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Abstract: Concerns about corporate scandals and abusive leadership suggest that individuals with an opportunistic and manipulative personality take advantage of incomplete incentive and control systems to get their way into managerial positions. Against this background, we examine whether there is an association between Machiavellianism and occupying a managerial position. We suggest how to incorporate the psychological concept of Machiavellianism into agency theory and hypothesize that individuals scoring high on Machiavellianism are more likely to attain and keep a managerial position. Using a large and representative panel dataset from Germany, our empirical analysis confirms a strong and positive relationship between Machiavellianism and occupying a managerial position. This result holds in various robustness checks and in instrumental variable estimations accounting for possible endogeneity. Furthermore, our analysis provides evidence that the relationship is monotone; i.e., those with the highest scores of Machiavellianism are most likely to be managers. It also suggests that the direction of influence runs from Machiavellianism to occupational status and not vice versa.

Keywords: Machiavellianism, Dark Triad, Managers, Agency Theory, Occupational Sorting.

JEL: D23, D90, J24, M12, M51.

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1. Introduction

Corporate social responsibility and ethical leadership play a prominent role in discussions among academics, government officials and business leaders (Den Hartog 2014, Hansen et al. 2013, Kitzmueller and Shimshack 2012). Yet, high expectations that managers voluntarily take social responsibilities or even just promote the interests of shareholders may be naive and unrealistic. Concerns about corporate scandals, excessive bonus cultures, wage theft and destructive leadership causing considerable economic and social costs loom high (Artz et al. 2020, Bertrand and Mullainathan 2001, Carson 2003, Dyck et al. 2023, Hail et al. 2018, Krasikova et al. 2013, Raghunandan 2021, Schnatterly et al. 2018, Schyns and Schilling 2013).

An obvious explanation for unethical firm behavior is that imperfect governance and control mechanisms provide scope for management misconduct. However, while failure of control and incentive systems is certainly an important factor, it may not be the whole story. Individuals with opportunistic and manipulative personalities may tend to sort into managerial positions. These individuals may be particularly effective in taking advantage of the imperfections of incentive and control systems.

Against this background, we examine whether there is a link between Machiavellianism and holding a managerial position. Psychologists consider Machiavellianism as one dimension of personality (Christie and Geis 1970). Individuals high in Machiavellianism have a cynical worldview, are willing to put morality aside, use manipulative tactics, and strategically look for situations to exploit others for selfish gain.

We provide both an intuitive theoretical discussion and an empirical analysis. In our theoretical background discussion, we suggest how to incorporate the psychological

concept of Machiavellianism into economic thinking. Using agency theory, we argue that information asymmetries provide a series of opportunities for Machiavellians to use their malevolent behavior in order to attain and keep managerial positions. Machiavellians can successfully engage in projects that primarily serve to advance their career, but do not necessarily maximize expected financial returns to firm owners or account for the interests of stakeholders. They are cunning in sabotaging opponents in promotion tournaments, take advantage of the discretionary and subjective nature of performance appraisals, and participate in collusive activities within the firm.

Our theoretical considerations lead to the hypothesis that individuals scoring high on Machiavellianism are more likely to hold a managerial position than those with a lower score. We use a large and representative dataset from Germany to test this hypothesis. Our empirical analysis indeed shows a significant and economically meaningful link between Machiavellianism and occupying a managerial position. This result holds in regressions controlling for other personality traits (narcissism, psychopathy, Big Five) and basic socio-demographic characteristics. It holds in various robustness checks and persists in instrumental variable estimations accounting for possible endogeneity. Our result applies to both men and women and also holds when distinguishing between top level and non-top level managers. Importantly, examining the direction of influence with our panel data in more detail, we find that scoring high on Machiavellianism increases the chance of becoming a manager, but obtain no evidence that holding a managerial position has an influence on changes in Machiavellianism. This indicates that the direction of influence runs from Machiavellianism to occupational status and not vice versa. Furthermore, we consider possible nonlinearities by examining whether intermediate or high

Machiavellianism maximizes the likelihood of holding a managerial position. Our results suggest that this likelihood is greatest for those with a high score of Machiavellianism.

As we will discuss in detail, our finding has a series of practical implications for employment relations, corporate governance, and the design of managerial pay, promotions, and performance appraisals systems. We also emphasize that our finding has implications for society and democracy that go beyond the boundaries of the single firm. Managers' opportunism may not only undermine trustful employment relationships within firms, but also citizens' trust in market economies and democracies.

2. Background Discussion

In what follows, we set the stage by placing our study in context of the literature. We proceed with an introduction into the psychological concept of Machiavellianism. Finally, crossing the bridges between psychology and economics, we suggest how to incorporate Machiavellianism into agency theory.

2.1 Contribution of the Study

Our study contributes in several ways to the literature. Apart from a few exceptions, the literature has paid almost no attention to the question of whether managers are more Machiavellian than other employees. A handful of psychological studies addressed this question, but used small cross-sectional datasets and obtained mixed results (Gemmill and Heisler 1972, Nuzulia and Why 2020, Paleczek et al. 2018, Siegel 1973, Spurk et al. 2016). Some other psychological studies considered the role of related personality traits such as psychopathy, but ignored Machiavellianism (Babiak et al. 2010). This is problematic. If

personality traits are correlated, the influence of each trait can only be disentangled in a multivariate analysis that controls for the other traits.

The only large-scale study we are aware of is a notable econometric examination by Lindley (2018). However, as her data did not contain direct information, Lindley had to construct a proxy for Machiavellianism (along with proxies for psychopathy and narcissism) from information on the Big Five personality traits. Thus, she emphasized that measures of the Dark Triad "should be integrated into publically available data to facilitate further research" (p. 793).

Our empirical analysis uses representative large-scale panel data providing direct information on the relevant personality traits. Importantly, our study goes beyond the literature not only by using a unique dataset. It addresses the possible endogeneity of Machiavellianism, examines the monotonicity and direction of the influence and shows that the influence of Machiavellianism holds for the various layers of hierarchy.

On a broader scale, our study contributes to the growing body of econometric research showing that personality plays an important role in the labor market outcomes and well-being of individuals (Caliendo et al. 2014, Cobb-Clark and Tan 2011, Filer 1986, Flinn et al. 2018, Heckman and Kautz 2012, Heineck 2011, Jirjahn and Ottenbacher 2023, John and Thomsen 2014, Laible and Brenzel 2022, Mueller and Plug 2006, Nyhus and Pons 2005, Osborne Groves 2005, Wells et al. 2016). Examining the consequences of personality has been identified as "one of the most exciting developments in labor economics over the past decade" (Cobb-Clark 2015: p. 1). However, econometric studies overwhelmingly focus on personality traits such as locus of control or the Big Five (Alderotti et al. 2023, Almlund et al. 2011, Borghans et al. 2008, Bowles et al. 2001).

Ferguson et al. (2020: p. 484) suggest that researchers could increase the explanatory power of their analyses by considering malevolent personality traits that are related to the immorality of human behavior. Our study shows that accounting for what psychologists call the dark side of personality indeed yields deeper insights into occupational sorting and the processes within hierarchies.

Considering Machiavellianism is timely as experimental economists are increasingly interested in the issue of deception and discuss to what extent there exists lying aversion (Abeler et al. 2019, Battigalli et al. 2013, Cappelen et al. 2013, Gneezy 2005, Kajackaite and Gneezy 2017, Khalmetski and Sliwka 2019). Our study suggests that differences between individuals are important. Individuals systematically differ in their opportunistic inclinations and these differences make a difference. Those who have a higher willingness to lie are more likely to occupy leading positions within firms.

Altogether, our study follows a trend in economics to expand its scope of inquiry to topics traditionally addressed by other scientific disciplines such as psychology. Of course, expanding the boundaries of economics into other disciplines by using larger and representative data sets or examining explanatory variables with greater statistical sophistication would be of limited value if it does not yield additional theoretical insights. A successful expansion of the scope of inquiry into nontraditional topics requires integrating these topics into the analytical thinking of economics (Lazear 2000). Thus, to guide our empirical analysis, we provide an informal theoretical discussion incorporating the psychological concept of Machiavellianism into agency theory.

2.2 Machiavellianism as a Dimension of Personality

Machiavellianism is a personality dimension introduced by Christie and Geis (1970). Their research was inspired by Niccolò Machiavelli's (1950/1532) book *The Prince*, a 16th-century treatise on how princes and royals can seize and retain political power. Machiavelli, a political advisor to the Medici family in Florence, suggested that successful leaders are strategic, tactical, cold, pragmatic, sly, cunning, manipulative and, at times, immoral. The phrase 'the end justifies the means' captures the idea that a leader with a clear agenda should be open to any and all effective strategies and tactics, including flattery and lying. Christie and Geis (1970) observed stable differences between individuals agreeing and individuals disagreeing with Machiavelli's ideas. They developed these observations into theoretical arguments, assessments and research on the personality trait that came to be known as Machiavellianism. Since then, Machiavellianism has received considerable attention in psychological research.

