

# **In the Same Boat: Behavioural Influence on Investors, Executives, and Financial Markets**

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# Synopsis

This dissertation consists of three empirical studies that examine distinct behavioural features in individual traders, corporate managers, and financial markets. Specifically, the first study investigates changes in traders' biases regarding the use of alternative payment methods and their saliency. The second study documents the impact of CEO narcissism on accounting conservatism discretion. Lastly, the third study empirically tests the existence of gravitational effects in the foreign exchange market with bounded prices. This research addresses several gaps in the extant literature and aims to become part of the body of knowledge relevant for academics as well as investors, managers, and other actors operating in financial markets.

The first study investigates whether payment methods utilized by investors in mutual funds are associated with investors' tendency to realize gains earlier than losses – the disposition effect. We utilize a proprietary dataset of investor trading accounts in Indonesian mutual funds who are permitted to buy and sell securities with an exchange for cash or other assets. These two payment methods are economically equivalent but differ in payment saliency. We find more salient payment methods are associated with a higher disposition effect, and vice versa, namely less salient payments are associated with a reduced tendency to realize gains more readily than losses.

The second study investigates the relationship between CEO narcissism and accounting conservatism. Conservative accounting implies companies should recognize the impact of the negative news they receive as soon as possible (i.e.,

conditional conservatism). Conversely, information regarding potential positive circumstances should not be noted in the firms' financial accounts until they become relatively certain (i.e., unconditional conservatism). We hypothesise that CEO narcissism has a twofold influence on accounting conservatism. First, narcissistic CEOs are more likely to attempt to facilitate early recognition of positive news events and seek to reduce unconditional accounting conservatism. Alternately, narcissistic CEOs may anticipate negative news events and seek to improve conditional accounting conservatism. We find CEO narcissism is associated with accounting practices that promote the timely recognition of both positive and negative news. We provide the first evidence that executive narcissism can produce positive outcomes, contrary to widely held views that narcissism is a personality trait with only negative outcomes. Our results are robust to tests of endogeneity, multiple model specifications, CEO tenure, and degrees of CEO narcissism.

The third study tests the presence of behavioural distortions and anomalies in the context of foreign exchange markets under a target-zone regime. The impact of price boundaries has been documented in the context of futures and stock markets; however, there is currently no research testing whether the presence of price limitations also generates behavioural consequences in the foreign exchange market. This study fills this gap in the literature utilizing trades and quote data on the Hong Kong Dollar (HKD). The HKD is one of the world's most traded currencies and is pegged to the USD within a target-zone exchange rate that ranges between HK\$7.75 and HK\$7.85 per 1US\$. Consistent with the presence of behavioural expectations, the empirical results of this research reveal that market trading conditions are impacted in the moments

prior to the market valuation reaching the edge of the HKD's target zone. Further, this research also shows that the HKD price patterns are altered when the currency's spot price is close to the edges of its target-zone. In line with extant literature, the intensity of the phenomenon is monotonically increasing as the price of HKD approaches its limits.

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## **Statement of Original Authorship**

The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

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# Chapter 1 . Introduction

*“The difference between us is that you assume people are as smart as you are,  
while I assume people are as dumb as I am.”*

Richard Thaler, one of the founding fathers of behavioural finance

## 1.1 Sources of Behavioural Distortions

Traditional theory assumes financial markets are populated by perfectly rational agents who make unbiased decisions and maximize self-interest. The so-called *homo economicus* has perfectly predictable preferences and the capacity to process any quantity of available information (Baker & Nofsinger, 2010). Such assumptions have important implications regarding how financial markets are expected to function. The efficient market hypothesis (EMH) prescribes that all known facts and every probability about the future is perfectly impounded in current market valuations. An asset's expected return always depends upon its specific level of risk and the relationship between the two is precisely described by the capital asset pricing model (CAPM). Therefore, it follows that changes in market prices are due to the release of new information only. Individuals who make suboptimal decisions are punished with poor returns, and therefore in the long-term they are pushed to either learn to make better decisions or abandon financial markets. Additionally, market participants' suboptimal decisions are independent of each other and hence these individual errors do not affect the market equilibrium price.

While the paradigm of traditional finance is appealing and helps researchers in the process of creating descriptive models, empirical evidence shows the assumption of a perfectly rational agent is unrealistic and does not hold true in the real world.

Human beings belong to the *homo sapiens* species and thus they are prone to errors and their decisions are influenced by several irrational factors and by the finite amount of information they can process (Baker & Nofsinger, 2010). Behaviourists acknowledge these human limitations and attempt to explain the many instances in which empirical evidence contrasts with the outcomes prescribed by the theories of traditional finance.

Extant literature in behavioural finance attempts to identify the motivations why various economic actors often make irrational decisions. Scholars have identified several contributing factors; however, the main sources of irrational biases have been divided into three broad categories, namely (i) heuristics; (ii) individual personality; and (iii) framing.

Everyday problems tend to be complicated and their solutions might require extensive calculations and long probability assessments. In contrast, the term heuristics describes the intuitive judgement with which real-world issues are often dealt with. In other words, heuristics are shortcuts, or rules of thumb, that individuals utilize in order to obtain satisfying solutions in a context that is constrained in terms of time, information, and computational capacity (Selten & Gigerenzer, 2001). While heuristics might be helpful in the resolution of uncertainty, they can also lead to biased decisions and misjudging the probability of certain events. Specifically, the use of heuristics can lead to erroneous decisions for several reasons including representativeness, availability, and anchoring (Tversky & Kahneman, 1974). Representativeness refers to the errors people commit when they infer specific probabilities by observing the likelihood of other events that are not relevant, despite the similarity to their problem. Availability is a fallacy that occurs when people overestimate the frequency of certain phenomena because the

information on such events is readily and easily accessible. For example, plane crashes are perceived to be more likely after the media reports news that such an accident has recently happened. Lastly, the concept of anchoring describes the misjudgements of individuals who rely too heavily on an initial piece of information (“anchor”) they received. This heuristic can be problematic because the anchor can be set from random, false, and/or irrelevant data, yet all future evaluations will be evaluated in relation to such value. Anchoring is one of the root causes of the disposition effect bias, which is investigated in this dissertation.

The second main source of behavioural biases identified in the literature regards individuals’ personalities. One’s personality is a set of characteristics deriving from environmental and biological factors (Corr & Matthews, 2010) and it affects individual perceptions, emotions, and decisions. Personality is often described using five statistically identifiable traits: (i) openness to experience; (ii) conscientiousness; (iii) extraversion; (iv) agreeableness; and (v) neuroticism (Rothmann & Coetzer, 2003). These traits are regarded to be relatively stable throughout a person’s lifetime (Roberts & DelVecchio, 2000). The existence of several personality types suggests people will react to the same stimuli in different ways, which confirms that a number of behavioural biases might affect individuals’ decision-making processes. Consistently, many pieces of research in empirical finance have documented that personality traits influence people's resolutions in a number of economic fields. For example, overconfidence – which is among the most investigated personality types – is associated with a better-than-average belief and an inflated perception of the precision of one’s own private information (Moore & Healy, 2008). Consistently, overconfident investors hold more undiversified portfolios and they even obtain lower expected returns (Odean, 1998b).

Additionally, overconfidence is shown to influence corporate managers, especially with respect to firm decisions such as discount rates, share repurchase, and dividend policies (Ben-David, Graham, & Harvey, 2007). The personality trait of focus in this thesis is narcissism.

The last major category among the sources of behavioural biases is framing. The concept of framing refers to the fact people's choices and opinions can be heavily influenced by how problems and information are presented. This is a clear exception to what rational theories prescribe, as one's decisions should be independent of the way the input data are formulated. In contrast, it is empirically determined that although the objective facts are the same, individuals reply differently depending on how a specific question is worded (Tversky & Kahneman, 1981). The effects of framing have been extensively used in several social fields including psychology, politics, and journalism (Druckman, 2001). More recently, finance research has also approached this phenomenon. For example, studies show that pension fund choices depend largely on how the same investment opportunities are framed (Choi, Laibson, Madrian, & Metrick, 2001). Similarly, individual investors are documented to provide inconsistent answers depending on whether they are asked to forecast future prices or future returns (Glaser, Langer, Reynders, & Weber, 2007). This dissertation indirectly discusses the concept of framing as a biasing factor in the third set of empirical investigations (developed in Chapter 5).

The subsequent sections provide an introduction to the investigations further developed in Chapters 3, 4, and 5. Each of these investigations seeks to identify, explain, and model the practical inconsistencies that affect the behaviour of individual traders, corporate managers, and financial markets - the three major objects of research in the field of behavioural finance. Specifically, Section 1.2

introduces behavioural biases in individual investors. Section 1.3 introduces the impact of personality traits on the decision making of corporate executives, and Section 1.4 introduces market structures that spur behavioural side-effects. Section 1.5 concludes with a summary of the chapter.

## **1.2 Payment Methods and the Disposition Effect: Evidence from Indonesian Mutual Fund Trading**

Economic theories prescribe the evaluation of a deal depends on a product's attributes and price. Consequently, payment methods should not influence one's purchasing and selling decisions. However, extant literature documents that alternative payment forms influence decision-makers. For example, the corporate finance literature reports that the use of cash or scrip in mergers, acquisitions, and asset sales affects a firm's future performance (Maksimovic & Phillips, 2001; Rhodes-Kropf, Robinson, & Viswanathan, 2005; Shleifer & Vishny, 2003). Support has also been provided that alternative payment methods influence consumer behaviour. Hirschman (1979) shows certain purchasing mechanisms facilitate greater spending while others limit consumption. Buying methods have also been shown to affect individuals' reference prices (Monger & Feinberg, 1997) and the valuation consumers assign to particular products (Prelec & Simester, 2001). Absent however is evidence on how different payment methods affect the decision-making process and behavioural biases from the perspective of individual investors. The first empirical investigation included in this dissertation aims to address this issue and tests whether the different payment methods with which investment and divestment decisions are settled are associated with investors' tendency to suffer

from the disposition effect (Kahneman & Tversky, 1979; Odean, 1998a; Shefrin & Statman, 1985).

We utilize a proprietary dataset on Indonesia-based mutual funds investors provided by a global asset manager<sup>1</sup>. The data span the period between the 2<sup>nd</sup> of January 2013 to 30<sup>th</sup> December 2016 and identify individual trades by account holders across multiple fund characteristics. Distinctly, the database details the two payment mechanisms offered by the manager to clients. The first method is the traditional cash exchange of a certain value of financial instruments for corresponding fiat currency (i.e., Indonesian rupiah). Alternatively, investors settle their trades by means of swapping out with other assets already in their portfolio, mimicking to an extent a barter transaction. Transaction fees are equal across the two payment methods and investors are free to choose their preferred method of payment. Despite similarities, the two payment methods differ in terms of saliency (Kamleitner & Erki, 2013; Morewedge, Holtzman, & Epley, 2007). Specifically, settlements that involve monetary flows are the most salient and memorable due to their immediate depletion of available wealth (Gourville & Soman, 1998; Soman, 2001). Conversely, payment methods that involve little rehearsal (Soman, 2001) and lower transparency (Raghubir & Srivastava, 2008; Soman, 2003) are considered less salient.

We identify three channels by which decisions associated with greater saliency exhibit a higher order of the disposition effect bias. First, salient transacting systems make it comparatively more apparent to detect whether one's holding is in profit or loss and thus recognize that they can realize a possible gain or loss (Brown & Yang,

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<sup>1</sup> We are unable to disclose the fund manager due to agreements in place with respect to the provision of data.



2017; Frydman & Rangel, 2014). Second, salient settlements heighten the emotional outcomes of transactions, including feelings of pride and regret, which underpin the inclination to hold losers longer than winners (Kahneman & Tversky, 1979; Shefrin & Statman, 1985). Third, less salient trading practices mitigate the disposition effect as they delay the mental accounting of realized financial gains and losses (Frydman, Hartzmark, & Solomon, 2018). We find a significant relationship between alternative payment methods and the disposition effect, whereby fund investments and divestments that are executed with more salient settlements are associated with a higher investors' propensity to realize gains and delay losses. Vice versa, less salient transactions are associated with a lower tendency to suffer the disposition effect bias. The difference in the reported effects across the payment methods is significant. For instance, a category of investors in our data, namely those who operate with foreign bank intermediaries (FB), while trading with highly salient payment methods show a disposition effect bias that is more than three times the size of the bias they suffer when they deal with less salient payment systems.

### **1.3 The bright side of CEO Narcissism and its impact on Accounting Conservatism**

The term narcissism is typically associated with negative connotations because psychologists had originally considered such a personality trait an undesirable and pathological mental disease (Emmons, 1987). One only needs to consider press articles of embattled leaders and the number of instances narcissism is mentioned<sup>2</sup>. This commonly held view has also been extended to investigations in the financial management literature (Amernic & Craig, 2010; Judge, Piccolo, & Kosalka, 2009).

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<sup>2</sup> For example, a brief search identifies 56,300 news articles.

These judgements however are at odds with the updated theories on personality that consider narcissistic tendencies neither negative nor positive and measure this individual trait on a spectrum (Raskin & Hall, 1981). The present analysis tries to solve the discrepancy between these two fields of research and aims to provide initial evidence regarding the relation between executives' narcissism and desirable accounting practices. Specifically, the second empirical investigation included in this dissertation extends the literature by assessing the impact of CEO narcissism on accounting conservatism. Conservative accounting implies companies should recognize the impact of the negative news they receive as soon as possible (i.e., conditional conservatism). Conversely, information regarding potential positive circumstances should not be noted in the books until they become relatively certain (i.e., unconditional conservatism). Such an asymmetric approach is connected to narcissism because narcissists are shown to have different reactions to feedback received depending on whether it is positive or negative. In the psychology literature it has been shown that narcissists exhibit low avoidance motivation (Elliot & Thrash, 2002; Foster & Brennan, 2011) and hence they find it easier to accept negative results. Similarly, Byrne and Worthy (2013) demonstrate that narcissists can forego immediate rewards to obtain larger long term benefits. Consistently, we conjecture CEO narcissism is associated with desirable accounting practices in the form of increased conditional conservatism. However, narcissists also seek out recognition and applause from others because they need to bolster their inflated sense of self (Campbell, Goodie, & Foster, 2004; Kernis, 2005; Resick, Whitman, Weingarden, & Hiller, 2009). As a result, we hypothesize that narcissistic CEOs are also associated with reduced unconditional conservatism.

We test the relation between CEO narcissism and accounting conservatism for a sample of 907 US companies and their corresponding CEOs for the period between 2010 to 2017. We apply three established models of accounting conservatism (Ball & Shivakumar, 2005; Basu, 1997; Givoly & Hayn, 2000) and measure executives' narcissism using a non-intrusive approach ubiquitous in the literature (Capalbo, Frino, Lim, Mollica, & Palumbo, 2018; Chatterjee & Hambrick, 2007; Patel & Cooper, 2014). The results obtained support our hypotheses across several model specifications. We show that narcissistic CEOs are associated with timelier recognition of negative news — increased conditional conservatism (Ball & Shivakumar, 2005; Beaver & Ryan, 2005), as well as the anticipation of future profits — reduced unconditional conservatism (Ahmed & Duellman, 2013). Our robustness tests rule out several alternative explanations by controlling for whether narcissistic CEOs self-select into certain firms with specific accounting practices. We show that newly appointed executives are not associated with abnormal levels of accounting conservatism. Further, consistent with prior literature predicting incoming CEOs require sufficient time to influence accounting practices (Ahmed & Duellman, 2013; Castellano & Lightle, 2005), we show that long-standing narcissistic CEOs are those that apply higher levels of conditional conservatism. Lastly, we find evidence to support the claim of Amernic and Craig (2010) that extreme narcissists are associated with unethical behaviours and biased financial reporting. In particular, we show that an excessive level of narcissism is not associated with a timely recognition of negative news.

Our research contributes to the literature in the following ways. First, we provide additional evidence to the growing, yet limited, corpus of research that relates CEOs' personalities and corporate financial reporting (Dworkis, 2013; Hales, Hobson, &

Resutek, 2012; Schrand & Zechman, 2012). Second, we contribute to the literature on narcissism by answering the calls of Judge et al. (2009) to shed a positive light on the personality trait, which in almost every case has been associated with negative connotations. Lastly, the identification of accounting conservatism's determinants will benefit corporate stakeholders such as equity owners (Kim & Pevzner, 2010; Lafond & Roychowdhury, 2008; LaFond & Watts, 2008), bondholders (Ahmed, Billings, Morton, & Stanford-Harris, 2002; Ahmed & Duellman, 2007; García Lara, García Osma, & Penalva, 2009), board members (Ahmed & Duellman, 2011; Francis & Martin, 2010), and financial analysts (Givoly & Palmon, 1982).

## **1.4 A Behavioural Exploration of the Hong Kong Dollar Exchange-Rate Target-Zone**

Extant literature on exchange rate behaviour under a target-zone regime is based on the seminal work from Krugman (1991). This framework is based on the assumptions: (i) market participants have rational expectations; (ii) monetary authorities are perfectly credible; and (iii) they only intervene when the exchange rate hits the boundaries (Bauer, De Grauwe, & Reitz, 2009). Under these conditions, Krugman (1991) predicts the imposition of a target-zone regime produces a stabilizing effect whereby the exchange rate becomes less and less receptive to changes in the fundamentals as it approaches its boundaries (i.e., the honeymoon effect). While the honeymoon effect is widely cited in the literature and is often considered a natural consequence of target-zone exchange rate systems (Anthony &

Macdonald, 1998), the related mean-reverting prediction has been consistently rejected empirically<sup>3</sup> (Duarte, Andrade, & Duarte, 2013).

The weak empirical performance of the model has led to theoretical developments and models accepting different assumptions such that central banks are not perfectly credible (Bertola, 1993; Bertola & Caballero, 1992) or that their corrective measures are implemented within the target-zone band. The third empirical investigation included in this dissertation does not propose a new framework for target-zone regimes; however, it seeks to understand the inconclusiveness of empirical tests of Krugman (1991) by investigating whether foreign exchange markets with bounded prices exhibit patterns consistent with behavioural expectations.

Specifically, the analysis tests for the existence of behavioural phenomena in the environment of the Hong Kong Dollar (HKD) target-zone. We exploit high-frequency trade and quote data in HKD to determine whether the bounds generate behavioural effects, much like extant literature in equity and futures markets that identifies the presence of a magnet or gravitational effect regarding investors' concerns with restrictions to trade around price limits. As the 9<sup>th</sup> most traded currency in the world (BIS, 2019) the HKD target-zone is well established (Genberg, 2011; Lo, Hui, Fong, & Chu, 2015) and its boundaries – HK\$7.75 and HK\$7.85 per \$1US – are highly salient to market participants, going unchanged since May 2005.

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<sup>3</sup> For example, Flood, Rose, and Mathieson (1991) test the target-zone model's predictions with daily data for the European Monetary System but fail to detect statistical support. Similarly, De Jong (1994) finds evidence supporting a clear rejection of the model using an univariate analysis on the EMS exchange rates. Further, Rose and Svensson (1994) utilize EMS related data and are unable to document nonlinear patterns consistent with the model from Krugman (1991). More recently, Miller (2011) shows empirical evidence contrasts with the presence of a stabilizing honeymoon effect near the bounds of a target-zone exchange rate regime.

This aspect is relevant for our behavioural investigation as it fosters traders' expectations of altered market conditions (Subrahmanyam, 1995).

Contrary to the rational expectation assumption (Krugman, 1991), we show the HKD exhibits patterns consistent with the presence of behavioural phenomena. We evaluate the presence of behavioural expectations using two approaches. Our first approach focuses on ex-ante behaviour prior to boundary hits. We identify several market microstructure variables that significantly change in the 30 minutes before the HKD value reaches one of its price boundaries. Specifically, the transaction frequency, price volatility, and order pressure assume accelerating patterns consistent with behavioural expectations in the form of market momentum. Our second approach measures the probability of HKD's prices advancing towards their boundaries and thus prompting a possible market intervention by the Hong Kong Monetary Authority (HKMA). We find that the probability the spot exchange rate moves towards its closest boundary increases monotonically as the market valuations approach the edges of the target-zone. This evidence is consistent with the presence of behavioural expectations caused by market participants' illusion of price momentum (Arak & Cook, 1997) and/or the fear of being locked out from trading (Subrahmanyam, 1994). We also observe an asymmetric response depending on proximity to upper or lower boundary prices of the HKD target-zone. Specifically, the gravitational effect appears to be stronger on the weak side of the peg (HK\$7.85 per 1US\$) which shows market participants unreasonably expect the HKMA might stop supporting the HKD-USD target-zone. Lastly, our results are consistent with the presence of psychological barriers at specific distances from the bounds of the target-zone. In particular, we find symmetric and abnormal price

patterns as the HKD value is at about 200 ticks from both edges of the target-zone (i.e., when the HKD price is near HK\$7.830 and HK\$7.770 per 1US\$).

This research extends the literature in several ways. First, we add to the literature on target-zone regimes, identifying the weak empirical performance of the model proposed by Krugman (1991) might be justified by the fact that the author's rational expectation assumption is not respected in the foreign exchange market. Our research is also closely related to the findings from several other empirical papers documenting foreign exchange traders are affected by behavioural biases. For example, Cavaglia, Verschoor, and Wolff (1993) show agents in the foreign exchange market fail to efficiently use all the available information while producing their rate forecasts. Again, Ito (1990) detects that participants in the foreign exchange market are not rational as they consistently exhibit "wishful expectations": their future expectations tend to be biased in the direction that would benefit them the most. Lastly, this research extends the literature on price limit mechanisms. This is a relevant topic because although price limit rules are widely implemented across countries (Kim & Limpaphayom, 2000) and asset classes (Berkman & Steenbeek, 1998; Yan Du, Liu, & Rhee, 2009), their behavioural effects are scarcely investigated (Harris, 1997).

Our results are relevant for the many financial actors trading in HKD and will thus affect billions of dollars in trade value. The evidence provided in this study also has implications for the HKMA, which stands to benefit by improving their exchange rate stabilization models. For example, the Hong Kong authorities will be able to improve the timing of their intervention, thus minimizing their disbursement of foreign exchange reserves. Lastly, the results are important in times of financial turmoil, as discussions regarding the application of target-zone regimes become

increasingly popular during economic crises (Bauer et al., 2009) due to the supposed stabilizing effect of “managed floats”.

## **1.5 Summary**

This introductory chapter delineates, motivates, and establishes a connection between the three theoretical questions addressed in the next chapters of this thesis. Specifically, the investigations in this dissertation discuss issues concerning the three main objects of interest in behavioural finance, namely traders, corporate managers, and financial markets. Further, the studies in this thesis are linked together by the fact each of them explores one of the most relevant behavioural aspects shown to cause suboptimal choices: the existence of individual biases, the relevance of personality traits, and the patterns with which future expectations are formed.

The remainder of this dissertation is structured as follows. The next chapter reviews the relevant theoretical and empirical literature regarding the topics discussed in this thesis. Further, the second chapter of this thesis presents the hypotheses that are tested in the subsequent chapters. Chapter 3 examines the interaction between the use of alternative payment methods and investors’ disposition effect. Chapter 4 investigates the relationship between the narcissistic personality trait of corporate CEOs and the practice of accounting conservatism. Chapter 5 consists of an investigation regarding the impact of price boundaries in the foreign exchange market with target-zone arrangements. Lastly, Chapter 6 concludes this dissertation.



## **Chapter 2 . Literature Review**

### **2.1 Introduction**

The present chapter undertakes a review of the literature regarding the three empirical investigations included in this dissertation. Sections 2.2 – 2.4 discuss topics relevant to the first analysis presented in this dissertation. Specifically, Section 2.2 discusses the disposition effect bias together with its causes and the elements that modify its magnitude. Section 2.3 expands on the topic of payment methods and how they affect consumers' behaviour. Section 2.4 concludes with a discussion of the characteristics that differentiate alternative payment methods and what determines their saliency. Sections 2.5 – 2.7 relate to the second investigation included in this thesis. Section 2.5 introduces the relevant literature on the relationship between executives' personalities and firms' results. Section 2.6 then extends in greater detail the concept of narcissism while Section 2.7 develops the notion of accounting conservatism. Sections 2.8 – 2.10 outline the literature linked to the third research contained in this dissertation. In particular, Section 2.8 introduces the institutional details regarding HKD trading and its target-zone exchange rate arrangement. Further, Section 2.9 discusses the relevant literature on financial markets with price boundaries and Section 2.10 describes the empirical findings regarding the behavioural consequences price limit rules have in the equity and futures markets. Drawing on the above literature, Section 2.11 develops the three hypotheses that are later tested within this dissertation.

## **2.2 Overview of the Disposition Effect**

Extant research demonstrates that investors exhibit several irrational behaviours (Barberis & Huang, 2001; Barberis, Shleifer, & Vishny, 1998; Benartzi & Thaler, 1995; Coval & Shumway, 2005; Daniel, 1998). One of the most commonly reported – the disposition effect – describes the propensity to hold losing investments for too long and to close winning positions too early (Kahneman & Tversky, 1979; Odean, 1998a). This behavioural bias is considered an investment shortcoming (Heimer, 2016) as it shows traders assign too much importance to the past.

Prior research has sought to rationalize the determinants of the disposition effect. Odean (1998a) suggests individuals might decide to continue holding their losers because they irrationally believe such assets will eventually outperform today's winners. Similarly, Lakonishok and Smidt (1986) argue the disposition effect derives from traders' attempts to restore portfolio diversification after wide market movements. Lakonishok and Smidt (1986) also argue that traders with favourable private clues believe their information is not yet incorporated in market prices. Alternatively, Harris (1988) and Odean (1998a) suggest investors hesitate to sell undervalued assets because they refuse to pay relatively high trading fees on low-value assets or for tax considerations, respectively.

