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EDITORIAL COMMENTARY

Sustainable Finance in Asia: Editors' Overview

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1 | Sustainable Finance in Asia

This special issue of the *Asian Economic Policy Review* is devoted to the theme of "Sustainable Finance in Asia". Although we have had two issues devoted to finance (Vol. 6, No. 2 and Vol. 17, No. 2), and two issues devoted to the environment (Vol. 5, No. 1 and Vol. 16, No. 1), this is the first issue where these issues are considered together.

Flammer (2026) defines "sustainable finance" as covering a broad range of financial activities including raising finance and investment activities that integrate environmental and social factors. In this sense, the term sustainable finance is much broader in coverage than "green finance" which refers to financial activities that only integrate environmental considerations. Within green finance, green bonds are instruments whose proceeds are earmarked for investments in environmentally beneficial projects. There are other types of relevant instruments that Flammer (2026) highlights as being within sustainable finance, and these include: (a) biodiversity finance which uses private capital to finance biodiversity conservation and restoration; (b) blended finance which blends or combines development funding from the public sector or philanthropic organizations with private capital to reduce the risk borne by private investors; and (c) impact investing which refers to investments that are directed towards the dual objectives of financial returns and social/environmental impact.

We can obtain some idea of the size of financing in this area from Climate Bonds Initiative (CBI 2024) which reports the cumulative total of green, social, sustainability (GSS) bonds and sustainability-linked bonds (SLB) issued that are in alignment with CBI's methodologies as being USD 4.4 trillion with an additional USD 1.1 trillion of bonds that are not aligned according to their methodology. Green bonds are a little over 60% of the total at USD 2.8 trillion. On a flow basis, in 2023 USD 872 billion of GSS and SLB bonds were issued. The Asian-Pacific region was the source of 33% of this amount with 11% and 7% of the world total issued in Chinese Yuan and in Korean Won, respectively. Of the USD 587 billion of green bonds issued in 2023, the Asian-Pacific region contributed USD 189 billion of which 44% came from China.

The interaction between different bond markets is one important theme for this issue. Kim et al. (2026) examine the impact of *sovereign* sustainable bond issues on the *corporate* sustainable bond markets, while Zhan et al. (2026) examine the impact of *green* bond issues on *conventional* bonds in China. Another theme is how environmentally-related actions within the firm impact on the firm's financial and other outcomes. Xie et al. (2026) examine how a firm's environmental, social and global (ESG) practices impact on its financial outcomes like its rate of return on assets and Tobin's Q, while Li et al. (2026) focus on "green" human capital and how their employment is associated with carbon emissions of Asian

Caroline Flammer was a Guest Editor for this issue of the journal.

†Unfortunately, Takatoshi Ito passed away on 20 September 2025 before this Editors' Overview was completed.

firms. A final theme relates to the appropriate financial incentives/disincentives to be imposed on green and non-green ("brown") firms to move them toward better environmental outcomes (see Liang and Punzi 2026).

2 | Summary of Papers and Discussions

This section summarizes the six papers presented at the Forty-First Asian Economic Policy Review Conference held on April 11, 2025, the twelve comments by the assigned discussants, and the general floor discussion of each paper. This conference was held online. A list of the conference participants appears at the end of this paper (Appendix A).

2.1 | Flammer on Sustainable Finance: Tools, Effectiveness, and Challenges

Caroline Flammer (Flammer 2026) provides a summary of her recent research with her coauthors in the area of sustainable finance which she defines as covering the integration of environmental and social considerations into financial decision-making While this financing has expanded rapidly, Flammer sees many challenges remaining in relation to its actual effectiveness, particularly in the light of greenwashing concerns and the difficulty of measuring environmental and social impacts.

There are six major insights that Flammer suggests can be derived from her summary of her recent work. The first insight is that, as can be seen from the CBI data cited in Section 1, green bonds have emerged as a major vehicle for channeling investment funds into environmentally beneficial projects. Flammer argues the empirical evidence indicates that the issuance of corporate green bonds is associated with a positive stock market reaction and reduces corporate emissions both globally and for Asia. A second insight that is also supported by the CBI data cited in Section 1 is that, in addition to green bonds, other asset classes have started to emerge. One class that Flammer highlights is the relative new practice of biodiversity finance. While financing biodiversity is complex due to the public good nature of biodiversity, financial returns can sometimes be generated through the bundling of the public good (biodiversity) with a private good whose value it enhances. Empirical evidence from asset management firms that provide biodiversity finance investments indicates that: (a) biodiversity projects with high expected returns are financed by pure private capital; (b) biodiversity projects with low expected returns but high biodiversity impact are financed through blended financing structures; and (c) biodiversity projects whose expected return and biodiversity impact are below a certain threshold are difficult to finance by private capital (even in blended financing structures). The last point indicates that private capital on its own is unlikely to substitute for the implementation of effective public policies in addressing the biodiversity crisis.

