

From metrics to strategy: quantifying the glass ceiling and its influence on strategic performance in finance

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Abstract

Purpose – This study examines gender inequality in corporate leadership as a strategic challenge and introduces the Glass Ceiling Indicator (GCI), a novel quantitative measure to assess disparities in executive roles within the US financial sector, linking diversity to performance and governance.

Design/methodology/approach – An unbalanced panel data model is applied to the S&P 500 financial institutions (2020–2024). The GCI compares the proportion of women in executive and senior management roles to the overall proportion of female employees. Gender-related and financial variables are included, and the model is estimated using feasible generalized least squares (FGLS).

Findings – Female CEO duality, greater hiring of women, and a narrower gender pay gap are linked to weaker glass ceiling effects, while firm size and return on assets also foster gender equality in leadership. Conversely, higher entry-level female representation and older CEO age correlate with stronger glass ceiling dynamics, underscoring the influence of strategic decisions and organizational structures on leadership diversity.

Practical implications – Findings support inclusive recruitment, pay equity, and leadership structures as strategic levers to reduce gender barriers and enhance performance.

Social implications – By making invisible barriers measurable, the study contributes to advancing gender equity and fostering inclusive corporate cultures.

Originality/value – This research proposes the first empirically validated GCI applicable across firms and sectors. It offers a strategic framework for quantifying gender inequality and identifying organizational drivers of inclusive leadership.

Keywords Glass ceiling indicator, Financial industry, Company performance, Leadership strategy

Paper type Research article

1. Introduction

Gender diversity in leadership is widely recognized as a strategic asset that strengthens governance, resilience, and long-term performance. Yet women remain underrepresented in executive roles, particularly in the US financial sector, a key industry for economic stability, where they account for 52.6% of the workforce but only 19% of C-suite positions (McKinsey, 2024). Persistent barriers such as biased promotion practices, exclusion from informal networks, and limited mentorship continue to hinder advancement (Baeckström *et al.*, 2025). Given the sector's pivotal role in capital allocation and investment decisions, addressing

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gender inequality carries significant social and economic implications, making this context critical for institutional and cultural transformation (Benton, 2018).

Recent research frames the glass ceiling as a multifaceted phenomenon sustained by structural, cultural, and psychological barriers such as exclusion from informal networks, gender-biased evaluations, and occupational segregation, that restrict women's advancement to top management, often compounded by higher performance standards and limited sponsorship. Although gender-diverse leadership is associated with improved governance, financial stability, and reduced risk (Jouber, 2024), existing studies remain fragmented and lack standardized, replicable measures for assessing the glass ceiling across firms and sectors, relying mainly on descriptive or case-based analyses with limited comparability. Qualitative approaches provide valuable insights into lived experiences but are time-intensive, difficult to replicate, and prone to bias (Kumar and Phore, 2025), underscoring the need for robust, scalable tools to complement these findings.

Qualitative studies have explored patterns and perceptions of the glass ceiling but lack the capacity to quantify its magnitude. To address this gap, we introduce the Glass Ceiling Indicator (GCI), a standardized metric that measures whether women's representation in executive roles aligns with their overall workforce presence, enabling cross-firm and longitudinal comparisons. Additionally, we propose a complementary model to identify organizational variables for targeted interventions, supporting evidence-based strategies for inclusive governance and organizational transformation.

Drawing on Glass Ceiling Theory, this study analyzes the relationship between female representation in top management and a set of financial and gender-related indicators using data from S&P 500 financial firms (2020–2024). Results indicate that CEO duality, firm size, a narrower gender pay gap, and increased hiring of women contribute to mitigating glass ceiling effects, while financial variables linked to performance, risk, and efficiency show positive associations with executive-level gender equality. By employing an unbalanced panel data model estimated through feasible generalized least squares (FGLS), this research advances the literature on inclusive governance and strategic management, offering a replicable, data-driven approach that empirically connects gender dynamics with organizational performance and provides actionable insights for aligning diversity with effectiveness.

The remainder of this paper is structured as follows. Section 2 presents the literature review and development of hypotheses. Section 3 details the construction of the indicator and the methodological approach. Section 4 discusses the empirical results, and Section 5 concludes with the main findings and implications.

2. Literature review and hypotheses development

The glass ceiling refers to persistent, invisible barriers that prevent women from reaching top leadership positions despite comparable qualifications (Powell and Butterfield, 1994). These barriers, embedded in organizational practices rather than formal rules (Morrison *et al.*, 1987), arise from structural biases, cultural norms, and psychological constraints that persist beyond entry-level inclusion (Watanabe and Kwarteng, 2024). Achieving gender parity at lower levels does not guarantee advancement; for example, women hold 52% of entry-level roles in US finance yet remain underrepresented in senior leadership (McKinsey, 2024). Gendered Organizational Theory argues that workplace structures reflect male norms, perpetuating exclusion even under formal equality (Acker, 1990).

