

Reputational concerns in globally systemically important US banks

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Abstract

This paper examines banks' self-reported concern about reputation and its relationship with financial performance. Using natural language processing, it analyzes annual 10-K filings over 2004-2025 by six globally important banks. A reputation-focused lexicon is constructed and used to measure the frequency of reputational references for each institution and year. Among traditional banks, JPMorgan Chase displays the most reputational concern, while Citigroup displays the least. Among shadow banks, Goldman Sachs records the highest frequency, followed by Morgan Stanley, whereas AIG remains at consistently low levels. These linguistic patterns are broadly consistent with changes in market capitalization, as institutions expressing stronger reputational concerns experienced smaller losses during the global financial crisis and stronger growth thereafter. The findings suggest that reputational language in financial disclosures may contain economically meaningful information about banks' resilience, market performance, and attention to stakeholder confidence.

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I would like to express my sincere gratitude to my thesis supervisor, Professor Vasia Panousi, for her invaluable guidance, expert advice and steadfast support throughout the course of this research. I hereby certify that the work carried out and presented in this submitted thesis is exclusively my own. Any information and material included that has been drawn from other sources has been properly cited in this thesis. Furthermore, I am aware that if it is established that the above declaration is not true, my thesis will be annulled.

1 Introduction

Bank reputation constitutes an important intangible asset that may influence the behavior of depositors, borrowers, investors, and other market participants. Given the information asymmetries inherent in banking, reputation can serve as a signal of a bank's financial soundness, reliability, and commitment to meeting its obligations. Thus, a strong reputation may enhance customer confidence, support deposit retention, facilitate access to funding, and strengthen the bank's relationships with investors and counterparties. Conversely, reputational deterioration may undermine confidence and increase the likelihood of customer withdrawals, higher funding costs, and adverse market reactions. Overall, reputational concerns are important not only for the financial resilience of banks but also for the stability of the broader banking system.

This thesis examines banks' self reported reputational concerns using natural language processing on a corpus of financial 10-K documents. Specifically, for the period 2004-2025, the 10-Ks are collected from Edgar for Bank of America, JPMorgan Chase, Citigroup, Goldman Sachs, Morgan Stanley and AIG. A reputational lexicon is constructed, containing words like [???]. The frequency of the lexicon is estimated for each bank and each year.

The main findings are as follows. First, for traditional banks, the linguistic analysis shows that JPMorgan Chase exhibits the most and Citigroup the least concern for reputation throughout the sample period. This could be because all banks are using reputation rhetoric after the end of the crisis or recession, perhaps to appease the doubts of regulators about the prudence of their investment strategies. Or it could imply that JPMorgan Chase really did fare better during the financial crisis, compared to Citigroup and to Bank of America. In fact, the latter is borne out in the numerical data. Specifically, in terms of decline in market capitalization from the pre-crisis peak to the March 2009 trough, Citigroup experienced the largest decline, losing approximately 89 percent of its market value, compared with 45 percent for Bank of America and only 6 percent for JPMorgan Chase. In this case, therefore, the words in the 10-K filing appear to correspond to actual concern about the banks' clients and its reputation.

Second, for shadow banks, Goldman Sachs exhibits the highest reputation frequency, followed relatively closely by Morgan Stanley, with AIG remaining stagnant at very low levels throughout the entire period. In terms of market capitalization from the October 2007 peak to the March 2009 trough, AIG experienced by far the largest decline, losing approximately 98 percent of its market value, compared to almost 50 percent for Morgan Stanley and 25 percent for Goldman Sachs. Thus, measured by the destruction of shareholder value during the financial crisis, AIG was substantially more severely affected than Morgan Stanley, while Goldman Sachs was comparatively more resilient than the other two, a picture consistent with the linguistic findings.

Third, when comparing all banks in terms of year-end market capitalization from 2015 to 2020, Morgan Stanley experienced the largest increase (+103 percent), followed by JPMorgan (+60 percent), Bank of America (+50 percent), and Goldman Sachs (+20 percent). By contrast, Citigroup exhibited a modest decline (16 percent) and AIG a large decline (55 percent) in market capitalization. Qualitatively, these results are consistent with the linguistic findings, in that the banks, whether traditional or shadow, that expressed the highest reputational concerns also experienced post-recession growth in market capitalization, whereas banks that did not care as much about reputation exhibited declines in market capitalization.

Overall, the findings suggest that reputational language in financial disclosures may contain economically meaningful information about banks’ resilience, market performance, and attention to stakeholder confidence. More broadly, the paper demonstrates how textual analysis of regulatory filings can complement conventional financial indicators in evaluating bank behavior and performance.

