



Markets view

How does board gender diversity affect stock risk?



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- Empirical research shows that companies with insufficient board gender diversity have higher idiosyncratic risk – and these results are robust and consistent over time and across markets
- Sophisticated portfolio construction or voting and engagement can be solutions to help mitigate unintended idiosyncratic risk relating to board gender diversity
- Good progress has been made in the ‘Improving Board Gender Diversity in Asia’ project initiated by the Responsible Investment team in 2023

Introduction

Board gender diversity has received increasing attention within corporate governance discussions in recent decades, and latterly from a political perspective. Norway was the first country to introduce a female representation quota, kickstarting an international push for fairer female representation – even in relatively conservative places such as Japan, Korea and China. Lots of research has been conducted to understand the benefits and/or the downsides of having a more diverse board. Inevitably, there has also been a backlash – for instance, the stock exchange set to launch in Texas (TXSE) will be less demanding¹ in this regard.

Here we examine the relationship between board gender diversity and stock idiosyncratic risk (that is, the risk that is related to company specifics and cannot be explained by systematic risks, which is the overall risk that affects all assets). Our analysis shows that companies with insufficient board gender diversity practices exhibit higher idiosyncratic risks compared to those with sufficient gender diversity on their boards. The results hold consistently across global developed markets. Following this insight, implications for portfolio management and means of mitigating the risks associated with insufficient board gender diversity are discussed.

Data and methodology

The stock universe in our analysis is the MSCI World Index, as at the end of June 2023. It contains 1,512 developed market listed companies. We gathered monthly stock returns from Bloomberg. For the board gender diversity indicator, we use the percentage of women on the board, provided by ISS (Institutional Shareholder Services)², a leading proxy adviser providing corporate governance solutions. Appendix 1 gives the details about the progression of the data coverage.

The average percentages of women on boards varies in different markets. According to Deloitte³, globally in 2023 women held less than a quarter of the world's board seats (23.3%). The proportion is 28.5% in North America and 33.8% in Europe, due to an enhanced regulatory requirement in the European Union – at least 33% of directors must be female, and 40% of non-executive directors – that will come into force in 2026. The proportion in Asia is only 14.8% – much lower than the rest of the world.

At Columbia Threadneedle Investments, our Responsible Investment (RI) team sets different criteria for gender representation in firms in different regions. In line with the RI team's criteria, in this study we use 13.5%⁴ female representation on boards for Asia, and 30%⁵ for the rest of the developed markets⁶. In this analysis, the stock universe is divided into two groups: those meeting the board gender diversity requirement (sufficient group), and those that do not (insufficient group). Appendix 2 exhibits the evolution of the number of stocks in the sufficient and insufficient groups over time within each region.

To calculate stock idiosyncratic risk, we employ the Fama-French Five-factor Regression model⁷, with an extension of the regional and sector factors. This approach allows us to isolate company-specific factors not covered by other common factors, such as size, profitability and sector. The volatility of the residual returns from the regression model serves as an indicator of the stocks' idiosyncratic risk (Appendix 3 explains the details of the calculation).

The next step is to link board gender diversity groups and stock idiosyncratic risks. Each month, the stocks are divided into two groups: one with sufficient board gender diversity and one with insufficient diversity. From the previous step, every stock has a residual volatility value assigned each month. For each group, an average residual volatility of the stocks is calculated. So, we produce two residual volatility values – one each for the sufficient and insufficient groups, and then we repeat the process for every month.

Results

We observe that companies with insufficient board gender diversity exhibit higher average residual volatility⁸ compared to those with sufficient board gender diversity. The trend persists over time and across all regions in our analysis. Asia, even with a lower diversity requirement than the other markets, already shows a noticeable reduction of the idiosyncratic risk. On average, the idiosyncratic risk of the insufficient group is 8% higher than the sufficient group. A robustness test using two equal split sample periods indicates the same conclusion (see Appendix 4).