Furthermore, discriminatory mechanisms, taste-based (Becker, 1957), statistical (Phelps, 1972), and mistake-based (Forret and Dougherty, 2004), systematically undervalue women, reinforced by leadership expectations privileging agentic traits associated with men (Eagly and Wood, 2012). Role Congruity Theory highlights a “double bind”: women are penalized for communal traits yet criticized for agentic behavior (Eagly and Karau, 2002). Informal male-dominated networks and tokenism further restrict access to senior roles (Kanter, 1977; Lapeira

and Samara, 2025), while disproportionate domestic responsibilities exacerbate work-family conflicts (Shockley *et al.*, 2024).

In this sense, these interconnected mechanisms reaffirm Acker's (1990) concept of gendered organizations, in which work practices, power relations, and cultural norms systematically reproduce gender segregation and sustain the glass ceiling. Male-dominated informal networks, tokenism, and the disproportionate domestic responsibilities borne by women exemplify how organizational structures are not gender-neutral but operate through divisions of labor, symbolic representations, and interactional patterns that privilege men and constrain women's access to leadership roles.

At the individual level, psychological barriers such as self-doubt and impostor syndrome hinder women's leadership trajectories. Lower self-efficacy when considering high-responsibility roles is well-documented in self-efficacy theory (Bandura, 1997) and recent studies on female advancement (Mateos de Cabo and Gimeno, 2017). These dynamics are reflected in women's lower likelihood of applying for leadership positions unless fully qualified, whereas men apply even when underqualified (Wysińska-Di Carlo and Karpiński, 2024). Combined with structural and cultural constraints, these factors create a leaky pipeline where women exit promotion tracks despite strong initial representation. Addressing this requires more than entry-level inclusion; it demands strategic recruitment targeting leadership-track roles. Organizations that actively recruit women show higher representation in senior management, signaling institutional commitment to diversity. Evidence also links board gender diversity to improved corporate human rights performance, though effects are weaker in patriarchal contexts (Forret and Dougherty, 2004). Taken together, these findings suggest that entry-level parity alone cannot dismantle the glass ceiling; targeted recruitment strategies are essential.

This leads to the following hypothesis:

- H1.* An increased proportion of women among new hires is associated with an improvement in the Glass Ceiling Indicator, while a higher percentage of women in entry-level roles does not contribute significantly to its mitigation.

CEO duality, where the Chief Executive Officer also serves as the chair of the board, has long been debated in corporate governance literature due to its implications for power concentration, strategic decision-making, and organizational control (Krause *et al.*, 2014). While prior research has examined CEO duality primarily from the perspective of agency theory and firm performance, its interaction with gender dynamics and the persistence of the glass ceiling remain underexplored.

The glass ceiling encompasses not only structural barriers but also organizational, cultural, and perceptual obstacles that limit women's advancement to top executive roles (Powell and Butterfield, 1994; Watanabe and Kwarteng, 2024). Visible signals of commitment to gender equality are crucial, and CEO duality held by a woman, combining CEO and board chair roles, can challenge entrenched norms and stereotypes, reducing the glass ceiling effect. This configuration demonstrates organizational willingness to dismantle hierarchical constraints and increases female representation at the highest level. Conversely, CEO duality with a male CEO tends to reinforce traditional leadership patterns and perpetuate inequality (La Rocca *et al.*, 2024), suggesting that its impact on the glass ceiling is gender contingent. Based on this reasoning, we propose the following hypothesis:

- H2.* The presence of CEO duality and greater CEO age are positively associated with the persistence of glass ceiling barriers.

The gender pay gap, defined as earnings disparities between men and women in comparable roles, persists despite decades of equality legislation (Morin, 2025). It is driven by human capital differences, occupational segregation, and women's concentration in lower-paid positions. Gendered Organizational Theory argues these disparities are embedded in structures that normalize unequal compensation (Acker, 1990). Complementary frameworks, including Gender-Specific Referents, the Fair Wage Hypothesis, and Rewards Expectancy Theory,

explain how persistent inequality shapes advancement expectations and leadership ambition (Wysieńska-Di Carlo and Karpiński, 2024), limiting women's upward mobility.

Cultural norms and status beliefs reinforce pay gaps by framing women as less suited for high-responsibility roles, while caregiving expectations contribute to the "motherhood penalty," reducing wages and promotion opportunities. Men, conversely, benefit from longer working hours and stronger networks that accelerate advancement and perpetuate the glass ceiling (Morin, 2025).

