe that the higher their deferred compensation share of their total compensation is, the more investment bankers feel invested into their careers and into the firm they work for. […]"* (Managing Director, Credit Sales, Male)

Moreover, the interviews raise the idea for future research to include Executive Directors and Managing Directors to the sample.

> *"[…]These findings allow us maybe to grasp the psychology of more seasoned bankers as they progress through the ranks. It would have been great if you were also able to collect data from Executive Directors and Managing Directors to see if this relationship between different ranks and risk-taking behaviour holds all the way to the top. […]"* (Managing Director, M&A, Male)

With regard to the impact of social comparison on risk-taking behaviour between ranks (H4.1 to H4.6), the interviews confirm that social comparison is omnipresent and tacitly impacting the behaviour of front office investment banking professionals.

> *"[…] during the year-end review and at the start of new promotion cycles, you can clearly feel the energy and vibe changing across the entire floor. People who rank lower than their*

> *peers get incredibly upset. Everything about them changes. […] organizational announcements are extremely painful for individuals that watch their peers being promoted but not them. […] It takes quite some time, I would say months, before a certain level of normality and harmony has returned to the floor. During this time, where employees are so agitated, I doubt that they are able to serve their clients to their best ability due to an emotional bias, let alone evaluating heavy financial models. […]"* (Managing Director, M&A, Male)

An overarching view among the interviewees voice the concern that younger generations might suffer from the negative implications more than their older counterparts.

> *"I think your results simply mirror in what kind of world we live in today. This phenomenon starts with young teenagers who suffer from great anxiety and goes all the way up through adolescence to professionals in management positions. The results clearly show that no one is exempt from this phenomenon. We cannot have hurt egos advise on or invest our clients' capital while suffering from emotional biases. […] I can certainly say that I see such behaviour especially among younger investment banking professionals. Probably, all of which would fall under the category of Millennials. Comparing their ranks is the only way for them to achieve social status. […]"* (Managing Director, Diversified Industries, Female)

> *"[…] The absolute individual return has no meaning to a banker if it is not put in a ranking comparison to their peers. Through social media and far more open communications about salaries than it was common back in the days, young investment bankers*

> *have far too much information and vast amounts of opportunities to compare themselves and guess what, you can't always win on all dimensions. Kids that join our desks are most of the time coming from the most elite universities on the planet and have adjusted their egos accordingly."* (Managing Director, Futures & Options, Male)

Overall, the respondents show great interest in this research project. Particularly, the inclusion of the social element in the decision-making process has largely been viewed as being ignored by academia and regulatory bodies. Furthermore, the senior practitioners suggest incorporating these findings into investment banks' culture and conduct training programmes for their broader employee base.

> *"[…] Finally, someone addresses the elephant in the room. I have been an investment banker for nearly 2 decades and I first-hand witnessed the Global Financial Crisis in 2008. All papers and reports that I read about the potential causes of the Global Financial Crisis only and exclusively tried to link the outbreak of the crisis with misaligned structures, incentives, leverage ratios etc. But let's face it, everything is a choice. Integrity and ethical behaviour start with each and every single one of us. […]"* (Managing Director, M&A, Male)

> *"[…] I believe that the mindset is like a muscle and requires continuous and regular exercise to practice sustainably sound and morally just virtues. This research of yours should be used in the broader financial industry to make a use case for more granular culture and conduct training programmes. […]"* (Managing Director, Futures & Options, Male)

> *I think the social aspect and failures that caused the financial crisis have been largely neglected by academia and also by banks*

themselves. Although the industry is going through a paradigm shift, that is, an increased deployment of artificial intelligence and machine learning are replacing individual discretionary decision-making, human beings are still in the driver's seat and are not machines (yet). […]" (Managing Director, Diversified Industries, Female)

"I think your research is quite novel and I have never seen such concise work and analysis on the behaviour of our peers. I believe it is very useful and we should show these results to all compliance departments within investment banks. On this basis, we could propose annual compliance tests on dysfunctional risk-taking." (Managing Director, Country Head France, Male)

8. Conclusion and recommendation

To date, many questions remain as to how the Global Financial Crisis of 2008 could have happened in the first place. What components that had caused the unethical, value destructive behaviour of key players (i.e., investment bankers) that led to the biggest financial crisis in history (prior to the global systemic financial crisis that resulted from the outbreak of the COVID-19 pandemic, which occurred during this dissertation project).

Driven by a need and high practical relevance, for empirical research in combination with a lacking body of literature, this dissertation focuses on enhancing academia's understanding of the social context that impacts the risk-taking behaviour of financial professionals within the investment banking industry. To meet the academic purpose of this research, a comprehensive dataset of 222 investment banking professionals was collected first-hand.