The Machiavellian personality is defined by a series of interrelated characteristics (Bereczkei 2015, Jones 2016, Jones and Mueller 2022, Jones and Paulhus 2009, Rauthmann and Will 2011). Individuals high in Machiavellianism have a cold and cynical view of human nature. They see others as weak, untrustworthy and vicious. On the one hand, such cynical worldview may lead to manipulative tactics as a form of preemptive strike. On the other hand, the cynical worldview helps rationalize the propensity of manipulating and exploiting other people.

The moral outlook of Machiavellians puts expediency over principle. While Machiavellians are willing to turn a blind eye to the morality of their decisions, they are adaptable and engage in unethical behavior only in favorable situations where expected

rewards for breaking the norms outweigh the risks. They act well behaved if they see doing so as beneficial to themselves. They break the norms if this involves a selfish gain. Machiavellians are ultimately self-interested and lack concern for others. They show cold instrumentality in pursuing goals such as money, power, and status while they give low priority to communal goals such as harmony, love and family.

Machiavellians have an avowed belief in the effectiveness of manipulative tactics in dealing with other people. They use a broad set of tactics to get what they want, such as alliance building, exchange for favor, flattery, ingratiation, supplication, self-disclosure, impression management, deceit, lying, cheating, betrayal, intimidation, and sabotage. Machiavellians are more likely to use friendliness and tactics for emotional and thought manipulation. They are cautious and tend to hide their opportunistic behavior. Importantly, Machiavellians are flexible in their tactics and show high sensitivity and adaptability to the respective social environment. They continuously evaluate the social situation and adjust their behavior to changing circumstances. While Machiavellians possess deficits in understanding other people's feelings, needs and suffering, they permanently monitor their partners and focus on their moves. This allows Machiavellians finding opportunities for exploitative gain and effectively choosing potential victims.

While Machiavellianism appears to be modestly correlated with negative emotionality, they have the ability to postpone momentary emotions and needs. This is a basic requirement for long-term strategic planning and careful preparation of plans and tactics. It allows making rational decisions, effectively controlling situations, and successfully manipulating others.

Machiavellianism is only one of several toxic traits. Together with psychopathy and narcissism, it is part of what is known as the Dark Triad of personality (Furnham et al. 2013, Paulhus and Williams 2002). The key facets of narcissism are a sense of personal superiority, grandiosity, dominance, entitlement and a desire for admiration and power. The basic characteristics of psychopathy are continuous antisocial behavior, lack of remorse, thrill-seeking, high impulsivity, and low empathy and anxiety. Machiavellianism, psychopathy and narcissism share some common features and are positively correlated. To varying degrees, these personality traits show tendencies of antisocial behavior, callousness, selfishness, and aggressiveness.

However, the overlap between the toxic traits is far from perfect so each has to be considered as a distinct dimension of personality in its own right. In contrast to Machiavellians, individuals high in psychopathy and narcissism are more impulsive and pay less attention to the environment (Bereczkei 2015, Carré et al. 2020, Jones 2016, Jones and Mueller 2022). They are characterized by distraction, short-term thinking, inaccurate decision-making, and failure to delay gratification. Their deficit in inhibiting aggressive impulses implies that they respond in a reckless manner to provocation and criticism. They are more likely to make errors in hiding their unethical behavior. By contrast, Machiavellianism is associated with strategic planning, more reflective problem solving, and rational decision-making. Machiavellians engage in aggression only if it involves a selfish gain. As Machiavellians are more cautious and deliberate, they are more able to hide their unethical behavior and, hence, are less likely to be detected as bad actors. They use tactics that are less likely to backfire in the mid- to long-term. Moreover, Machiavellianism and narcissism differ with respect to overconfidence and self-deception. While narcissism

is associated with overconfidence and self-deception (Chatterjee and Hambrick 2011, Gupta et al. 2018, O'Reilly III et al. 2018), Machiavellians chart a more realistic course to attain their goals.

Altogether, Machiavellianism is a personality trait that has the potential to help employees attain and keep managerial positions. Employees high in Machiavellianism have a strategic perspective in pursuing their career ambitions. They carefully monitor their social environment and adjust their behavior to the respective circumstances. If it is useful in pursuing their career, they put ethics aside and use manipulative and opportunistic tactics, including flattery, deceit, lying, betrayal, and cheating. They use their tactics in a cautious, deliberate and hidden way reducing the risk that their misbehavior is detected.

At issue is the question as to which specific transmission channels allow Machiavellians using their manipulative and opportunistic tactics to advance their career. In what follows, we argue that agency theory can provide insights into the transmission channels that enable Machiavellians to get away successfully with their malevolent behavior. A series of agency models lend themselves for incorporating the psychological concept of Machiavellianism.

2.3 Incorporating Machiavellianism into Agency Theory

One simple reason as to why Machiavellians may be disproportionately in managerial positions could be that dark personalities are deliberately hired for these positions (Harris et al. 2022). It could be profitable for the firm to employ managers who are not only strategic, but also willing to engage in opportunistic activities such as earnings manipulation, wage theft and reneging on implicit agreements with stakeholders. In the economic literature, hostile takeovers are one example for opportunistic profit

maximization (Shleifer and Summers 1988). Hostile takeovers facilitate opportunistic profit maximization, as they do not only involve the replacement of inefficient managers, but also the replacement of managers who are loyal to the firm's stakeholders. For example, newly installed managers may break promises made to the workforce by reverting pension plans, reducing the employment of more-tenured employees or flattening their wage-tenure profiles (Gokhale et al. 1995, Pontiff et al. 1990).[1] Such opportunism is particularly effective if the new managers lack moral concerns and are cunning in finding ways for rent extraction and covering up their opportunistic actions.

While hiring Machiavellians for opportunistic profit maximization has some plausibility, it can only be a partial reason for a sorting of Machiavellian individuals into managerial jobs. First of all, there is a selection problem. As Machiavellians tend to hide their opportunistic personality, firms face the difficulty in identifying candidates with personality traits that exactly fit the aim of opportunistic profit maximization. Moreover, imperfections of control and incentive systems imply that managers tend to pursue their own goals (e.g. advancing their career) instead of solely engaging in activities that are profitable for the firm.[2] The very characteristics of Machiavellians suggest that they are particularly cunning in taking advantage of the imperfections of control and incentive systems. Thus, even firms interested in opportunistic profit maximization may be reluctant to hire Machiavellians. Finally, not all firms engage in opportunistic profit maximization. Some firms may prefer to avoid opportunism and, hence, are simply not interested in employing Machiavellian managers. These firms are rather interested in building trustful and mutually beneficial relationships with stakeholders and do not want to risk legal problems or a loss of their reputation.

However, Machiavellians may attain and keep managerial positions even if it is not in the interest of the owners or shareholders of the firm. A series of agency models developed in economics can provide insights into the ways Machiavellians make it to managerial positions. The key assumption of these models is that there exist information asymmetries. The employer can only imperfectly monitor and observe the actions of employees. This gives employees discretion in their actions. They can advance their career not only by productive actions, but also by counterproductive actions gaming imperfect control and incentive systems.

Models of career concerns show that employees engage in projects and propose investments that primarily improve their reputation, but do not necessarily maximize the expected financial return to firm owners (Borland 1992, Holmstrom 1999, Holmstrom and Ricart I Costa 1986, Naryana 1985, Scharfstein and Stein 1990). If employees have private information about potential projects, they will choose investments and put effort in those projects that produce a positive signal of their ability to their bosses or to the managerial labor market. On the one hand, they excessively invest firm resources to realize big and visible projects and to minimize the risk of failure of these projects. In order to quickly advance their career, they propose investments yielding short-term gains at the expense of the long-term interests of the firm owners. On the other hand, they refrain from proposing profitable projects if a high risk of failure of these projects could jeopardize their career prospects. The strategic and manipulative orientation of Machiavellians suggests that they are particularly successful in proposing projects and investments that primarily serve to advance their career.

Moreover, as emphasized by tournament models, the promotion to a managerial position is often based on a contest among employees within the firm (Lazear and Rosen 1981). Thus, the promotion does not depend on an employee's absolute performance, but instead on his or her performance relative to that of other employees. As the promotion is based on relative performance, each employee can improve the chance of being promoted not only by exerting effort to increase own performance, but also by sabotaging opponents to decrease their performance (Che 2003, Chowdhurry and Gürtler 2015, Lazear 1989). Sabotage activities can take many forms such as refusing help and cooperation, spreading rumors about opponents, purposefully delaying execution, and transmitting false information.[3] These are typical Machiavellian tactics suggesting that Machiavellians have a comparative advantage in sabotaging opponents and winning the promotion tournament.