Wage inequality not only reflects structural disparities but actively discourages women from pursuing leadership roles, diminishes female role models, and devalues women's contributions (Ryan, 2023). Firms with smaller pay gaps exhibit weaker glass ceiling effects, suggesting that equitable compensation policies are a strategic lever for promoting gender inclusion at the top (Morin, 2025).

Taking the above into account, the third hypothesis proposed is:

H3. Companies with a smaller gender pay gap exhibit a lower glass ceiling.

The glass ceiling generates consequences beyond individual careers, affecting organizational performance and societal equity (Huebler and Sigmund, 2025). At the personal level, it fosters psychological strain, lower confidence, stress, and burnout, undermining job satisfaction and career engagement. Organizationally, underutilizing female talent limits innovation, narrows strategic thinking, and harms financial outcomes. Societally, it perpetuates economic inequality, reduces female role models, and restricts diversity in governance.

Firm characteristics, particularly size and profitability, strongly influence the ability to challenge the glass ceiling. Larger, more profitable firms possess resources and stakeholder pressure to adopt inclusive policies, attracting investors who value board diversity (DiMaggio and Powell, 1983). Evidence links female board representation to improved profitability, reduced risk, and stronger market performance (Huebler and Sigmund, 2025). Conversely, smaller firms often rely on informal networks and flat hierarchies, limiting women's access to strategic roles and mentorship. Gender-diverse leadership, more common in large firms, correlates with ethical governance, transparency, and sustainability (Gander and Sharafizad, 2025), while transformational leadership styles, frequently associated with women, further enhance inclusive cultures (Benton, 2018).

Taken together, these findings suggest that firm size and profitability are not merely structural attributes but key enablers of gender equity in leadership.

Based on this reasoning, the fourth hypothesis proposed is:

H4. Larger and more profitable companies contribute to mitigating the glass ceiling effect.

Companies with lower risk profiles, particularly in banking, tend to exhibit greater female representation on boards due to stricter risk control practices (Huang *et al.*, 2024). Female directors are associated with prudent financial intermediation, greater stability, and lower volatility. These outcomes are largely attributed to women's risk aversion and their role in promoting transparency and collective decision-making. (Mateos de Cabo and Gimeno, 2017; Joubert, 2024). These findings reinforce the glass ceiling theory, highlighting that women in leadership bring distinct perspectives that improve governance and organizational performance (Morrison *et al.*, 1987).

Beyond gender inequality, the glass ceiling reflects economic inefficiency, as biased evaluation processes and institutional norms hinder optimal talent allocation (DiMaggio and Powell, 1983). Firms failing to promote qualified women operate below their efficiency frontier, with measurable impacts such as higher cost-to-income ratios (Benton, 2018). Organizations with robust governance, inclusive networks, and transparent evaluation systems (supported by social capital theory) are better positioned to dismantle these barriers. Therefore, they foster meritocratic advancement and benefit from women's contributions to

H5. Less risky and more efficient companies show a lower glass ceiling.

3. Data and methodology

3.1 Sample and data

The sample analyzed comprises the financial institutions included in the S&P 500 index with available information for the assorted variables used, in the sample period from 2020 to 2024, amounting to a total of 26 companies [1]. The data is expressed on a yearly basis and was sourced from the Bloomberg platform (Bloomberg, 2018). This platform database has been chosen for its vast information and the extensive range of ESG (Environmental, Social and Governance) data, both reported from other sources and calculated independently.

The US financial sector offers a critical context for studying the glass ceiling due to its economic influence and persistent gender disparities (Baeckström *et al.*, 2025). Although women enter the industry in similar proportions to men, they hold only 19% of senior management roles and 5% of CEO positions globally (OECD, 2025). These gaps are reinforced by structural barriers such as exclusion from informal networks, biased promotion practices, and limited mentorship opportunities. Moreover, women often assume additional diversity-related responsibilities without proportional recognition. Given the sector's role in resource allocation, gender inequality here has broad economic implications (Baeckström *et al.*, 2025). Research also links gender-diverse leadership teams to improved transparency and ethical governance, making this sector a key setting for identifying leverage points for institutional transformation (Benton, 2018).

3.2 Glass Ceiling Indicator (GCI)

Several quantitative approaches assess gender inequality in corporate and financial contexts. The Bloomberg Gender-Equality Index (GEI) evaluates firms based on transparency and policy indicators such as female leadership and pay equity, though its disclosure focus limits its ability to capture structural barriers (Bloomberg, 2018). The OMFIF Gender Balance Index measures female representation in central banks and financial institutions, revealing persistent leadership gaps (OMFIF, 2025). In academia, the European Institute for Gender Equality (EIGE) and the Spanish National Research Council (CSIC) have developed ratio-based Glass Ceiling Indices to compare women's representation in top positions (EIGE, 2022; CSIC, 2018). ESG datasets like Thomson Reuters ASSET4 also link gender diversity to financial performance (Thomson Reuters, 2014).