The predominant view, however, is the disposition effect is mainly driven by behavioural factors (Talpsepp, Vlcek, & Wang, 2014). Shefrin and Statman (1985) first discuss this concept by creating a framework including elements of prospect theory (Kahneman & Tversky, 1979), mental accounting (Thaler, 1985), and regret aversion. Every time a trader buys an asset, a relative mental account opens and its natural reference point is the security's purchase price. Investors frame their

decisions as potential winners or losers relative to this reference point (Kahneman & Tversky, 1979). Traders avoid selling securities if the decision closes the relative mental account with a loss inducing a feeling of regret (Gross, 1988). Vice versa, investors tend to dispose of appreciating assets as they are not willing to miss out on the opportunity to realize a gain and feel a sense of pride (Shefrin & Statman, 1985). Existing evidence shows these emotional forces are so strong they prompt individuals to disregard self-imposed limits. Consistently, Braga and Fávero (2017) note investors commonly accept higher-than-wanted losses and realize lower-than-expected profits.

The disposition effect has been identified across multiple investment classes: equities (Garvey & Murphy, 2004; Odean, 1998a), mutual funds (Frazzini, 2005; Shefrin & Statman, 1985), derivatives (Coval & Shumway, 2005; Frino, Johnstone, & Zheng, 2004), stock-options (Heath, 1999), commodities (Locke & Mann, 2005), and real estate (Genesove & Mayer, 2001). Further, the disposition effect has been identified in laboratory subjects (Weber & Camerer, 1998), gamblers (Brown & Yang, 2017), retail investors (Odean, 1998a), professional traders (Shapira & Venezia, 2001), and financial advisors (Pelster & Hofmann, 2018).

Due to its prevalence, several studies have focused on the identification of the disposition effect's determinants and investigated the conditions under which the bias is reduced or exacerbated (Dhar & Zhu, 2006). Extant literature has predominantly focused on two classes of factors: investors' characteristics and environmental variables. More recently, a shift has sought to identify the link between transactional features and the magnitude of investors' disposition effect. Frydman et al. (2018) show the timing between trades is a relevant factor as investors do not exhibit the disposition effect when asset divestments are

immediately followed by subsequent purchases. Moreover, an individual's aversion to loss diminishes in cases where the purchase price cannot be recalled (Frydman & Rangel, 2014). Similarly, Brown and Yang (2017) detect that investors are more prone to suffer from the disposition effect when they clearly recognize the net outcome of their round-trip trades. We seek to contribute to this list of factors by investigating the nature of the relationship between the disposition effect and the payment methods people use to settle their investment and divestment transactions.

## **2.3 Payment Methods and Consumers' Behaviour**

Consumer behaviour research identifies that individuals' spending decisions are affected by the increasing list of payment options (Soman & Lam, 2002). Unlike in the past, when cash and checks were the only options to complete transactions, the majority of payments today are processed via electronic systems such as debit and credit cards (Soman & Lam, 2002). These transacting methods are being superseded by more technological alternatives (Marlin, 1998; Yoon, 2001). For example, it is now possible to complete everyday purchases utilizing third-party applications, exchanging private phone numbers, or by extending one's mobile phone to sellers' POS machines. A consequence of these advancements is that common buying decisions are becoming increasingly different from the simple cash-and-carry experiences, where the costs and benefits of a transaction are encountered at or about the same time (Gourville & Soman, 1998; Schneider, 2002). Soman (2001) points out that, despite the proliferation of so many payment options, academic research in the field has not correspondingly grown. A possible explanation is that, in theory, payment methods have no role in the evaluation of a purchase opportunity (Tokunaga, 1993). Indeed, rational buyers should only compare the utility generated

by the product they acquire and the disutility from the price they pay (Prelec & Loewenstein, 1998). Soman (1998) summarizes this concept by stating individuals are expected to finalize their purchases only in the case where their “net transaction value” is greater than zero. Nevertheless, common wisdom suggests spending money is not simply a rational decision as it also induces a wide range of emotions (Soman, 2003). In practical terms, transactions may depart from what is theoretically prescribed for at least two reasons. On the one hand, the way circumstances are presented might alter the utility that buyers can extract from very similar products (Huber, Payne, & Puto, 1982). On the other hand, the disutility from the purchase price can be perceived as more or less costly as a function of the context. In this regard, Levin and Gaeth (1988) and Russo (1977) suggest a key role is played by the manner with which information is framed and structured, respectively. For example, Gourville (1998) argues the formulation of a transaction can be perceived as more expensive than another albeit the two total amounts are identical. A similar effect is evident when payment partitioning is employed (Morwitz, Greenleaf, & Johnson, 1998). Further, Heath and Soll (1996) claim buyers have mental budgets for each of their spending categories, and their purchase decisions are affected by how much money is left in each of these accounts.

Payment methods affect individuals both in laboratory experiments (Prelec & Simester, 2001; Soman & Lam, 2002) and the field (Feinberg, 1986; Hirschman, 1979). Four major impacts are identified pertaining to the use of alternative payment methods. First, alternative buying systems are shown to affect consumers’ willingness to spend. Using field transactions, Hirschman (1979) finds that people spend more when they pay with credit cards versus cash. The influence is so strong that the sole presence of a credit card stimuli can modify people’s decisions

(Feinberg, 1986). Prelec and Simester (2001) extend these results and find that individuals who are instructed to pay by cash will bid significantly lower than those paying via electronic methods at auctions. The most accepted factor driving these results comes from the fact certain payment methods reduce the emotional cost of a transaction (Kamleitner & Erki, 2013). Second, alternative spending mechanisms influence the formation of buyers' reference prices (Monger & Feinberg, 1997). Such value differs from the actual retail price (Rosch, 1975) as it describes the amount a person is willing to pay for a certain product (Lichtenstein, Karson, & Burton, 1991). The reference price is a fundamental concept in consumers' decision-making theory as it affects whether a transaction will be completed or not (Heath, Chatterjee, & France, 1995). Specific payment methods can lower the reference price people assign to the very same product. For instance, buyers who pay in cash versus those who use credit cards assign significantly lower fair values to exactly the same products (Monger & Feinberg, 1997). The third effect pertains to how people feel about the objects they purchase. Specifically, the choice between alternative payment methods influences the perception of ownership that buyers have towards their goods (Kamleitner & Erki, 2013; Pierce, Kostova, & Dirks, 2003). Alternative payment methods alter one's perceived ownership as a function of how much pain buyers feel in the purchasing process (Kamleitner & Erki, 2013). This interpretation is empirically supported as consumers exhibit a significantly higher perception of ownership when they pay with cash versus when they use their credit cards. Lastly, payment methods have such a predominant impact on buyers' mindset that it can determine what individuals decide to buy. Prelec and Loewenstein (1998) were the first to show that individuals prefer to use credit cards to purchase long-lasting products such as household appliances. Conversely, the two authors also document that cash is the preferred payment method for ephemeral goods. Cash purchases are

known to induce negative feelings, while credit cards generate lower reactions. This is consistent with the use of cash for unplanned and hedonic spending (Inman, Winer, & Ferraro, 2009; Thomas, Desai, & Seenivasan, 2011). Indeed, such types of purchases generate immediate emotional rewards that counterbalance the discomfort originating from cash disbursements.

## **2.4 Payment Characteristics and Saliency**

The term “pain of paying” (Zellermayer, 1996) has been coined to describe the negative feelings associated with the process of parting from one’s money. Such emotional discomfort is shown to affect individuals’ perception of past experiences (Soman, 2001), present evaluations at the point of purchase (Monger & Feinberg, 1997), and decisions about future spending (Soman, 1998). Clearly, the pain related to a payment depends primarily on the amount to be spent (Soman, 2003); however, payment methods also play an important role.

Raghubir and Srivastava (2008) claim payment methods differ in terms of the degree to which customers are aware of the real values being used. Further, Soman (2003) distinguishes two types of payment transparency. First, spending can be transparent in physical terms. For example, cash payments are more material than electronic purchases as buyers can touch and see the money they spend. Second, payment methods are transparent in terms of the amount that a transaction involves. Again, the use of cash is associated with high transparency because the parties need, for example, to count banknotes. Conversely, automatic payments and payroll deductions are less transparent methods as the values assigned to such transactions are often ignored even by individuals (Soman, 2003). Payment mechanisms also differ from each other in terms of rehearsal. For instance, paying

by check exhibits higher rehearsal as it requires multiple repetitions given that buyers need to write down their expenditure both in numbers and words (Soman, 2001). In contrast, electronic systems present very low rehearsal and require no reiteration (Hawkins & Hoch, 1992). Consequently, certain payment methods afford greater opportunities for consumers to learn and recall their final purchase price (Soman, 2001). Transactions with low rehearsal also cause underestimation of past expenses (Soman, 2003) and higher future spending (Kamleitner & Erki, 2013). Third, immediacy – the temporal separation between the timing of the payment and the moment of consumption – differentiates alternative transacting systems (Gourville & Soman, 1998). For example, cash and credit cards exhibit opposing immediacy. Prior studies suggest that delayed timing and low rehearsal produce similar effects on consumers' transacting sensitivity. Consistent with this point, Sterman (1989) claims actual bank account movements and in-process-payments induce opposite reactions for individuals and their spending decisions. Soman (2001) further extends this point and suggests such differences result from buyers considering credit card payment as commitments to pay rather than real expenses. Fourth, payment methods differ with respect to spending limits. Thaler (1985) claims individuals exhibit biased behaviours because they irrationally split their money into mental accounts. Consumers have distinct buckets for each spending category (Heath & Soll, 1996) but also in terms of spending methods (Cheema & Soman, 2006). Cash payments, for example, have a maximum limit equal to the amount of money available inside one's wallet. On the contrary, other spending systems (e.g., credit cards) have much less stringent boundaries. Morewedge et al. (2007) argue that these differences affect individuals' decisions as the perception of limited resources inhibits spending decisions. Consistently, Soster, Gershoff, and



Bearden (2014) demonstrate that spending one's last available funds in a budget reduces the satisfaction consumers receive from their purchases.

Research on alternative payment methods often compares different settlement systems along with one single dimension, termed *saliency* (Kamleitner & Erki, 2013; Morewedge et al., 2007; Soman, 2003; Sterman, 1989). In particular, payments are deemed to be salient if they exhibit higher transparency, rehearsal level, relative speed of wealth depletion, and spending limit rigidity. Notably, the saliency of a payment method is closely related to the pain consumers perceive in the process of parting from their own funds.

## **2.5 Executives' Personality and Firm Results**

Despite the responsibilities, duties, and powers of firms' boards of directors being set by corporate regulators and state laws (Chatterjee & Hambrick, 2007), top executives influence the companies they manage (Certo, Lester, Dalton, & Dalton, 2006) by means of their personalities, experiences, and dispositions (Carpenter, Geletkanycz, & Sanders, 2004; Reger, Finkelstein, & Hambrick, 1997). Consistent with this argument, several studies show that the characteristics of companies' board of directors affect firm strategy and accounting practice. For example, Finkelstein (1990) finds the tenure of corporate executives is associated with lower levels of strategic dynamism. Further, the average amount of formal education and cultural diversity amongst the management team increases the willingness of companies to undertake strategic changes (Wiersema & Bantel, 1992). Extant research also shows that a higher percentage of outside directors reduces the likelihood of financial fraud (Beasley, 1996; Dechow, Sloan, & Sweeney, 1996; Farber, 2005). Similarly, the presence of external board members reduces the

probability of earnings management practices (Bowen, Rajgopal, & Venkatachalam, 2008; Klein, 2002; Peasnell, Pope, & Young, 2000; Xie, Davidson, & Dadalt, 2003). In addition to influencing financial reporting, the characteristics of a firm's management team also influence analyst ratings (Wright, 1996) and debt ratings (Anderson, Mansi, & Reeb, 2004; Ashbaugh-Skaife, Collins, & Lafond, 2006).

While the features of the entire board of directors are relevant drivers of corporate outcomes, a parallel field of literature focuses on the characteristics of CEOs (Reger et al., 1997; Sanders, 2001; Zajac & Westphal, 1996). Such interest stems from the fact that, despite no CEO being able to make completely autonomous decisions (Dimaggio & Powell, 1983; Hannan & Freeman, 1977; Lieberman & O'Connor, 1972), it is generally accepted they are afforded the greatest discretion (Finkelstein, 1990) in many strategic initiatives (Andrews, 1971; Chandler, 1966) and policies (Castellano & Lightle, 2005; Greiner & Bhambri, 1989). Research shows firm outcomes correlate with many innate CEO characteristics such as risk appetite (Osborn & Jackson, 1988; Thaler & Johnson, 1990), locus of control (Miller & Toulouse, 1986), dominance (Brown & Sarma, 2007) and individual experience (Menkhoff, Schmidt, & Brozynski, 2006).

Overwhelmingly, the personality trait of interest in the literature is overconfidence. Overconfidence has been shown to be both beneficial and harmful. On the one hand, several studies document that managerial overconfidence is advantageous for firms because it acts as a motivator (Campbell, Gallmeyer, Johnson, Rutherford, & Stanley, 2011) and facilitates the introduction of innovative products (Simon & Houghton, 2003). On the other hand, overconfidence can be detrimental as it is associated with risky decisions and related poor corporate performance. Overconfident executives undertake a higher number of value-destroying

acquisitions (Campbell et al., 2011; Malmendier & Tate, 2005; Roll, 1986) and in the process also pay larger purchase premiums (Hambrick, 1997). Overconfident CEOs delay the recognition of losses (Ahmed & Duellman, 2013), underestimate the probability of failures, and hinder organizational learning (Hsu, 2017). Furthermore, recent analyses find overconfidence is significantly related to biased financial reporting. Specifically, overconfident CEOs manipulate company dividend policies (Baker & Wurgler, 2013), misreport earnings (Hilary & Hsu, 2011) and are involved in financial fraud (Schrand & Zechman, 2012). Starting from this line of research, the present investigation aims to extend the academic literature that studies the relationship between CEOs' personalities and financial reporting practices.

## **2.6 Narcissism in the Psychology and Corporate Finance Literature**

The term narcissism was introduced in the psychology literature by Ellis (1898) more than a century ago. Freud extended the concept and identified several of its manifestations such as self-admiration and the need for continuous attention (Freud & Brill, 1917). By the end of 1980 more than a thousand books and articles discussed the subject (Raskin & Shaw, 1988). The word narcissism has an aura of negativity because in the early stages of investigation it was considered a pathological personality trait or mental disease (Emmons, 1987). Today personality theorists agree that narcissism should be simply considered a common trait that shapes one's character (Raskin & Hall, 1981). As such, all individuals can be placed on a continuum that ranges between very low to extremely high narcissistic tendencies (Campbell et al., 2004; Morf & Rhodewalt, 2001).

There are at least four fundamental characteristics that define narcissism. First, a narcissist is extremely focused on reaching their goals, and values personal achievements more than getting along with others (Campbell & Green, 2008; Morf & Rhodewalt, 2001). For this reason, it is generally assumed narcissists lack empathy and care little about others (Campbell et al., 2004). Second, narcissists have an inflated view of themselves (Baumeister, Smart, & Boden, 1996). They often rate themselves higher than average in areas of competence, intelligence, leadership, and creativity (Farwell & Wohlwend-Lloyd, 1998; Judge, Lepine, & Rich, 2006). Third, narcissists also tend to protect their exaggerated self-views (Raskin, Novacek, & Hogan, 1991) and react with hostility when they receive negative comments on their persona (Kernis & Sun, 1994). Lastly, narcissists have an inexhaustible desire for gratification and admiration (Foster & Brennan, 2011). In particular, they require such a “narcissistic supply” (Kernberg, 1975) to come from others (Wallace & Baumeister, 2002) and at frequent intervals (Buss & Chiodo, 1991). Notably, this craving for external appreciation is so extreme that narcissists often engage in bold and extravagant actions only to garner other people’s attention (Raskin & Shaw, 1988).

For the purpose of this research, it is relevant to distinguish narcissism from similar psychological constructs, namely hubris, Machiavellianism, self-esteem, and overconfidence. Narcissism and hubris share the presence of an inflated view of the self; however, they differ for at least two reasons. First, the perception of grandiosity in hubristic people is often induced by the perception of power (Roll, 1986), while a narcissist’s bloated ego is a personality feature that does not depend on the context. Second, hubris generates the expectation that the exaggerated self will be rewarded while narcissism requires constant confirmations (Chatterjee & Hambrick, 2007).

Machiavellianism and narcissism are both focused on the achievement of personal goals; however, they differ in terms of how they strive for success. Machiavellianism condones the use of unethical behaviour when necessary as it is characterized by a cynical disregard of morality (Wakefield, 2008). On the other hand, narcissists can cope with failures and do not need to distort reality because they have enough self-confidence and adaptability to accept their missteps (de Vries & Miller, 1985). Additionally, Machiavellianism is not linked with self-enhancement, which is one of the main features of narcissistic individuals (Paulhus & Williams, 2002). Emmons (1987) finds that self-esteem and narcissism are two traits significantly correlated as they both encompass a great deal of self-admiration. However, it is important to highlight that narcissists have an exceedingly fragile image of themselves (“contingent self-esteem”) (Kernis, 2005) which explains why they need continuous positive feedback (Zeigler-Hill & Jordan, 2012). Vice versa, this necessity is absent in the case of high levels of self-esteem as such individuals show emotional stability and internal locus of control (Judge, Bono, & Thoresen, 2003).

Tangential to this study is the distinction between narcissism and overconfidence as a body of literature has investigated the relationship between overconfident executives and accounting practices, with mixed findings. Overconfident people are known to suffer from a miscalibration bias (Ben-David, Graham, & Harvey, 2010) that causes: (i) illusion of control; (ii) high commitment to positive outcomes; and (iii) the use of abstract reference points (Langer, 1975; Weinstein, 1980). As a result, overconfidence is significantly related with a number of corporate outcomes such as dividend policies (Baker & Wurgler, 2013), R&D investments (Hirshleifer, Low, & Teoh, 2012), company acquisitions (Brown & Sarma, 2007), and investment decisions (Cooper, Woo, & Dunkelberg, 1988). Although overconfident people have

honest personal beliefs (Hsu, 2017), their perceptions tend to be biased and cause the minimization of unfavourable information and negative feedback (Åstebro, Jeffrey, & Adomdza, 2007). Related to this point, it is interesting to notice that Schrand and Zechman (2012) find a positive correlation between managerial overconfidence and fraud. As opposed to overconfidence, narcissism comprises a much wider set of characteristics (Campbell et al., 2004). Both narcissists and overconfident people are overly positive about their own abilities; however, the latter tend to overestimate the capabilities of other individuals too. Most importantly, narcissists do not ignore negative feedback but aggressively respond to such feedback (Kernis & Sun, 1994) with corrective decisions (Campbell & Green, 2008), actively defending their self-image (Morf & Rhodewalt, 2001) and fostering an impression of supremacy regardless of any recent missteps.

Extant studies in psychology literature develop several theoretical frameworks that describe what motivates the actions of narcissistic individuals. Despite narcissists viewing themselves as superior entities, they are extremely consumed with what other people think of them (Morf & Rhodewalt, 2001). Narcissists constantly ask for others' opinions because their exaggerated self is often not supported by reality and therefore it needs external endorsements to stand on its own. Narcissists assign great importance to the feedback they receive, to the point that much of their daily actions are directed towards receiving signals supporting their grandiose self. With this in mind, Raskin et al. (1991) conclude that external approval and the audience's admiration are the strongest stimuli to inspire a narcissist's will. Consistent with this view, Foster and Trimm (2008) suggest that narcissism also correlates with a strong "approach motivation". In other words, narcissists are predominantly motivated by the desire to achieve what they consider a positive outcome (Elliot,

1999). This finding is confirmed by Foster and Brennan (2011) who complete the picture by showing that narcissists also exhibit a weak “avoidance motivation”. This suggests that individuals with narcissistic features can face negative stimuli and not necessarily abscond. In this light, Morf and Rhodewalt (2001) suggest that narcissism leads to “dynamic self-regulation”. Narcissists make good use of both positive and negative feedback. On the one hand, applause and acclaim help the pursuit of a narcissist’s main goal – the reinforcement of his grandiose self. On the other hand, criticism serves to adjust and fine-tune one’s self-image and to make it more objective in case it does not match reality.

The commonly held view of executive narcissism is that such a personality trait leads to negative consequence (Amernic & Craig, 2010). However, it is incorrect to assume that narcissistic CEOs always underperform (Judge et al., 2009; Maccoby, 2003). Narcissistic leaders are often described as visionaries (Deutschman, 2005) who can attract and retain loyal employees (Hogan, Curphy, & Hogan, 1994). Narcissists are also charismatic (Deluga, 1997) and excel in typical leadership activities such as decision-making and environmental scanning (de Vries & Miller, 1985). Further, a narcissist’s desire for recognition makes them extremely determined in pursuing their goals (Campbell, Reeder, Sedikides, & Elliot, 2000; Wallace & Baumeister, 2002). Early empirical studies on CEO narcissism assessed its impact on corporate risk-taking (Li & Tang, 2010; Resick et al., 2009; Wales, Patel, & Lumpkin, 2013). Consistent with the psychology literature, narcissists engage in riskier transactions because their inflated self-view reinforces their ability to succeed (Chatterjee & Hambrick, 2007). Additionally, bold decisions are highly visible, which in turn satisfies a narcissist’s desire for exhibitionism (Resick et al., 2009). Narcissistic CEOs undertake more frequent and larger acquisitions (Chatterjee & Hambrick,

2007) as well as authorize larger investments (Ham, Seybert, & Wang, 2018). As a result, higher levels of executive narcissism correlate with greater strategic dynamism, which can result in either larger profits (Lieberman & Montgomery, 1988) or larger losses (Finkelstein, 2003). Narcissistic leaders tend to be forces for change (Rosenthal & Pittinsky, 2006), which is relevant especially when companies are underperforming. In these cases, the future performance of a company depends on a CEO's willingness to undertake organizational turnarounds (Latham & Braun, 2011). The literature further suggests narcissists lack empathy concerning decisions such as redundancies and cost-cutting measures. In line with this view, Patel and Cooper (2014) find that narcissist leaders deliver better financial performance when it comes to helping firms recover from negative shocks. However, this result does not apply under normal business conditions. In particular, Chatterjee and Hambrick (2007) highlight that, in normal conditions, CEO narcissism is associated with greater variation in financial performance.

Recent research investigates how narcissism affects accounting choices (Dworkis, 2013; Hales et al., 2012; Schrand & Zechman, 2012). Olsen, Dworkis, and Young (2014) find that narcissistic characteristics of CEOs are positively associated with accounting-related measures such as earnings per share and stock price. This effect can be explained by the view that narcissistic executives are more likely to manipulate accounting numbers to enhance their public image (Anderson & Tirrell, 2004). Consistently, Rijsenbilt and Commandeur (2013) detect the existence of a positive relationship between CEO narcissism and accounting fraud misstatements. Capalbo et al. (2018) also find that narcissism is positively related to the practice of earnings management. All of this empirical evidence can be explained by the fact that accounting and corporate financial disclosure provide narcissistic CEOs the



opportunity to obtain the praise they crave (Foster & Brennan, 2011). For example, quarterly forecast updates offer narcissistic CEOs the chance to be the centre of attention (Chatterjee & Hambrick, 2007). Nonetheless, it is important to recognize that narcissistic CEOs also influence reported earnings via real operational choices such as price discounts or overproduction (Roychowdhury, 2006).

## **2.7 Overview of Accounting Conservatism**

Penndorf (1930) reports that even during the 15<sup>th</sup> century in medieval Europe, cautious asset valuation was a predominant practice. Consistent with this view, Leftwich (1983) notes that when private companies depart from the Generally Accepted Accounting Principles (GAAP), they err on the side of greater prudence. Despite its fundamental role in financial reporting, there is not a generally recognized definition of accounting conservatism (Givoly & Hayn, 2000). Officially, the Financial Accounting Standard Board (FASB) outlines that conservatism implies a “prudent reaction to uncertainty” to make sure that “risks inherent in business situations are adequately considered”. However, it should be noted that such a definition does not explain what sort of prudent reactions should be undertaken nor does it specify how these reactions are meant to protect companies from business risks (Givoly & Hayn, 2000). Other definitions of accounting conservatism tend to be more descriptive. For example, Basu (1997) interprets conservatism as an accountant’s disposition to demand higher verification for reporting good news than negative news. According to Givoly and Hayn (2000), the doctrine of prudence implies that, when in doubt, one should choose the option with the least favourable outcome, namely to report assets and revenues at their lowest values, but liabilities and expenses at their highest (Belkaoui, 1985). Consequently, the book value of a

company's assets will always be understated with the positive outcome that executives will have less available resources to use for detrimental or non-profitable payouts (Lafond & Roychowdhury, 2008).