Promotion decisions usually are not only based on an employee's objective performance, but also on subjective performance appraisals by superiors. This provides a further way in which Machiavellians can use their manipulative talent. While performance appraisals enable the employer to conduct a comprehensive evaluation of the various dimensions of employee performance, their subjective character means that superiors' personal judgements and opinions enter the evaluation (Baker et al. 1988, Brown and Heywood 2005, Gibbons 1998, Jirjahn and Poutsma 2013, Prendergast 1999). This provides the opportunity for subordinates to engage strategically in influence activities that result in a positive evaluation but not necessarily in increased performance (Acemoglu et al. 2008, de Janvry et al. 2023, Milgrom 1988, Milgrom and Roberts 1988). For example, in Prendergast's (1993) model of "yes men," superiors favor proposals from subordinates that mirror their own opinions. This creates an incentive for subordinates to make just such

proposals. The manipulative personality of Machiavellians suggests that they are particularly effective in telling superiors what they want to hear.

The subjective nature of performance appraisals not only implies that superiors' evaluations may be manipulated without them noticing. As emphasized by models of hidden gaming, it also implies that superiors have a high degree of discretion they can strategically use in many opportunistic ways. The discretionary nature of performance appraisal provides opportunities for favoritism (Prendergast and Topel 1996). A less-productive superior can favor unproductive subordinates to protect him- or herself from being replaced by productive subordinates (Friebel and Raith 2004). A superior may also take credit for his or her subordinates' innovative ideas and put the blame on subordinates when a project fails (Benabou and Tirole 2003). Alternatively, the superior may rate most subordinates highly to demonstrate to those further up in the firm's hierarchy his or her outstanding managerial skills. Importantly, superiors can use their discretionary power to reward those subordinates who provide private services to them (Laffont 1990). This has two crucial implications. On the one hand, Machiavellian superiors may use performance appraisals to extract subordinates' loyalty to their career concerns. This helps them secure their position or attain an even higher managerial position. On the other hand, Machiavellian subordinates are willing to provide such private services to their superiors if this is helpful to their own career.

The exchange of private services for good performance evaluations brings us to another transmission channel through which Machiavellians attain and keep managerial positions. Machiavellians may be particularly successful in engaging in collusion within firms. Collusion means that some members of an organization form a strategic alliance at

the expense of other members (Laffont and Rochet 1997, Tirole 1986). Such collusion within organizations can take many forms. Superiors not only have discretion in performance evaluations, but also in task assignment. Thus, they have scope to assign loyal subordinates to those tasks or projects that help the subordinates advance their career (Suzuki 2007). Moreover, Machiavellians may not only participate in vertical, but also in horizontal collusion. For example, they can collude in promotion tournaments to sabotage high-ability opponents.

To summarize, agency theory identifies a series of imperfections of control and incentive systems that enable Machiavellian individuals to make their way into managerial positions. Of course, one may question whether these imperfections are severe enough to allow a sorting of Machiavellians into managerial positions. Even though they tend to hide their opportunistic behavior, Machiavellians always face some risk of being caught and punished. Thus, in the end, only empirical research can answer the question of whether Machiavellian individuals are disproportionately represented in management jobs.

3. Data and Variables

3.1 The Dataset

Our empirical examination uses data from the pairfam (Panel Analysis of Intimate Relationships and Family Dynamics), a nationally representative panel dataset for Germany (Brüderl et al. 2018, Hunink et al. 2011). The pairfam project is based on a cooperation of University of Bremen, Friedrich Schiller University of Jena, University of Cologne and Ludwig Maximilian University of Munich. The German Research Foundation (DFG) provides financial support. Kantar Public, a leading survey and opinion research institute, carries out the survey.

A nucleus of themes is addressed annually while different additional topics are sampled in consecutive waves. The survey includes both a personal interview by a professional interviewer and a self-administered questionnaire for particularly sensitive questions. The self-administered questionnaire is completed during the interview using the official laptop. In order to avoid interviewer effects, reporting bias, and refusal to answer questions, all questions on personality are asked in the self-administered questionnaire.

The first wave of interviews was conducted in the year 2008. Addresses were randomly drawn from the local population registers of 343 randomly chosen municipalities. The sample of the first wave has been used as the basis for the following waves. A refreshment sample has been included since 2018. Nonresponse patterns in the pairfam are similar to other panel studies based on voluntary participation. Bias due to panel attrition does not appear to be a large issue (Müller and Castiglioni 2015).

While the pairfam has a special focus on intimate relationships and family relations, it is unique in that it provides information on both the Dark Triad and the occupational status of the interviewees. This information is available for the waves 2016, 2018 and 2020. We pool the three waves for our analysis. In the analysis, we focus on employees who are older than 25 years. We do not consider apprentices and individuals who are unemployed, marginally employed, self-employed or have an armed forces occupation.

3.2 Variables

Table 1 provides the definitions and descriptive statistics of the key variables. Our dependent variable builds from the International Standard Classification of Occupations (ISCO-08). This classification has ten major occupational categories. The first category captures managerial occupations. Employees are considered as managers if they have

overall responsibility for the strategic and operational direction of a business or organizational unit. We define a dummy equal to one if a person is a manager. The dummy equals zero if the person is a nonmanagerial employee. Moreover, as a check of robustness, we will also distinguish between top-level managers (e.g., chief executives or managing directors) and non-top level managers (e.g., production managers or specialized service managers).

As usual in large surveys, personality traits are captured in the pairfam by using concise measures. Machiavellianism is captured by items from Küfner et al.'s (2014) Naughty Nine scales. The Naughty Nine measure is a psychometrically optimized version of Jonason and Webster's (2010) Dirty Dozen measure. Jonason and Webster have developed and validated a concise measure of the Dark Triad capturing Machiavellianism, narcissism and psychopathy each with four items, respectively. Their Dirty Dozen measure focuses on items that are most central to each of the three personality traits and behaves in ways that the longer, original measures of the traits do. The concise measure has several advantages. It saves time, avoids response errors from interviewee fatigue, and drops ambiguous items contained in the original measures. The psychometric quality of the Dirty Dozen has been confirmed by a series of follow-up studies for various world regions and countries (Jonason and Luévano 2013, Pechorro et al. 2021, Rogoza et al. 2021). The Dirty Dozen is correlated with the unabridged, original measures and predicts behavior in a similar way suggesting that it indeed tapes the same personality traits as the original Dark Triad measures. Küfner et al. (2014) validate the Dirty Dozen measure for Germany, but suggest that it can be improved by using just three instead of four items for each of the dark personality traits.

The three items capturing Machiavellianism focus on the manipulative and opportunistic core of this trait: (1) I tend to manipulate others to get my way; (2) I have used deceit or have lied to get my way; (3) I have used flattery to get my way. Interviewees respond to each of the statements on a five-point Likert scale ranging from 1 "does not apply to me at all" to 5 "applies to me perfectly." Note that interviewees are assured of absolutely anonymous treatment of the data. Thus, while individuals might tend to hide their Machiavellian orientation in a job interview or at work, they have no incentives for strategic answers in the survey. Moreover, the computer assisted self-interviewing supports truthful responding. We construct a score of Machiavellianism by adding up the items and dividing the sum by three. The score holds together with a Cronbach's alpha of 0.73 suggesting a suitably high amount of covariation.

Appendix Table A1 shows the definitions and descriptive statistics of the control variables. The survey also provides information on psychopathy and narcissism, the other two parts of the Dark Triad. While psychopathy is also captured by items of Küfner et al.'s (2014) Naughty Nine measure, the data distinguishes between narcissistic admiration and rivalry (Back et al. 2013). This distinction takes into account that a narcissist's overarching goal to maintain a grandiose self can be achieved in two separate ways: assertive self-enhancement ("Let others admire you!") and antagonistic self-protection ("Don't let others tear you down!").

Information on the Big Five personality traits (extraversion, openness to experience, conscientiousness, agreeableness, and neuroticism) is only available from waves 2013 and 2017.[4] Thus, we use the Big Five variables only in a robustness check to examine whether our key results also hold when controlling for further personality traits.

For this robustness check, we match the information from 2013 to wave 2016 and the information from 2017 to wave 2020. Thus, while our main regressions use three waves of observations, the robustness check with the Big Five personality traits is based on two waves of observations.

Table 2 shows the correlations of Machiavellianism with the other personality traits. Machiavellianism shows significantly positive correlations with psychopathy, narcissistic admiration, and narcissistic rivalry. This confirms some overlap between the dark personality traits. However, the overlap is far from perfect. The correlation coefficients are around 0.5. Thus, Machiavellianism is a personality trait in its own right that cannot be reduced to psychopathy or narcissism. Machiavellianism shows also significant correlations with the Big Five. It is positively correlated with extraversion and neuroticism, and negatively with conscientiousness and agreeableness. The magnitudes of these correlations are much smaller than the magnitudes of those with the dark personality traits.

