Response to Reviewer 2 Comments

Thank you for reading our manuscript and reviewing it, which will help us improve it to a better scientific level. We revised our manuscript, and quite a lot of changes have taken place. So we have sent the revised manuscript, and a version containing all the changes to be visible.
There are two things to tell you here. One is that when we send the article to the MDPI English editing system for editing, the version that needs to be uploaded does not include the title, pictures, forms, author information, patents and references of the article, so when we receive the edited version, we pasted the related content in, these parts turned red because of the function of "track changes", so it is not clear which references have been modified. In fact, we added thirteen references. It can also be seen in a modified version before the English editor. Second, the word line number marks are discontinuous after retouching. If the comments in word are turned off, continuous line number marks will appear. In order not to cause confusion, the line number mark in the modified report is a continuous version of the latter.
The main corrections are in the manuscript and the responds to the reviewers' comments are as follows (the replies are highlighted in red).

Point 1: Open Review: I would not like to sign my review report.

Response 1: Thank you very much for the comment.

Point 2: English language and style: Moderate English changes required.

Response 2: Thank you very much for the comment. We have used MDPI English Editing Service to revise the English language.

Point 3: Does the introduction provide sufficient background and include all relevant references? Must be improved.

Response 3: Thank you very much for the comment. We have improved the introduction part. Particularly, in order to avoid repetition, regarding this reply, please see the ninth reply below, thank you.

Point 4: Is the research design appropriate? Must be improved.

Response 4: Thank you very much for the comment. In order to avoid repetition, regarding this reply, please see the eighth reply below, thank you.

Point 5: Are the methods adequately described? Must be improved.

Response 5: Thank you very much for the comment. In order to avoid repetition, regarding this reply, please see the eighth reply below, thank you.

Point 6: Are the results clearly presented? Must be improved.

Response 6: Thank you very much for the comment. We have compared obtained results with other authors in line 337-341, line 354-356, line 367-372, line 385-387, and line 408-410. That is

"On the basis of Corollary 1, the value of inside debt (ID) is positively associated with the bank default risk (σ_θ), which is similar to Freund et al. [35] who found positive relationships between CEO inside debt holdings and the firm's likelihood to issue debt. This finding is consistent with that of Hagendorff and Vallascas [10] who held that high vega banks pursue acquisitions that result in increasing default risk."

"On the basis of Corollary 2, the number of periods (λ) is positive with the inside debt value (ID). This finding is consistent with Gopalan et al. (see prediction 2), who concluded that the shorter the pay duration of a firm, the more volatile the cash flows [49]."

"On the basis of Corollary 3, both number of periods (λ) and the default risk (σ_θ) are positive with inside debt value (ID). As a consequence, the shorter the time period $\Delta = \kappa/\lambda$, the stronger the effect of the default risk. This demonstrates that bankers with shorter tenure have a stronger incentive to take more risks for more return. This finding is consistent with that reported by Gopalan et al. (see prediction 2), who concluded that the shorter the pay duration of a firm, the more volatile the cash flows [49]."

"On the basis of Corollary 4, the value of total compensation (TC) is positively associated with the bank default risk (σ_θ). This finding is consistent with the findings of the IMF [9], who showed that higher pay is associated with lower bank risk containing default risk, equity risk, and tail risk."

"On the basis of Corollary 4, bankruptcy occurs when $\boldsymbol{\sigma_\theta > -\frac{P_B+G}{B\times\rho}}$. This is consistent with Roy [43] and Laeven and Levine [44], who stated that insolvency is defined as a state in which losses surmount equity."

Point 7: Are the conclusions supported by the results? Must be improved.

Response 7: Thank you very much for the comment. We have improved the conclusion part. To be more specific, we have provided a detailed description of the contribution of this study. Particularly, we have expressed better how they "close theoretical gap" in line 658-661. That is

"This long-term compensation model lays the foundation for further theoretical analysis because, in prior studies, most researchers only used annual data to analyze the relationship of different kinds of executive compensation and bank risk and ignored the compensation of one CEO for their entire tenure. In other words, we set up a long-term compensation model, which provides a new perspective for theoretical analysis."

Point 8: The manuscript must better discuss the research topic, since it appears to dwell without finalizing the topic. On the one hand, it seems more a mathematical demonstration theorem than an academic and research paper. On the other, it has a non-traditional structure that creates confusion. For instance, there are some boxes and mathematical equations that even though they are interesting, they may deviate the attention of readers.

