Journal of Economics and Business 123 (2023) 106095

Contents lists available at ScienceDirect

Journal of Economics and Business

journal homepage: www.elsevier.com/locate/jeb

Facial attractiveness and CEO compensation: Evidence from the banking industry☆

Shaker Ahmed [a,1], Mikko Ranta [a], Emilia Vähämaa [b,2], Sami Vähämaa [a,*,1]

[a] University of Vaasa, School of Accounting and Finance, Finland
[b] Hanken School of Economics, Department of Finance and Economics, Finland

ARTICLE INFO

JEL classification:
G01
G21
G30
G32

Keywords:
Facial attractiveness
CEO compensation
Beauty premium
Bank CEOs

ABSTRACT

This paper examines the effect of facial attractiveness on the compensation of bank Chief Executive Officers (CEOs). Consistent with the so-called beauty premium hypothesis, we document that good looks pay off for bank CEOs. Specifically, by utilizing machine learning to assess the facial appearance of the CEOs of large U.S. banks, we find that CEO facial attractiveness is positively associated with the annual total compensation and the discretionary, performance-based components of compensation. The total compensation of above-average looking bank CEOs is about 24% higher than the compensation of CEOs with below-average looks after controlling for various CEO-specific and bank-specific attributes that are known to affect executive compensation. Furthermore, our results indicate that facial attractiveness is weakly positively related to the annual base salary while being unrelated to the pay-performance and pay-risk sensitivities of bank CEO compensation. Overall, our empirical findings provide strong evidence for the existence of a beauty premium in the executive labor market.

1. Introduction

Beauty matters in life and brings advantages in a wide range of situations and social interactions. Anecdotal evidence as well as an ample body of research indicate that the physical attractiveness of individuals influences various social outcomes such as initial impressions (Feingold, 1992; Jackson, Hunter, & Hodge, 1995), romantic appeal and dating choices (Carmalt, Cawley, Joyner, &

☆ We thank two anonymous referees, Tom Aabo, John Broussard, Gonul Colak, Filippo Curti, Denis Davydov, Nebojsa Dimic, Michal Dzieliński, Veda Fatmy, Björn Hagströmer, Jamshed Iqbal, Markku Kaustia, Mikko Leppämäki, Lars Nordén, Jarkko Peltomäki, Vanja Piljak, Elias Rantapuska, Raluca Roman, Elena Shakina, Jukka Sihvonen, Alvaro Taboada, Janne Äijö, and conference and seminar participants at the 2021 Annual Meeting of the Southern Finance Association, the 2019 Winter Workshop of the Finnish Graduate School of Finance, HSE University, Stockholm University, and the University of Vaasa for helpful discussions and suggestions. We also thank Rico Wathén for research assistance. We gratefully acknowledge the financial support of the OP Group Research Foundation, the Finnish Savings Banks Research Foundation, the Marcus Wallenberg Foundation, the KAUTE Foundation, the Foundation for the Advancement of Finnish Securities Markets, and the Foundation for Economic Education. Part of this paper was written while E. Vähämaa was visiting Harvard University and S. Vähämaa was visiting Bentley University.

* Corresponding author.
E-mail addresses: sahmed@uwasa.fi (S. Ahmed), mran@uwasa.fi (M. Ranta), emilia.vahamaa@hanken.fi (E. Vähämaa), sami@uwasa.fi (S. Vähämaa).
[1] *Address:* University of Vaasa, School of Accounting and Finance, P.O. Box 700, FI-65101 Vaasa, Finland.
[2] *Address:* Hanken School of Economics, Department of Finance and Economics, P.O. Box 287, FI-65101 Vaasa, Finland.

https://doi.org/10.1016/j.jeconbus.2022.106095
Received 14 September 2021; Received in revised form 12 September 2022; Accepted 4 November 2022
Available online 17 November 2022
0148-6195/© 2022 The Author(s). Published by Elsevier Inc. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).

Sobal, 2008; Meltzer, McNulty, Jackson, & Karney, 2014), peer judgment and treatment (Langlois et al., 2000), the success and popularity of politicians and athletes (Berggren, Jordahl, & Poutvaara, 2010; Brewer & Howarth, 2012; Hamermesh, 2006; Williams, Park, & Wieling, 2010), and even student evaluations of university professors (Hamermesh & Parker, 2005; Jobu Babin, Hussey, Nikolsko-Rzhevskyy, & Taylor, 2020; Oghazi, 2016). As put forth by Webster and Driskell (1983), "it is fortunate to be beautiful and unfortunate to be ugly".

Beauty is also known to affect job-related outcomes and attractive individuals may be rewarded for their good looks in the labor market (see e.g., Chiu & Babcock, 2002; Hosada, Stone-Romero & Coats, 2003; Luxen & van de Vijver, 2006). In their seminal study, Hamermesh and Biddle (1994) document that attractive-looking employees earn higher wages than less attractive individuals. This so-called "beauty premium" is economically meaningful as the wages of above-average looking employees are found to exceed the wages of less good-looking individuals by about 10–15%. Over the last two decades, the existence of the beauty premium has been documented in various experimental studies as well as in many different labor market settings and among different social and occupational groups (see e.g., Biddle & Hamermesh, 1998; Harper, 2000; Mobius & Rosenblat, 2006; Andreoni & Petrie, 2008; Fletcher, 2009; Johnston, 2010; Borland & Leigh, 2014; Deryugina & Shurchkov, 2015; Doorley & Sierminska, 2015; Parrett, 2015; Scholz & Sicinski, 2015). In general, attractiveness appears to be a favorable and enduring labor market attribute that persists even after controlling for individuals' other personal characteristics such as age, gender, education, intelligence, personality, and family background (e.g., Scholz & Sicinski, 2015).

Despite the extensive literature on the beauty premium, surprisingly little is known about the effects of physical attractiveness in the executive labor market. In this study, we attempt to fill this gap. Specifically, we aim to contribute to the beauty premium literature by examining whether facial attractiveness is reflected in the compensation of Chief Executive Officers (CEOs) using data on large, publicly traded U.S. banks. We utilize machine learning to evaluate facial images of individual bank CEOs and then investigate if facial attractiveness influences the level and structure of CEO compensation. In brief, our empirical findings demonstrate that good looks pay off for bank CEOs.

The banking industry provides an expedient and unique context to investigate the existence of a beauty premium at the top executive level for several reasons. First, the CEOs of large banks are among the highest-paid individuals in the economy. Kaplan and Rauh (2010) document that bank CEOs are at the very top end of the income distribution, while the findings of Philippon and Reshef (2012) indicate that the CEOs of financial institutions earn a 250% premium relative to CEOs in other industries. Although the compensation of bank CEOs is often considered excessive, economic theories posit that the compensation policies of the top executives reflect optimal contracting and equilibrium in a competitive market for managerial talent (Murphy, 2013). Unless beauty affects managerial talent and skills, it should not be compensated for in a competitive executive labor market.

Furthermore, due to their economic and societal importance, banks and their compensation policies are subject to extensive regulations, guidelines, and supervision as well as intensive scrutiny by the market participants and other stakeholders. It is widely acknowledged that the compensation policies of bank CEOs which are generally designed to maximize shareholder value may lead to managerial short-termism, excessive risk-taking, and misaligned incentives that are conflicting with the interests of banks' other stakeholders such as depositors, debt holders, and the society in general (e.g., Acrey, McCumber, & Nguyen, 2011; Bai & Elyasiani, 2013; DeYoung, Peng, & Yan, 2013; Bhagat & Bolton, 2014; Bharati & Jia, 2018; Koch, Waggoner, & Wall, 2018). In the aftermath of the global financial crisis of 2008–2009, new legislation such as the Dodd-Frank Act as well as say-on-pay provisions within the Troubled Asset Relief Program (TARP) was explicitly designed to regulate executive compensation in the banking industry. Thus, in contrast to non-financial firms, the regulatory oversight of financial institutions also encompasses their managerial compensation policies.

Finally, the CEOs of large banks are a relatively homogenous group of individuals who have very similar demographic characteristics, educational backgrounds, and employment history (e.g., Nguyen, Hagendorff, & Eshraghi, 2015; King, Srivastav, & Williams, 2016; Altunbaş, Thornton, & Uymaz, 2018). While the top executives of publicly traded U.S. firms generally are very homogenous in terms of their demographic characteristics and educational backgrounds with the archetypical CEO being a white male in his mid-50s, bank CEOs are even more predominantly white men who are in their late-50s. In comparison to non-financial firms, bank CEOs tend to be slightly older and there is also less gender and racial diversity among bank CEOs.[3] Moreover, in addition to undergraduate university degrees, bank CEOs are more likely to have MBA degrees and hold CPA designations than the CEOs of non-financial firms.[4] Given that personal attributes such as age, gender, ethnicity, and educational attainment may influence compensation, the focus on a rather homogenous set of CEOs helps to alleviate challenges related to the confounding effects of other CEO characteristics than facial

[3] The average CEO age in our sample of the S&P 1500 banks is 58 years whereas the average CEO age of non-financial S&P 1500 or Fortune 500 firms reported in previous studies is typically about 55–56 years (see e.g., Serfling, 2014; Peltomäki, Sihvonen, Swidler, & Vähämaa, 2021; Hill, Upadhyay, & Beekun, 2015; He & Hirshleifer, 2022). In contrast to the age range of 28–89 years reported in Peltomäki et al. (2021) for the CEOs of the non-financial S&P 1500 firms, the age of bank CEOs in our sample varies from 34 to 83 years and 75% of the bank CEOs are between 51 and 65 years old. Females hold about 4–8% of the CEO positions of the S&P 1500 and Fortune 500 firms (e.g., Peltomäki et al., 2021; Zweigenhaft, 2021; Aabo & Giorici, 2022), but a mere 2% of bank CEOs are women. While previous studies suggest that whites make up approximately 93% of the CEOs of the S&P 1500 and Fortune 500 firms (e.g., Hill et al., 2015; Zweigenhaft, 2021), bank CEOs are even more predominantly white and only 4% of the CEO positions are held by individuals of other ethnic backgrounds.

[4] 44% of the bank CEOs in our sample hold MBA degrees and about 16% have CPA qualification. Previous studies suggest that about 30–35% of the CEOs of non-financial firms have an MBA and only about 5% of the CEOs hold a CPA designation (e.g., Gottesman & Morey, 2010; Dittmar & Duchin, 2016; Gounopoulos, Loukopoulos, & Loukopoulos, 2021; He & Hirshleifer, 2022).

attractiveness on executive compensation.

Our paper complements a small body of literature on the effects of CEO appearance and facial traits on corporate decisions and outcomes. Previous studies indicate that the physical appearance of the CEO may influence the firm's market valuation and stock returns (Blankespoor, Hendricks, & Miller, 2017; Halford & Hsu, 2020), financial performance (Graham, Harvey, & Puri, 2017; Rule & Ambady, 2008; Wong, Ormiston, & Haselhuhn, 2011), financial reporting practices (Jia, van Lent, & Zeng, 2014), the level of risk-taking (Ahmed, Sihvonen, & Vähämaa, 2019; Kamiya, Kim, & Park, 2019), and CEO selection process and the likelihood of CEO dismissal (Connelly, Lee, Hersel, & Walker, 2020; Cook & Mobbs, 2022; Gomulya, Wong, Ormiston, & Boeker, 2017).

Directly related to but distinct from our study, Graham et al. (2017), Cook and Mobbs (2022), Halford and Hsu (2020), and Li, Triana, Byun, and Chapa (2021) examine the relationship between facial appearance and CEO compensation. Graham et al. (2017) employed a group of business students to grade the facial images of 136 individual CEOs of large U.S. firms in terms of beauty, competence, likability, and trustworthiness. Using a single cross-section for the year 2003, they document that competent and attractive-looking CEOs have higher total compensation. The nearly contemporaneous studies by Cook and Mobbs (2022), Halford and Hsu (2020), and Li et al. (2021) explore the beauty premium in the executive labor market using rather similar samples of the S&P 500 firms.[5] Collectively, their findings demonstrate that facial attractiveness is positively associated with CEOs' annual total compensation. We aim to contribute to this literature by examining whether facial attractiveness affects the level as well as the structure of CEO compensation in the banking industry.

In our empirical analysis, we use data on the S&P 1500 banks over the period 2005–2020. We collect facial images of 272 individual bank CEOs and utilize a deep convolutional neural network developed by He, Zhang, Ren, and Sun (2016) to assess the facial attractiveness of these CEOs on a scale of 1–5. Following the prior executive compensation literature (e.g., Core, Holthausen, & Larcker, 1999; Ang, Lauterback & Schreiber, 2002; Coles, Daniel, & Naveen, 2006; Bugeja, Matolcsy, & Spiropoulos, 2012; Rekker, Benson, & Faff, 2014; Gande & Kalpathy, 2017; Cerasi, Deininger, Gambacorta, & Oliviero, 2020), we measure CEO compensation with annual total compensation, base salary, and the discretionary components of compensation. In addition, we also examine the effect of CEO facial attractiveness on compensation incentives as measured by the CEO's pay-performance sensitivity and pay-risk sensitivity.

Our empirical findings provide strong evidence for the existence of a beauty premium in CEO compensation. Specifically, we document that facial attractiveness is positively associated with the total compensation and the discretionary, performance-based compensation components of bank CEOs. The magnitude of the documented beauty premium in bank CEO compensation is economically significant. Our results suggest that a one standard deviation increase in the CEO facial attractiveness measure increases the total compensation by almost 9% ($395,000) after controlling for various CEO-specific and bank-specific attributes that are known to affect executive compensation. Moreover, the total compensation of above-average looking bank CEOs is about 24% ($1.06 million) higher than the compensation of CEOs with below-average looks, and the above-average looking CEOs have about 55% higher sum of bonuses, stock grants, and option grants than their less attractive peers. Nevertheless, our findings also indicate that facial attractiveness is only weakly positively related to the annual base salary while being unrelated to the pay-performance and pay-risk sensitivities of bank CEO compensation.

We perform a number of additional tests to investigate the robustness of our findings and to rule out alternative explanations. These tests demonstrate that the positive association between facial attractiveness and CEO compensation is not influenced by the strength of board monitoring or managerial power. In addition to controlling for a wide set of CEO-specific and bank-specific attributes and including different types of fixed-effects in the regressions, we also utilize propensity score matching to mitigate any remaining endogeneity concerns. We also show that the beauty premium in the compensation of bank CEOs cannot be explained by demographic attributes such as age, gender, or ethnicity nor by differences in bank size and business models. Collectively, our results offer strong support for the beauty premium hypothesis in the executive labor market. The beauty premium persists at the top executive level and bank CEOs are as susceptible to attractiveness gaps in their compensation as average employees. Intriguingly, the documented size of the beauty premium among bank CEOs is very similar to the beauty premium in the general labor market (e.g., Hamermesh & Biddle, 1994; Scholz & Sicinski, 2015).

Although our study complements and builds on the work of Graham et al. (2017), Cook and Mobbs (2022), Halford and Hsu (2020), and Li et al. (2021), there are at least three important differences. First, unlike the prior studies, we focus on a single industry that provides a particularly attractive setting to examine the association between CEO attractiveness and compensation. Banks operate in a highly competitive and regulated environment and constitute a homogenous industry with a relatively homogenous set of top executives who are among the highest-paid individuals in the economy.[6] By utilizing data from a single homogenous industry, we mitigate concerns that structural differences across industries may influence both the level and the determinants of executive pay. We argue that this restrictive setting reduces noise and provides a more powerful test of the beauty premium hypothesis in the executive labor market.

Second, while Graham et al. (2017), Cook and Mobbs (2022), Halford and Hsu (2020), and Li et al. (2021) examine only the total compensation of CEOs, we also explore the effect of facial attractiveness on bank CEOs' annual base salary, the performance-contingent compensation components and incentives that require considerable discretion by the board of directors, and

[5] Cook and Mobbs (2022) use a sample of 255 unique executives in 100 different S&P 500 firms over the period 2000–2009, Halford and Hsu (2020) use data on 667 CEOs of the S&P 500 firms for years 2000–2012, and Li et al. (2021) use data on 861 individual CEOs of the S&P 500 firms over the period 2004–2013.