¹ The Economist, "Want to avoid woke stockmarket rules? List in Texas", 8 June 2024

² ISS Q354: What is the percentage of women on the board?

³ Deloitte, Women in the boardroom: a global perspective, 21 March 2024

⁴ The RI team sets the 13.5% voting threshold in Asia, as the majority of boards have more than eight members. It would be less of a burden for board sizes of fewer than seven to have more than two female directors. For developed markets, the RI team uses 27% as the voting criterion. In this study, 30% is used to make sure EMEA has enough number of stocks in the 'insufficient' group.

⁵ Too many male or female directors on a board is not considered sufficiently gender diverse. In practice, however, there are only a few cases with insufficient male director representation.

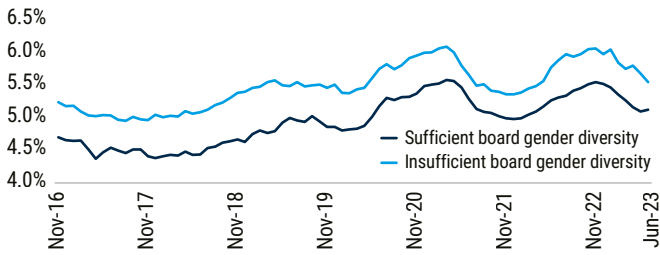
⁶ In our analysis, North America includes the US and Canada; EMEA includes EMEA and Australia; the rest is Asia.

⁷ Journal of Financial Economics, Fama and French, "A Five-Factor Asset Pricing Model", April 2015

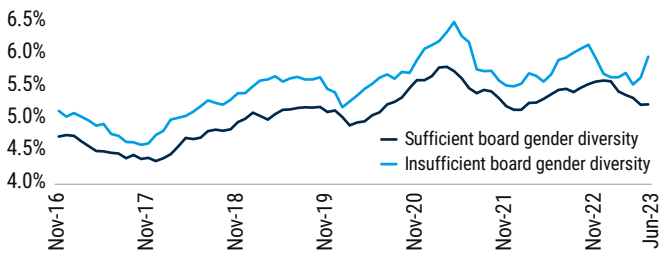
⁸ The average residual return is by definition zero.

Figure 1a/b/c: Regional residual volatilities

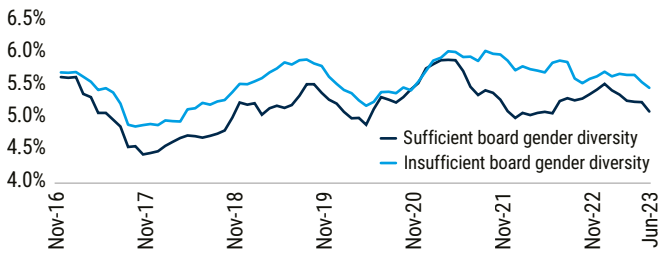
Residual volatilities North America



Residual volatilities EMEA



Residual volatilities Asia



Source: Columbia Threadneedle Investments, 2024

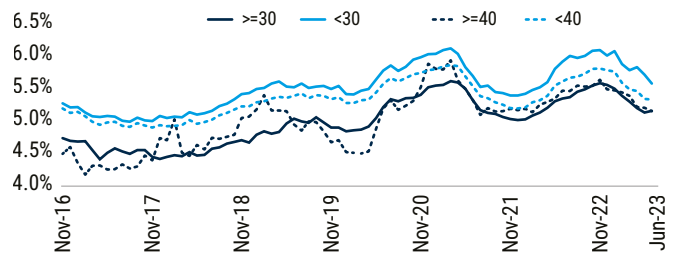
Gender is an important source of managerial diversity. Several studies show women can often bring in more diverse perspectives to a board and make problem solving more effective⁹. Other studies also show that women directors tend to be less overconfident¹⁰ and more diligent in monitoring¹¹, as well as helping to improve group dynamics¹² in the boardroom. The literature review results do not imply women are better managers, but they reaffirm that having a more inclusive and diverse perspective can achieve better management and decision-making quality.