A central contribution of this research is the development of the Glass Ceiling Indicator (GCI), the first quantitative and relative measure specifically designed to capture the glass ceiling effect in leadership structures. Unlike broader gender inequality indices, the GCI provides a focused approach to identifying structural barriers to women's advancement, applicable across companies and sectors. It enables cross-sector and longitudinal comparisons, makes invisible barriers visible, and offers actionable data to inform targeted policy interventions. Additionally, the GCI promotes transparency by encouraging organizations to disclose promotion practices, raises awareness of gender-based discrimination, and fosters cultural change. By quantifying these barriers, the GCI empowers both organizations and women to advocate for equal opportunities and supports evidence-based strategies for inclusive governance.

For the definition of the variables that make up the indicator proposed in this research, this work is based on the estimation made by The Spanish National Research Council (CSIC, 2018). This indicator has been applied to Spanish academia, and it offers a relative measure calculated by comparing the proportion of women across the three research categories

(associate scientists, research scientists, and research professors) to the proportion of women specifically in the research professor category.

The indicator proposed in this study aims to quantify whether the proportion of female executives and senior managers increases in line with the proportion of female employees within the company. The calculation of the indicator involves a labor-intensive process that combines data obtained directly from Bloomberg with additional computations, and the steps to calculate it are shown in [Table 1](#).

Therefore, our GCI would be calculated as follows:

$$\text{Glass Ceiling Indicator} = \frac{\frac{\text{Total number of executive and management women}}{\text{Total number of executive and management workers}}}{\frac{\text{Total number of female workers}}{\text{Total number of workers}}} \quad (1)$$

To this end, an indicator value of 1 would indicate that the proportion of female executives and senior management over the total number of executives and senior management matches the total proportion of female employees in the company over the total number of employees. If it is greater than 1, it would indicate that the proportion of women in managerial positions is higher than the proportion of women in the company, indicating the absence of a glass ceiling. Conversely, values below 1 would reflect a lower proportion of female managers compared to the total proportion of women, implying the existence of a glass ceiling in the company.

[Figure 1](#) shows the average indicator for each financial institution during 2020–2024. Only two companies (The Charles Schwab Corp and T. Rowe Price Group Inc) report averages above 1, while the rest remains below 1 but above 0.5. Examining its temporal evolution ([Figure 2](#)), a downward trend appears, falling from 0.82 to 0.79, except in 2023 when it peaked at 0.83. This highlights the need to analyze variables firms can leverage to raise this indicator and mitigate the glass ceiling.

Table 1. Steps for calculating the glass ceiling indicator

Step	Description
1. Calculate female executives	Use Bloomberg data on the percentage and absolute number of female executives to determine the total number of male and female executives
2. Estimate women in management	Multiply the total number of employees by the percentage of women among all employees to estimate women in management roles
3. Compute total women in executive and management positions	Sum the number of female executives (Bloomberg data) and the estimated number of women in management
4. Calculate total female employees	Multiply the percentage of women in the company by the total number of employees
5. Estimate total individuals in management	Use proportional calculation based on the number of women in management and their share of the total to estimate all individuals in management
6. Compute total individuals in executive and management roles	Sum the total number in management and the total number of executives (men and women). This serves as the denominator
7. Calculate the numerator ratio	Divide the total number of women in executive and management positions by the total number of individuals in those roles
8. Compute the Glass Ceiling Indicator	Divide the ratio obtained in Step 7 by the Bloomberg variable indicating the percentage of female employees in the company