Response 8: Thank you very much for the comment. We understand your comments. Indeed, you may feel too much math when you first read our article, but this is because of the following reasons. The first is the research object. Our research question is the impact of inside debt and other types of compensation on bank risk-taking. In actual calculations, the calculation of inside debt requires many variables, which are based on facts, not blindly added in order to appear complicated. Secondly, it also involves European call options, and

there are at least five variables involved in options, as we know. Thirdly, in order to better distinguish the variables of different dimensions, we pioneered the annual compensation, pay-per-use, and compensation for the entire term, and divided the total compensation into three categories to study the structure of the compensation. Therefore, the mathematics part is mostly to clarify the problem, which is caused by the objective of the research object.
In addition, for our article you said is not a traditional structure, we believe that, on the one hand, from the perspective of econometric analysis and research, it is true. Econometric articles generally first conjecture, then describe the data, perform the regression analysis, and robustness test, etc. On the other hand, there are many other research methods for a problem, such as case analysis, questionnaire survey, experimental analysis, theoretical analysis, simulation analysis, numerical analysis, and so on. Our article is written based on a theoretical analysis framework, that is, first put forward the assumption of the model (see Assumption 1-14), then establish a theoretical analysis model, get lemmas, propositions, corollaries, etc., and then perform numerical analysis and simulation and combine specific cases to make the data more accurate. For instance, see Black and Scholes (1973) (reference 42 in our paper, Fischer Black; Myron Scholes. The Pricing of Options and Corporate Liabilities. J. Polit. Econ. 1973, 81, 637-654.) So from this perspective, this article can be regarded as a traditional theoretical analysis article, but the mathematical derivation is a bit long. But we did ignore the robustness test. We have done the robustness test in the past few days and the results are robust, so thank you for your valuable comments.

Point 9: The introduction should be focused on a brief summary of the motivation, research question, definitions of key terms, arguments, data used, contributions, and perhaps an outline of the remainder of the paper.

Response 9: Thank you very much for the comment. We have revised the introduction part carefully and restructured this part according to the order in the following table.

Location	Content
line 44 to 50, paragraph 2	a brief summary of the motivation
line 35 to 37, paragraph 1	research question
line 32 to 35, paragraph 1	definitions of key terms
line 51 to 115, paragraph 3-10	arguments
line 116 to 125, paragraph 11	data used
line 126 to 135, paragraph 12	contributions
line 136 to 143, paragraph 13	an outline of the remainder of the paper

That is
Introduction

"During the four decades since Jensen and Meckling published their article in 1976 [1], the academic literature on executive compensation has increased. Most of the papers focused predominantly on equity-based compensation (also called "inside equity" here) paid in the form of restricted stock, stock options, and other instruments, whose value lies in the equity returns in the future. However, Sundaram and Yermack [2] first proposed that chief executive officers (CEOs) with high debt-based compensation (also called "inside debt" here) manage their firms conservatively. Per Jensen and Meckling [1], inside debt is defined as benefit pensions and deferred compensation. Sundaram and Yermack [2] defined inside debt as "the promise to pay them fixed sums of cash in the future". In this study, we investigated the true relationship of inside debt and bank risk and found the principle and reason for the relationship, proceeding from reality. Figure 1 summarizes the related studies and outlines the framework of our study. We define the total compensation as the sum of cash salary, inside equity, and inside debt from

the following aspects: remuneration level, compensation structure level, bank level, measure level, board level, and reform level.

Overall, our study is important for understanding financial stability. Specifically, Abad-Segura et al. [3] raised the obligation of companies to corporate social responsibility from a sustainability approach. Of the unique characteristics of the banking industry, corporate governance in banks is different from that in nonfinancial firms [4]. Banks have various special attributes: their high leverage, their opaqueness, and their systemic risk. In other words, the risk taking of a single bank may result in depression and even collapse of the whole economy, with potential for international consequences (Figure 1, middle right).

The factors influencing bank risk from the perspective of corporate governance include board attributes, remuneration and pay contract, risk management, and the measure of risk.

Firstly, in terms of board attributes, Beltratti and Stulz [5] found that shareholder-friendly boards are positively associated with default risk. Erkens et al. [6] stated that banks with a higher fraction of independent directors reduced leverage risk by raising equity during the 2008 financial crisis. Berger et al. [7] concluded that portfolio risk is positively related to younger executives and female directors. Minton et al. [8] demonstrated the positive association between a higher amount of financial experts and bank risk, including equity risk, leverage risk and portfolio risk. The International Monetary Fund (IMF) [9] reported that a higher fraction of independent directors is positively associated with lower bank risk. However, the effect of following remain unknown: nonexecutive directors, the board process, and the joint impact of board attributes and CEO power (Figure 1, upper right).