The third insight is that blended finance, which combines/blends development funding from the public sector or philanthropic funding with private capital to reduce the risk borne by private investors, is gaining traction as a way to finance a wide array of projects with environmental and social benefits. The fourth insight relates to impact investing, and Flammer's findings that this investment can boost local social outcomes and uncover profitable opportunities. Flammer's fifth insight relates to the contrast of passive strategies such as divestment that may signal value but often lack impact with active shareholder engagement that has proven more effective at improving firms' engagement in sustainable practices. Flammer's final insight is that while corporate sustainability can benefit companies in multiple ways, many companies are reluctant to engage in sustainability initiatives due to a focus on the short-term. This leads to a discussion of governance mechanisms that provide long-term incentives and/or promote the use of sustainability criteria in executive compensation.

Ayako Yasuda (Yasuda 2026) notes that the literature contains some disagreement about what sustainable finance should cover. Should it be limited to a definition that puts emphasis on the intentionality toward the impact of the investment as Flammer defines it or should it be conceptualized more broadly? As Yasuda points out, these definitional differences can lead to non-trivial differences in measures of sustainable finance. Yasuda also argues that the morals driving some western investors in this area may not be observed in Asia suggesting one source of differences between research results for Europe and Asia.

Lloyd Kurtz (Kurtz 2026) raises two important challenges for research in the area of sustainable finance. The first is the need for multidisciplinary research and he notes the current incentives facing academics and academic journals drive many academics (and journals) away from multidisciplinary research. The second challenge is what he calls "the problem of attention," namely, even if the quality of research is improving in this area, there is a problem in ensuring that markets and policy makers are listening all the time.

Hal Hill raised the issue of how important are the policy and institutional settings in Asia for what we might expect to find when there is research on some of these issues in many Asian countries. He pointed to their lack of financial depth, their lack of intermediation over long horizons, and their lack of carbon pricing mechanisms. He also raised the issue of how President Trump's activities like leaving the Paris Accord might affect outcomes in this area.

Although a large part of Flammer's paper focuses on bond issues, Cassey Lee wanted to know about green bank lending and data availability for such lending. Takatoshi Ito raised the issue of whether investing in ESG activities raises or reduces returns. If it raises returns, then why is there any objection to pension funds engaging in this type of investment? If there is a pricing premium associated with green bonds meaning that green bonds have higher prices than comparable bonds, doesn't this mean that investors would lose returns and investors like pension funds shouldn't invest in these bonds?

2.2 | Xie et al. on Inclusive Wealth and ESG Practices

The focus of the study by Jun Xie, Kenichi Yoshida, Shuning Chen, Alexander Keeley, Hidemichi Fujii, and Shunsuke

Managi (Xie et al. 2026) is twofold: what variables are associated with a firm's Environmental, Social and Governance (ESG) practices; and what is the relationship between the firm's ESG practices and two financial corporate outcomes, the return on assets (ROA) and Tobin's Q. In their analysis, Xie et al. use firm-level data over the period 2013 to 2022 from 38 economies including 11 Asian economies, China, Hong Kong, Indonesia, India, Japan, South Korea, Malaysia, the Philippines, Singapore, Thailand and Taiwan. One key contribution of their study is its investigation of the moderating role of regional sustainability as measured by the Inclusive Wealth Index (IWI) on the relationship between ESG practices and financial outcomes. The evaluations of a firm's ESG practices are taken from Moody's, although an early version of this paper (Xie et al. 2025) discusses ESG evaluations provided by other ratings firms and the extent of their overlap with these Moody's ratings.

Whether the ESG practices are examined together or individually, Xie et al. find that larger, older and more profitable firms are more likely to engage in ESG practices which they suggest is consistent with resource-based and natural resource-based theoretical perspectives.

Xie et al.'s results suggest there is a positive relationship between ESG practices and the two financial measures they analyze, but the strength and significance of the relationship varies widely across regions. Interestingly enough, the impact of ESG practices on Tobin's Q is generally stronger and more consistent than the impact on ROA. While firms in South East Asia have lower ESG performances, they derive stronger financial benefits from their engagement in ESG practices especially when Tobin's Q is examined.

Finally, an IWI which is measured at the country level and is designed to capture produced capital (PC), human capital (HC), and natural capital (NC) is incorporated into their analysis on a per capita basis either in aggregate or through its individual components. IWI is found to positively moderate the impact of environmental ESG performance. In particular, firms operating in economies with higher levels of HC and NC tend to achieve higher financial returns from ESG activities, while firms with higher levels of PC may face diminishing returns.

Drawing on the existing literature relating to whether more sustainable firms deliver superior performances, Yuxia Zou (Zou 2026) seeks to provide some theoretical rationales for some of the results that Xie et al. (2026) observe. For example, the association between sustainability and ROA is suggested as reflecting the sustainability preferences of the firm's customers.