There are a number of valid explanations to justify the practice of accounting conservatism and the consequent use of asymmetric standards for the financial reporting of losses and bad events vis-à-vis recognizing profits and good news (Lafond & Roychowdhury, 2008). First, accounting conservatism reduces the agency problem between shareholders and executives that arises due to managerial opportunism (Ball, 2001; Ball & Shivakumar, 2005; Watts, 2003) and the separation of ownership and control (Jensen & Meckling, 1976). While shareholders have long term horizons, executives are typically interested in short term results (Lafond & Roychowdhury, 2008) that determine their remuneration (Watts, 2003). Conservatism thus prevents executives from being overcompensated by limiting their ability to inflate current earnings (Ahmed et al., 2002), overstate net asset values (Watts & Zimmerman, 1986), or delay the termination of loss-making projects that in the short term increase a firm's bottom line (Ball, 2001). Second, LaFond and Watts (2008) and Kim and Pevzner (2010) suggest that conservative accounting improves the relationship between informed and uninformed equity investors by reducing information asymmetry. Third, accounting conservatism improves debt contracting as it adds a layer of protection for creditors (Ahmed et al., 2002; Ahmed & Duellman, 2007; García Lara et al., 2009) by identifying possible debt covenant violations earlier (Zhang, 2008) and reducing a manager's ability to transfer wealth from bondholders to shareholders via payout policy (Ahmed et al., 2002). Additionally, Bickler (1979) notes that creditors prefer conservative practices as their claims are more sensitive to negative news than

positive news. Consistent with this point, firms with more prudent accounting enjoy narrower spreads in the secondary bond markets (Wittenberg-Moerman, 2008). Fourth, well-intentioned executives can take advantage of conservative accounting practices (Ball, 2001) by being able to take corrective actions earlier (Hsu, 2017), pivot, and improve returns on investments (Ahmed & Duellman, 2011; Francis & Martin, 2010) to increase the value of the firm (Watts, 2003, 2006). Basu (1997) summarizes these notions stating that accounting conservatism plays an ex-ante role in regulating relationships between the different parties involved in firms. Similarly, Watts (2003) describes accounting conservatism as an ‘efficient contracting technology’. Nevertheless, it should be noted that accounting conservatism can also have negative consequences. For example, Ahmed and Duellman (2013) argue that the practice of reporting revenues more slowly than expenses (Givoly & Hayn, 2000) creates distortions by limiting the communication of firms’ future potential. Furthermore, excessive accounting conservatism may lead to the premature cessation of valuable investments for the sole reason they had initial negative cash flows (Ahmed & Duellman, 2011).

The practice of accounting conservatism has serious economic consequences (Ho, Li, Tam, & Zhang, 2015) to the extent that prudent financial reporting is closely tied with the debate about inflated stock prices (Givoly & Hayn, 2000). On the one hand, practitioners argue that today’s market values are artificially inflated as measured against historical market-to-book ratios and earnings multiples. On the other hand, in recent times, accounting practices have become more conservative, resulting in a biased view that there is no evidence to claim an inflated market setting. Givoly and Hayn (2000) support the latter and show that over recent decades, the average profitability of companies has declined; however, their cash flows remained stable.

Similarly, they also claim that consistent with higher accounting conservatism, negative non-operating accruals have dramatically increased, while firms' distributions have become more dispersed and negatively skewed. At least two reasons explain why recent financial reporting could have increased in conservatism. First, political and regulatory forces have steered towards that direction to reduce social and contracting costs. Consistent with this point, Basu (1997) highlights that the FASB started to require the inclusion of formerly off-balance sheet liabilities such as environmental costs, pension benefits, and employees' health obligations. Second, auditors' legal liability for the late disclosure of negative news has continually increased (Skinner, 1994). In this view, the increase in accounting conservatism is a response to reduce accountants' exposure (Basu, 1997). Elliott and Shaw (1988) support this hypothesis by proving that from the early 1980s there has been an abnormal increase in companies' write-offs.

Several studies on accounting conservatism focus on its determinants at a company level. In other words, researchers have focused their attention on understanding what makes a firm more conservative vis-à-vis another. The majority of the research confirms judicious financial reporting is a tool to address agency issues within the firm. For example, Lafond and Roychowdhury (2008) show that the demand for accounting conservatism arises especially when managerial ownership declines. Other studies confirm this finding and add that the percentage of inside directors within the board positively affects the timeliness with which companies report their losses (Ahmed & Duellman, 2007). Ball and Shivakumar (2005) show that the type of ownership affects a firm's accounting conservatism, whereby private companies tend to be less prudent than public ones.

A recent area of interest regarding accounting conservatism seeks to explore drivers concerning CEO characteristics and personalities. Aligned with this proposition, some studies find that the gender of a company's top executive may affect corporate financial reporting. In particular, Ho et al. (2015) find that companies run by female CEOs tend to be more conservative. Turning the focus on managers' characteristics, Ahmed and Duellman (2013) find robust evidence that overconfident executives tend to postpone the accounting recognition of negative events; thus they are associated with lower accounting conservatism. The second empirical investigation in this dissertation aims to extend the currently limited literature on this topic and as such, we test whether there is a significant relationship between accounting conservatism and CEOs' levels of narcissism.

## **2.8 History and Institutional Details of the Hong Kong Dollar**

The Bank of International Settlements describes the foreign exchange market as the biggest and most liquid financial market in the world with an average daily turnover of US\$6.6 trillion in April 2019 (BIS, 2019). Currency markets operate under the spectrum of fixed or floating regimes. Under a fixed exchange rate regime, a currency's value is set and maintained by a government; in free-floating regimes, the fluctuations in exchange rates are determined by free-market forces and affected by several factors such as macroeconomic news (information regarding a country's inflation, economic growth, productivity, and its trade balance) and political aspects (government instability, decisions on future budgets, and changes in fiscal and monetary policies). Target-zone arrangements, like the one in place in Hong Kong, are a special case of a combination of fixed and free-floating regimes that allow

exchange rates to adjust to their fundamentals while ensuring relatively stable trading conditions, with an upper and lower boundary price set and maintained by a government.

The Hong Kong Dollar (HKD) is the official currency of Hong Kong and is also commonly used in the bordering region of Macau. The HKD operated under the silver standard until 1935 when the Hong Kong Monetary Board decided to move towards an exchange rate pegged to the British sterling (Zhang, 2002). With the exception during the Second World War, the HKD remained pegged to the sterling until July 1972, after which it was pegged to the US dollar at a fixed rate plus a fluctuation margin of 2.25%. After November 1974, the HKD became a free-floating currency but on October 15, 1983, the Hong Kong authorities chose to revert to the previous system — pegged to the USD at a fixed conversion rate of HK\$7.80 per 1US\$. Additional features introduced persist today, such as the requirement from the Hong Kong Monetary Authority (HKMA) that the monetary base is at least fully matched by foreign reserves (Huang, Neftci, & Guo, 2008; Lo et al., 2015; Zhang, 2002). Notably, an element unique to the Hong Kong regime is that while the HKMA directly manages the HKD supply, the actual issuance of banknotes is licensed to three commercial banks – HSBC, Standard Chartered, and Bank of China. Today the HKD is pegged to the USD within a target-zone that ranges between HK\$7.75 (strong side) and HK\$7.85 (weak side) per 1US\$. The HKMA can always maintain the HKD exchange rate at or above the strong side of the target-zone by selling domestic currency in exchange for foreign reserves. Vice versa, the central bank can prevent the HKD from breaking at the weak side of the target-zone by purchasing domestic currency with foreign reserves. As a consequence, the HKD target-zone

can be supported only as long as the HKMA possesses adequate foreign reserves (Lo et al., 2015).

The exchange rate setup of the HKD has always been a key characteristic of the Hong Kong economy (Huang et al., 2008) as it helped the country to move from an uninhabited island into a developed trading and financial hub (Tang, 2002). Hong Kong is currently one of the world's largest financial hubs and commercial ports, which explains why, as of April 2019, the HKD is the ninth most traded currency (BIS, 2019). The HKMA aims to preserve the pegged exchange rate and to stabilize the related interest rate (Huang et al., 2008). Empirical evidence shows the HKD traded relatively close to its fundamental value up until 1995 when it started a brief period of overvaluation (Zhang, 2002). With the onset of the Asian financial crisis in 1997, the HKMA was under severe pressure (Tang, 2002; Zhang, 2002) and the HKD suffered from several speculative attacks (Quah, 2012). The HKMA was able to sustain speculative attacks due to its large foreign exchange reserves; however, in 1998 the Hong Kong government decided to launch a program of monetary stabilizing reforms. These conditions led the HKMA to make progressive adjustments to the HKD exchange rate mechanism which finally came into its current form on the 18<sup>th</sup> of May 2005.

Empirical research on the current HKD target-zone has focused on the practical consequences of the target-zone regime. Huang et al. (2008) show the current peg induces a positive correlation between the US Treasury curve and the HKD swap curve. Rodríguez and Rowe (2007) further show Hong Kong's gross domestic product is strongly impacted by the US monetary policy due to the pegging system that ties their economies and the difference in their relative sizes. Another area of interest within the research on the HKD regards the validation of alternative

currencies to substitute the USD in the pegging arrangement. While the current HKD peg has become more and more credible over time (Genberg, 2011; Lo et al., 2015), in the last two decades authors started questioning whether it would be beneficial to move the nominal anchor to the Chinese Yuan (CNY) due to the increasing economic ties between the two countries (Tang, 2002). The literature on this topic suggests a monetary unification between China and Hong Kong could bring potential benefits (Kim, 2007; Zhang & Sato, 2008); however, Quah (2012) argues that the Japanese Yen (JPY) could also be a good monetary anchor.

## **2.9 Financial markets with price boundaries**

Target-zone regimes represent instances of price boundaries within the context of the foreign exchange market. The idea of target-zone regimes became increasingly important after the signing of the Louvre Accord on February 22, 1987 (Krugman, 1991). Theoretical research in the area of foreign exchange markets has sought to understand the functioning of exchange rate target-zone regimes due to the relevance that this topic has for public policy (Sarno & Taylor, 2001) – the greater flexibility implied in a target-zone system makes it more appealing than a strict peg, due to the lower level of intervention required to maintain a set exchange rate. Early contributions to the subject are provided by McKinnon (1982), Williamson and Miller (1987), and Dumas (1992); however, the predominant framework on how price boundaries affect exchange rates is established by Krugman (1991). The theory from Krugman (1991) is based on a stochastic model in a world where prices are flexible and the economic agents have rational expectations (Duarte et al., 2013). Further, the target-zone exchange rate is perfectly credible and the relative monetary authority defends it with marginal interventions only (Bekaert & Gray,



1998). One of the main implications of this model regards the behaviour of the exchange rate within the band. Specifically, the currency's price is expected to exhibit a strong mean-reverting pattern (Anthony & Macdonald, 1998) and the volatility of the exchange rate should be lower in the proximity of the target-zone's edges (Bekaert & Gray, 1998). However, Krugman's honeymoon effect predictions have been consistently rejected empirically (Duarte et al., 2013). This situation is at odds with the fact that the model from Krugman (1991) is still the baseline from which researchers start their investigations on the impact of price boundaries in the foreign exchange market.

The literature on price boundaries is more developed in the context of equity and futures markets. This is because price limit rules became ubiquitous in financial markets (Imtiaz & Azhar, 2018) after the Brady Commission (1988), as a result of the 1987 market crash, pursued changes in the regulations of financial exchanges (Kim & Yang, 2004) to reduce the negative effects of abnormal market conditions. The function of price limits rules is to constrain – either with trading halts or by rejecting extreme quotes – the trading activity of certain assets when their daily prices move too much from a reference point. Despite a great deal of research on the topic, academics have not reached a consensus view on how this type of regulation affects markets and their participants' decisions (Kim & Limpaphayom, 2000). Proponents for price limits in equity and futures trading argue such regulations do not negatively interfere with normal market activities (Cho, Russell, Tiao, & Tsay, 2003); rather, they promote efficient trading in times of severe uncertainty (Goldman & Sosin, 1979). For example, Kim and Yang (2004) advocate that setting a ceiling and a floor for the daily price of an asset prevents panic among investors and reduces speculative trading. Some researchers also argue that the existence of

price limits indirectly produces a cooling-off effect on the markets. Another advantage of price limits is that the related trading halts give brokers more time to contact their clients and thus trading decisions will be better aligned with investors' opinions (Kim & Yang, 2004). Additionally, Chowdhry and Nanda (1998) argue that price limits enhance market stability because such mechanisms automatically exclude extreme market prices that are potentially destabilizing. Kodres and O'Brien (1994) develop a theoretical model for which imposing price limits on the value of futures contracts benefits market participants as it improves risk-sharing among investors.

However, opponents explain there are multiple reasons why price limit rules should be revoked. For example, Fama (1989) claims high volatility is not necessarily a negative feature for efficient markets as it is a physiological reaction to changes in the assets' fundamental values. Consequently, price limits are a set of sub-optimal regulations because they aim to achieve the wrong objective. Others accept regulators' intention to curb markets' volatility yet they contend the negative consequences of price limit rules outweigh their benefits (Kim & Yang, 2004). Ackert, Church, and Jayaraman (2001) claim price limits cause perverse trading interferences because such trading halts damage the markets by reducing available liquidity. Additionally, trading halts also penalize investors who are prevented from hedging the risk of ownership when transactions are interrupted (Alchian & Allen, 1969). Another criticism of price limit rules regards their interference in the natural movement of assets' valuations (Lee, Ready, & Seguin, 1994). This is an issue because, in the event of information being released to the markets, constrained prices may not be allowed to reach their new equilibrium (Telser, 1981). As a result, there will be friction in the markets due to certain investors postponing their trades

until the current valuations are more aligned with the assets' fundamentals (Kim & Sweeney, 2000) which in turn causes delayed price discovery (Lehmann, 1989). Further, some authors contend price limits do not reduce the absolute volatility in the markets as this is only spread across a longer period of time (Yan Du et al., 2009). Such a hypothesis is often referred to as volatility spillover (Kim, 2001; Kim & Rhee, 1997; Kuhn, 1992) and it has been empirically validated by Lee et al. (1994) and Corwin and Lipson (2000) who find price movements are wider in the days after price limit hits.

## **2.10 Behavioural impact of price boundaries**

Both proponents and opponents to price boundaries focus on their effects after such mechanisms are introduced. However, extant research has also sought to examine ex-ante impacts. A well-known feature of financial markets is that structural limitations facilitate the occurrence of perturbations and intraday regularities. For example, several studies document trading volumes, returns, and prices' volatility present cyclical U-shaped trends (Gerety & Mulherin, 1992). Admati (1988) suggests the above patterns are caused by the periodical opening and closing of transactions and they would disappear if markets were open 24 hours a day. In line with this theory, Brock and Kleidon (1992) claim the majority of deals around the market open represent trades that would have already happened if investors were able to transact earlier in the day. Similarly, market closures heighten trading activity because an investor's optimal portfolio differs during trading and non-trading hours (Gerety & Mulherin, 1992). Additionally, Slezak (1994) suggests market closures relate to higher volumes as they dictate higher risks on both informed and uninformed traders. Price bounded markets are characterized by structural

limitations in trading activity; therefore, in light of the above literature, many authors predict this type of arrangement could generate frictions similar to those at the beginning and end of each trading session (Wong, 2009).

Extant research confirms price boundary regulations induce ex-ante behavioural effects in the equity and futures markets (Hsieh, Kim, & Yang, 2009). In other words, price limit rules affect investors' decisions even before assets' values hit their limits and thus normal trading activity is hindered (Hall, 2001). The most studied of these phenomena is commonly referred to as the "magnet" or "gravitational" effect to describe the scenario in which the more the assets' valuations approach their price limit, the more they will accelerate towards the price limit itself (Cho et al., 2003). Such market anomaly emerges because the imposition of artificial price limits generates a self-fulfilling effect for which the anticipation of a trading halt (or the rejection of certain quotes) makes market participants herd in a way that will eventually disrupt the normal trading activities (Yan Du et al., 2009). Berkman and Steenbeek (1998) analyse the transactions of a Nikkei 225 futures contract traded on both the Osaka Securities Exchange (OSE), a major venue with strict price limit rules, and the Singapore International Monetary Exchange (SIMEX), a smaller exchange without circuit breakers. The authors find no clear evidence of the magnet effect, likely due to the arbitrage opportunities existing between the two venues. However, the study also shows that, consistent with the magnet effect hypothesis, trading volumes and price volatility decrease in OSE and increase in SIMEX when market values approach the price limits. Another study from Holder, Ma, and Mallett (2002) suggests that, consistent with the existence of a behavioural effect associated with price limit rules, investors overreact when current valuations approach their boundaries. Additionally, the paper finds that current and theoretical

futures prices diverge, on average, 3 hours before price limit rules are triggered and hence it is possible to predict when normal trading will be affected. Academics find additional proof for the existence of a magnet effect in equity markets. For example, Cho et al. (2003) investigate transactions in the Taiwan Stock Exchange and provide evidence that the assets' values are attracted by the upper price limits – notably, they fail to identify magnet effects for the lower limits. A subsequent study by Wong (2009) analyses the effects of price limits in the Taiwan equity market. In contrast with the earlier research, the author provides evidence in favour of the magnet effect on both sides of the price boundaries. This second study provides two additional contributions. First, it shows that similar to what happens in the futures markets (Berkman & Steenbeek, 1998), the magnet effect relates to higher volatility and trading spikes when values approach their price limits. Second, the influence of price limits is more intense when markets are dominated by uninformed investors. Vice versa, the magnet effect is less severe or absent when institutional investors are the most active market participants. Another empirical study of a behavioural impact of price limit rules is provided by Yan Du et al. (2009) who use data from the Korea Stock Exchange. In this study, the authors confirm the existence of the magnet effect near the price limits in terms of several variables such as price return, trading volume, volatility, order flow, and order type. They also report it takes approximately 20 minutes for market valuations to hit their price limits, and is persistent for all companies, regardless of their market capitalization. One of the few papers who fail to find a magnet effect in equity markets is provided by Abad and Pascual (2007) who use data from the Spanish Stock Exchange. However, the two authors specify the lack of a price attraction towards the limit could be due to the specific rules of the tested venue which only imposes very short trading halts.

Nevertheless, even if a magnet effect is not detected, the authors admit that trading activities are more volatile and intense on limit hit days.

## **2.11 Hypothesis Development**

Drawing on the above literature, this section introduces the three hypotheses linked with the empirical investigations in this dissertation. Specifically, Section 2.11.1 presents the reasons why the use of alternative payment methods should be associated with investors' disposition effect. Further, Section 2.11.2 delineates the hypothesis on the relationship between accounting conservatism and CEOs' narcissism. To conclude, Section 2.11.3 proposes an explanation for the existence of behavioural expectations, and the related market patterns, near the edges of the HKD's target-zone. The empirical tests for the hypotheses developed here are then reported in the following chapters.

### **2.11.1 Payment Saliency and the Disposition Effect**

Chapter 3 seeks to relate payment methods and the disposition effect with each other since the tendency to ride losers and sell winners is intimately linked with the buying and selling decision. We hypothesize that the disposition effect is larger when salient payment methods are used in the process of buying or selling assets. Vice versa, the propensity to anticipate profits and postpone losses should be reduced when investors decide to adopt less salient settlements. Specifically, we test:

*H3: Payment saliency is positively related to investors' disposition effect bias.*

There are at least three reasons why the emotional outcome underpinning the disposition effect is associated with a payment method's saliency.

#### **2.11.1.1      *Profits and Losses Recognition***

Scholars agree that the investors' disposition effect increases the more they become aware of the paper gains they can realize and of the paper losses they can suffer (Brown & Yang, 2017; Frydman & Rangel, 2014). This is because the awareness of possible profits and losses is what stimulates the feelings of pride and regret underpinning the desire to sell winners and hold losers. Individuals who adopt salient payment systems are assisted in recognizing and recalling the amounts involved in their trades. It follows that investors can easily estimate their net trading balance by comparing the current market values with what they remember to be their original purchase price. The result of such computation determines whether individuals will perceive pride or regret. Either way, the existence of one of these two feelings will likely lead to decisions affected by the disposition effect. For the opposite reason, individuals are more likely to forget the price they initially paid for their assets if they adopted a non-salient payment method (Soman, 2001). As a consequence, such investors are impeded from determining whether they are making a profit or a loss and therefore they will not be influenced by any emotion of pride or regret. The ultimate result is that such a category of individuals will be less affected by the disposition effect.

#### **2.11.1.2      *Greater Emotional Response***

The saliency of alternative payment methods also provides further incentives for investors to realize gains or avoid losses. On the one hand, extant literature suggests that salient purchases are emotionally unpleasant because they induce a higher pain of paying (Zellermayer, 1996). Investors who have experienced greater discomfort in the buying process should be more reluctant to realize losses to avoid suffering a

second time during the divestment process. It follows that these investors will be more likely to lock in losses and thus hold depreciated stocks for longer. Correspondingly, salient divestment systems should be associated with a greater disposition effect. Such relation comes from the fact salient asset sales induce traders to experience greater reward and satisfaction. As a consequence of these pleasant emotions, gains opportunities will become more and more appealing, increasing the propensity to realize winners and thus also individuals' disposition effect.

#### **2.11.1.3      *Postponed Mental Accounting***

A third reason why the saliency of alternative payment methods may be associated with the disposition effect lies in the relationship between this bias and mental accounting (Thaler, 1999). The purchase of an asset opens a mental account, while its sale corresponds to closing that same account. Frydman et al. (2018) however, identify exceptions. In particular, they find when the sale of an asset is promptly followed by a subsequent purchase, investors do not exhibit the disposition effect - as if their mental accounts did not close but simply rolled over. We predict the saliency of alternative payment methods produces similar effects as a result of its influence on investors' available wealth. In particular, non-salient divestments are associated with a longer temporal separation as these decisions produce only delayed results and no direct consequences on the resources an investor can utilize for individual consumption. Such elements ensure traders do not immediately come to terms with their losses (Gross, 1988; Shefrin & Statman, 1985) and hence their aversion to close unprofitable positions is reduced. Further, the reward that comes from locking-in profits is postponed and traders' gain propensity is reduced as well.



As a result of these two effects, we expect less salient settlements to be related with lower or no disposition effect.

### **2.11.2 CEO Narcissism and Accounting Conservatism**

The investigation developed in Chapter 4 is based on the idea that individuals appointed as CEO tend to assume personal ownership over the accounting results of the firms they manage (Amernic & Craig, 2010). Kutscher, Donaldson, and Lorsch (1985) find that top executives exhibit realization and accomplishment when their companies perform well, but they also feel disappointed during negative periods. Similarly to previous studies (Amernic & Craig, 2010; Capalbo et al., 2018; Olsen et al., 2014), we contend that such an emotion is stronger in the case of narcissistic CEOs because this trait implies a tendency to consider others as a projection of one's self (Chatterjee & Hambrick, 2007; Freud & Brill, 1917). Additionally, executives are the primary source of information about the firm's present and future performance (Lafond & Roychowdhury, 2008) and thus it is easy to understand why Schwartz (1991) claims accounting is the corporate function that offers the greatest narcissistic possibilities.

Several studies report that narcissistic executives tend to make biased decisions and eventually underperform or damage their firm's results. However, narcissism is a complicated construct that involves several apparent paradoxes (Morf & Rhodewalt, 2001). For this reason, we claim the relationship between narcissistic CEOs and accounting conservatism is not straightforward (Chatterjee & Hambrick, 2011). Prudent financial reporting implies two opposite behaviours: a timely identification of expenses and liabilities and a measured recognition of revenues (Givoly & Hayn, 2000). More precisely, scholars often refer to these two symmetrical approaches

respectively as conditional and unconditional conservatism (Ahmed & Duellman, 2013; Ball & Shivakumar, 2005; Beaver & Ryan, 2005).

#### **2.11.2.1      *CEO Narcissism and Conditional Conservatism***

Previous accounting research speculates that narcissistic CEOs would be associated with lower levels of conditional conservatism as they could be more willing to hide and withhold negative performance news (Amernic & Craig, 2010). Such unethical behaviour is likely since the release of adverse information would reduce positive praise. On the contrary, the most robust and updated theories in psychology literature lead to the opposite conclusion. Specifically, narcissistic CEOs who receive negative news should recognize them more readily than other executives. This is because, as opposed to Machiavellianism, narcissism does not involve the use of unethical means to achieve success (Wakefield, 2008). It follows there is no reason to believe narcissists who face negative results will deliberately lie and manipulate financial reporting more often than other managers. Narcissists exhibit low avoidance motivation (Elliot & Thrash, 2002; Foster & Brennan, 2011), which suggests they are better than average at accepting bad outcomes. Further, scholars claim that narcissism involves a stronger response to negative feedback (Kernis & Sun, 1994; Rhodewalt & Morf, 1998) consistent with expedient recognition of undesired performance results. Narcissistic CEOs may be willing to recognize losses in advance compared to other executives because such a decision is usually unexpected and unconventional; hence it is likely to provide them with what they want, namely to be the centre of attention (Chatterjee & Hambrick, 2007). Similarly, Teoh and Yang Hwang (1991) suggest that certain managers might voluntarily disclose negative news to signal their quality. If this holds true, narcissistic CEOs will be more willing to report bad news to prove they are better than their peers.

Another reason why narcissism can lead to the anticipation of negative information comes from the fact narcissists seek reinforcement via feedback (Morf & Rhodewalt, 2001). As a consequence, narcissists CEOs will control the performance of their projects more often than other executives, which in turn increases the chances negative news is accounted for in a timely manner. Lastly, Byrne and Worthy (2013) find that narcissists are better at foregoing short term results when this implies achieving larger future returns, while Patel and Cooper (2014) show that narcissistic CEOs perform better than their peers in the recovery process after economic shocks and financial crises. This is consistent with a timely recognition of negative news because, to be successful in such scenarios, firms need to undertake substantial retrenchments and cost-cutting decisions (de Vries & Miller, 1985). It follows the first hypothesis to be evaluated in Chapter 4 is whether:

*H4(A): CEO narcissism is positively related with conditional conservatism.*

#### **2.11.2.2 CEO Narcissism and Unconditional Conservatism**

Narcissists need constant support to sustain their inflated self (Kernis, 2005). Additionally, they are exhibitionists (Raskin & Shaw, 1988) who constantly crave recognition (Resick et al., 2009) and external praise (Wallace & Baumeister, 2002). It follows that narcissistic CEOs who receive positive performance news are likely to immediately recognize and eventually overstate such results to obtain the attention and praise they desire. This behaviour is similar to what narcissists do when receiving compliments and positive personal feedback: they overvalue the importance of such comments to the extreme of reinforcing and expanding their inflated ego. Such a claim is supported by previous theoretical and empirical research. For example, our assumption is consistent with the fact that narcissists are

highly approach motivated (Elliot & Thrash, 2002; Foster & Brennan, 2011) and are inclined to make active decisions for the achievement of their goals. From the above considerations, it follows that:

*H4(B): CEO narcissism is negatively related with unconditional conservatism.*

### **2.11.3 Behavioural expectations as the spot price approaches the edges of the HKD's target-zone**

Chapter 5 acknowledges recent empirical evidence casts doubt on the supposed efficiency of the foreign exchange market and suggests certain market valuations can be influenced by behavioural elements. For example, Evans (2018) detects that, contrary to what theory predicts, extraordinary market conditions tend to repeat around the time of calculation of the 4:00 pm WMR Fix<sup>4</sup>. Furthermore, Dominguez (1986) and Frankel and Froot (1987) state traders in the foreign exchange market generate forecasts without using all the available information and exhibit future expectations that are biased towards the direction that would benefit them the most (Ito, 1990). Extant research suggests behavioural expectations might be stronger in the context of exchange rate target-zone regimes. The first indication for this argument comes from the weak empirical performance of the model from Krugman (1991), which is based on the assumption that market participants have rational expectations. Further, Hall (2001) suggests a link between target-zone exchange rate regimes and equity and futures markets with price limit rules. Empirical

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<sup>4</sup> This is the most important benchmark in the spot foreign exchange markets. The exchange rates used to determine the value of the 4:00 pm WMR Fix come from three different platforms (Thomson Reuters Matching, EBS, and Currenex). The calculation methodology uses trades and quotes data during a 5-minute period from 3:57:30 to 4:02:30. Before the 15<sup>th</sup> of February 2015 the fix window was a 1-minute period from 3:59:30 to 4:00:30. The fix window has been extended to prevent dealers' collusion and the consequent benchmark manipulation.

research in financial markets with price limits detects the presence of boundaries generates ex-ante behavioural phenomena such as the gravitational effect and changes in the normal market conditions. Therefore, it is also possible that target-zone regimes are affected by behavioural elements.

