

Pelster, Matthias; Hofmann, Annette; Klocke, Nina; Warkulat, Sonja

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Dark Triad Personality Traits and Selective Hedging

Matthias Pelster¹ · Annette Hofmann² · Nina Klocke¹ · Sonja Warkulat¹

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Abstract

We study the relationship between risk managers' dark triad personality traits (Machiavellianism, narcissism, and psychopathy) and their selective hedging activities. Using a primary survey of 412 professional risk managers, we find that managers with dark personality traits are more likely to engage in selective hedging than those without. This effect is particularly pronounced for older, male, and less experienced risk managers. The effect is also stronger in smaller firms, less centralized risk management departments, and family-owned firms.

Keywords Managers · Personality traits · Corporate risk management · Selective hedging

JEL Classification G30 · G34 · G39

[...] the most significant risk management failures in recent history have their roots in psychology, and [...] the practice of risk management can be improved by incorporating an explicit psychological dimension. Shefrin (2016)

Introduction

The main goal of financial risk management is to stabilize cash flows, eliminate specific sources of volatility, reduce the risk of losing money because of market uncertainty, and reduce the probability of entering distress (Mian, 1996; Faulkender, 2005; Stulz, 1996, 2013). In contrast to passive hedging, *selective hedging* refers to managers *actively* varying the size of their hedge ratios and the timing of their derivatives transactions based on their market views,

personal preferences, attitudes, or skills (Stulz, 1996; Brown et al., 2006; Adam et al., 2015, 2017). By doing so, managers increase the risk exposure of firms, the firms' probabilities of bankruptcy, and—ultimately—the firms' future stock return volatility (Adam et al., 2017; Stulz 1996). As such, selective hedging stands in contrast to corporate risk management policies from textbook hedging (Beber & Fabbri, 2012).

Prior studies provide global evidence that firms adjust their hedge ratios and regularly speculate within the context of their hedging programs (Adam & Fernando, 2006; Tufano, 1996). For example, Beber and Fabbri (2012) find that 63% of firms in their sample change their derivative position at least by 30% every year, which is consistent with managers adjusting derivative holdings over time according to active views, but “hard to reconcile with derivatives being exclusively managed according to an optimal hedging policy” (p. 1066).

A large body of literature shows that the additional risk in selective hedging does not increase shareholders' returns (Beber & Fabbri, 2012; Brown et al., 2006). Adam et al. (2017) document that the extent of selective hedging is positively correlated with a firm's future stock return volatility, supporting the homonymous suggestion by Stulz (1996). In fact, firms that speculate the most feature the highest probabilities of bankruptcy (Adam et al., 2017).

Companies incurring major losses from selective hedging highlight its potentially devastating consequences. For

✉ Matthias Pelster
matthias.pelster@upb.de
Annette Hofmann
hofmanna@stjohns.edu

¹ Center for Risk Management, Paderborn University, Warburger Str. 100, 33098 Paderborn, Germany

² Maurice R. Greenberg School of Risk Management, Insurance and Actuarial Science, St. John's University, 101 Astor Place, New York, NY 10003, USA

example, Japan's leading oil refiner and distributor, Showa Shell Sekiyu, half-owned by the Royal Dutch/Shell Group, reported in February 1993 that it lost approximately \$1 billion—more than 80% of its shareholder equity at the time—because of risk managers' unauthorized incorporation of their market views in hedging decisions, speculating that the US dollar would rise against the yen (Ipsen, 1993). Similarly, Chesapeake's reported selective hedging losses exceeded \$750 million in 2012 from hedging decisions that were essentially speculative (Adam et al., 2017). Against this backdrop, "the widespread practice of managers speculating by incorporating their market views into firms' hedging programs ("selective hedging") remains a puzzle" (Adam et al., 2017).

Liu et al. (2020) note that "people hope and expect that appointees to high-ranking positions will use their authority wisely and for the betterment of their organizations" (p. 745). Based on this principle and considering that the primary task of risk managers is to reduce volatility, one would expect them not to engage in selective hedging and, by doing so, increase the risk exposure of the firm. Given the potentially severe financial losses that might result in serious consequences for investors, employees, and the company's reputation, the additional risk-taking of risk managers is ethically at least debatable.

This paper studies how risk managers' personality traits can explain selective hedging and shows that dark personality traits increase managers' propensity to engage in selective hedging. Our hypothesis is based on the notion that dark personality traits are associated with increased sensation-seeking and risky behaviors (Crysel et al., 2013). Engaging in selective hedging activities satisfies the sensation-seeking need of managers with pronounced dark personality traits. It may also be a good match for other typical behavioral patterns of people with pronounced Machiavellistic, narcissistic, or psychopathic personality traits. As noted by Bajo et al. (2021), "derivative usage offers the narcissistic manager a convenient stage for bold and decisive action that generates a continuous supply of attention."

The upper echelons theory establishes a general link between managerial characteristics and firm outcomes (Hambrick & Mason, 1984; Hambrick, 2007). Senior managers influence firm outcomes both directly through their immediate decisions and indirectly through their guiding example, behavior, and values (Berson et al., 2008). Middle managers with decision-making authority also serve as important interfaces by shaping strategic decisions and firm outcomes (Balogun & Johnson, 2004). According to Wooldridge et al. (2008), "middle managers are central to explaining key organizational outcomes." Given that managers exert a strong influence on corporate decisions, we study the impact of dark personality traits on firms' selective hedging activities.

We build on the psychological literature to study the effects of (dark) managerial personality traits on corporate hedging. The most prominent negative personality traits are Machiavellianism, narcissism, and psychopathy. Due to their significant overlap, they are together referred to as the dark triad of personality (Paulhus & Williams, 2002). Affecting different parts of the unethical decision-making process, the elements of the dark triad nevertheless act in concert as powerful psychological antecedents to unethical behaviors (Harrison et al. 2018). Dark triad traits predict individuals' propensity to take financial, investment, and gambling risks (Sekścińska & Rudzinska-Wojciechowska, 2020). Dark personality traits also predict various (workplace) behaviors (Neo et al. 2018) and may inflict financial damage on the firm (see, e.g., Babiak & Hare, 2006, for the case of corporate psychopathy). Dark triad personality features have been associated with a series of undesirable (firm) outcomes, such as extreme and fluctuating organizational performance (Chatterjee & Hambrick, 2007) or reduced investment performance (ten Brinke et al., 2018).

Our survey-based approach allows us to access managers' personality traits and their hedging activities at the same time. We use the "dirty dozen scale" to elicit managers' dark triad personality traits (see also Jonason & Webster, 2010). We follow Mutschmann et al. (2021) and obfuscate the questions within several other uncontroversial questions to ensure that participants do not immediately realize that they are describing potentially negatively perceived personality traits. We carefully control for other potential drivers of selective hedging, such as the manager's age, overconfidence, and risk preferences. Additionally, we study the moderating influence of the firm's ownership structure and managerial discretion.

Dark personality traits are prevalent among the overall population (Boddy, 2017; Caponecchia et al., 2012), and even more so in the corporate environment (Babiak et al., 2010). Various characteristics of a person with dark personality traits seem to be advantageous when rising to leadership positions in organizations (Babiak & Hare, 2006; Rovelli & Curnis, 2020). Organizations might even hire managers with dark personality traits because their willingness to push ethical boundaries aligns with organizational objectives (Harris et al., 2021).

We contribute to the literature in three important ways. First, we link findings from personality psychology to the corporate risk management literature by analyzing whether dark personality traits influence corporate risk management. Doing so, we extend the existing knowledge on the motivations and drivers of selective hedging. Second, we analyze whether the organizational context can function as a moderator of the influence of personality traits on corporate hedging activities. Important practical implications arise from understanding the conditions under which the

influence of personality traits on selective hedging is most pronounced. Third, we contribute to personality theory in the management context. While a large part of the literature on managerial personality traits focuses on narcissism (see, e.g., Petrenko et al., 2016) to exploit several readily available proxies for this personality trait (e.g., signature size, the use of first-person pronouns, or the size of the manager's picture in annual reports), we study the influence of dark personality traits in general. By doing so, we also address concerns regarding the validity of these proxies for narcissism (Carey et al., 2015).

Related Literature and Hypotheses

Corporate Hedging and Selective Hedging

Traditional corporate risk management theory suggests that passively matching one risk exposure with an opposing one creates value for shareholders (see, e.g., Geyer-Klingenberg et al., 2020, for a recent meta-analysis). In particular, derivatives allow firms to stabilize their cash flows by eliminating specific sources of volatility (Moore et al., 2000). While the theory does not suggest that companies should hedge their entire risk exposure and create a hedge ratio of 100%, it argues that firms should determine their optimal hedging policies based on their preferences and passively adhere to them without actively attempting to time hedging decisions based on their market views. For instance, companies might decide to passively hedge 50% to prevent financial distress and still be in line with traditional academic theory (Stulz, 1996). In a similar fashion, a passive risk management strategy that is designed to protect the firm against costly lower-tail outcomes is in line with theoretical recommendations from a corporate value-adding perspective. Additionally, this traditional notion of risk management does not hinge on the concept that hedging transactions have zero net present value—that hedging is costless.¹

Corporate risk management adds value to the firm by alleviating market imperfections (Adam & Fernando, 2006). Hedging affects firm values by reducing the probability of financial distress and expected bankruptcy costs, underinvestment risk, expected tax liabilities, agency costs, and information asymmetries (see, e.g., Campello et al., 2011; Carter et al., 2006; Froot et al., 1993). Estimating the increase in firm value, Geyer-Klingenberg et al. (2020) find that foreign currency hedgers realize a firm value hedging premium of 1.8%. Firms that have access to newly created

hedging opportunities also experience up to a 40% decline in the variance of their stock returns (Biguri et al., 2018).

However, this passive risk avoidance notion of hedging is deficient in explaining hedging behavior in practice (Adam et al., 2015; Haushalter, 2000). Survey studies of corporate risk management have shown considerable (time) variation in managerial practice because risk managers seem to incorporate their market views and actively vary their hedge ratios (Adam and Fernando 2006; Brown et al. 2006). In contrast to the theoretical notion discussed above, selective hedging increases the risk exposure of firms (Adam et al. 2017).