Source(s): Authors' own work using Bloomberg information

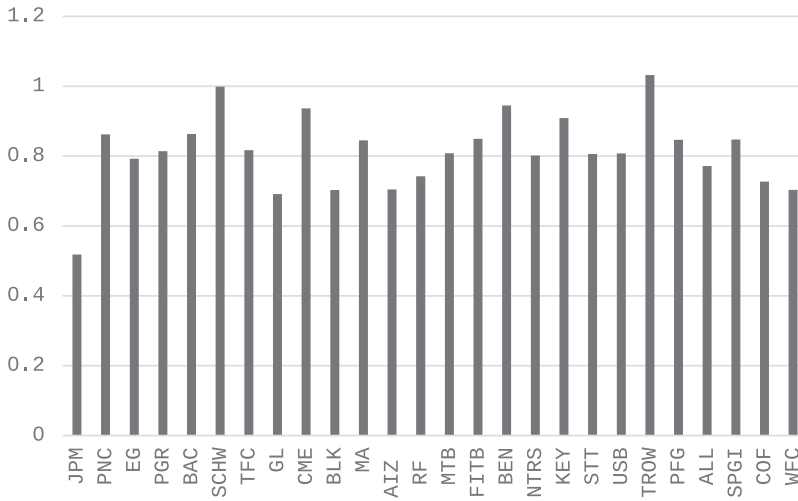


Figure 1. Average Indicator per Financial Institution. JPM (JP Morgan Chase & Co.); PNC (The PNC Financial Services Group Inc.); EG (Everest Group Ltd.); PGR (Progressive Corporation); BAC (Bank of America Corp.); SCHW (The Charles Schwab Corp.) TFC (Truist Financial Corp.); GL (Globe Life Inc.); CME (CME Group Inc.); BLK (BlackRock Inc.); MA (Mastercard Inc.); AIZ (Assurant); RF (Regions Financial Corp.); MTB (M&T Bank Corp.); FITB (Fifth Third Bancorp); BEN (Franklin Resources Inc.); NTRS (Northern Trust Corp.); KEY (Keycorp); STT (State Street Corp.); USB (US Bancorp); TROW (T Rowe Price Group Inc.); PFG (Principal Financial Group Inc.); ALL (The Allstate Corp.); SPGI (S&P Global Inc); COF (Capital One Financial Corp.); WFC (Wells Fargo & Corp.). Source: Authors own work using Bloomberg information

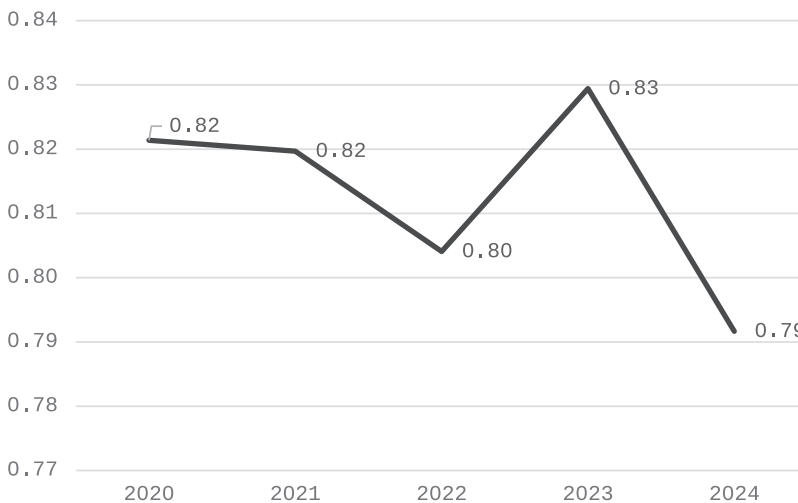


Figure 2. GCI average per year. Source: Authors' own work using Bloomberg information

3.3 Explanatory variables

The variables obtained from Bloomberg database and included in the model are shown in [Table 2](#).

Table 2. Description of the variables included in the model

Variable	Description
Percentage women in entry level positions (WLP)	Percentage of women of the total full-time employees in entry level positions. The Bloomberg Gender-Equality Index (BGEI) Reporting Framework began collecting this metric as of FY 2018. In FY 2019, the Bloomberg Gender-Equality Index (BGEI) excluded administrative roles from this definition
Percentage of women new hires (WNH)	Provides the percentage of women new hires, of the total new hires during the fiscal year
CEO duality (CD)	Indicates whether the company's Chief Executive Officer (CEO), or equivalent, also serves as the Chair of the board. 'N' indicates the two roles are separate
Chairman age (CA)	Age of the current chairperson of the board, in years. Where the company has a supervisory board and a management board (two-tier board), this field refers to the chairperson of the supervisory board. Field is part of the Environmental, Social and Governance (ESG) group of fields
The mean gender pay gap waterfall (GPG)	Provides percentage difference between men and women's mean (average) total compensation, the mean gender pay gap, where workforce representation is confirmed to be at least 80%, if available. Otherwise, mean gender pay gap where workforce representation is confirmed to be less than 80% or otherwise unknown
CEO Women (CW)	CW takes value 1 if the CEO is a woman, 0 otherwise
Revenue (log) (LRE)	Indicator of firm size as measured by Profit and Loss Account Total Revenue on a logarithmic scale
Return on Assets (ROA)	Measures the efficiency of a company's management in generating profits from the total assets on its balance sheet. The higher the result, the more efficient this management is
Financial leverage (LvR)	Measures the average assets to average equity. Unit: Actual. Calculated as: Average Total Assets/Average Total Common Equity
Efficiency Ratio (EFFR)	Efficiency Ratio (also known as Cost to Income Ratio) is an efficiency measure commonly used in the financial sector. The efficiency ratio measures costs compared to revenues. Unit: Actual