Next, we explore whether a stricter criterion could further reduce idiosyncratic risk. We increased the gender diversity threshold from 30% to 40% in developed markets,

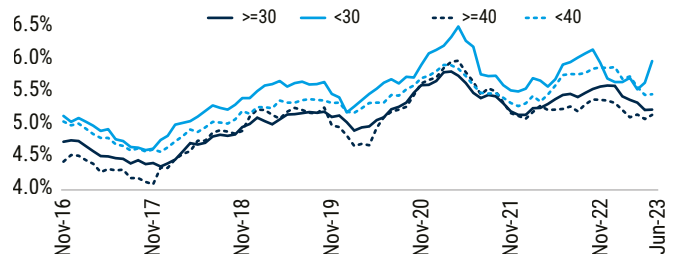
which resulted in fewer companies qualifying as having sufficient diversity. Figure 2a and 2b illustrates that the average residual volatilities of companies within the original and updated "sufficient" categories are comparable (the dark blue solid and dotted lines), albeit with a slightly "bumpy" trend in the 40% group due to its smaller sample size. Meanwhile, the residual volatilities in the original "insufficient" categories are consistently higher than those in the updated "insufficient" categories (light blue solid and dotted lines). This suggests that further improving board gender diversity in those companies which already have sufficient diversity has limited room for residual volatility reduction. Conversely, improving companies in the tail "insufficient" group have a higher potential in reducing idiosyncratic risk.

Figure 2 a/b: Comparison between different criteria

Residual volatilities North America



Residual volatilities EMEA



Source: Columbia Threadneedle Investments, 2024

Interaction with other governance factors

One might question whether other factors influence these results, such as the possibility that larger companies inherently have better corporate governance and board gender diversity practices, potentially biasing our findings. This concern was one of the reasons for initially adopting the multi-factor regression model, allowing us to isolate factors not captured

⁹ Science Direct, Board gender diversity, firm performance and risk-taking in developing countries: The moderating effect of culture, July 2021
¹⁰ Journal of Management and Governance, Female management, overconfidence and debt maturity: European evidence, September 2020
¹¹ Emerald insight, Women on boards and monitoring tasks: an empirical application of Kanter's theory, 25 January 2021
¹² Sage Journals, Women Directors and Board Dynamics: Qualitative Insights from the Boardroom, 4 June 2023
¹³ We exclude Asia in this analysis as it does not have enough data in the >=40% category.

by common variables, such as size and sector. However, so far corporate governance factors are yet to be accounted for in the regression analysis. Although the structure, composition and operation of boards will vary from country to country and company to company, certain elements of effective boards are universal. The composition of the board is of the utmost importance. We therefore chose board independence¹⁴ to examine the interaction with the gender factor.

We observe that the percentage of independent board members in the gender diverse board group is higher than in the non-diverse group, with EMEA and North America averaging about 4% higher and Asia about 14% higher over time. To further isolate the board gender diversity effect, the independent board factor is then included in the previous regression, and we compute a new residual volatility. The independent board factor for each region is defined as the average return of companies in the top quantile of board independence minus the average return of the companies in the bottom quantile. The result supports our earlier conclusion. Appendix 5 shows that the residual volatility, excluding the board independence, of the sufficient board gender diversity group is also consistently lower than the one from the insufficient group in all three regions.

Implication for portfolio management

Our analysis has shown that insufficient board gender diversity is related to higher idiosyncratic risk. The next step is to consider how to integrate board gender diversity into the investment process to mitigate risk.