[6] Bank CEOs tend to be even more predominantly white men in their late-50 s than the CEOs of other publicly traded U.S. firms.

the sensitivities of CEO compensation to changes in stock prices and stock return volatility. As noted already by Jensen and Murphy (1990), in addition to the level of pay, it is important to consider the structure of how CEOs are paid. In the banking industry, the structure of CEO compensation is different with bonuses and other types of discretionary incentive compensation components comprising a higher proportion of total compensation than in other industries (e.g., Houston & James, 1995; Murphy, 2013). Thus, we contribute to beauty premium literature by providing a more nuanced investigation into different components of CEO compensation and compensation-based incentives.

Finally, in contrast to the prior beauty premium literature, we exploit state-of-the-art machine learning techniques to assess the facial attractiveness of bank CEOs. Our machine learning approach can be considered to yield an objective assessment of facial attractiveness by generalizing perceptions about what constitutes a beautiful face. The beauty assessments based on deep convolutional neural networks reflect both the biological traits of beauty such as facial averageness, bilateral symmetries, and sexual dimorphism as well as nonphysical attributes such as a pleasant expression, youthful appearance, and good grooming (see e.g., Rhodes, 2006 for a review). As a consequence, machine-based image analysis should reduce noise and provide an objective consensus perception of facial attractiveness rather than reflecting the idiosyncrasies in respondents' subjective assessments of appearance as in survey-based designs.[7]

The remainder of the paper proceeds as follows. Section 2 outlines the background on CEO compensation and the beauty premium and presents our research hypotheses. Section 3 describes the data on U.S. banks, presents the machine learning approach to assess CEO facial attractiveness, and introduces the variables used in our empirical analysis. Section 4 presents the empirical setup and reports our results on the effect of facial attractiveness on CEO compensation. Finally, Section 5 summarizes the findings and concludes the paper.

2. Background and hypotheses

Beauty may matter in the labor market for several reasons (for a review, see e.g. Hosoda, Stone-Romero, & Coats, 2003). In general, attractive-looking individuals are judged and treated more positively than unattractive individuals, even by those who know them (Langlois et al., 2000), and, consequently, physical attractiveness is likely to influence observed or presumed competence and job success. Since the seminal study of Hamermesh and Biddle (1994), a vast body of literature has documented evidence of pay differences based on attractiveness in many different labor market settings and among different social and occupational groups (e.g., Biddle & Hamermesh, 1998; Harper, 2000; Borland & Leigh, 2014; Doorley & Siermienska, 2015; Parrett, 2015). In general, the prior literature suggests that beauty is a favorable and enduring labor market attribute that persists even after controlling for individuals' other personal characteristics such as age, gender, weight, education, intelligence, personality, and family background (e.g., Hamermesh, 2011; Scholz & Sicinski, 2015). To explain the higher wages of attractive employees, Mobius and Rosenblat (2006) argue that attractive individuals portray confidence while communicating or socializing with their employers, thereby forming a positive impression about their competence which then, in turn, increases their wages. Psychology literature suggests that people tend to associate positive stereotypes, many of which correspond to leadership ability, to physically attractive people (e.g., Warner & Sugarman, 1986).

Over recent years, the existence of a beauty premium has also been examined in the executive labor market. Directly related to the current study, Graham et al. (2017), Cook and Mobbs (2022), Halford and Hsu (2020), and Li et al. (2021) examine the relationship between facial appearance and CEO compensation in large U.S. firms and document a positive relation between attractiveness and compensation. According to Cook and Mobbs (2022), attractive-looking CEOs may have better interpersonal communication and leadership skills and attractiveness may also influence directors' assessments of a CEO's ability.

The level and structure of CEO compensation are set by the board of directors. In large, publicly traded firms, CEO compensation typically consists of an annual base salary, bonuses, and different types of equity-based compensation components and incentives. According to the optimal contracting approach to executive compensation, CEO compensation policies are designed to maximize shareholder value and to reflect optimal contracting and equilibrium in the competitive market for managerial talent (e.g., Bebchuk, Fried, & Walker, 2002; Murphy, 2013). In order to minimize agency problems, the optimal compensation plan needs to be designed in a way that reduces agency problems and aligns executives' interests with the shareholders. Under the optimal contracting view, beauty should not be compensated for in executive compensation unless it affects managerial skills and creates shareholder value.

In contrast to the optimal contracting view, the managerial power theory suggests that executives have possibilities to influence their own pay. As argued by Bebchuk and Fried (2004), managerial power plays a key role in shaping executive pay arrangements because CEOs may have power over the board of directors due to structural and social-psychological mechanisms that may influence the board's decision-making processes. Consequently, Bebchuk and Fried (2004) postulate that rent extraction plays a significant role in executive compensation, and powerful, self-interested CEOs may extract higher compensation than they would receive under an optimal principal-agent contract. Under this view, the relationships between the CEO and the directors have a pivotal role in the compensation-setting process, and thus, these relationships are a potential mechanism through which attractiveness may influence CEO compensation.

[7] In survey-based assessments of attractiveness, the demographic characteristics of the survey participants may create noise in the assessments. The age and gender of the survey participants are likely to influence their perception of beauty and, moreover, age and gender differences between the survey participants and their assessment objects may be reflected in the assessments. For instance, young males and old females may assess the attractiveness of an older male very differently.

Given the prior evidence of a beauty premium in many different labor market settings and various occupational groups, we posit the following general research hypothesis:

H1: Facial attractiveness is positively associated with the compensation of bank CEOs.

As noted by Jensen and Murphy (1990), in addition to the level of compensation, it is important to consider the structure of how CEOs are paid. Therefore, to provide a more nuanced investigation into the beauty premium in executive compensation, we examine the effect of facial attractiveness on different components of bank CEO compensation. In addition to focusing on the level of total compensation similar to Graham et al. (2017), Cook and Mobbs (2022), Halford and Hsu (2020), and Li et al. (2021), we also explore the effect of facial attractiveness on bank CEOs' base salary and the performance-contingent compensation components and incentives that require considerable discretion and qualitative assessment by the board of directors. A vast proportion of the total CEO compensation is typically paid in the form of bonuses and different types of equity-based compensation components and incentives (see e.g., Murphy, 2013; Ahmed, Davydov, & Vähämaa, 2022). Partially due to tax laws and accounting rules, the annual base salaries of CEOs have been relatively stagnant and most of the variation in the level of CEO compensation both over time and cross-sectionally comes from the other, more discretionary compensation components. The prior literature suggests that these discretionary components of CEO compensation involve more negotiation and are more susceptible to the influence of personal connections, communication skills, and CEO-director relationships (e.g., Bertrand & Mullainathan, 2001; Bebchuk & Fried, 2004; Keller, Molina, & Olney, 2020; Keller & Olney, 2021). If beauty affects the development of interpersonal relationships between the CEO and the directors as argued by Cook and Mobbs (2022), we would expect the discretionary components of compensation to be more susceptible to CEO attractiveness than the base salary. These arguments lead to the following hypothesis:

H2: The effect of facial attractiveness on CEO compensation is more pronounced for the more discretionary elements of compensation.

In addition to the level and structure of CEO compensation, we also examine the effect of facial attractiveness on the sensitivities of compensation to changes in stock prices and stock return volatility. These pay-performance and pay-risk sensitivities are important elements of executive pay arrangements that have been documented to influence corporate outcomes (e.g., Coles et al., 2006; Bai & Elyasiani, 2013; DeYoung et al., 2013). Ex ante, depending on the preferences of the CEO, the relation between facial attractiveness and CEO compensation sensitivities can be positive or negative. On one hand, attractive-looking CEOs may be able to extract compensation arrangements that emphasize discretionary pay components that are less sensitive to the firm's stock market performance. On the other hand, however, if attractiveness is related to self-confidence as suggested e.g. by Langlois et al. (2000) and Mobius and Rosenblat (2006), attractive CEOs may negotiate compensation packages that provide them with stronger pay-performance and risk-taking incentives. Thus, the question of how CEO facial attractiveness influences pay-performance and pay-risk sensitivities is ultimately addressed empirically.

3. Data and variables

3.1. Data

In our empirical analysis, we use data on publicly traded U.S. banks included in the S&P 500, S&P MidCap 400, and S&P SmallCap 600 indices (i.e., S&P 1500 banks) over the period 2005–2020. Following Fahlenbrach and Stulz (2011), we define banks as firms with primary Standard Industrial Classification (SIC) codes between 6000 and 6300.[8] We begin by compiling the names of the incumbent bank CEOs from ExecuComp and then manually collecting high-resolution professional facial images of these CEOs using Google Image Search. We collect at least two images of each individual bank CEO and use the image that is of the best quality for assessing facial attractiveness. In addition to facial images, we collect data on CEO compensation and observable CEO attributes such as age, gender, tenure, and education from ExecuComp and BoardEx. The balance sheet and income statement data used in our analysis are obtained from Bloomberg and data on the banks' board characteristics are collected from BoardEx. After excluding banks with insufficient data, we are left with a final sample of 272 individual CEOs, 167 individual banks, and 1806 bank-year observations.

3.2. CEO facial attractiveness

We begin by manually collecting professional facial images of the bank CEOs using Google Image Search. The quality of each facial image is evaluated based on resolution, clarity, and the neutrality of the head pose in the picture. In the collection process, we pursued to identify facial images that are as similar as possible to the other CEO images in terms of quality and overall appearance.

After collecting the facial images, we exploit machine learning to assess the facial attractiveness of bank CEOs. Specifically, we utilize the so-called transfer learning approach to deal with limited labeled data. The generic idea of this approach is that models and parameters trained in one context can be used in another. Image classification or object recognition are typical applications because there are usually not enough data to train large-scale convolutional neural networks used in machine-based image analysis. In transfer learning, the convolutional neural networks are first trained with a similar-type dataset and then transferred to other image recognition tasks where only the last layers are trained, and the pre-trained parameters are used as starting values. Intuitively, even though

[8] Firms with SIC codes between 6000 and 6300 are depository institutions, non-depository credit institutions, and security and commodity brokers, dealers, exchanges, and services.

the neural network is ultimately trained to different classification tasks, the first layers of that network learn how to identify general structures in images that are useful for other applications.

We evaluate the attractiveness of facial images with the ResNet50 deep convolutional neural network developed by He et al. (2016). This approach is considered as the state-of-the-art technique for machine-based image analysis (Mishkin, Sergievskiy, & Matas, 2017). The ResNet50 is first pre-trained with ImageNet data (Deng et al., 2009). The last ten layers of the neural network are then re-trained using data on facial attributes, while the parameters of the first 40 layers are kept locked. This fine-tuning is conducted using a dataset of 5500 facial images (Liang, Lin, Jin, Xie, & Li, 2018) for which the facial attractiveness has been evaluated on a scale of 1–5.[9] The neural network is first trained using 70% of the facial images and then validated using the remaining 30% of the data. After fine-tuning, the final training is performed using the full dataset of 5500 facial images. With this procedure, the neural network achieves an average absolute error of 0.34, which is similar to the results reported in Liang et al. (2018). Finally, the trained ResNet50 convolutional neural network is utilized to assess the facial attractiveness of each individual bank CEO on a scale of 1–5, with 5 being the most attractive appearance. The resulting variable, *Attractiveness*, is the main test variable in our empirical analysis.

In addition to *Attractiveness*, we use three alternative binary variables as proxies for facial attractiveness in the regressions. *Above-median attractiveness* is a dummy variable which equals one for bank CEOs with facial attractiveness scores above the sample median. We also use *High attractiveness* and *Low attractiveness* dummies. *High attractiveness* equals one for bank CEOs with facial attractiveness score in the top tercile of the attractiveness distribution, while *Low attractiveness* is assigned to one for bank CEOs with facial attractiveness score in the bottom sextile. The underlying reasoning for these two dummies is that previous studies have documented that the beauty premium is most prevalent for individuals in the top tercile of attractiveness scores whereas individuals belonging to the bottom sextile in terms of attractiveness tend to suffer a plainness penalty (see e.g., Hamermesh, 2011).

3.3. CEO compensation

We use three alternative measures of CEO compensation as the dependent variable in our main regressions: (i) annual total compensation, (ii) annual base salary, and (iii) annual discretionary compensation. In addition, we also examine the effect of CEO facial attractiveness on compensation incentives as measured by the CEO's pay-performance sensitivity and pay-risk sensitivity. These variables have been extensively used in the prior literature to measure CEO compensation and compensation-based incentives (e.g., Core et al., 1999; Mishra & Nielsen, 2000; Ang, Lauterbach, & Schreiber, 2002; Coles et al., 2006; Gabaix & Landier, 2008; Elkinawy & Stater, 2011; Bugeja et al., 2012; Aivazian, Lai, & Rahaman, 2013; Rekker et al., 2014; Hadley, 2019). *Total compensation* is defined as the sum of the CEO's annual base salary, bonuses, non-equity incentive plan compensation, the grant-date fair value of option awards, the grant-date fair value of stock awards, deferred compensation earnings, and other compensation. *Salary* is the annual base salary of the CEO and measures the fixed component of CEO compensation. We define *Discretionary compensation* as the sum of annual bonuses, non-equity incentive plan compensation, and the grant-date fair value of option and stock awards.

CEOs' pay-performance and pay-risk sensitivities are measured with *Delta* and *Vega*, respectively. *Delta* is defined as the dollar gain or loss in CEO wealth for a 1% change in the bank's stock price. Thus, a higher delta indicates that the CEO will earn higher compensation for strong stock market performance. *Vega* is defined as the dollar gain or loss in CEO wealth for a 1%-point change in the bank's stock return volatility. Thus, it provides a direct proxy for CEO risk-taking incentives. The deltas and vegas for each CEO are defined following the approach of Core and Guay (2002) and Coles et al. (2006).[10]

3.4. CEO-specific control variables

CEO compensation can be influenced by CEO-specific attributes such as age, gender, education, and experience. Therefore, to account for the potentially confounding effects of CEO attributes other than facial attractiveness on CEO compensation, we employ the following set of CEO-specific control variables in our regressions: (i) *CEO age* is the age of the bank's CEO in years, (ii) *Female CEO* is a dummy variable which equals one if the bank's CEO is a female, (iii) *Non-Caucasian CEO* is a dummy variable which equals one if the ethnic background the bank's CEO is other than Caucasian, (iv) *CEO tenure* is the length of tenure of the incumbent CEO in years, (v) *CEO duality* is a dummy variable which equals one if the CEO is also the chairman of the board of directors, (vi) *MBA/CPA* is a dummy variable which equals one if the CEO holds an MBA graduate degree or is a Certified Public Accountant (CPA), and (vii) *PhD* is a dummy variable that equals one if the CEO holds a doctoral degree.

Age, gender, and ethnicity are known to influence the salaries of individuals in the general population, and at the same time, these attributes may also affect the perception of attractiveness. On average, younger individuals are perceived to be more attractive than older individuals (Hamermesh, 2011). Salaries, on the other hand, tend to increase with age, and the findings of Adhikari, Bulmash, Krolikowski, and Sah (2015) demonstrate that older CEOs have higher total compensation than their younger counterparts. Although the existence of a gender wage gap in the general population has been extensively documented in the literature (see e.g., Weichselbaumer and Winter-Ebmer, 2005; Castilla, 2008; Blau & Kahn, 2017), the prior studies on executive compensation provide mixed

[9] We acknowledge that differences in demographic characteristics may potentially influence assessments of attractiveness. The training data of 5500 images comprise facial images of both males and females and individuals of different ages and different ethnic backgrounds. Consequently, the neural network should arguably be able to generalize the traits of beauty across different demographic dimensions. In this regard, it is also important to stress that bank CEOs are a relatively homogenous group of individuals who have very similar demographic characteristics.

[10] The data on deltas and vegas are obtained from Lalitha Naveen's data library at https://sites.temple.edu/lnaveen/data/.

evidence and often suggest that the gender wage gap may disappear or even reverse at the CEO level (Bugeja et al., 2012; Canil, Karpavičius, & Yu, 2019; Elkinawy & Stater, 2011; Gayle, Golan, & Miller, 2012; Gupta, Mortal, & Guo, 2018; Hill et al., 2015; Leszczynska & Chandon, 2019). Moreover, the findings of Hamermesh and Biddle (1994) and Parrett (2015) suggest that gender may also affect the magnitude of the beauty premium. We also control for CEOs' ethnic backgrounds because of the systematic racial wage inequality documented in the U.S. labor market (e.g., McCall, 2001; Antecol & Bedard, 2004; Kim & Sakamoto, 2010; Dreher, Lee, & Clerkin, 2011).