While positively evaluating Xie et al.'s (2026) contribution, Xiaoyun Yu (Yu 2026) also suggests that their analysis would have benefited from having a theoretical framework or a model to help readers understand why and how country-level sustainability (as measured by IWI) has a moderating role compared to existing sustainability measures. Yu argues that Xie et al.'s findings regarding the directions of the moderating impacts of the components of IWI may differ from the existing findings in the literature, for example, Vargas-Santander et al. (2023), and that resolving why these different findings occur would be useful.

Somkiat Tangkitvanich also highlighted the need for a theoretical explanation for why inclusive wealth should be a predictor or moderator of ESG performance. He wondered whether the institutional environment in which firms operate might influence their corporate ESG behavior. In addition to physical capital, human capital and natural capital, Kazumasa Iwata argued it was important to consider institutional capital and measure the quality of institutions in the economy. Given the small number of firms observed in each country (Xie et al.'s 2026; Table A2 in the Supporting Information for the paper), Cassey Lee wanted to know about how firms were chosen for inclusion in the sample and about the possibility of sampling biases.

2.3 | Liang and Punzi on the Effects of Financing Green and Brown Sectors

Hao Liang and Maria Teresa Punzi (Liang and Punzi 2026) explore how financial interventions in the green and brown sectors affect environmental outcomes, firm behavior, and macroeconomic stability. They highlight a key tension in climate finance: while green finance—directing capital to low-emission, environmentally sustainable firms—is widely seen as critical to decarbonization, it alone cannot achieve net-zero targets. Brown sectors, which are responsible for the majority of emissions, must also be included in the transition. Ignoring them risks economic disruption and, paradoxically, higher emissions. Liang and Punzi propose "transition finance" as a complementary approach: channeling funds to carbon-intensive firms to help them adopt cleaner technologies and practices over time.

Through a dynamic stochastic general equilibrium (DSGE) model, Liang and Punzi simulate the macroeconomic and environmental effects of different financial interventions, such as lowering the cost of capital for green firms or raising it for brown firms. The results are noteworthy. Reducing green firms' capital costs yields only modest environmental improvements because these firms already operate efficiently. In contrast, raising capital costs for brown firms backfires: it reduces their investment in research and development (R&D), lowers the probability of a successful transition, and ultimately increases emissions. Liang and Punzi's model shows that such policies are counterproductive, both environmentally and economically, particularly in contexts where brown-sector firms are still critical to growth.

The empirical evidence cited in Liang and Punzi (2026) supports these findings. While green finance tools such as green bonds and sustainability-linked loans have shown promise—improving firm-level environmental performance and attracting investors' interest—their aggregate impact remains limited. Studies show that brown firms can be powerful sources of green innovation, especially in areas like carbon capture and storage, or in energy-intensive industries such as steel and cement. However, these firms require access to capital to fund transition-related R&D. Penalizing them through tighter financing conditions or higher carbon taxes can lead to social costs, including job losses and regional economic decline. Moreover, some firms may attempt to improve their environmental ratings by divesting

high-emission assets rather than actually reducing emissions, a form of greenwashing.

Given these complexities, Liang and Punzi argue that transition finance is especially critical in Asia, where many countries are still undergoing rapid industrialization and remain heavily reliant on fossil fuels. In such economies, conventional green finance frameworks—often modeled based on European standards—might not be well suited to the economic and structural realities on the ground in Asia. Transition finance may offer a more flexible and inclusive solution by supporting "in-between" projects that may not yet meet green criteria but may represent meaningful steps toward decarbonization. Examples include hydrogen-based steelmaking, natural gas as a bridge fuel, and biofuel-powered aviation.

For transition finance to be effective, Liang and Punzi call for credible transition taxonomies, policy coordination, blended finance mechanisms, and accountability safeguards. Emerging instruments such as transition bonds, SLBs, and loans tied to emissions targets can play a vital role in aligning capital flows with climate objectives. Countries like Japan, China, and Singapore are already pioneering such efforts. However, scaling them across Asia will require harmonized standards, deeper capital markets, and greater collaboration between governments, financial institutions, and industry.

In conclusion, Liang and Punzi warn against a binary view of climate finance that simply rewards green sectors while starving brown ones. A more balanced approach that supports both immediate environmental gains and long-term structural change is needed. In this regard, transition finance may represent a promising strategy for achieving an inclusive and economically viable decarbonization. By integrating brown sectors into the financial architecture of the energy transition, policymakers could potentially avoid unintended consequences, accelerate innovation, and ensure a more just and resilient path to net zero.

David Zerbib (Zerbib 2026) commends Liang and Punzi for addressing a timely question and offers a series of suggestions to extend their analysis. In particular, he recommends linking the model more closely to the literature on general equilibrium models with endogenous technical change; considering alternative calibrations of the model that take into account the insights from this literature; and expanding the analysis to test alternative policy and investment scenarios that may yield better environmental outcomes.