The analysis aims to determine whether foreign exchange markets exhibit patterns consistent with behavioural expectations. To this end, the third empirical investigation included in this dissertation seeks to address such an issue by performing a behavioural exploration of the Hong Kong Dollar (HKD) target-zone when the currency's market valuation approaches its boundaries. Specifically, the third empirical investigation in this dissertation tests the following hypothesis:

*H5: Market valuations near the edges of the HKD's target-zone are associated with abnormal price and trading patterns.*

There are at least three reasons why HKD prices near the edges of the target-zone should be associated with abnormal market conditions and the surge of behavioural expectations.

#### **2.11.3.1      *Breaking the Peg***

Financial speculators have incentives to try and break currency pegs because 'winning such bets' has the potential to yield huge returns. The 16<sup>th</sup> September 1992 (also known as "Black Wednesday") is a classic example of a currency peg break down: on that day many speculators created a strong devaluation of the British Pound and forced the United Kingdom to withdraw from the European Exchange Rate Mechanism. Maintaining the HKD-USD peg requires the HKMA to constantly monitor the exchange rate and to modify the money supply accordingly. When the

HKD appreciates against the USD (i.e., when its value approaches HK\$7.75 per 1US\$) the HKMA needs to increase the monetary base. Such intervention seeks to reduce the value of the HKD as a consequence of the higher currency supply available in the market. For the opposite reason, when the HKD depreciates against the USD (i.e., market valuations close to HK\$7.85 per 1US\$), the HKMA needs to purchase HKD with foreign currency reserves. The latter case is the most complicated for the HKMA, as foreign exchange reserves are not unlimited and thus strong market pressures might reduce its ability to support the value of the currency and maintain the peg. Traders are aware of this situation; thus, if valuations rapidly approach HK\$7.85 per 1US\$ (the weak side of the target-zone), more and more market participants might anticipate a break in the peg, generating a self-fulfilling prophecy resulting in abnormal price patterns and altered market conditions driven by behavioural expectations.

#### **2.11.3.2      *Fear of Abnormal Market Conditions***

One can adapt the findings of Subrahmanyam (1994) who suggests market participants seek to avoid being locked in their positions when there are abnormal market conditions and market interventions. In the absence of price limitations, traders naturally split their transactions across different periods. However, in situations where price boundaries exist, traders understand the likelihood of a disruption to the normal trading activity is inversely related to the distance between current market valuations and the price limits (Hsieh et al., 2009). Consequently, market valuations approaching their boundaries induces behavioural fears of future trading impediments. This leads traders to anticipate their transactions, thus exacerbating the movements of the assets' valuations and increasing the variability of prices.

This element is relevant especially in the context of the HKD trading because the related target-zone is unchanged since May 2005. As a result, the event of the HKD approaching its price boundaries is highly salient because the values of the edges of the currency's target-zone are well known to anyone who operates in the foreign exchange market. It follows that traders are facilitated in forecasting imminent alterations in the market conditions which, in turn, exacerbates the behavioural impact associated with price boundaries (Subrahmanyam, 1995). This is different from what happens in the equity and futures markets, where the bounds are updated on a daily basis and the new limitations are not particularly salient because they are based on the values of the previous day's close prices.

### **2.11.3.3      *Technical analysis strategies***

Another explanation for the presence of behavioural expectations as the HKD valuations approach the edges of its target-zone is connected to the ubiquitous trading strategy of technical analysis in the foreign exchange market (Osler, 2000). For example, it has been reported that almost 30 percent of traders in foreign exchange markets use technical analysis as the primary tool for deciding on their transactions (Chinn, 1999; Wong, 1999). Additionally, surveys document more than 90 percent of foreign exchange traders accept technical analysis resources as either primary or secondary reference for trading in both London (Taylor & Allen, 1992) and Hong Kong (Lui & Mole, 1998). Among the most common forms of technical analysis, we find the identification of Support and Resistance levels (S&R) – areas of valuations where there is a sufficient quantity of demand and supply to stop prices from moving down or up, respectively (Pring, 2014). The existence of S&R strategies, and more broadly of technical analysis, suggests the presence of clustering and psychological barriers in financial markets (Mitchell, 2001). Further,

in the context of the HKD trading, the existence of pseudo price limits – the target-zone – is likely to induce a framing bias on the traders, which in turn facilitates to a greater degree the formation of clustering and psychological barriers near the values of HK\$7.75 and HK\$7.85 per 1US\$.



# **Chapter 3 . Payment Methods and the Disposition Effect: Evidence from Indonesian Mutual Fund Trading**

## **3.1 Introduction**

The empirical investigation included in this chapter studies and tests the first set of hypotheses presented in Chapter 2. Specifically, this chapter presents an analysis of the relationship between the saliency of investors' investment and divestment decisions and the magnitude of their disposition effect.

As presented in the literature review in the second chapter of this thesis, rational economic theories argue the use of alternative payment methods should not influence the behaviours of the decision-makers. In sharp contrast, different payment forms are shown to affect economic actors in many fields. For example, the literature in corporate finance documents the decision to use cash or scripts has important consequences in the outcomes of projects such as mergers, acquisitions, and the sale of corporate assets (Maksimovic & Phillips, 2001; Rhodes-Kropf et al., 2005; Shleifer & Vishny, 2003). Similarly, research in consumer behaviour supports the relevance of utilizing specific payment systems as their different saliency influences many aspects, including spending decisions (Hirschman, 1979), the formation of reference prices (Monger & Feinberg, 1997), and the individual evaluation of products (Prelec & Simester, 2001). While the topic of alternative transacting methods could have important consequences in the field of trading finance, extant research does not include any empirical investigation regarding the influence that such a factor has on the decisions made by traders and investors. The

ambition of the first empirical investigation included in this dissertation is to fill this gap in the literature. In particular, it investigates the connection between the use of alternative investment and divestment systems and the magnitude of investors' disposition effect. The decision to focus on the disposition effect is determined by the fact such behavioural bias is among the most common pitfalls affecting investors (Shefrin & Statman, 1985). Further, the tendency to hold onto losses and realize profits is tightly linked with the choice to buy or sell assets which, in turn, is convenient for a study that investigates the relevance of utilizing alternative payment methods. A better understanding of the disposition effect will interest several different economic actors as this bias has important repercussions on investors' returns and efficient asset pricing in financial markets. Additionally, documenting that the saliency of alternative transacting methods affects financial investors will confirm the importance of this factor and foster further empirical research.

The second chapter included in this dissertation presents an extensive literature review on the disposition effect and explains the behavioural reasons why individuals are affected by such bias. Additionally, Chapter 2 also points out the justifications underlying the impact that differences in the saliency of payment methods have on individuals' decision-making process. The first hypothesis included in this dissertation brings together these aspects. Specifically, H3 posits that investment and divestment methods with lower saliency should be associated with reduced magnitudes of the disposition effect, and vice versa. Such a relationship should exist because the saliency of a transacting system affects the recognition of the existence of profit and loss opportunities, the emotional response

that investors might have to such occurrences, and their psychological acceptance via mental accounting.

The remainder of this chapter is structured as follows. Section 3.2 describes the alternative payment methods available to the investors in our dataset. Sections 3.3 and 3.4 describe the data and the research design used to test hypothesis H3. Section 3.5 presents the descriptive statistics, Section 3.6 reports the empirical results, and Section 3.7 describes the robustness tests. Section 3.8 provides a summary of the chapter.

## **3.2 Payment Methods**

We test our hypothesis using a proprietary dataset that identifies how traders buy and sell holdings in Indonesian mutual funds. On the one hand, investors can settle their transactions in a traditional manner. With such a system, the processes of investing and divesting consist of an exchange between a certain number of financial instruments and an equivalent counter-value of fiat currency that is subtracted (for investments) or added (for divestments) to the investor's bank account. On the other hand, traders have the opportunity to transact with a less common system. Specifically, investors can directly trade their holdings for an equivalent value of other assets, avoiding intermediate monetary transactions. Conceptually, this payment method is similar to a fair barter between different types of securities. Suppose, for example, that a trader owns some equities from company A, whose market value is \$10 per share, and wants to buy a stock from company B, currently worth \$20 per share. In this situation, a switch transaction will result in an investment that is made by swapping two assets from company A for each security related to company B. For the rest of this chapter, we will refer to these two

transacting mechanisms as “cash” and “switch”, respectively. It is important to note that the term “cash” does not mean investors deal with banknotes in their hands; “cash” is the name we assign to the transacting mechanism involving new monetary flows that impact on a trader’s bank account and available liquidity. Investors are free to decide which payment method they prefer; both options have been the normal practice since establishment and fees are consistent across the payment methods. Irrespective of the payment method investors choose to trade with, all the transactions are settled at the end of the trading day at the security’s closing price.

### **3.3 Database Information**

The data extends from January 2013 to December 2016 and is provided by the Indonesian branch of an international investment management company. All the trades in our database are executed by local (i.e., Indonesian) investors and relate to participation in mutual funds. Our initial dataset comprises information on individual trades including transaction IDs, dealing dates, intermediary account identifiers, the direction of the trades (buy or sell), ISIN Codes to identify the involved securities, the number of units traded, the fund price, and the total amount for each transaction. Additionally, every trade has information regarding its specific investing or divesting method. We distinguish between a total of four types of transactions: cash purchase, switch purchase, cash sale, and switch sale. Further, we are also able to divide the transactions into five groups depending on the financial intermediary used to clear the deals. More precisely, our investors are categorized based on whether they trade via Foreign Banks and Intermediaries (FB), Local Banks and Intermediaries (LB), Insurance-Linked Products (ILP), Institutional

Investors (INS), and Individual Investors (IND)<sup>5</sup>. Such categorization is not negligible as previous papers find a substantial relationship between the disposition effect and traders' background characteristics (Shapira & Venezia, 2001; Talpsepp, 2011). Notably, the investment management company could not disclose investors' level information and therefore we are unable to control for traders' fixed effect or socioeconomic characteristics. Further, the data do not include information on investor characteristics.

### **3.4 Measuring the Disposition Effect**

Extant literature identifies several approaches to test the traders' disposition effect (Feng & Seasholes, 2005; Ferris, Haugen, & Makhija, 1988; Schlarbaum, Lewellen, & Lease, 1978). Several of these methods have been developed in light of shortcomings identified with data not including certain information on the transactions (Schlarbaum et al., 1978; Shefrin & Statman, 1985). One of the most common methods used to study the disposition effect is from Feng and Seasholes (2005) who test investors' propensity to realize gains and delay losses with the use of an OLS regression. Alternatively, other researchers investigate the disposition effect with the use of hazard models (Talpsepp, 2011). Both of these methods are well accepted in the literature because they allow for control for possible exogenous shocks (Frydman & Wang, 2020) and are particularly useful when the data utilized are rich in terms of investors' specific characteristics. Our dataset does not include such information and therefore we decided to test our hypothesis with the methodology suggested by Odean (1998a). This methodology is widely used in disposition effect analyses and is best suited for investigations like ours, where the

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<sup>5</sup> We do not investigate INS and IND investors due to small sample size issues.

disposition effect is tested for groups of investors (Feng & Seasholes, 2005). Further, the method from Odean (1998a) has an elegant and intuitive interpretation and does not suffer issues from portfolio turnover fluctuations like the model from Feng and Seasholes (2005).

The approach we apply requires defining what constitutes gains and losses. We consider as gains all the instances when at the end of the trading day an asset is worth more than the original purchase price. Conversely, when a security is valued less than its purchase price, we term it a loss. Gains and losses can be on paper (PG and PL) or realized (RG and RL), depending on whether the trader continues to hold the relative asset or closes the position that day. Such a definition of gains and losses implies that the reference point of an investor equals the original purchase price (Frino et al., 2004; Talpsepp, 2011). This assumption is consistent with previous literature (Gross, 1988; Odean, 1998a); however, Feng and Seasholes (2005) demonstrate the results are qualitatively the same when other values are used (e.g., highest, latest, and average purchasing price). For every round-trip, we follow the asset's valuation in chronological order, and we count how many times investors face paper gains and paper losses. Further, we check whether each position is closed with a realized gain or with a realized loss. Finally, we calculate each round-trip's proportion of realized gains (PGR) and losses (PLR) as follows:

$$PGR = \frac{RG}{RG + PG} \quad PLR = \frac{RL}{RL + PL} \quad (3.1)$$

On the one hand, PGR represents how much investors crave to lock-in winners. Intuitively, a high PGR implies a large propensity to realize gains. On the other hand, PLR exhibits the relationship investors have with their losses. More precisely, low

PLR values imply high loss aversion. Theory prescribes investors are rational decision-makers and they should be indifferent between realizing gains and losses as they should only focus on the expected price developments in order to maximize their future returns. In other words, we expect to see no difference in the aggregate proportions of realized gains and losses. Conversely, if the investors in our database are biased and suffer from the disposition effect, our analyses will reveal that the distribution of PGRs is significantly greater than that of PLRs.

### **3.5 Descriptive Statistics**

In Table 3.1, Panel A provides a summary of initial data on single side transactions. The majority of the trades analysed are performed by investors who transact through FB, LB, and ILP intermediaries. Combined, these three types of investors account for more than 97% of the trades investigated. The predominant means by which trades are settled is fiat currency (i.e., Indonesian rupiah) with 78% of the investments committing new money in the form of “cash” payments. Concerning the divestments, approximately 75% are settled via “cash” transactions.

Following extant literature, we analyse in chronological order each account identifier’s trading record to match purchases with sales (Grinblatt & Keloharju, 2000; Odean, 1998a; Talpsepp, 2011) and apply first-in-first-out (F.I.F.O.) accounting. We aggregate multiple purchases to build-up a single position and vice versa when it comes to divestment decisions to establish two-side or round-trip transactions (Feng & Seasholes, 2005; Shapira & Venezia, 2001; Talpsepp, 2011). Approximately 39% of all purchases are sold in a single sale. We do not consider open positions prior to January 2013 or after December 2016. This choice is obligated because we cannot determine whether these positions resolved in realized

gains or losses as we lack the information regarding either their initial purchasing price or the related final selling value.

In Table 3.1, Panel B provides a breakdown of the round-trip assessed. In particular, we show the details of those positions both opened and closed with “cash” (“Cash-Cash”) or “switch” (Switch-Switch) settlements. The final sample includes 142,685 observations with the vast majority deriving from investors classified as FB, LB, or ILP. Less than 1% of the round-trips we analyse relate to institutional investors (INS) or individual traders (IND). Consistent with expectations, the majority of round-trips in the sample (79%) consist of positions opened and closed with a settlement in terms of fiat currency. 21% of the round-trips analysed (29,913) did not involve monetary flows as the related trades were settled via asset switching.

In Table 3.1, Panel C shows the number of gains and losses realized by the traders in our sample. Investors who transacted with Cash-Cash round-trips realized 77,335 gains and 35,418 losses. Switch-Switch positions resulted in 20,849 gains and 9,059 losses. The sum of all gains (98,194) and losses (44,477) differs from the total number of round-trips in our sample by 29 units as this is the number of positions opened and closed at exactly the same price. Roughly two-thirds of the round-trips in our sample conclude with the realization of a gain. Such a proportion of realized gains is consistent with previous literature (Odean, 1998a; Schlarbaum et al., 1978). Additionally, this proportion does not significantly change when we compare round-trips that differ in terms of settlement methods or investor class. The only exceptions are the INS and IND subsamples because these groups of investors account for a very small number of round-trips.



**Table 3.1 Characteristics of trades (Panel A) and round-trips (Panels B and C) by investor class and settlement method**

Panel A:

	Buy Transactions			Sell Transactions		
	Obs.	%	Avg. IDR value	Obs.	%	Avg. IDR value
Cash	100,332	78	1,014,650,845	90,553	75	1,176,049,646
Switch	28,239	22	2,173,056,336	29,682	25	2,068,898,580
FB	71,775	56	1,498,956,234	68,171	57	1,509,838,047
LB	26,821	21	233,141,192	17,783	15	305,281,298
ILP	27,709	22	970,617,407	32,746	27	981,025,011
INS	1,550	1	14,795,003,539	914	1	30,150,884,961
IND	716	1	143,952,346	621	1	315,502,869
Total	128,571	100	1,271,506,055	120,235	100	1,401,611,081

Panel B:

	Cash - Cash			Switch - Switch		
	Obs.	%	Avg. IDR value	Obs.	%	Avg. IDR value
FB	49,545	44	548,475,716	28,737	96	1,206,141,905
LB	28,126	25	132,281,606	322	1	271,726,222
ILP	33,857	30	370,558,357	822	3	2,862,007,092
INS	987	1	12,844,145,209	2	0	13,510,577,547
IND	257	0	62,061,929	30	0	433,328,993
Total	112,772	100	498,049,670	29,913	100	1,241,719,259

Panel C:

	Cash - Cash			Switch - Switch		
	Gains	Losses	Gains %	Gains	Losses	Gains %
FB	34,403	15,128	69	20,064	8,668	70
LB	19,285	8,841	69	207	115	64
ILP	22,610	11,242	67	558	264	68
INS	856	131	87	2	-	-
IND	181	76	70	18	12	60
Total	77,335	35,418	69	20,849	9,059	70

This table reports descriptive statistics in terms of trade value (in Indonesian Rupees), settlement methods, and gains and losses realized. Our initial dataset includes raw information on the single side trades performed by Indonesian mutual fund investors between January 2013 and December 2016. Traders are allowed to settle their trades with two alternative payment methods ("Cash" or "Switch") which differ in terms of saliency. Specifically, Cash trades are more salient than Switch trades. Traders in our database are divided into five categories depending on the intermediary they deal with: Foreign Banks (FB), Local Banks (LB), Insurance Linked (ILP), Institutional Investors (INS), and Individual Investors (IND). Panel A summarizes data on the single side trades divided by investor class and settlement type. Panel B shows the details of the round-trips we use for our analysis on the disposition effect. Each round-trip derives from a combination of buy and sell decisions paired in chronological order with first-in-first-out accounting (F.I.F.O.). "Cash-Cash" round-trips indicate positions opened and closed with two Cash transactions. "Switch-Switch" round-trips indicate positions opened and closed with two Switch transactions. The majority of the round-trips we analyze are performed by traders classified as FB, LB, and ILP. Additionally, the majority of the round-trips assessed are Cash-Cash. Panel C shows details on the gains and losses realized by the traders in our sample. The ratio between realized gains and realized losses is similar to those of previous studies.

### 3.6 Results

Table 3.2 reports PGR and PLR summary statistics across payment methods and investors. Cash-Cash round-trips are associated with a positive and significant disposition effect: the relative PGR – PLR equals 0.019 and is statistically significant at the 1% level of significance. Similarly, the Switch-Switch round-trips present statistical evidence of the disposition effect (the average difference between PGR and PLR equals 0.008, significant at 1%). We compute the 5% confidence intervals for the difference in the PGR, PLR, and PGR – PLR of Cash-Cash vis-a-vis Switch-Switch round-trips. The 5% confidence interval for the difference in PGRs is strictly positive, indicating that Cash-Cash round-trips are associated with a greater proportion of realized gains vis-à-vis Switch-Switch. Consistently, the 5% confidence interval for the difference in PLRs is strictly negative. Such evidence shows Cash-Cash round-trips are associated with greater loss aversion. Again, the 5% confidence interval for the difference in the average values of PGR-PLR is strictly positive. These results suggest Cash-Cash round-trips are associated with a greater disposition effect than Switch-Switch round-trips. Lastly, it is important to consider the magnitude of the phenomenon here analysed. Although both Cash-Cash and Switch-Switch round-trips are associated with a positive and significant disposition effect, the magnitude of the bias is different between the two groups. Specifically, the Cash-Cash transactions have a disposition effect that is more than twice the size of the bias associated with Switch-Switch round-trips ( $2.375 = 0.019/0.008$ ). This is an economically meaningful difference in the behaviour of investors which impacts their trading performance, as the disposition effect is shown to lead to lower after-tax returns (Odean, 1998a).

**Table 3.2 Test for differences in the disposition effect: Cash-Cash versus Switch-Switch settlement methods**

	Cash - Cash		Switch - Switch		Difference	
	Obs.	Avg. Value	Obs.	Avg. Value	Avg. Value	C.I. @5%
PGR	104624	0.059	28527	0.054	0.005	( 0.0039 ; 0.0070 )
PLR	90294	0.040	21589	0.045	-0.005	( -0.0065 ; -0.0027 )
PGR - PLR		0.019***		0.008***	0.010	( 0.0066 ; 0.0135 )
t-stat		26.391		8.187		

This table presents the PGR and PLR ratios by settlement method, Cash-Cash and Switch-Switch, respectively. The third row refers to the size of the disposition effect (PGR-PLR) and its significance. The data presented in this table refer to our whole sample without distinction between investors' class. In the right section of the above table (labelled as "Difference") we test whether Cash-Cash and Switch-Switch round-trips are associated with statistically different levels of the disposition effect. We compute the 5% confidence intervals for the difference in PGR, PLR, and PGR-PLR. The results show Cash-Cash round-trips are associated with a greater disposition effect than Switch-Switch round-trips.

\* denotes t-statistic significant at 0.1 level;

\*\* denotes t-statistic significant at 0.05 level;

\*\*\* denotes t-statistic significant at 0.01 level

Table 3.3 reports the results of our analysis dividing the sample by investor class. Panel A expands our results for FB investors. Empirical evidence suggests FB investors suffer from the disposition effect regardless of the settlement methods they transact with. Specifically, the value of PGR – PLR is positive and significant for both Cash-Cash and Switch-Switch round-trips – the average difference equals 0.028 and 0.009, respectively. The right-hand side of Panel A shows FB investors exhibit a different disposition effect depending on the settlement methods they trade with. Consistently with what we find in Table 3.2, the 5% confidence intervals for the difference in the values of PGR and PLR are strictly positive and negative, respectively. Such evidence suggests Cash-Cash settlements are associated with both higher gain propensity and loss aversion relative to Switch-Switch round-trips. Further, the 5% confidence interval for the difference in the values of PGR – PLR is strictly positive, confirming Cash-Cash round-trips are associated with a greater disposition effect than Switch-Switch positions. Additionally, it is relevant to discuss the size of the difference in the disposition effect that has just been discussed.

Specifically, when FB investors deal with Cash-Cash transactions, they display a disposition effect that is more than three times the size of the bias they suffer when performing Switch-Switch round-trips ( $3.111 = 0.028/0.009$ ).

Panel B provides similar evidence and confirms LB investors suffer from the disposition effect in the case of Cash-Cash settlements (PGR – PLR is positive with a t-stat of 13.559). Yet LB investors exhibit a reverse disposition effect when they perform Switch-Switch round-trips as, in such cases, the average PGR – PLR value is negative and significant. Panel C reports our results regarding ILP traders. ILP traders exhibit a disposition effect in the case of Cash-Cash settlements as their PGR – PLR value is positive (0.006) and significant (t-stat equals to 3.877). Vice versa, ILP investors are not affected by the disposition effect in the case of Switch-Switch round-trips as the average value of PGR – PLR is not statistically different from 0.

The hypothesis development section outlines a list of possible explanations regarding the relationship between the use of different payment methods and the size of investors' disposition effect. The discussed results allow us to confirm the existence of such a relation, documenting that the limited bias in traders who use less salient payment methods derives from both a reduced loss aversion and a diminished appetite to realize gains. The results, however, do not permit us to identify which of the three mechanisms described (profit and loss recognition, greater emotional response, or postponed mental accounting) is responsible for the observed effect. It is important to emphasize that the results in this analysis cannot exclude the impact from any of the listed mechanisms. Therefore, the documented association between payment methods and the disposition effect may be driven by a combination of these mechanisms.