Secondly, for the remuneration level, Hagendorff and Vallascas [10] reported that high vega banks pursue acquisitions that result in increasing default risk. DeYoung et al. [11] pointed out that a higher vega results in shifting the business model of banks to non-traditional activities associated with an increase in equity risk. Galletta and Mazzù [12] created a liquidity mismatch index based on the loan-to-deposit ratio for three different bank business models. The IMF [9] showed that higher equity-based pay is associated with lower bank risk, including default risk, equity risk, and tail risk. Bennett et al. [13] found that higher inside debt was associated with lower default risk during the 2008 financial crisis. van Bekkum [14] and Bolton et al. [15] demonstrated the negative relationship between inside debt and tail risk. Cheng et al. [16] identified that residual compensation is positively related to equity risk (Figure 1, middle left).

Thirdly, on the risk management level, Keys et al. [17] reported that stronger risk management is associated with less risky subprime loan securitizations. Fahlenbrach et al. [18] stated that banks with persistent risk-taking culture performed poorly and were more likely to fail during the 2007–2008 financial crisis. Ellul and Yerramilli [19] reported that the stronger risk management index (RMI) is associated with lower tail risk exposure and better loan quality. RMI was also a strong predictor of bank tail risk exposures during the financial crisis. Köhler et al. [20] studied the impact of business models on bank stability in European Union (EU) countries. The IMF [9] stated that banks with a risk committee are associated with lower risk-taking. The joint impact is still unknown (Figure 1, lower right).

Fourthly, risk can be measured using different methods, for instance, portfolio risk [17], default risk [18], tail risk [19], equity risk [9], and leverage [8] (Figure 1, upper right).

Though usually calculated on the basis of cash salary and inside equity, which can promote risk incentives, inside debt has been almost considered a tool for risk reduction in prior work on empirical analysis. The results reported by Wu [21] further indicate that this positive effect of CEO inside debt is mainly driven by deferred compensation. Srivastav et al. [22] concluded that inside debt can help to address risk-shifting concerns by aligning the interests of CEOs with those of creditors, regulators, and, in the case of TARP banks, the taxpayer. Then, Srivastav et al (2018) [23] sated that banks, when acquiring CEOs, have high inside debt incentives and display lower market measures of risk and lower loss exposures for taxpayers. Reid [24] outlined the best structures of inside debt so that it functions as a resource to manage firm risk. Mo et al. [25] empirically found a positive association between CEO inside debt holdings and long-term horizons. Milidonis et al. [26] identified a significant and negative relationship between CEO inside debt holdings and risk-taking behavior. Deng et al. [27] showed that

CEO compensation deferring significantly reduces bank risk-taking in an emerging market. Chen and Fan [28] investigated the effects of a borrowing firm's CEO inside debt holdings on the structure of the firm's syndicated loans. Bhandari et al. [29] linked debt-like compensation to financial analyst behavior.

Other aspects of inside debt and its mechanisms influence a bank's situation. For instance, the results reported by Sheikh [30] suggest that market competition significantly influences the effect of CEO inside debt on corporate risk-taking. Li et al. [31] provided an inside debt metric that is conceptually superior to previously used metrics. Li and Zhang [32] stated that firms with a higher ratio of female directors tend to have a larger proportion of short-maturity debt. Li et al. [33] found that when a CEO holds a large amount of inside debt, the firm is less likely to issue convertibles than straight debt. Im et al. [34] investigated the impact of CEO inside debt on cost decisions. Freund et al. [35] identified positive relationships between CEO inside debt holdings and the firm's likelihood to issue debt. Dasgupta et al. [36] reported that employee deposits mitigate firms' risk-taking behavior and reduce the agency cost of debt. Colonnello et al. [37] showed that the size and seniority of inside debt are crucial in the relationship between inside debt and credit spreads. Chi et al. [38] highlighted the importance of investigating the implication of CEO debt-like compensation for corporate tax policies. Brisker and Wang [39] thought that debt-type compensation (inside debt) exacerbates the divergence in risk preferences, affecting capital structure decisions. Belkhir et al. [40] were the first to examine the relationship between debt-like compensation and excess cash valuation. Beavers [41] found that larger firms with high CEO inside debt have lower interest rates on these debt instruments and shorter maturities. Overall, the above suggest a more conservative financing policy with regards to debt.