The length of the CEO's tenure and CEO duality are proxies for the CEO's experience and managerial power within the bank which are likely to influence the level of compensation. CEOs with longer tenure are more experienced and are considered to have greater managerial power and higher firm-specific human capital investment. The managerial power theory suggests that powerful CEOs have higher compensation because of greater rent extracting ability (e.g., Bebchuk et al., 2002; Bebchuk & Fried, 2003; Fulmer, 2009; Morse, Nanda, & Seru, 2011). Consistent with this view, previous studies have documented that CEO power is positively associated with compensation (Core et al., 1999; Cyert, Kang, & Kumar, 2002; Hill & Phan, 1991; Song & Wan, 2019). Finally, we control for the CEO's education level because educational attainment may serve as a proxy for the latent abilities of CEOs. CEO education has been documented to influence various firm-level outcomes as well as the level and structure of CEO compensation (e.g., King et al., 2016; Gounopoulos et al., 2021; Chen, Torsin, & Tsang, 2022; Urquhart & Zhang, 2022).

3.5. Bank-specific control variables

Following the prior literature on executive compensation, we control for bank size, financial performance, capital ratio, risk, growth, and board characteristics to account for the effects of bank-specific attributes on CEO compensation. *Size* is measured as the natural logarithm of the bank's total assets. CEO compensation is documented to increase with the firm size as the executives of larger firms arguably face greater responsibilities and demands as well as a more complex operating environment (e.g., Smith & Watts, 1992; Tosi, Werner, Katz, & Gomez-Mejia, 2000; Ang et al., 2002; Gabaix & Landier, 2008; Elkinawy & Stater, 2011; Murphy, 2013). Given that executive compensation is positively associated with the firm's financial performance and growth rate (e.g., Murphy, 1985; Core et al., 1999; Bebchuk et al., 2002), we control for profitability and loan growth. We measure *Profitability* with return on assets (ROA) which is calculated as net income divided by total assets, while *Growth* is calculated as the logarithmic difference in the net loans. Executive compensation may also be related to the bank's capital and asset structures which broadly capture the stability and business policy choices of the financial institution (e.g., Aggarwal & Samwick, 1999; John, Saunders, & Senbet, 2000; Adams & Mehran, 2003; DeYoung et al., 2013). Therefore, we include *Capital ratio* measured as the ratio of Tier 1 equity capital to risk-weighted assets under the Basel capital requirements and *Loans to assets* calculated as total loans divided by total assets among the set of bank-specific controls.

In addition to financial variables, we control for board characteristics because the level and structure of CEO compensation are set by the board of directors. Following the prior literature, we assume that differences in observable board characteristics such as size, independence, and gender diversity reflect differences in the quality and intensity of board monitoring (e.g., Coles, Daniel, & Naveen, 2008; Guthrie, Sokolowsky, & Wan, 2012; Pathan & Faff, 2013; Baselga-Pascual, Trujillo-Ponce, Vähämaa, & Vähämaa, 2018; Owen & Temesvary, 2019). We measure *Board size* as the natural logarithm of the number of board members. *Board independence* is measured as the number of non-executive directors divided by the total number of board members. Finally, *Board gender diversity* is defined as the number of male directors divided by the total number of board members.

3.6. Descriptive statistics and correlations

Table 1 reports descriptive statistics for the variables used in our empirical analysis. The mean level of CEO total compensation in our sample is $4.43 million and the mean annual salary is $802,190, indicating that bonuses and other types of more discretionary compensation items comprise a vast proportion of CEO compensation in the banking industry. On average, the sum of discretionary compensation items is about $3.44 per year. As can be seen from Table 1, there is substantial variation across banks in the level of CEO compensation with *Total compensation* ranging from zero to $43.12 million and *Discretionary compensation* from zero to $42.11 million. The sample banks are also very heterogeneous in terms of pay-performance and pay-risk sensitivities of their CEOs with *Delta* varying between zero and $10.96 million, with a mean of $460,310, and *Vega* ranging from zero to about $3 million.

Fig. 1 depicts the distribution of CEO total compensation into its subcomponents and the developments in pay structure across the years. Although the base salary of the CEOs has remained relatively constant throughout the sample period, the average total compensation first decreased by almost 63% from 2006 to 2009 and then increased by 133% from 2009 to 2020. For an average CEO, bonuses account for approximately one-fourth of the annual total pay, while stock grants and option grants represent about 45–65% of total compensation. Similar to Murphy (2013), it can be observed from Fig. 1 that the composition of CEO compensation has largely shifted from options towards restricted stock in the aftermath of the global financial crisis.

Table 1 further shows that the mean facial attractiveness score of the bank CEOs is 2.67 on a scale of 1–5. The attractiveness scores based on the ResNet50 convolutional neural network range from 1.18 to 3.92 with a standard deviation of 0.54, indicating a reasonable dispersion in the looks of the sample CEOs. Regarding the CEO-specific control variables, the descriptive statistics demonstrate that bank CEOs are a relatively homogenous group of individuals in terms of their demographic characteristics; a typical bank CEO is a 58-year old white male. Our sample of 272 individual CEOs includes 254 Caucasian males, 9 non-Caucasian males, and 9 females, and 75% of the sample CEOs are between 51 and 65 years old. The average CEO tenure is 9.7 years and about half of the CEOs are also board chairs. About 55% of the bank CEOs hold either an MBA degree or are Certified Public Accountants, and 11% of the

Table 1
Descriptive statistics.

	Mean	Median	Min	Max	Std. dev.	Obs.
CEO attractiveness:						
Attractiveness	2.67	2.66	1.18	3.92	0.54	1806
Above-median attractiveness	0.51	1.00	0.00	1.00	0.50	1806
High attractiveness	0.35	0.00	0.00	1.00	0.48	1806
Low attractiveness	0.16	0.00	0.00	1.00	0.37	1806
CEO compensation:						
Total compensation	4434.86	2340.96	0.00	43012.78	5701.69	1806
Salary	802.19	754.17	0.00	5600.00	408.67	1806
Discretionary compensation	3439.34	1395.96	0.00	42110.86	5409.05	1806
Delta	460.31	110.27	0.00	10956.53	1031.73	1407
Vega	109.18	15.11	0.00	3032.99	287.91	1415
CEO-specific control variables:						
CEO age	58.14	58.00	34.00	83.00	7.04	1806
Female CEO	0.02	0.00	0.00	1.00	0.15	1806
Non-Caucasian CEO	0.04	0.00	0.00	1.00	0.20	1806
CEO tenure	9.71	8.00	1.00	42.00	7.94	1806
CEO duality	0.55	1.00	0.00	1.00	0.50	1806
MBA/CPA	0.55	1.00	0.00	1.00	0.50	1806
PhD	0.11	0.00	0.00	1.00	0.31	1806
Bank-specific control variables:						
Size (in millions)	116,442.60	12,258.78	686.08	3384,757.00	376,845.50	1806
Profitability (%)	0.93	0.99	-15.05	18.25	1.41	1806
Growth (%)	9.31	6.64	-97.93	110.44	15.80	1806
Capital ratio (%)	13.24	12.19	3.30	101.00	6.15	1806
Loans to assets (%)	62.99	67.39	1.49	95.42	16.80	1806
Board size	11.97	12.00	5.00	23.00	2.80	1806
Board independence (%)	86.81	88.89	53.33	100.00	6.87	1806
Board gender diversity (%)	84.61	84.60	44.40	100.00	9.84	1806

The table reports summary statistics for the sample of 167 banks over the period 2005–2020. The four CEO facial attractiveness proxies are (i) Attractiveness which is a machine-based assessment of the CEO's facial attractiveness on a scale of 1–5, (ii) Above-median attractiveness is a dummy variable which equals one for bank CEOs with facial attractiveness scores above the sample median, (iii) High attractiveness equals one for bank CEOs with facial attractiveness score in the top tercile of the attractiveness distribution, and (iv) Low attractiveness is assigned to one for bank CEOs with facial attractiveness score in the bottom sextile. The five CEO compensation measures are defined as follows: (i) Total compensation is the sum of the CEO's annual base salary, bonuses, non-equity incentive plan compensation, the grant-date fair value of option awards, the grant-date fair value of stock awards, deferred compensation earnings, and other compensation, (ii) Salary is the annual base salary of the CEO, (iii) Discretionary compensation is the sum of bonuses, non-equity incentive plan compensation, the grant-date fair value of option awards, and the grant-date fair value of stock awards, (iv) Delta measures the dollar gain or loss in CEO wealth for a 1% change in the bank's stock price, and (v) Vega measures the dollar gain or loss in CEO wealth for a 1%-point change in the bank's stock return volatility. The control variables are the following: CEO age is the age of the bank's CEO in years, Female CEO is a dummy variable which equals one if the bank's CEO is a female, Non-Caucasian CEO is a dummy variable which equals one if the ethnic background of the bank's CEO is other than Caucasian, CEO tenure is the length of tenure of the incumbent CEO in years, CEO duality is a dummy variable which equals one if the CEO is also the chairman of the board of directors, MBA/CPA is a dummy variable which equals one if the CEO holds an MBA graduate degree or is a Certified Public Accountant, PhD is a dummy variables that equals one if the CEO holds a doctoral degree, Size is measured by the bank's total assets, Profitability is the return on assets calculated as net income divided by total assets, Growth is the logarithmic difference in net loans, Capital ratio is the ratio of Tier 1 equity capital to risk-weighted assets, Loans to assets is calculated as total loans divided by total assets, Board size is the number of board members, Board independence is the number of non-executive directors divided by the total number of board members, and Board gender diversity is the number of male directors divided by the total number of board members.

CEOs hold a Ph.D.

Although we are focusing on a single homogenous industry, it can be noted from Table 1 that the sample exhibits considerable variation in terms of the bank-specific control variables. The total assets of the sample banks range from about $686 million to $3.38 trillion, with a mean of $116.44 billion. On average, the banks hold capital ratios of 13.2% and have invested about 63% of their assets into loans. Return on assets varies from a minimum of − 15.1% to a maximum of 18.3% with a mean of 0.93%, and the growth rate of loans fluctuates substantially around its mean of 9.3%. The boards of the sample banks typically consist of 12 directors and about 85% of the board seat are held by males.

The pairwise correlations between the variables used in our regressions are reported in Table 2. Consistent with the beauty premium hypothesis, *Attractiveness* is significantly positively correlated with the five measures of CEO compensation and compensation incentives. With respect to the CEO-specific and bank-specific control variables, it can be noted from Table 2 that *Attractiveness* is most strongly correlated with *CEO tenure*, *MBA/CPA*, and *Board gender diversity*. The negative correlation between *Attractiveness* and *Board gender diversity* suggests that female representation on the board of directors is positively associated with CEO facial attractiveness.

Not surprisingly, *Total compensation*, *Salary*, and *Discretionary compensation* are strongly positively correlated with each other. *Delta*

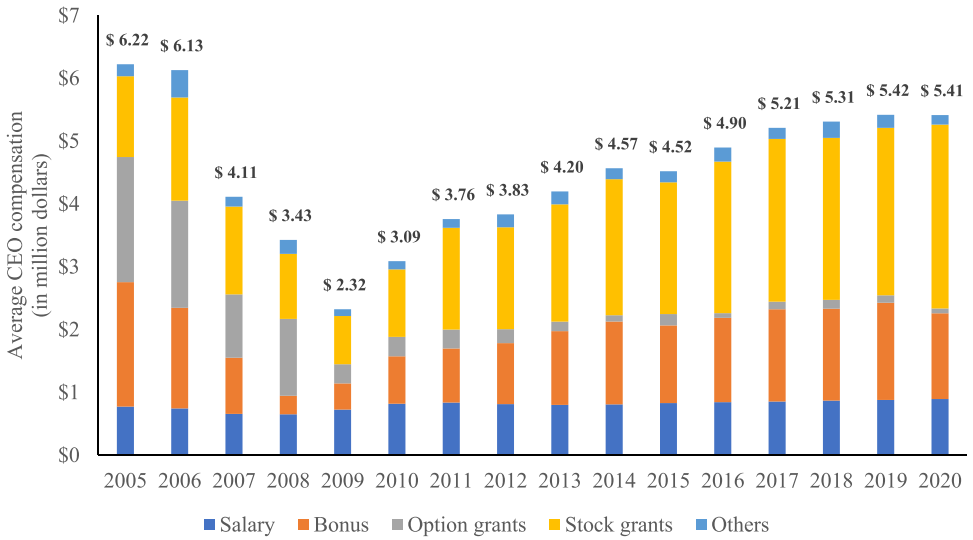

Fig. 1. Bank CEO total compensation. The figure depicts of the distribution of CEO total compensation into its subcomponents and the developments in pay structure during the period 2006–2014. *Total compensation* is the sum of the CEO's annual base salary, bonuses, non-equity incentive plan compensation, the grant-date fair value of option awards, the grant-date fair value of stock awards, deferred compensation earnings, and other compensation, *Salary* is the annual base salary of the CEO, *Bonus* is the sum of annual bonus and the non-equity incentive plan, *Stock grants* and *Option grants* are the grant-date fair value of stock and option awards, respectively, and *Other* includes all other compensation items in excess of *Salary*, *Bonus*, *Stock grants* and *Option grants*.

and *Vega* exhibit strong positive correlations with *Total compensation*, but much weaker correlations with *Salary*. The CEO compensation measures are also highly correlated with many of our control variables. Specifically, as can be seen from Table 2, CEO compensation is positively correlated with *CEO age*, *CEO tenure*, *CEO duality*, *Non-Caucasian CEO*, and *MBA/CPA* while being negatively correlated with *Female CEO*. Furthermore, the correlations suggest that the level of CEO compensation is higher in larger and more profitable banks with less traditional business models. Table 2 also shows that several of our control variables are relatively highly correlated with each other.[11] The strongest correlations among the control variables are those between *Capital ratio* and *Profitability* (0.55), *Size* and *Loans to assets* (−0.43), *Capital ratio* and *Loans to assets* (−0.42), and *CEO age* and *CEO tenure* (0.40).

4. Results

4.1. Univariate tests

As a preliminary test of the beauty premium hypothesis, we perform univariate tests to examine compensation differences between more attractive and less attractive bank CEOs. To accomplish this, we divide the sample CEOs into two subsamples based on the median facial attractiveness score. The results of two-tailed *t*-tests for the null that there is no difference in the means of the compensation variables between the subsamples are presented in Table 3.

Overall, the univariate tests in Table 3 provide support for the hypothesis that facial attractiveness is positively associated with CEO compensation. The mean differences in *Total compensation*, *Salary*, and *Discretionary compensation* between the two subsamples are positive and statistically significant at the 1% level, and thereby suggest that good looks pay off for bank CEOs. The observed differences in CEO compensation can be considered economically significant; the annual total compensation of more attractive CEOs exceeds the compensation of their less attractive counterparts by about $1.33 million (35%) and the good-looking CEOs earn about $94,000 more in annual base salary. Nevertheless, the univariate tests also indicate that facial attractiveness is unrelated to the sensitivities of CEO compensation to changes in stock prices and stock return volatility.

4.2. Main results

We test the hypothesis that facial attractiveness is positively associated with the compensation of bank CEOs by estimating alternative versions of the following panel regression specification:

[11] Given these relatively high correlation coefficients, we perform several robustness checks to ascertain that our results are not affected by multicollinearity.