Table 3 provides the average personality scores for managers and nonmanagers. Managers and nonmanagers on average differ significantly in their score of Machiavellianism. The average Machiavellianism score of managers is 14.5 percent higher than that of nonmanagers. This can be seen as first empirical support for our theoretical expectation. However, managers and nonmanagers also differ in a series of other personality traits. Managers on average score lower on neuroticism and higher on extraversion, psychopathy and narcissistic admiration than nonmanagers.

Thus, the question arises as to which of the personality traits are finally relevant for holding a managerial position. This question can only be answered by a multiple regression analysis that simultaneously incorporates the various traits. In the regression analysis, we

also control for a series of socio-demographic characteristics. We include variables for education, age, gender, migration background, marital status, household size, and the number of children. The year of observation and regional influences are accounted for, too.

4. Empirical Analysis

4.1 Initial Regressions

Column (1) of Table 4 shows the key results of our baseline regression. Control variables are included in the regression, but suppressed to save space (see Appendix Table A2 for the full results). The determinants of holding a managerial position are estimated by using the random effects probit model.[5] The random effects model accounts for cross-period correlation of individual-specific error terms. Furthermore, we cluster the standard errors at the individual level using the Huber-White sandwich estimator.

While psychopathy and narcissistic admiration do not emerge as significant determinants, narcissistic rivalry takes a significantly negative coefficient. Most salient to our topic, Machiavellianism is a significantly positive determinant of holding a managerial position. Thus, we find a positive association between Machiavellianism and being a manager even when controlling for socio-demographic characteristics and the other two components of the Dark Triad. The magnitude of this association is meaningful. An additional point on the Machiavellianism scale increases the probability of being a manager by 1.3 percentage points. Given that 4.2 percent of our observations are managers, this implies an increase of almost 31 percent.

Our baseline regression also shows that women are less likely to hold a managerial position than men. This confirms a substantial gender leadership gap. Particularly interesting in our context is the question of whether gender also plays a moderating role in

the association between Machiavellianism and holding a managerial position. In order to test for a moderating role of gender, we additionally include a variable for the possible interaction between gender and Machiavellianism. As shown in column (2), the interaction variable does not take a significant coefficient while Machiavellianism remains a significantly positive determinant. Thus, we find no evidence that the influence of Machiavellianism on being a manager differs between men and women.

In regression (3), we additionally control for the Big Five personality traits; i.e., extraversion, openness to experience, conscientiousness, agreeableness, and neuroticism. Among the variables, only extraversion emerges as significant determinant. Extraversion has a positive influence on the likelihood of holding a managerial position. Most importantly, the inclusion of the Big Five does not change our key finding of a significantly positive relationship between Machiavellianism and holding a managerial position.

4.2 Robustness Checks

Table 5 provides a series of robustness checks. The findings presented so far are based on an estimation sample of persons who are older than 25 years. In order to check if the results are influenced by the minimum age of persons in the estimation sample, we experimented with alternative thresholds. Columns (1) and (2) show regressions for persons older than 30 and for persons older than 35 years. These regressions confirm our key finding.

So far, we have considered persons with all levels of education in our estimation sample. However, managers are often highly qualified. This gives rise to the question of whether our key finding also holds when focusing only on highly qualified persons (i.e., those with a university degree). As shown in column (3), we find a significant relationship

between Machiavellianism and occupying a managerial position even when running the regression only for highly qualified individuals.

Moreover, so far, we have compared managers with all other occupations. As a further robustness check, we compare managers only with professionals and, hence, use a much more homogeneous reference group. Column (4) shows that this exercise also confirms our key results.

Appendix Table A3 provides an alternative approach to account for the heterogeneity of occupations. We consider the ISCO-08 occupational main categories and run a multinomial probit regression. The multinomial probit regression shows that a positive influence of Machiavellianism specifically holds for occupying a managerial position, but not for any of the other occupations.

Finally, in Appendix Table A4, we provide separate probit estimations for the three years of the sample. We find for each year that Machiavellianism is positively associated with being a manager. Altogether, our key finding persists in a series of important robustness checks.

4.3 A Monotonic or Nonmonotonic Influence of Machiavellianism?

At issue is whether Machiavellianism has a monotonic or nonmonotonic influence. On the one hand, individuals scoring highest on Machiavellianism may be particularly cunning in gaming the system. On the other hand, there could be instead an intermediate degree of Machiavellianism that maximizes the chance of holding a managerial position. Individuals who are too Machiavellian may face a high risk of being detected and punished.

In order to examine a possible nonmonotonic influence, we build from the literature (Laible and Brenzel 2022, Heineck 2011, Mueller and Plug 2006) and replace the linear

Machiavellianism variable with two dummies on whether the Machiavellianism score is in the bottom or top 25% of the distribution. The middle 50% are the reference group. For a matter of comparison, we apply the same procedure to narcissism and psychopathy. Table 6 shows the results. While almost none of the dummies for narcissism and psychopathy take a significant coefficient, the dummies for Machiavellianism emerge as significant determinants. The variable for those in the bottom 25% of the Machiavellianism distribution takes a significantly negative coefficient. Thus, those in the bottom 25% of the distribution have a lower likelihood of being a manager than those in the middle of the distribution. The variable for those in the top 25% of the Machiavellianism distribution takes a significantly positive coefficient. Thus, those in the top 25% of the distribution have a higher likelihood of being a manager than those in the middle of the distribution. This pattern of results suggests a monotonic influence of Machiavellianism. Those with the highest scores of Machiavellianism have the greatest likelihood of occupying a managerial position.

4.4 Top Level and Non-Top Level Managers

We now distinguish between top level managers (e.g., chief executives or managing directors) and non-top level managers (e.g., production managers or specialized service managers) in order to examine whether the influence of Machiavellianism depends on the position in the organization's hierarchy. Table 7 provides the key results of a multinomial probit regression. For each outcome category, the coefficients show the influence of the explanatory variables relative to the reference group of nonmanagerial employees. Average marginal effects on the likelihood of an outcome category are calculated relative to the respectively two other categories.

The regressions shows that Machiavellianism has a significantly positive influence on both the likelihood of being a non-top level manager and the likelihood of being a top level manager. An additional point on the Machiavellianism scale increases the likelihood of being a top level manager by 0.2 percentage points. Given that 0.5 percent of our observations are top level managers, this implies a 40 percent increase in the likelihood of occupying this position. For non-top level managers, an additional point in the Machiavellianism scale is associated with a 1.5 percentage point higher likelihood. Taking into account that 3.7 percent of observations in our sample are non-top level managers, this implies a 40.5 percent increase in the likelihood of occupying this position. Altogether, the results suggest that Machiavellianism substantially increases the chance of holding a managerial position at the various layers of hierarchy.

4.5 The Direction of Influence

A further issue is the direction of influence. Our theoretical considerations suggest that Machiavellianism influences the chance of being a manager. However, one may argue that there can be also a reverse direction of influence. Being a manager may require some degree of opportunism and this may in the end change an individual's personality.

The panel nature of our data allows examining the direction of influence in more detail. First, we estimate the determinants of becoming a manager to examine whether the direction of influence runs from Machiavellianism to occupational status. Thus, we replace our dummy dependent variable for *being* a manager with a dummy for *becoming* a manager. This analysis focuses on individuals who are not managers in the respective initial year t ($t = 2016, 2018$). The dummy for becoming a manager is equal to one if an individual is a manager in the year $t + 2$ ($t + 2 = 2018, 2020$). It equals zero if the person is still a non-

managerial employee in that year. Becoming a manager in the period between the years t and $t + 2$ is explained by the individual's characteristics in the initial year t. Thus, we have two waves of observations we pool for the analysis.

Column (1) of Table 8 shows the key results of a random effects probit estimation. As the share of employees becoming a manager is relatively low, we also estimate a rare events logit in column (2) to check the robustness of results. Both the probit model and the rare events logit yield very similar results. While the variables for psychopathy and narcissism do not take significant coefficients, Machiavellianism emerges as a significantly positive determinant of becoming a manager. This supports the view that the direction of influence runs from Machiavellianism to occupational status. The influence is quantitatively meaningful. An additional point on the Machiavellianism scale increases the probability of becoming a manager by 0.5 percentage points. Given that 1 percent of our observations become managers, this implies a 50 percent increase in the chance of becoming a manager.

Next, we estimate the determinants of changes in Machiavellianism to examine whether there also exists a reverse influence. The dependent variable is the difference between the Machiavellianism scores of the years $t + 2$ and t. The change in Machiavellianism is explained by the individual's characteristics in the initial year t. Again, we have two waves of observations we pool for the analysis. When estimating the determinants of a change in Machiavellianism we return to the combined sample of managerial and non-managerial employees to test whether holding a managerial position has a significant influence on the change.