However, in practice, only cash salary is paid per year, not inside debt or inside equity. As a consequence, identifying the principle and mechanism of inside debt using empirical analysis with annual data is hard. In the literature, most of the empirical analysis of various remunerations was conducted on an annual basis, but only the actual calculation of fixed remuneration was conducted on an annual basis. In reality, inside equity is issued on a recurring basis only when the company's equity increases, and the inside debt is deferred, the value of which is linearly related to the first two. In this study, we aimed to define and distinguish the three types of compensation calculations and the relationship with risk in three dimensions, to further analyze the changes in their nature considering bankruptcy, and to establish a case with an executive's tenure as a term. We used CEO compensation and U.S. bank accounting data from the ExecuComp and BvD Orbis databases.

We initiated this research by modeling the theoretical relationship between inside debt and bank default risk. First, if the bank's possibility of bankruptcy is not considered, the cash salary of bankers is paid per year and is not irrelevant to the bank risk; inside equity is paid per time (usually not by year) and can be considered as a series of sequential call options. Inside debt is paid in the latter part of the banker's tenure and the calculation of inside debt is linearly related to the sum of cash salary and inside equity per year. So, we defined the three kinds of compensation using three dimensions: inside debt per time, per year, and during the tenure, completing the same for inside equity and cash salary for the convenience of calculation. After setting the model of inside debt and default risk, we performed a simulation using data from Wells Fargo & Co. to identify further features. Then, considering the possibility of bankruptcy, we attempted to identify further features.

The remainder of this paper is organized as follows. We create a model of long-term debt-based compensation in Section 2. We characterize the function of inside debt and bank default risk and then we analyze the nature of functions and related indicators such as the inside debt vega $Vega_{ID}$ and the sensitivity of inside debt SEN_{ID} in Section 3. Since the function is an implicit function of risk, it is impossible to directly write the expression based on the nature of the similarity to the BS option function, we drew the fitting graph using Wells Fargo & Co. data in Section 4. We directly obtained some more intuitive features from the figures that are not to obtain from other mathematical methods. The last section concludes the paper.

Point 10: The introduction should also clearly state the conversation this manuscript wants to participate.

Response 10: Thank you very much for the comment. We did considered this question. Actually the conversation this manuscript wants to participate is in Section 2.1 Assumptions of the model. Due to the inclusion of some specialized variables, we put this part in Section 2 instead of Section 1 to make the reader clearer. Because the second part begins with a collation table of the variables in this article (See Table 1. Notations and definitions in Theoretical Analysis), it is easier to understand the content of the assumption part with the table. And usually this form does not appear in the introduction section.

Point 11: Perhaps, the authors should dive deeper into previous literature by identifying a common theoretical framework; otherwise, that literature may be disparate and chaotic.

Response 11: Thank you very much for the comment. We have revised the literature review part by identifying a common theoretical framework on the basis of your comment. Specifically, we have restructured this part and changed two paragraphs to make it more clearly. That is

"The factors influencing bank risk from the perspective of corporate governance include board attributes, remuneration and pay contract, risk management, and the measure of risk. "

"Other aspects of inside debt and its mechanisms influence a bank's situation. For instance, the results reported by Sheikh [30] suggest that market competition significantly influences the effect of CEO inside debt on corporate risk-taking. Li et al. [31] provided an inside debt metric that is conceptually superior to previously used metrics. Li and Zhang [32] stated that firms with a higher ratio of female directors tend to have a larger proportion of short-maturity debt. Li et al. [33] found that when a CEO holds a large amount of inside debt, the firm is less likely to issue convertibles than straight debt. Im et al. [34] investigated the impact of CEO inside debt on cost decisions. Freund et al. [35] identified positive relationships between CEO inside debt holdings and the firm's likelihood to issue debt. Dasgupta et al. [36] reported that employee deposits mitigate firms' risk-taking behavior and reduce the agency cost of debt. Colonnello et al. [37] showed that the size and seniority of inside debt are crucial in the relationship between inside debt and credit spreads. Chi et al. [38] highlighted the importance of investigating the implication of CEO debt-like compensation for corporate tax policies. Brisker and Wang [39] thought that debt-type compensation (inside debt) exacerbates the divergence in risk preferences, affecting capital structure decisions. Belkhir et al. [40] were the first to examine the relationship between debt-like compensation and excess cash valuation. Beavers [41] found that larger firms with high CEO inside debt have lower interest rates on these debt instruments and shorter maturities. Overall, the above suggest a more conservative financing policy with regards to debt."

Besides, we have added more references based on recently published papers from high-level scientific journals indexed in Clarivate Analytics Web of Science database (years 2017-2019) and trace the intellectual progression of the field in line 66-67, 78-79, and 98-115, and adding the respective reference in the reference part, that is reference [10], [12], [30]~[41]. To sum up, we have totally added 13 references to illustrate the new progression of the field.