Source(s): Authors' own work using Bloomberg information

3.4 Model

To identify the factors influencing the reduction of the Glass Ceiling Indicator (GCI) in US financial institutions, we consider two categories: variables related to women's presence in top positions and financial-economic performance indicators. The analysis employs an unbalanced panel data linear model estimated through feasible generalized least squares (FGLS), which accounts for autocorrelation within panels, cross-sectional correlation, and heteroscedasticity (Baltagi, 2021). This approach expresses the GCI of different insurers at time t as a function of firm-specific characteristics during 2020–2024, under assumptions of temporal and spatial independence, linearity, and homoscedasticity.

$$\begin{aligned}
 GCI_{it} = & \beta_0 + \beta_1(WLP_{it-1}) + \beta_2(WNH_{it}) + \beta_3(CD_{it}) + \beta_4(CA_{it}) + \beta_5(GPG_{it}) + \beta_6(CW_{it}) \\
 & + \beta_7(LRE_{it-1}) + \beta_8(ROA_{it-1}) + \beta_9(LvR_{it-1}) + \beta_{10}(EFFR_{it}) + \alpha_i + \mu_{it}
 \end{aligned}
 \tag{2}$$

$$\mu_{it} \sim N(0, \sigma^2), \text{Cov}(\mu_{it}, \mu_{js}) = 0 \quad \forall i \neq j, t \neq s$$

Where, i refers to each of the 26 financial institutions companies in the sample; t represents the year, and β_i are the coefficients that multiply the different explanatory variables [2] related to gender or economic-financial aspects of the insurers.

To determine if there is a correlation between the regressors and α_i and, therefore, to decide whether it is more appropriate to estimate a panel data model with fixed or random effects, the Hausman statistic will be used (under the null hypothesis of random effects (RE) versus the alternative of fixed effects (FE)). This Hausman statistic (the ratio of the square of the difference between the two estimators and the difference of their variances) converges to a χ^2_{NT} and is given by the following expression,

$$Q_{FE.RE} = (\widehat{\beta}_{FE} - \widehat{\beta}_{RE})' (\widehat{\sigma}_{\beta FE}^2 - \widehat{\sigma}_{\beta RE}^2)^{-1} (\widehat{\beta}_{FE} - \widehat{\beta}_{RE}) \sim \chi^2_{NT} \quad (3)$$

Finally, the Wooldridge test allows for the examination of the existence of first-order autocorrelation, and the Arellano and Bond test tests the hypothesis of no second-order autocorrelation in the disturbances. If autocorrelation exists, it would be necessary to propose a new model that includes it. The Sargan test will also be used to verify if the equations are correctly identified.

Upon analyzing the results of the Hausman test, Table 3, it is observed that the p -value is greater than 0.05, which implies that there are no systematic differences between the estimators, and the null hypothesis is not rejected. Therefore, the most efficient estimator is the one obtained using random effects.

Both the Wooldridge autocorrelation test, where the null hypothesis is that there is no first-order autocorrelation, and the Arellano and Bond autocorrelation test indicate that there is neither first-order nor second-order autocorrelation, as the p -value is less than 0.05.

The Sargan test indicates that the equations are correctly identified since its p -value is greater than 0.05, showing that the specification is correct. On the other hand, the Pesaran test indicates that there is no cross-sectional dependence, and therefore, the errors are not correlated between the cross-sectional units. Finally, the Wald test for detecting heteroscedasticity in panel data models indicates that heteroscedasticity exists. Therefore, it is necessary to estimate the model using feasible generalized least squares (FGLS) to correct this heteroscedasticity and obtain more reliable and efficient estimates (Kripfganz, 2016).

4. Results

To estimate the model that allows explaining which variables may be most affecting the reduction of the glass ceiling in American financial institutions, two models will be estimated (see Table 4). The first model (M1 Model) includes only the economic and financial variables related to the economic and financial performance of the company used in other studies. In a second model, in addition to these, the variables related to the presence of women in significant

Table 3. Different tests to determine the most appropriate model

Test	Statistician	p -value
Hausman	$\chi^2(24) = 3.24$	0.862
Wooldridge	$F(1,24) = 4.049$	0.068
Arellano-Bond	AR(1): -1.561	0.1185
	AR(2): 1.0819	0.2794
Sargan	$\chi^2_{24} = 1.73257$	0.8848
Pesaran	$\lambda = 0.612$	0.5407
Wald	$\chi^2_{24} = 1566.4$	0.0000

Source(s): Authors' own work using Bloomberg information

Table 4. Results of the unbalanced panel data models estimated for the glass ceiling indicator (GCI) of US financial institutions (2020–2024)