A theoretical attempt to explain selective hedging that is in line with a shareholder value-adding perspective comes from Stulz (1996), who argues that some firms might have a comparative advantage in bearing certain financial risks, for example, inside information. Although it is unclear which firms might have an informational advantage, larger firms have higher potential to acquire valuable information than smaller firms because they can hire better analysts and have a more expansive market footprint (Stulz, 1996). Nevertheless, the major risk associated with selective hedging is that the firm's information might not in fact be better than the market's and managers acting on their market views might in fact destroy value (Brown et al. 2006). According to Stulz (1996), "the lesson of market efficiency for corporate risk managers is that the attempt to earn higher returns in most financial markets generally means bearing large (and unfamiliar) risks." Even if the firm has comparative advantages, the possibility always exists that the firm will experience significant losses from selective hedging.

Thus, not surprisingly, cash flow gains from selective hedging appear to be small at best, and it does not provide meaningful economic gains (Adam & Fernando, 2006; Brown et al. 2006). If anything, passive hedgers appear to have outperformed selective hedgers (see, e.g., Beber & Fabri, 2012). Consistent with the homonymous notion of Stulz (1996), Adam et al. (2017) even document that the extent of selective hedging is positively correlated with a firm's future stock return volatility and that firms that speculate the most feature the highest probabilities of bankruptcy. Overall, the evidence does not support the notion that selective hedging increases firm value.

Several recent studies attempt to explain the heterogeneity in the corporate use of derivatives. For example, a firm's ownership structure (Pennings and Garcia 2004) or managerial power and inside ownership (Jankensgård, 2019) might explain some of this heterogeneity. Moreover, selective hedging is more prevalent among financially constrained firms, but not related to managerial compensation (Adam et al., 2017; Croci et al., 2017).

Another approach to explain the differences in the corporate use of derivatives is to take a closer look at managers. Risk managers' personal characteristics have been shown

¹ In fact, Adam and Fernando (2006) show that this assumption can be violated for extended periods.

to exhibit strong explanatory power over firm and industry characteristics (Beber & Fabbri, 2012). Pennings and Garcia (2004) highlight that factors such as risk perception and individual risk preferences explain variations in derivatives usage, whereas Croci et al. (2017) report that firms' hedging practices vary with CEO age. Beber and Fabbri (2012) find that younger, MBA-trained, and less experienced managers exhibit higher variability in notional amounts of hedging dimensions. Adam et al. (2015) propose managerial behavioral biases, in particular overconfidence, as an explanation for selective hedging. Firms hedge more selectively following past gains, which Adam et al. (2015) attribute to increased confidence levels that lead managers to believe they have superior information or ability when they do not. Most closely related to our study, Bajo et al. (2021) investigate the relationship between narcissism and selective hedging and find that narcissistic managers engage more in selective hedging activities.

At the end of the day, many observations and research findings around the practice of selective hedging remain puzzling (Adam et al., 2017). We attempt to help solve this puzzle and investigate the extent to which (dark) personality traits contribute to selective hedging.

Dark Triad Personality Traits

Personality traits make up who an individual is as a person, defining one's personal values and preferences (Parks-Leduc et al., 2015). The dark triad includes the most prominent negative personality traits: Machiavellianism, narcissism, and psychopathy (Paulhus & Williams, 2002).

Individuals who score high on the Machiavellianism scale are, on average, more self-interested and opportunistic than those who do not (Gunnthorsdottir et al., 2002). They exhibit less guilt (Murphy, 2012) and have been reported to be more likely to cheat, manipulate others for their own gain, and believe that manipulation is an important key to success (Paulhus & Jones, 2015). Moreover, Machiavellianism is often accompanied by a lack of empathy and a focus on pursuing one's own goals at the expense of others (LeBreton et al. 2018). Individuals with pronounced Machiavellianism have a view of morality that offers a greater acceptance of behaviors that are normally be described as immoral or unethical (LeBreton et al., 2018).

Individuals with narcissistic traits are known for their continuous need for attention and admiration from others as well as the continuous reinforcement of their ego (Vazire & Funder, 2006). As a result, their behavior is directed toward gaining status and esteem (Campbell et al., 2004). Highly narcissistic individuals feel a need to undertake large-stakes initiatives to reinforce their ego (Chatterjee & Hambrick, 2007). Narcissists are characterized by thinking that they are more intelligent than they actually are, and by having a need

to feel superior to others (Gabriel et al., 1994). In addition, they display high levels of impulsivity (Vazire & Funder, 2006). Similar to individuals with pronounced Machiavellianism, narcissists are associated with cheating and unethical behavior (Menon & Sharland, 2011). They are also more likely to show a propensity for engaging in exploitative acts or behaviors and simultaneously lack empathy with a tendency toward callousness (LeBreton et al., 2018). Finally, Vogel (2006) argues that the typical narcissist is unfazed by setbacks and feels neither regret nor remorse.

Individuals with psychopathic traits exhibit a significant lack of consciousness and feelings for others. They experience low empathy and remorse (Babiak & Hare, 2006) and do as they please without any feeling of guilt (Hare, 1999). Individuals with psychopathic traits are characterized as reckless, selfish, and aggressive (Patrick, 2007). Williams et al. (2007) note that psychopaths pursue an irresponsible lifestyle and counterproductive behavior.

All three personality traits of the dark triad are associated with an increase in excitement seeking and risk-taking (Crysel et al., 2013). Individuals with Machiavellian (Rim, 1966), narcissistic (Campbell et al., 2004), and psychopathic (Jones, 2014) traits generally take more risks than those without these traits. Sekścińska and Rudzinska-Wojciechowska (2020) find that narcissism and psychopathy also predict individuals' general propensity for financial risk-taking. Individuals with narcissistic traits cannot stand boredom because it creates a mismatch between their high inner ambitions and external goals (Wink & Donahue, 1997). As a result, they tend to engage more in "sensation-seeking" (Emmons, 1981). Similarly, psychopaths have also been reported to more heavily engage in sensation-seeking (Zuckerman, 1979).

Studies on the composite dark triad of personality traits have associated individuals with a high dark triad score with emotional coldness, unethical decision making, a lack of guilt and remorse, and a sense of superiority (Babiak & Hare, 2006; Paulhus & Williams, 2002; Stevens et al., 2012).

Dark Triad Personality Traits in the Context of the Firm

Dark personality traits might be especially pronounced among corporate executives (Furtner et al., 2017). In fact, Kets de Vries (2004) notes that narcissism is "at the heart of leadership" and that rising to the top of an organization might be facilitated by a dose of narcissism (p. 188). Dark triad personalities can be found among leaders because of their strong need for power and their social dominance orientation (Furtner et al., 2017). Furthermore, individuals with psychopathic traits are good at strategic thinking and tend to be innovative (Babiak & Hare, 2006). Consequently, the

impact of dark personality traits has also been studied in an organizational context.

Among others, the literature has studied the volatility of organizational performance (Chatterjee & Hambrick, 2007), the M&A process (Aktas et al., 2016), accounting choices and fraudulent reporting (Mutschmann et al., 2021), corporate sustainability (Pelster & Schaltegger, 2021), and risk management decisions (Bajo et al., 2021) in connection with managerial personality traits. Managerial narcissism has also been associated with less effective monitoring (Chatterjee & Pollock, 2017). Overall, psychopathic characteristics in firms' top management teams reduce future shareholder wealth (Omar et al., 2019).

Chatterjee and Hambrick (2007) document that CEOs with narcissistic personality traits create extreme and fluctuating organizational performance. Despite the more volatile performance, however, firms with narcissistic CEOs realize similar performance compared to firms with non-narcissistic CEOs, on average. Similarly, Chatterjee and Hambrick (2011) evaluate the impact of narcissism on CEOs' risk-taking and find that highly narcissistic CEOs are much less responsive to recent objective performance than their less narcissistic peers. In contrast to these findings, ten Brinke et al. (2018) find that hedge fund managers with more psychopathic tendencies produced lower absolute returns than their less psychopathic peers and that managers with more narcissistic traits produced decreased risk-adjusted returns.

Individuals who exhibit higher Machiavellianism are more likely to engage in fraudulent financial reporting and feel significantly less guilt than others who misreport (Murphy, 2012). Related, Rijsenbilt and Commandeur (2013) find that Machiavellians seem to be more willing to tamper with financial accounts or engage in fraudulent behavior in an effort to preserve their positive self-image. Managers with greater narcissistic personality tendencies are more likely to inflate reported earnings when there are positive social status implications, such as praise, acclaim, and affirmation (Hobson & Resutek, 2008).

Studying corporate risk management, Bajo et al. (2021) argue that even in the absence of specific beliefs about markets, narcissistic managers might be attracted to derivative usage as a way to enhance their self-image. Making bets using derivatives draws attention and staves off boredom at the same time and might help sustain a perception of the manager as bold and decisive.

In conclusion, a large part of the literature that relates dark personality traits to organizational outcomes focuses on narcissism as a single construct. Much less thought has been given to Machiavellianism, psychopathy, and the dark triad composite scale, which is surprising considering that, for example, Machiavellianism, narcissism, and psychopathy might act together to explain certain behaviors (Harrison et al., 2018). Thus, we argue that the composite dark triad

trait might incorporate the various dimensions of a dark personality that relate to selective hedging activities. In addition, Jonason and Webster (2010) note that the individual scales for Machiavellianism, narcissism, and psychopathy are associated with distinctive response biases. Hence, measuring all three traits simultaneously increases internal consistency.

Hypotheses

Based on the above insights, we hypothesize that risk managers who score high on the dark triad personality scale engage more heavily in selective hedging activities than other risk managers. Selective hedging provides these managers with benefits that cater to their personal preferences. It provides them with additional excitement and satisfies their "thirst for risk." Moreover, selective hedging provides the potential for large additional financial gains that will be attributed to the manager's skill, satisfying the need for attention and status. Finally, managers who score high on the dark triad scale are not affected by the negative outcomes of their speculative behavior because they do not experience feelings of guilt and are likely able to allocate the blame to someone else. As a result, our main hypothesis is as follows:

H1: Managers who score high on the dark triad personality scale engage more heavily in selective hedging activities.