Point 12: This possible limitation is also observed throughout a lack of research questions, propositions or hypotheses.

Response 12: Thank you very much for the comment. Usually, a frame work of a theoretical analysis article contains the assumptions (See Assumption 1~14 in Section 2.1 in our paper) and lemmas (See lemma 1 and lemma 1') and propositions (See Proposition 1 and Proposition 1') and corollaries (See Corollary 1~4 in Section 3). Maybe, it has predictions,

which is similar to the hypotheses in a pure empirical analysis article. However, the prediction is not necessary as the other items mentioned above. For instance, see Black and Scholes (1973) (reference 42 in our paper, Fischer Black; Myron Scholes. The Pricing of Options and Corporate Liabilities. J. Polit. Econ. 1973, 81, 637-654.) In a words, thank you very much for pointing out that.

Point 13: Lines 60-61: is not possible to mention, "shifting in business model of banks" and risk without considering studies on the relationships between bank business models and risk analyzed in the previous literature. Indeed, Galletta and Mazzù (2019) made a Liquidity Mismatch Index based on the loan-to-deposit ratio on three different bank business models.

Response 13: Thank you very much for the comment. We have added the reference numbered as [12] in introduction part and the respective reference part. Specifically, reference [12] of Galletta, S.; Mazzù, S (2019) is in line 90-91.

Point 14: Moreover, taking into account former studies on the impact of business models on bank stability (Köhler, 2015) in EU countries would improve the literature review part.

Response 14: Thank you very much for the comment. We have added the reference numbered as [20] in introduction part and the respective reference part. Specifically, reference [20] of Köhler, M (2015) is in line 102-103.

Point 15: Why did the authors consider the time frame from 2007 and 2016 in choosing bank dataset case study?

Response 15: Thank you very much for the comment. We consider the time frame from 2007 and 2016 in choosing bank dataset case study is because the inside debt in our study is not annual issued, it is seen as a tool during a CEO's entire tenure. Actually, John G. Stumpf became the Wells Fargo & Co's CEO at June 26, 2007 and left the bank at October 12, 2016. To study his total compensation during his term, we choose the periods from 2007 to 2016.

Point 16: Did they consider the effects of the financial distress?

Response 16: Thank you very much for the comment. Actually, we use the data from 2007 to 2016 only to calculate the structure coefficient μ and the length of the tenure κ.
Firstly, μ is in line 443 to 444 of the paper, that is

"The structure coefficient

$$\mu = \frac{ID}{CS + IE} = \frac{164842.9}{26538.88 + 207031.465} \approx 0.7058."$$

Secondly, κ is in line 445 to 446 of the paper, that is

"Stumpf's whole tenure

$$\kappa = \frac{Day\ Num\ From\ 20070626\ to\ 20161012}{365} = 9 + \frac{119}{365} \approx 9.326."$$

Specifically, μ stands for the proportion of inside debt value in the sum of cash salary and inside equity value. Practically, in the precondition of normal business of the bank (Assumption 14 in Section 2.2.4 in our paper), the influence of the financial distress on the structure coefficient is limited. Besides, the analysis of figures in Section 4.2 is drawn by the data in 2015 (See line 448-449 and line 469), we choose the latest entire year but use data

2007 to 2016 to calculate the variables (structure coefficient and the tenure) to achieve a more accurate result. In a word, the analysis in Case study of Section 4 is irrelevant with the financial distress.

Point 17: The authors must spend more effort in explaining the dataset.

Response 17: Thank you very much for the comment. We have spent more effort in explaining the dataset in line 461 to 463 in Section 4.2.1. That is

"Overall, the data in Figures 3–5 were calculated in Section4.1. The specific data used in the figure of the function image and the basis of the propositions or corollaries in this paper are introduced in the note below each figure."

Point 18: Did the authors provide any robustness check for their results?

Response 18: Thank you very much for pointing out this. We use the data of Richard M. Adams, Sr. of United Bankshares INC/WV to conclude the robust test. He has been the chairman and CEO of United Bankshares since 19840101. His salary in 2006 is 641.667 USD. The results show that our conclusion is robust and effective. In the precondition of Assumption 14, inside debt is positively associated with bank default risk. Besides, the number of periods is positively associated with bank default risk, too.

The following is the result of our robust test. Due to space limitations, these results are not shown in the paper, but we describe this result on line 565-570.

According to Corollary 4, we draw the entire function image of inside debt in Figure 2'.