Qifei Zhu (Zhu 2026) highlights Liang and Punzi's (2026) useful distinction between "growing the green economy" by reallocating capital to green firms and "greening the economy" by helping brown firms transition. While Zhu sees Liang and Punzi's DSGE model as a useful theoretical demonstration, he notes that the model's assumptions, particularly the assumption that all brown firms can transition, may overstate the effectiveness of transition finance. In addition, Zhu raises questions about the permissiveness of transition finance. Without strong constraints, such financing may risk supporting polluting firms without ensuring real progress toward decarbonization. He emphasizes the importance of maintaining firm-level incentives and cautioned against misallocating resources under the label of green transition. Finally, Zhu praises Liang and Punzi's focus on Asia's unique development challenges, which are often overlooked in the green finance literature. He sees Liang and Punzi's (2026) region-specific approach as a valuable contribution that might inform future research and policy design tailored to the realities of emerging economies.

The floor discussion of Liang and Punzi (2026) generated a number of thoughtful interventions from conference participants. In particular, several participants noted that, while the conclusion that green finance alone is insufficient to drive the transition may seem intuitive, it is nevertheless a valuable intervention in the current policy debates. In this regard, some participants highlighted the need to delve deeper into the specific mechanisms through which the different approaches might lead to tangible reductions in emissions.

In addition, a number of participants emphasized the critical role that brown-sector firms—such as those in oil, gas, and heavy industry—can play in the green transition, particularly through technological innovation. Participants broadly agreed with Liang and Punzi's argument that restricting finance to these sectors can be counterproductive. They stressed that many of these firms possess the internal capacity and incentives to innovate, provided they have access to capital. This point was seen as particularly important given the limited impact that green-only finance has shown in isolation.

The modeling approach, while appreciated, also drew constructive criticism. Participants noted that the DSGE model used by Liang and Punzi, although helpful for illustrating the basic intuition, might oversimplify the complexities of the transition process. Suggestions included introducing a more explicit innovation channel and differentiating between "good" brown firms (those genuinely seeking to transition) and "bad" brown firms (those that continue to resist change). Others proposed modeling the influence of lobbying behavior or the risks of greenwashing, both of which could significantly affect how financing policies are implemented and interpreted in the real world.

Several participants highlighted the need for stronger empirical support to validate the model's key assumptions and findings. In particular, the claim that penalizing brown firms increases emissions was seen as provocative and in need of further substantiation in the data.

Leaving the technical aspects aside, some participants emphasized the importance of integrating social and political economy dimensions into the analysis. The idea of a "just transition" came up repeatedly, with participants stressing that financing decisions must consider social outcomes such as employment, regional development, and equity. One participant pointed out that, in many Asian countries, where economic development remains a central priority, financing strategies need to be tailored to local contexts rather than being simply adapted from Europe or North America.

Some of the discussions also centered on the definition and operationalization of transition finance. Participants found the concept compelling but somewhat vague in Liang and Punzi (2026). They called for a clearer explanation of what qualifies as

transition finance and how such financing can be distinguished from greenwashing. As they argued, without rigorous taxonomies and clear benchmarks, there is a risk that transition finance could be used to justify business-as-usual practices under the guise of sustainability.

The participants also encouraged Liang and Punzi to bring in more real-world examples to ground their arguments, especially given the wide variety of transition paths across countries and sectors. While Liang and Punzi's broad framing was appreciated, several participants argued that the paper would benefit from more concrete policy recommendations. In their view, calling for more transition finance is insufficient unless accompanied by actionable proposals on how to design and implement such financial instruments effectively.

Investor behavior and market constraints were also discussed. One participant noted that many institutional investors face mandates or ESG scoring systems that discourage any engagement with brown-sector firms, even those actively transitioning. This limits the flow of capital into potentially high-impact transition projects and suggests a need for better tools to assess and support credible transition plans. Finally, the issue of accountability gave rise to considerable discussion. Participants agreed that without strong governance, transition finance could easily be misused. They called for performance-based financing structures, third-party verification, and credible transition pathways to ensure that funds are tied to measurable progress.

2.4 | Kim et al. on the Impacts of Sovereign Sustainable Bond Issues on the Corporate Sustainable Bond Market

Seiwan Kim, Resi Ong Olivares, Donghyun Park, Shu (Grace) Tian, and Sunjoo Yang (Kim et al. 2026) examine how government issuance of sustainable bonds affects private-sector sustainable bond markets across eight Asian economies between 2018 and 2024. Using a panel vector autoregression (VAR) framework with daily, monthly, and quarterly data, Kim et al. assess how sovereign sustainable bond issuance influences corporate sustainable bond liquidity, yield spreads, and broader market dynamics.

Kim et al. find that initial sovereign sustainable bond issuance significantly improves corporate sustainable bond liquidity in the short run, as indicated by narrower bid-ask spreads, and reduces corporate yield spreads in the medium term. This decline in yield spreads is primarily driven by a persistent fall in the greenium—the yield differential between sustainable and comparable conventional corporate bonds—rather than a change in the risk premium. These findings indicate that sovereign issuance strengthens investor confidence and catalyzes demand for sustainable assets, leading to lower financing costs for corporate issuers.