2 Related literature

A number of empirical papers have examined the role of reputation for banks outcomes, such as profitability, stock prices, bankruptcy rates, client retention and so on. Doan et al. (2020) examine whether banks with better media reputations achieve better financial performance. Using data on Vietnamese commercial banks from 2007–2018, the authors measure reputation through media coverage and estimate its relationship with return on equity. They find a positive relationship between media reputation and bank performance, particularly for large and listed banks and for banks with stronger risk-management capacity. They also find evidence that the effect operates partly through lower non-performing loans.

Heidinger and Gatzert (2018) examine whether firms that explicitly manage reputation risk obtain economic value from doing so. They use text analysis of annual reports from US and European banks and insurers to measure firms’ awareness of reputation risk and examine the determinants and value of reputation-risk management. They find that larger firms and European firms are more likely to implement reputation-risk management programs, and they report initial evidence that reputation-risk management is value relevant.

Fiordelisi, Soana, and Schwizer (2013) study reputational damage following operational losses using a large sample of European and US banks between 2003 and 2008. They find that reputational damage is related to bank risk, profitability, size, capitalization, intangible assets, and the business area in which the operational loss occurs. In particular, higher capitalization and greater intangible assets reduce the probability of reputational damage.

Sturm (2013) examines how financial markets respond when European financial institutions experience operational losses. Using 136 operational-loss events between 2000 and 2009, he finds a significant negative stock-price reaction when operational losses are publicly announced. Importantly, the decline in market value cannot be explained simply by the direct financial loss. Instead, the evidence suggests an additional reputational effect, particularly when investors have limited public information about the event. This provides evidence that reputational damage can impose measurable economic costs on banks through financial-market reactions.

Alamsyah et al. (2020) examine factors affecting trust in individual banks, using a survey of 992 retail depositors in Indonesia. They find that individual-bank trust is particularly important and that bank reputation is one of the factors associated with depositors’ trust. Thus, a bank’s reputation can affect depositor confidence, which can in turn matter for funding stability

Brown, Guin, and Morkoetter (2020) find that depositors are more likely to withdraw funds as a bank becomes more distressed, but that strong pre-existing bank-client relationships substantially reduce withdrawal risk. Although the paper does not directly measure reputation, it is relevant to a reputation argument because it demonstrates empirically that trust and established relationships can provide banks with more stable funding

during periods of distress.

The present paper contributes to the literature via the linguistic study of banks' own reputational concerns, as captures in the language used in their public SEC filings.

3 Data description

This section presents the panel dataset and the sample selection.

3.1 Panel data

The panel dataset used in the analysis includes bank-level information from six large globally systemically important US financial institutions (G-SIBs) for the period 2004–2026. The textual data used are from the online regulatory repository of the US Securities and Exchange Commission (SEC Edgar). Specifically, the corpus consists of 242 annual regulatory filings (Form 10-K). The panel is balanced.

3.2 Financial institutions

The selection of the G-SIBs was guided by the size of their total assets, capturing the largest and most macroprudentially critical financial institutions in the US for which continuous data was accessible. The geographic classification refers to the jurisdiction where banks originated and maintain regulatory headquarters. By contrast, their financial and market operations are global in scope. Specifically, the panel consists of the following financial institutions: JPMorgan Chase, Bank of America, Citigroup, Morgan Stanley, Goldman Sachs, and AIG. The first three banks are regular or traditional banks, in that they accept deposits and are subject to strict regulation by authorities. The second three banks are shadow banks, i.e. banks that do not accept deposits but provide other financial services and are subject to less strict regulation.

4 Textual analysis and reputation lexicon

Methods of natural language processing (NLP) are used for the construction of a reputation lexicon. First, a data preprocessing procedure was designed to prepare the 10-K filings for textual analysis and ensure consistency across banks and years. The 10-Ks were downloaded in HTML format, HTML formatting was removed, and unnecessary spacing was normalized to produce a comparable textual format across the sample. The text was then divided into sentences. During the procedure of identification of reputation-related terms, the text was transformed into all lowercase letters.

Next, a textual reputation lexicon is constructed. This lexicon contains words like "credibility", "confidence", and "trust". The frequency of each reputation word in each 10-K for each bank and each year is then constructed as the ratio of times the reputation word appears normalized by the total words in the 10-K for that bank and year. The sum of all frequencies yields the frequency of the reputation lexicon for each bank and year. This frequency is used as the indicator of how much a bank claims to care about its reputation over time. The complete reputation lexicon is presented in the appendix of this paper. In the appendix, Table 1 and Figure 1 present the annual frequency of the reputation lexicon for each of the six banks in the sample.