Column (3) provides the key results. As the change in Machiavellianism is a continuous variable, a random effects GLS model is used for the estimation. Along with the usual control variables, the regression also includes variables for the initial levels of Machiavellianism, narcissism and psychopathy. Individuals initially high in Machiavellianism exhibit a decline in their opportunistic orientation whereas high initial levels of narcissistic rivalry and admiration are associated with an increase in the Machiavellianism score. These findings conform to the notion that personality traits – albeit being relatively stable – to some degree change over time (Almlund et al. 2011, Borghans et al. 2008, Specht et al. 2011). However, most salient to our topic, the variable for holding a managerial position does not emerge with a significant coefficient. Thus, our analysis provides no evidence of a reverse influence running from occupational status to personality. As shown in column (4), this also holds when excluding the variables for the initial levels of the Dark Triad from the specification. While the variable for holding a managerial position now even takes a negative coefficient, the coefficient remains insignificant. Altogether, the findings suggest that the direction of influence runs from Machiavellianism to occupational status, but not vice versa.

4.6 The Issue of Endogeneity

The findings shown in column (3) of Table 8 give rise to the question of whether or not Machiavellianism is endogenous. In order to address this question, we return to the variable of *being* a manager as the dependent variable. Our key result of a positive relationship between Machiavellianism and occupying a managerial position might be biased if there are unobserved factors influencing both the personality trait and the occupational position.

Researchers examining the consequences of personality traits usually refer to the stability of personality in order to assume that the traits are exogenous. However, while personality exhibits a high degree of stability in adulthood, it is not completely stable (Almlund et al. 2011, Borghans et al. 2008, Cobb-Clark and Schurer 2012, Elkins et al. 2017, Roberts et al. 2017, Specht et al. 2011). Personality not only changes with age, but to some degree may be also influenced by life events or intervention. Moreover, even if a personality trait was completely stable, this would not necessarily mean that it is exogenous. Unobserved long-run factors such parental background or other traits might be correlated with both the personality trait under consideration and the outcome variable.

Nyhus and Pons (2005) and Osborne Groves (2005) and have suggested to use age-effect free personality variables. The idea is to remove age effects by regressing personality on age and employing the predicted residuals in the further analysis. This approach to some extent might pick up unobserved factors that an individual is exposed to over the life course. Table A5 provides the results of this exercise. Columns (1)–(4) show that Machiavellianism, psychopathy, narcissistic rivalry and narcissistic admiration are decreasing in age. Most salient to our topic, using the age-effect free personality variables in the linear random effects probability model in column (5) and the random effects probit estimation in column (6) confirms our key results. Machiavellianism is a significantly positive and narcissistic rivalry a significantly negative determinant of occupying a managerial position.

Of course, employing age-effect free personality variables is only an imperfect approach to account for unobserved factors. Thus, in a further step, we use an instrumental variable (IV) approach to address the issue of endogeneity. A crucial requirement of IV

estimates is that the IV influences the key explanatory variable, but not the outcome variable. Finding convincing exclusion restrictions is always a matter of debate. Just-identifying exclusion restriction are based on assumptions that cannot be formally tested (Heckman 2000). They can only be justified by reasoning and an appeal to intuition. Thus, attempts to account for endogeneity should be largely viewed as exploratory. In our context, we use the death of a close person (spouse/partner, child, parent, and/or sibling) during the year of the survey as an IV. The death of a close person may induce an individual to reflect their life and remember moral values resulting in a lower opportunistic inclination. While this severe life event can affect the individual's personality, there is no specific reason to expect that it has a direct influence on occupying a managerial position. The influence should only be indirect through changing the individual's personality.

Column (1) of Table 9 shows the results of a random effects IV estimation. In the first step we estimate the determinants of Machiavellianism. The dummy variable for the death of a close person takes a significantly negative coefficient and the robust F test rejects the hypothesis that this variable is a weak instrument. In the second stage, the predicted values of Machiavellianism obtained from the first-stage estimation are included in a linear probability regression estimating the determinants of occupying a managerial position. Machiavellianism remains a significantly positive determinant of holding a managerial position. Importantly, the Wooldridge robust score test does not reject the hypothesis that Machiavellianism is exogenous.

Column (2) shows the results of a probit IV regression that accounts for the dichotomous nature of the variable for occupational status. The determinants of Machiavellianism und occupying a managerial position are jointly estimated by using

maximum likelihood method. The regression confirms the basic insights. The death of a close person is significantly associated with a lower degree of Machiavellianism. A Wald test does not reject the hypothesis of exogeneity of Machiavellianism. Finally, the regression shows a significantly positive link between Machiavellianism and occupying a managerial position. Compared to the simple probit estimations in Table 4, the estimated coefficient on Machiavellianism is even higher in the probit IV regression.[6]

To summarize, we do not find evidence that the estimated influence of Machiavellianism on occupational status simply reflects endogeneity. Even in IV estimations Machiavellianism remains a significantly positive determinant of holding a managerial position. Moreover, statistical tests do not reject the hypothesis of exogeneity.

5. Discussion

Our empirical analysis shows a strong and robust association between Machiavellianism and occupying a managerial position. This finding conforms to our theoretical expectations. Agency theory suggests that imperfect control and incentive systems entail information asymmetries. These information asymmetries provide opportunities for Machiavellians to use their malevolent behavior to make their way into managerial positions. Machiavellians may be particularly cunning in sabotaging opponents in promotion tournaments, take advantage of the subjective nature of performance evaluations, participate in collusive arrangements within the organization, and engage in projects that primarily advance their career, but do not necessarily maximize financial returns to shareholders or take into account the interests of stakeholders.

Interestingly, we find that only Machiavellianism, but not psychopathy or narcissism increases the likelihood of holding a managerial position. Narcissistic rivalry

even decreases the likelihood of being a manager. As shown by psychological research, individuals scoring high on psychopathy or narcissism are characterized by higher impulsivity or overconfidence and self-deception. They are more likely to make errors in hiding their unethical behavior and chart a less realistic course to attain their goals. By contrast, Machiavellians are characterized by a more strategic and rational perspective in pursuing their goals. They carefully monitor their environment and adjust their behavior to the respective circumstances. Thus, they are more successful in gaming the system and minimizing the risk of being caught.

The finding that Machiavellians disproportionately hold managerial positions has a series of practical implications. First of all, it casts some doubt on the effectiveness of attempts to implement ethics norms, codes of conduct, and corporate social responsibility. The very nature of the Machiavellian personality makes it very unlikely that Machiavellians will internalize such norms and develop a sense of responsibility. Of course, the high adaptability of Machiavellians implies that they may follow the norms if they see doing so as beneficial to themselves. However, they will break the norms if this yields a selfish gain. They may even use concepts such as corporate social responsibility as a tool to deceive stakeholders and to hide their malevolent behavior behind empty phrases.

Furthermore, our finding gives rise to the question of whether the control of managers should be intensified. One may argue that intensified control could crowd out managers' intrinsic motivation to behave morally and, in the end, leads to more instead of less opportunism (Shi et al. 2017). This may hold for individuals scoring low on Machiavellianism. However, individuals high in Machiavellians are intrinsically

opportunistic. This makes an ethical crowding-out effect very unlikely. There is nothing to crowd out. Thus, intensified control and monitoring have the potential to curb the problem of Machiavellianism within firms as they reduce the opportunities of Machiavellians for using their manipulative talent.

Of course, at issue is what type of control is most effective in avoiding that Machiavellians get their way within firms. Recent research suggests that internal control mechanisms are particularly effective in deterring managerial misbehavior. Such internal control mechanisms include employee evaluations of managers (Cai and Wang 2022), unions (Ng et al. 2022), works councils (Jirjahn 2009, Jirjahn and Smith 2018) and board-level codetermination (Fauver and Fuerst 2006).

Moreover, avoiding excessive bonus cultures may reduce the incentive of Machiavellian employees to attain a managerial position. This supports Frey and Osterloh's (2005) idea that managers should rather be paid like bureaucrats. The question is how to avoid excessive bonus cultures. Findings by Park (2021) show that employee voice can also help in this respect.

Our finding also points to the importance of appropriate selection and promotion decisions. A first step is certainly to increase decision makers' awareness of the problem. A further step is to rethink the criteria for promotions. Seniority-based promotions instead of promotion tournaments could reduce favoritism by superiors and mitigate incentives to sabotage opponents. One may even consider systematically incorporating random components in selection and promotion decisions (Osterloh and Frey 2019) to lower the risk that Machiavellians attain a managerial position.

Finally, we stress that Machiavellianism within firms can have consequences for society as a whole that go far beyond the narrow boundaries of the single firm. Unethical firm behavior undermines citizens' confidence in the functioning of a country's market economy and democracy (Pfeifer and Schneck 2017). This is particularly concerning in times of globally spreading populism (Guriev and Papaioannou 2022).