Next, we analyze the cross-sectional differences in the connection between dark triad personality traits and selective hedging along several dimensions. Considering that several demographic characteristics, such as age and gender, are known to be important determinants of general risk-taking behavior (see, e.g., Halek and Eisenhauer 2001; He et al. 2008) and seem to impact managers' hedging practices (Crocini et al., 2017; Beber & Fabbri, 2012), age and gender might also moderate the relationship between dark triad personality traits and selective hedging activities. Because female and older decision makers are reported to be more risk averse than male and younger decision makers, we hypothesize

H2: The influence of managers' dark personality traits on their selective hedging activities is greater for male and younger managers.

In a similar vein, experience has been documented to have important effects on behavioral biases (Feng & Seasholes, 2005) and managers' hedging preferences (Beber & Fabbri, 2012). In particular, experience has been shown to mitigate the impact of behavioral biases on decision making (Feng & Seasholes, 2005). We hypothesize

H3: The influence of managers' dark personality traits on their selective hedging activities is stronger for less experienced managers.

At the same time, managers' education influences their hedging decisions (Beber & Fabbri, 2012). In particular, a higher educational background could provide a manager with superior information and a higher (perceived) ability to time the market and forecast future market developments. People with a superior educational background might be more risk tolerant or even (over)confident as a result of their (perceived) superior training. In fact, managers with higher educational degrees follow more aggressive strategies (Bertrand & Schoar, 2003). Thus, it is reasonable to assume that education and (perceived) expertise might also moderate the relationship between dark triad personality traits and selective hedging. We hypothesize

H4: The influence of managers' dark personality traits on their selective hedging activities is greater for highly educated managers.

Risk managers with dark personality traits need to have a platform to receive attention and admiration for their selective hedging activities. These managers need to be able to regularly report to their supervisors on their hedging activities. Otherwise, risk managers will not have access to external admiration, to a large extent. Consequently, a reduced reporting frequency undermines the benefits of these managers from engaging in selective hedging. Hence, we hypothesize the following:

H5: The influence of managers' dark personality traits on their selective hedging activities is stronger for managers who report on their hedging activities more frequently.

Risk managers might have different perceptions about what constitutes successful risk management. Some risk managers might perceive little variation in firms' cash flows as an indication of successful risk management—in line with traditional theories of corporate risk management. Others, however, might perceive the creation of financial gains with their derivatives usage as an indication of successful risk management. For managers with pronounced dark personality traits to feel admired for their financial gains, these managers first need to perceive generating financial gains as an indication of successful risk management. Thus, risk managers who feel that only little cash flow variation is a sign of successful risk management will not feel excited about financial gains. We hypothesize

H6: The influence of managers' dark personality traits on their selective hedging activities is greater for managers who

perceive financial gains as an indication of successful risk management.

The organizational context is important for managerial interpretations (Sharma, 2000). Firms that have established routines and structures with respect to corporate hedging decisions leave less scope for managerial discretion. In addition, empirical findings indicate that selective hedging is related to managerial power (Jankensgård, 2019). Therefore, organizational factors might also moderate the impact of managers' personality traits on their selective hedging decisions. Managers' personality traits might influence their risk management activities through their opportunity to exercise discretion (Finkelstein & Hambrick, 1990; Finkelstein & Boyd, 1998). Thus, we hypothesize

H7: The influence of managers' dark personality traits on their selective hedging activities increases in their managerial discretion.

Methodology and Data

An online survey allows us to gather data on the personality traits of risk managers and their preferred hedging activities at the same time, which would not be possible using large archival data sources (see, e.g., Graham et al., 2013). Using a self-reported measure provides a valid proxy for managers' personality traits. In fact, Cragun et al. (2020) emphasize in their meta-analysis that a psychometric self-report is the first choice for researchers to study managers' personality traits, while Graham et al. (2013) argue that inferring managerial attitudes from observed actions in archival datasets raises questions about the validity of the action as a broad-based proxy. Moreover, such samples are limited to a few managers for whom such actions are observable (Graham et al., 2013).

Data Collection

The survey targets high-ranking professionals responsible for the corporate hedging decisions of their organization. We commissioned *QuestionPro*—one of the largest providers of online panels with a database of more than 22 million potential respondents—to carry out the actual questioning of the respondents. *QuestionPro*'s business online panel consists primarily of business decision makers. During the recruiting process, individuals are asked to indicate several characteristics about themselves, allowing researchers to profile respondents based on, for example, the industry or the department of their occupation. *QuestionPro* provides respondents a strong assurance of anonymity, which may improve the response rate and quality of the data collected (Durant et al., 2002; Pearlin, 1961) and is compliant with

general data protection regulations. Thus, making use of this database allows us to obtain a high-quality sample. The survey was executed in English via the *QuestionPro* survey platform.

The invitation to the survey was sent to 1220 professionals in September 2020. We specifically targeted individuals who had previously indicated that they hold a high-ranking position (e.g., EVP, SVP, AVP, Director or Group Manager, Senior Manager) with decision-making authority in the financial department of their organization. We targeted individuals from financial departments because previous research indicates that the risk management function is commonly anchored in this division (Aabo et al., 2012). We screened individuals for whether their original indications are still up to date. In addition, respondents had to reply “yes” to two qualifying questions to be included in our survey. The organization for which they worked had to use derivatives and the hedging decisions had to fall into the professional area of the respondent’s responsibility. We restricted participation to respondents from firms in the United States or the United Kingdom. These restrictions were included in the announcement of the survey and queried using the first questions in the questionnaire; only participants who answered “yes” to these questions were allowed to continue the survey. The initial reply rate was 87%. 135 respondents were disqualified because of our screening and qualification questions, and 161 respondents did not complete the survey. We included an attention check in our actual survey (Kung et al., 2018) to lessen the concern of careless responses.² A total of 333 respondents did not pass the attention check and, thus, were excluded. Eighteen respondents did not provide answers to all items needed for the analysis, leaving 412 complete questionnaires for the analysis. The average time needed to complete the questionnaire was 11 minutes.

Table 1 shows the distribution of respondents across industries, firm size, and firm structures. We proxy the size of the firms with the number of employees and sales revenue. The sample includes an overrepresentation of firms in the financial sector, with almost 54% of all observations. The sample includes public (38.11%), private, and government-owned firms (6.07%). The majority of private firms are non-family-owned (42.96%), but the sample also includes almost 13% of family-owned firms.

The unit of analysis is risk managers’ corporate hedging decisions. Table 2 summarizes the personal characteristics

Table 1 Characteristics of respondents’ firms

	Percent
<i>Industry</i>	
Agriculture, forestry, fishing	1.70
Mining	0.73
Manufacturing	12.86
Transportation & public utilities	3.64
Wholesale trade	2.67
Retail trade	14.56
Finance, insurance, real estate	54.37
Services	5.58
Public administration	2.43
Unclassified industry	1.46
<i>No. employees</i>	
1–50	4.13
51–250	14.08
251–500	22.57
501–1000	24.27
1001–5000	22.33
5001–10,000	7.28
10,001–25,000	2.67
25,001 or more	2.67
<i>Sales revenue</i>	
0–999,999	1.70
1,000,000–4,999,999	10.68
5,000,000–9,999,999	14.08
10,000,000–99,999,999	23.54
100,000,000–999,999,999	23.79
1,000,000,000–4,999,999,999	13.59
5,000,000,000–9,999,999,999	7.04
10,000,000,000 or above	5.58
<i>Firm type</i>	
Public firm	38.11
Private firm	42.96
Family firm	12.86
Government firm	6.07

of the respondents. The majority of the respondents were between 35 and 44 years old, male, and held a graduate degree. Additionally, more than 90% of respondents had at least 3 years of experience / tenure with the organization.

Common method bias is an important issue when using data collected through surveys. We attempt to reduce common method bias by following best practices to enhance the validity of our survey procedure and by using both procedural and statistical remedies that have been employed by other researchers (Fowler, Jr. 2013; Bergman, et al. 2020). We measure the dependent and independent variables at a maximum distance within the survey (Chang et al., 2010; Podsakoff et al., 2003). We also measure the independent variable of interest with negatively loaded items and hide

² We presented the following prompt to the participants, “Everyone has hobbies. Nevertheless, we would like you to skip this question to show that you are reading carefully. Do not click any of the buttons corresponding to bike riding, hiking, swimming, playing sports, reading or watching TV.” We also provided the following options: bike riding, hiking, swimming, playing sports, reading, and watching TV.

Table 2 Personal characteristics of the respondents

	Percent
<i>Age</i>	
18 to 34	24.27
35 to 44	55.83
45 to 54	16.99
55+	2.91
<i>Gender</i>	
Female	28.64
Male	71.36
<i>Residence</i>	
United States	52.67
United Kingdom	47.33
<i>Education</i>	
High school / GED	5.34
Undergraduate degree	17.23
Graduate degree	40.78
MBA	26.70
Other Non-MBA	2.43
Ph.D.	7.52
<i>Derivatives expertise</i>	
< 1 year	0.73
1–2 years	9.71
3–5 years	39.32
6–10 years	41.50
> 10 years	8.74
<i>Experience / tenure</i>	
< 1 year	0.24
1–2 years	5.10
3–5 years	29.37
6–10 years	46.60
> 10 years	18.69
<i>Professional position</i>	
Director/Manager corporate risk management	83.25
Other employee with decision-making power	16.50
Not a managing position	0.24

them among a positively loaded scale, which further reduces bias (Mutschmann et al., 2021). We use the Harman (1976) single-factor test to test whether the correlations between the variables are artificially inflated and find that a single factor can explain 21.5% of the variance, indicating low common method bias.

Variables

Dependent Variables

We ask the participants about their corporate hedging practices using various questions that allow us to capture different dimensions of selective hedging. Our questions

on selective hedging activities are inspired by prior studies on hedging practices (Bodnar et al., 1998; Phillips, 1995).