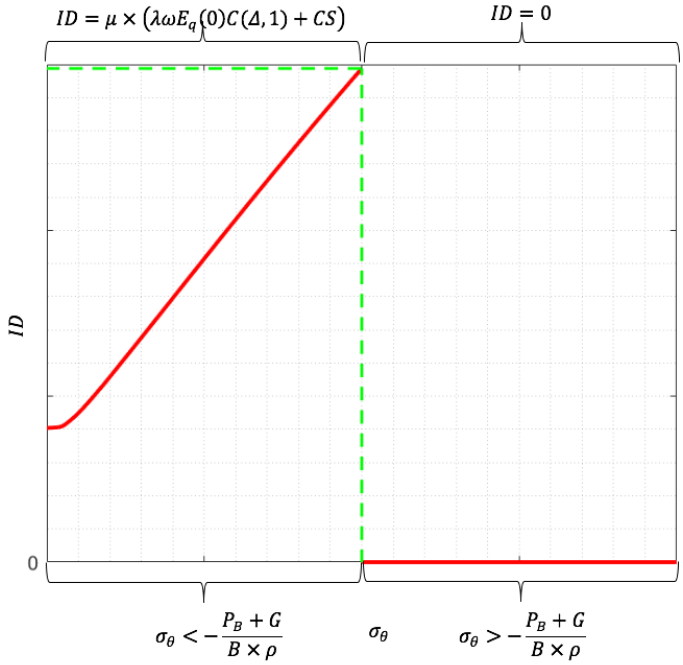
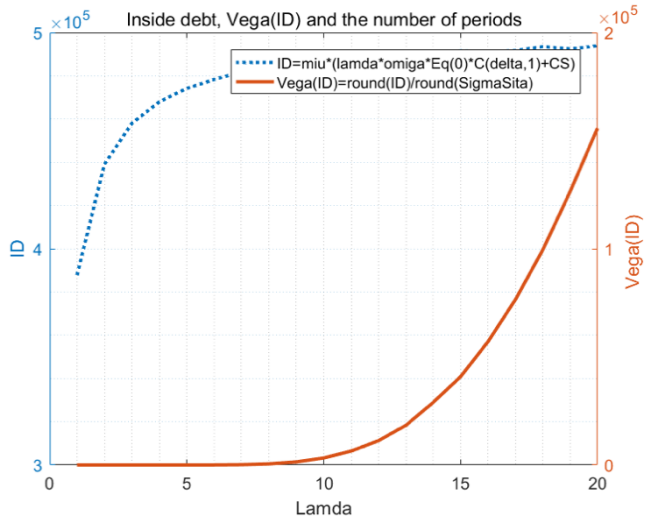
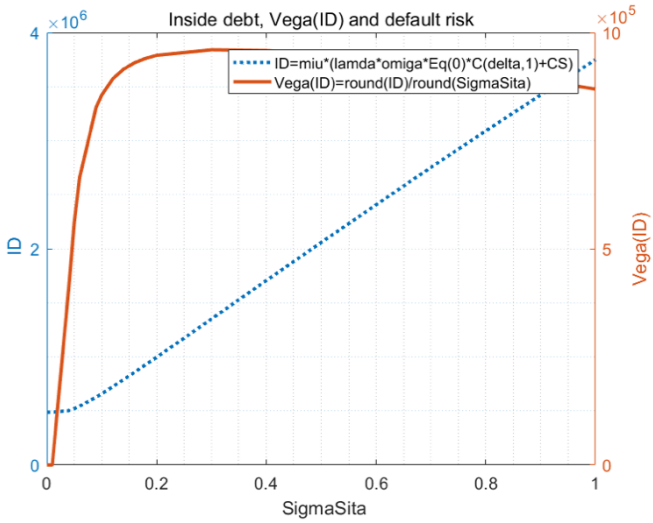


Figure 2'. Schematic diagram of inside debt value (ID) and the corresponding default risk (σ_θ) based on Corollary 4 in the more comprehensive situation that taking the probability of bankruptcy during the term of the executive (when Assumption 14 is invalid). (Note: Parameter values of the left half of the image on behalf of lemma 1'. (example bank: United Bankshares INC/WV, year: 2006): $E_q(0) = 634092000, r = 0.05325, \mu = 0.4, \kappa = 10, \omega = 0.0037\ and\ \lambda = 10$. The risk-free rate r is the mean of monthly 1-year interest rate swaps in 2006 in the US.)