**Table 3.3 Test for differences in the disposition effect by investor class: Cash-Cash versus Switch-Switch settlement methods**

Panel A: FB

	Cash - Cash		Switch - Switch		Difference	
	Obs.	Avg. Value	Obs.	Avg. Value	Avg. Value	C.I. @5%
PGR	46277	0.061	27415	0.053	0.008	( 0.0058 ; 0.0094 )
PLR	38451	0.033	20740	0.044	-0.011	( -0.0129 ; -0.0087 )
PGR - PLR		0.028***		0.009***	0.018	( 0.0146 ; 0.0224 )
t-stat		28.760		8.775		

Panel B: LB

	Cash - Cash		Switch - Switch		Difference	
	Obs.	Avg. Value	Obs.	Avg. Value	Avg. Value	C.I. @5%
PGR	26493	0.043	310	0.042	0.001	( -0.0098 ; 0.0117 )
PLR	24355	0.027	241	0.062	-0.035	( -0.0533 ; -0.0159 )
PGR - PLR		0.016***		-0.020*	0.036	( 0.0061 ; 0.0650 )
t-stat		13.559		-1.828		

Panel C: ILP

	Cash - Cash		Switch - Switch		Difference	
	Obs.	Avg. Value	Obs.	Avg. Value	Avg. Value	C.I. @5%
PGR	30649	0.071	773	0.067	0.004	( -0.0074 ; 0.0148 )
PLR	26450	0.064	582	0.072	-0.008	( -0.0229 ; 0.0074 )
PGR - PLR		0.006***		-0.005	0.011	( -0.0148 ; 0.0377 )
t-stat		3.877		-0.551		

This table extends in detail the data shown in Table 2. Results are presented by investor class. We do not investigate INS and IND investors due to small sample size issues. Panel A shows the results for FB investors while Panels B and C repeat the same analysis for LB and ILP investors, respectively. The results we obtain are consistent with our hypothesis on the link between the saliency of settlement methods and the disposition effect.

\* denotes *t*-statistic significant at 0.1 level;

\*\* denotes *t*-statistic significant at 0.05 level;

\*\*\* denotes *t*-statistic significant at 0.01 level

## 3.7 Robustness Tests

### 3.7.1 Non-independent observations

Frino et al. (2004) argue the methodology from Odean (1998a) might produce biased results in the case of non-independent observations. This can be the case, for example, if the market moves substantially higher or lower than the average reference price of the traders' long positions. Our first robustness test addresses this issue as we apply a form of bootstrapping. Specifically, we repeat our test on a random subsample of the full dataset. To ensure the soundness of our test we reiterate the analysis 1000 times on new random samples made of 8000 round-trips per settlement method (i.e. Cash-Cash and Switch-Switch). Such a sample size is sufficiently small to ensure independency between observations while it is also large enough to prevent sampling errors. Table 3.4 exhibits the results of our first robustness test, which are similar to the main results in Table 3.2.

**Table 3.4 Robustness Test 1 - Bootstrapping**

	Cash - Cash		Switch - Switch		Difference	
	Obs.	Avg. Value	Obs.	Avg. Value	Avg. Value	C.I. @5%
PGR	8000	0.059	8000	0.053	0.006	( 0.0014 ; 0.0098 )
PLR	8000	0.040	8000	0.045	-0.005	( -0.0088 ; -0.0003 )
PGR - PLR		0.019***		0.008***	0.010	( 0.0018 ; 0.0186 )
t-stat		7.607		4.726		

This table presents the results of our first robustness test that controls for possible dependency between sample observations. We have applied a bootstrapping procedure reiterating 1000 times our previous tests on random subsamples made of 8000 observations each. This sample size is small enough to ensure independency between observations, but it is also large enough to prevent sampling issues. Here we display the average values for the 1000 tests we performed. Results are qualitatively identical to those obtained in Table 3.2. Specifically, both Cash-Cash and Switch-Switch round-trips are associated with a significant disposition effect; however, the bias is comparatively larger for the former group.

\* denotes t-statistic significant at 0.1 level;

\*\* denotes t-statistic significant at 0.05 level;

\*\*\* denotes t-statistic significant at 0.01 level

### **3.7.2 Tax Motivations**

Another possible explanation for our results could be related to tax-motivated decisions. Extant literature shows that investors prefer to sell their undervalued assets and thus realize losses at the end of the year (Lakonishok & Smidt, 1986; Odean, 1998a; Shefrin & Statman, 1985). If this is the case, it could be that our results are due to the fact traders predominantly adopt specific settlement methods in December but not during the rest of the year. More precisely, it could be that the Switch-Switch round-trips seem to be associated with a lower disposition effect because such settlement methods are used specifically for portfolio rebalancing at year-end. To rule out this possibility, we repeat our tests controlling for various monthly and seasonal combinations. Consistent with previous studies (Odean, 1998a), Table 3.5 shows the results of our analysis excluding from the assessment the round-trips closed in December<sup>6</sup>. The results are qualitatively similar to those in Table 3.2, indicating that Switch-Switch round-trips are associated with a lower disposition effect than Cash-Cash round-trips. This conclusion holds true for the entire sample (Panel A) and each investor class (Panels B to D).

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<sup>6</sup> The Indonesian tax year-end is on the 31<sup>st</sup> of December.

**Table 3.5 Robustness Test 2 - Analysis of the round-trips excluding December**

Panel A: Full sample

	Cash - Cash		Switch - Switch		Difference	
	Obs.	Avg. Value	Obs.	Avg. Value	Avg. Value	C.I. @5%
PGR	97454	0.060	26739	0.054	0.006	( 0.0042 ; 0.0074 )
PLR	83496	0.041	20258	0.046	-0.005	( -0.0065 ; -0.0025 )
PGR - PLR		0.019***		0.008***	0.010	( 0.0067 ; 0.0139 )
t-stat		25.522		7.802		

Panel B: FB

	Cash - Cash		Switch - Switch		Difference	
	Obs.	Avg. Value	Obs.	Avg. Value	Avg. Value	C.I. @5%
PGR	43267	0.062	25694	0.054	0.008	( 0.0058 ; 0.0096 )
PLR	35647	0.034	19461	0.045	-0.011	( -0.0130 ; -0.0086 )
PGR - PLR		0.028***		0.009***	0.018	( 0.0144 ; 0.0226 )
t-stat		27.554		8.454		

Panel C: LB

	Cash - Cash		Switch - Switch		Difference	
	Obs.	Avg. Value	Obs.	Avg. Value	Avg. Value	C.I. @5%
PGR	24637	0.044	294	0.040	0.004	( -0.0063 ; 0.0153 )
PLR	22495	0.028	225	0.066	-0.038	( -0.0581 ; -0.0183 )
PGR - PLR		0.016***		-0.027**	0.043	( 0.0119 ; 0.0734 )
t-stat		13.204		-2.327		

Panel D: ILP

	Cash - Cash		Switch - Switch		Difference	
	Obs.	Avg. Value	Obs.	Avg. Value	Avg. Value	C.I. @5%
PGR	28459	0.072	722	0.065	0.007	( -0.0042 ; 0.0182 )
PLR	24418	0.065	546	0.072	-0.006	( -0.0218 ; 0.0093 )
PGR - PLR		0.007***		-0.007	0.013	( -0.0135 ; 0.0400 )
t-stat		3.882		-0.695		

This table shows the results of our second robustness test that controls for possible effects of seasonal and tax motivated trading. We perform our analysis excluding the round-trips closed in December as they could relate with abnormal loss realization rates. Results are qualitatively identical to those obtained in Table 3.2 and Cash-Cash round-trips are associated with a larger disposition effect than Switch-Switch round-trips.

\* denotes t-statistic significant at 0.1 level;

\*\* denotes t-statistic significant at 0.05 level;

\*\*\* denotes t-statistic significant at 0.01 level



### 3.7.3 Size of the Transactions

Differences in transaction size could be associated with different levels of the disposition effect because such a factor affects the absolute value of traders' gains and losses. For example, the opportunity to realize the same 3% profit is much more enticing when the invested capital is \$100,000 than \$100. Similarly, traders are more reluctant to realize losses for larger capital investments than for smaller ones. In Table 3.1, Panel B shows that the average IDR value of Switch-Switch round-trips is greater than that of Cash-Cash transactions. This evidence suggests that if the round-trips' IDR value influenced our results, such an effect might have reduced the differences we find between Cash-Cash and Switch-Switch round-trips. Our third robustness test excludes from the assessment all those positions with initial investment greater than IDR 100,000,000 (roughly \$8,000). We chose this threshold as it reduces the dispersion of the transaction sizes between different investor categories and does not excessively reduce the sample size. Table 3.6 shows the results of our third robustness test at an aggregate level and divided by investor class. The results are in line with our theory and expectations as in all instances Cash-Cash round-trips are associated with a greater disposition effect than Switch-Switch round-trips. In particular, Cash-Cash round-trips are always associated with positive and significant PGR – PLR. Conversely, for Switch-Switch round-trips we can never reject the null hypothesis for which PGR – PLR is equal to zero. This robustness test further reinforces our main hypothesis and is consistent with the idea that larger transactions increase investors' disposition effect.

**Table 3.6 Robustness Test 3 - Analysis of the round-trips with similar IDR value**

Panel A: Full sample

	Cash - Cash		Switch - Switch		Difference	
	Obs.	Avg. Value	Obs.	Avg. Value	Avg. Value	C.I. @5%
PGR	54547	0.064	7070	0.056	0.007	( 0.0043 ; 0.0106 )
PLR	47742	0.047	5305	0.054	-0.007	( -0.0116 ; -0.0033 )
PGR - PLR		0.017***		0.002	0.015	( 0.0077 ; 0.0222 )
t-stat		15.769		0.714		

Panel B: FB

	Cash - Cash		Switch - Switch		Difference	
	Obs.	Avg. Value	Obs.	Avg. Value	Avg. Value	C.I. @5%
PGR	21418	0.067	6570	0.056	0.011	( 0.0073 ; 0.0145 )
PLR	17533	0.040	4905	0.054	-0.013	( -0.0179 ; -0.0088 )
PGR - PLR		0.027***		0.003	0.024	( 0.0161 ; 0.0323 )
t-stat		16.923		1.031		

Panel C: LB

	Cash - Cash		Switch - Switch		Difference	
	Obs.	Avg. Value	Obs.	Avg. Value	Avg. Value	C.I. @5%
PGR	17003	0.042	124	0.040	0.002	( -0.0063 ; 0.0153 )
PLR	15806	0.029	102	0.057	-0.028	( -0.0581 ; -0.0183 )
PGR - PLR		0.013***		-0.017	0.030	( 0.0119 ; 0.0734 )
t-stat		8.610		-1.103		

Panel D: ILP

	Cash - Cash		Switch - Switch		Difference	
	Obs.	Avg. Value	Obs.	Avg. Value	Avg. Value	C.I. @5%
PGR	15868	0.083	370	0.059	0.024	( 0.0081 ; 0.0393 )
PLR	14163	0.075	294	0.065	0.010	( -0.0114 ; 0.0312 )
PGR - PLR		0.007***		-0.007	0.014	( -0.0231 ; 0.0508 )
t-stat		2.964		-0.498		

This table shows the results of our third robustness test that controls for possible effects of transaction size. We perform our analysis excluding the round-trips exceeding IDR 100,000,000 (roughly \$8,000). Results are qualitatively identical to those obtained in Table 3.2 and Cash-Cash round-trips are associated with a larger disposition effect than Switch-Switch round-trips.

\* denotes t-statistic significant at 0.1 level;

\*\* denotes t-statistic significant at 0.05 level;

\*\*\* denotes t-statistic significant at 0.01 level

### **3.8 Summary**

This chapter has investigated the impact that alternative payment methods have on investors' trading decisions. Specifically, this chapter has studied the relationship between the saliency of investment and divestment methods and the magnitude of traders' disposition effect. Extant literature demonstrates that the use of alternative payment methods is a relevant aspect in both corporate finance (Maksimovic & Phillips, 2001; Rhodes-Kropf et al., 2005; Shleifer & Vishny, 2003) and in the field of consumer behaviour (Hirschman, 1979; Monger & Feinberg, 1997; Prelec & Simester, 2001). Further, existing studies detect the magnitude of investors' disposition effect is influenced by the saliency of certain aspects of a trade decision (Frydman & Rangel, 2014; Frydman & Wang, 2020). This chapter extends the literature on the determinants for which individuals are attracted to realize gains and refuse to lock in losses and finds a statistical association between the use of alternative payment methods and the magnitude of investors' disposition effect.

The results presented in this chapter show that investors' disposition effect is positively correlated with the saliency of the payment methods used to transact. On the one hand, salient investment and divestment methods relate to a positive and significant disposition effect. Vice versa, transactions performed with less salient payment systems are associated with a statistically lower or absent disposition effect. The results presented here are valid across different types of investors and hold true after several robustness tests. Overall, the study provides new and important insights that can benefit financial investors as well as academics studying behavioural biases and the effects of alternative payment methods.

# **Chapter 4 . The bright side of CEO Narcissism and its impact on Accounting Conservatism**

## **4.1 Introduction**

The second empirical study in this dissertation aims to extend the literature revolving around the impact that personality traits of corporate executives have on firm results. Specifically, this chapter examines and tests the relationship between CEO narcissism and accounting conservatism.

As mentioned in Chapter 2, corporate finance and accounting literature is increasingly interested in understanding how and why executives' innate characteristics affect firm performance (Chatterjee & Hambrick, 2007; Schrand & Zechman, 2012). The personality traits of companies' board of directors have been associated with several firm features including strategic dynamism (Finkelstein, 1990), willingness to undertake important changes (Wiersema & Bantel, 1992), as well as the likelihood of committing financial fraud (Beasley, 1996; Dechow et al., 1996; Farber, 2005). Similarly, the individual characteristics of companies' CEOs are relevant in explaining financial performance (Chatterjee & Hambrick, 2011; Hsu, 2017; Olsen et al., 2014) and decisions regarding accounting practices (Castellano & Lightle, 2005) and dividend policies (Chen, Zheng, & Wu, 2011; Deshmukh, Goel, & Howe, 2013). Overconfidence is the most investigated personality trait in this field of research (Brown & Sarma, 2007; Malmendier & Tate, 2005), followed by other characteristics such as gender (Huang & Kisgen, 2013), optimism (Campbell et al., 2011; Heaton, 2002), and risk appetite (Shapira, 1995). Interestingly, although narcissism is traditionally considered one of the main

characteristics of a leader (de Vries & Miller, 1985), this personality trait has not received much attention in this field of literature and very few empirical studies investigate it (Chatterjee & Hambrick, 2007). Nevertheless, the rare analyses on executives' narcissism document its relevance in explaining variations in the quality and quantity of R&D investments (Ham et al., 2018), fluctuations in market stock prices (Olsen et al., 2014), and the presence of more generous compensation packages (Amp et al., 2014). Recently, CEO narcissism has also been shown to relate with accounting aspects such as the practice of earnings management (Capalbo et al., 2018). Still absent, however, is evidence of a statistical relationship between executive narcissism and accounting conservatism. The objective of the second empirical investigation presented in this dissertation is to uncover the nature of such a relationship. A better understanding of this topic will benefit several corporate stakeholders including equity owners (Kim & Pevzner, 2010; Lafond & Roychowdhury, 2008; LaFond & Watts, 2008), bondholders (Ahmed et al., 2002; Ahmed & Duellman, 2007; García Lara et al., 2009), board members (Ahmed & Duellman, 2011; Francis & Martin, 2010), and financial analysts (Givoly & Palmon, 1982). Further, this empirical investigation also answers the call from Judge et al. (2009) who questions whether narcissism always produces only negative outcomes as the extant literature seems to suggest.

Chapter 2 in this dissertation provided a review of the literature to explain the reasons why executives' narcissism may be associated with accounting conservatism. Consistent with previous theoretical investigations, the present study posits that narcissism has a twofold effect on accounting conservatism. On the one hand, the first hypothesis here tested – H4(A) – posits narcissistic CEOs anticipate the recognition of future expenses and liabilities to a greater extent than their peers.

On the other hand, H4(B) claims that CEO narcissism also has a negative effect on the unconditional conservatism of firms which, in turn, will also anticipate the financial reporting of revenue.

The remainder of this chapter is structured as follows. Section 4.2 provides a discussion of the methodologies that previous researchers have applied within their studies on narcissism as well as accounting conservatism. Section 4.3 presents information on the sources of the data utilized for this empirical investigation. Section 4.4 presents the empirical results and Section 4.5 reports the various robustness tests conducted. To conclude, Section 4.6 provides a summary of this chapter.

## **4.2 Method**

### **4.2.1 Measuring Narcissism**

Narcissism is not a binary variable and individuals can be ranked across a spectrum (Emmons, 1987; Raskin & Shaw, 1988). While a person's level of narcissism can be influenced by life experiences and external stimuli, researchers largely agree it remains relatively stable over time (Campbell, Foster, & Finkel, 2002; Cramer, 1998). The most commonly used method to measure one's narcissistic tendencies is the Narcissistic Personality Inventory (NPI) developed by Raskin and Hall (1981). However, for the scope of the present analysis, it is important to note that CEOs and top executives are typically unwilling to participate in surveys, and results obtained via such mechanisms would be affected by desirability biases (Cycyota & Harrison, 2006).

Following the suggestion of Webb, Campbell, Schwartz, and Sechrest (1966) we use an unobtrusive measure applied by previous studies. One of the leading principles in the use of unobtrusive measures is to not discard what might seem trivial (Webb & Weick, 1979). For this reason, academics categorize the personality of people using a wide range of cues such as the arrangement of one's office and bedroom (Gosling, Ko, Mannarelli, & Morris, 2002), the layout of personal websites (Vazire & Gosling, 2004), and even the engine size of their selected automobiles (Brown, Lu, Ray, & Teo, 2018). In our analysis, we measure CEO narcissism by using cues from their verbal communications as speeches are a form of expression that reflects the most dominant personality traits (Ramsay, 1968). Following previous research (Capalbo et al., 2018; Chatterjee & Hambrick, 2007; Patel & Cooper, 2014), we measure individual CEO narcissism by identifying the preponderance of first-person pronouns in one's speech. Such a measure is proven to positively correlate with the NPI score (Raskin & Shaw, 1988) as it intuitively captures at least two of the most relevant elements of the narcissistic personality: self-absorption and exhibitionism. More precisely, each individual value in our analysis is calculated as the ratio between the total of first-person singular pronouns to the total of all first-person pronouns, singular and plural:

$$Narcissism\ Score = \frac{\sum_i(I, me, my, mine, myself)}{\sum_i(I, me, my, mine, myself, we, us, our, ours, ourselves)} \quad (4.1).$$

#### **4.2.2 Measuring Accounting Conservatism**

To test hypotheses H4(A) and H4(B) three models of accounting conservatism are applied, respectively from Basu (1997), Ball and Shivakumar (2005), and Givoly and Hayn (2000).

#### **4.2.2.1      *Model 1***

According to Basu (1997), prudent financial reporting should anticipate all losses but not profits. It follows that greater accounting conservatism results in earnings that are more tightly related to ‘bad news’ than ‘good news’, or as per the following equation:

$$NI = \alpha + \beta_1 Return + \beta_2 D + \beta_3 Return * D + Controls \quad (4.2),$$

where *NI* is annual earnings per stock, *Return* is the buy-and-hold stock return from 9 months before, to 3 months after the end of the fiscal year-end, to exclude any noise associated with previous years’ earnings announcement (Basu, 1997; Easton & Harris, 1991; Givoly & Palmon, 1982) and *D* is a dummy variable that assumes value 1 if *Return* is negative, 0 in the opposite case.

#### **4.2.2.2      *Model 2***

The second model we use in our analysis is based on Ball and Shivakumar (2005) which identifies that timely gain and loss recognition is related to expected but non-realized cash flows, as per the following equation:

$$ACC = \alpha + \beta_1 CFO + \beta_2 D + \beta_3 CFO * D + Controls \quad (4.3).$$

In the above equation *ACC* refers to the yearly corporate accruals and are calculated as follows:



$$ACC = \Delta Inventory + \Delta Receivables + \Delta Other \text{ Current Assets} - \Delta Payables - \Delta Other \text{ Current Liabilities} - Depreciation \quad (4.4),$$

where *CFO* represents the firm's cash flows from operations while *D* is a dummy variable that assumes value 1 if *CFO* is negative, 0 in the opposite case.

#### **4.2.2.3 Model 3**

The third methodology we apply relies on the model of Givoly and Hayn (2000) who create a firm-year measure of conditional conservatism (*CONSER\_NOA*). This framework is based on the assumption that persistent negative non-operating accruals are a sign of conditional conservatism (Givoly & Hayn, 2000) and, as a consequence, *CONSER\_NOA* is calculated as the negative 3-year-average of the firm's non-operating accruals scaled by the company's total assets where:

$$Non \text{ Operating Accruals} = Total \text{ Accruals} - Operating \text{ Accruals} \quad (4.5),$$

$$Total \text{ Accruals} = Net \text{ Income} + Depreciation - Cash \text{ Flows from Operations} \quad (4.6),$$

$$Operating \text{ Accruals} = \Delta Receivables + \Delta Inventory + Prepaid \text{ Exp} - \Delta Payables - \Delta Taxes \text{ Payables} \quad (4.7).$$

Appendix A better explains all the variables included in the above models as well as describing the related items and references in the COMPUSTAT database.

### 4.2.3 Relation between CEO Narcissism and Accounting Conservatism

To test the association between CEO narcissism and accounting conservatism we modify the three models above following literature that has already documented a relationship between prudent financial reporting and managerial ownership (Lafond & Roychowdhury, 2008), CEO gender (Ho et al., 2015), as well as managerial overconfidence (Ahmed & Duellman, 2013). Specifically:

$$\begin{aligned} \text{Model 1 : } NI = & \alpha + \beta_1 \text{Return} + \beta_2 D + \beta_3 \text{Return} * D + \beta_4 \text{NARC}_{CEO} \\ & + \beta_5 \text{Return} * \text{NARC}_{CEO} + \beta_6 D * \text{NARC}_{CEO} \\ & + \beta_7 \text{Return} * D * \text{NARC}_{CEO} + \text{Controls} \end{aligned} \quad (4.8)$$

$$\begin{aligned} \text{Model 2 : } ACC = & \alpha + \beta_1 CFO + \beta_2 D + \beta_3 CFO * D + \beta_4 \text{NARC}_{CEO} \\ & + \beta_5 CFO * \text{NARC}_{CEO} + \beta_6 D * \text{NARC}_{CEO} \\ & + \beta_7 CFO * D * \text{NARC}_{CEO} + \text{Controls} \end{aligned} \quad (4.9)$$

where  $\text{NARC}_{CEO}$  is the measure of CEO narcissism. In Equations (4.8) and (4.9),  $\beta_5$  measures the impact of the CEO on unconditional conservatism. Vice versa,  $\beta_7$  measures the impact of CEO narcissism on conditional conservatism.

The third model is extended as follows:

$$\text{Model 3: } CONSER\_NOA = \alpha + \beta_1 \text{NARC}_{CEO} + \text{Controls} \quad (4.10),$$

where  $\beta_1$  measures the impact of CEO narcissism on conditional conservatism.

#### **4.2.4 Control variables**

Following extant literature, we include in our estimations several control variables that are known to be correlated with firms' accounting conservatism. Consistent with the suggestions from Ball and Shivakumar (2005) we control for the yearly change in corporate sales (CSALES), the book value of fixed assets (FASSETS), and the equity market value (Vo). More precisely, these control variables are included for Specification A in Model 1, Specification B in Model 2, as well as Specifications A and C in Model 3.

Further, we identify the relevance of the market-to-book ratio (MB), firm leverage (LEV), and the firm's total assets (SIZE). As a result, we include these variables in Specification B in Model 1, in Specification A in Model 2, and Specifications B and C in Model 3.

Lastly, consistently with Lafond and Roychowdhury (2008) and Francis, Philbrick, and Schipper (1994) we also control for LIT, a dummy variable that represents whether the firm operates in a litigious industry. More precisely, LIT assumes value 1 and denotes that a company belongs to a litigious environment if it operates in an industry with SIC codes of 2833-2836, 3570-3577, 3600-3674, 5200-5961, and 7370-7374. In any other case, LIT assumes value 0. Our estimations control for industry litigiousity in Specification B in Model 1 and Model 2 as well as in Specification C in Model 3.

## **4.3 Data**

### **4.3.1 Source of Data**

In order to measure CEO narcissism levels, we collected Quarterly Earnings Call Bloomberg Transcripts during the period 2010-2018. We identified a total of 44,741 transcript documents pertaining to 2561 different businesses and 6321 different CEOs (the discrepancy between the two numbers is due to changes in the companies' CEOs). These transcripts include both formal presentations and a Question and Answers (Q&A) session. The latter part is the most relevant for our research design as it allows us to capture a CEO's spontaneous speech (Raskin & Shaw, 1988). The relevant Q&A section is then parsed with a Natural Language Processing (NLP) algorithm to count how many times the CEOs in our sample used each first-person pronoun<sup>7</sup>.

Companies' financial performance data and further CEO information (e.g., tenure) were obtained from the COMPUSTAT – Capital IQ database.

It should be noted the two datasets we utilized do not perfectly overlap. For example, some firms are included in only one of the two databases. As a result, our final sample was obtained by crossing and matching the data from the two sources of raw data. For the period 2010 to 2018, we identified a total of 5901 CEO-firm-year Narcissism Scores, pertaining to 907 businesses and 1419 CEOs.

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<sup>7</sup> We selected a random subsample of Bloomberg Transcripts to control and confirm the precision of our NLP algorithm.

### 4.3.2 Descriptive Statistics

Table 4.1 presents the summary statistics for the variables relevant to our analysis. The mean value of our Narcissism Score is 0.25, consistent with previous research (Capalbo et al., 2018; Chatterjee & Hambrick, 2007). Table 4.2 shows the correlation matrix among the variables we use in our tests. The lower right-side portion of the table exhibits the Pearson correlation while the upper right side presents the Spearman correlation. The two models are generally aligned with each other and with previous analyses. For example, we see that accruals (ACC) and operating cash flows (CFO) are negatively correlated (Ho et al., 2015).