Kim et al. further find that these results operate through both supply and demand channels. On the supply side, sovereign issuance stimulates a larger and more diverse set of corporate sustainable bond issuers, increases the volume and maturity of corporate sustainable debt, and enhances market diversification by sector and issuer. On the demand side, Kim et al. document an increase in fund inflows into ESG-themed mutual funds—especially exchange-traded funds—following sovereign issuance, suggesting that governments' market participation boosts investor appetite for sustainable assets.

Kim et al. (2026) contains some relevant policy implications. In particular, the findings suggest that sovereign sustainable bonds can act as a credible signal of government commitment to sustainability, reducing policy uncertainty, improving market transparency, and setting benchmarks for pricing and disclosure that private issuers can follow. As a result, sovereign issuances can potentially crowd in private participation, deepen market liquidity, and lower borrowing costs in sustainable finance. Kim et al. conclude that for Asian economies—where sustainable bonds remain a small share of the total bond market—strategic and well-sequenced sovereign issuance can play a catalytic role in expanding private sustainable finance. Kim et al. further recommend that governments complement sovereign programs with stronger regulatory frameworks and corporate incentives to sustain market growth.

Haruyoshi Ito (Ito 2026) praises Kim et al. for providing novel empirical evidence using underexplored Asian data, and highlights Kim et al.'s methodological strength in decomposing yield spreads into a greenium and a risk premium. Ito also identifies several avenues for follow-on work. In particular, he calls for a deeper analysis of how country-level ESG practices and green policies shape the effects of sovereign issuance, and suggests studying institutional investors' behavior to understand the substitution and complementarity between sovereign and corporate sustainable bonds. He also suggests methodological refinements to better identify the liquidity channel (e.g., through the use of a two-stage model). These considerations notwithstanding, Ito concludes that Kim et al. (2026) make a valuable contribution by showing how sovereign sustainable bonds can catalyze private-sector sustainable finance in Asia.

Irene Monasterolo (Monasterolo 2026) further commends Kim et al. for addressing the underexplored link between sovereign and corporate sustainable bond markets, emphasizing the relevance of the Asian context given the region's rapid green finance development and strong investor demand for sovereign green bonds. She highlights the importance of properly defining "greenness," since the classification affects the measurement of the greenium and hence the inference that can be drawn from the analysis. Monasterolo also stresses the importance of accounting for country heterogeneity in the empirical specification. As avenues for future research, Monasterolo suggests studying the impact of weakening climate disclosure regulations in the United States and the European Union on Asian markets, exploring ownership structures, and comparing alternative measures of greenness for deeper insights.

The floor discussion of Kim et al. (2026) reflected strong interest in the paper's contribution, but also focused on conceptual clarification, empirical strategy, and theoretical interpretation. A central theme concerned terminology: several participants noted inconsistencies between the use of the "green

bonds" and "sustainable bonds" terminologies. This raised concerns that mixing classifications without a clear framework could blur the interpretation of the pricing effects and market responses. Participants emphasized that sustainable bonds may include green, social, and sustainability-linked instruments—each motivated by different objectives and investor expectations—which could affect liquidity, yield behavior, and transmission mechanisms. One participant stressed that SLBs differ fundamentally from green/sustainable use-of-proceeds bonds, as the former are not constrained to specific projects but tied to key performance indicators (KPIs), implying they may require a separate treatment or a set of indicator variables to avoid confounding effects.

Beyond terminology, participants recommended expanding the mechanism linking sovereign issuance to corporate outcomes. Several participants noted that while the results suggest increased liquidity and reduced spreads, the explanation of *why* these patterns emerge is underdeveloped. Participants encouraged formalizing channels such as regulatory signaling, investor portfolio rebalancing, or credibility effects that sovereign issuers may generate. Suggestions included modeling the decomposed yield components—green premium and credit risk—to reveal whether sovereign issuance strengthens investor demand for green assets, reduces perceived risk, or improves market depth through benchmarks and pricing reference points.

Methodological remarks focused on data structure and model specification. Participants noted that although the dataset is large, the regressions pool all countries despite meaningful cross-country differences in financial development, climate regulation, and investor base. Suggestions included running country-specific regressions, or at minimum incorporating a large set of country-level controls. The use of daily data for pricing dynamics also prompted discussion; some recommended incorporating lag structures or focusing on monthly/quarterly frequency to capture slower spillover effects, especially if institutional investors rebalance their portfolios gradually. Finally, it was suggested that sovereign non-green bonds could serve as a comparison case to demonstrate whether the results derive specifically from ESG signaling rather than general sovereign issuance activity.