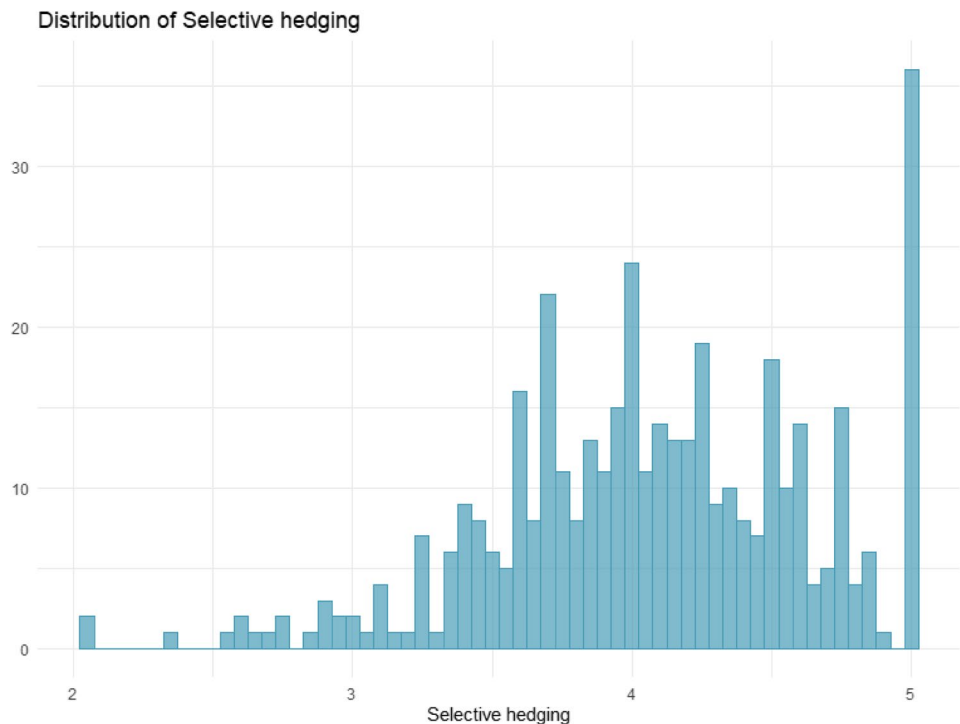
Trade for profit We ask the participants to rate their answers to the question, “What best describes the purpose of your derivatives usage?” on an 11-level Likert item ranking from “Reduce cash flow / earnings volatility” to “Trading for profit.” Risk managers have, on average, a strong tendency to trade for profits, with a mean of 8.54 and a median of 9. The standard deviation is 2.08 (see Table 3).

Market view We ask participants about the extent to which their view of the market influences their hedging decisions. We ask, “How often does your market view cause you to... (i) alter the timing of hedges, (ii) alter the size of hedges, and (iii) actively take positions in derivatives?” using 5-level Likert items ranging from “Never” to “Very frequently.” We aggregate the answers to a single variable using the average (Cronbach’s alpha = 0.72). Risk managers seem to consider their market view to a large extent when making hedging decisions, as indicated by a mean of 3.96 (standard deviation of 0.69) and a median of 4.

Selective hedging We create a variable that aggregates the various dimensions of selective hedging behavior using an 8-item scale. Four of those eight items come from our variables *trade for profit* and *market view*. We complement these items with questions on the extent to which participants use various hedging practices. In total, the scale contains the following questions:

1. How important do you consider trading for profit for your hedging decisions? (Ranges from “Never” to “Very frequently”)
2. How often do you use derivatives to reduce costs / increase profits by arbitraging the markets? (Ranges from “Never” to “Very frequently”)
3. How often do you use derivatives to reduce costs / increase profits by taking a view? (Ranges from “Never” to “Very frequently”)
4. How important do you rate the profit potential when you consider choosing a derivative product? (Ranges from “Not at all important” to “Very important”)
5. What best describes the purpose of your derivatives usage? (Ranges from “Reduce cash flow / earnings volatility” to “Trading for profit”)
6. How often does your market view cause you to alter the timing of hedges? (Ranges from “Never” to “Very frequently”)
7. How often does your market view cause you to alter the size of hedges? (Ranges from “Never” to “Very frequently”)
8. How often does your market view cause you to actively take positions in derivatives? (Ranges from “Never” to “Very frequently”)

Fig. 1 Distribution of the dependent variable, “Selective hedging”



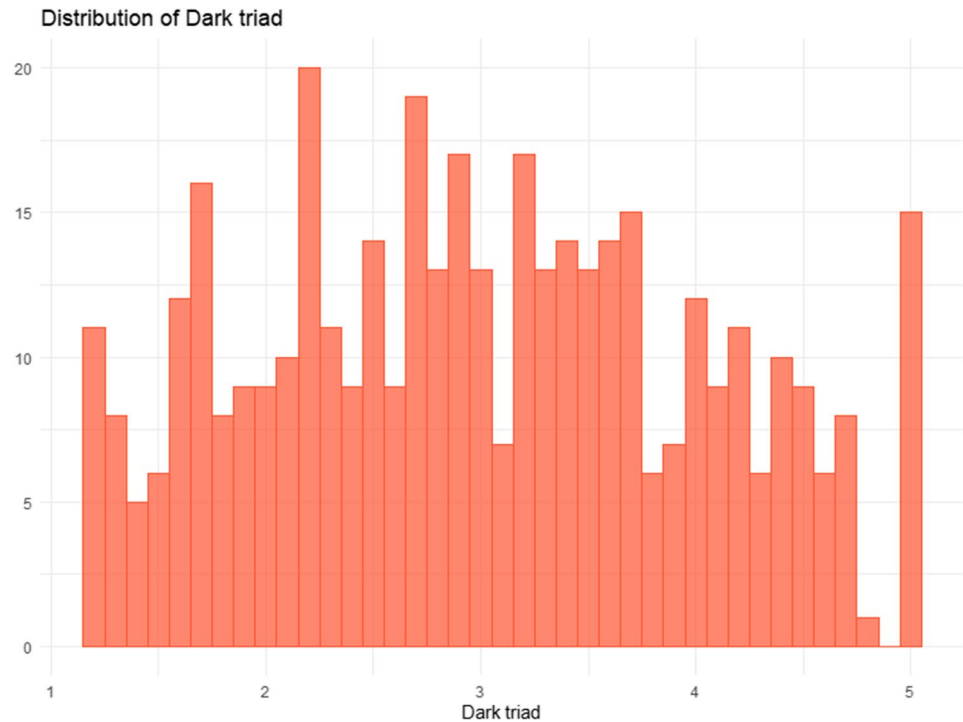
We obfuscate the selective hedging items among a number of other statements that focus on corporate hedging preferences and activities to ensure that participants are not immediately made aware of the focus of the study. We aggregate the variables that capture the various dimensions of selective hedging behavior to a single variable by first scaling all items to a range from 1 to 5 (if necessary) and then taking the average of all items. The internal consistency of the selective hedging measure is very high (Cronbach’s alpha = 0.82). Figure 1 shows the distribution of *Selective hedging*. With a mean and a median of 4.09 (standard deviation of 0.57), the variable indicates that risk managers in our sample engage in selective hedging practices. Given the large number of risk managers who show the maximum value of five, we are concerned that several respondents systematically ticked the maximum value, which may distort our results. Consequently, we carefully check whether participants systematically chose one value for all survey questions and find meaningful variation across replies for all respondents.

Independent Variable

Dark triad We ask the participants about the extent to which they agreed with a set of short statements that include the dirty dozen scale (Jonason & Webster, 2010). The scale comprises three four-item subscales for Machiavellianism, narcissism, and (subclinical) psychopathy. Specifically, the scale contains the following questions, with 5-levels ranging from “Disagree strongly” to “Agree strongly”:

- M1 I have used deceit or lied to get my way.
- M2 I tend to manipulate others to get my way.
- M3 I have used flattery to get my way.
- M4 I tend to exploit others toward my own end.
- N1 I tend to want others to admire me.
- N2 I tend to want others to pay attention to me.
- N3 I tend to expect special favors from others.
- N4 I tend to seek prestige or status.
- P1 I tend to lack remorse.
- P2 I tend to be callous or insensitive.
- P3 I tend to not be too concerned with morality or the morality of my actions.
- P4 I tend to be cynical.

The dirty dozen scale has been previously used and validated to measure dark triad personality traits (Webster & Jonason, 2013). To mitigate the potential impact of social desirability bias in our measure of respondents’ dark personality traits, we hide the dirty dozen scale within a large number of positively loaded items that assess leadership behavior and other personality traits. We randomize the order of all of the questions to alleviate the possible bias of negatively framed questions. We opt for the dirty dozen because this shorter scale allows us to hide the items properly, and it can be answered in a short time. The Cronbach’s alpha of the dark triad scale is 0.92, indicating very high internal consistency. Figure 2 shows the distribution of the main explanatory variable. We observe a fairly uniform distribution with

Fig. 2 Distribution of the independent variable, “Dark triad”**Table 3** Summary statistics

	N	Mean	SD	Min	25	Median	75	Maximum
Selective hedging	412	4.0863	0.5684	2.0250	3.7250	4.0875	4.5250	5.0000
Trade for profit	412	8.5388	2.0848	1.0000	8.0000	9.0000	10.0000	11.0000
Market view	412	3.9579	0.6889	1.0000	3.3333	4.0000	4.3333	5.0000
Dark triad	412	3.0051	1.0157	1.1667	2.1667	2.9583	3.7500	5.0000
Machiavellianism	412	2.7203	1.2603	1.0000	1.5000	2.7500	3.8125	5.0000
Narcissism	412	3.4132	1.0352	1.0000	2.7500	3.5000	4.2500	5.0000
Psychopathy	412	2.8817	1.1557	1.0000	2.0000	2.7500	3.7500	5.0000
Risk preference	412	8.8252	1.9303	1.0000	8.0000	9.0000	11.0000	11.0000
Confidence	412	9.0801	1.6333	2.0000	8.0000	9.0000	11.0000	11.0000
Tail outcomes	412	4.1553	0.6461	1.5000	4.0000	4.0000	4.5000	5.0000
Success = profitability	412	0.5121	0.5005	0.0000	0.0000	1.0000	1.0000	1.0000
Performance measurement	412	4.3689	0.7891	1.0000	4.0000	5.0000	5.0000	5.0000
Reporting frequency	412	4.2694	1.1282	1.0000	3.0000	4.0000	5.0000	6.0000
Centralization	412	8.5316	2.0305	1.0000	8.0000	9.0000	10.0000	11.0000
Guidelines	412	3.6141	1.1501	0.0000	3.0000	4.0000	4.2500	5.0000

Variable definitions can be found in Table 9 in the Appendix

several observations, obtaining the largest possible value of five as well. A comparison with other studies on the personality trait shows that the distribution in our sample is similar to the distributions reported in other studies that do not explicitly target risk managers (see e.g. Crysel et al., 2013; Jonason & Webster, 2010).