There are broadly two components in a generic equity investment process. The first is to identify companies that potentially have positive future outperformance (alpha). This is typically referred to as stock selection. The second is how stocks are combined into a portfolio. This is referred to as portfolio construction. Our analysis does not provide any insight as to whether board gender diversity contributes positively to individual stock returns – alpha. The analysis does show that there is a relationship between board gender diversity and the idiosyncratic risk of a stock, and portfolio construction is focused on balancing risk against expected return.

When a stock is introduced into a portfolio it brings both systematic and idiosyncratic risk to the portfolio. Lower idiosyncratic risk does not necessarily equate to lower total risk. Stock A can have higher total risk and lower idiosyncratic risk than stock B, if stock A has higher exposures to systematic risk factors. Besides, higher idiosyncratic risk is not necessarily considered bad. There are managers who deliberately seek higher alpha by bearing higher idiosyncratic risk, and there are

also managers who target specific systematic factors, such as small cap or value, keeping low idiosyncratic risk. However, it is the unintended risk that needs to be minimised.

One way to mitigate the unintended idiosyncratic risk relating to board gender diversity is through portfolio construction. Another way would be to address the insufficient board gender diversity risk at source – ie, improving board diversity of the companies in the portfolio – by engagement and voting.

Example: systematic factor investing strategy

Our systematic equity factor investing strategy has a solid live track record of more than 15 years. Refined factors and sophisticated portfolio construction methodology are used to maximise the factor exposure while controlling for risk. For example, portfolio optimisation takes various constraints such as market beta, sector, currency risk and other responsible investment criteria such as carbon intensity, governance score and so on.

From the backtesting result we found that incorporating board gender diversity, by imposing a portfolio level board gender diversity score no worse than the benchmark score, leads to lower drawdowns and lower portfolio idiosyncratic risk.

Our engagement framework and proxy voting approach

At Columbia Threadneedle Investments, the RI team communicates the company's gender diversity expectation for the make-up of corporate boards through our public Corporate Governance Guidelines¹⁵. This is supplemented with a tailored Proxy Voting Updates letter to a substantial group of investee companies and through our engagement efforts, in line with our Environmental and Social Practices Statement¹⁶ on board gender diversity. If a company fails to meet our expectations, the RI team will look for a statement that sets out the board's approach to promote diversity and a dialogue with the company to understand the difficulty they face and their near-term plans. The disclosure of specific diversity targets set by the board, and subsequent reporting on performance against these targets, are welcomed by the RI team. When disclosure and dialogue are absent or appropriate gender diversity levels have not been met, the RI team may recommend that portfolio managers not support the re-election of nomination committee chairs or other relevant directors with a vote comment to encourage improvement within a reasonable timeframe.

¹⁴ ISS Q10: What percentage of the board is independent according to the ISS local market classification?

¹⁵ Columbia Threadneedle Investments, Corporate Governance Guidelines, January 2024

¹⁶ Columbia Threadneedle Investments, Environmental and Social Practices Statement, January 2024



In 2023, our RI team initiated an engagement project linked to board gender diversity in Asia, aiming to engage with 26 of the largest companies that continue to have all-

male boards. Good progress has been observed, with 20 companies adding at least one female director (as at 31 May 2024).

Example: Xiaomi Corporation¹⁷

Xiaomi Corporation is a Chinese consumer electronics company and the third largest smartphone provider in the world. In December 2021, the Hong Kong Stock Exchange prohibited single-gender boards for all listed companies with a deadline to comply of 31 December 2024. However, Xiaomi has never had a female director on its board since listing in 2018.

The RI team emailed Xiaomi in April 2023 but did not get a response prior to the early June AGM. The team therefore voted against the members of the nomination committee who were up for election in 2023.

The RI team had recommended voting against the chair and the members of the nomination committee since 2021 with a vote comment expecting it to improve board gender diversity. The company subsequently updated its board gender policy in the 2023 annual report and started to disclose gender representation at different managerial levels. It also committed to complying with the rules and further increase female representation.