**Table 4.1 Descriptive statistics**

	Mean	Std. Dev.	Q1	Median	Q3
Narcissism Measure					
NARC <sub>CEO</sub>	0.2501	0.0938	0.1852	0.2411	0.3063
Conservatism Measures					
NI	0.1357	2.2975	0.0639	0.1220	0.1970
Return	0.2610	7.1920	-0.0562	0.1119	0.2981
ACC	-0.0525	0.0859	-0.0753	-0.0451	-0.0212
CFO	0.1064	0.0779	0.0673	0.0995	0.1417
CONSER_NOA	-0.1823	0.1302	-0.2402	-0.1725	-0.1200
Control Variables					
MB	4.0045	34.5493	1.6387	2.5039	4.0116
LEV	0.4910	6.1664	0.0703	0.2208	0.4717
SIZE	8.1671	1.5271	7.0644	8.0517	9.1879
CSALES	1.0072	0.7322	0.5275	0.8201	1.2755

FASSETS	0.5404	0.4656	0.2078	0.4097	0.7945
MVE	11792.01	47539.44	1127.07	2916.78	9096.36

This table shows the summary statistics of variables for 5464 firm-year- $NARC_{CEO}$  observations in the sample database for the period 2010-2018. The sample includes data on 907 businesses and 1419 CEOs.  $NARC_{CEO}$  is measured using CEO responses during Q&A sessions of quarterly earnings call conferences. Specifically,  $NARC_{CEO}$  is the ratio of the instances a CEO has used first person singular pronouns to total first person pronouns. NI represents annual stock earnings. Return is the buy-and-hold stock return from 9 months before, to 3 months after the end of the fiscal year. ACC refers to the yearly corporate accruals. CFO is the yearly firm's cash flows from operations. CONSER\_NOA is the measure of conditional conservatism proposed by Givoly and Hayn (2000) and is calculated as the negative 3-year-average of the firm's non-operating accruals scaled by the company's total assets. MB is the market-to-book value. LEV is the firm's leverage, calculated as debt-to-equity ratio. SIZE represents the natural log of the company's total assets. CSALES refers to the yearly change in corporate sales scaled by total assets. FASSETS is the book value of the company's fixed assets scaled by total assets and MVE refers to the firm's equity market value.

**Table 4.2 Pearson (bottom) and Spearman (top) Correlation Matrix**

	a	b	c	d	e	f	g	h	i	j	k	l
$NARC_{CEO}$		-0.03	-0.01	0.03	-0.05	0.04	-0.04	0.01	0.03	-0.07	-0.05	0.01
NI	0.00		0.08	0.24	0.47	-0.49	0.57	-0.17	0.11	0.27	-0.05	0.27
Return	0.01	0.00		-0.01	0.10	0.04	0.16	0.03	-0.05	0.03	-0.06	-0.14
ACC	0.02	0.04	0.04		-0.46	0.16	-0.04	0.01	0.04	0.09	-0.31	0.01
CFO	-0.07	0.04	-0.01	-0.30		-0.77	0.42	-0.43	-0.09	0.20	0.14	0.16
CONSER_NOA	0.06	-0.06	0.02	0.01	-0.77		-0.38	0.45	0.06	-0.25	-0.16	-0.23
MB	0.00	0.60	0.00	0.00	0.02	-0.01		-0.32	-0.02	0.13	-0.15	0.25
LEV	0.02	0.00	0.99	0.03	-0.04	0.04	0.00		0.45	-0.27	0.26	0.10
SIZE	0.03	0.03	-0.01	0.03	-0.06	0.02	0.01	0.02		-0.35	0.12	0.87
CSALES	-0.04	0.01	-0.01	0.05	0.19	-0.22	0.00	-0.03	-0.24		0.00	-0.28
FASSETS	-0.06	0.00	0.01	-0.37	0.12	-0.10	-0.01	0.03	0.11	-0.08		0.03
MVE	0.03	0.02	-0.01	0.01	0.08	-0.09	0.01	-0.01	0.37	-0.08	-0.03	

This table reports the correlation matrix of variables measured. Pearson correlation measures are presented below the diagonal; Spearman correlation measures are shown above the diagonal.  $NARC_{CEO}$  is the ratio of the instances a CEO has used first person singular pronouns to total first person pronouns. NI represents annual stock earnings. Return is the buy-and-hold stock return from 9 months before, to 3 months after the end of the fiscal year. ACC refers to the yearly corporate accruals. CFO is the yearly firm's cash flows from operations. CONSER\_NOA is the measure of conditional conservatism proposed by Givoly and Hayn (2000) and is calculated as the negative 3-year-average of the firm's non-operating accruals scaled by the company's total assets. MB is the market-to-book value. LEV is the firm's leverage, calculated as debt-to-equity ratio. SIZE represents the natural log of the company's total assets. CSALES refers to the yearly change in corporate sales scaled by total assets. FASSETS is the book value of the company's fixed assets scaled by total assets and MVE

refers to the firm's equity market value.

## 4.4 Results

Table 4.3 exhibits the results of our hypotheses testing according to the methodology proposed by Basu (1997), where the coefficient for the interaction term  $Return \times NARC_{CEO}$  represents the influence that CEO narcissism has on unconditional conservatism, and hence the timely recognition of good news (Ahmed & Duellman, 2013; Lafond & Roychowdhury, 2008). Consistent with our second hypothesis, the coefficient is positive and significant, suggesting that narcissistic CEOs tend to anticipate the accounting of positive news. This result holds across Specifications A and B where additional control variables have been added. The second coefficient of interest in this study,  $Return \times D \times NARC_{CEO}$  reports the association that CEO narcissism has with the accounting anticipation of negative news (Ho et al., 2015; Lafond & Roychowdhury, 2008), namely conditional conservatism. Coefficient estimates support our first hypothesis as the coefficient is positive and significant in both Specification A and Specification B. Such evidence suggests that CEOs with narcissistic tendencies are associated with the anticipation of the accounting recognition of negative financial events.

Table 4.4 reports evidence similar to Table 4.3 and shows the results of our tests that follow the framework suggested by Ball and Shivakumar (2005). The relation between CEO narcissism and the timeliness of the accounting of positive results (unconditional conservatism) is represented by the coefficient  $CFO \times NARC_{CEO}$  which is positive and significant across both Specifications A and B. Such evidence suggests that consistent with our previous findings and with the second hypothesis in this chapter, narcissistic CEOs are associated with timely recognition of good

news; thus, they are negatively associated with unconditional conservatism. Further, we can observe the influence produced by CEO narcissism over conditional conservatism by turning our attention to the coefficient  $CFO \times D \times NARC_{CEO}$ . Once more, the coefficient is positive and significant for both Specifications A and B. We therefore accept our first hypothesis, H4(A), that narcissistic CEOs are positively associated with conditional conservatism, suggesting they anticipate the recognition of negative news.

Lastly, Table 4.5 analyses the relationship between CEO narcissism and conditional conservatism by applying the methodology suggested by Givoly and Hayn (2000). This model is applied to three different sets of control variables. Our results are consistent across Specifications A, B, and C and the evidence suggests that narcissistic CEOs are positively related with higher conditional conservatism. In other words, we further document that executive narcissism is associated with accounting conservatism as it can produce an anticipated accounting recognition of negative news. This empirical evidence is aligned with our first hypothesis and with the results we obtained in Table 4.3 and Table 4.4.



**Table 4.3 Test for Conditional and Unconditional Conservatism, according to Basu (1997)**

Dep. Variable	NI				
Model:	OLS				
Observations:	5464				
	Expected Sign	Specification A		Specification B	
		Coefficient	t-value	Coefficient	t-value
Intercept		0.1437	1.4950	-0.2280	-1.2000
MB		0.0401***	55.8900	0.0401***	55.8780
LEV		-0.0685**	-2.2520	-0.0823***	-2.6050
MVE		0.0000	1.0320	0.0000	0.2840
Return		-0.2373*	-1.8970	-0.2417*	-1.8950
D		-0.5710***	-2.6460	-0.5642***	-2.6140
Return x D		-1.5702**	-2.1110	-1.5253**	-2.0410
NARC <sub>CEO</sub>		-0.4135	-1.2130	-0.4013	-1.1770
<b>Return x NARC<sub>CEO</sub></b>	+	<b>0.8605**</b>	2.2660	<b>0.9076**</b>	2.3400
D x NARC <sub>CEO</sub>		1.8324**	2.2610	1.8074**	2.2300
<b>Return x D x NARC<sub>CEO</sub></b>	+	<b>6.5013**</b>	2.3050	<b>6.2237**</b>	2.2020
LIT				0.0134	0.2170
CSALES				0.0485	0.8700
FASSETS				0.0506	1.4440
SIZE				0.0362*	1.9400
R-squared:		0.3660		0.3670	
Adj. R-squared:		0.3650		0.3650	
F-statistic:		315.1000		225.5000	

This table reports the coefficient estimates of Equation (8) on the relationship between CEO narcissism and accounting conservatism according to the model proposed by Basu (1997). NARC<sub>CEO</sub> is the ratio of the instances a CEO has used first person singular pronouns to total first person pronouns. NI represents annual stock earnings. Return is the buy-and-hold stock return from 9 months before, to 3 months after the end of the fiscal year. MB is the market-to-book value. LEV is the firm's leverage, calculated as debt-to-equity ratio. SIZE represents the natural log of the company's total assets. CSALES refers to the yearly change in corporate sales scaled by total assets. FASSETS is the book value of the company's fixed assets scaled by total assets. MVE refers to the firm's equity market value. LIT is a dummy identifying the litigiousity of a firm's industry. The bolded coefficients are the most relevant in terms of our analysis as they describe the relationship between CEO narcissism and unconditional and conditional conservatism, respectively. Specification A includes the control variables suggested by Basu (1997); Specification B includes additional control variables that are shown to be relevant in the literature.

\* denotes t-statistic significant at 0.1 level;

\*\* denotes t-statistic significant at 0.05 level;

\*\*\* denotes t-statistic significant at 0.01 level

**Table 4.4 Test for Conditional and Unconditional Conservatism, according to Ball and Shivakumar (2005)**

Dep. Variable	ACC				
Model:	OLS				
Observations:	5464				
	Expected Sign	Specification A		Specification B	
		Coefficient	t-value	Coefficient	t-value
Intercept		-0.0134	-1.5450	-0.0124	-1.3770
FASSETS		-0.0628***	-27.9770	-0.0634***	-27.9710
SIZE		0.0040***	5.6600	0.0039***	5.1310
CSALES		0.0112***	7.5940	0.0113***	7.6590
CFO		-0.4291***	-9.8050	-0.4241***	-9.6640
D		-0.0215	-1.0050	-0.0197	-0.9220
CFO x D		-0.1921	-1.0550	-0.1966	-1.0790
NARC <sub>CEO</sub>		-0.0642***	-2.9150	-0.0662***	-3.0040
<b>CFO x NARC<sub>CEO</sub></b>	<b>+</b>	<b>0.4713***</b>	<b>2.8510</b>	<b>0.4804***</b>	<b>2.9050</b>
D x NARC <sub>CEO</sub>		0.1791**	2.3220	0.1756**	2.2780
<b>CFO x D x NARC<sub>CEO</sub></b>	<b>+</b>	<b>1.3863**</b>	<b>2.4000</b>	<b>1.3524**</b>	<b>2.3400</b>
LIT				-0.0043*	-1.6610
MB				0.0000	0.2910
LEV				0.0004***	2.6750
MVE				0.0000	0.0360
R-squared:		0.2230		0.2240	
Adj. R-squared:		0.2210		0.2220	
F-statistic:		156.3000		112.5000	

This table reports the coefficient estimates for Equation (9) on the relationship between CEO narcissism and accounting conservatism according to the model proposed by Ball and Shivakumar (2005). *NARC<sub>CEO</sub>* is the ratio of the instances a CEO has used first person singular pronouns to total first person pronouns. ACC refers to the yearly corporate accruals. CFO is the yearly firm's cash flows from operations. MB is the market-to-book value. LEV is the firm's leverage, calculated as debt-to-equity ratio. SIZE represents the natural log of the company's total assets. CSALES refers to the yearly change in corporate sales scaled by total assets. FASSETS is the book value of the company's fixed assets scaled by total assets and MVE refers to the firm's equity market value. The bolded coefficients are the most relevant in terms of our analysis as they describe the relationship between CEO narcissism and unconditional and conditional conservatism, respectively. Specification A includes the control variables originally suggested by Ball and Shivakumar (2005); Specification B includes additional control variables that are shown to be relevant in the literature.

\* denotes t-statistic significant at 0.1 level;

\*\* denotes t-statistic significant at 0.05 level;

\*\*\* denotes t-statistic significant at 0.01 level

**Table 4.5 Test for Conditional Conservatism, according to Givoly and Hayn (2000)**

Dep. Variable	CONSER_NOA						
Model:	OLS						
Observations:	5464						
	Expected Sign	Specification A		Specification B		Specification C	
		Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Intercept		-0.2053***	-40.6740	-0.1181***	-10.3320	-0.1415***	-11.7720
<b>NARC<sub>CEO</sub></b>	+	<b>0.0921***</b>	<b>4.9440</b>	<b>0.0663***</b>	<b>3.6360</b>	<b>0.0664***</b>	<b>3.6750</b>
MB		0.0063***	3.4980			0.0043**	2.4710
LEV		0.0008***	2.8530			0.0007***	2.7000
MVE		0.0000***	-7.0230			0.0000***	-8.1910
FASSETS				-0.0319***	-8.6290	-0.0352***	-9.5410
CSALES				-0.0416***	-17.3100	-0.0406***	-16.9700
SIZE				-0.0026**	-2.2860	0.0009	0.6860
LIT						-0.0138***	-3.2780
R-squared:		0.0170		0.0660		0.0830	
Adj. R-squared:		0.0160		0.0650		0.0810	
F-statistic:		23.460		96.030		61.380	

This table reports the coefficient estimates for Equation (10) on the relationship between CEO narcissism and accounting conservatism according to the model proposed by Givoly and Hayn (2000). CONSER\_NOA is the measure of conditional conservatism proposed by Givoly and Hayn (2000) and is calculated as the negative 3-year-average of the firm's non-operating accruals scaled by the company's total assets. MB is the market-to-book value. LEV is the firm's leverage, calculated as debt-to-equity ratio. SIZE represents the natural log of the company's total assets. CSALES refers to the yearly change in corporate sales scaled by total assets. FASSETS is the book value of the company's fixed assets scaled by total assets and MVE refers to the firm's equity market value. The bolded coefficient is the most relevant for the scope of our analysis as it describes the relationship between CEO narcissism and firms' conditional conservatism. Models 1, 2 and 3 include different sets of control variables that the literature shows to be relevant for a study on accounting conservatism.

\* denotes t-statistic significant at 0.1 level;

\*\* denotes t-statistic significant at 0.05 level;

\*\*\* denotes t-statistic significant at 0.01 level

## **4.5 Robustness Tests**

We perform three additional robustness tests to triangulate the aforementioned results. The first controls for possible endogeneity issues, while the second and third assess the relationship between accounting conservatism and CEO narcissism controlling for CEO tenure and extreme narcissism, respectively.

### **4.5.1 Self-Selection**

It is possible we detected a significant relationship between CEO narcissism and accounting conservatism since certain executives self-select into firms that are extremely cautious in their financial reporting (Capalbo et al., 2018). We repeat our analyses for the subset of firm-years where a new CEO is appointed (sample size = 331). We do this as it is reasonable to expect that a CEO cannot set the ‘tone at the top’ (Castellano & Lightle, 2005) immediately after his or her designation (Ahmed & Duellman, 2013). Consistent with our expectations, we do not find any significant relationship between the Narcissism Score of new CEOs and the accounting conservatism of the firms they manage in Table 4.6. These results confirm the validity of our hypotheses and reject the alternative theory for which narcissistic executives actively decide to manage companies with specific accounting practices.

**Table 4.6 Robustness test for CEO Self-Selection into conservative firms**

Model:	OLS			
Observations:	331			
Dep. Variable		Specification A	Specification B	Specification C
		NI	ACC	CONSER_NOA
	Expected Sign	Coefficient	Coefficient	Coefficient
Intercept		0.2763	-0.0045	-0.1469**
Return		-0.0807		
D		-0.1092		
Return x D		-1.4393		
NARC_CEO		0.5052		
<b>Return x NARC_CEO</b>	<b>ns</b>	<b>-0.2720</b>		
D x NARC_CEO		-0.3931		
<b>Return x D x NARC_CEO</b>	<b>ns</b>	<b>4.6739</b>		
CFO			-0.7790*	
D			0.1920	
CFO x D			0.8451	
NARC_CEO			-0.2762	
<b>CFO x NARC_CEO</b>	<b>ns</b>		<b>1.7427</b>	
D x NARC_CEO			-0.7914	
<b>CFO x D x NARC_CEO</b>	<b>ns</b>		<b>-3.7673</b>	
<b>NARC_CEO</b>	<b>ns</b>			<b>-0.0428</b>
MB		-0.0034	0.0007	0.0276*
LEV		0.2048***	0.0006	0.0001
MVE		0.0000	0.0000	0.0000***
FASSETS		-0.7306***	-0.1231***	-0.0251*
CSALES		0.0315	0.0122	-0.0170*
SIZE		0.0087	0.0026	0.0038
LIT		-0.0335	0.0097	-0.0364**
R-squared		0.2390	0.1590	0.0940
Adj. R-squared		0.2060	0.1220	0.0710
F-Statistic		7.1080	4.2710	4.1540

This table reports the results for our first robustness test on the relationship between CEO narcissism and accounting conservatism. This robustness test investigates the subset of CEOs who have just been appointed. This test thus controls for possible endogeneity issues related to the fact that narcissistic CEOs might prefer to move into firms that adopt more prudent financial reporting. Specification A follows the model on accounting conservatism proposed by Basu (1997) while Specifications B and C follow Ball and Shivakumar (2005) and Givoly and Hayn (2000), respectively.

\* denotes t-statistic significant at 0.1 level;

\*\* denotes t-statistic significant at 0.05 level;

\*\*\* denotes t-statistic significant at 0.01 level

### **4.5.2 CEO tenure**

We perform an additional robustness test by analysing the subsample of firm-years where a CEO is in charge for at least 4 years (3718 observations). With this analysis, we can identify the attitudes that executives with a long-term horizon have towards accounting conservatism. Our results in Table 4.7 are consistent across the three models. We find evidence of greater conditional conservatism where narcissistic CEOs have been in charge for four or more years. However, companies with long-standing narcissistic CEOs exhibit ordinary levels of unconditional conservatism and hence they do not anticipate good news more than other firms. Such evidence is aligned with our hypotheses and reinforces the theory that, because narcissistic CEOs assume personal ownership over their firms' results (Amernic & Craig, 2010), they are better than their peers at making decisions that provide larger gains in the long term (Byrne & Worthy, 2013).

### **4.5.3 Extreme narcissism**

Our last robustness test relies on the theoretical arguments from Amernic and Craig (2010) who claim that extremely narcissistic CEOs should be more prone to behave unethically and manipulate their firms' financial reporting. We investigate whether this hypothesis holds true by performing our analyses on the subsample of firm-years where CEOs' Narcissism Score is above the 65<sup>th</sup> percentile. The decision to utilize number as a cut-off is consistent with the work from Hsu (2017) on overconfident CEOs. Evidence across our three models in Table 4.8 suggests that extreme executive narcissism is not related to conditional conservatism. This result further supports our second hypothesis as such extremely high levels of narcissism tend to be very rare at the top levels of companies (Chatterjee & Hambrick, 2007).

**Table 4.7 Robustness test for the impact of CEO Tenure**

Model:	OLS			
Observations:	3718			
Dep. Variable		Specification A NI	Specification B ACC	Specification C CONSER_NOA
	Expected Sign	Coefficient	Coefficient	Coefficient
Intercept		-0.2502	-0.0237***	-0.1441***
Return		-0.2430		
D		-0.8236***		
Return x D		-2.3142***		
NARC_CEO		-0.7965*		
<b>Return x NARC_CEO</b>	<b>ns</b>	<b>1.0762</b>		
D x NARC_CEO		2.5957***		
<b>Return x D x NARC_CEO</b>	<b>+</b>	<b>7.1150**</b>		
CFO			-0.3616***	
D			-0.0171	
CFO x D			-0.2898*	
NARC_CEO			-0.0218	
<b>CFO x NARC_CEO</b>	<b>ns</b>		<b>0.1680</b>	
D x NARC_CEO			0.2318***	
<b>CFO x D x NARC_CEO</b>	<b>+</b>		<b>1.9831***</b>	
<b>NARC_CEO</b>	<b>+</b>			<b>0.0430**</b>
MB		0.0512***	0.0000	0.0041**
LEV		-0.0685	-0.0065***	0.0448***
MVE		0.0000	0.0000	0.0000***
FASSETS		0.1422**	-0.0531***	-0.0057
CSALES		0.1156***	0.0040***	-0.0565***
SIZE		0.0317	0.0126***	-0.0423***
LIT		0.0153	-0.0071***	0.0013
R-squared		0.5850	0.3050	0.1620
Adj. R-squared		0.5830	0.3030	0.1600
F-Statistic		372.2000	116.2000	89.5500

This table reports the results for our second robustness test on the relationship between CEO narcissism and accounting conservatism. This robustness test investigates the subset of CEOs who have been in charge for at least 4 consecutive years. This test shows that CEOs need time to modify corporate financial reporting practices and confirms narcissistic CEOs adopt a more conservative accounting approach as they assume personal ownership over their firms' results. Specification A follows the model on accounting conservatism proposed by Basu (1997) while Specifications B and C follow Ball and Shivakumar (2005) and Givoly and Hayn (2000), respectively.

\* denotes t-statistic significant at 0.1 level;

\*\* denotes t-statistic significant at 0.05 level;

\*\*\* denotes t-statistic significant at 0.01 level

**Table 4.8 Robustness test for the impact of Extreme CEO Narcissism**

Model:	OLS			
Observations:	1913			
Dep. Variable		Specification A NI	Specification B ACC	Specification C CONSER_NOA
	Expected Sign	Coefficient	Coefficient	Coefficient
Intercept		0.5294*	-0.0222	-0.0818***
Return		-2.9004***		
D		-0.9789*		
Return x D		2.1980		
NARC_CEO		-3.0869***		
<b>Return x NARC_CEO</b>	<b>+</b>	<b>8.5305***</b>		
D x NARC_CEO		2.9361*		
<b>Return x D x NARC_CEO</b>	<b>ns</b>	<b>-5.9684</b>		
CFO			-0.3369**	
D			0.1136	
CFO x D			0.5667	
NARC_CEO			0.0002	
<b>CFO x NARC_CEO</b>	<b>+</b>		<b>0.1434</b>	
D x NARC_CEO			-0.2308	
<b>CFO x D x NARC_CEO</b>	<b>ns</b>		<b>-0.6803</b>	
<b>NARC_CEO</b>	<b>ns</b>			<b>0.0617</b>
MB		0.0302***	0.0000	-0.0019
LEV		-0.0434	0.0005**	0.0004
MVE		0.0000	0.0000	0.0000***
FASSETS		-0.112	-0.0604***	-0.0427***
CSALES		0.0973**	0.0028*	-0.0392***
SIZE		0.066***	0.0087***	-0.0063***
LIT		-0.153**	-0.0088	-0.0022
R-squared		0.3370	0.1360	0.0660
Adj. R-squared		0.3330	0.1290	0.0620
F-Statistic		69.0400	21.3000	16.8500

This table reports the results for our third robustness test on the relationship between CEO narcissism and accounting conservatism. This robustness test investigates the subset of CEOs who exhibit high narcissistic tendencies (above the 65th percentile in our sample). This tests confirms the theoretical argument from Amernic and Craig (2010) who claim extremely narcissistic CEOs are associated with lower accounting conservatism.. Specification A follows the model on accounting conservatism proposed by Basu (1997) while Specifications B and C follow Ball and Shivakumar (2005) and Givoly and Hayn (2000), respectively.

\* denotes t-statistic significant at 0.1 level;

\*\* denotes t-statistic significant at 0.05 level;

\*\*\* denotes t-statistic significant at 0.01 level



## 4.6 Summary

This chapter has investigated the impact that executives' personality traits have within the context of corporate financial reporting. Specifically, this chapter has explored the relationship between the narcissistic tendencies of CEOs and the level of accounting conservatism of the firms they manage. Extant literature documents that executives' personalities affect several corporate aspects, including dividend policy (Chen et al., 2011; Deshmukh et al., 2013), market strategy (Chatterjee & Hambrick, 2007; Galasso & Simcoe, 2011), and financial performance (Chatterjee & Hambrick, 2011; Hsu, 2017; Olsen et al., 2014). Further, existing literature shows that CEOs' innate characteristics also affect firms' accounting practices (Castellano & Lightle, 2005) and the tendency to manipulate earnings (Capalbo et al., 2018). This chapter confirms the relevance that executives' personality traits have on financial reporting practices and suggests corporate stakeholders should start focusing more on such aspects due to their impacts on firm results.

The results detailed in this chapter support a twofold relationship between CEO narcissism and accounting conservatism. Specifically, CEO narcissism is statistically associated with a timely recognition of negative news (increased conditional conservatism) as well as with a timely recognition of positive news (reduced unconditional conservatism). The results are robust to multiple model specifications and additional tests including sample selection bias. Overall, the study provides new and important insights that can benefit several corporate stakeholders.

# **Chapter 5 . A Behavioural Exploration of the Hong Kong Dollar Exchange-Rate Target-Zone**

## **5.1 Introduction**

The third empirical investigation included in this dissertation investigates and tests the last hypothesis presented in Chapter 2. Specifically, this chapter analyses the existence of behavioural expectations in the context of the foreign exchange market.