Table 2
Correlations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(1) Attractiveness																				
(2) Total compensation	0.15																			
(3) Salary	0.08	0.35																		
(4) Discretionary compensation	0.14	0.82	0.24																	
(5) Delta	0.12	0.61	0.12	0.49																
(6) Vega	0.07	0.37	0.03	0.28	0.56															
(7) CEO age	0.01	0.12	0.12	0.04	0.25	0.04														
(8) Female CEO	0.05	-0.11	-0.06	-0.06	-0.12	-0.04	-0.03													
(9) Non-Caucasian CEO	0.08	0.11	0.07	0.08	0.11	0.11	0.04	-0.04												
(10) CEO tenure	0.14	0.04	0.01	0.03	0.35	0.03	0.40	-0.05	0.07											
(11) CEO duality	-0.03	0.28	0.11	0.21	0.43	0.28	0.29	-0.10	0.12	0.32										
(12) MBA/CPA	0.17	0.13	-0.06	0.14	0.02	0.06	-0.06	-0.06	0.02	-0.11	0.01									
(13) PhD	-0.02	0.03	0.01	0.02	0.11	0.09	-0.11	-0.01	0.21	0.02	0.00	-0.21								
(14) Size	0.11	0.74	0.23	0.53	0.58	0.47	0.14	-0.08	0.07	-0.08	0.28	0.10	0.01							
(15) Profitability	0.00	0.19	0.02	0.24	0.31	0.07	-0.05	-0.06	0.03	0.04	0.01	0.06	0.07	0.04						
(16) Growth	0.01	0.01	-0.08	0.07	0.08	0.00	-0.05	-0.02	0.01	0.05	-0.02	0.01	0.07	-0.10	0.10					
(17) Capital ratio	-0.02	0.04	-0.03	0.05	0.05	-0.13	-0.13	-0.02	-0.02	-0.02	-0.07	0.06	0.01	-0.07	0.55	-0.11				
(18) Loans to assets	-0.06	-0.37	-0.10	-0.27	-0.30	-0.29	0.15	0.06	-0.04	0.10	-0.13	0.03	-0.10	-0.43	-0.22	0.12	-0.42			
(19) Board size	0.11	0.26	0.19	0.18	0.18	0.18	0.02	-0.07	-0.07	-0.11	0.12	0.02	-0.03	0.39	0.04	0.04	-0.10	-0.14		
(20) Board independence	0.00	0.08	0.07	0.07	-0.14	0.06	-0.11	0.02	-0.08	-0.18	-0.07	0.10	-0.22	0.23	-0.11	-0.06	-0.21	0.11	0.25	
(21) Board gender diversity	-0.13	-0.31	-0.16	-0.26	-0.12	-0.04	-0.01	-0.22	-0.02	0.06	-0.06	-0.14	0.09	-0.38	-0.06	0.08	0.00	0.15	-0.19	-0.29

The table reports pairwise correlation coefficients between variables used in the regressions. Attractiveness is a machine-based assessment of the CEO's facial attractiveness on a scale of 1–5, Total compensation is the logarithm of the sum of the CEO's annual base salary, bonuses, non-equity incentive plan compensation, the grant-date fair value of option awards, the grant-date fair value of stock awards, deferred compensation earnings, and other compensation, Salary is the logarithm of the annual base salary of the CEO, Discretionary compensation is the logarithm of the sum of bonuses, non-equity incentive plan compensation, the grant-date fair value of option awards, and the grant-date fair value of stock awards, Delta is the logarithm of the dollar gain or loss in CEO wealth for a 1% change in the bank's stock price, Vega is the logarithm of the dollar gain or loss in CEO wealth for a 1%-point change in the bank's stock return volatility, CEO age is the age of the bank's CEO in years, Female CEO is a dummy variable which equals one if the bank's CEO is a female, Non-Caucasian CEO is a dummy variable which equals one if the ethnic background the bank's CEO is other than Caucasian, CEO tenure is the length of tenure of the incumbent CEO in years, CEO duality is a dummy variable which equals one if the CEO is also the chairman of the board of directors, MBA/CPA is a dummy variable which equals one if the CEO holds an MBA graduate degree or is a Certified Public Accountant, PhD is a dummy variables that equals one if the CEO holds a doctoral degree, Size is the logarithm of the bank's total assets, Profitability is the return on assets calculated as net income divided by total assets, Growth is the logarithmic difference in net loans, Capital ratio is the ratio of Tier 1 equity capital to risk-weighted assets, Loans to assets is calculated as total loans divided by total assets, Board size is the logarithm of the number of board members, Board independence is the number of non-executive directors divided by the total number of board members, and Board gender diversity is the number of male directors divided by the total number of board members.

Table 3
Univariate tests.

Variables	Low Attractiveness (a)	Obs.	High Attractiveness (b)	Obs.	Difference (b-a)	*t*-stat
Total compensation	3770.60	903	5099.13	903	1328.53***	4.98
Salary	755.02	903	849.36	903	94.34***	4.94
Discretionary compensation	2862.50	903	4016.18	903	1153.69***	4.56
Delta	456.52	707	464.13	700	7.62	0.14
Vega	109.28	712	109.08	703	-0.19	-0.01

The table reports the results of t-tests for the null hypothesis that there is no difference in the means of the CEO compensation measures between the subgroups of banks constructed based on the median CEO facial attractiveness. Total compensation is the sum of the CEO's annual base salary, bonuses, non-equity incentive plan compensation, the grant-date fair value of option awards, the grant-date fair value of stock awards, deferred compensation earnings, and other compensation, Salary is the annual base salary of the CEO, Discretionary compensation is the sum of bonuses, non-equity incentive plan compensation, the grant-date fair value of option awards, and the grant-date fair value of stock awards, Delta measures the dollar gain or loss in CEO wealth for a 1% change in the bank's stock price, and Vega measures the dollar gain or loss in CEO wealth for a 1%-point change in the bank's stock return volatility. The t-statistics are based on heteroskedasticity and autocorrelation corrected standard errors. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

$$log\left(\text{Compensation}_{j,t}\right) = \alpha + \beta_1 \text{Attractiveness}_{j,t} + \sum_{k1=1}^{7} \beta_{k1} \text{CEO-specific controls}_{j,t} + \sum_{k2=1}^{8} \beta_{k2} \text{Bank-specific controls}_{j,t} + \sum_{s=1}^{S-1} \beta_s \text{State}_j + \sum_{b=1}^{N-1} \beta_b \text{Bank}_j + \sum_{y=2006}^{2020} \beta_y \text{Year}_t + \varepsilon_{j,t} \quad (1)$$

where *Compensation*$_{j,t}$ is one of the five alternative compensation measures (*Total compensation*, *Salary*, *Discretionary compensation*, *Delta*, or *Vega*) of bank *j*'s CEO at time *t* and *Attractiveness*$_{j,t}$ is the facial attractiveness of the CEO on a scale of 1–5. In addition to the attractiveness score, we estimate specifications with the following three alternative proxies for CEO facial attractiveness as the test variables of interest: (i) *Above-median attractiveness*, (ii) *High attractiveness*, and (iii) *Low attractiveness*.

The set of CEO-specific control variables in Equation (1) includes *CEO age*, *Female CEO*, *Non-Caucasian CEO*, *CEO tenure*, *CEO duality*, *MBA/CPA*, and *PhD* and the bank-specific control variables are *Size*, *Profitability*, *Growth*, *Capital ratio*, *Loans to assets*, *Board size*, *Board independence*, and *Board gender diversity*. These control variables should account for the potentially confounding effects of CEO attributes and bank characteristics on compensation. Given that state-specific factors and norms may influence CEO compensation and bank performance, we include state fixed-effects (*State*) based on the bank's headquarter state. Furthermore, to control for potential biases related to omitted variables and time-invariant unobserved heterogeneity in CEO compensation, Equation (1) includes *Bank* which denotes either bank fixed-effects or bank-type fixed-effects based on two-digit SIC codes. We also account for systematic variation in CEO compensation over time by including year fixed-effects (*Year*) in the regressions. To moderate the effects of outliers, we winsorize the dependent and the independent variables at the 1st and 99th percentiles. Throughout all the alternative model specifications, we use robust standard errors which are adjusted for heteroskedasticity and clustered by bank.

The estimation results of six alternative versions of Equation (1) with *Total compensation* as the dependent variable are reported in Table 4. In Models 1 and 4, *Attractiveness* is used as the proxy for CEO facial attractiveness, while in Models 2, 3, 5, and 6 we employ the three alternative binary variants of *Attractiveness* as the test variable of interest. All specifications include the full set of control variables and state and year fixed-effects. In addition, bank-type fixed-effects are included in Models 1–3 and bank fixed-effects in Models 4–6. The adjusted R^2s indicate that the bank-type fixed-effects regressions explain about 70% of the variation in *Total compensation*.

As can be noted from Table 4, the estimated coefficient for *Attractiveness* in Model 1 is positive and significant at the 1% level, thus providing support for the beauty premium hypothesis. The magnitude of the coefficient estimate suggests that the positive relation between facial attractiveness and total compensation is economically significant; a one standard deviation increase in the CEO facial attractiveness measure increases annual total compensation by almost 9% ($395,000). When bank-type fixed-effects are replaced with bank fixed-effects in Model 4, the coefficient for *Attractiveness* is positive and significant at the 10% level and remains almost unchanged in magnitude.

Consistent with Models 1 and 4, the estimates of Models 2–3 and 5–6 indicate that facial attractiveness is positively associated with CEO total compensation as the coefficients for *Above-median attractiveness* and *High attractiveness* are positive and statistically highly significant. The estimates of Model 2 suggest that the annual total compensation of bank CEOs with above-median facial attractiveness scores is about 24% ($1.06 million) higher than the compensation of their less attractive peers. Intriguingly, the size of the beauty premium among bank CEOs is very similar to the beauty premium in the general labor market (e.g., Hamarmesh & Biddle, 1994; Scholz & Sicinski, 2015), suggesting that the highly-paid bank CEOs are as susceptible to attractiveness gaps in their compensation as average employees. When the *High attractiveness* dummy variable is used as the proxy for CEO facial attractiveness in Models 3 and 6, the beauty premium remains very similar in economic magnitude, while the coefficient for *Low attractiveness* appears insignificant in both specifications.

The coefficient estimates for the control variables in Table 4 indicate that *Total compensation* is significantly positively associated with *CEO duality*, *CEO tenure*, *Size*, *Profitability*, *Capital ratio*, and *Loans to assets*, and negatively related to *Female CEO* and *Board gender diversity*. Thus, consistent with the prior literature, the results suggest that CEO compensation increases with increasing bank size and

Table 4
CEO facial attractiveness and total compensation.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
CEO facial attractiveness:						
Attractiveness	0.165***			0.166*		
	(3.01)			(1.70)		
Above-median attractiveness		0.240***			0.267***	
		(4.12)			(2.63)	
High attractiveness			0.192***			0.227***
			(3.41)			(2.89)
Low attractiveness			-0.014			0.101
			(−0.17)			(0.91)
CEO-specific controls:						
CEO age	-0.002	-0.004	-0.003	-0.004	-0.004	-0.007
	(−0.39)	(−0.81)	(−0.75)	(−0.65)	(−0.68)	(−1.18)
Female CEO	-0.347***	-0.354***	-0.344***	-0.605***	-0.594***	-0.576***
	(−3.58)	(−4.17)	(−4.04)	(−3.33)	(−3.40)	(−3.31)
Non-Caucasian CEO	0.054	0.020	0.069	-0.352	-0.340	-0.193
	(0.23)	(0.09)	(0.31)	(−0.61)	(−0.62)	(−0.32)
CEO tenure	0.057	0.067*	0.070*	0.115**	0.122**	0.143***
	(1.51)	(1.79)	(1.87)	(2.42)	(2.55)	(3.05)
CEO duality	0.190***	0.196**	0.197**	0.038	0.044	0.040
	(2.62)	(2.56)	(2.58)	(0.73)	(0.82)	(0.75)
MBA/CPA	-0.053	-0.052	-0.039	-0.188*	-0.170*	-0.180*
	(−0.81)	(−0.89)	(−0.65)	(−1.86)	(−1.91)	(−1.78)
PhD	-0.112	-0.124	-0.128	0.008	-0.010	-0.053
	(−1.04)	(−1.27)	(−1.22)	(0.07)	(−0.08)	(−0.41)
Bank-specific controls						
Size	0.447***	0.445***	0.445***	0.497***	0.491***	0.499***
	(15.29)	(13.96)	(13.71)	(9.56)	(9.31)	(9.60)
Profitability	4.383	4.575	4.397	9.460***	9.329***	9.196***
	(1.56)	(1.64)	(1.57)	(3.36)	(3.36)	(3.31)
Growth	0.130	0.111	0.097	0.179*	0.172*	0.168*
	(1.27)	(1.09)	(0.96)	(1.78)	(1.72)	(1.68)
Capital ratio	0.387	0.372	0.364	1.234***	1.189***	1.207***
	(0.76)	(0.71)	(0.70)	(3.18)	(3.11)	(3.17)
Loans to assets	0.057	0.128	0.035	1.162***	1.180***	1.161***
	(0.26)	(0.60)	(0.17)	(4.64)	(4.68)	(4.63)
Board size	-0.055	-0.036	-0.037	-0.113	-0.124	-0.118
	(−0.44)	(−0.28)	(−0.29)	(−0.84)	(−0.93)	(−0.91)
Board independence	-0.159	-0.151	-0.202	-0.250	-0.265	-0.271
	(−0.35)	(−0.33)	(−0.43)	(−0.45)	(−0.49)	(−0.51)
Board gender diversity	-0.395	-0.368	-0.417	-1.172***	-1.161***	-1.183***
	(−1.45)	(−1.42)	(−1.53)	(−3.31)	(−3.37)	(−3.28)
Constant	3.620***	3.861***	4.135***	3.083***	3.472***	3.576***
	(4.67)	(4.91)	(5.09)	(3.92)	(4.09)	(4.03)
Bank-type fixed-effects	Yes	Yes	Yes	No	No	No
Bank fixed-effects	No	No	No	Yes	Yes	Yes
State fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	1806	1806	1806	1806	1806	1806
Adjusted R^2	0.69	0.70	0.69	0.28	0.29	0.28

The table reports the estimates of six alternative versions of Equation (1). The dependent variable Total compensation is the logarithm of the sum of the CEO's annual base salary, bonuses, non-equity incentive plan compensation, the grant-date fair value of option awards, the grant-date fair value of stock awards, deferred compensation earnings, and other compensation. The four alternative CEO facial attractiveness measures are (i) Attractiveness which is a machine-based assessment of the CEO's facial attractiveness on a scale of 1–5, (ii) Above-median attractiveness is a dummy variable which equals one for bank CEOs with facial attractiveness scores above the sample median, (iii) High attractiveness equals one for bank CEOs with facial attractiveness score in the top tercile of the attractiveness distribution, and (iv) Low attractiveness is assigned to one for bank CEOs with facial attractiveness score in the bottom sextile. The control variables are defined as follows: CEO age is the age of the bank's CEO in years, Female CEO is a dummy variable which equals one if the bank's CEO is a female, Non-Caucasian CEO is a dummy variable which equals one if the ethnic background of the bank's CEO is other than Caucasian, CEO tenure is the length of tenure of the incumbent CEO in years, CEO duality is a dummy variable which equals one if the CEO is also the chairman of the board of directors, MBA/CPA is a dummy variable which equals one if the CEO holds an MBA graduate degree or is a Certified Public Accountant, PhD is a dummy variables that equals one if the CEO holds a doctoral degree, Size is the logarithm of total assets, Profitability is the return on assets calculated as net income divided by total assets, Growth is the logarithmic difference in net loans, Capital ratio is the ratio of Tier 1 equity capital to risk-weighted assets, Loans to assets is calculated as total loans divided by total assets, Board size is the logarithm of the number of board members, Board independence is the number of non-executive directors divided by the total number of board

members, and Board gender diversity is the number of male directors divided by the total number of board members. All the continuous variables are winsorized at the 1th and 99th percentiles. The t-statistics (in parentheses) are based on robust standard errors which are adjusted for heteroskedasticity and are clustered by bank. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

stronger financial performance. Moreover, our estimates indicate that powerful CEOs with a long tenure receive higher total compensation and that female CEOs are paid less than their male counterparts.

Table 5 presents the regression results with *Salary* as the dependent variable. Analogously to Table 4, Models 1 and 4 are the baseline models with *Attractiveness* employed as the measure of CEO facial attractiveness, while the three alternative CEO attractiveness proxies are used in Models 2, 3, 5, and 6. In general, the regression results show that CEO facial attractiveness is weakly positively related to the annual base salary. As shown in Table 5, the coefficient estimates for the facial attractiveness measures are positive and statistically significant at the 10% level in Models 2 and 4, and the positive coefficient for *High attractiveness* is significant at the 5% level in Model 6. Consistent with the beauty premium hypothesis, the coefficient estimate for *High attractiveness* indicates that bank CEOs with facial attractiveness scores in the top tercile earn about 13.7% ($73,800) higher salaries than the less good-looking CEOs.