Control Variables

Risk preference We elicit respondents' risk preferences using their responses to the question, “How do you see yourself: are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?” on an 11-level

Likert item from “not at all willing to take risks” to “very willing to take risks” following the suggestion of Dohmen et al. (2011).

Success=profitability We proxy risk managers’ perception that creating (additional) financial gains is an important success criterion (compared with, for example, reduced volatility relative to a benchmark) through their responses to the questions, “How successful in managing company risk would you characterize your derivatives’ usage over the last three years?” and “How profitable would you characterize your derivatives’ usage over the last three years?” on 11-level Likert items. We then create a dummy variable that takes the value of one for managers who provide the same reply to both questions and zero otherwise. The idea is that, on average, risk managers who perceive financial gains as an important success criterion are more likely to reply identically to both questions than those who do not.

Confidence Motivated by evidence on the impact of confidence on risk managers’ selective hedging activities (Adam et al. 2015), we control for participants’ level of confidence in their (selective) hedging activities. We measure respondents’ confidence in their hedging decisions with the help of a one-item measure based on Weber and Brewer (2003). Specifically, we ask “How confident are you usually in the derivatives positions that you take?” on an 11-level Likert item ranging from “not at all confident” to “very confident.”

Derivatives expertise We measure managers’ expertise with derivatives using a 5-level item ranging from less than one year to more than 10 years.

Experience / tenure We measure managers’ tenure with the company using a 5-level item ranging from less than one year to more than 10 years.

Performance measurement The evaluation of the risk manager’s performance might provide these managers with incentives to engage in selective hedging activities to improve their performance evaluation. Hence, we ask participants to indicate the importance of the absolute profit/loss when assessing their performance as a risk manager using a 5-level Likert item ranging from “Not at all important” to “Very important.” On average, the absolute profit/loss is highly important for the evaluation of the performance of risk managers in our sample, as indicated by a mean of 4.4 and a median of 5.

Guidelines We use a scale ranging from “very restrictive policy” to “No, there is no such policy or guidelines at all” to ask the participants about the extent to which they are bound in their corporate hedging decisions by internal guidelines. For our analysis, we invert the scale such that high values indicate a restrictive policy.

Centralization We ask participants to rate the degree of centralization of the hedging activities within their firms (“Please rate your organizations’ degree of centralization associated with the usage of derivative contracts to manage

risk exposure.”) on an 11-level Likert item. With a mean of 8.53 and a standard deviation of 2.03, risk management activities in our sample are fairly centralized.

Reporting frequency We measure the reporting frequency on derivatives usage using participants’ replies to the question, “How often do you report to your supervisors / the board on your derivatives activities?” on a 6-level item ranging from never to daily. The items are “Never,” “Annually,” “Quarterly,” “Monthly,” “Weekly,” and “Daily.”

Tail outcomes We ask participants how important they consider eliminating the possibility of extreme losses for their hedging decisions and how often they use derivatives to eliminate lower-tail outcomes on 5-level Likert items. We aggregate the answers to a single variable by taking the average. A mean of 4.15 (standard deviation 0.65, median 4) indicates that risk managers in our sample consider eliminating lower-tail outcomes to be an important part of their hedging decisions.

Additional control variables We include several additional control variables in our analysis. We collect information about participants’ age, gender, education, residence, and their current position. We summarize the characteristics of the respondents in Table 2. We also control for firm size, measured using the number of employees and sales, firm structure (i.e., public firm, private firm, family firm, and government firm), and industry with full sets of dummy variables. We summarize all variable definitions in Table 9 in the Appendix.

Model Estimation

We estimate the following main model using a standard ordinary least squares (OLS) model with robust standard errors (MacKinnon and White 1985):

$$\text{Selective hedging}_i = \alpha + \beta \text{ dark triad}_i + \sum_{j=1}^J \gamma_j \text{ controls}_{ij} + \epsilon_i \quad (1)$$

Results

Pearson’s Correlation Matrix

Table 4 reports the Pearson correlations. We observe a strong positive correlation between the selective hedging variable and the different dimensions of selective hedging. We also observe a significantly positive correlation between the dark triad and selective hedging and the different dimensions of selective hedging. Thus, bivariate correlations provide initial support for our first hypothesis.

Table 4 Pearson's correlation table

	Selective hedging	Trade for profit	Market view	Dark triad	Machiavel- lianism	Narcissism	Psychopathy	Risk preference	Confidence	Male	Age
Trade for profit	0.6592***										
Market view	0.8509***	0.5037***									
Dark triad	0.1937***	0.2826***	0.2270***								
Machiavel- lianism	0.0708	0.1918***	0.1167*	0.9172***							
Narcissism	0.3279***	0.3109***	0.3457***	0.8081***	0.5876***						
Psychopathy	0.1397**	0.2575***	0.1616***	0.9126***	0.8015***	0.5943***					
Risk prefer- ence	0.4508***	0.4382***	0.4372***	0.1817***	0.0934	0.2496***	0.1538**				
Confidence	0.6597***	0.5789***	0.5530***	0.1714***	0.0221	0.3275***	0.1343**	0.4621***			
Male	-0.0780	-0.0423	-0.0699	0.1028*	0.0565	0.1182*	0.1037*	-0.0574	0.0147		
Age	0.0468	-0.0803	0.0094	-0.0894	-0.1015*	-0.0452	-0.0846	-0.0628	0.0429	0.0265	
Education	0.2231***	0.2038***	0.2266***	0.0095	-0.0716	0.1488**	-0.0302	0.1446**	0.2532***	0.1148*	0.0086
Derivatives expertise	0.1752***	0.1029*	0.1212*	-0.0350	-0.0951	0.0760	-0.0567	0.0486	0.2290***	0.0688	0.2896***
Experience / tenure	0.0829	-0.0001	-0.0032	-0.1079*	-0.1280**	-0.0498	-0.1004*	0.0069	0.1248*	0.0827	0.3238***
Tail outcomes	0.5677***	0.2448***	0.5031***	0.0720	-0.0320	0.2044***	0.0418	0.2374***	0.4309***	-0.0888	0.1266*
Success = profitability	0.3185***	0.2526***	0.2791***	0.1449**	0.0464	0.1999***	0.1524**	0.2390***	0.2980***	-0.0168	-0.0253
Professional position	-0.1723***	-0.1365**	-0.1698***	-0.0367	0.0345	-0.1209*	-0.0260	-0.1772***	-0.2244***	-0.0134	0.0200
Performance measure- ment	0.5282***	0.2797***	0.3598***	0.0480	-0.0116	0.1413**	0.0126	0.2565***	0.3489***	-0.1054*	0.0737
Reporting frequency	0.4533***	0.3612***	0.4477***	0.2154***	0.1490**	0.2336***	0.1962***	0.4239***	0.4504***	0.0085	0.0033
Centralization	0.3860***	0.3931***	0.3720***	0.1277**	0.0842	0.2034***	0.0626	0.3050***	0.5352***	-0.0510	-0.0076
Guidelines	0.2360***	0.1955***	0.1914***	0.2358***	0.1901***	0.1966***	0.2383***	0.1197*	0.2199***	-0.0212	0.0110
No. employ- ees	-0.0721	-0.0160	-0.1019*	-0.0552	-0.0381	-0.0793	-0.0331	-0.0895	-0.1146*	-0.0041	0.0417
Sales revenue	-0.0182	0.0542	-0.0094	0.0111	0.0149	0.0189	-0.0040	0.0192	-0.0217	0.0824	0.1099*

Table 4 (continued)

	Education	Derivatives expertise	Experience / tenure	Tail outcomes	Success = profitability	Professional position	Performance measurement	Reporting frequency	Centralization	Guidelines	No. employees
Trade for profit											
Market view											
Dark triad											
Machiavel- lianism											
Narcissism											
Psychopathy											
Risk prefer- ence											
Confidence											
Male											
Age											
Education											
Derivatives expertise	0.1007*										
Experience / tenure	- 0.0222	0.5089***									
Tail outcomes	0.1363**	0.2145***	0.1011*								
Success = profitability	0.0904	0.0126	- 0.0025	0.2086***							
Professional position	- 0.1491**	- 0.2067***	- 0.0851	- 0.1169*	- 0.0362						
Performance measure- ment	0.1114*	0.1299**	0.0752	0.3574***	0.2043***	- 0.0873					
Reporting frequency	0.0996*	0.0527	- 0.0054	0.3464***	0.2980***	- 0.0669	0.1996***				
Centralization	0.1618***	0.0990*	- 0.0393	0.2837***	0.1864***	- 0.1918***	0.1415**	0.2687***			
Guidelines	0.0701	0.0182	- 0.0816	0.1202*	0.1202*	- 0.0552	0.1278**	0.1891***	0.2985***		
No. employ- ees	- 0.0485	- 0.0167	0.1964***	- 0.1401**	- 0.0231	0.0537	- 0.0891	- 0.0622	- 0.0975*	0.0052	
Sales revenue	0.0132	0.0971*	0.1546**	- 0.0649	0.0718	0.0814	0.0495	0.1159*	0.0278	0.0093	0.2512***

Variable definitions can be found in Table 9 in the Appendix. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

High correlations between Machiavellianism, narcissism, and psychopathy support the notion of a significant overlap of these personality traits.

We also observe strong positive correlations between selective hedging activities and risk managers' risk preferences, confidence levels, education, and derivatives expertise. Risk managers who are particularly concerned with lower tail outcomes are also more engaged in selective hedging activities.

While we also observe several positive correlations between our control variables, multicollinearity is not an issue in our regressions, as none of the correlations are above .7. Generalized variance inflation factors below 3 also indicate that multicollinearity is not an issue.

Hypothesis Testing

Table 5 presents our main regression results. Column (1) indicates a positive regression coefficient of 0.0384 on Dark triad, with a *t*-statistic of 2.16. The coefficient suggests that a one-unit increase in Dark triad explains approximately 6.6% ($= 0.04/0.6$) of the standard deviation of selective hedging. To put this into perspective, the coefficient of Dark triad is slightly larger than the coefficient of risk preferences, indicating a somewhat larger effect size when comparing the two variables. However, when interpreting the effect size, keep in mind that estimating precise effect sizes is a task that is better suited for large-scale archival studies (Libby et al., 2002). We focus on the trade-off between reducing the volatility of earnings and cash flows versus trading for profit in column (2), with risk managers with more pronounced dark personality traits having a clear preference for trading for profit (coefficient of 0.3194; *t*-statistic of 3.65). Economically, a one-unit increase in Dark triad explains approximately 15% of the standard deviation of Trade for profit. We find statistically significant and positive coefficients in column (3) as well. These results are consistent with Hypothesis H1: Managers who score high on the dark triad personality scale engage more heavily in selective hedging activities.