5 Results

This section presents the empirical results of the textual analysis for the six financial institutions over the period 2004-2026. The figures were constructed to examine differences across institutions, changes over time, and differences between traditional and shadow banking institutions.

5.1 Traditional banks

This section focuses on the traditional banks of the sample, i.e. the banks that accept deposits, shown in Figure 2. This figure shows the annual frequency of reputation-related terms identified by the strict reputation sub-lexicon across the three traditional US banks over the period 2004-2026. Each line represents one traditional banking institution. The frequency values are expressed as the percentage of the total words in each 10-K filing.

JPMorgan Chase (the blue line) exhibits the highest frequency of reputation-related terms throughout the entire sample period. However, this frequency also exhibits important fluctuations. Specifically, from 2003 to 2014, the frequency declines, reaches a minimum and then plateaus at this low level. After 2014, the frequency increases at a rapid rate until almost the end of the sample period. This overall behavior indicates a lack of reported reputational during the housing boom and the subsequent financial crisis, followed by a renewed concern for reputation after the end of the Great Recession.

Bank of America (the orange line) exhibits the fastest growth across the three banks. Although it starts at the lowest level at the beginning of the period, it increases to JPMorgan maximum levels by the end of the sample. Most of this increase takes place after 2012, indicating that reputation became more important for the bank after the financial crisis.

Citigroup (green line) records the lowest reputation frequencies throughout the entire period. In fact, from 2003 to 2015, the frequency remains roughly stable, and the concerns for reputation starts increasing only in 2015. By the end of the period, its frequency has reached a maximum which is below that of the other two banks.

The interpretation of these linguistic results is that JPMorgan Chase shows the most and Citigroup the least concern for reputation throughout the period. This could be because all banks are using reputation rhetoric after the end of the crisis or recession, perhaps to appease the doubts of regulators about the prudence of their investment strategies. Or it could imply that JPMorgan Chase really did fare better during the financial crisis, compared to Citigroup and to Bank of America.

In fact, the latter is borne out in the numerical data. Specifically, in terms of decline in market capitalization from the pre-crisis peak to the March 2009 trough, Citigroup experienced the largest decline, losing approximately 89 percent of its market value, compared to 45 percent for Bank of America and only 6 percent for JPMorgan Chase. Thus, measured by the destruction of shareholder value during the financial crisis, Citigroup was substantially more severely affected than Bank of America, while JPMorgan Chase was comparatively more resilient than the other two. In addition, discussions about a potential Federal Reserve conservatorship were more intense surrounding Citigroup and Bank of America, which also received extra funds from the Troubled Asset Relief Program (TARP), than they ever were about JP Morgan Chase. In this case, therefore, the words in the 10-K filing appear to correspond to actual concern about the banks' clients and its reputation.

5.2 Shadow banks

This section focuses on the traditional banks of the sample, i.e. the banks that do not accept deposits, shown in Figure 3.

Goldman Sachs (the blue line) presents the highest frequency of reputation- related terms through the entire period, compared to the other two banks. However, this frequency declined steadily until 2010 and only started increasing after the financial crisis, reaching a maximum at the end of the period.

Morgan Stanley (the orange line) does not exhibit frequency changes on average until 2010. Thereafter, it increases at a similar rate as Goldman Sachs, but at lower levels.

AIG (the green line) shows a frequency increase and then reversal in the pre-2010 period. After reaching a minimum in 2010, AIG remains at those low levels for the remainder of the period. Thus, AIG appears to be the only institution among all banks in the sample, traditional or shadow, that does not exhibit an increasing or renewed concern for reputation after the financial crisis or after the end of the Great Recession.

Using the same metric as for traditional banks, i.e. the decline in market capitalization from the October 2007 peak to the March 2009 trough, the comparison among shadow banks is as follows. AIG experienced by far the largest decline, losing approximately 98 percent of its market value, compared to almost 50 percent for Morgan Stanley and 25 percent for Goldman Sachs. Thus, measured by the destruction of shareholder value during the financial crisis, AIG was substantially more severely affected than Morgan Stanley, while Goldman Sachs was comparatively more resilient than the other two. In fact, Ben Bernanke, the Chair of the Federal Reserve during 2006-2014, had declared that the collapse of AIG was the most crucial moment for the stability of the global financial system. Additionally, one potential reason why AIG does not show a concern for reputation, even after the crisis, could be that, in 2016, the new US government removed its title of G-SIFI (globally systemically important financial institution), reducing the supervision burden for AIG.