With respect to the control variables, it can be noted from Table 5 that the coefficient estimates for many of the control variables are statistically significant. In particular, the regressions indicate that *Salary* is positively associated with *Size*, *Capital ratio*, *CEO tenure*, and *Board size*, while being negatively related to *Loan growth* and *Female CEO*. Thus, our estimates suggest that CEOs who manage larger banks with higher capital ratios and lower growth rates have higher salaries. Although previous studies have documented that the prevalent gender wage gap does not necessarily persist at the CEO level (e.g., Bugeja et al., 2012; Gupta et al., 2018), our regressions indicate that the annual base salary of female bank CEOs is over 20% lower than that of their male counterparts. Nevertheless, given that our sample includes only nine female CEOs, the coefficient estimates must be approached cautiously.

We proceed by regressing *Discretionary compensation* on the alternative CEO facial attractiveness measures. The estimation results of these regressions are reported in Table 6. Overall, the regression results with *Discretionary compensation* as the dependent variable are very similar to the total compensation regressions presented in Table 4. The coefficient estimates for the alternative CEO facial attractiveness variables are positive and highly significant, with the only exceptions being the insignificant coefficient for *Low attractiveness* in Model 3 and for *Attractiveness* in Model 4. Taken as a whole, the regressions in Tables 4–6 suggest that the observed beauty premium in total compensation of bank CEOs mostly pertains to the discretionary, performance-based pay components rather than to the base salary.

In addition to being statistically highly significant, the observed positive relationship between CEO facial attractiveness and the discretionary compensation components can be considered economically significant. In Model 1, the estimated coefficient suggests that a one standard deviation increase in *Attractiveness* would increase the CEO's performance-based compensation by approximately 21.6% ($743,000), while Model 2 indicates that bank CEOs with above-median facial attractiveness scores have about 55% higher sum of bonuses, stock grants, and option grants. Regarding the control variables, it can be noted from Table 6 that the level of discretionary compensation of bank CEOs is positively linked to *CEO chair*, *Size*, *Profitability*, *Loan growth*, *Loans to assets*, while being negatively associated with *CEO age* and *Board gender* diversity.

Collectively, the regression results reported in Tables 4–6, as well as the univariate tests in Table 3, demonstrate that good looks pay off for bank CEOs. We find strong evidence that CEO facial attractiveness is positively associated with the annual total compensation and discretionary, performance-based compensation components while being only weakly related to the annual base salary. Thus, consistent with hypothesis 2, the results suggest that the beauty premium in total compensation of bank CEOs is mostly driven by performance-based compensation components and incentives that require considerable discretion by the board of directors. The size of the beauty premium can be considered economically significant as we document that the total compensation of bank CEOs with above-median facial attractiveness scores is about 24% higher than the compensation of less attractive CEOs. Overall, our empirical findings provide strong support for the beauty premium hypothesis in the executive labor market.

4.3. CEO compensation sensitivities

Going forward, we examine the effect of facial attractiveness on the sensitivities of CEO compensation to changes in stock prices (pay-performance sensitivity) and stock return volatility (pay-risk sensitivity). Panel A of Table 7 reports the estimation results of six alternative versions of Equation (1) with *Delta* as the dependent variable. Models 1–3 include the full set of control variables and state, bank-type, and year fixed-effects whereas bank-type fixed-effects are replaced with bank fixed-effects in Models 4–6. As can be seen from Panel A, the adjusted R^2s indicate a good fit of the regressions. Intriguingly, the coefficients for the alternative CEO facial attractiveness measures are insignificant in all six model specifications, suggesting that the pay-performance sensitivity of bank CEOs is unaffected by facial attractiveness. The coefficient estimates for the control variables (not tabulated) indicate that *Delta* is positively associated with *CEO tenure*, *CEO duality*, *Size*, *Profitability*, and *Growth*, and negatively related to *Board independence*.

The regression results with *Vega* as the dependent variable are presented in Panel B of Table 7. Similar to Panel A, the coefficients for the CEO facial attractiveness measures appear statistically insignificant throughout the regressions. Thus, we conclude that facial attractiveness does not influence the sensitivity of bank CEO compensation to changes in stock return volatility. The coefficients for most of the control variables (not tabulated) are statistically significant, thereby demonstrating the importance of these variables for explaining cross-sectional differences in CEO risk-taking incentives. Specifically, the regression results indicate that CEOs' compensation-based risk-taking incentives are stronger in large banks with higher profitability and growth rates and lower capital ratios and lending activity.

Table 5
CEO facial attractiveness and salary.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
CEO facial attractiveness:						
Attractiveness	0.046			0.170*		
	(0.82)			(1.90)		
Above-median attractiveness		0.099*			0.148	
		(1.75)			(1.61)	
High attractiveness			0.060			0.137**
			(1.31)			(2.16)
Low attractiveness			0.028			0.134
			(0.41)			(1.29)
CEO-specific controls:						
CEO age	-0.001	-0.002	-0.002	-0.014	-0.015	-0.017
	(−0.29)	(−0.38)	(−0.46)	(−1.44)	(−1.43)	(−1.63)
Female CEO	-0.230***	-0.240***	-0.222***	-0.351**	-0.309**	-0.278*
	(−3.04)	(−3.14)	(−2.94)	(−2.46)	(−2.39)	(−1.86)
Non-Caucasian CEO	0.356	0.333	0.366	-0.475	-0.418	-0.279
	(1.36)	(1.32)	(1.40)	(−1.31)	(−1.22)	(−0.70)
Tenure	0.071	0.071	0.078	0.158**	0.170***	0.191***
	(1.39)	(1.30)	(1.50)	(2.59)	(2.67)	(2.88)
CEO duality	0.026	0.030	0.029	-0.017	-0.015	-0.017
	(0.49)	(0.59)	(0.58)	(−0.39)	(−0.34)	(−0.38)
MBA/CPA	-0.085	-0.089	-0.080	0.001	0.018	0.015
	(−1.30)	(−1.28)	(−1.18)	(0.01)	(0.17)	(0.14)
PhD	0.125	0.122	0.119	0.110	0.093	0.056
	(1.15)	(1.12)	(1.07)	(1.04)	(0.86)	(0.51)
Bank-specific controls:						
Size	0.144***	0.142***	0.144***	0.276***	0.269***	0.273***
	(4.04)	(3.88)	(4.04)	(5.50)	(5.44)	(5.63)
Profitability	0.464	0.581	0.483	2.640	2.703	2.640
	(0.16)	(0.20)	(0.17)	(1.27)	(1.29)	(1.26)
Growth	-0.533***	-0.541***	-0.545***	-0.188	-0.193	-0.194
	(−2.84)	(−2.86)	(−2.87)	(−1.58)	(−1.59)	(−1.61)
Capital ratio	0.209	0.205	0.207	1.532***	1.493***	1.496***
	(0.55)	(0.54)	(0.54)	(2.84)	(2.84)	(2.85)
Loans to assets	0.055	0.084	0.048	0.442*	0.440*	0.419*
	(0.26)	(0.40)	(0.22)	(1.83)	(1.83)	(1.79)
Board size	0.234**	0.240**	0.244**	-0.094	-0.095	-0.089
	(1.98)	(2.01)	(2.02)	(−0.92)	(−0.96)	(−0.95)
Board independence	0.710	0.725*	0.695	-0.008	0.014	0.001
	(1.65)	(1.69)	(1.60)	(−0.02)	(0.03)	(0.00)
Board gender diversity	-0.262	-0.239	-0.274	-0.533*	-0.523*	-0.543*
	(−0.73)	(−0.69)	(−0.76)	(−1.84)	(−1.80)	(−1.82)
Constant	3.922***	3.949***	4.070***	4.064***	4.504***	4.602***
	(5.96)	(6.44)	(6.34)	(5.46)	(5.85)	(5.91)
Bank-type fixed-effects	Yes	Yes	Yes	No	No	No
Bank fixed-effects	No	No	No	Yes	Yes	Yes
State fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	1806	1806	1806	1806	1806	1806
Adjusted R^2	0.49	0.49	0.49	0.13	0.13	0.13

The table reports the estimates of six alternative versions of Equation (1). The dependent variable Salary is the logarithm of the annual base salary of the CEO. The four alternative CEO facial attractiveness measures are (i) Attractiveness which is a machine-based assessment of the CEO's facial attractiveness on a scale of 1–5, (ii) Above-median attractiveness is a dummy variable which equals one for bank CEOs with facial attractiveness scores above the sample median, (iii) High attractiveness equals one for bank CEOs with facial attractiveness score in the top tercile of the attractiveness distribution, and (iv) Low attractiveness is assigned to one for bank CEOs with facial attractiveness score in the bottom sextile. The control variables are defined as follows: CEO age is the age of the bank's CEO in years, Female CEO is a dummy variable which equals one if the bank's CEO is a female, Non-Caucasian CEO is a dummy variable which equals one if the ethnic background of the bank's CEO is other than Caucasian, CEO tenure is the length of tenure of the incumbent CEO in years, CEO duality is a dummy variable which equals one if the CEO is also the chairman of the board of directors, MBA/CPA is a dummy variable which equals one if the CEO holds an MBA graduate degree or is a Certified Public Accountant, PhD is a dummy variables that equals one if the CEO holds a doctoral degree, Size is the logarithm of total assets, Profitability is the return on assets calculated as net income divided by total assets, Growth is the logarithmic difference in net loans, Capital ratio is the ratio of Tier 1 equity capital to risk-weighted assets, Loans to assets is calculated as total loans divided by total assets, Board size is the logarithm of the number of board members, Board independence is the number of non-executive directors divided by the total number of board members, and Board gender diversity is the

number of male directors divided by the total number of board members. All the continuous variables are winsorized at the 1th and 99th percentiles. The t-statistics (in parentheses) are based on robust standard errors which are adjusted for heteroskedasticity and are clustered by bank. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

4.4. The role of board monitoring and CEO power

The level and structure of CEO compensation are set by the board of directors. If the board provides strong oversight of executive compensation and ensures that the bank acts in the best interests of its shareholders, CEO compensation policies should reflect optimal contracting and equilibrium in the executive labor market. In this optimal contracting setting, the strength of board monitoring may moderate the influence of facial attractiveness on CEO compensation. Therefore, as the next step of our analysis, we examine whether the positive association between CEO attractiveness and compensation is moderated by boards that exert more stringent monitoring. For this purpose, we follow the approach of Baselga-Pascual et al. (2018) and build a composite index variable based on board characteristics to measure the boards' monitoring strength. In particular, *Strong monitoring* is a (0,3) index measure constructed as the sum of the following three binary criteria: (i) the number of directors is above the sample median (0,1), (ii) the percentage of independent directors is above the sample median (0,1), and (iii) the percentage of female directors is above the sample median (0,1). We then estimate modified versions of Equation (1) in which *Attractiveness* is interacted with *Strong monitoring*.

In contrast to the optimal contracting view, the managerial power theory of Bebchuk and Fried (2004) suggests that powerful, self-interested executives may receive excessive compensation by influencing the board's pay-setting process and compensation policies. Under this view, managerial power may strengthen the influence of facial attractiveness on CEO compensation. Thus, we also explore whether CEO power affects the relationship between facial attractiveness and CEO compensation. Similar to *Strong monitoring*, we implement this test by constructing a (0,3) index measure *CEO power* as the sum of the following three binary criteria: (i) *CEO duality*, i.e. the CEO is the chairman of the board of directors (0,1), (ii) *CEO tenure* is above the sample median (0,1), and (iii) the CEO's total compensation relative to the bank's total assets is above the sample median (0,1). We then include an interaction term between *Attractiveness* and *CEO power* in the regressions.

Table 8 reports the estimates of six alternative interaction regressions. As can be noted from the table, the coefficients for both interaction variables *Attractiveness* × *Strong monitoring* and *Attractiveness* × *CEO power* are statistically insignificant and relatively small in magnitude throughout the regressions. This suggests that the documented positive association between facial attractiveness and CEO compensation is not influenced by the strength of board monitoring or managerial power. The coefficient estimates for *Attractiveness* are positive and significant in Models 1–2 and 4–5, thereby providing further support for the beauty premium hypothesis. Consistent with the managerial power theory, the interaction regressions also indicate that *CEO power* is positively associated with *Total compensation* and *Salary*.

4.5. Endogeneity concerns

As with any empirical analysis such as ours, it is possible that some omitted variables or unobservable factors are correlated with CEO facial attractiveness and compensation, thereby creating an artificial linkage between the two variables of interest. In our regressions, we have controlled for various bank-specific and CEO-specific attributes that are known to affect CEO compensation.[12] Moreover, in order to mitigate endogeneity concerns related to omitted variables and unobserved heterogeneity, we have included either bank or bank-type fixed-effects as well as state and year fixed-effects in the regressions. Given that the facial attractiveness measures for individual CEOs are time-invariant, the inclusion of bank fixed-effects in Tables 4–7 essentially implies that the estimates reflect within-firm changes in CEO attractiveness around the time of CEO succession events. It can also be argued that the potentially confounding effects of omitted CEO characteristics should be of lesser concern for our study because bank CEOs are a relatively homogenous group of individuals in terms of their demographic characteristics and educational backgrounds. Nevertheless, we acknowledge that some omitted personal characteristics of the CEOs such as personality, intelligence, communication skills, height, weight, body type, and self-confidence could bias our regressions if CEO beauty and compensation are correlated with these attributes.[13] Because we are unable to completely rule out endogeneity caused by omitted variable bias, it is important to recognize that many other factors than facial attractiveness obviously may affect the compensation of bank CEOs.

The second potential source of endogeneity in empirical analysis such as ours is reverse causality. However, in the beauty premium context, reverse causality would somewhat counterintuitively imply that a higher CEO compensation would lead to more attractive facial features, for instance, through the use of cosmetic surgery. The diminishing marginal utility of income would also suggest that the compensation differences across highly paid bank CEOs are unlikely to influence their looks. Thus, although not completely implausible, it is unlikely that our estimates are plagued by reverse causality. Nonetheless, given that we do not formally address

[12] While Graham et al. (2016) only control for firm size in their analysis, Halford and Hsu (2020) include a broad set of firm-specific and CEO-related control variables to mitigate omitted variable bias. Specifically, in their total compensation regressions, Halford and Hsu (2020) control for firm size, market-to-book ratio, and leverage as well as CEO age, gender, educational background, tenure, overconfidence, and facial width-to-height ratio. Their results suggest that in addition to facial attractiveness, CEO age is the only CEO-specific attribute that influences total compensation.

[13] Hamermesh (2011) provides a comprehensive discussion of potentially confounding factors that could affect the beauty premium. Nevertheless, he concludes that the beauty premium is only marginally influenced by confounds such as individual's personality and weight.