Control variables, such as managers' risk preference (0.03, *t*-statistic of 2.21) and confidence (0.11, *t*-statistic of 6.36), are in line with the prior literature (Pennings & Garcia, 2004; Adam et al., 2015). We also find that managers concerned with lower-tail outcomes engage more in selective hedging (0.22, *t*-statistic of 5.67).

To alleviate the concern that one particular trait of the dark triad, for example, narcissism, might explain our results, we provide results using the subscales for the individual traits as main explanatory variables in Table 10 in the Appendix. We observe positive and significant coefficients of similar magnitude for all traits, with the coefficient of Psychopathy on Selective hedging being the only exception. This observation provides additional support for the

use of the composite dark triad measure. We also address the concern that participants from the financial sector are the main driver of our findings. We summarize the results excluding respondents from the financial sector in Table 11. Our conclusions are not (exclusively) driven by respondents from the financial sector. The coefficients on selective hedging (0.0613, *t*-statistic of 2.03), trade for profit (0.3751, *t*-statistic of 2.81), and market view (0.0802, *t*-statistic of 1.76) are slightly larger than in the main analysis but also have somewhat larger standard errors.

We next study the moderating function of demographic factors. We add a set of interaction variables to Eq. (1). We first interact Dark triad with our dummy variable for male managers. To simplify the interpretability of the results, we separately report the coefficients for Dark triad for female managers (Dark triad female) and for male managers (Dark triad male). This approach simplifies the readability of the effect sizes and captures the entire domains of both the dark triad and the relevant dummy, while being otherwise completely equivalent to a standard interaction approach.³ In column (1) of Table 6 we find a positive coefficient on Dark triad male (0.0487, *t*-statistic of 2.23), whereas the coefficient for female managers (0.0166, *t*-statistic of 0.62) is not significantly different from zero. The relationship between the Dark triad and Selective hedging is less pronounced for female risk managers, in line with Hypothesis H2.

In column (2), we turn to the moderating function of age. We classify managers who are 44 years of age or younger as "young" and managers who are 45 years or older as "old". The results suggest that the relationship between Dark triad and Selective hedging is particularly pronounced for older risk managers. We observe a positive coefficient on Dark triad old (0.0745, *t*-statistic of 2.16) and a coefficient of 0.0271 (*t*-statistic of 1.36) on Dark triad young. Thus, the overall support for Hypothesis H2 is mixed.

In column (3), we study the moderating function of experience. Using a median split our findings indicate that the relationship between Dark triad and Selective hedging is particularly pronounced for risk managers who are less experienced. We find a positive coefficient on Dark triad short tenure (0.09, *t*-statistic of 3.59) but not on Dark triad long tenure (0.0108, *t*-statistic of 0.50)—in line with Hypothesis H3.

Turning to Hypothesis H4, we observe a positive coefficient on Dark triad high education (column 4, 0.04, *t*-statistic

³ A "traditional" interaction term in a regression is the product of two terms. However, using such an interacted regressor has one disadvantage when it comes to readability: it requires mental arithmetic, not only to quantify the effect size but also to determine the standard errors of the effect sizes of both groups that are part of the interaction. Making use of a simple modification and including two "interaction" terms simplifies this issue and allows the reader to immediately read both coefficients and standard errors directly from the table.

Table 5 Managerial dark triad personality and selective hedging

	Dependent variable		
	Selective hedging	Trade for profit	Market view
	(1)	(2)	(3)
Constant	0.4338** (1.9969)	- 0.0485 (- 0.0522)	0.4344 (1.2592)
Dark triad	0.0384** (2.1621)	0.3194*** (3.6537)	0.0779*** (3.1826)
Risk preference	0.0284** (2.2051)	0.1529* (1.8278)	0.0405** (2.1808)
Confidence	0.1056*** (6.3609)	0.5098*** (6.3310)	0.0744*** (3.0401)
Male	- 0.0531 (- 1.3792)	- 0.2186 (- 1.2583)	- 0.0996* (- 1.8711)
Age (18-34)	0.0203 (0.4389)	0.3267* (1.8463)	- 0.0543 (- 0.8702)
Age (45-54)	0.0361 (0.7119)	- 0.1716 (- 0.5563)	0.0291 (0.4349)
Age (55+)	0.0176 (0.1712)	- 0.2810 (- 0.4359)	- 0.1496 (- 0.9015)
Education	0.0209 (1.3501)	0.1158 (1.4981)	0.0415* (1.8484)
Derivatives expertise	0.0054 (0.1689)	0.1248 (0.9276)	0.0140 (0.2918)
Experience / tenure	0.0025 (0.0756)	- 0.0613 (- 0.4406)	- 0.0480 (- 1.0044)
Tail outcomes	0.2193*** (5.6668)	- 0.1560 (- 1.0692)	0.2703*** (5.2686)
Success = profitability	0.0666 (1.6204)	0.1518 (0.9168)	0.0826 (1.4559)
Professional position	- 0.0139 (- 0.2523)	0.0941 (0.4532)	- 0.0520 (- 0.7132)
Performance measurement	0.1855*** (5.2300)	0.2384* (1.8189)	0.0882** (2.0477)
Reporting frequency	0.0406** (2.0173)	0.0481 (0.5389)	0.0803*** (2.8290)
Centralization	0.0032 (0.3228)	0.1102* (1.9652)	0.0191 (1.3209)
Guidelines	0.0227 (1.2634)	- 0.0241 (- 0.3198)	- 0.0038 (- 0.1287)
No. employees	0.0059 (1.6459)	0.0290 (1.4343)	0.0015 (0.3141)
Sales revenue	- 0.0006 (- 1.0023)	0.0038 (1.2379)	0.0002 (0.1715)
Private firm	- 0.0258 (- 0.6686)	- 0.4164** (- 2.3761)	- 0.1095** (- 2.0241)
Family firm	- 0.0811 (- 1.2307)	- 0.2055 (- 0.9022)	- 0.2296** (- 2.3679)
Government firm	- 0.0138 (- 0.2487)	- 0.0915 (- 0.2994)	- 0.1077 (- 1.3256)
Industry effects	Yes	Yes	Yes
Country effects	Yes	Yes	Yes

Table 5 (continued)

	Dependent variable		
	Selective hedging (1)	Trade for profit (2)	Market view (3)
Observations	412	412	412
Adjusted R ²	0.6244	0.4202	0.4906
Residual SE	0.3484	1.5875	0.4917
F Statistic	22.3552***	10.3067***	13.3681***

Regression coefficients are presented with *t*-values in parentheses and robust standard errors (MacKinnon and White 1985). **p* < 0.1; ***p* < 0.05; ****p* < 0.01. Variable definitions of control variables can be found in Table 9 in the Appendix

of 2.16) and a coefficient of zero on Dark triad low education (0.0106, *t*-statistic of 0.27). As an alternative proxy for education, we take risk managers' experience trading with derivatives (column 5). The rationale behind this proxy is that managers with significant experience in trading derivatives are educated *in the field*. Overall, the findings are in line with Hypothesis H4.

With respect to Hypotheses H5 and H6 and the moderating function of the reporting frequency and the perception of successful risk management, respectively, we first interact reporting frequency (median split) with the Dark triad variable in Table 7, and find some support for Hypothesis H5.

Column (2) of Table 7 shows that the relationship between dark triad personality traits and selective hedging activities is particularly pronounced for risk managers who perceive generating additional profits through hedging activities as a success, providing support for Hypothesis H6. The coefficient on Dark triad success = profitability is 0.05 and statistically significant (*t*-statistic of 2.35), whereas the coefficient on Dark triad success ≠ profitability (0.0214) is statistically not different from zero.

Finally, we turn to Hypothesis H7. We use various proxies for managerial discretion. First, we investigate the impact of managers' professional positions on our findings. We distinguish between managers who are directors or managers of corporate risk management and those who are not. Obviously, directors enjoy greater managerial discretion. Column (1) of Table 8 summarizes the results. We find a positive coefficient for risk managers in charge (coefficient of 0.03, *t*-statistic of 1.71), also suggesting that our findings are not driven primarily by risk managers who are not in charge.

As a second proxy, motivated by the finding that the heterogeneity of hedging behavior can, to some degree, be explained by the firm's ownership structure (Pennings & Garcia, 2004), we investigate the moderating influence of firm structure. Managers of family firms enjoy more discretion than those of non-family firms. The characteristics of firm owners tend to significantly affect their business strategies (Falkner & Hiebl, 2015). Family firms do not routinely

select employees using common techniques, such as assessment centers, but often put family members in important decision-making positions after they form skills and personalities over the years to be successful future leaders within the family business. In fact, family members who follow in the leadership of the firm might show dark personality traits as a result of their upbringing (Barach & Ganitsky, 1995). We separately study family-owned firms and non-family-owned firms [column (2) of Table 8]. The coefficient on Dark triad family is 0.09 (*t*-statistic of 1.86) and larger than the coefficient on Dark triad other (0.03, *t*-statistic of 1.62), suggesting that the relationship between dark personality traits and selective hedging is more pronounced in family firms.

Larger firms and those with a more centralized risk management approach are more likely to have established routines and structures with respect to corporate hedging decisions, leaving less scope for managerial discretion (see also Li & Tang, 2010). In addition, risk managers with dark personality traits aim to receive attention and admiration for their selective hedging activities. These managers have stronger incentives to engage in such activities when the firm is smaller; then, their impact is relatively higher, ensuring more external admiration for their actions. A similar argument holds when firms have a less centralized risk management approach, making the potential for receiving admiration more pronounced. Our results in columns (3) and (4) of Table 8 indicate that the relationship between Dark triad and Selective hedging is more prevalent in small firms. In column (5) of Table 8, we turn to the degree of centralization of the risk management function and observe a larger effect size in less centralized risk management functions. Overall, these findings provide support for Hypothesis H7. Note that our findings on the moderating role of the manager's age and education are also in line with this hypothesis, considering that older managers—or those with a higher education—likely enjoy more managerial discretion because of their seniority and education.