Section 7 presents the empirical analyses and results of the research questions. Based on the results, this section links the findings to the theoretical background of this dissertation.

The following concluding subsections provide a summary of the major findings, present the theoretical and practical implications and conclude with the limitations of this dissertation as well as ideas and suggestions for future research.

8.1 General discussion of the findings

This section will discuss the results in more detail and relate them to the questions that are derived from the concepts and notions outlined in the literature review of this dissertation, such as:

- Does the risk-taking behaviour of investment banking professionals (subject to different compensation schemes) differ across ranks? That is, do investment banking professionals that work under a differed bonus scheme in their regular

jobs exhibit lower risk-taking than investment banking professionals that work under a traditional bonus remuneration scheme?

- In line with the proposition of Prospect Theory, does the notion of a social loss based on a social referent hold?
- Does social comparison influence the risk-taking behaviour of investment banking professionals?
- Does social comparison moderate the relationship between the rank of an investment banking professional and their risk-taking behaviour?

Table 38.
Summary of hypotheses results

Hypotheses:		*Direct relation. Confirmed?*	
H_1:	Investment Banking Analysts are more risk-seeking than Investment Banking Associates	✓	
H_2:	Investment Banking Analysts are more risk-seeking than Investment Banking Vice Presidents	✓	
H_3:	Investment Banking Associates are more risk-seeking than Investment Banking Vice Presidents	✓	
Hypotheses:		*Direct relation. Confirmed?*	*Social comp. Moderator?*
$H_{4.1}$:	In a social loss domain, Investment Banking Analysts engage in increased risk-seeking behaviour.	✓	✗
$H_{4.2}$:	In a social loss domain, Investment Banking Associates engage in increased risk-seeking behaviour.	✓	✗
$H_{4.3}$:	In a social loss domain, Investment Banking Vice Presidents engage in increased risk-seeking behaviour.	✓	✓
$H_{4.4}$:	In a social loss domain, Investment Banking Associates engage in more risk-seeking behaviour than Investment Banking Analysts.	✓	✗
$H_{4.5}$:	In a social loss domain, Investment Banking Vice Presidents engage in more risk-seeking behaviour than Investment Banking Associates.	✓	✗
$H_{4.6}$:	In a social loss domain, Investment Banking Vice Presidents engage in more risk-seeking behaviour than Investment Banking Analysts.	✓	✗

The table above provides a summary of the results for each tested hypothesis. Source: Author.

Risk-taking behaviour across ranks

The deductive reasoning based on the literature review in the realm of deferred bonus schemes did hold in this dissertation.

As outlined earlier, Analysts in the investment banking industry are subject to a variable cash-based (immediate) compensation regime, whereas Associates and Vice Presidents fall into a variable equity-based (deferred) compensation regime. It was expected that investment banking professionals that fall into an equity-based compensation demonstrate lower risk-taking behaviour as their rank profile is subject to a remuneration scheme, which promotes long-term incentives and helps to mitigate excessive or dysfunctional risk-taking behaviour (Jensen and Meckling, 1976; Fahlenbrach and Stulz, 2011).

In contrast, it was predicted that investment banking professionals that fall into cash-based bonus compensation scheme demonstrate lower risk-taking behaviour as theory proposes that cash bonuses are positively related to managerial risk-taking since high risks are taken by bankers to meet short-term performance goals (Murphy, 2000).

As per literature review, the empirical results of this dissertation confirm that higher ranks exhibit lower risk-taking behaviour. That is, the Analysts demonstrate a higher risk-taking behaviour than the Associates – and the Associates, in turn, demonstrate a higher risk-taking behaviour than the Vice Presidents.

Loss aversion and social reference dependence

The second research question aims to investigate to what extent social comparison influences the risk-taking behaviour of investment banking professionals.

As outlined in the literature review, the phenomenon of upward contrast, as described earlier in this chapter, and the condition of a social loss impose a threat

to the self-view (Brickman and Bulman, 1977; Pettit and Lount, 2010), leading to a sequence of mental behaviours that carry consequences for decision-making (Hill and Buss, 2010).

Prospect Theory suggests that individuals facing a disadvantageous social condition (i.e., social loss: lower performance ranking or earnings compared to their co-workers) are willing to embrace more risks than individuals with an advantageous social condition (e.g., social gain: higher performance ranking or earnings compared to their co-workers) as they are driven by the incentive to level with their social referents.