5.3 All banks

Figure 1 presents the comparison for all banks in the sample. Overall, Goldman, a shadow bank, exhibits the highest level of reputational concerns among all banks for the entire period. In the last third of the period, Goldman levels of reputation are comparable to those of Bank of America and JPMorgan Chase, two traditional banks. Morgan Stanley and Citigroup follow, with AIG at the very bottom of the distribution. Most of the increases in reputational frequencies occur after 2015 for all banks, whereas the pre-recession period is characterized by declines or fluctuations in reputation language. If increased post-crisis regulation was the only reason for increased reputation references, then traditional banks should be systematically higher than shadow banks, as they face stricter supervision. However, the analysis shows that this is not the case. In fact, there are shadow banks that express the same concern for reputation as traditional banks.

In terms of year-end market capitalization from 2015 to 2020, Morgan Stanley experienced the largest increase (+103 percent), followed by JPMorgan (+60 percent), Bank of America (+50 percent), and Goldman Sachs (+20 percent). By contrast, Citigroup exhibited a modest decline (16 percent) and AIG a large decline (55 percent) in market capitalization. Qualitatively, these results are consistent with the linguistic findings, in that the banks, whether traditional or shadow, that expressed the highest reputational concerns also experienced post-recession growth in market capitalization, whereas banks

that did not care as much about reputation exhibited declines in market capitalization. Unfortunately, given the decline in its supervision after 2016, AIG exhibits a worrying trend of no reputation references and a substantial decline in stock market value, raising potential renewed concerns about its role for global financial stability going forward.

6 Conclusions

This paper examines banks' self-reported concerns about reputation and their relationship with financial performance. Using natural language processing, it analyzes annual 10-K filings submitted between 2003 and 2020 by Bank of America, JPMorgan Chase, Citigroup, Goldman Sachs, Morgan Stanley, and AIG. A reputation-focused lexicon is constructed and used to measure the frequency of reputational language for each institution and year. Among traditional banks, JPMorgan Chase displays the greatest reputational concern, while Citigroup displays the least. Among shadow banks, Goldman Sachs records the highest frequency, followed by Morgan Stanley, whereas AIG remains at consistently low levels. These linguistic patterns are broadly consistent with changes in market capitalization. Institutions expressing stronger reputational concerns experienced smaller losses during the global financial crisis and stronger growth between 2015 and 2020. By contrast, institutions with less emphasis on reputation generally suffered larger declines. The findings suggest that reputational language in financial disclosures may contain economically meaningful information about banks' resilience, market performance, and attention to stakeholder confidence. More broadly, the paper demonstrates how textual analysis of regulatory filings can complement conventional financial indicators in evaluating bank behavior and performance.

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Appendix: Tables and Figures

Reputation Sub-Lexicon Terms. The list below presents the terms comprising the reputation sub-lexicon used in the frequency analysis, grouped by category.

Explicit Reputation Terms: reputation, reputational risk, reputation risk, damage to our reputation, harm to our reputation, our reputation could be harmed, adversely affect our reputation, protect our reputation, reputational damage, reputational harm, reputational concerns.

Trust, Confidence & Perception: public trust, customer confidence, public perception, negative perception, adverse publicity, negative publicity, unfavorable media coverage.

Brand & Goodwill: value of our brand, customer relationships.

Customer / Client Base: customer base, client base, clientele, customer retention, client retention, account holders, customer attrition, loss of customers, loss of clients, client relationships.

Credibility & Image: credibility.

Table 1: Textual reputation lexicon frequency (%) by year and financial institution

Year	JPMorgan	BankOfAmerica	Citigroup	GoldmanSachs	MorganStanley	AIG
2004	0.024	0.006	0.008	0.048	0.012	0.001
2005	0.022	0.002	0.009	0.032	0.016	0.002
2006	0.028	0.011	0.010	0.032	0.027	0.002
2007	0.025	0.013	0.010	0.036	0.028	0.013
2008	0.021	0.013	0.007	0.034	0.027	0.011
2009	0.018	0.010	0.006	0.024	0.017	0.009
2010	0.018	0.015	0.010	0.028	0.021	0.004
2011	0.019	0.019	0.009	0.028	0.018	0.003
2012	0.020	0.016	0.011	0.026	0.017	0.001
2013	0.020	0.015	0.011	0.026	0.017	0.001
2014	0.025	0.018	0.009	0.031	0.018	0.001
2015	0.033	0.017	0.008	0.032	0.019	0.002
2016	0.034	0.023	0.012	0.032	0.021	0.002
2017	0.030	0.025	0.015	0.032	0.024	0.002
2018	0.036	0.028	0.015	0.035	0.027	0.002
2019	0.041	0.034	0.016	0.037	0.027	0.002
2020	0.040	0.039	0.017	0.040	0.026	0.001
2021	0.041	0.038	0.024	0.043	0.027	0.001
2022	0.042	0.043	0.024	0.043	0.032	0.001
2023	0.041	0.041	0.028	0.045	0.033	0.002
2024	0.040	0.041	0.027	0.045	0.032	0.002
2025	0.039	0.041	0.028	0.050	0.034	0.003
2026	0.032	0.042	0.023	0.049	0.033	0.003