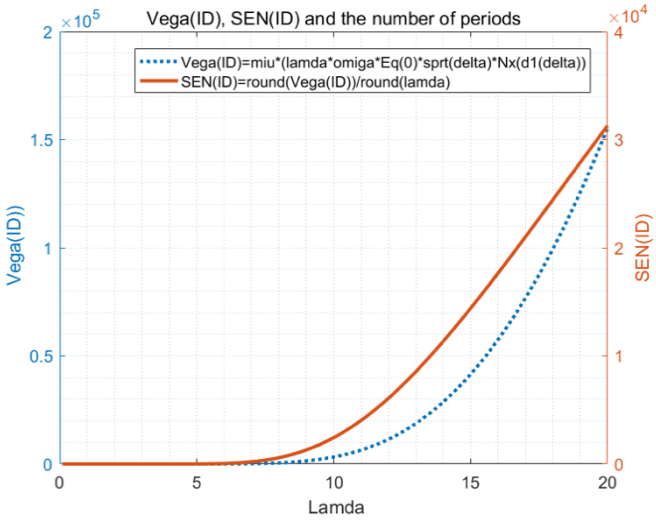


(a)

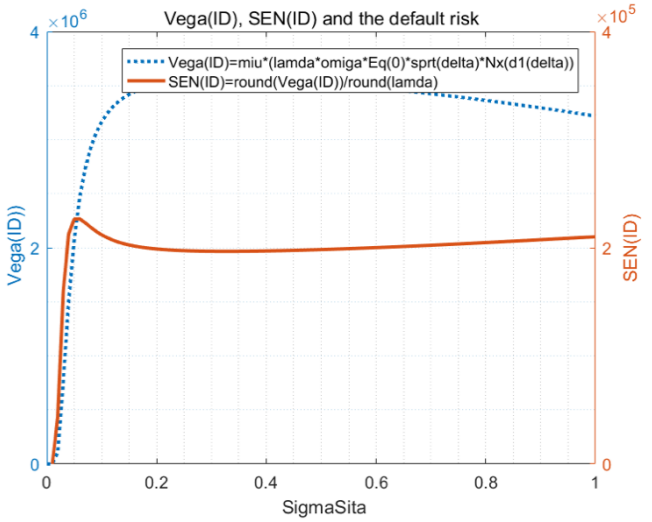


(b)

Figure 3'. (a) Fitting map of inside debt value (ID) and the corresponding risk-taking incentive $(Vega_{ID})$ with respect to the number of periods (λ) based on Proposition 1 and Corollary 2; (Note: Parameter values (example bank: United Bankshares INC/WV, year: 2006): $E_q(0) = 634092000$, $\sigma_\theta = 0.0142, r = 0.05325, \mu = 0.4, \kappa = 10$ and $\omega = 0.0037$. The risk-free rate r is the mean of monthly 1-year interest rate swaps in 2006 in the US.) (b) Fitting map of inside debt value (ID) and the corresponding risk-taking incentive $(Vega_{ID})$ with respect to the default risk (σ_θ) based on Proposition 1 and Corollary 1. (Note: Parameter values (example bank: United Bankshares INC/WV, year: 2006): $E_q(0) = 634092000, r = 0.05325, \mu = 0.4, \kappa = 10, \omega = 0.0037$ and $\lambda = 10$. The risk-free rate r is the mean of monthly 1-year interest rate swaps in 2006 in the US.)



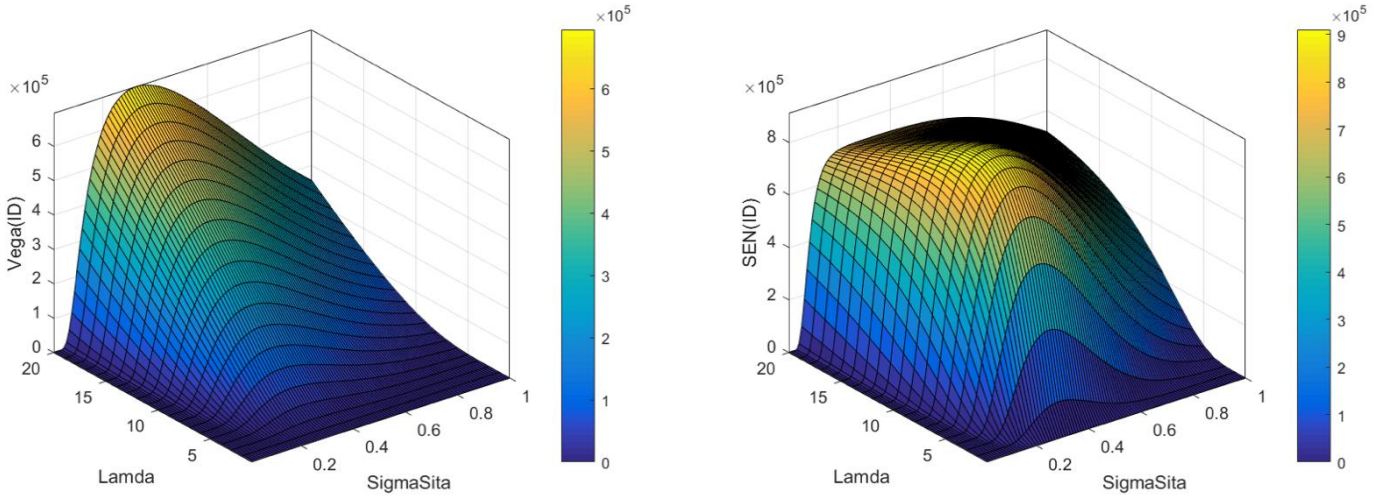
(a)