In a call with the company in late June 2023, the RI team communicated our board gender expectation and aimed to understand Xiaomi's readiness to comply with the HKEX's requirements on board gender diversity.

As all the companies on the HKEX with all-male boards were under pressure to appoint female directors by 2024, Xiaomi did not manage to find an ideal candidate straightaway. The company said that as it was seeking someone who could add value in the long term, rather than simply appointing someone as a compliance requirement, it acknowledged the difficulty of making a suitable appointment that would fit the company culture and who had the desired industry background.

In January 2024, the company appointed its first female directors to the board, as well as two female C suite-level managers in May. It also confirmed that it will always have at least one female on the board. The RI team is glad to see this transformation and will continue monitoring the gender diversity ratio at the company and its progress on delivering its commitment in the future.

Summary

Our empirical research shows that companies with insufficient board gender diversity practices exhibit higher stock idiosyncratic risk compared to those with a sufficient gender diverse board¹⁸. To mitigate the unintended risk that is related to insufficient board gender diversity, one can think of solutions such as portfolio construction or use company engagement

and voting. At Columbia Threadneedle Investments, the Responsible Investment team initiated an "Improving Board Gender Diversity in Asia" project in 2023. Subsequently, and also with a concurrent regulatory push, the majority of the companies with which the RI team engaged have improved their board gender diversity.

¹⁷ Mention of specific stocks is not a recommendation to buy or sell

¹⁸ Our research focusses on board gender diversity, but there are other elements of diversity that aren't considered here, but might play a role, such as age, experience, ethnicity etc. However, there is no data available for these factors.

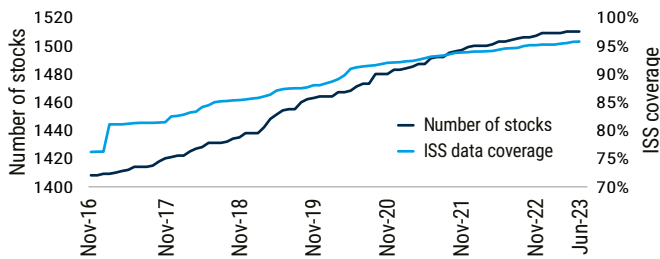
Appendix

Appendix 1: Progression of the data coverage

We use the constituents of MSCI World index, as at the end of June 2023. It consists of 1,512 developed market listed companies. Since November 2016, ISS has data on board gender diversity available on its platforms. Of the 1,512 names, 1,410 have the full monthly return history from November 2016.

The ISS diversity indicator is not a monthly series as it is determined by the timing of the board election frequency of each company. To address this, we use a forward-filling method that carries forward the latest data for a given company until the data is updated. Over time, the coverage of the board gender diversity data improves, enhanced from 77% in late 2016 to 96% by June 2023 (Appendix 1 Figure 1).

Appendix 1 Figure 1: Data coverage



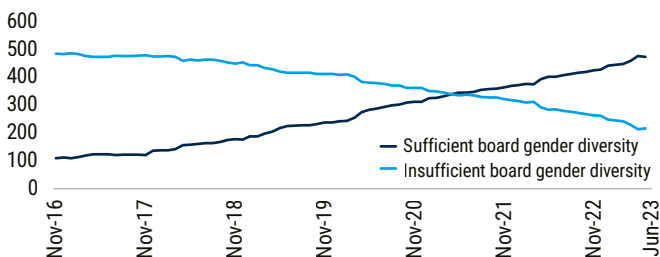
Source: Columbia Threadneedle Investments, 2024

Appendix 2: Evolution of the number of stocks in the sufficient and insufficient board gender diversity baskets