The literature review in Section 2.8 of Chapter 2 details the characteristics of the HKD's exchange regime and the related target-zone that serves to link the value of the currency to the USD. The predominant framework on target-zone regimes is provided by Krugman (1991) and has three main assumptions: (i) monetary authorities are perfectly credible; (ii) monetary authorities only intervene when the exchange rate hits the boundaries; and (iii) economic agents act according to rational expectations (Duarte et al., 2013). Despite its wide theoretical impact, this model has had little empirical success as the related prediction has been rejected by several studies (Duarte et al., 2013). Extant research addresses this puzzle by modifying the first two assumptions that describe the decisions of the monetary authorities. In contrast, the present research tries to explain the weak empirical performance of the model from Krugman (1991) by testing whether traders in foreign exchange markets act as rational agents or are, instead, influenced by behavioural expectations. Specifically, we test whether normal market conditions are altered in the scenario where the HKD's valuations approach the edges of the currency's target-zone. Investigating this topic is beneficial to improve the models with which monetary authorities try to stabilize the values of their currencies.

Additionally, our findings have the potential to affect several billions of dollars of trades because the HKD is one of the most traded currencies in the world.

Chapter 2 in this dissertation includes a review of the literature on the behavioural effects detected in equity and futures markets with price boundaries. Additionally, the second chapter in this dissertation presents some empirical evidence suggesting that traders in the foreign exchange market are also affected by behavioural biases. The last hypothesis tested in this dissertation links together these elements. Specifically, H5 posits that there is a rise in behavioural expectations as the HKD spot price nears the edges of the currency's target-zone.

The remainder of this chapter is structured as follows. Section 5.2 describes the data and provides the related descriptive statistics. Section 5.3 presents the methodologies utilized to test the hypothesis and Section 5.4 details the empirical results. Section 5.5 concludes with a summary of this chapter.

## **5.2 Data**

### **5.2.1 Source of Data**

This study uses trade and quote data from Thomson Reuters DataScope, and the sample period extends from the 1<sup>st</sup> of January 2014 to the 30<sup>th</sup> of June 2019. Consistent with the other major currencies in the world, HKD trading is continuously open from Monday at 6:00 am Hong Kong local time to Friday at 10:00 pm London local time. Relevant information included in the dataset comprises the transaction date, time (up to microseconds), trade price or bid and ask quotes, whether the trade was seller or buyer initiated, and specification of the venue where the transaction took place – either on Thomson Reuters Matching or EBS. Notably,

the data provider is unable to share information on the actual trade sizes, but we are aware the smallest allowed transaction corresponds to a value of one million USD.

### **5.2.2 Summary Statistics**

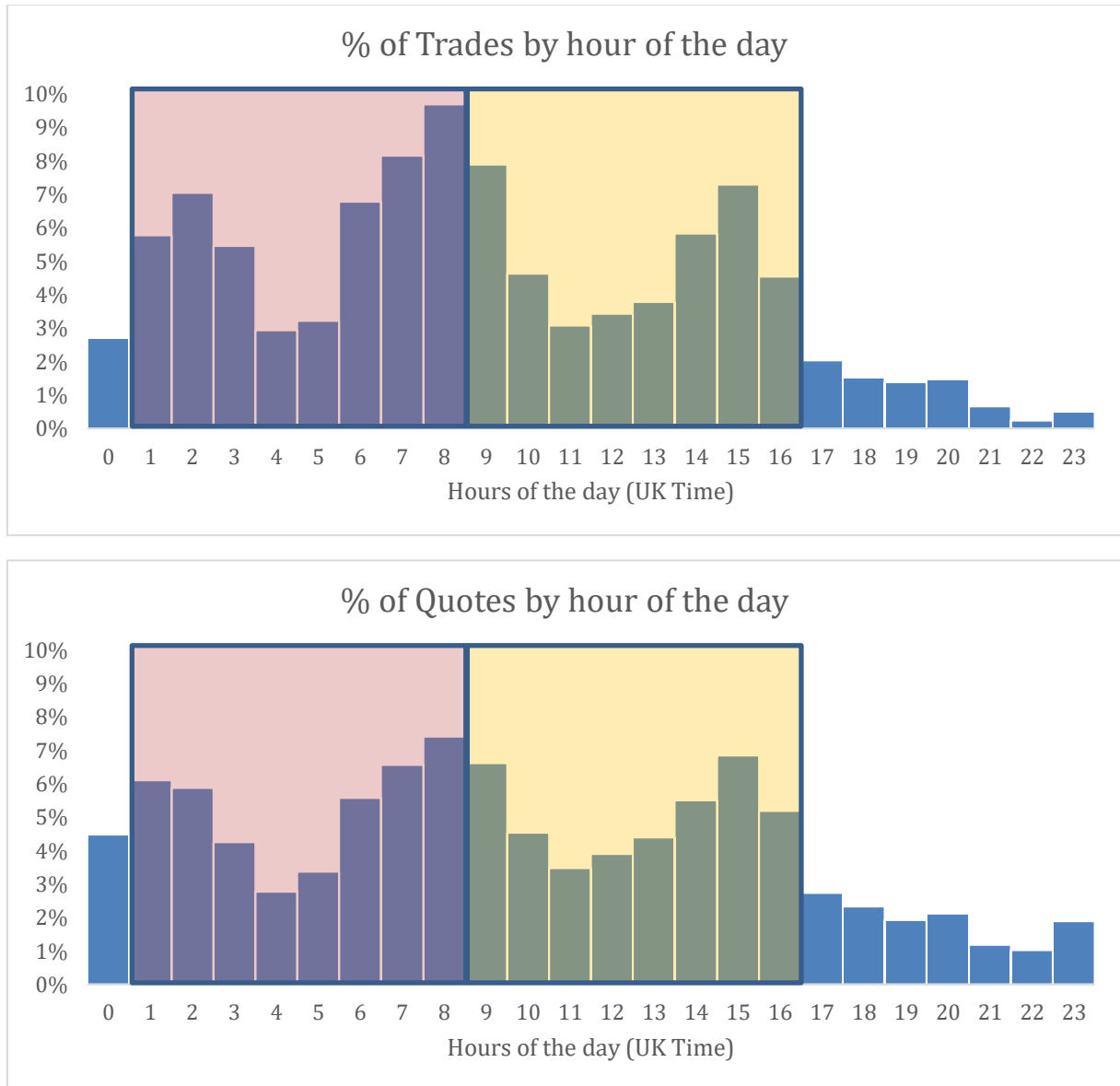
Table 5.1 presents summary statistics for the trades and quotes included in the analysed dataset. The sample includes a total of 1375157 trades and 2369656 quotes. Across the five and a half years of investigation, there has been a trend of growing activity, especially in terms of trades – 2019 covers only the first 6 months. Grouping the data by month shows the market activity is quite well spread across the months of the year. Trades and quotes are also evenly distributed during the weekdays from Monday to Friday. Consistent with the market closures, there are no trades or quotes on Saturdays and the average volumes are substantially lower on Sundays. Figure 5.1 shows the average distribution of the trades and quotes for each hour of the day. Trades and quotes follow a similar pattern and the frequency of these activities is heightened at the opening and closing of both Hong Kong (orange shaded) and London (yellow shaded) trading hours.

**Table 5.1 Trades and quotes summary statistics**

	Trades				Quotes			
	Total	Daily Min.	Daily Av.	Daily Max.	Total	Daily Min.	Daily Av.	Daily Max.
<i>Overall</i>	1375157	0	685	6182	2369656	2	1181	10477
<hr/>								
<i>Year</i>								
2014	158917	0	508	2132	209986	6	671	4370
2015	217061	0	693	2150	237448	2	759	4697
2016	258452	0	828	3206	554295	12	1777	8345
2017	286769	0	919	3483	647239	5	2074	6984
2018	301787	0	964	6182	501435	10	1602	10477
2019	152171	0	982	4143	219253	18	1415	7914
<hr/>								
<i>Month</i>								
January	145261	0	914	3206	258104	5	1623	8345
February	110323	0	761	2173	194783	9	1343	7239
March	132667	0	834	5129	206276	16	1297	4029
April	117244	0	761	3089	165001	3	1071	5235
May	123051	0	769	2952	190697	11	1192	4866
June	141805	0	921	4143	251275	7	1632	7914
July	95737	0	720	1862	153590	15	1155	3979
August	98691	0	742	2913	146887	2	1104	5578
September	113275	0	885	6182	198699	3	1552	9869
October	91832	0	690	1854	186338	3	1401	5000
November	97402	0	755	2357	196686	6	1525	10477
December	107869	0	823	2881	221320	10	1689	8894
<hr/>								
<i>Day of the Week</i>								
Monday	237528	0	831	2196	415945	5	1454	6476
Tuesday	267522	13	935	2664	441585	3	1544	8894
Wednesday	290324	1	1012	4143	488258	3	1701	7914
Thursday	285625	17	995	3364	504269	33	1757	8345
Friday	292680	38	1023	6182	503560	12	1761	10477
Saturday	-	-	-	-	-	-	-	-
Sunday	1478	0	5	271	16039	2	56	579

This table reports the frequency distribution of the Hong Kong Dollar trades and quotes included in our sample. The period of analysis extends from the 1<sup>st</sup> of January 2014 to the 30<sup>th</sup> of June 2019. We report the total, daily minimum, daily average, and daily maximum frequency of trades grouped by year, month, and day of the week. The same statistics are also reported for the frequency of quotes. Notably, on Saturday there is no activity due to market closure.

**Figure 5-1 Average trades and quotes distribution across the hours of the day**



The above figures show the average daily distribution of the trades and quotes in our sample grouped by hour of the day. The horizontal axis refers to the hours in UK time – Hong Kong time is 8 hours ahead throughout the entire year. Trades and quotes follow a similar pattern: activity is heightened at the opening and closing of both Hong Kong (orange shaded) and London (yellow shaded) trading hours.

Table 5.2 provides information on the limit hit occurrences. Lower limit hits are defined as instances in which the HKD value has dropped to or below HK\$7.75 per 1US\$. Vice versa, upper limit hits are defined as those occurrences when the HKD value is equal to or greater than HK\$7.85 per 1US\$. Panel A provides details on the entire sample. The full dataset includes a total of 121 lower limit hit days and 5945

individual instances. All of the lower limit hits have occurred either in 2014 or in 2015. Conversely, all of the 1581 upper limit hits included in our data have occurred in 46 days across 2018 and the first half of 2019. Panel B and Panel C provide the same information regarding the subsamples of days with at least 100 and 500 daily trades, respectively.

Consistent with Yan Du et al. (2009) we measure transaction frequency, volatility, and order pressure data for each 3-minute interval of the trading session. Table 5.3 reports the related descriptive statistics. Panel A presents the variables related to the frequency of transactions within each 3-minute interval: number of trades, number of quotes, and number of orders (trades plus quotes). Panel B details the variables related to market volatility: the absolute value of the return between the last price of two consecutive intervals and the price delta between the maximum and the minimum price within each 3-minute interval. Panel C shows the variables related to order imbalances: buy (sell) side is the ratio between the number of buy (sell) transactions and the total number of orders within each 3-minute interval.

**Table 5.2 Upper and Lower Limit Hit summary statistics**

	Days	Upper Limit Hits			Lower Limit Hits		
		Days	Total	Daily Av.	Days	Total	Daily Av.
Panel A:							
<i>Overall</i>	1718	46	1581	34.4	121	5945	49.1
Year							
2014	313	-	-	-	30	990	33.0
2015	313	-	-	-	91	4972	54.6
2016	312	-	-	-	-	-	-
2017	312	-	-	-	-	-	-
2018	313	28	972	34.7	-	-	-
2019	155	18	608	33.8	-	-	-
Panel B:							
<i>At least 100 trades</i>	1422	44	1579	35.9	108	5928	54.9
Year							
2014	259	-	-	-	27	979	36.3
2015	258	-	-	-	81	4959	61.2
2016	260	-	-	-	-	-	-
2017	258	-	-	-	-	-	-
2018	259	27	971	36.0	-	-	-
2019	128	17	607	35.7	-	-	-
Panel C:							
<i>At least 500 trades</i>	1249	42	1548	36.9	66	3642	55.2
Year							
2014	174	-	-	-	7	184	26.3
2015	217	-	-	-	59	3465	58.7
2016	246	-	-	-	-	-	-
2017	245	-	-	-	-	-	-
2018	247	26	942	36.2	-	-	-
2019	120	16	605	37.8	-	-	-

This table reports the frequency of the Hong Kong Dollar price limit hits in the period between the 1<sup>st</sup> of January 2014 to the 30<sup>th</sup> of June 2019. The data are grouped by year and the yearly number of trading days is shown. We distinguish between upper and lower limit hits, identified as the instances when the Hong Kong Dollar price was equal to or above 7.85HKD/USD and equal to or below 7.75HKD/USD, respectively. For each type of price limit hit we present the number of days in which the limit was hit, the frequency of price limit hits, and the average number of price limit hits during a limit-hit day. Panel A shows the limit hit statistics for every trading day in our sample. Panel B shows the limit hit statistics for the trading days where a minimum of 100 daily trades were executed. Panel C shows the limit hit statistics for the trading days where a minimum of 500 daily trades were executed. Notably, there are no limit hit days across 2016 and 2017.



**Table 5.3 Summary statistics of the market microstructure variables utilized in our analysis**

	Mean	Std.	Min.	25%	50%	75%	Max.
Panel A:							
<i>Transaction Frequency</i>							
Trades counts	3.43	6.87	0.00	0.00	1.00	4.00	646.00
Quotes counts	5.87	9.72	0.00	1.00	3.00	7.00	541.00
Total activities	9.30	14.46	1.00	2.00	5.00	11.00	966.00
Panel B:							
<i>Price Volatility</i>							
Abs. Return	0.002%	0.003%	0.000%	0.001%	0.001%	0.002%	0.270%
High-Low Price	0.021%	0.031%	0.000%	0.005%	0.015%	0.025%	2.285%
Panel C:							
<i>Order Pressure</i>							
Demand side	0.18	0.28	0.0000	0.0000	0.0000	0.2647	1.00
Supply side	0.17	0.27	0.0000	0.0000	0.0000	0.2500	1.00

This table presents the descriptive statistics of the market microstructure variables used in our analysis. Each data point refers to every 3-minute interval in our sample period with at least one trade or one quote (N=400562). For each variable we show mean value, standard deviation, minimum value, 1<sup>st</sup> quartile, median, 3<sup>rd</sup> quartile, and maximum value. Panel A presents the variables related to the frequency of transactions within each 3-minute interval: number of trades, number of quotes, and number of orders (trades plus quotes). Panel B details the variables related to market volatility: absolute value of the return between the last price of two consecutive intervals and the price delta between the maximum and the minimum price within each 3-minute interval. Panel C shows the variables related to order imbalances: buy (sell) side is the ratio between the number of buy (sell) transaction and the total number of orders within each 3-minute interval.

## 5.3 Methods

We address the research question outlined in Section 2.11.3 utilizing two models that are established in the literature regarding the association between behavioural phenomena and price limit rules. First, we follow Yan Du et al. (2009) and assess whether there are alterations in the market conditions in the minutes immediately before the HKD's valuation hits its boundaries. Second, we adopt the methodology from Hsieh et al. (2009) to test if the probability of prices hitting their boundaries increases when the market valuations are near the edges of the HKD's target-zone.

### 5.3.1 Model 1

To assess the presence of altered trading conditions prior to the HKD reaching its price bounds, we examine a number of market microstructure variables in the preceding 30-minutes as extant literature suggests that a half-hour time horizon is long enough to capture eventual behavioural elements and short enough to exclude the noise derived from other factors (Chordia, Roll, & Subrahmanyam, 2005; Yan Du et al., 2009). The following time-distanced quadratic function is estimated:

$$\text{Market Microstructure variable} = \beta_0 + \beta_1 INT + \beta_2 INT^2 \quad (5.1).$$

Seven dependent variables pertaining to transaction frequency, market volatility, and order pressure are examined. We account for the transaction frequency in terms of: (i) total number of trades; (ii) total number of quotes; and (iii) total number of orders received within each 3-minute interval. Our market volatility measures are: (iv) the absolute return between the last prices of two consecutive 3-minute intervals; and (v) the difference between the maximum and the minimum prices recorded within each 3-minute interval. In terms of order imbalance, we analyse: (vi) the ratio between the number of buy transactions and the total number of orders within each 3-minute interval; and (vii) the ratio between the number of sell transactions and the total number of orders within each 3-minute interval. Each variable is standardized by its mean and standard deviation during non-limit-hit days.

Among the independent variables,  $INT$  assumes a value from 1 to 10 from the furthest to the closest 3-minute interval before a price limit hit has occurred.  $INT^2$  is the squared  $INT$  and describes the acceleration rate in the function.  $INT^2$  is the

variable of interest to detect whether the sample analysed presents evidence of an accelerating pattern consistent with behavioural expectations.

### 5.3.2 Model 2

The second method applies a logistic framework with a binary dependent variable indicating whether the next price movement approaches the closest price boundary. This is represented in a generic form by the following equation:

$$\log \left( \frac{p}{1-p} \right) = \alpha + \beta X + \varepsilon \quad (5.2),$$

where  $p$  defines the probability of a security's price to progress towards its price boundary and  $X$  is the vector of explanatory variables. Following Hsieh et al. (2009), the relevant independent variables capture the distance between the market price and the closest edge of the HKD's target-zone. We also control for a number of microstructure variables known to affect the movements of assets' prices (Hausman, Lo, & Mackinlay, 1992 1992). Specifically, the model estimated is as follows:

$$\begin{aligned} X'_K B = & \beta_0 + \beta_1 Spread_{k-1} + \beta_2 \Delta T_k + \beta_3 IBS_{k-1} + \beta_4 IBS_{k-2} + \beta_5 IBS_{k-3} \\ & + \beta_6 TickGroup_{k-1}^{1i} + \dots + \beta_{6+m} TickGroup_{k-1}^{mi} \end{aligned} \quad (5.3).$$

is our dependent variable and represents the conditional probability that the price of the  $k^{th}$  transaction has advanced towards the price boundary compared to the price of the trade  $k-1^{th}$ . is the intercept and capture the variability of that is not explained by the other independent variables.

denote a set of  $m$  dummy variables capturing the distance between the previous trade price and the price boundary. Each of the dummies is linked with a price range that is wide a number of ticks equal to  $i$ . Each dummy is equal to 1 when the  $k-1^{\text{th}}$  trade price falls within  $(m-1)*i$  ticks and  $m*i$  ticks from the price limit. Conversely, all the other dummies in the set will assume the value of 0.

Among the control variables,  $\Delta P_{k-1}$  exhibits the difference between the prevailing bid and ask quotes immediately before the trade in question and is used to capture the influence of liquidity changes (Brockman & Chung, 1999). The variable represents the time duration between the  $k^{\text{th}}$  and the  $(k-1)^{\text{th}}$  trade and is relevant because a trade's price impact becomes lower and lower as the duration between trades lengthens (Easley, Kiefer, O'Hara, & Paperman, 1996 & Paperman, 1996).  $\Delta P_{k-1}$  is a three lagged categorical variable that assumes the value 1 if the  $k-n^{\text{th}}$  trade was buyer initiated and equals -1 if it was seller initiated. This variable is needed to control for the impact of potential order imbalance (Amihud & Mendelson, 1986; O'Hara, 2003).

## 5.4 Results

### 5.4.1 Altered market activity anticipates hitting the bounds

Table 5.4 details the results of the analysis following Model 1 on the accelerating patterns of market activity in the 30-minutes before the HKD's valuation reaches one of the edges of its target-zone. All coefficients are significant at 1% level. Our investigation distinguishes between the two edges of the HKD's target-zone. From now on, the term 'depreciating' will refer to the investigation regarding the price area where the HKD value approaches HK\$7.85 per 1US\$. Vice versa, the term

‘appreciating’ will refer to the area of prices where the HKD value is close to HK\$7.75 per 1US\$.

Panel A presents the results regarding the market microstructure variables on the transaction frequency in the 30-minute window before a price limit is hit. Empirical evidence supports the theoretical argument from Subrahmanyam (1994) regarding the association between market valuations approaching their boundaries and a behavioural alteration on the level of market activity. Specifically, we find strong statistical support consistent with the fact that the number of trades, quotes, and total orders progressively grows in the 30 minutes before the current market price hits either its upper or lower boundary. Notably, there are no significant differences when comparing the results between what happens in the depreciating versus the appreciating area of the HKD’s target-zone.

Panel B shows the results of our investigation in terms of price volatility. Volatility measured as absolute returns between the last price of two consecutive 3-minute intervals appears to be increasing and accelerating in the minutes before a price limit hit both in the appreciating and in the depreciating areas of the HKD’s target-zone. Consistently, our second measure of volatility – the difference between the highest and the lowest prices recorded within each 3-minute interval – seems to follow a similar pattern. These results are aligned with the predictions of theoretical frameworks regarding the presence of behavioural expectations rising in the markets (Subrahmanyam, 1994). Further, these findings are consistent with the empirical literature on markets with price limitations, which contrasts with the theoretical prediction from Krugman (1991) for which the presence of a target-zone regime induces a stabilizing effect on the exchange rate behaviour.

Panel C presents the results of our analysis with a focus on the order pressure variables. Once again, in both the appreciating and depreciating areas of the target-zone, the statistical evidence exhibits significant market alterations in the minutes before a price limit is reached. In the depreciating area of the target-zone, both demand and supply-side pressure are significantly reduced. These results suggest traders withdraw from participating in the market, which is consistent with an increased uncertainty related with a possible and imminent break of the HKD-USD peg. This evidence is interesting especially in light of the fact the HKMA has abundant foreign currency reserves - as of May 2020 they amount to over six times the currency in circulation - and never released information regarding the possibility they would stop supporting the HKD's target-zone. Therefore, it is not rational for market participants to be concerned with such a circumstance. Conversely, the investigation regarding the appreciating side of the target-zone exhibits a negative coefficient for the demand side pressure and a positive coefficient for the supply-side pressure. Overall, these findings confirm the hypothesis for which the HKD's trades and quotes are affected by behavioural phenomena in the minutes immediately before a price boundary hit.

**Table 5.4 Acceleration rate of market microstructure variables**

	Depreciating HKD (n=460)			Appreciating HKD (n=1210)		
	Coefficient	Std. Error	t-stat	Coefficient	Std. Error	t-stat
Panel A:						
<i>Transaction Frequency</i>						
Trade counts	0.046	0.003	15.318	0.016	0.002	8.223
Quote counts	0.013	0.003	4.439	0.010	0.002	5.126
Total activity	0.030	0.003	10.018	0.014	0.002	7.207
Panel B:						
<i>Price Volatility</i>						
Abs Return	0.010	0.003	3.656	0.010	0.002	5.424
Max-Min Price	0.014	0.003	4.770	0.020	0.002	10.624
Panel C:						
<i>Order Pressure</i>						
Demand side	-0.012	0.004	-3.059	-0.015	0.003	-5.079
Supply side	-0.012	0.004	-3.052	0.021	0.003	7.119

This table shows the acceleration rates of seven market microstructure variables using the model suggested by Yan Du et al. (2009). An OLS regression is run for upper and lower limit hits, respectively. The independent variables are INT and INT<sup>2</sup> where INT ranges from 1 to 10, indicating each of the 10 3-minute intervals before a price limit hit from the furthest to the closest, respectively. The acceleration rate discussed here is interpreted as the coefficient of INT<sup>2</sup>. Panel A shows the results of our analysis when the dependent variable relates to the transaction frequency within each 3-minute interval. Panel B details the results using two alternative dependent variables linked to price volatility. Panel C presents the results regarding the buy side and sell side order imbalance. Each dependent variable is standardized utilizing the mean and the standard deviation of the 3-minute intervals of the days when no price limit is reached. As in Yan Du et al. (2009), we avoid confounding factors by utilizing data for the first daily limit hit only. All estimated coefficients are significant at 1% level.

### 5.4.2 Attraction near the edges of the HKD's target zone

Table 5.5 reports the results of Model 2 which investigates the attraction the boundaries of the HKD's target-zone induce on the currency's valuation probabilistically. The test uses all the trades and quotes in our dataset and runs two separate regressions for both the appreciating and depreciating areas of the target-zone, respectively. Translated odds are calculated as  $e^{-(coefficient)} - 1$  and are interpreted as the change in the conditional probability of the event that the k<sup>th</sup> trade price is closer to the limit compared to the k-1<sup>th</sup> transaction. We show the results of our tests where the equation includes 13 intervals of investigation ( $m=13$ ) with a

width of 20 ticks ( $i=20$  ticks). For example, the TickGroup [0.0000-0.0020] in the depreciating area of the target-zone refers to every situation when the current market price is between 7.8500 and 7.8480 HK\$ per 1US\$. Figure 5.2 shows the results of our logistic regression in graphical terms. The horizontal axis represents the distance of the current market price from its closest boundary while the vertical axis represents the conditional probability that the next price movement will be towards the closest price limit. This figure thus shows how the magnitude of the effect investigated here changes as the HKD's market valuations depart from the edges of the target-zone. The solid blue dots indicate statistically significant coefficients, and the red intermittent line represents the trend line. The two investigations regarding the appreciating and depreciating areas of the target-zone present the same evidence, for which the conditional probability of a movement towards the edges of the target-zone progressively increases as the current market price approaches its bounds.

The results for the depreciating area of the target-zone (i.e., on the weak edge of the target-zone with prices close to HK\$7.85 per 1US\$) support the hypothesis for which the boundaries of the HKD's target-zone generate a behavioural attraction on the currency's valuations. The coefficient for the first five TickGroups is statistically significant and associated with positive translated odds. Specifically, when the current HKD market valuation is within 20 ticks from its upper bound (first TickGroup), the conditional probability that the next price will be closer to the bound increases by 96.7%. When the last trade price falls within 20 and 40 ticks from the upper bound (second TickGroup), the conditional probability of a price increase is 47.7%. We find evidence for the same effect up to the fifth TickGroup in the analysis. Specifically, the third, fourth, and fifth TickGroups are associated with



a price increase translated odds of 36.7%, 11.4%, and 20.5%, respectively. Consistent with the theory, the empirical evidence we find near the weak edge of the HKD's target-zone suggests the detected effect weakens as the price departs from its limit – initially the translated odds are statistically significant and almost perfectly monotonically decreasing, while as we depart from the edge of the HKD's target-zone (from the sixth TickGroup onwards) the coefficients become statistically insignificant.