Note: The table represents the annual frequency of the textual reputation lexicon for the six US financial institutions over the period 2004-2026. Each row represents one year and each column represents one financial institution. The frequency of reputational words is expressed as percentage of the total words in each 10-K filing.

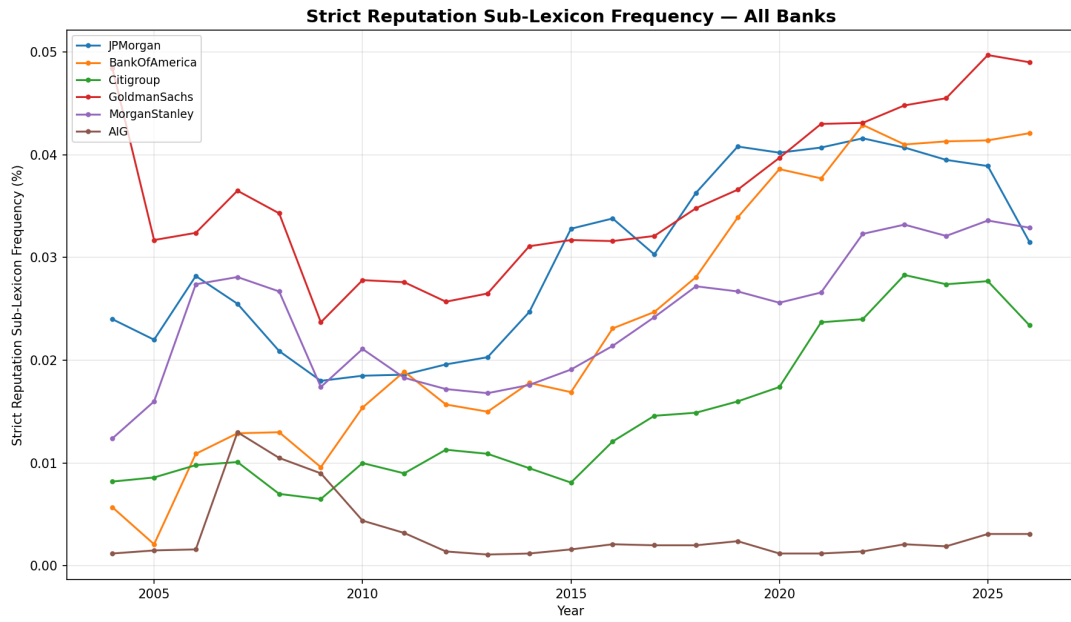


Figure 1: Textual reputation lexicon frequency — all banks

Note: The figure represents the annual frequency of the textual reputation lexicon across all six US financial institutions over the period 2004-2026. Each line represents one financial institution. The frequency of reputational words is expressed as percentage of the total words in each 10-K filing.