Machiavellianism within firms may also undermine equality of opportunity within society. As shown by Corak and Piraino (2011), one source of the transmission of inequality across generations is that well-advantaged parents help their children get good jobs through information, networks, or even direct control of the hiring process. Our research shows that Machiavellians disproportionately make their way to well-advantaged positions within firms – i.e., to those positions that enable them to promote the career of their children. This might suggest that specifically parents with a manipulative personality have more opportunities to improve the adult success of their children by providing them access to good jobs.

6. Conclusions

In this study, we established theoretically and empirically a link between Machiavellianism and occupying a managerial position. In our theoretical contribution, we incorporated the psychological concept of Machiavellianism into agency theory to predict that individuals scoring high on Machiavellianism are more likely to attain and keep a managerial position. Using a large and representative panel dataset from Germany, our empirical analysis confirmed a strong and positive relationship between Machiavellianism and holding a managerial position. Our analysis also provided evidence that the relationship is monotone; i.e., those with the highest scores of Machiavellianism are most likely to be managers.

Furthermore, it showed that the direction of influence runs from Machiavellianism to occupational status and not vice versa. Finally, we provided an indepth discussion on the practical implications of our finding.

We recognize the need for future research within this theme. First, comparative analyses could be a fruitful avenue for future research. Examining the link between Machiavellianism and occupational status for different countries could provide valuable insights into whether the link is influenced by broad cultural and institutional factors. Second, our theoretical discussion suggests several transmission mechanisms that can drive the association between Machiavellianism and occupational status. Future research could examine which transmission channels play the most important role (e.g., sabotaging opponents or providing private services to superiors).

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Table 1: Definition and Descriptive Statistics of the Key Variables

Variable	*Definition*	*Mean*	*Std.dev.*	*N*
Manager	Dummy equals 1 if the person is a manager according to the ISCO-08 classification.	0.042	0.200	8587
Top level manager	Dummy equals 1 if the person is a top level manager.	0.005	0.072	8587
Non-top level manager	Dummy equals 1 if the person is a non-top level manager.	0.037	0.188	8587
Machiavellianism	Score of Machiavellianism constructed from adding up three survey items measured on a five-point Likert scale ranging from 1 "does not apply to me at all" to 5 "applies to me perfectly." The sum of the items is divided by 3. The items are as follows: (1) I tend to manipulate others to get my way; (2) I have used deceit or lied to get my way; (3) I have used flattery to get my way.	1.717	0.717	8587
Becoming a manager	Dummy equals 1 if a nonmanager becomes a manager between the years t and $t+2$.	0.010	0.099	4118
Change in Machiavellianism	The difference between the Machiavellianism scores of the years $t+2$ and t.	-0.016	0.603	4365

Table 2: Correlation of Machiavellianism With Other Personality Traits

Personality Trait	*Correlation with Machiavellianism*
Dark Triad	
Psychopathy	0.489***
Narcissistic rivalry	0.520***
Narcissistic admiration	0.447***
Number of observations	8587
Big Five	
Openness	0.010
Conscientiousness	-0.187***
Extraversion	0.045***
Agreeableness	-0.272***
Neuroticism	0.067***
Number of observations	4194

*** Statistically significant at the 1% level.

Table 3: Differences in the Personality Traits of Managers and Nonmanagers

Variable	*Managers* *Mean* *(Std. dev.)*	*Nonmanagers* *Mean* *(Std. dev.)*	*Difference* *(t-statistic)*
Dark Triad			
Machiavellianism	1.955 (0.839)	1.707 (0.709)	0.248 (6.43)***
Psychopathy	1.764 (0.741)	1.674 (0.688)	0.090 (2.43)**
Narcissistic rivalry	1.555 (0.643)	1.515 (0.627)	0.040 (1.19)
Narcissistic admiration	1.995 (0.916)	1.828 (0.816)	0.167 (3.78)***
Number of observations	359	8228	8587
Big Five			
Openness	3.634 (0.670)	3.567 (0.676)	0.067 (1.26)
Conscientiousness	3.901 (0.549)	3.862 (0.559)	0.038 (0.87)
Extraversion	3.706 (0.693)	3.450 (0.819)	0.256 (3.97)***
Agreeableness	3.271 (0.706)	3.295 (0.700)	-0.024 (0.43)
Neuroticism	2.494 (0.749)	2.667 (0.778)	-0.173 (2.82)***
Number of observations	166	4028	4194

** Statistically significant at the 5% level; *** at the 1% level.

Table 4: Determinants of Being a Manager; Initial Estimates

Explanatory variables	*(1)*	*(2)*	*(3)*
Machiavellianism	0.435 [0.013] (4.06)***	0.328 [0.008] (2.05)**	0.310 [0.010] (2.15)**
Psychopathy	-0.032 [-0.001] (0.32)	-0.037 [-0.001] (0.36)	-0.019 [-0.001] (0.13)
Narcissistic rivalry	-0.323 [-0.010] (2.63)***	-0.328 [-0.010] (2.65)***	-0.329 [-0.010] (1.70)*
Narcissistic admiration	0.124 [0.004] (1.24)	0.125 [0.004] (1.25)	0.174 [0.006] (1.27)
Openness	---	---	-0.108 [-0.003] (0.77)
Conscientiousness	---	---	0.064 [0.002] (0.35)
Extraversion	---	---	0.322 [0.010] (2.57)**
Agreeableness	---	---	-0.177 [-0.006] (1.21)
Neuroticism	---	---	-0.123 [-0.004] (0.90)
Male	0.638 [0.020] (3.34)***	0.314 [0.020] (0.74)	0.613 [0.019] (2.79)***
Male x Machiavellianism	---	0.177 [0.010] (0.90)	---
Pseudo R2	0.048	0.048	0.079
Number of observations	8587	8587	4194
Number of individuals	4631	4631	2897

Dependent variable: Manager. Method: Random effects probit. The table shows the estimated coefficients. Z-statistics in parentheses are based on clustered standard errors at the individual level. Average marginal effects are in square brackets. * Statistically significant at the 10% level; ** at the 5% level; *** at the 1% level. Control variables are included, but suppressed to save space.

Table 5: Determinants of Being a Manager; Robustness Checks

Explanatory variables	*(1)* *Manager vs. all (Age > 30)*	*(2)* *Manager vs. all (Age > 35)*	*(3)* *Manager vs. all (Highly qualified)*	*(4)* *Manager vs. professional*
Machiavellianism	0.417 [0.014] (3.64)***	0.413 [0.013] (3.10)***	0.484 [0.024] (3.78)***	0.667 [0.020] (5.28)***
Psychopathy	-0.006 [-0.0002] (0.05)	-0.040 [-0.001] (0.29)	-0.018 [-0.001] (0.15)	-0.087 [-0.003] (0.56)
Narcissistic rivalry	-0.281 [-0.009] (2.03)**	-0.212 [-0.007] (1.28)	-0.404 [-0.020] (2.45)**	-0.501 [-0.015] (2.86)***
Narcissistic admiration	0.109 [0.004] (0.99)	0.139 [0.004] (1.08)	0.165 [0.008] (1.39)	0.262 [0.008] (2.02)**
Pseudo R^2	0.029	0.069	0.028	0.042
Number of observations	6777	5414	3284	2541
Number of individuals	3296	2962	1823	1447

Dependent variable: Manager. Method: Random effects probit. The table shows the estimated coefficients. Z-statistics in parentheses are based on clustered standard errors at the individual level. Average marginal effects are in square brackets. ** Statistically significant at the 5% level; *** at the 1% level. Control variables are included, but suppressed to save space.

Table 6: Determinants of Being a Manager; Accounting for Nonmonotonic Influences

Explanatory variables	*(1)*
Machiavellianism (Bottom 25%)	-0.373 [-0.010] (2.19)**
Machiavellianism (Top 25%)	0.584 [0.022] (3.63)***
Psychopathy (Bottom 25%)	-0.039 [-0.001] (0.27)
Psychopathy (Top 25%)	-0.060 [-0.002] (0.34)
Narcissistic rivalry (Bottom 25%)	0.276 [0.009] (1.86)*
Narcissistic rivalry (Top 25%)	-0.109 [-0.003] (0.61)
Narcissistic admiration (Bottom 25%)	-0.120 [-0.004] (0.77)
Narcissistic admiration (Top 25%)	0.132 [0.004] (0.85)
Pseudo R^2	0.048
Number of observations	8587
Number of individuals	4631

Dependent variable: Manager. Method: Random effects probit. The table shows the estimated coefficients. Z-statistics in parentheses are based on clustered standard errors at the individual level. Average marginal effects are in square brackets. * Statistically significant at the 10% level; ** at the 5% level; *** at the 1% level. Control variables are included, but suppressed to save space.