Similar to prior scholars, the study at hand manipulates the social reference point experimentally (Hill and Buss, 2010; Linde and Sonnemans, 2012). Its findings confirm that the fictive ranking has caused a feeling of social loss, and, in line with the literature review, its research has found that individuals are less risk-averse when finding themselves in a social loss domain, which is consistent with the notion of social loss aversion.

Social comparison as a moderator

In the same vein, Schwerter (2013) provides empirical evidence on how risk attitudes alter if risky decisions lead to outcomes that can reverse social ranking, implying that individuals are less risk-averse when in a social loss domain, which is consistent with the notion of social loss aversion.

The results of this dissertation reveal that social comparison directly influences the risk-taking behaviour of investment banking professionals. However, it does not moderate the relationship between the rank of an investment banking professional and their risk-taking behaviour.

8.2 Contribution

The dissertation makes several theoretical and practical contributions. The use case of the results derived from this research and the resulting implications stretch beyond the financial services industries and become relevant to any organisational context involving incentive schemes and conflicts of interests. Further, the analyses conducted in this dissertation can provide insights into regulatory bodies and corporate governance functions, as well as the ways in which social factors and social needs can lead to system-wide failures through the dysfunctional risk-taking of financial institutions at large. This, in turn, can have a systemic impact on the overall global economy as it occurred during the global financial crisis in 2008. Catering to social factors rather than merely focusing on defining monetary incentive schemes can curb unfavourable risk-levels and ultimately unfavourable cost burdens that are borne by the greater public. The results of this dissertation make contributions to both academia and practice as outlined in the subsequent two sub-sections.

8.2.1 Theoretical implications

Contribution to Prospect Theory literature

In individual decision-making, “losses loom larger than gains” (Kahneman and Tversky, 1979, pp. 279). Similarly, Fehr and Schmidt (1999) propose that people care much more about being worse off than others than about being better off.

This study contributes to the existing literature through its reiteration of the notions on reference dependence and loss aversion but placing them in the context of social comparison. As such, this dissertation aims to contribute to a better understanding of the factors that impact competitive risk-taking behaviour, when the agent is behind its contiguously ranked competitor. In order to better predict or anticipate the risk-taking behaviour of investment professionals, as well as the trajectory and curvature of one’s utility function, the notion of reference is ideally

broadened to a multidimensional level encompassing social reference dependence.

Contribution to Social Comparison literature

"Comparison is the thief of joy."

– Theodore Roosevelt, 26th president of the United States

Social comparison is deeply embedded in human nature and in today's digital world it is unprecedentedly rampant with potentially severe implications for the state of an individual's happiness and mental health. The emergence of diverse social network services (e.g., Facebook, Instagram, LinkedIn and others) provides abundant social comparison opportunities (Vogel et al., 2014). Although this research focuses on the 'offline' social comparison context (i.e., co-workers, friends, family) rather than the 'online' context, this research sheds light on how quickly professionals can feel social unhappiness or social loss based on their comparison to their co-workers. Linking an individual's drive to engage in social comparisons to the negative affect outlined in this dissertation, does not only reveal the potential for chronic dissatisfaction (Vogel et al., 2014), but also shows how it can trigger higher risk-taking behaviour, as shown in the results of this dissertation.

Furthermore, this study contributes to the existing notion of situational factors leading to social comparison in the competitive landscape.

Contribution to deferred bonus scheme literature

This study performs first-hand primary data collection from 222 investment banking professionals, which is unprecedented in terms of scale and scope when compared to prior literature. This dissertation establishes, with some level of

proof, that the effectiveness of deferred bonus schemes might hold given the risk-taking behaviour documented by each rank.

8.2.2 Practical implications

Investment Banking industry

Excessive risk-taking in the finance sector has been described as one of the major contributors to the GFC in recent years (FCIC, 2011; Dewatripont and Freixas, 2012). As a result of the crisis and following more stringent regulations, banks have implemented lower risk-level tolerance from an operational and human capital point of view through the introduction of an operational risk-related stress-test and deferred compensation schemes to reduce managerial risk-taking. However, this dissertation provides empirical evidence that risk-taking behaviour and related curbing mechanisms cannot solely be considered and monitored through financial metrics. To reduce excessive risk-taking stemming from social comparison poses a challenge that relates to the competitive dynamics and nature of investment banks. One path to address this is to design and implement adequate codes of conduct and training seminars that will lower barriers to recognising instances of risk-taking induced by social comparison. Such trainings will fall under the theme of ethical behaviour and can be tailored to the comparative moral self-evaluation of an investment banking professional.

Regulatory bodies

Low regulatory oversight and the absence of material risk-curbing mechanisms played a substantial role in the advent of the crisis.