2.5 | Zhan et al. on the Impacts of Green Bond Issues on Conventional Bonds in China

The rapid rise in global climate concerns has triggered a corresponding shift in corporate financing toward sustainability-oriented instruments, particularly green bonds. By the end of 2023, global green bond issuance exceeded USD 2.8 trillion, with China ranking second in the world in terms of cumulative issuance.

Xintong Zhan, Junting Liu, Jie Cao, Ruijing Yang, and Linyu Zhou (Zhan et al. 2026) examine the broader financial implications of green bond issuance in China, focusing on its impact on the pricing of firms' outstanding conventional corporate bonds. While prior studies have primarily analyzed equity market reactions to green bond issuance, Zhan et al. address an important gap in the literature by investigating how the issuance of green bonds affects other key stakeholders, particularly existing bondholders.

Theoretically, the net effect on existing bondholders is ambiguous. On the one hand, issuing green bonds may increase leverage and redirect cash flows toward capital-intensive environmental projects, thereby raising default risk. On the other hand, green bond issuance may signal reduced regulatory and reputational risks, thus improving creditworthiness. Zhan et al. (2026) empirically evaluate these competing hypotheses within China's unique institutional and regulatory environment.

Zhan et al. collect 765 conventional bonds issued by 120 green-bond issuers and match each treated bond with a comparable conventional bond issued by a non-green issuer. Their final sample comprises 734 matched treatment–control pairs. Using a difference-in-differences (DiD) framework and 1468 corporate bonds issued between August 2016 and June 2023, Zhan et al. find that green bond issuance leads to a 21-basis-point decline in the yield spreads of firms' existing conventional bonds. This reduction is statistically significant and economically meaningful, corresponding to an average monthly interest saving of more than RMB 3 million per bond.

Zhan et al.'s robustness checks also support this finding. The decline in yield spreads persists across balanced event windows surrounding green bond issuance and remains significant even after the exclusion of bonds issued by Local Government Financing Vehicles (LGFVs), whose credit quality may be affected by implicit government guarantees, as well as after excluding matched control bonds.

Zhan et al. provide strong evidence that the reduction in yield spreads operates through decreased environmental regulatory risk. The effect is concentrated among firms headquartered in cities with stricter regulatory environments. In such regions, green bond issuance serves as a credible signal of environmental compliance, thereby reducing the perceived risk of existing bonds. Additional analysis shows that these bonds experience subsequent improvements in credit ratings and a higher probability of upgrades following green bond issuance, indicating a decline in perceived default risk. Zhan et al. also rule out two alternative explanations—improved cash flows and enhanced bond liquidity—based on further empirical tests.

Zhan et al. make several important contributions. First, their study expands the literature on green bond externalities by demonstrating a direct benefit for existing bondholders, complementing prior work on equity and primary bond markets. Second, Zhan et al. highlight environmental regulatory risk as a key transmission channel through which green financing instruments shape the pricing and risk assessment of existing debt. Third, Zhan et al. (2026) provide policymakers with actionable insights by illustrating the benefits of expanding green bond markets and strengthening regulatory transparency and rigor.

Zhan et al. (2026) thus show that green bond issuance in China not only advances environmental objectives but also delivers financial gains to existing bondholders by reducing perceived environmental regulatory risks. These findings have broad implications for sustainable finance policy design and

underscore the importance of regulatory stringency in developing the green bond market.

Naoyuki Yoshino (Yoshino 2026) begins by asking whether China's criteria for green bonds are consistent with those defined by the International Capital Market Association (ICMA). He also asks about the credit rating system in China. While several major global credit rating agencies follow their own criteria, Yoshino wants to know which agencies operate in China and whether CO_2 emissions are incorporated into their credit ratings. Noting Zhan et al.'s finding of a significant 21-basis-point reduction in the yield spreads of existing bonds following green bond issuance, and recognizing that different investor types—banks, insurance companies, pension funds, and corporations—have varying preferences for bond maturities, Yoshino asks whether yield spreads differ depending on investor composition across maturities. Yoshino further notes the limited secondary market for green bonds, in contrast to the extensive secondary markets for non-green bonds, which may influence yield spreads. Highlighting the challenges small and medium-sized enterprises (SMEs) face in issuing bonds due to high issuance costs and insufficient capital-market knowledge, Yoshino argues for carbon pricing and/or a carbon tax applicable to both large firms and SMEs. He suggests that governments could use the resulting revenue to subsidize SMEs in adopting new technologies to reduce CO_2 emissions.

Konari Uchida (Uchida 2026) acknowledges Zhan et al.'s valuable contribution to the expanding literature on green bonds and commends their innovative approach of examining the impact of green bond issuance on the issuing firms' existing straight bonds. While Ucha finds the empirical analyses carefully conducted and persuasive, he raises several concerns. First, Uchida questions the explanation of the mechanism through which green bond issuance reduces risk for straight bonds. He challenges the argument that green bond issuance lowers environmental regulatory risk, pointing out that the effect is stronger for firms headquartered in cities where government reports frequently use environment-related terminology. Second, Uchida doubts the generalizability of the findings, as the sample includes only state-owned enterprises (SOEs) and excludes non-SOEs. Third, Uchida questions the interpretation of the result that the impact of green bond issuance on yield spreads is stronger for more liquid bonds. Finally, he wonders if the insignificant impact of green bond issuance on cash flow may be due to the inclusion of profitability as a control variable and argues that any cash-flow benefits from green bond issuance may emerge with a lag.