Table 7: Determinants of Being a Top Level or Non-Top Level Manager

Explanatory variables	*(1)* *Top level manager*	*(2)* *Non-top level manager*
Machiavellianism	0.284 [0.002] (2.34)**	0.277 [0.015] (3.74)***
Psychopathy	-0.173 [-0.002] (1.26)	0.044 [0.003] (0.62)
Narcissistic rivalry	0.065 [0.001] (0.52)	-0.227 [-0.012] (2.67)***
Narcissistic admiration	0.083 [0.001] (0.90)	0.062 [0.003] (0.93)
Log likelihood	-1515.225	
Number of observations	8587	
Number of individuals	4631	

Method: Multinomial Probit. The reference group consists of nonmanagerial employees. Z-statistics in parentheses are based on clustered standard errors at the individual level. Average marginal effects are in square brackets. ** Statistically significant at the 5% level; *** at the 1% level. Control variables are included, but suppressed to save space.

Table 8: The Direction of Influence

Explanatory variables	*(1)* *Becoming a manager* *Method:* *Random effects probit*	*(2)* *Becoming a manager* *Method:* *Rare events logit*	*(3)* *Change in Machiavellianism* *Method:* *Random effects GLS*	*(4)* *Change in Machiavellianism* *Method:* *Random effects GLS*
Manager	---	---	0.036 (0.75)	-0.076 (1.59)
Machiavellianism	0.215 [0.005] (3.26)***	0.503 (2.65)***	-0.581 (28.43)***	---
Psychopathy	0.063 [0.002] (0.62)	0.156 (0.64)	-0.017 (1.03)	---
Narcissistic rivalry	-0.181 [-0.004] (1.27)	-0.417 (1.04)	0.091 (4.20)***	---
Narcissistic admiration	0.005 [0.0001] (0.05)	0.022 (0.09)	0.037 (2.65)***	---
Pseudo R^2 / Overall R^2	0.079	---	0.226	0.003
Number of observations	4118	4118	4365	4365
Number of individuals	2805	2805	3013	3013

The table shows the estimated coefficients. Z-statistics in parentheses are based on clustered standard errors at the individual level. Average marginal effects are in square brackets. Average marginal effects are not available for the rare events logit. *** Statistically significant at the 1% level. Control variables are included, but suppressed to save space.

Table 9: Determinants of Being a Manager; the Issue of Endogeneity

	(1) *RE IV*	*(2)* *Probit IV*
Explanatory variables	*Manager*	
Machiavellianism	0.267 (1.67)*	1.513 [0.200] (3.14)***
Psychopathy	-0.072 (1.64)	-0.413 [-0.055] (2.36)**
Narcissistic rivalry	-0.082 (1.78)*	-0.521 [-0.069] (3.97)***
Narcissistic admiration	-0.030 (1.36)	-0.192 [-0.025] (1.70)*
	Machiavellianism	
Death of close person	-0.075 (2.12)**	-0.107 (2.65)***
Wald test of exogeneity (χ^2)	---	1.75
Wooldridge robust score test	2.06	---
Robust F test	6.99***	---
Number of observations	8587	8587
Number of individuals	4631	4631

Method: Generalized two-stage least squares random-effects (1) and probit IV using maximum likelihood estimator (2). The table shows the estimated coefficients. Z-statistics in parentheses are based on clustered standard errors at the individual level. Average marginal effects are in square brackets. * Statistically significant at the 10% level; ** at the 5% level; *** at the 1% level. Control variables are included, but suppressed to save space.

Appendix

Table A1: Definitions and Descriptive Statistics of Control Variables and the Instrument

Variable	*Definition (Mean, std.dev.)*
Psychopathy	Score of psychopathy constructed from adding up three survey items measured on a five-point Likert scale ranging from 1 "does not apply to me at all" to 5 "applies to me perfectly." The sum of the items is divided by 3. The items are as follows: (1) I tend to lack remorse, (2) I tend not be too concerned with the morality of my actions, and (3) I tend to be callous or insensitive. (1.678, 0.691).
Narcissistic rivalry	Score of narcissistic rivalry constructed from adding up three survey items measured on a five-point Likert scale ranging from 1 "does not apply to me at all" to 5 "applies to me perfectly." The sum of the items is divided by 3. The items are as follows: (1) I react annoyed if another person steals the show from me, (2) I want my rivals to fail, and (3) Most people are somehow losers. (1.517, 0.627).
Narcissistic admiration	Score of narcissistic admiration constructed from adding up three survey items measured on a five-point Likert scale ranging from 1 "does not apply to me at all" to 5 "applies to me perfectly." The sum of the items is divided by 3. The items are as follows: (1) I deserve to be seen as a great personality, (2) Being a very special person gives me a lot of strength, and (3) I manage to be the center of attention with my outstanding contributions. (1.835, 0.821).
Openness	Score of openness to experience constructed from adding up five survey items measured on a five-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree." The sum of items is divided by 5. The items are as follows: (1) I am interested in many kinds of things, (2) I am intellectual and like to contemplate things, (3) I am very imaginative, (4) I appreciate artistic and esthetic impressions, and (5) I am hardly interested in art. Item 5 was recoded in reverse order before adding up. (3.588, 0.682).
Conscientiousness	Score of conscientiousness constructed from adding up four survey items measured on a five-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree." The sum of items is divided by 4. The items are as follows: (1) I complete my tasks thoroughly, (2) I make things comfortable for myself and tend to be lazy, (3) I am proficient and work fast, and (4) I make plans and carry them out. Item 2 was recoded in inverse order before adding up. (3.879, 0.569).
Extraversion	Score of extraversion constructed from adding up four survey items measured on a five-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree." The sum of items is divided by 4. The items are as follows: (1) I am usually modest and reserved, (2) I get enthusiastic easily and can motivate others easily, (3) I tend to be the strong and silent type, and (4) I am expansive and gregarious. Items 1 and 3 were recoded in inverse order before adding up. (3.463, 0.816).
Agreeableness	Score of agreeableness constructed from adding up four survey items measured on a five-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree." The sum of items is divided by 4. The items are as follows: (1) I tend to criticize others, (2) I trust others easily and believe that people are inherently good, (3) I can be cold and distanced in my behavior, and (4) I can be gruff and dismissive with others. Items 1, 3, and 4 were recoded in inverse order before adding up. (3.292, 0.706).
Neuroticism	Score of neuroticism constructed from adding up four survey items measured on a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree." The sum of items is divided by 4. The items are as follows: (1) I easily become depressed or discouraged, (2) I am relaxed and do not let myself be worried by stress, (3) I worry a lot, and (4) I easily

	become nervous and insecure. Item 2 was recoded in reverse order before adding up. (2.683, 0.792).
Male	Dummy equals 1 if the interviewee is a man (0.472, 0.499).
Married	Dummy equals 1 if the interviewee is married (0.520, 0.500).
Number of previous partners	The number of previous partners the interviewee had (1.741, 1.602).
Migration background	Dummy equals 1 if the interviewee is a first-generation or second-generation immigrant (0.156, 0.363).
Age	The interviewee's age by years (37.780, 7.078).
Household size	The number of persons in the household (2.895, 1.281).
Number of children	The number of children in the household (1.030, 1.071).
East Germany	Dummy equals 1 if the interviewee is living in East Germany (0.277, 0.448).
Years of schooling	The interviewee's years of education (14.340, 2.845).
Wave dummies	Two wave dummies included in the regressions with three waves of observations. One wave dummy included in the regressions two waves of observations.
Death of close person	Dummy equals 1 if a close person (spouse/partner, child, parent, and/or sibling) died during the year of the survey (0.019, 0.137).

N = 8587. For the Big Five variables, the number of observations is equal to 4194.