Variables	M1. Economic-financial variables Coefficient	M2. Gender and economic-financial variables Coefficient
Percentage women in entry level positions (WLP _{t-1})	–	–0.0024* [0.098]
Percentage of women new hires (WNH)	–	0.0116** [0.001]
CEO duality (CD)	–	–0.0989* [0.051]
Chairman age (CA)	–	–0.0104** [0.016]
Mean gender pay gap (GPG)	–	–0.006** [0.041]
CEO women (CW)		0.3868 [0.000]
Revenue (RE _{t-1})	0.0195* [0.075]	0.0641** [0.000]
ROA _{t-1}	0.0046** [0.000]	0.007** [0.018]
Leverage ratio (LvR _{t-1})	–0.0018** [0.014]	–0.0223** [0.001]
EFF Ratio	–0.0008** [0.001]	–0.0004 [0.891]
Cons	1.0121** [0.000]	0.6086** [0.043]
No. of observations	128	128
No. of companies	26	26
R-squared	0.3831	0.7771
Wald χ^2	220.45 [0.00]	434.37 [0.00]

Note(s): The *p*-value in brackets. **Significant at 5%. *Significant at 10%

Source(s): Authors' own work using Bloomberg information

positions in American financial companies will be included as a contribution of this work (M2 Model).

The variables included in the M1 Model are: Revenue (RE), ROA, Leverage Ratio (LvR), (these three variables have been included into the model as lagged variables to avoid potential overestimation) and a newly calculated variable EFF Ratio. In the M2 Model, in addition to these variables, the following gender-related variables have been included: Percentage of women of the total full-time employees in entry-level positions (WLP) as lagged variable, the percentage of women new hires of the total new hires during the fiscal year (WNH), CEO duality (CD), CEO Women (CW), Chairman age (CA), and the mean gender pay gap (GPG). Table 4 shows the estimated results.

According to the results, it can be stated that if only economic-financial variables (Model M1) are considered, all variables are significant at 5% level except Revenue, which is statistically significant at 10%. Among the statistically significant variables, ROA has the highest influence on the Glass Ceiling Indicator. Conversely, an increase in the leverage ratio or EFF ratio is not contributing to an improvement in the glass ceiling. These results are confirmed when estimating an extended model that includes, in addition to gender variables, those related to the financial-economic aspects of the company (Model M2), except for EFF Ratio, which is not statistically significant.

The values of the coefficient of determination reflect that the explanatory power of Model M2 is better than that of Model M1, as it has increased from 0.38 (Model M1) to 0.77 (Model M2).

The positive and significant estimated parameter for the percentage of new female hires (M2 Model) suggests that increasing the hiring of women in financial institutions alleviates the glass ceiling. Once again, this finding indicates that newly hired women could be advancing to senior roles, underscoring the persistent barriers. However, the percentage of women in entry-level positions is not contributing to the reduction of the glass ceiling, as the estimated coefficient value is significant but negative. Consequently, an increase in women in entry-level

positions does not necessarily lead them to occupy senior positions, thereby perpetuating the glass ceiling in financial institutions. These outcomes support H1.

Analyzing the effect of CEO duality and CEO women, it is observed that when CEO duality is held by a woman, there is a reduction in the barriers imposed by the glass ceiling by nearly 0.2879 points (0.3868–0.0989), *ceteris paribus*. Conversely, the CEO duality and the Chairman age does not contribute to the improvement of the glass ceiling. The older the chairman, the lower the possibility of improvement the glass ceiling. These results confirm H2.

The results obtained regarding the average gender pay gap are particularly significant, as a wider gender pay gap is associated with a lower GCI and, consequently, stronger glass ceiling barriers. Thus, if the pay gap in financial companies increases by 1 point, it implies an average decrease of 0.6% in the GCI compared to those that do not reduce their pay gap (*ceteris paribus*). This outcome supports H3.

Concerning the company's financial variables, both the ROA and revenue contribute to diminishing the glass ceiling in financial institutions, which implies that H4 is true. According to the estimated results, the influence of the Revenue is greater than that of ROA, as their estimated parameters are respectively: 0.0641 and 0.007. Finally, increases in the leverage ratio led to a decrease in the GCI. However, the EFF ratio is not statistically significant. These results imply that H5 is partially true.

Figure 3 summarizes the relationship between the hypotheses and the GCI proposed. It is important to note that higher indicator values are associated with a substantial diminution of the glass ceiling.

5. Discussion, conclusions, limitations and future research

The persistent underrepresentation of women in top management roles within the US financial industry highlights the existence of a glass ceiling, which may lead women to perceive the sector as less rewarding than their male counterparts. To address this issue, our study introduces a novel quantitative metric, the Glass Ceiling Indicator (GCI), designed to assess whether the proportion of women in managerial positions grows at a lower, equal, or higher rate than the overall proportion of women in the company. Although applied here to the financial sector, the GCI offers potential for broader use across industries and countries.