Table 6 Managerial demographics, dark triad personality, and selective hedging

	Dependent variable				
	Selective hedging				
	(1)	(2)	(3)	(4)	(5)
Dark triad female	0.0166 (0.6154)				
Dark triad male	0.0487** (2.2284)				
Dark triad young		0.0271 (1.3615)			
Dark triad old		0.0745** (2.1608)			
Young (D)		0.1082 (0.7778)			
Dark triad short tenure			0.0931*** (3.5911)		
Dark triad long tenure			0.0108 (0.4980)		
Experience / tenure (D)			0.2881** (2.5159)		
Dark triad low education				0.0106 (0.2703)	
Dark triad high education				0.0427** (2.1630)	
Education (D)				- 0.0412 (- 0.3040)	
Dark triad low derivatives expertise					0.0776 (1.4315)
Dark triad high derivatives expertise					0.0343* (1.8297)
Derivatives expertise (D)					0.1820 (1.0237)
Male	- 0.1470 (- 1.3168)	- 0.0545 (- 1.4168)	- 0.0601 (- 1.5626)	- 0.0495 (- 1.2507)	- 0.0527 (- 1.3648)
Controls	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes
Country effects	Yes	Yes	Yes	Yes	Yes
Observations	412	412	412	412	412
Adjusted R ²	0.6242	0.6265	0.6290	0.6235	0.6245
Residual SE	0.3485	0.3474	0.3462	0.3488	0.3483
F Statistic	21.6845***	23.2403***	22.1147***	21.6284***	21.7155***

Regression coefficients are presented with *t*-values in parentheses and robust standard errors (MacKinnon and White 1985). **p* < 0.1; ***p* < 0.05; ****p* < 0.01. Variable definitions: Young (D) is a dummy variable that takes the value of one for risk managers who are 44 years of age or younger and zero otherwise; Experience / tenure (D) is a dummy variable that takes the value of one for risk managers with higher than the median experience and zero otherwise; Education (D) is a dummy variable for risk managers who hold a graduate degree or higher and zero otherwise; Derivatives expertise (D) is a dummy variable that takes the value of one for risk managers with higher than the median derivatives expertise and zero otherwise; *Dark triad female* takes the value of Dark triad for female respondents and zero otherwise; *Dark triad male* takes the value of Dark triad for male respondents and zero otherwise; *Dark triad young* takes the value of Dark triad for Young (D) = 1 and zero otherwise; *Dark triad old* takes the value of Dark triad for Young (D) = 0 and zero otherwise; *Dark triad short tenure* takes the value of Dark triad for Experience / tenure (D) = 0 and zero otherwise; *Dark triad long tenure* takes the value of Dark triad for Experience / tenure (D) = 1 and zero otherwise; *Dark triad low education* takes the value of Dark triad for Education (D) = 0 and zero otherwise; *Dark triad high education* takes the value of Dark triad for Education (D) = 1 and zero otherwise; *Dark triad low derivatives expertise* takes the value of Dark triad for Derivatives expertise (D) = 0 and zero otherwise; *Dark triad high derivatives expertise* takes the value of Dark triad for Derivatives

Table 6 (continued)

expertise (D) = 1 and zero otherwise. Variable definitions of control variables can be found in Table 9 in the Appendix

Table 7 Reporting frequency, perception of success, dark triad personality, and selective hedging

	Dependent variable	
	Selective hedging	
	(1)	(2)
Dark triad low reporting	0.0342 (1.2411)	
Dark triad high reporting	0.0471* (1.9313)	
Reporting frequency (D)	– 0.0096 (– 0.0750)	
Dark triad success = profitability		0.0504** (2.3510)
Dark triad success ≠ profitability		0.0214 (0.7274)
Success = profitability		– 0.0185 (– 0.1598)
Controls	Yes	Yes
Industry effects	Yes	Yes
Country effects	Yes	Yes
Observations	412	412
Adjusted R ²	0.6197	0.6241
Residual SE	0.3505	0.3485
F Statistic	21.2959***	21.6750***

Regression coefficients are presented with *t*-values in parentheses and robust standard errors (MacKinnon and White 1985). * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Reporting frequency (D) is a dummy variable that takes the value of one for reporting frequencies above the median and zero otherwise; *Dark triad low reporting* takes the value of Dark triad for Reporting frequency (D) = 0 and zero otherwise; *Dark triad high reporting* takes the value of Dark triad for Reporting frequency (D) = 1 and zero otherwise; *Dark triad success = profitability* takes the value of Dark triad for Success = profitability = 1 and zero otherwise; *Dark triad success ≠ profitability* takes the value of Dark triad for success = profitability = 0 and zero otherwise. Variable definitions of control variables can be found in Table 9 in the Appendix

Implications and Conclusion

We use a survey setting to study the relation between managerial personality traits and selective hedging activities. We ask managers to rate the importance of particular criteria when selecting their hedging activities. Our results indicate that dark personality traits are positively associated with selective hedging when controlling for various manager and firm characteristics. We also find that the results are more pronounced for male managers, which is consistent with the general notion that women are more risk averse than men (Halek & Eisenhauer, 2001). We find a stronger effect for older risk managers, which might seem counterintuitive given the well-established

idea that individuals' risk aversion increases with age; however, this finding might be particularly interesting because it hints at the possibility that the dark triad effect overwrites the risk aversion effect as an individual ages. The result is also consistent with the notion of Croci et al. (2017), who argue that younger managers prefer to hedge more because they suffer the consequences of an impaired reputation that comes from potential financial distress caused by selective hedging activities over a longer career horizon.

In addition to age and gender, we document that managers' experience and education play an important role in the relationship between their dark triad personality traits and selective hedging activities. We show that less experienced managers are more prone to selective hedging, given pronounced dark triad personality traits—in line with the notion that experience mitigates behavioral biases (Feng & Seasholes, 2005). Note that age is often used as a proxy for experience but does not necessarily determine experience for highly specialized tasks, such as financial risk management. In support of this notion, we observe a correlation between age and experience of 0.33 in our sample, indicating that these two variables have a common dimension but indeed measure different constructs. Our results on education indicate that risk managers with a higher level of education are more prone to engage in selective hedging when scoring high on the dark triad personality scale, which is also in line with the notion of Beber and Fabbrì (2012) that high levels of education are associated with a greater tendency to engage in selective hedging. Our results indicate that the relation between education and selection hedging might be particularly driven by highly educated risk managers with pronounced dark personality traits.

A finding with important practical implications is that risk managers who perceive the isolated profit of hedging decisions to be a measure of success drive the relationship between dark personality traits and selective hedging activities. In addition, we find that the relationship between dark managerial personality traits and selective hedging increases with the manager's discretion; we proxy for managerial discretion with firm structure and firm size. Considering previous evidence that selective hedging is more prevalent in small firms (Adam et al., 2017), which contradicts the notion of Stulz (1996), and when multiple departments are responsible for financial risk management (Aabo et al. 2012), our results indicate that these relationships might be particularly driven by risk managers with pronounced dark personality traits who are responsible for financial risk management in smaller and less centralized firms. Thereby, we add a potential explanation to the literature as to why selective hedging is particularly prevalent in small firms. Although Adam et al. (2017) and Graham and Harvey (2001) suggest that managers of smaller firms might be less sophisticated,

Table 8 Firm structure, dark triad personality, and selective hedging

	Dependent variable				
	Selective hedging				
	(1)	(2)	(3)	(4)	(5)
Dark triad not managing	0.0869 (1.4610)				
Dark triad managing	0.0314* (1.7147)				
Professional position (D)	0.1839 (0.9392)				
Dark triad family		0.0936* (1.8560)			
Dark triad other		0.0302 (1.6241)			
Family firm (D)		- 0.2690 (- 1.3334)			
Dark triad low sales			0.0681*** (2.8617)		
Dark triad high sales			0.0054 (0.2106)		
Sales revenue (D)			0.1842 (1.6209)		
Dark triad few employees				0.0664*** (2.6037)	
Dark triad many employees				0.0115 (0.4851)	
No. employees (D)				0.1752 (1.5763)	
Dark triad less centralized					0.0431** (1.9910)
Dark triad highly centralized					0.0299 (0.9217)
Centralization (D)					0.1181 (0.8969)
Controls	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes
Country effects	Yes	Yes	Yes	Yes	Yes
Observations	412	412	412	412	412
Adjusted R ²	0.6246	0.6265	0.6259	0.6242	0.6254
Residual SE	0.3483	0.3474	0.3477	0.3485	0.3479
F Statistic	21.7207***	23.2389***	21.8343***	21.6858***	21.7932***

Regression coefficients are presented with *t*-values in parentheses and robust standard errors (MacKinnon and White 1985). **p* < 0.1; ***p* < 0.05; ****p* < 0.01. Variable definitions: Professional position (D) is a dummy variable that takes the value of one for risk managers who hold a position as director or manager corporate risk management and zero otherwise; Family firm (D) is a dummy variable that takes the value of one for family firms and zero otherwise; Sales revenue (D) is a dummy variable that takes the value of one for firms with above median sales revenue and zero otherwise; No. employees (D) is a dummy variable that takes the value of one for companies with higher than the median number of employees and zero otherwise; Centralization (D) is a dummy variable that takes the value of one for highly centralized firms and zero otherwise; *Dark triad not managing* takes the value of Dark triad for Professional position (D) = 0 and zero otherwise; *Dark triad managing* takes the value of Dark triad for Professional position (D) = 1 and zero otherwise; *Dark triad family* takes the value of Dark triad for Firm type (D) = 1 and zero otherwise; *Dark triad other* takes the value of Dark triad for Firm type (D) = 0 and zero otherwise; *Dark triad low sales* takes the value of Dark triad for Sales revenue (D) = 0 and zero otherwise; *Dark triad high sales* takes the value of Dark triad for Sales revenue (D) = 1 and zero otherwise; *Dark triad few employees* takes the value of Dark triad for No. employees (D) = 0 and zero otherwise; *Dark triad many employees* takes the value of Dark triad for No. employees (D) = 1 and zero otherwise. *Dark triad less centralized* takes the

Table 8 (continued)

value of Dark triad for centralization (D) = 0 and zero otherwise; *Dark triad highly centralized* takes the value of Dark triad for centralization (D) = 1 and zero otherwise. Variable definitions of control variables can be found in Table 9 in the Appendix

our results show that risk managers with dark personality traits might engage more often in selective hedging—particularly in small firms and potentially as a result of increased managerial discretion in these smaller firms.