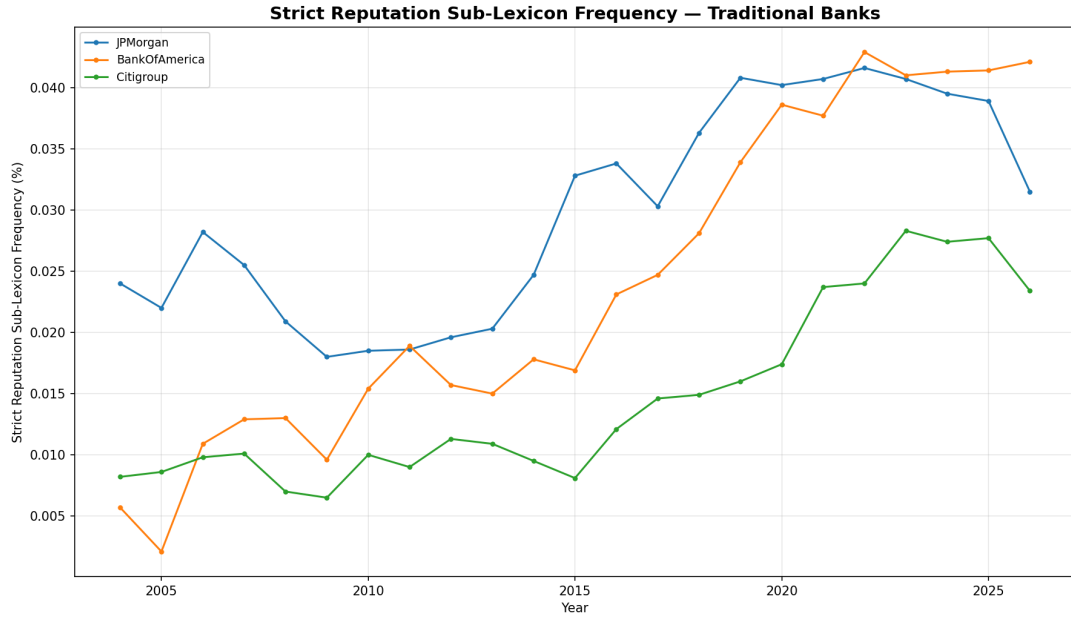


Figure 2: Textual reputation lexicon frequency — traditional banks

Note: The figure represents the annual frequency of the textual reputation lexicon across the three traditional US banks in the sample over the period 2004-2026. Each line represents one traditional banking institutions. The frequency of reputational words is expressed as percentage of the total words in each 10-K filing.

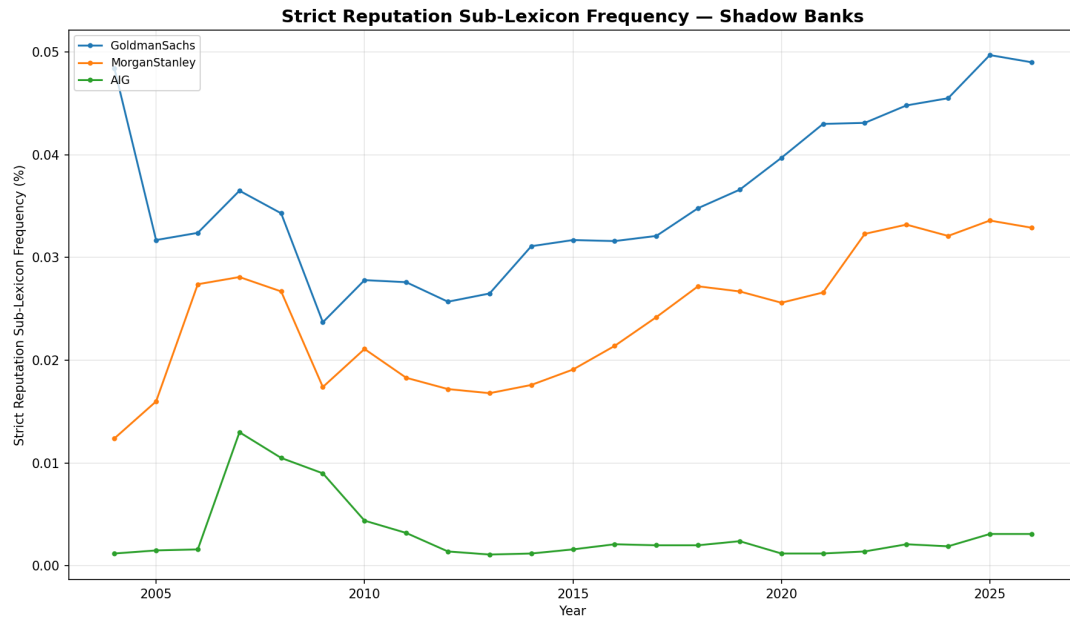


Figure 3: Textual reputation lexicon frequency — shadow banks

Note: The figure represents the annual frequency of the textual reputation lexicon across the three US shadow banking institutions in the sample over the period 2004-2026. Each line represents one shadow bank. The frequency of reputational words is expressed as percentage of the total words in each 10-K filing.