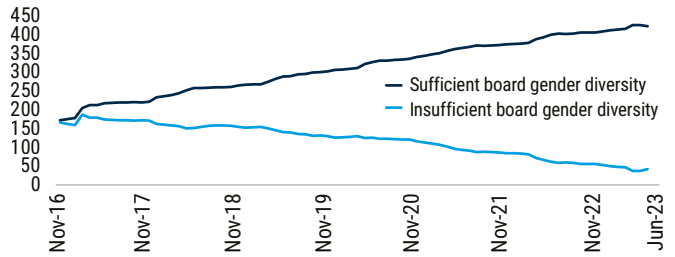
Appendix 2 Figure 1a/b/c exhibit the number of stocks in the “sufficient” and “insufficient” groups over time within each region. Overall, we observe a gradual increase in the percentage of gender diversity in corporate boards. EMEA, especially, has a notably higher proportion of companies with a sufficient gender diversity in its boards. In 2021, the number of companies classified as sufficient and insufficient in terms of board gender diversity in North America reached parity. Encouragingly, Asia is showing signs of catching up.

Appendix 2 Figure 1a/b/c: ‘Sufficient’ and ‘Insufficient’ stocks regionally

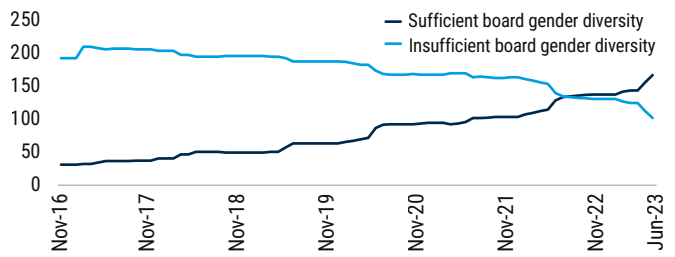
Number of stocks in North America



Number of stocks in EMEA



Number of stocks in Asia



Source: Columbia Threadneedle Investments, 2024

Appendix 3: Calculation of the stock idiosyncratic risk

The Fama-French Five-factor Regression model is an extension of the Capital Asset Pricing Model (CAPM). In addition to the market return, the model includes factors that explain asset returns such as size (the return spread between small- and large-cap stocks), value (the return spread between value and growth stocks), profitability (the return spread between stocks with robust and weak operating profitability), and investment (the return spread between stocks with conservative and aggressive investments)¹⁹.

We use the monthly data published on the Kenneth R. French website²⁰. We further incorporate region and sector factors, determined on a monthly basis by the average excess return of each region or sector over the market return. The residual returns obtained from this time series regression represent stock idiosyncratic returns. Subsequently, we use a 12-month rolling window (in month t, the residual returns from t-11 to t months are used) to calculate the volatility, which we refer to as residual volatility. This metric serves as an indicator of the stocks’ idiosyncratic risk.

$$\begin{aligned}
 \text{stock return} = & \text{constant} + \beta_1 * \text{market return} + \beta_2 * \text{size factor return} + \beta_3 * \text{value} \\
 & \text{factor return} + \beta_4 * \text{profitability factor return} + \beta_5 * \text{investment} \\
 & \text{factor return} + \beta_6 * \text{region excess return} + \beta_7 * \text{sector excess} \\
 & \text{return} + \text{residual return } \epsilon
 \end{aligned}$$

¹⁹ Kenneth R. French, Description of Fama/French 5 Factors (2x3)

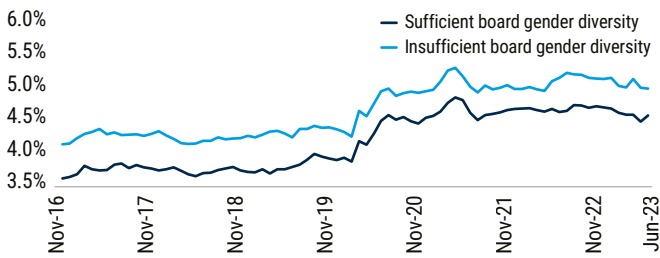
²⁰ Kenneth R. French, Current Research Returns https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

Appendix 4: Residual volatilities in two board gender diversity groups using two periods