Our tests also confirm the existence of a symmetrical effect for the appreciating area of the target-zone (i.e., when the market valuations are close to HK\$7.75 per 1US\$). Consistent with what we find near the opposite edge of the target-zone and with the extant literature, the detected gravitational effect weakens as the HKD's price departs from its boundary. Two additional points need to be noted as we compare the results of our analysis regarding the depreciating versus the appreciating area of the HKD's target-zone. First, in the appreciating area of the target-zone, the gravitational phenomenon appears to be less intense as the absolute value of the translated odds is smaller than the value they assume when the HKD's value is close to HK\$7.85 per 1US\$. Second, it is interesting to note the detected phenomenon starts at a greater distance in the appreciating area of the HKD's target zone as the coefficients are significant up to the seventh TickGroup; in the depreciating area of the target-zone, the gravitational effect stops at the fifth TickGroup.

The evidence provided in Table 5.5 (and in Figure 5.2) suggests an additional alteration in the HKD price pattern as market valuations near the edges of the target-zone. The results provided in Table 5.5 regarding the depreciating area of the target-zone show a positive and statistically significant coefficient for the eleventh TickGroup and a negative and statistically significant coefficient for the twelfth

TickGroup. Specifically, when the HKD's market value is between HK\$7.828 and HK\$7.830 per 1US\$, i.e., the eleventh TickGroup, this is associated with a price increase translated odds of 14.9%. Vice versa, the twelfth TickGroup is associated with a conditional probability of a price increase lower by 15%. Symmetrically, the eleventh and twelfth TickGroups in the appreciating area of the HKD's target-zone are also associated with a positive and a negative statistically significant coefficient, respectively. Specifically, the conditional probability of a price drop increases by 19.1% for the eleventh TickGroup, while the translated odds of a price decrease are lower by 9.4% for the twelfth TickGroup. These results support the hypothesis regarding the existence of behavioural effects near the edges of the HKD's target-zone for two reasons. First, these results show traders have clustered a disproportionate amount of limit orders at a specific price threshold, which is consistent with the presence of psychological barriers in the HKD trading. Second, the fact these psychological barriers are set at identical distances from both edges of the HKD' target zone – 200 ticks from each bound – denotes market participants link their trading decision to the limits imposed by the HKMA. This instance is known as anchoring bias (Tversky & Kahneman, 1974) and shows traders are behaviourally impacted by the existence of the HKD's target-zone as they are more interested in the values of the bounds than on the currency's fundamentals.

**Table 5.5 Logit regression results – probability to approach the limit conditional to the price distance**

TickGroup	Depreciating HKD			Appreciating HKD		
	Coefficient	p-value	Translated odds (%)	Coefficient	p-value	Translated odds (%)
0.000 - 0.002	-0.677***	0.0000	96.7	-0.352***	0.0000	42.1
0.002 - 0.004	-0.390***	0.0000	47.7	-0.193***	0.0000	21.2
0.004 - 0.006	-0.312***	0.0000	36.7	-0.105***	0.0000	11.1
0.006 - 0.008	-0.108**	0.0161	11.4	-0.097***	0.0000	10.2
0.008 - 0.010	-0.187***	0.0001	20.5	-0.112***	0.0000	11.9
0.010 - 0.012	0.032	0.5326	-3.1	-0.060***	0.0002	6.1
0.012 - 0.014	-0.106	0.2476	11.2	-0.066***	0.0002	6.9
0.014 - 0.016	-0.039	0.6389	3.9	0.013	0.5088	-1.3
0.016 - 0.018	0.039	0.5364	-3.8	-0.050**	0.0119	5.1
0.018 - 0.020	-0.121	0.1245	12.9	-0.035	0.1601	3.5
0.020 - 0.022	-0.139**	0.0157	14.9	-0.175***	0.0000	19.1
0.022 - 0.024	0.162***	0.0000	-15.0	0.099*	0.0263	-9.4
0.024 - 0.026	0.017	0.4549	-1.7	-0.014	0.6923	1.4

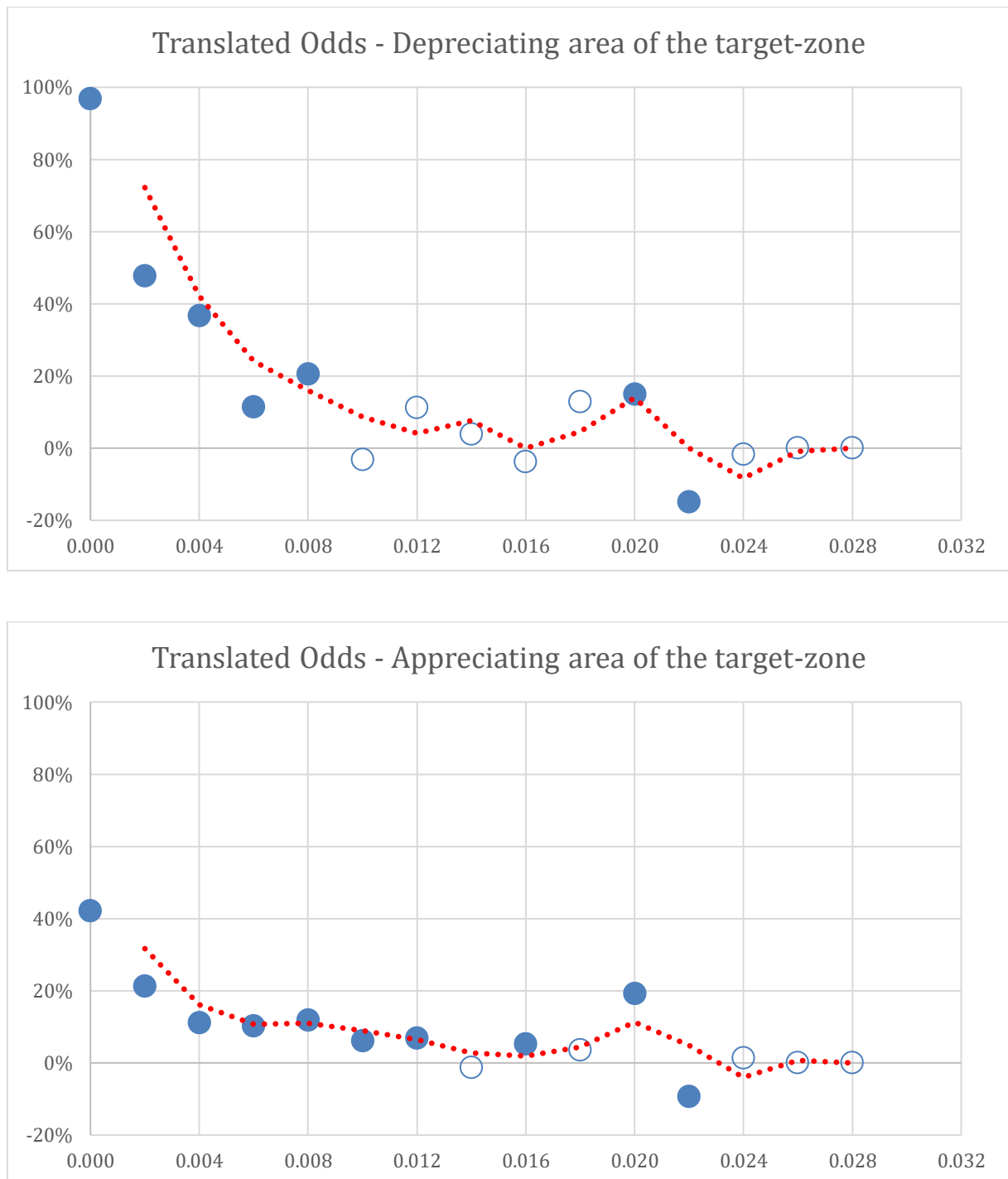
This table shows the results of our logit regression for the variables of interest, namely the set of dummies indicating a range of distances between the last trade price and the price limits. Each TickGroup refers to a specific dummy in our model that captures the situation in which the current market price is at a specified distance from the closest price limit. For example, the TickGroup [0.000-0.002] in the Depreciating HKD section of the table refers to every situation when the current market price is between 7.850 and 7.848 HKD/USD. The dependent variable equals 1 when the price of the (k-1)<sup>th</sup> transaction is lower (higher) than that of the k<sup>th</sup> transaction in the Depreciating (Appreciating) area of the HKD's target-zone, respectively. Translated odds are calculated as  $e^{-(\text{coefficient})}-1$  and indicate the change in the conditional probability that the next trade price will move towards the price limit.

\* denotes t-statistic significant at 0.1 level;

\*\* denotes t-statistic significant at 0.05 level;

\*\*\* denotes t-statistic significant at 0.01 level.

**Figure 5-2 Graphical representation of the logit regression results**



The above figures show in graphical terms the results of our logistic regression. The horizontal axis represents the distance of the current market price from its closest limit. The vertical axis represents the conditional probability that the next price movement will be towards the closest price limit. The full blue dots indicate statistically significant coefficients, while the blue-outlined dots represent non-significant coefficients. The red intermittent line shows the trend line of the magnet effect when the market price approach its limits. Both the depreciating and appreciating areas of the target-zone present the same evidence, consistent with a gravitational phenomenon, for which the conditional probability of a movement towards the limits progressively increases as the current market price approach its limits.

## 5.5 Summary

This chapter has investigated the existence of the gravitational effect in a foreign exchange market bounded by upper and lower prices. Specifically, this chapter has performed a study on the HKD's target-zone and tested whether market prices approaching their bounds are associated with altered market conditions as a result of behavioural expectations. Extant literature suggests that the foreign exchange market might be affected by behavioural influences. For example, it has been shown that traders in the foreign exchange market have expectations that are biased towards the direction that would benefit them the most (Ito, 1990). Further, the weak empirical performance of the model from Krugman (1991) – which is based on the assumption that market participants have rational expectations – provides additional support for the presence of behavioural phenomena in the context of foreign exchange markets with a target-zone regime. This chapter confirms that when the HKD spot price approaches the bounds of its target-zone, normal market conditions are altered consistent with the presence of behavioural expectations.

The findings included in this chapter are supported by two models that yield consistent results despite addressing two distinct perspectives. On the one hand, the first set of results focuses on the ex-ante behaviour prior to boundary hits and detects altered market conditions in terms of transaction frequency, volatility, and order pressure. On the other hand, the second set of results shows the probability of a price movement towards the edge of the HKD's target-zone relates to the distance between the currency's spot price and its boundaries.

## **Chapter 6 . Conclusions**

Behavioural finance seeks to identify, explain, and model the practical inconsistencies that affect three major parts of the financial system, namely, individual traders, corporate managers, and financial market operation.

With respect to the decisions of individuals, traditional finance accepts several rational explanations for investors to trade. First of all, investors are expected to trade in order to profit from the possession of private information (Grossman & Stiglitz, 1980). Secondly, individual traders should transact after major changes in the assets' valuations as this allows them to rebalance their portfolio and to maintain their preferred risk exposure. In doing so, specific individuals may need to sell their assets in order to raise cash to use for consumption purposes. Other possible reasons for trading include tax motivations as well as future expectations about lifetime income (Ando & Modigliani, 1963). These rational motivations are confirmed by the empirical patterns in financial markets; however, real world data also show investors' decisions may sometimes depart from optimal decision-making. For example, scholars have identified that certain investors tend to trade excessively, which negatively impacts their returns due to the burden of the associated transaction costs. A number of behavioural studies are successful in explaining this phenomenon by means of several irrational biases including overconfidence (Barber & Odean, 2001) and sensation seeking (Grinblatt & Keloharju, 2009). Further, many more anomalies in the decisions of financial traders can be related to other behavioural aspects including availability or representativeness. In this regard, it is well known that investors typically trade more attention-grabbing assets (Barber & Odean, 2008; Dhar, Goetzmann, Zhu, & Moscow, 2009) and that stocks with similar

tickers exhibit significant correlation in volatility, volumes, and returns despite their fundamentals being completely unrelated (Rashes, 2001). These findings show traditional theories do not perfectly describe what happens in financial markets and highlight the importance of behavioural studies in understanding individual investors' decisions.

Another branch of research in behavioural finance regards the decision-making process of corporate managers. This area of investigation is relevant because executives often make decisions that involve millions and millions of dollars and hence the consequences of biased judgments are likely to be significant. The term capital budgeting describes the process wherein firms decide how to invest their money. In principle, a firm should invest in a project because its managers rationally expect the new undertaking will increase the value of the company. In reality, executives' decisions are often shown to be biased and, as a result, firms also invest in value-destroying businesses. For example, empirical evidence documents that executives tend to overestimate the precision of their assessments (Fischhoff, Slovic, & Lichtenstein, 1977 1977), and, as a consequence, firms miscalculate the level of risk of their investments. Similarly, managers are irrational in attributing the negative outcomes of their projects to outside events and, as a consequence, they may refuse to revise future cash flow forecasts. Further, managers are prone to overcommit to the projects they have initiated and, as a result, they may make suboptimal decisions in real option scenarios (Denison, 2009) and refuse to accept past sunk costs (Garland, 1990; Ross & Staw, 1993).

The third object of investigation in behavioural studies is the activity of financial markets. Traditional finance assumes financial markets are rational and efficient, meaning that the current price of a specific asset equals the present value of all the

future cash flows that result from owning it. This hypothesis is supported by the idea that investors are rational agents who would only trade assets at their fundamental values. Further, the belief of efficient markets also holds in the case that some investors are not rational as long as their biases are not systematic. Indeed, if the traders' biases are not correlated, the net effect would be negligible as the different errors will counterbalance each other. Additionally, scholars theorize financial markets can be efficient if irrational investors are systematically biased in the same direction. Specifically, in such a situation, the efficiency of the market would be ensured by the presence of some rational investors who would be able to take advantage of the existing biases and profit from them until asset prices reflect their fundamental values. Despite these theoretical justifications, over the last three decades, researchers have abundantly shown that financial markets are far from being rational and efficient and several anomalies have been observed and continue to persist. For instance, just like normal human beings, financial markets appear to have "moods" as assets' valuations are shown to be tightly connected with factors such as the morning weather (Hirshleifer & Shumway, 2003), the season of the year (Kamstra, Kramer, & Levi, 2003 2003), and international sports results (Edmans, García, & Norli, 2007 2007). Further, markets appear to react in an irrational manner to certain types of news. On the one hand, the volatility of market prices responds to completely unrelated events such as the bombing of Pearl Harbor or the assassination of US President Kennedy (Cutler, Poterba, & Summers, 1989 1989). On the other hand, the response to relevant news also differs from what is rationally prescribed as, for example, the expected adjustments in stock prices after the release of corporate earnings results are not immediate and continue for several days after the disclosure of the relevant information (Ball & Brown, 1968).



This dissertation brings together these three elements of behavioural finance. Specifically, the first study in this dissertation investigates some of the determinants of behavioural biases in individual investors, the second paper studies the impact of personality traits on decision making in corporate executives, and the last investigation tests the existence of behavioural patterns in financial markets where price boundaries are imposed.

The second chapter in this dissertation identifies three areas of research in behavioural finance literature. Specifically, the first area of research presented regards the interaction between traders' biases and the use of alternative payment methods. A clearer understanding of the impact of payment methods and their saliency is relevant as it could help to minimize individual investors' irrational decisions. The second area of research included in Chapter 2 addresses the impact that the personality of CEOs has on their firms' accounting conservatism. This strand of literature demonstrates that executives' innate characteristics might be an important aspect to consider when comparing corporate financial performance. Lastly, the third area of research discussed examines the behavioural implications connected with target-zone regimes in the foreign exchange market. This aspect is relevant to improve our understanding of financial markets with price boundaries and contributes to solving the puzzle of the weak empirical performance of the model from Krugman (1991).

Chapter 3 examines the association between alternative payment methods and the magnitude of investors' disposition effect. Extant research documents that payment methods affect the decision making process in areas such as corporate finance (Maksimovic & Phillips, 2001; Rhodes-Kropf et al., 2005; Shleifer & Vishny, 2003) and consumer behaviour (Monger & Feinberg, 1997; Prelec & Simester, 2001). The

first empirical investigation included in this dissertation extends previous literature and tests whether different settlement systems are associated with distinct behaviours of financial investors. Specifically, we investigate the association between payment methods and the disposition effect – the tendency to ride losers and sell winners – because such behavioural bias is intimately linked with the buying and selling decision. The proprietary database we analyse provides an opportunity to address this topic as the traders in our sample are allowed to transact with two alternative methods. Consistent with previous research, we distinguish among trades in terms of their saliency. On the one hand, we claim that traditional investment and divestment decisions are more salient because they involve monetary flows. On the other hand, transactions that consist solely of asset exchanges are less salient. Following extant literature, we conjecture that salient payment methods should be associated with a greater disposition effect. We test this hypothesis with the methodology suggested by Odean (1998a), which suits the objective of our investigation and has an elegant and intuitive interpretation. The results provided in Chapter 3 confirm that salient settlement methods are positively related to realizing gains too early and holding losers too long. Vice versa, round-trips performed with non-salient settlement systems are associated with relatively low or absent disposition effect. Our results are robust to alternative measures of PRG and PRL, tax considerations, and trade size. These findings suggest additional research on this topic could be profitable. For example, it would be interesting to detect whether our results hold for different types of traders; thus, future research could investigate whether the saliency of payment methods also affects investors that are more sophisticated. Similarly, prospective researchers should aim to confirm that the saliency of payment methods affects traders dealing with different types of securities, such as equity instruments or futures contracts. Additionally,

despite the several tests conducted, it is possible the results presented in Chapter 3 are linked with some issues in the applied methodology. It follows that it could be beneficial for future research to utilize different models to confirm the positive association between the disposition effect and the saliency of payment methods. Another caveat regards limitations in the data. The utilized database does not ensure heterogeneity in observations (e.g., tax rates) and does not contain individual investors' characteristics. Such aspect prevented us from relating the disposition effect to a larger set of determinants. Further, the data was made available from a single provider and region. We suggest future research evaluate the generalizability to our findings across multiple sources and other international markets.

Chapter 4 studies the relationship between executives' personality and firm outcomes. Innate CEO characteristics have been associated with decisions on corporate strategy (Chatterjee & Hambrick, 2011; Galasso & Simcoe, 2011), investment performance (Chatterjee & Hambrick, 2011; Hsu, 2017; Olsen et al., 2014), and dividend policies (Chen et al., 2011; Deshmukh et al., 2013). While managerial overconfidence has received a great deal of attention, the effects of executives' narcissism are still widely unexplored (Chatterjee & Hambrick, 2007). We thus contribute to the literature by investigating the relationship between CEO narcissism and accounting conservatism. Previous accounting research is biased against narcissistic individuals and often assumes that this personality type necessarily leads to negative firm performance when present in corporate executives. Psychology literature, however, suggests narcissistic traits might also have positive outcomes and we test this idea in the accounting context by investigating the relationship between CEO narcissism and accounting conservatism. We conjecture that CEO narcissism should have a twofold effect on

prudent financial reporting. On the one hand, CEO narcissism should be correlated with low levels of unconditional conservatism due to an excessively rapid recognition of good news. On the other hand, narcissistic executives should be associated with quick recognition of negative results and hence with higher levels of conditional conservatism. We test our hypotheses with a sample that is considerably larger than any previous research on executives' narcissism. Additionally, we investigate accounting conservatism by borrowing three of the most widely used and trusted methodologies in this field of research. The results presented in Chapter 4 are consistent across all of the models we used. Both our hypotheses are confirmed by empirical evidence and therefore we claim that narcissistic top managers tend to anticipate the accounting recognition of both positive and negative news. Our robustness tests confirm the validity of our hypotheses and discard the explanation that narcissistic CEOs self-select into companies with abnormal financial reporting practices. Further, we provide initial empirical evidence to the claim from Amernic and Craig (2010) who argue extreme levels of narcissism might relate to unethical behaviour and accounting manipulation. Our results suggest several avenues for future research. For example, it would be interesting to investigate whether the findings of this study hold true in other contexts (i.e., outside the US). Additionally, given the increasing scholarly attention narcissism is attracting, whether various corporate stakeholders consider such a factor in their decisions is an important topic for future empirical studies. Further, consistent with Judge et al. (2009), we suggest that future analysis should consider the positive aspects associated with narcissism. Notwithstanding the several alternative methods utilized in this research and the many controls applied, we acknowledge the relationship between CEO narcissism and accounting conservatism documented in this study might derive from a set of

omitted variables. To this extent, it is possible our results include some noise and should be interpreted with caution.

Chapter 5 performs a behavioural exploration of the Hong Kong Dollar (HKD) target-zone to test the existence of behavioural expectations within the foreign exchange market. This research question is relevant for several reasons. First, documenting that the actors in foreign exchange markets are affected by irrational phenomena and thus have behavioural expectations will explain why the model from Krugman (1991) did not have much empirical success. Second, extant research shows price limit rules are shown to induce behavioural responses in the market participants of equity and futures markets (Hsieh et al., 2009). We extend this branch of literature by studying whether price limits – in the form of a target-zone exchange rate regime – produce behavioural phenomena in the context of foreign exchange markets. The use of HKD information suits our purposes as this currency is pegged to the USD within a fixed target-zone; therefore, the value of the currency can only range between HK\$7.75 and HK\$7.85 per 1US\$. These two values act as de facto price limits for the currency, and they are both predictable and credible. According to Subrahmanyam (1995), these features are relevant because a stable price bound is salient and thus eases investors' beliefs of trading impediments and favours the existence of behavioural phenomena. Third, the Hong Kong Dollar is the ninth most traded currency in the world (BIS, 2019), hence the detection of related irrational trading may benefit several financial actors and billions of dollars in trade value. Our results indicate market valuations near the edges of the HKD's target-zone have patterns consistent with the presence of behavioural expectations. Specifically, we find that the 30-minute window before the HKD price hits the edges of its target-zone is associated with heightened market activity, higher volatility, and

modified order pressure. Extant literature justifies this evidence with the fact that the presence of a target-zone regime induces market participants to anticipate their transactions due to the fear of possible future trading alterations (Subrahmanyam, 1994). Alternatively, it is possible the evidence here discussed derives from traders' perception that market momentum is growing as the HKD's price approaches the edges of its target-zone. We also detect altered price patterns near both edges of the HKD's target-zone. In particular, we find that the conditional probability of a price movement towards the bounds becomes higher and higher as the market valuations approach their limits. Consistent with previous studies (Cho et al., 2003), we detect the intensity of this effect is not symmetrical and the gravitational field is stronger near the upper limit of HK\$7.85 per 1US\$. Given the specific environment of our investigation, we provide two explanations for such a phenomenon. First, the stronger magnet effect around the upper limit could be due to a market pressure artificially created by speculators trying to break the HKD. Alternatively, it is important to consider the upper limit of the HKD target-zone as the "weak" side, as it is here that the Hong Kong authorities might encounter difficulties to support the currency when they are short of foreign exchange reserves. As a consequence, the stronger magnet effect around the valuation of HK\$7.85 may be due to the herding of market participants who fear Hong Kong authorities will stop supporting the peg. Lastly, we detect abnormal price patterns at around 200 ticks from both edges of the HKD's target-zone. This evidence is consistent with the extant literature supporting the presence of psychological barriers in the foreign exchange market (Mitchell, 2001). These findings have direct practical implications for the HKMA as it can take advantage of this study's results by improving their models for the HKD exchange rate stabilization. For example, the HKMA might decide to anticipate its future market interventions in order to prevent the formation of a gravitational

effect and thus minimizing the disbursement of foreign exchange reserves. Future research should aim to confirm the existence of the detected gravitational effect for the HKD's target-zone and to exclude the phenomena here discussed are due to unknown instances of information-based trading. Additionally, it could be important for prospective investigations to detect whether other types of regulations imposed by the central banks are associated with distinct behavioural consequences.

These results contribute to our understanding of the impact of different behavioural elements in the field of finance. Specifically, the first study included in this dissertation highlights the importance of salience as it pertains to the use of different payment methods. The second study focuses on the relevance of personality traits and shows how these could affect corporate outcomes. Lastly, the third study in this thesis confirms the existence of behavioural expectations in financial markets as a result of specific trading regulations.

## Appendix A:

Variable name	Description and identification of COMPUSTAT item
NI	Net income before extraordinary items (#IB) divided by beginning of the year stock prices (MVE)
Return	Buy-and-hold stock return from 9 months before to 3 months after the end of the fiscal year
MB	Market-to-book ratio. MVE/#CEQ
LEV	Leverage. (#DLTT+#DLC)/MVE
MVE	Market value of equity at end of fiscal year. #CSHO*#PRCC_F
ACC	Yearly corporate accruals. Calculated as defined in Equation (4)
CFO	Operating cash flows (#OANCF) divided by beginning of the year total assets (#AT)
CSALES	Change in yearly sales (#SALE) divided by beginning of the year total assets (#AT)
FASSETS	Book value of fixed assets (#PPEGT) divided by beginning of year total assets (#AT)
SIZE	Firm's size. Natural log of end of year total assets (#AT)
Δ Inventory	Yearly change in firm's inventory #INVCH
Δ Other Current Assets	Yearly change in firm's current assets Difference between two consecutive years' #ACT
Δ Other Current Liabilities	Yearly change in firm's current liabilities Difference between two consecutive years' #LCT
Depreciation	Yearly value of firm's depreciation #DP
Δ Receivables	Yearly change in firm's account receivables #RECCH
Prepaid Expenses	Yearly value of firm's prepaid expenses #XPP
Δ Payables	Yearly change in firm's account payables #APALCH
Δ Taxes Payables	Yearly change in Difference between two consecutive years' #TXP
LIT	Dummy variable for industry litigiosity identified as specified in text. Assumes value 1 if industry is litigious; value is 0 otherwise.



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