Table 6
CEO facial attractiveness and discretionary compensation.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
CEO facial attractiveness:						
Attractiveness	0.400***			0.278		
	(3.34)			(1.49)		
Above-median attractiveness		0.554***			0.639***	
		(4.50)			(3.03)	
High attractiveness			0.304**			0.495***
			(2.30)			(3.34)
Low attractiveness			-0.220			0.553**
			(−1.02)			(2.14)
CEO-specific controls:						
CEO age	-0.025**	-0.029***	-0.026**	0.000	0.000	-0.010
	(−2.35)	(−2.90)	(−2.45)	(0.02)	(0.02)	(−0.64)
Female CEO	-0.229	-0.238	-0.228	-0.478	-0.507	-0.347
	(−1.12)	(−1.17)	(−1.09)	(−1.41)	(−1.60)	(−0.89)
Non-Caucasian CEO	-0.185	-0.255	-0.150	-0.405	-0.454	0.135
	(−0.55)	(−0.80)	(−0.42)	(−0.50)	(−0.63)	(0.15)
Tenure	0.092	0.119	0.115	0.102	0.105	0.194
	(0.83)	(1.12)	(1.05)	(0.69)	(0.71)	(1.35)
CEO duality	0.353**	0.366**	0.345**	0.117	0.131	0.121
	(2.24)	(2.34)	(2.17)	(0.69)	(0.77)	(0.72)
MBA/CPA	0.097	0.104	0.138	-0.011	0.019	0.013
	(0.69)	(0.78)	(0.99)	(−0.04)	(0.08)	(0.05)
PhD	-0.240	-0.268	-0.264	0.042	0.009	-0.131
	(−1.29)	(−1.42)	(−1.37)	(0.17)	(0.04)	(−0.51)
Bank-specific controls:						
Size	0.660***	0.655***	0.659***	0.894***	0.887***	0.897***
	(8.70)	(8.76)	(8.64)	(6.85)	(6.68)	(7.18)
Profitability	20.424**	20.831**	20.168**	38.376***	37.856***	37.826***
	(2.42)	(2.51)	(2.38)	(3.64)	(3.64)	(3.60)
Growth	0.535*	0.489*	0.491*	0.798***	0.785**	0.784**
	(1.91)	(1.77)	(1.79)	(2.64)	(2.60)	(2.60)
Capital ratio	-0.534	-0.572	-0.612	1.843	1.758	1.769
	(−0.43)	(−0.46)	(−0.49)	(1.61)	(1.55)	(1.56)
Loans to assets	0.026	0.189	-0.006	2.031***	2.093***	1.989***
	(0.05)	(0.38)	(−0.01)	(2.74)	(2.79)	(2.73)
Board size	-0.329	-0.282	-0.315	-0.767*	-0.803**	-0.770**
	(−0.98)	(−0.85)	(−0.94)	(−1.96)	(−2.03)	(−2.03)
Board independence	0.360	0.368	0.240	0.223	0.140	0.122
	(0.35)	(0.35)	(0.23)	(0.19)	(0.12)	(0.10)
Board gender diversity	-1.088	-1.036	-1.153*	-2.104***	-2.084***	-2.165***
	(−1.65)	(−1.61)	(−1.75)	(−2.66)	(−2.72)	(−2.72)
Constant	2.365	2.987*	3.613**	-1.353	-0.767	-0.342
	(1.26)	(1.69)	(2.00)	(−0.66)	(−0.38)	(−0.16)
Bank-type fixed-effects	Yes	Yes	Yes	No	No	No
Bank fixed-effects	No	No	No	Yes	Yes	Yes
State fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	1806	1806	1806	1806	1806	1806
Adjusted R^2	0.47	0.47	0.47	0.18	0.19	0.18

The table reports the estimates of six alternative versions of Equation (1). The dependent variable Discretionary compensation is the logarithm of the sum of bonuses, non-equity incentive plan compensation, the grant-date fair value of option awards, and the grant-date fair value of stock awards The four alternative CEO facial attractiveness measures are (i) Attractiveness which is a machine-based assessment of the CEO's facial attractiveness on a scale of 1–5, (ii) Above-median attractiveness is a dummy variable which equals one for bank CEOs with facial attractiveness scores above the sample median, (iii) High attractiveness equals one for bank CEOs with facial attractiveness score in the top tercile of the attractiveness distribution, and (iv) Low attractiveness is assigned to one for bank CEOs with facial attractiveness score in the bottom sextile. The control variables are defined as follows: CEO age is the age of the bank's CEO in years, Female CEO is a dummy variable which equals one if the bank's CEO is a female, Non-Caucasian CEO is a dummy variable which equals one if the ethnic background of the bank's CEO is other than Caucasian, CEO tenure is the length of tenure of the incumbent CEO in years, CEO duality is a dummy variable which equals one if the CEO is also the chairman of the board of directors, MBA/CPA is a dummy variable which equals one if the CEO holds an MBA graduate degree or is a Certified Public Accountant, PhD is a dummy variables that equals one if the CEO holds a doctoral degree, Size is the logarithm of total assets, Profitability is the return on assets calculated as net income divided by total assets, Growth is the logarithmic difference in net loans, Capital ratio is the ratio of Tier 1 equity capital to risk-weighted assets, Loans to assets is calculated as total loans divided by total assets, Board size is the logarithm of the number of board members, Board independence is the number of non-executive directors divided by the total number of board members, and Board gender diversity is the number of male directors divided by the

total number of board members. All the continuous variables are winsorized at the 1th and 99th percentiles. The t-statistics (in parentheses) are based on robust standard errors which are adjusted for heteroskedasticity and are clustered by bank. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 7
CEO facial attractiveness and compensation sensitivities.

Panel A: CEO facial attractiveness and pay-performance sensitivity						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
CEO facial attractiveness:						
Attractiveness	0.119			-0.073		
	(1.17)			(−0.41)		
Above-median attractiveness		0.182			0.072	
		(1.43)			(0.35)	
High attractiveness			0.204			-0.005
			(1.43)			(−0.02)
Low attractiveness			-0.015			-0.248
			(−0.09)			(−0.93)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Bank-type fixed-effects	Yes	Yes	Yes	No	No	No
Bank fixed-effects	No	No	No	Yes	Yes	Yes
State fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	1407	1407	1407	1407	1407	1407
Adjusted R^2	0.73	0.73	0.73	0.39	0.39	0.39
Panel B: CEO facial attractiveness and pay-risk sensitivity						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
CEO facial attractiveness:						
Attractiveness	0.097			-0.078		
	(0.66)			(−0.24)		
Above-median attractiveness		0.109			-0.161	
		(0.61)			(−0.48)	
High attractiveness			0.314			0.015
			(1.54)			(0.04)
Low attractiveness			-0.020			-0.040
			(−0.09)			(−0.10)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Bank-type fixed-effects	Yes	Yes	Yes	No	No	No
Bank fixed-effects	No	No	No	Yes	Yes	Yes
State fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	1415	1415	1415	1415	1415	1415
Adjusted R^2	0.56	0.56	0.56	0.19	0.19	0.19

The table reports the estimates of six alternative versions of Equation (1). In Panel A, the dependent variable Delta is the logarithm of the CEO's pay-performance sensitivity measured as the dollar gain or loss in CEO wealth for a 1% change in the bank's stock price. In Panel B, the dependent variable Vega is the logarithm of the CEO's pay-risk sensitivity measured as the dollar gain or loss in CEO wealth for a 1%-point change in the bank's stock return volatility. The four alternative CEO facial attractiveness measures are (i) Attractiveness which is a machine-based assessment of the CEO's facial attractiveness on a scale of 1–5, (ii) Above-median attractiveness is a dummy variable which equals one for bank CEOs with facial attractiveness scores above the sample median, (iii) High attractiveness equals one for bank CEOs with facial attractiveness score in the top tercile of the attractiveness distribution, and (iv) Low attractiveness is assigned to one for bank CEOs with facial attractiveness score in the bottom sextile. The control variables used in the regressions are defined as follows: CEO age is the age of the bank's CEO in years, Female CEO is a dummy variable which equals one if the bank's CEO is a female, Non-Caucasian CEO is a dummy variable which equals one if the ethnic background of the bank's CEO is other than Caucasian, CEO tenure is the length of tenure of the incumbent CEO in years, CEO duality is a dummy variable which equals one if the CEO is also the chairman of the board of directors, MBA/CPA is a dummy variable which equals one if the CEO holds an MBA graduate degree or is a Certified Public Accountant, PhD is a dummy variables that equals one if the CEO holds a doctoral degree, Size is the logarithm of total assets, Profitability is the return on assets calculated as net income divided by total assets, Growth is the logarithmic difference in net loans, Capital ratio is the ratio of Tier 1 equity capital to risk-weighted assets, Loans to assets is calculated as total loans divided by total assets, Board size is the logarithm of the number of board members, Board independence is the number of non-executive directors divided by the total number of board members, and Board gender diversity is the number of male directors divided by the total number of board members. All the continuous variables are winsorized at the 1th and 99th percentiles. The t-statistics (in parentheses) are based on robust standard errors which are adjusted for heteroskedasticity and are clustered by bank. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 8
The role of board monitoring and CEO power.

	Total compensation		Salary		Discretionary compensation	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Attractiveness	0.177**	0.158*	0.050	0.16**	0.557***	0.141
	(2.28)	(1.95)	(0.61)	(2.3)	(3.86)	(0.77)
Attractiveness x Strong monitoring	-0.006		-0.002		-0.117	
	(-0.13)		(-0.07)		(-1.41)	
Attractiveness x CEO power		-0.025		-0.073		0.100
		(-0.63)		(-1.35)		(1.04)
Strong monitoring	0.019		0.037		0.389	
	(0.16)		(0.37)		(1.65)	
CEO power		0.308***		0.251*		0.298
		(2.71)		(1.72)		(1.12)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
State fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
Bank-type fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	1806	1806	1806	1806	1806	1806
Adjusted R^2	0.69	0.71	0.49	0.49	0.47	0.50

The table reports the estimates of six alternative versions of Equation (1). The three CEO compensation measures are defined as follows: (i) Total compensation is the logarithm of the sum of the CEO's annual base salary, bonuses, non-equity incentive plan compensation, the grant-date fair value of option awards, the grant-date fair value of stock awards, deferred compensation earnings, and other compensation, (ii) Salary is the logarithm of the annual base salary of the CEO, and (iii) Discretionary compensation is the logarithm of the sum of bonuses, non-equity incentive plan compensation, the grant-date fair value of option awards, and the grant-date fair value of stock awards. Attractiveness is a machine-based assessment of the CEO's facial attractiveness on a scale of 1–5. Strong monitoring is a (0,3) index measure constructed as the sum of the following three binary criteria: (i) the number of directors is above the sample median (0,1), (ii) the percentage of independent directors is above the sample median (0,1), and (iii) the percentage of female directors is above the sample median (0,1). CEO power is a (0,3) index measure constructed as the sum of the following three binary criteria: (i) CEO duality, i.e. the CEO is the chairman of the board of directors (0,1), (ii) CEO tenure is above the sample median (0,1), and (iii) the CEO's total compensation relative to the bank's total assets is above the sample median (0,1). All the continuous variables are winsorized at the 1th and 99th percentiles. The t-statistics (in parentheses) are based on robust standard errors which are adjusted for heteroskedasticity and are clustered by bank. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

endogeneity concerns related to reverse causality in our empirical design, any causal interpretations of our findings should be made with caution.[14]

To alleviate any remaining endogeneity concerns, we utilize propensity score matching (PSM) to build a matched-bank sample in which banks led by CEOs with facial attractiveness scores in the top decile are matched with banks that are as similar as possible in terms of size, profitability, growth rate, and capital ratio but are led by less attractive CEOs. This PSM approach should control for any endogenous selection on observed bank characteristics. After constructing the propensity score matched sample of banks based on one-to-one nearest neighbor matching without replacement, we estimate CEO compensation regressions with *Attractiveness* as the test variable of interest.

Table 9 presents the regression results based on the propensity score matched sample of banks. As can be seen from the table, the estimates are broadly consistent with our main analysis in Tables 4–6. The estimated coefficients for *Attractiveness* are positive and statistically significant in the regressions with *Total compensation* and *Discretionary compensation* as the dependent variables, and insignificant in the regression with *Salary* as the dependent variable. Interestingly, the effect size of facial attractiveness is greater in the matched-bank sample than in our main regressions. Overall, the estimates based on the propensity score matched sample provide additional support for the beauty premium hypothesis in the executive labor market.

4.6. Additional tests

We perform several additional tests to examine the robustness of our findings. Table 10 summarizes the results of these robustness checks. The table reports the estimated coefficients for *Attractiveness* from 16 different regression setups with *Total compensation*, *Salary*, and *Discretionary compensation* as the dependent variables. The baseline estimation results from Tables 4–6 are summarized in the first row of Table 10 (Specification 0).

First, to ascertain that our results are not influenced by spurious correlations between the independent variables, we estimate constrained versions of Equation (1) with *Size*, *Profitability*, and *Capital ratio* as the only control variables (Specification 1). In addition, we also estimate constrained models without the CEO-specific control variables (Specification 2). The estimates of these additional

[14] Endogeneity concerns arising from reverse causality could be addressed with two-stage instrumental variable regressions. It is, however, challenging to identify a suitable instrument that would be strongly correlated with CEO facial attractiveness while being uncorrelated with CEO compensation.

Table 9
Propensity score matching.

	Total compensation	Salary	Discretionary compensation
CEO facial attractiveness:			
Attractiveness	0.233***	0.001	0.639**
	(3.27)	(0.02)	(2.48)
CEO-specific controls:			
CEO age	0.004	0.001	-0.027
	(0.52)	(0.17)	(−1.27)
Female CEO	-0.312*	-0.375**	-0.093
	(−1.70)	(−2.49)	(−0.22)
Non-Caucasian CEO	0.081	0.580*	-0.748
	(0.46)	(1.91)	(−1.31)
Tenure	0.058	0.090	0.000
	(0.7)	(0.85)	(0)
CEO duality	0.121	-0.115	0.792**
	(1.19)	(−1.23)	(2.52)
MBA/CPA	0.050	-0.214**	0.161
	(0.53)	(−2.16)	(0.57)
PhD	0.026	0.317*	-0.230
	(0.14)	(1.88)	(−0.44)
Bank-specific controls:			
Size	0.433***	0.132***	0.439**
	(9.73)	(2.72)	(2.52)
Profitability	-1.723	-1.336	-0.366
	(−0.41)	(−0.66)	(−0.03)
Growth	-0.191	-0.787***	-0.676
	(−0.83)	(−2.94)	(−0.88)
Capital ratio	1.359	0.565	1.824
	(1.2)	(0.66)	(0.64)
Loans to assets	-0.124	-0.124	-0.691
	(−0.30)	(−0.38)	(−0.62)
Board size	0.133	0.154	-0.317
	(0.62)	(1.17)	(−0.47)
Board independence	-0.669	0.783*	-2.624
	(−1.15)	(1.82)	(−1.57)
Board gender diversity	-0.221	-0.352	-1.477
	(−0.54)	(−0.85)	(−1.09)
Constant	3.023***	4.519***	6.867**
	(2.89)	(4.62)	(2.28)
Bank-type fixed-effects	Yes	Yes	Yes
State fixed-effects	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes
No. of observations	405	405	405
Adj. R^2	0.76	0.58	0.48

The table reports the estimates of three alternative versions of Equation (1) based on a propensity score matched sample of banks. The three CEO compensation measures are defined as follows: (i) Total compensation is the logarithm of the sum of the CEO's annual base salary, bonuses, non-equity incentive plan compensation, the grant-date fair value of option awards, the grant-date fair value of stock awards, deferred compensation earnings, and other compensation, (ii) Salary is the logarithm of the annual base salary of the CEO, and (iii) Discretionary compensation is the logarithm of the sum of bonuses, non-equity incentive plan compensation, the grant-date fair value of option awards, and the grant-date fair value of stock awards. Attractiveness is a machine-based assessment of the CEO's facial attractiveness on a scale of 1–5. The control variables used in the regressions are defined as follows: CEO age is the age of the bank's CEO in years, Female CEO is a dummy variable which equals one if the bank's CEO is a female, Non-Caucasian CEO is a dummy variable which equals one if the ethnic background of the bank's CEO is other than Caucasian, CEO tenure is the length of tenure of the incumbent CEO in years, CEO duality is a dummy variable which equals one if the CEO is also the chairman of the board of directors, MBA/CPA is a dummy variable which equals one if the CEO holds an MBA graduate degree or is a Certified Public Accountant, PhD is a dummy variables that equals one if the CEO holds a doctoral degree, Size is the logarithm of total assets, Profitability is the return on assets calculated as net income divided by total assets, Growth is the logarithmic difference in net loans, Capital ratio is the ratio of Tier 1 equity capital to risk-weighted assets, Loans to assets is calculated as total loans divided by total assets, Board size is the logarithm of the number of board members, Board independence is the number of non-executive directors divided by the total number of board members, and Board gender diversity is the number of male directors divided by the total number of board members. All the continuous variables are winsorized at the 1th and 99th percentiles. The t-statistics (in parentheses) are based on robust standard errors which are adjusted for heteroskedasticity and are clustered by bank. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

regressions are very similar to the results reported in Tables 4–6, and indicate that CEO facial attractiveness is positively associated with *Total compensation* and *Discretionary compensation*. In both specifications, the coefficients for *Attractiveness* retain their statistical significance and are slightly larger in magnitude. Thus, we conclude that our results are robust to alternative model specifications and are not driven by multicollinearity.

Table 10
Additional tests.