Our paper speaks to the ethical dimension of selective hedging behavior. Firm stakeholders expect that appointees to important positions, such as risk managers, use their authority to improve the organization. According to traditional financial theory, risk managers should aim to reduce volatility, stabilize cash flows, and reduce the probability of financial distress (see, e.g., Stulz, 1996; Mian, 1996; Stulz, 2013). As such, the goal of hedging is not to make money but to protect from losses. However, the literature provides ample evidence that risk managers instead engage in selective hedging activities (Adam & Fernando, 2006), thereby creating additional risk exposures and subjecting firms to new risks (Adam et al., 2017). Selective hedging might lead to severe losses for the firm and, consequently, constitutes a potential dimension of ethical misconduct by management (Jones, 1991).

Our results have important implications for theory and practice, given that various conclusions for public policy and corporate governance, corporate risk management research, education, and theory testing can be drawn from the analysis.

For corporate practice, our analysis shows that specific personality traits might negatively affect financial risk management approaches. Managers with dark personalities might be particularly prone to selective hedging behaviors. This could have implications for human resources departments to carefully consider dark triad personality traits when hiring risk managers. Management assessment tests might need to explicitly consider such personality traits. Firms might also want to place more weight on risk managers' experience because these factors mitigate the impact of dark personality traits on unhealthy financial risk management decisions.

In addition, public and corporate policies promoting explicit corporate hedging activities could be expected to mitigate the impact of managers' dark personality traits on corporate risk management. Creating an environment within the risk management function that does not focus on the profitability of the hedging decisions but, rather, uses a risk-related measure to quantify success might be helpful. Particularly useful might also be to identify whether risk managers perceive generating additional profits as an important success criterion for financial risk management. Risk managers who focus on profitability rather than risk measures should not be put in charge of the firm's risk management function. This provides human resources departments with a more practical approach that does not rely on personality assessments. Considering the criticism of these

assessments (Caponecchia et al., 2012), this approach might be particularly valuable.

From a research perspective, our study provides evidence that future research on educating risk managers should investigate how personality traits relate to risk management competencies. Although significant research has been conducted on competencies for risk managers, links to personality traits are to date missing in this literature. Can personality traits, which help to support corporate risk management, be identified with specific educational formats? Moreover, how can personality traits be considered when assessing candidates for risk management positions?

Despite the contribution to the literature and important practical implications, our study has some caveats. Although the survey methodology allows us to ask important questions, it has limits. Discussing causation is not possible. A common concern in survey-based research is that the results are affected by endogeneity issues. However, considering that individual differences in personality traits are essentially fixed by age 30 (McCrae & Costa, 1994), before (most) risk managers are in the position to decide on their firms' hedging decisions, we are cautiously confident that reverse causality is not an issue in our setting. However, individuals with pronounced dark personality traits might actively pursue careers as risk managers to satisfy their thirst for risk and excitement. Such self-selection makes it particularly likely to find individuals with dark personality traits in risk manager positions, given the larger pool of applicants for these positions with said personality traits. However, it would not invalidate the association between dark personality traits and selective hedging. Another potential drawback is that surveys measure beliefs and preferences and not necessarily actions (Graham et al., 2013). However, considering that we specifically target risk managers with decision-making authority, we believe that a respondent who considers objectives such as "trading for profit" important for their hedging decisions not only has a preference to engage in selective hedging activities but can act on this preference. Thus, we are cautiously confident that the manager's preferences also characterize the company's hedging policy. Lastly, some of the questions might be misunderstood or produce only noisy measures of the variable in question. However, because it is difficult to obtain managers' personality traits and their propensity to engage in selective hedging at the same time through another research method, we nonetheless believe that our paper makes an important contribution. We also take great care and use best practices to mitigate the well-known pitfalls of surveys. Importantly, our results are in line with the previous literature on the prevalence of selective hedging activities (see, e.g., Adam & Fernando, 2006) and established determinants

of selective hedging, such as (over)confidence (Adam et al., 2015) or risk preferences (Pennings & Garcia, 2004).

Keeping these concerns in mind, our research design offers new and unique insights into the relationship between managers' personality characteristics and risk management competence, particularly selective hedging. These findings nicely complement recent studies on the determinants of selective hedging that use archival data (Adam et al., 2015; Bajo et al., 2021).

This study is a first step in evaluating the impact of dark personality traits on financial risk management activities in organizations. Future research should shed additional light on the mitigating factors that might help keep risk managers' dark personality traits at bay and, thereby, improve corporate

risk management outcomes. Future research might want to study the degree to which the size of selective hedging positions varies with risk managers' personality traits. In particular, we expect that risk managers with more pronounced dark personality traits are not only more willing to engage in selective hedging but also are more willing to take larger positions based on their views.

Appendix: Additional Analyses

See Tables 9, 10, and 11.

Table 9 Variable definitions

Variable	Definition
<i>Dependent variables</i>	
Selective hedging	Composite scale ranging from 1 to 5 measuring the selective hedging activities of risk managers
Trade for profit	Scale ranging from 1 to 11 measuring the degree to which risk managers attempt to make additional profit with their hedges rather than manage the volatility of earnings and cash flows
Market view	Composite scale ranging from 1 to 5 measuring the degree to which a risk manager's market view influences their hedging decisions
<i>Independent variables: personality traits</i>	
Dark triad	Composite scale ranging from 1 to 5 measuring managerial personality traits (Machiavellianism, narcissism, and psychopathy) based on Jonason and Webster (2010)
Machiavellianism	Scale ranging from 1 to 5 measuring Machiavellianism based on Jonason and Webster (2010)
Narcissism	Scale ranging from 1-5 measuring narcissism based on Jonason and Webster (2010)
Psychopathy	Scale ranging from 1 to 5 measuring psychopathy based on Jonason and Webster (2010)
<i>Control variables</i>	
Risk preference	11-level scale measuring managerial risk attitude based on Dohmen et al. (2011)
Confidence	11-level scale measuring risk managers' confidence in their hedging activities based on Weber and Brewer (2003)
Male	Dummy variable that takes the value of one for male risk managers and zero otherwise
Age	6-level scale measuring risk managers' age
Education	6-level scale measuring risk managers' education
Derivatives expertise	5-level scale measuring risk managers' experience using derivatives
Experience / tenure	5-level scale measuring the risk manager's tenure with the firm
Tail outcomes	Composite scale ranging from 1 to 5 measuring the degree to which risk managers use hedging to eliminate lower-tail outcomes
Success=profitability	Dummy variable that takes the value of one for risk managers who perceive additional financial gains to be an important success criterion of risk management activities and zero otherwise
Professional position	Dummy variable that takes the value of one if the risk manager is the director/manager corporate risk management and zero otherwise
Performance measurement	Scale ranging from 1 to 5 measuring the degree to which a risk manager's performance is evaluated based on his or her absolute profit/loss
Reporting frequency	Scale ranging from 1 to 6 measuring the reporting frequency on a risk manager's hedging activities
Centralization	Scale ranging from 1 to 11 measuring the degree to which firms' hedging activities are centralized
Guidelines	Scale ranging from 0 to 5 measuring the degree to which risk managers' hedging decisions are bound by internal guidelines
No. employees	8-level variable indicating the number of employees in the respondent's firm
Sales revenue	8-level variable indicating the annual sales of the respondent's firm
Private firm	Dummy variable that takes the value of one for non-family firms and zero otherwise
Family firm	Dummy variable that takes the value of one for family firms and zero otherwise
Government firm	Dummy variable that takes the value of one for government firms and zero otherwise

Table 10 Robustness: Dark personality traits and selective hedging

	Dependent variables		
	Selective hedging (1)	Trade for profit (2)	Market view (3)
Machiavellianism	0.0267* (1.9308)	0.2469*** (3.8056)	0.0521*** (2.7306)
Controls	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Country effects	Yes	Yes	Yes
Observations	412	412	412
Adjusted R^2	0.6234	0.4190	0.4871
Residual SE	0.3488	1.5892	0.4934
F Statistic	22.2647***	10.2612***	13.1981***
	(4)	(5)	(6)
Narcissism	0.0414** (2.2027)	0.2063** (2.3444)	0.0810*** (2.8887)
Controls	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Country effects	Yes	Yes	Yes
Observations	412	412	412
Adjusted R^2	0.6251	0.4075	0.4914
Residual SE	0.3481	1.6048	0.4913
F Statistic	22.4144***	9.8319***	13.4114***
	(7)	(8)	(9)
Psychopathy	0.0249 (1.5433)	0.2831*** (3.5247)	0.0553** (2.5032)
Controls	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Country effects	Yes	Yes	Yes
Observations	412	412	412
Adjusted R^2	0.6225	0.4203	0.4864
Residual SE	0.3493	1.5873	0.4937
F Statistic	22.1791***	10.3130***	13.1632***

Regression coefficients are presented with t -values in parentheses and robust standard errors (MacKinnon and White 1985). * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Variable definitions can be found in Table 9 in the Appendix

Table 11 The non-finance sector, dark triad personality, and selective hedging

	Dependent variable		
	Selective hedging (1)	Trade for Profit (2)	Market view (3)
Dark triad	0.0613** (2.0282)	0.3751*** (2.8104)	0.0802* (1.7569)
Controls	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Country effects	Yes	Yes	Yes
Observations	188	188	188
Adjusted R ²	0.6160	0.4161	0.5021
Residual SE	0.3371	1.5629	0.4847***
F Statistic	10.6765***	5.2992***	7.0828

Regression coefficients are presented with *t*-values in parentheses and robust standard errors (MacKinnon and White 1985). **p* < 0.1; ***p* < 0.05; ****p* < 0.01. Variable definitions can be found in Table 9 in the Appendix

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Declarations

Conflict of interest All authors declare they have no conflicts of interest.

Ethical Approval The procedures performed involving human participants were in accordance with the ethical standards of the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Every precaution was taken to protect the privacy of research subjects and the confidentiality of their personal information. The study was reviewed and approved by the institutional ethics review board of Paderborn University (2020-08-12).

Informed Consent Informed consent was obtained from all individual participants included in the study. Participation by individuals was voluntary, and all participants could terminate the study at any time without negative consequences.

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