Supplementary Appendix: Individual Bank Figures

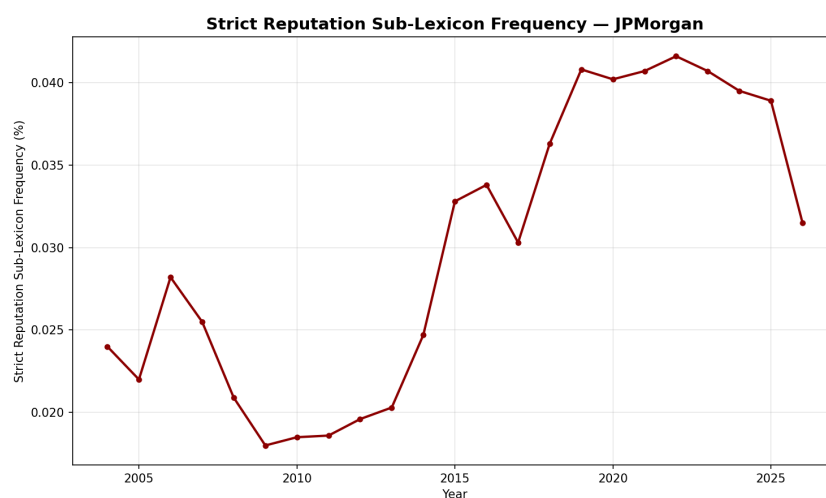


Figure 4: Textual reputation lexicon frequency — JPMorgan

Note: The figure represents the annual frequency of reputation-related terms across for JPMorgan over the period 2004-2026. The line shows the changes in frequency reputation-related terms over the years. The frequency values are expressed as the percentage of the total words in each 10-K filing.

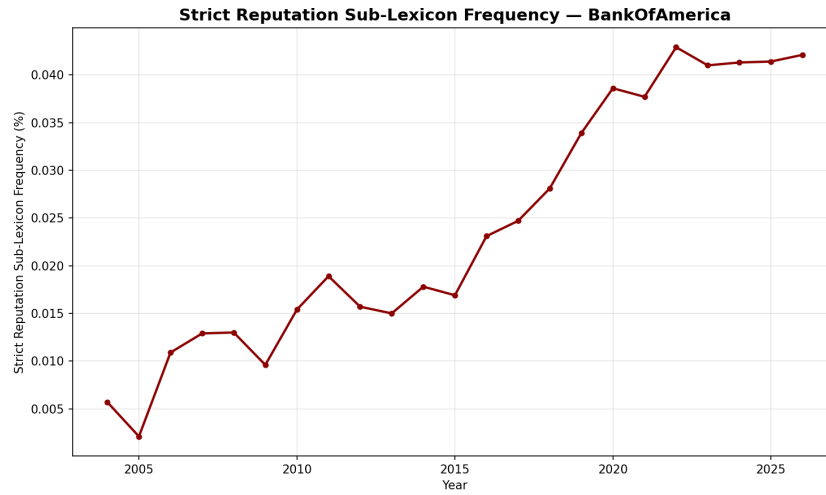


Figure 5: Textual reputation lexicon frequency — Bank of America

Note: The figure represents the annual frequency of reputation-related terms across for Bank of America over the period 2004-2026. The line shows the changes in frequency reputation-related terms over the years. The frequency values are expressed as the percentage of the total words in each 10-K filing.

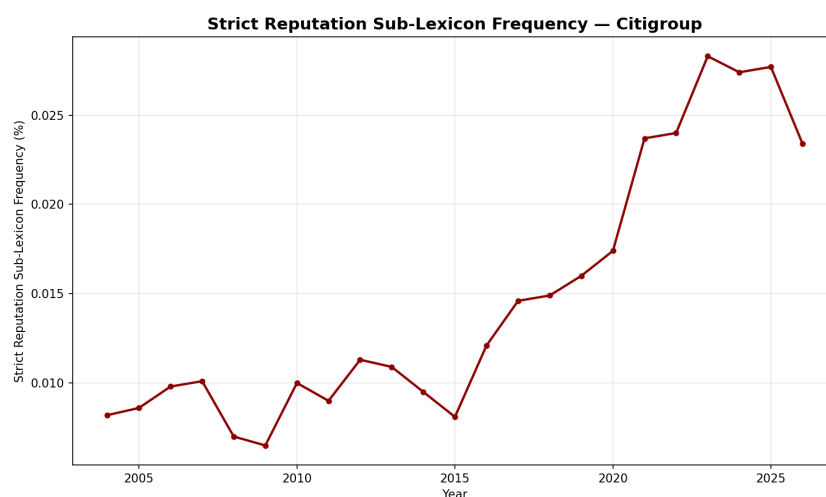


Figure 6: Textual reputation lexicon frequency — Citigroup

Note: The figure represents the annual frequency of reputation-related terms across for Citigroup over the period 2004-2026. The line shows the changes in frequency reputation-related terms over the years. The frequency values are expressed as the percentage of the total words in each 10-K filing.