Specification	Total compensation	Salary	Discretionary compensation
S0. The baseline results fromTables 4–6	0.165***	0.046	0.400***
S1. Constrained set of control variables	0.174***	0.059	0.456***
S2. Exclude CEO-specific control variables	0.167***	0.062	0.441***
S3. Exclude female and non-Caucasian CEOs	0.163***	0.050	0.408***
S4. Exclude oldest CEOs	0.154***	0.006	0.413***
S5. Exclude youngest CEOs	0.177***	0.069	0.366***
S6. Include only commercial banks	0.154**	0.078**	0.343**
S7. Exclude most non-traditional banks	0.188***	0.120**	0.491***
S8. Exclude most traditional banks	0.138**	0.046	0.420***
S9. Exclude TBTF banks	0.168***	0.062	0.424***
S10. Exclude smallest banks	0.165**	0.064	0.269**
S11. Dependent variables scaled by total assets	0.173***	0.011	0.212***
S12. Include TARP-recipient dummy	0.161***	0.040	0.388***
S13. Exclude TARP-recipient banks	0.144**	0.077	0.390***
S14. Truncated sample period, years 2005–2009	0.113	0.023	0.539**
S15. Truncated sample period, years 2010–2020	0.212***	0.057	0.383***
S16. Truncated sample period, exclude years 2008–2009	0.185***	0.058	0.389***

The table reports the estimated coefficients for Attractiveness from 16 different regression setups. The baseline estimates from Tables 4–6 are summarized in the first row (Specification 0). The three CEO compensation measures are defined as follows: (i) Total compensation is the logarithm of the sum of the CEO's annual base salary, bonuses, non-equity incentive plan compensation, the grant-date fair value of option awards, the grant-date fair value of stock awards, deferred compensation earnings, and other compensation, (ii) Salary is the logarithm of the annual base salary of the CEO, and (iii) Discretionary compensation is the logarithm of the sum of bonuses, non-equity incentive plan compensation, the grant-date fair value of option awards, and the grant-date fair value of stock awards. Attractiveness is a machine-based assessment of the CEO's facial attractiveness on a scale of 1–5. All the continuous variables are winsorized at the 1th and 99th percentiles. The t-statistics (in parentheses) are based on robust standard errors which are adjusted for heteroskedasticity and are clustered by bank. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Second, given that bank CEOs are primarily white males and female and non-white CEOs comprise only about 6% of firm-year observations in our sample, we next examine the robustness of our findings by re-estimating the regressions using a sample from which the female and ethnic minority CEOs have been excluded (Specification 3).[15] Given that the perception of facial attractiveness may apply differently to different demographic groups (see e.g., Li et al., 2021), this additional test also ensures that our results are not affected by potential biases in the beauty assessments related to demographic dimensions. The estimates of these regressions are consistent with the results presented in Tables 4–6. Most importantly, the estimated coefficients for *Attractiveness* are positive and significant at the 1% level in the regressions in which *Total compensation* and *Discretionary compensation* are used as the dependent variables.

Third, to further address concerns related to demographic attributes, we re-estimate the regressions using two subsamples from which either the youngest or the oldest quintiles of CEOs are excluded (Specifications 4 and 5). As documented by Adhikari et al. (2015), CEO total compensation increases with age, while, on the other hand, CEO age may also influence the perceived facial attractiveness. As can be seen from Table 10, the coefficients for *Attractiveness* are very similar to our main findings. Interestingly, the beauty premium in total compensation appears slightly larger for the subsample from which the youngest CEOs have been excluded whereas the effect of facial attractiveness on the discretionary components of compensation is slightly larger in economic magnitude for the subsample without the oldest CEOs.

Fourth, although our sample mostly comprises commercial banks, it also includes a small number of other savings and credit institutions, investment banks, and other financial services firms. To ensure that our findings are not affected by the different types of financial institutions, we re-estimate the regressions using three different subsamples. When the sample is constrained to include only commercial banks (Specification 6), the estimated coefficients for *Attractiveness* are positive and statistically significant not only in the *Total compensation* and *Discretionary compensation* regressions, but also in the regression with *Salary* as the dependent variable. As an alternative approach to investigate the sensitivity of our findings, we build two subsamples from which either the most non-traditional banks or the most traditional banks are excluded. For this purpose, we use *Loans to assets* and classify banks in the bottom and top quintiles as the most non-traditional and the most traditional banks in terms of their business model, respectively. When the most non-traditional banks are excluded (Specification 7), the coefficients for *Attractiveness* are positive and significant regardless of the dependent variable, and the coefficient estimates are larger in magnitude in comparison to our baseline results. When the most traditional banks are excluded from the sample (Specification 8), the coefficients for *Attractiveness* are positive and significant in the regressions with *Total compensation* and *Discretionary compensation* as the dependent variables.

Fifth, because bank size influences CEO compensation as well as the bank's business strategies, corporate governance mechanisms, and monitoring stringency, we next examine the sensitivity of our results to potential bank-size effects. We first re-estimate the

[15] Our sample of 272 individual bank CEOs includes 254 Caucasian males, 9 non-Caucasian males, and 9 females.

regressions using a subsample from which the too-big-to-fail banks with total assets in excess of $100 billion have been excluded (Specification 9). The estimated coefficients for *Attractiveness* are remarkably similar to our main regressions both in terms of statistical significance and economic magnitude. When the regressions are re-estimated using a subsample that excludes the smallest quintile of banks (Specification 10), the coefficients for *Attractiveness* are positive and significant at the 5% level in the regressions with *Total compensation* and *Discretionary compensation* as the dependent variables. As an alternative approach, we scale the CEO compensation variables by bank size. When these size-scaled compensation variables are used as the dependent variables (Specification 11), the coefficient estimates for *Attractiveness* remain positive and are statistically significant at the 1% level in the *Total compensation* and *Discretionary compensation* regressions. Thus, we can conclude that our results are not driven by bank-size effects.

Sixth, we acknowledge that banks participating in the Troubled Asset Relief Program (TARP) in the aftermath of the global financial crisis faced strict restrictions on their executive compensation policies (see e.g., Murphy, 2013). To investigate the potential influence of TARP executive-pay restrictions on our findings, we estimate regressions in which a dummy variable for the TARP recipients is used as an additional control variable (Specification 12). Once again, consistent with our main findings, the regression results indicate that *Attractiveness* is positively associated with *Total compensation* and *Discretionary compensation*, while being unrelated to *Salary*. Our second approach is to re-estimate the regressions using a subsample from which the TARP recipient banks have been excluded (Specification 13). The estimates based on this constrained subsample are similar to our main regressions; the coefficients for *Attractiveness* are positive and significant in the regressions with *Total compensation* and *Discretionary compensation* as the dependent variables.

Finally, we re-estimate the regressions using three truncated samples in order to examine the sensitivity of our results to the sample period used in the analysis. When the sample period is truncated to years 2005–2009 (Specification 14), the coefficient for *Attractiveness* is insignificant in the *Total compensation* and *Salary* regressions. Interestingly, however, in the regression with *Discretionary compensation* as the dependent variable, the coefficient estimate for *Attractiveness* is positive and significant and larger in magnitude than in any other specification. This finding may indicate that the influence of CEO facial attractiveness on the pay-setting process that involves more discretion and qualitative assessment has been constrained in the aftermath of the financial crisis by the advent of the new compensation-related regulations and disclosure requirements and more stringent market and regulatory oversight of executive compensation policies. As can be noted from Table 10, the estimation results based on the post-crisis years 2010–2020 (Specification 15) are consistent with our main regressions, and indicate that CEO facial attractiveness is positively associated with *Total compensation* and *Discretionary compensation*. Perhaps it is also worth noting that the effect of *Attractiveness* on *Total compensation* appears larger in economic magnitude during years 2010–2020. When we exclude the financial crisis years 2008–2009 from the sample, the regression results are qualitatively similar to our main analysis (Specification 16). Specifically, the coefficient estimates for *Attractiveness* are once again positive and significant at the 1% level in the regressions with *Total compensation* and *Discretionary compensation* as the dependent variables, while being insignificant in the *Salary* regressions.

Taken as a whole, the robustness checks demonstrate that our results are robust to many different empirical specifications and sample restrictions. Therefore, these additional tests provide strong evidence for the existence of a beauty premium in the executive labor market.

4.7. Limitations

Our empirical analysis is subject to several limitations that should be considered when interpreting the results. The most obvious critique towards any beauty premium study is omitted variable bias. We acknowledge that it is very difficult to isolate the effect of facial attractiveness and control for all the other, potentially latent confounding factors that are correlated with attractiveness and may influence CEO compensation. Although bank CEOs are a relatively homogenous group of individuals and we have controlled for a wide set of CEO-specific and bank-specific attributes and included different types of fixed-effects in the regressions, it is possible that omitted variables create a spurious linkage between the two variables of interest. Another related caveat in our analysis is that we focus only on facial attractiveness and ignore all other attractiveness traits such as body type or height.

Furthermore, while we argue that the banking industry provides an expedient context to investigate the beauty premium, the drawback of this choice is that it results in a relatively small sample of 167 banks and 272 individual CEOs. The small number of banks and individual CEOs naturally influences the statistical precision of our tests, and the use of large, publicly traded U.S. banks may limit the generalizability of our findings to other types of financial institutions and institutional settings.

Finally, it is important to recognize the common critique of machine learning techniques as black boxes. While beauty assessments based on deep convolutional neural networks should provide an objective consensus perception of facial attractiveness, we acknowledge that the model is not inherently interpretable and it is impossible to trace how the multitude of parameters are extracted from different facial attributes to make predictions about individuals' facial attractiveness. Moreover, training of the neural network requires large amounts of structured training data. The training data on facial attributes utilized in the fine-tuning of the deep convolutional neural network consists of 5500 facial images for which facial attractiveness has been evaluated on a scale of 1–5 by human assessment. Although the strong generalization power of deep learning models is already well established in the literature, given the relatively small number of facial images, our facial attractiveness scores based on the deep-learning algorithm may nevertheless be subject to potential idiosyncrasies in the human assessment of the training data.

5. Conclusions

This paper studies the effect of facial attractiveness on CEO compensation in the banking industry. A large body of literature has

documented that physical attractiveness may bring advantages in various situations and social interactions. Furthermore, beauty is also known to affect labor market outcomes. In their seminal study, Hamermesh and Biddle (1994) found that attractive-looking individuals are rewarded in the labor market for their good looks with higher wages. Over the last two decades, the existence of a beauty premium in wages has been documented in various experimental studies as well as in many different labor market settings and among different social and occupational groups. But does physical attractiveness influence compensation at the top executive level? In this paper, we address this question by examining whether facial attractiveness is reflected in the compensation of bank CEOs. Banks operate in a highly competitive environment and constitute a homogenous industry with a relatively homogenous set of top executives who are among the highest-paid individuals in the economy. Therefore, the banking industry provides a particularly attractive setting to investigate the beauty premium in the executive labor market.

We empirically test the beauty premium hypothesis using data on the S&P 1500 banks over the period 2005–2020. We exploit state-of-the-art machine learning techniques to evaluate facial images of 272 individual bank CEOs and then examine whether facial attractiveness influences the level and structure of CEO compensation. Our empirical findings demonstrate that good looks pay off for bank CEOs. Specifically, we find that CEO facial attractiveness is positively associated with the annual total compensation and discretionary, performance-based compensation components while being only weakly related to the annual base salary. Nevertheless, our findings also indicate that the pay-performance and pay-risk sensitivities of bank CEOs are unaffected by facial attractiveness.

The magnitude of the documented beauty premium in bank CEO compensation is economically meaningful. Our estimates suggest that a one standard deviation increase in the CEO facial attractiveness measure increases the total compensation by almost 9% ($395,000) after controlling for various CEO-specific and bank-specific attributes that are known to affect executive compensation. Moreover, the total compensation of above-average looking bank CEOs is about 24% ($1.06 million) higher than the compensation of CEOs with below-average looks, and the above-average looking CEOs have about 55% higher sum of bonuses, stock grants, and option grants than their less attractive peers.

Overall, the results documented in this paper offer strong evidence for the existence of a beauty premium in the executive labor market. The beauty premium persists even among the highest-paid individuals in the economy and bank CEOs seem to be as susceptible to attractiveness gaps in their compensation as average employees.

References

Aabo, T., & Giorici, I.C. (2022). Do female CEOs matter for ESG scores? Global Finance Journal, forthcoming.

Acrey, J. C., McCumber, W. R., & Nguyen, T. H. T. (2011). CEO incentives and bank risk. *Journal of Economics and Business, 63*(5), 456–471.

Adams, R. B., & Mehran, H. (2003). Is corporate governance different for bank holding companies? *Federal Reserve Bank of New York Economic Policy Review, 9*, 123–142.

Adhikari, H. P., Bulmash, S. B., Krolikowski, M. W., & Sah, N. B. (2015). Dynamics of CEO compensation: Old is gold. *The Quarterly Review of Economics and Finance, 57*, 191–206.

Aggarwal, R. K., & Samwick, A. A. (1999). The other side of the trade-off: The impact of risk on executive compensation. *Journal of Political Economy, 107*(1), 65–105.

Ahmed, S., Davydov, D., & Vähämaa, S. (2022). Trends in executive compensation across bank types. In Kalmi, P., Auvinen, T. & Järvenpää, M. (Eds.), Responsible Finance and Digitalization: Implications and Developments (pp. 24–45). Routledge.

Ahmed, S., Sihvonen, J., & Vähämaa, S. (2019). CEO facial masculinity and bank risk-taking. *Personality and Individual Differences, 138*, 133–139.

Aivazian, V. A., Lai, T., & Rahaman, M. M. (2013). The market for CEOs: An empirical analysis. *Journal of Economics and Business, 67*, 24–54.

Altunbaş, Y., Thornton, J., & Uymaz, Y. (2018). CEO tenure and corporate misconduct: Evidence from US banks. *Finance Research Letters, 26*, 1–8.

Andreoni, J., & Petrie, R. (2008). Beauty, gender and stereotypes: Evidence from laboratory experiments. *Journal of Economic Psychology, 29*, 73–93.

Ang, J., Lauterbach, B., & Schreiber, B. Z. (2002). Pay at the executive suite: How do US banks compensate their top management teams? *Journal of Banking & Finance, 26*(6), 1143–1163.

Antecol, H., & Bedard, K. (2004). The racial wage gap: The importance of labor force attachment differences across black, Mexican, and white men. *Journal of Human Resources, 39*(2), 564–583.

Bai, G., & Elyasiani, E. (2013). Bank stability and managerial compensation. *Journal of Banking & Finance, 37*, 799–813.

Baselga-Pascual, L., Trujillo-Ponce, A., Vähämaa, E., & Vähämaa, S. (2018). Ethical reputation of financial institutions: Do board characteristics matter? *Journal of Business Ethics, 148*(3), 489–510.

Bebchuk, L. A., & Fried, J. M. (2003). Executive compensation as an agency problem. *Journal of Economic Perspectives, 17*(3), 71–92.

Bebchuk, L.A., & Fried, J.M. (2004). Pay without Performance: The Unfulfilled Promise of Executive Compensation. Harvard University Press.

Bebchuk, L. A., Fried, J. M., & Walker, D. (2002). Managerial power and rent extraction in the design of executive compensation. *The University of Chicago Law Review, 69*(3), 751.

Berggren, N., Jordahl, H., & Poutvaara, P. (2010). The looks of a winner: Beauty and electoral success. *Journal of Public Economics, 94*(1–2), 8–15.

Bertrand, M., & Mullainathan, S. (2001). Are CEOs rewarded for luck? The ones without principals are. *The Quarterly Journal of Economics, 116*(3), 901–932.

Bhagat, S., & Bolton, B. (2014). Financial crisis and bank executive incentive compensation. *Journal of Corporate Finance, 25*, 313–341.

Bharati, R., & Jia, J. (2018). Do bank CEOs really increase risk in vega? Evidence from a dynamic panel GMM specification. *Journal of Economics and Business, 99*, 39–53.

Biddle, J. E., & Hamermesh, D. S. (1998). Beauty, productivity, and discrimination: Lawyers' looks and lucre. *Journal of Labor Economics, 16*(1), 172–201.

Blankespoor, E., Hendricks, B. E., & Miller, G. S. (2017). Perceptions and price: Evidence from CEO presentations at IPO roadshows. *Journal of Accounting Research, 55*(2), 275–327.

Blau, F. D., & Kahn, L. M. (2017). The gender wage gap: Extent, trends, and explanations. *Journal of Economic Literature, 55*(3), 789–865.

Borland, J., & Leigh, A. (2014). Unpacking the beauty premium: What channels does it operate through, and has it changed over time? *Economic Record, 90*, 17–32.

Brewer, G., & Howarth, S. (2012). Sport, attractiveness and aggression. *Personality and Individual Differences, 53*(5), 640–643.

Bugeja, M., Matolcsy, Z. P., & Spiropoulos, H. (2012). Is there a gender gap in CEO compensation? *Journal of Corporate Finance, 18*(4), 849–859.