In response to Yoshino's question about the credit rating system in China, Zhang explained that it is broadly similar to the international system. Responding to Uchida's comment regarding the use of environment-related terminology in government reports as a proxy for regulatory stringency, Zhang agreed on the need for a deeper examination of compliance and enforcement to conduct more rigorous analysis. Colin McKenzie asked how Zhan et al. address cases in which a firm's headquarters are located in one province while its factories are located in another prefecture. In such situations, environmental regulation in the headquarters' province may not apply to factories elsewhere. He asked how Zhan et al. account for this issue. In response, Zhang explained that the current study uses only headquarters-level information, and that additional data on factory locations would be required to examine the issue accurately.

2.6 | Li et al. on Green Human Capital and Carbon Emissions of Asian Firms

As climate change continues to pose significant risks to the global economy, countries around the world have increasingly incorporated carbon-reduction targets into their national legislation and strategic agendas. Asia, which accounted for nearly 60% of global CO_2 emissions in 2023, has consequently become a focal point in global decarbonization efforts. Understanding the drivers of firms' decarbonization strategies and performance is therefore particularly important in the Asian context.

Fangyuan (Flora) Li, Weiming (Elaine) Zhang, and Yaojia (Zoe) Zhang (Li et al. 2026) examine the role of green human capital (HC) in the decarbonization of Asian firms. While prior research has explored the influence of regulators, shareholders, and executives, Li et al. focus on non-executive "green-skilled" employees. Using firm-level carbon emissions data and detailed job-posting information for Asian firms from seven countries, China (including Hong Kong), India, Japan, Malaysia, Singapore, South Korea and Taiwan, between 2009 and 2020, Li et al. find that a higher share of green job postings is associated with significant reductions in Scope 1 carbon emissions, that is, direct greenhouse gas (GHG) emissions from sources owned or controlled by a company. This relationship holds across seniority levels (junior and senior) and across functional roles (managerial and technical), indicating that green HC plays an important role in reducing corporate carbon emissions.

To explore the mechanisms behind this relationship, Li et al. examine two potential channels: green innovation and renewable energy usage. Their results show that a higher green-job-posting ratio is positively associated with both the number of green patents and the adoption of renewable energy. These findings suggest that green HC contributes to lower emissions by facilitating green innovation and renewable energy use.

Li et al. (2026) make several contributions to the literature. First, they add to the debate on whether HC affects firm outcomes. While existing research has investigated the impact of skills such as AI or IT on financial performance, this study highlights the importance of green skills for non-financial outcomes, particularly sustainability. Second, Li et al. contribute to the emerging literature on green HC. Whereas earlier studies focus mainly on the profitability implications of investing in green talent, Li et al. examine the broader effects on corporate carbon emissions in Asia, providing new evidence that workforce composition may support firms' transition goals. Third, Li et al. expand the set of stakeholders considered influential in corporate decarbonization by highlighting the role of general employees. Prior literature has largely focused on regulators, shareholders, and customers; the study shows that green employees can also have a substantial impact.

Beyond their academic contributions, Li et al. (2026) provide several practical implications. For companies, their findings underscore the value of green HC. Integrating sustainability

considerations into recruitment and training may help empower both managers and general employees to implement effective carbon-reduction strategies. Such investments may encourage green innovation and renewable energy adoption, thereby accelerating progress toward sustainability.

For investors, Li et al.'s findings suggest that corporate investment in green HC may serve as a forward-looking indicator of environmental performance. Firms that strengthen their green talent may be better positioned to manage climate-related risks, offering sustainable investors an additional criterion for identifying promising firms.

For policymakers, Li et al. (2026) highlight the importance of developing green labor markets. Governments could support this objective through targeted education programs, tax incentives, and regulatory frameworks that encourage firms to cultivate and retain green expertise. Addressing both the supply and demand sides of the green labor market is essential for accelerating the transition to a low-carbon economy.

In summary, Li et al. show that strengthening green HC is a key step toward advancing decarbonization in Asia. Embedding green expertise within organizations enables firms, investors, and governments to collaborate more effectively in building a more environmentally responsible future.