The findings of this dissertation can serve as a starting point for financial authorities and regulatory bodies to take into account the social factors that can lead to dysfunctional risk-taking in the investment banking industry, ultimately causing poor judgment, which can have a damaging impact on the organisations and detrimental effects on society.

Similar to the entry exams of the FCA, which test the financial literacy of an incoming new investment banking professional, psychometric tests and evaluations can be used to determine one's cognitive and emotional maturity level in combination with one's individual risk-taking propensity. Such tests can be applied systemically on an annual basis to assess the well-being, accountability and competency of a professional, eventually detecting potential diminishing levels of responsibility.

8.3 Limitations and future research

The findings of this dissertation and their interpretation must be considered in the context of the research limitations. This study has several limitations, which are outlined below.

First, the experimental survey design in combination with the data sources that are sampled are novel and have not been previously covered in the literature, which limits the potential for data comparison versus previously conducted experiments.

Second, while the choice to investigate real investment banking professionals is based on the intention to increase the external validity of this research, the sample in this study is not representative of all investment bankers, nor are all banks equally represented in the sample.

Third, financial risk-profiling assessment posits the limitation that contextual factors, such as the respondent's mood at the time of the sampling and the general setting where the survey is conducted (Grable, 2000), will need to be taken into consideration as well.

Fourth, this dissertation bears a level of geographic focus given the overweight of respondents from Western and more individualistic cultures. This raises the concern that the findings are culture specific and may not be applicable to other non-Western and more collectivistic cultures. However, it is plausible that the

dynamics underlying competitiveness in the investment banking industry may be common across cultures.

A general limitation of this study is that the choices elicited are based on hypothetical scenarios whereby subjects are protected against negative outcomes. This, in turn, poses some limitations to the generalizability of the findings. Also, although this dissertation emphasises the role of social comparison in a competitive setup, the author recognises that competition has many layers and contributing elements.

Overall, the validity of the results needs to be assessed in relation to their limitations. Despite these shortcomings, this study provides first-hand insight and is a point of departure for understanding the relationship between investment banking professionals and their social context. Moreover, it allows policy setters and regulating bodies to derive implicit feedback on their remuneration policies.

Lastly, it is important to recognise that this study is mute on prescribing what level of risk-taking is perceived as desirable and what should be considered excessive.

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10. Appendices

10.1 Curriculum Vitae

Amir Reza Rezvani

PROFESSIONAL EXPERIENCE

Harvard Business School — **Boston, United States**
Doctoral Research Associate and MBA Teaching Assistant — Aug 19 – Jul 20

Investindustrial — **London, United Kingdom**
Private Equity — Oct 18 - Aug 19

J.P. Morgan — **London, United Kingdom**
Investment Banking — Sep 13 – Sep 18

German Red Cross/Aicher Ambulanz — **Cologne & Munich, Germany**
Paramedic and Nursing Assistant — Jul 06 – Jun 09

EDUCATION

University of St. Gallen | School of Management — **St. Gallen, Switzerland**
PhD, Institute of Accounting Control and Auditing — Aug 16 – May 21

Harvard University | Harvard Business School — **Boston, MA, USA**
PhD, Visiting Fellow, Accounting Unit — Aug 19 - Jul 20

Erasmus University | Rotterdam School of Management — **Rotterdam, Netherlands**
MSc, Management & CEMS double degree — Sep 11 - Mar 13

Fundação Getulio Vargas | Escola de Administração de São Paulo — **São Paulo, Brazil**
MSc, *Semester abroad* — Jan 12 - Jun 12

Maastricht University | School of Business and Economics — **Maastricht, Netherlands**
BSc, International Business Administration — Sep 08 - Jul 11

Nanyang Technological University | Nanyang Business School — **Singapore**
BSc, *Semester abroad* — Jan 11 - May 11

PUBLICATIONS

Harvard Business School — **Boston, United States**
Rich or King, Harvard Business Review (no. 821-028) — Sep 20
Persevere, Pivot or Perish, Harvard Business Review (no. 821-027) — Sep 20
Justice-as-a-Service at RightNow, Harvard Business Review (no. 820-117) — May 20

PricewaterhouseCoopers — **Amsterdam, Netherlands**
Decarbonisation and the Economy - An empirical analysis of the economic impact of energy and climate change policies in Denmark, Sweden, Germany, UK and The Netherlands — Oct 13

RSM Erasmus University Rotterdam — **Rotterdam, Netherlands**
The Impact of Exploitation, Exploration and Organisational Ambidexterity on Performance in Multinational Subsidiaries — Mar 13