Canil, J., Karpavičius, S., & Yu, C. F. (2019). Are shareholders gender neutral? Evidence from say on pay. *Journal of Corporate Finance, 58*, 169–186.

Carmalt, J. H., Cawley, J., Joyner, K., & Sobal, J. (2008). Body weight and matching with a physically attractive romantic partner. *Journal of Marriage and Family, 70*(5), 1287–1296.

Castilla, E. J. (2008). Gender, race, and meritocracy in organizational careers. *American Journal of Sociology, 113*(6), 1479–1526.

Cerasi, V., Deininger, S. M., Gambacorta, L., & Oliviero, T. (2020). How post-crisis regulation has affected bank CEO compensation. *Journal of International Money and Finance, 104*, Article 102153.

Chen, X., Torsin, W., & Tsang, A. (2022). International differences in the CEO gender pay gap. *Corporate Governance: An International Review, Forthcoming*.

Chiu, R. K., & Babcock, R. D. (2002). The relative importance of facial attractiveness and gender in Hong Kong selection decisions. *International Journal of Human Resource Management, 13*(1), 141–155.
Coles, J. L., Daniel, N. D., & Naveen, L. (2006). Managerial incentives and risk-taking. *Journal of Financial Economics, 79*(2), 431–468.
Coles, J. L., Daniel, N. D., & Naveen, L. (2008). Boards: Does one size fit all? *Journal of Financial Economics, 87*(2), 329–356.
Connelly, B. L., Lee, K., Hersel, M., & Walker, J. (2020). Attractive CEOs: Let off the hook or held to a higher standard? *Working Paper*.
Cook, D., & Mobbs, S. (2022). CEO selection and executive appearance. *Journal of Financial and Quantitative Analysis*. forthcoming.
Core, J., & Guay, W. (2002). Estimating the value of employee stock option portfolios and their sensitivities to price and volatility. *Journal of Accounting Research, 40*(3), 613–630.
Core, J. E., Holthausen, R. W., & Larcker, D. F. (1999). Corporate governance, chief executive officer compensation, and firm performance. *Journal of Financial Economics, 51*(3), 371–406.
Cyert, R. M., Kang, S. H., & Kumar, P. (2002). Corporate governance, takeovers, and top-management compensation: Theory and evidence. *Management Science, 48*(4), 453–469.
Deng, J., Dong, W., Socher, R., Li, L. J., Li, K., & Fei-Fei, L. (2009). Imagenet: A large-scale hierarchical image database. *In 2009 IEEE Conference on Computer Vision and Pattern Recognition*, 248–255.
Deryugina, T., & Shurchkov, O. (2015). Now you see it, now you don't: The vanishing beauty premium. *Journal of Economic Behavior and Organization, 116*, 331–345.
DeYoung, R., Peng, E. Y., & Yan, M. (2013). Executive compensation and business policy choices at U.S. commercial banks. *Journal of Financial and Quantitative Analysis, 48*(1), 165–196.
Dittmar, A., & Duchin, R. (2016). Looking in the rearview mirror: The effect of managers' professional experience on corporate financial policy. *The. Review of Financial Studies, 29*, 565–602.
Doorley, K., & Sierminska, E. (2015). Myth or fact? The beauty premium across the wage distribution in Germany. *Economics Letters, 129*, 29–34.
Dreher, G. F., Lee, J. Y., & Clerkin, T. A. (2011). Mobility and cash compensation: The moderating effects of gender, race, and executive search firms. *Journal of Management, 37*(3), 651–681.
Elkinawy, S., & Stater, M. (2011). Gender differences in executive compensation: Variation with board gender composition and time. *Journal of Economics and Business, 63*(1), 23–45.
Fahlenbrach, R., & Stulz, R. M. (2011). Bank CEO incentives and the credit crisis. *Journal of Financial Economics, 99*, 11–26.
Feingold, A. (1992). Gender differences in mate selection preferences: A test of the parental investment model. *Psychological Bulletin, 112*(1), 125.
Fletcher, J. (2009). Beauty vs. brains: Early labor market outcomes of high school graduates. Economics Letters, 105(3), 321–325.
Fulmer, I. S. (2009). The elephant in the room: Labor market influences on CEO compensation. *Personnel Psychology, 62*(4), 659–695.
Gabaix, X., & Landier, A. (2008). Why has CEO pay increased so much? *The Quarterly Journal of Economics, 123*(1), 49–100.
Gande, A., & Kalpathy, S. (2017). CEO compensation and risk-taking at financial firms: Evidence from U.S. federal loan assistance. *Journal of Corporate Finance, 47*, 131–150.
Gayle, G. L., Golan, L., & Miller, R. A. (2012). Gender differences in executive compensation and job mobility. *Journal of Labor Economics, 30*(4), 829–872.
Gomulya, D., Wong, E. M., Ormiston, M. E., & Boeker, W. (2017). The role of facial appearance on CEO selection after firm misconduct. *Journal of Applied Psychology, 102*(4), 617.
Gottesman, A. A., & Morey, M. R. (2010). CEO educational background and firm financial performance. *Journal of Applied Finance, 20*(2), 70–82.
Gounopoulos, D., Loukopoulos, G., & Loukopoulos, P. (2021). CEO education and the ability to raise capital. *Corporate Governance: An International Review, 29*(1), 67–99.
Graham, J. R., Harvey, C. R., & Puri, M. (2017). A corporate beauty contest. *Management Science, 63*(9), 3044–3056.
Gupta, V. K., Mortal, S. C., & Guo, X. (2018). Revisiting the gender gap in CEO compensation: Replication and extension of Hill, Upadhyay, and Beekun's (2015) work on CEO gender pay gap. *Strategic Management Journal, 39*(7), 2036–2050.
Guthrie, K., Sokolowsky, J., & Wan, K.-M. (2012). CEO compensation and board structure revisited. *Journal of Finance, 67*(3), 1149–1168.
Hadley, B. (2019). Executive compensation and political sensitivity: Evidence from government contractors. *Journal of Corporate Finance, 59*, 276–301.
Halford, J. T., & Hsu, H. C. S. (2020). Beauty is wealth: CEO attractiveness and firm value. *The Financial Review, 55*(4), 529–556.
Hamermesh, D., & Biddle, J. (1994). Beauty and the labor market. *The American Economic Review, 84*(5), 1174–1194.
Hamermesh, D. S. (2006). Changing looks and changing "discrimination": The beauty of economists. *Economics Letters, 93*(3), 405–412.
Hamermesh, D.S. (2011). Beauty pays: Why attractive people are more successful. Princeton University Press.
Hamermesh, D. S., & Parker, A. (2005). Beauty in the classroom: Instructors' pulchritude and putative pedagogical productivity. *Economics of Education Review, 24*(4), 369–376.
Harper, B. (2000). Beauty, stature and the labour market: A British cohort study. *Oxford Bulleting of Economics and Statistics, 62*, 771–800.
He, K., Zhang, X., Ren, S., & Sun, J. (2016). Deep residual learning for image recognition. *In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, 770–778.
He, Z., & Hirshleifer, D. (2022). The exploratory mindset and corporate innovation. *J. Financial Quant. Anal., 57*(1), 127–169.
Hill, A. D., Upadhyay, A. D., & Beekun, R. I. (2015). Do female and ethnically diverse executives endure inequity in the CEO position or do they benefit from their minority status? An empirical examination. *Strategic Management Journal, 36*(8), 1115–1134.
Hill, C. W., & Phan, P. (1991). CEO tenure as a determinant of CEO pay. *Academy of Management Journal, 34*(3), 707–717.
Hosoda, M., Stone-Romero, E. F., & Coats, G. (2003). The effects of physical attractiveness on job-related outcomes: A meta-analysis of experimental studies. *Personnel Psychology, 56*(2), 431–462.
Houston, J. F., & James, C. (1995). CEO compensation and bank risk: Is compensation in banking structured to promote risk taking? *Journal of Monetary Economics, 36*(2), 405–431.
Jackson, L. A., Hunter, J. E., & Hodge, C. N. (1995). Physical attractiveness and intellectual competence: A meta-analytic review. *Social Psychology Quarterly*, 108–122.
Jensen, M. C., & Murphy, K. J. (1990). CEO incentives-It's not how much you pay, but how. *Journal of Applied Corporate Finance, 3*(3), 36–49.
Jia, Y., van Lent, L., & Zeng, Y. (2014). Masculinity, testosterone, and financial misreporting. *Journal of Accounting Research, 52*(5), 1195–1246.
Jobu Babin, J., Hussey, A., Nikolsko-Rzhevskyy, A., & Taylor, D. A. (2020). Beauty premiums among academics. *Economics of Education Review, 78*, 10209.
John, K., Saunders, A., & Senbet, L. W. (2000). A theory of bank regulation and management compensation. *The Review of Financial Studies, 13*(1), 95–125.
Johnston, D. W. (2010). Physical appearance and wages: Do blondes have more fun? *Economics Letters, 108*(1), 10–12.
Kamiya, S., Kim, Y. H., & Park, S. (2019). The face of risk: CEO facial masculinity and firm risk. *European Financial Management, 25*(2), 239–270.
Kaplan, S. N., & Rauh, J. (2010). Wall Street and Main Street: What contributes to the rise in the highest incomes? *The Review of Financial Studies, 23*(3), 1004–1050.
Keller, W., Molina, T., & Olney, W.W. (2020). The gender gap among top business executives. NBER Working Paper Series, No. w28216).
Keller, W., & Olney, W. W. (2021). Globalization and executive compensation. *Journal of International Economics, 129*, Article 103408.
Kim, C., & Sakamoto, A. (2010). Have Asian American men achieved labor market parity with white men? *American Sociological Review, 75*(6), 934–957.
King, T., Srivastav, A., & Williams, J. (2016). What's in an education? Implications of CEO education for bank performance. *Journal of Corporate Finance, 37*, 287–308.
Koch, T. W., Waggoner, D. F., & Wall, L. D. (2018). Incentive compensation, accounting discretion and bank capital. *Journal of Economics and Business, 95*, 119–140.
Langlois, J. H., Kalakanis, L., Rubenstein, A. J., Larson, A., Hallam, M., & Smoot, M. (2000). Maxims or myths of beauty? A meta-analytic and theoretical review. *Psychological Bulletin, 126*(3), 390.
Leszczynska, D., & Chandon, J. L. (2019). Is there still a gender effect on CEO compensation? *Journal of Management Development, 38*(5), *336–356*.
Li, M., Triana, M. D. C., Byun, S.-Y., & Chapa, O. (2021). Pay for beauty? A contingent perspective of CEO facial attractiveness on CEO compensation. *Human Resource Management, 60*(6), 843–862.
Liang, L., Lin, L., Jin, L., Xie, D., & Li, M. (2018). SCUT-FBP5500: A diverse benchmark dataset for multi-paradigm facial beauty prediction. In 2018 24th International Conference on Pattern Recognition (ICPR) (pp. 1598–1603). IEEE.

Luxen, M. F., & Van De Vijver, F. J. (2006). Facial attractiveness, sexual selection, and personnel selection: When evolved preferences matter. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior, 27*(2), 241–255.
McCall, L. (2001). Sources of racial wage inequality in metropolitan labor markets: Racial, ethnic, and gender differences. *American Sociological Review, 66*(4), 520–541.
Meltzer, A. L., McNulty, J. K., Jackson, G. L., & Karney, B. R. (2014). Sex differences in the implications of partner physical attractiveness for the trajectory of marital satisfaction. *Journal of Personality and Social Psychology, 106*(3), 418.
Mishkin, D., Sergievskiy, N., & Matas, J. (2017). Systematic evaluation of convolution neural network advances on the imagenet. *Computer Vision and Image Understanding, 161*, 11–19.
Mishra, C. S., & Nielsen, J. F. (2000). Board independence and compensation policies in large bank holding companies. *Financial Management*, 51–69.
Mobius, M. M., & Rosenblat, T. S. (2006). Why beauty matters. *American Economic Review, 96*(1), 222–235.
Morse, A., Nanda, V., & Seru, A. (2011). Are incentive contracts rigged by powerful CEOs? *Journal of Finance, 66*(5), 1779–1821.
Murphy, K. J. (1985). Corporate performance and managerial remuneration: An empirical analysis. *Journal of Accounting and Economics, 7*(1–3), 11–42.
Murphy, K. J. (2013). Executive compensation: Where we are, and how we got there. In G. M. Constantinides, M. Harris, & R. M. Stulz (Eds.), *Handbook of the Economics of Finance* (Vol. 2, pp. 211–356). Elsevier.
Nguyen, D. D., Hagendorff, J., & Eshraghi, A. (2015). Which executive characteristics create value in banking? Evidence from appointment announcements. *Corporate Governance: An International Review, 23*(2), 112–128.
Oghazi, P. (2016). Beautiful teaching and good performance. *Journal of Business Research, 69*(5), 1887–1891.
Owen, A. L., & Temesvary, J. (2019). CEO compensation, pay inequality, and the gender diversity of bank board of directors. *Finance Research Letters, 30*, 276–279.
Parrett, M. (2015). Beauty and the feast: Examining the effect of beauty on earnings using restaurant tipping data. *Journal of Economic Psychology, 49*, 34–46.
Pathan, S., & Faff, R. (2013). Does board structure in banks really affect their performance? *Journal of Banking & Finance, 37*, 1573–1589.
Peltomäki, J., Sihvonen, J., Swidler, S., & Vähämaa, S. (2021). Age, gender, and risk-taking: Evidence from the S&P 1500 executives and market-based measures of firm risk. *Journal of Business Finance & Accounting, 48*(9–10), 1988–2014.
Philippon, T., & Reshef, A. (2012). Wages and human capital in the US finance industry: 1909–2006. *The Quarterly Journal of Economics, 127*(4), 1551–1609.
Rekker, S. A. C., Benson, K. L., & Faff, R. W. (2014). Corporate social responsibility and CEO compensation revisited: Do disaggregation, market stress, gender matter. *Journal of Economics and Business, 72*, 84–103.
Rhodes, G. (2006). The evolutionary psychology of facial beauty. *Annual Review of Psychology, 57*, 199–226.
Rule, N. O., & Ambady, N. (2008). The face of success: Inferences from chief executive officers' appearance predict company profits. *Psychological Science, 19*(2), 109–111.
Scholz, J. K., & Sicinski, K. (2015). Facial attractiveness and lifetime earnings: Evidence from a cohort study. *Review of Economics and Statistics, 97*(1), 14–28.
Serfling, M. A. (2014). CEO age and the riskiness of corporate policies. *Journal of Corporate Finance, 25*, 251–273.
Smith, C. W., Jr, & Watts, R. L. (1992). The investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Financial Economics, 32*(3), 263–292.
Song, W. L., & Wan, K. M. (2019). Does CEO compensation reflect managerial ability or managerial power? Evidence from the compensation of powerful CEOs. *Journal of Corporate Finance, 56*, 1–14.
Tosi, H. L., Werner, S., Katz, J. P., & Gomez-Mejia, L. R. (2000). How much does performance matter? A meta-analysis of CEO pay studies. *Journal of Management, 26*(2), 301–339.
Urquhart, A., & Zhang, H. (2022). PhD CEOs and firm performance. *European Financial Management, 28*(2), 433–481.
Warner, R. M., & Sugarman, D. B. (1986). Attributions of personality based on physical appearance, speech, and handwriting. *Journal of Personality and Social Psychology, 50*(4), 792–799.
Webster Jr, M., & Driskell Jr, J. E. (1983). Beauty as status. *American Journal of Sociology, 89*(1), 140–165.
Weichselbaumer, D., & Winter-Ebmer, R. (2005). A meta-analysis of the international gender wage gap. *Journal of Economic Surveys, 19*(3), 479–511.
Williams, K. M., Park, J. H., & Wieling, M. B. (2010). The face reveals athletic flair: Better National Football League quarterbacks are better looking. *Personality and Individual Differences, 48*(2), 112–116.
Wong, E. M., Ormiston, M. E., & Haselhuhn, M. P. (2011). A face only an investor could love: CEOs' facial structure predicts their firms' financial performance. *Psychological Science, 22*(12), 1478–1483.
Zweigenhaft, R. (2021). Diversity Among Fortune 500 CEOs from 2000 to 2020: White Women, Hi-Tech South Asians, and Economically Privileged Multilingual Immigrants from Around the World. University of California at Santa Cruz, https://whorulesamerica.ucsc.edu/.