Charika Channuntapipat (Channuntapipat 2026) evaluates Li et al. (2026) favorably, noting that they shift the discussion of firms' decarbonization challenges from external regulation to internal capacity, thereby opening up new avenues for research on workforce composition and sustainability outcomes. Channuntapipat also emphasizes the practical relevance of the findings for both firms and policymakers, and highlights several issues for future research. First, the organizational role of green hiring remains unclear: green hires may be involved in influential decision-making, or they may be confined to compliance functions. Second, job postings remain an imperfect proxy for actual employment. In emerging economies, green job postings tend to be low relative to advanced economies, as hiring through informal channels or redeployment is common. Third, the study's focus on Scope 1 emissions limits its applicability to some sectors—such as services—where Scope 2 emissions are dominant. Fourth, Channuntapipat argues that although green hiring may facilitate climate action, it does not directly address capital flows or financial mobilization, contrary to the authors' claims.

Zigan Wang (Wang 2026) also considers Li et al. a valuable contribution to the literature on corporate sustainability and climate finance for investigating the under-studied relationship between green HC and carbon emissions. However, Wang raises two concerns related to causality in estimating the impact of green job postings on carbon intensity. First, Wang questions the validity of the treatment-group definition in the stacked DiD approach. He suggests using the year in which the total number of graduates from all sustainability programs in a country exceeds a meaningful threshold as the treatment year, rather than the first graduation year of the first sustainability master's program, which typically has a small cohort. Second, Wang expresses concern about the endogeneity of sustainability master's programs, which are used as a means of identification. Universities may launch such programs in response to rising corporate demand, making them non-exogenous. Wang also questions the classification of certain job postings as green jobs; for example, he argues that a Director of Logistics is primarily responsible for logistics optimization with limited sustainability-related tasks. Methodologically, he suggests using industry-by-year fixed effects, rather than simple year fixed effects, to account for time-varying industry characteristics that could affect both green hiring and emissions. Finally, Wang notes that the selection of control countries appears somewhat arbitrary, and that a more rigorous matching procedure based on economic, demographic, and environmental-policy similarities would strengthen the credibility of the DiD analysis.

Caroline Flammer and Colin McKenzie pointed out the lack of a discussion regarding the mechanism through which green job postings reduce carbon intensity—a concern closely related to the endogeneity issues raised by Wang and by several floor participants. Keiko Ito asked why green job postings in Asia increased substantially in 2018. Ito and McKenzie also noted that the sample size of 743 firms is rather small.

In response to these questions and comments, Weiming Zhang agreed on the need to clarify and elaborate on several issues: a more detailed description of green human resources, the link between green job postings and the actual stock of green employees, the mechanisms through which green HC reduces carbon emissions, and the treatment of endogeneity in the estimations. She also explains the difficulty of obtaining the necessary data due to its unique characteristics. Regarding the sample size, she clarified that it is small because of strict data requirements. For instance, in the stacked DiD estimation, only countries that launched sustainability master's programs during the sample period can be included. As a result, China and Singapore—despite having many firms—had to be excluded because their programs were introduced before the study period.

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Appendix A

List of Conference Participants for the "Sustainable Finance in Asia" Conference

Chatib Basri, M., University of Indonesia, Indonesia

Channuntapipat, Charika, Thailand Development Research Institute (TDRI), Thailand

Cao, Jie (Jay), The Hong Kong Polytechnic University, Hong Kong

Hill, Hal, The Australian National University, Australia

Flammer, Caroline, Columbia University, USA

Huang, Yiping, Beijing University, China

Ito, Haruyoshi, Aoyama Gakuin University, Japan

Ito, Keiko, Chiba University, Japan

Ito, Takatoshi, Columbia University, USA

Iwata, Kazumasa, Japan Center for Economic Research (JCER), Japan

Kim, Seiwan, Ewha Womans University, Korea

Kurtz, Lloyd, Northwestern University, USA

Lee, Cassey, ISEAS—Yusof Ishak Institute, Singapore

Lee, Jong-Wha, Korea University, Korea

Liang, Hao, Singapore Management University, Singapore

Managi, Shunsuke, Kyushu University, Japan

McKenzie, Colin, Keio University, Japan

Monasterolo, Irene, Utrecht University, The Netherlands

Noguchi, Haruko, Waseda University, Japan

Noland, Marcus, Peterson Institute for International Economies, USA

Punzi, Maria Teresa, Singapore Management University, Singapore

Sawada, Yasuyuki, University of Tokyo, Japan

Tangkitvanich, Somkiat, Thailand Development Research Institute (TDRI), Thailand

Tian, Shu (Grace), Asian Development Bank, The Philippines

Uchida, Konari, Waseda University, Japan

Urata, Shujiro, Waseda University, Japan

Wang, Zigan, Tsinghua University, China

Yasuda, Ayako, University of California, Davis, USA

Yoshino, Naoyuki, Keio University, Japan

Yu, Xiaoyun, Shanghai Advanced Institute of Finance, China

Zerbib, Olivier-David, CREST, ENSAE Paris, Institut Polytechnique de Paris, France

Zhan, Xintong (Eunice), Fudan University, China

Zhang, Elaine, IE Business School, Spain

Zhu, Qifei, National University of Singapore, Singapore

Zou, Yuxia (Sarine), Nanyang Technological University, Singapore