(b)

Figure 4'. (a) Function image of the risk-taking incentive $(Vega_{ID})$ and the corresponding sensitivity of inside debt (SEN_{ID}) with respect to the number of periods (λ) based on Proposition 1 and Corollary 3; (Note: Parameter values (example bank: United Bankshares INC/WV, year: 2006): $E_q(0) = 634092000$, $\sigma_\theta = 0.0142, r = 0.05325, \mu = 0.4, \kappa = 10$ and $\omega = 0.0037$. The risk-free rate r is the mean of monthly 1-year interest rate swaps in 2006 in the US.) (b) Function image of

the risk-taking incentive ($Vega_{ID}$) and the corresponding sensitivity of inside debt (SEN_{ID}) with respect to the default risk (σ_θ) based on Proposition 1 and Corollary 3. (Note: United Bankshares INC/WV, year: 2006): $E_q(0) = 634092000, r = 0.05325, \mu = 0.4, \kappa = 10, \omega = 0.0037$ and $\lambda = 10$. The risk-free rate r is the mean of monthly 1-year interest rate swaps in 2006 in the US.)



(a) (b)

Figure 5‘. (a) Three-dimensional image of risk-taking incentive ($Vega_{ID}$) and the corresponding number of period (λ) and the default risk (σ_θ) based on Proposition 1 and Corollary 2; (Note: Parameter values (example bank: United Bankshares INC/WV, year: 2006): $E_q(0) = 634092000$, $\sigma_\theta = 0.0142, r = 0.05325, \mu = 0.4, \kappa = 10$ and $\omega = 0.0037$. The risk-free rate r is the mean of monthly 1-year interest rate swaps in 2006 in the US. The color bar demonstrates the value of ID.) (b) Three-dimensional image of sensitivity of inside debt (SEN_{ID}) and the corresponding number of periods (λ) and the default risk (σ_θ) based on Proposition 1 and Corollary 3. (Note: Parameter values (example bank: United Bankshares INC/WV, year: 2006): $E_q(0) = 634092000, r = 0.05325, \mu = 0.4, \kappa = 10, \omega = 0.0037$ and $\lambda = 10$. The risk-free rate r is the mean of monthly 1-year interest rate swaps in 2006 in the US. The color bar demonstrates the value of σ_θ.

Point 19: The conclusions are incomplete and need to be extended. The conclusion section must be analyzed more, so as to provide a detailed description of the contribution of this study (eg. express better how they “close theoretical gap” referred).

Response 19: Thank you very much for the comment. We have revised the conclusion part to to provide a detailed description of the contribution of this study. Particularly, we have expressed better how they “close theoretical gap” in line 657-661. That is

“This long-term compensation model lays the foundation for further theoretical analysis because, in prior studies, most researchers only used annual data to analyze the relationship of different kinds of executive compensation and bank risk and ignored the compensation of one CEO for their entire tenure. In other words, we set up a long-term compensation model, which provides a new perspective for theoretical analysis.”

Point 20: I recommend the following references to the authors:

- Galletta, S.; Mazzù, S. Liquidity Risk Drivers and Bank Business Models. Risks 2019, 7, 89
- Köhler, M. (2015). Which banks are more risky? The impact of business models on bank stability. Journal of Financial Stability, 16, 195-212.

Response 20: Thank you very much for the comment. We have added the two references numbered as [12] and [20] in introduction part and the respective reference part. Specifically, reference [12] of Galletta, S.; Mazzù, S (2019) is in line 66-67 and reference [20] of Köhler, M (2015) is in line 79-78.

Once again, thank you very much for your constructive comments and suggestions which would help us both in English and in depth to improve the quality of the paper.