Our panel data analysis confirms that reducing the gender pay gap is essential for promoting equity and enabling women's advancement into leadership roles. Wage equality

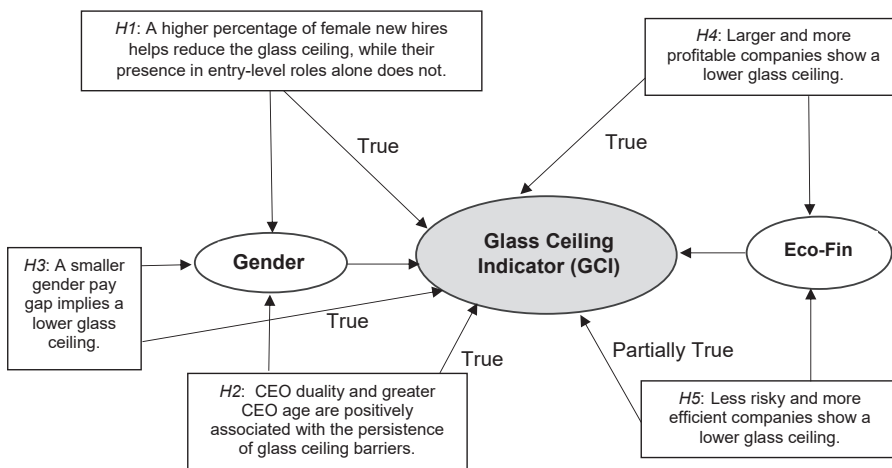


Figure 3. Relationships between hypotheses and glass ceiling. Source: Authors' own work

strengthens perceptions of fairness and motivation, helping overcome persistent barriers. CEO duality generally does not mitigate glass ceiling effects, but when the CEO is female, it appears to reduce them. Firm characteristics, such as size, revenue, ROA, and leverage, also shape the Glass Ceiling Indicator (GCI), with larger, lower-risk firms showing fewer barriers, likely due to their capacity for inclusive policies and diverse leadership. This contrasts with the glass cliff phenomenon, which links women's appointments to periods of poor performance or high risk (Ryan *et al.*, 2016; Morgenroth *et al.*, 2020). The inverse relationship observed here offers a nuanced view of the interplay between organizational performance and gender dynamics.

The development of GCI has strategic implications for both managers and policymakers. By identifying variables that significantly influence gender disparities in executive positions, our findings support the formulation of targeted strategies aimed at promoting equal opportunities. Managers who are aware of gender biases and committed to equity can leverage this indicator to guide internal policy reforms. Likewise, public policies focused on wage transparency and leadership development for women can benefit from the insights provided by the GCI.

The Glass Ceiling Indicator developed in this study offers a significant contribution to theory and practice. Academically, it provides a replicable, scalable quantitative tool that complements qualitative approaches and enables cross-sector and longitudinal comparisons. For practitioners, it serves as a diagnostic instrument to identify and monitor gender-based barriers, supporting effective equality policies. Its relevance extends to education and public policy by informing teaching on inclusive leadership and offering objective data for regulatory interventions. Beyond these domains, its societal impact lies in making the glass ceiling measurable, fostering awareness, and advancing women's access to leadership roles and workplace fairness.

Despite the robustness of our sample, this study presents limitations that suggest avenues for future research. Expanding the dataset to include a wider range of firms, sectors, and countries would improve generalizability and enable comparative international analyses. Applying the Glass Ceiling Indicator (GCI) across diverse industries and regions could validate its utility and reveal sector-specific barriers, while qualitative approaches, such as interviews with mid-level female managers, may offer deeper insights into the challenges women face in reaching top leadership roles. We also acknowledge a potential bias in the GCI in male-dominated sectors, where higher index values may reflect structural imbalances rather than genuine equity. To address this, future refinements should incorporate normalization techniques or complementary metrics to mitigate bias and enhance the index's applicability across varied organizational contexts.

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Notes

1. According to the GICS classification provided by Bloomberg, there are 73 financial institutions listed in the S&P 500. Of these, data is available for 26 companies, which represents 35% of the total financial institutions. By applying the formula for calculating sample size in finite populations, the margin of error is approximately 15%. The number of financial institutions is limited because this is all the information available that could be accessed on the Bloomberg platform.
2. The Variance Inflation Factor (VIF) for the explanatory variables in the model shows, in all cases, values below 10, indicating that there are no severe multicollinearity issues. The VIF values for these variables are as follows: WLP (7.08), VNH (5.94), CA (2.26), GPG (8.25), LRE (5.13), ROA (5.23), LvR (5.32), and EFF RATIO (4.61).

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