Table A2: Determinants of Being a Manager; Initial Estimates; Full Results

Explanatory variables	*(1)*	*(2)*	*(3)*
Machiavellianism	0.435 [0.013] (4.06)***	0.328 [0.008] (2.05)**	0.310 [0.010] (2.15)**
Psychopathy	-0.032 [-0.001] (0.32)	-0.037 [-0.001] (0.36)	-0.019 [-0.001] (0.13)
Narcissistic rivalry	-0.323 [-0.010] (2.63)***	-0.328 [-0.010] (2.65)***	-0.329 [-0.010] (1.70)*
Narcissistic admiration	0.124 [0.004] (1.24)	0.125 [0.004] (1.25)	0.174 [0.006] (1.27)
Openness	---	---	-0.108 [-0.003] (0.77)
Conscientiousness	---	---	0.064 [0.002] (0.35)
Extraversion	---	---	0.322 [0.010] (2.57)**
Agreeableness	---	---	-0.177 [-0.006] (1.21)
Neuroticism	---	---	-0.123 [-0.004] (0.90)
Male	0.638 [0.020] (3.34)***	0.314 [0.020] (0.74)	0.613 [0.019] (2.79) ***
Male x Machiavellianism	---	0.177 [0.010] (0.90)	---
Years of schooling	0.240 (6.84)***	0.241 (6.87)***	0.242 (5.84)***
Migration background	0.116 (0.48)	0.122 (0.50)	0.013 (0.05)
Married	0.322 (1.56)	0.324 (1.57)	0.286 (1.13)
Age	0.020 (1.37)	0.021 (1.39)	0.030 (1.72)*
Number of previous partners	0.050 (0.91)	0.050 (0.91)	0.085 (1.38)
Household size	-0.247 (1.73)*	-0.242 (1.70)*	-0.134 (0.63)
Number of children	0.183	0.177	0.111

	(1.08)	(1.05)	(0.47)
East Germany	0.425 (2.06)**	0.424 (2.06)**	0.321 (1.38)
Wave dummies	Included	Included	Included
Pseudo R^2	0.048	0.048	0.079
Number of observations	8587	8587	4194
Number of individuals	4631	4631	2897

Dependent variable: Manager. Method: Random effects probit. The table shows the estimated coefficients. Z-statistics in parentheses are based on clustered standard errors at the individual level. Average marginal effects are in square brackets. * Statistically significant at the 10% level; ** at the 5% level; *** at the 1% level.

Table A3: Determinants of Sorting into Different Occupations

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
Explanatory variables	*Manager*	*Professional*	*Clerical support workers*	*Service and sales workers*	*Skilled agricultural, forestry and fishery workers*	*Craft and related trades workers*	*Plant and machine operators, and assemblers*	*Elementary occupations*
Machiavellianism	0.228 [0.016] (3.44)***	0.060 [0.008] (1.15)	0.039 [0.009] (0.71)	-0.046 [-0.004] (0.78)	-0.103 [-0.001] (0.82)	-0.142 [-0.011] (2.12)**	-0.206 [-0.009] (2.41)**	-0.147 [-0.007] (1.67)*
Psychopathy	0.005 [0.001] (0.08)	-0.060 [-0.013] (1.20)	-0.006 [-0.003] (0.13)	0.047 [0.004] (0.87)	0.030 [-0.00001] (0.31)	0.046 [0.002] (0.79)	0.156 [0.008] (2.24)**	0.082 [0.003] (1.26)
Narcissistic rivalry	-0.118 [-0.011] (1.54)	-0.037 [-0.013] (0.58)	0.155 [0.021] (2.50)**	0.062 [-0.0002] (0.96)	0.135 [0.001] (1.25)	0.189 [0.014] (2.76)***	0.067 [-0.001] (0.75)	0.148 [0.005] (1.66)*
Narcissistic admiration	0.053 [0.004] (0.90)	0.012 [0.004] (0.29)	-0.089 [-0.015] (1.87)*	0.078 [0.015] (1.61)	-0.059 [-0.001] (0.78)	-0.112 [-0.011] (2.00)**	-0.017 [0.001] (0.26)	-0.059 [-0.002] (0.90)
Log likelihood	-12742.726							
Number of observations	8587							
Number of individuals	4631							

Method: Multinomial probit. Base outcome group is 'technicians and associate professionals.' The table shows the estimated coefficients. Z-statistics in parentheses are based on clustered standard errors at the individual level. Average marginal effects are in square brackets. * Statistically significant at the 10% level; ** at the 5% level; *** at the 1% level. Control variables are included, but suppressed to save space.

Table A4: Wave Splits

Explanatory variables	*(1)* *Wave 2016 only*	*(2)* *Wave 2018 only*	*(3)* *Wave 2020 only*
Machiavellianism	0.167 [0.013] (1.92)*	0.226 [0.019] (3.57)***	0.199 [0.017] (2.75)***
Psychopathy	0.090 [0.007] (0.97)	0.046 [0.004] (0.78)	-0.102 [-0.009] (1.34)
Narcissistic rivalry	-0.141 [-0.011] (1.35)	-0.151 [-0.013] (2.06)**	-0.106 [-0.009] (1.10)
Narcissistic admiration	0.059 [0.005] (0.77)	0.042 [0.004] (0.73)	0.038 [0.003] (0.62)
Pseudo R^2	0.088	0.072	0.063
Number of observations	2093	3527	2967

Method: Probit. The table shows the estimated coefficients. Z-statistics in parentheses are based on clustered standard errors at the individual level. Average marginal effects are in square brackets. * Statistically significant at the 10% level; ** at the 5% level; *** at the 1% level. Control variables are included, but suppressed to save space.

Table A5: Age-Effect Free Personality Variables

Explanatory variables	*(1) Machiavellianism*	*(2) Psychopathy*	*(3) Narcissistic rivalry*	*(4) Narcissistic admiration*	*(5) Manager*	*(6) Manager*
Age	-0.013 (10.07)***	-0.010 (7.95)***	-0.008 (7.03)***	-0.012 (8.31)***	0.001 (2.06)**	0.016 [0.001] (1.08)
Age-effect free Machiavellianism	---	---	---	---	0.010 (2.85)***	0.437 [0.014] (4.09)***
Age-effect free psychopathy	---	---	---	---	-0.003 (0.90)	-0.032 [-0.001] (0.31)
Age-effect free narcissistic rivalry	---	---	---	---	-0.009 (2.64)***	-0.323 [-0.010] (2.63)***
Age-effect free narcissistic admiration	---	---	---	---	0.005 (1.75)*	0.126 [0.004] (1.26)
Control variables	---	---	---	---	Included	Included
Overall R^2 / Pseudo R^2	0.019	0.008	0.009	0.013	0.022	0.048
Number of observations	8587	8587	8587	8587	8587	8587
Number of individuals	4631	4631	4631	4631	4631	4631

Method: Random effects (1, 2, 3, 4), random effects linear probability model (5), and random effects probit (6). The table shows the estimated coefficients. T- and z-statistics in parentheses are based on clustered standard errors at the individual level. Average marginal effects are in square brackets. ** Statistically significant at the 5% level; *** at the 1% level.

Endnotes

[1] Seniority wages and employer provided pensions are forms of deferred compensation. Deferred compensation schemes align incentives over the work life within a firm (Lazear 1979, 1981). They rearrange earnings profiles by paying employees less than their marginal products early in their tenure and more than their marginal products later in their tenure. As the wages of high-tenured employees exceed their marginal products, the employer may be tempted to break the promises made to these employees by firing them or cutting their wages.

[2] Of course, the theory of strategic delegation suggests that it can be even profitable to hire managers who do not behave as profit maximizers (Fershtman and Judd 1987, Vickers 1985). The reason is that this enables the owners of the firm to make commitments that cannot be credibly made otherwise. For example, the owners may delegate output decisions to an empire-building manager who aggressively discourages competing firms from expanding. However, even if there may be specific situations in which hiring non-profit-maximizing managers can be advantageous, this cannot be generalized to all situations. The theory of strategic delegation particularly applies to oligopolistic product markets. Moreover, even in this situation, managers may pursue their own goals to a degree that is no longer in the interest of the owners of the firm.

[3] Promotion tournaments not only occur among employees within the same firm. They can also occur among managers of different firms within the same industry. A study by Huang et al. (2020) shows that such industry tournaments are associated with committing financial misrepresentation and hence also entail perverse incentives.

[4] For the refreshment sample, it is available from wave 2018.

[5] We prefer the random effects (RE) over a fixed effects (FE) model. The FE model only accounts for the within variation of variables, but throws away all the information contained in the cross-sectional variation in the data. Thus, it is not possible to include time-invariant variables. While variables with small variation across time may be included, this can result in highly inefficient estimates. Attenuation bias due to measurement errors is also likely to be more severe in FE

regressions (Swaffield 2001). Finally, while the FE model solves the problem of unobserved time-invariant influences, it may aggravate a possible bias due to omitted time-varying variables. Dropping the between variation increases the influence of time-varying misspecification on parameter estimates (Plümper and Troeger 2019). A potential shortcoming of the RE model is the requirement that the random effects are uncorrelated with the explanatory variables. However, Clark and Linzer (2015) provide Monte Carlo simulations showing that the RE model may be preferred even if this requirement is violated. As long as the correlation between random effects and explanatory variables is not too high and, hence, the resulting bias is small enough, the lower variance of the RE estimator produces root mean square errors below those of the FE estimator. The advantage is specifically strong in estimations including variables with small within variation. Moreover, note that comparisons of RE and FE models are usually made under the assumption that both models include the same set of explanatory variables. Yet, the RE model allows controlling for time-invariant factors. This reduces the risk that the random effects are correlated with the explanatory variables.

[6] Substantial increases in the estimated coefficient are not unusual in studies accounting for the issue of endogeneity. For example, this phenomenon has been observed in studies on the returns to schooling (Card 1995, Ichino and Winter-Ebmer 1999).