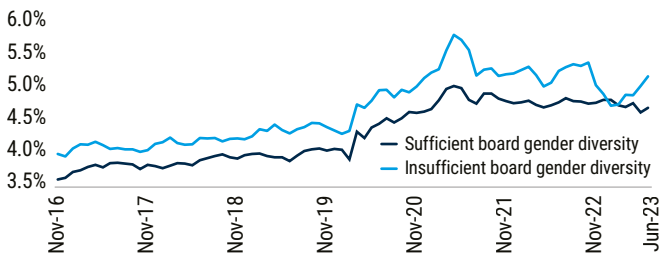
For robustness, we split the sample from November 2016 to June 2023 into two equal periods and ran regressions for each half. This allows us to verify if the results hold across different periods and to assess whether the varying number of companies in the sufficient and insufficient groups affects the outcomes, given that the second half has more sufficient companies. The results indicate that the patterns remain consistent across both periods (Appendix 4 Figure 1a/b/c).

Appendix 4 Figure 1a/b/c: Regional residual volatilities

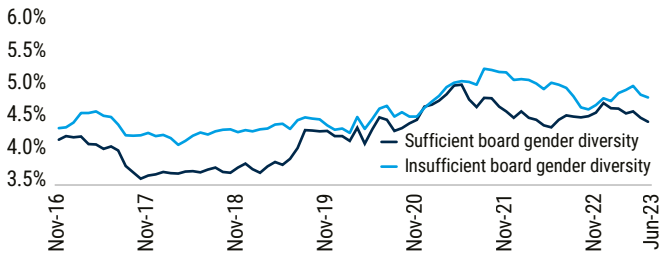
Residual volatilities North America



Residual volatilities EMEA



Residual volatilities Asia

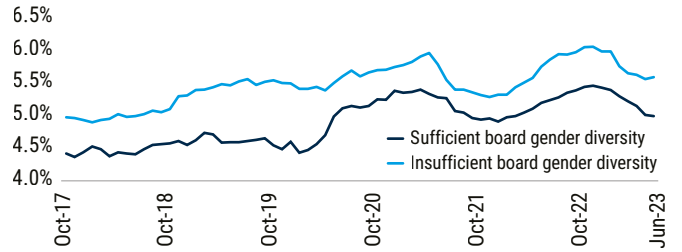


Source: Columbia Threadneedle Investments, 2024

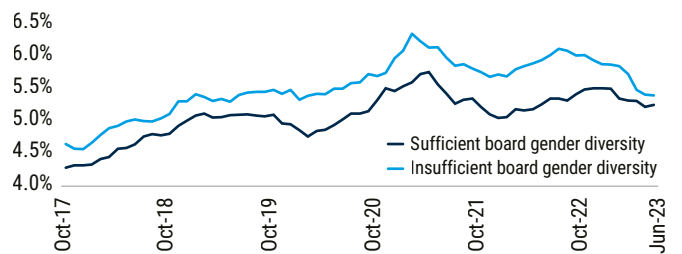
Appendix 5: Residual volatilities (exclude board independence) in two board gender diversity groups

Appendix 5 Figure 1a/b/c: Regional residual volatilities (excluding board independence)

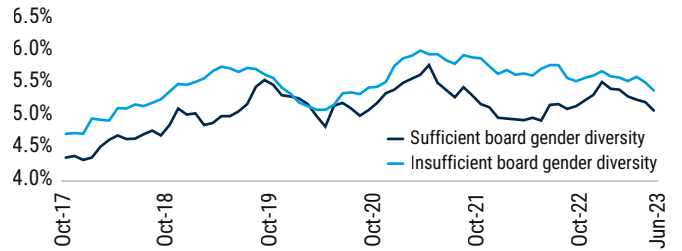
Residual volatilities North America



Residual volatilities EMEA



Residual volatilities Asia



Source: Columbia Threadneedle Investments, 2024

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