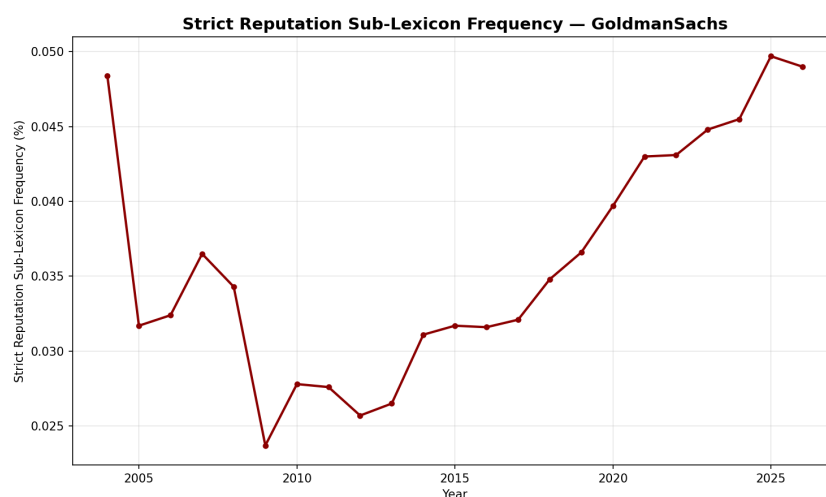


Figure 7: Textual reputation lexicon frequency — Goldman Sachs

Note: The figure represents the annual frequency of reputation-related terms across for Goldman Sachs over the period 2004-2026. The line shows the changes in frequency reputation-related terms over the years. The frequency values are expressed as the percentage of the total words in each 10-K filing.

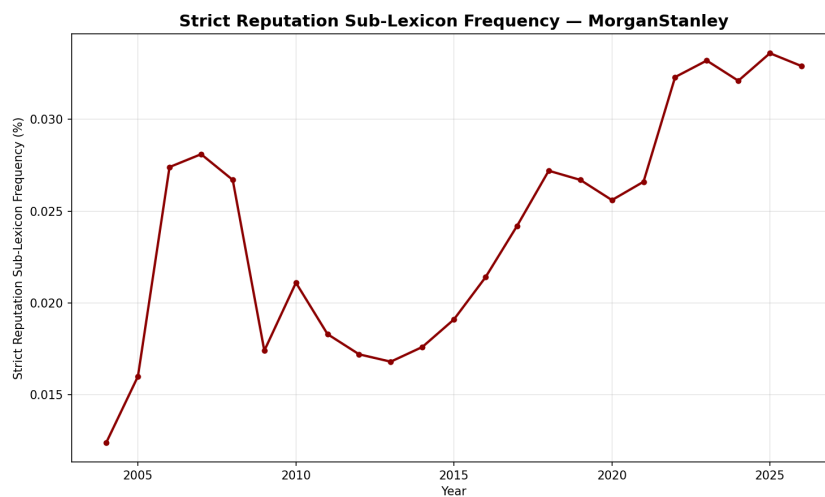


Figure 8: Textual reputation lexicon frequency — Morgan Stanley

Note: The figure represents the annual frequency of reputation-related terms across for Morgan Stanley over the period 2004-2026. The line shows the changes in frequency reputation-related terms over the years. The frequency values are expressed as the percentage of the total words in each 10-K filing.

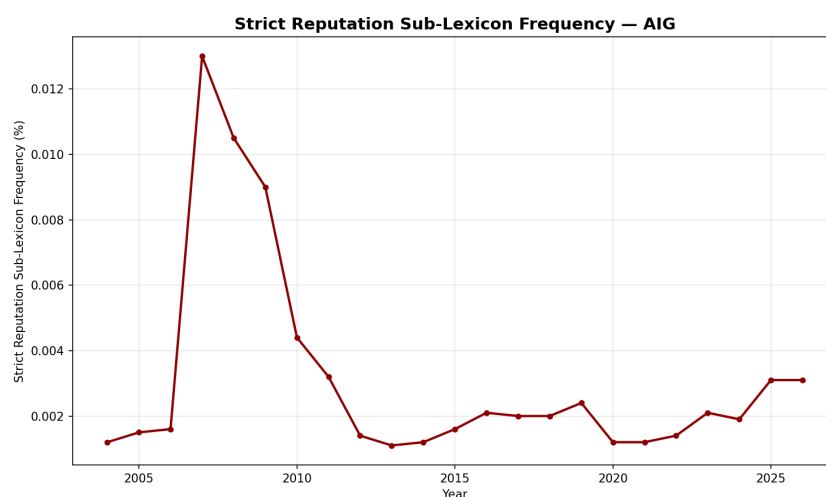


Figure 9: Textual reputation lexicon frequency — AIG

Note: The figure represents the annual frequency of reputation-related terms across for AIG over the period 2004-2026. The line shows the changes in frequency reputation-related terms over the years. The frequency values are expressed as the percentage of the total words in each 10-K filing.