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M&A or FDI? Pathways to Sustainable International Expansion in Taiwanese Firms: The Case of TSMC

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ABSTRACT
***Purpose**: This study explores, the strategic dilemma companies face when pursuing cross-border growth while remaining accountable to sustainability expectations. It sets mergers and acquisitions (M&A) alongside foreign direct investment (FDI) as two distinct pathways to international expansion, drawing on the Taiwanese corporate landscape and TSMC as a firm-level case to ground the discussion.*
***Methodology**: This descriptive qualitative study reviews 23 peer-reviewed articles (2017-2026) and TSMC's 2025 annual and sustainability reports, organized into four themes M&A, cross-border M&A and international expansion, M&A and sustainability, and FDI and sustainability and analyzed using content analysis.*
***Findings**: While M&A just supports sustainability when the acquiring firm manages ESG and governance risks well, FDI drives it more directly through cleaner production, technology transfer, and greater ESG transparency. TSMC relies mainly on FDI for growth seen in its overseas plants in the US, Japan, and Germany and this FDI has closely tracked its sustainability efforts, including renewable energy use, water conservation, and emission reductions.*
***Implications**: The results call for situating international expansion within a wider strategic lens one, where economic growth is pursued alongside, not ahead of, environmental, social, and governance responsibilities.*
***Originality**: Unlike prior work that treats M&A and FDI as separate lines of inquiry, this study brings both strategies into a single sustainability-oriented discussion and applies it to Taiwanese firms, yielding a comparative perspective still uncommon in the literature.*

***Keywords:** M&A, foreign direct investment, corporate sustainability, ESG performance, international expansion, TSMC-India.*

***JEL Classification:** G34, F23, Q56*

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1. INTRODUCTION

Companies frequently use mergers and acquisitions (M&A) to leverage resources and improve business performance. Firms in many countries have long engaged in M&A, but activity has now shifted towards Asia. Faff et al. (2019) recorded that the value of M&A in the Asia-Pacific region during the crisis reached approximately USD 658.8 million in 2016. M&A activity has continued to rise, yet academic interest remains limited. Most studies have examined countries such as Australia, Taiwan,

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and India, whereas research on Korea and Southeast Asia is still scarce. At present, the Asia-Pacific region offers substantial opportunities for foreign direct investment and cross-border M&A (Faff et al., 2019).

After the global financial crisis, financial centres such as Singapore and Hong Kong became the preferred destinations (Wójcik et al., 2022). Taiwan also plays an important role in studies of mergers and acquisitions (M&A) and foreign investment. Numerous studies have examined how Taiwanese companies have succeeded in attracting foreign investment and how this has affected Taiwan. Both are estimated to have positive effects on various economic sectors, such as industry, electricity, and gas (Soto & Zambrano-Monserrate, 2026). Foreign investment as well as mergers and acquisitions stimulate the economies of Taiwan and its neighbouring countries.

It is therefore important to examine the effects of mergers and acquisitions (M&A) on the economy of Taiwan and other countries. Although the number of academic publications on M&A activity in the Asia-Pacific region has increased, only a few focus on Taiwan. Accordingly, this study aims to examine M&A activity in Taiwan. It also seeks to identify the factors that influence and impede the development of M&A in Taiwan.

With regard to M&A, it is necessary to understand the condition of a company after expansion has taken place (Suryaningrum et al., 2023; Fidiana et al., 2023). M&A motives and corporate governance have a long-term relationship with firm performance. Success is not determined solely by the completion of the merger or takeover; long-term consequences may emerge when post-transaction management of the company receives insufficient attention (Rani et al., 2020).

Hsu and Liu (2024) found that uncertainty and asymmetry in the acquisition process can erode ESG reputation, while Maung et al. (2020) found that ESG problems at target companies are associated with a lower *acquisition premium*. This means that the M&A process should focus on the environmental, social, and governance conditions of the target company. *Sustainability* does not emerge only after a transaction is completed; it can also be taken into account from the moment a company considers an acquisition (Hsu & Liu, 2024; Maung et al., 2020).

Companies have another option when pursuing international expansion, namely *Foreign Direct Investment* (FDI), whereby direct investment in another country brings capital accompanied by technology and knowledge. Both strategies can influence production activities and productivity in the host country. Soto and Zambrano-Monserrate (2026) found FDI *spillover* effects on green productivity in several sectors in Taiwan. These results show that the presence of foreign investment can be associated with efficiency and productivity. This makes FDI relevant to discuss when corporate expansion is linked to *sustainability* (Soto & Zambrano-Monserrate, 2026).

M&A and FDI share the objective of overseas expansion, but they take different forms. In M&A, a company enters a market by merging with or taking over an existing company. FDI, by contrast, involves investing directly in the host country. This difference means that companies face different situations. In *cross-border* M&A, for example, companies need to understand the political, economic, institutional, and cultural conditions in the country where the target company is located. Wójcik et al. (2022) showed that the development of *cross-border* M&A is also related to changes in the network of global financial centres, including the rising position of the Asia-Pacific region. FDI itself can shape relationships with host countries through investment, technology, and knowledge. Therefore, discussing M&A and FDI together can provide a broader picture of how companies expand internationally (Wójcik et al., 2022).

This study uses TSMC as its object because the company originates in Taiwan and its operations are connected to international markets. Through TSMC, issues of expansion, investment, and sustainability are examined at the firm level, with information on the company's conditions and practices obtained from its Annual Report and Sustainability Report. These data are then linked to the findings of previous studies. In the subsequent discussion, TSMC is not presented as evidence that it undertook an M&A process during the research period.

Theoretically, this study links M&A (*Mergers & Acquisitions*) and FDI (*Foreign Direct Investment*) with sustainability in Taiwanese companies, implying that international expansion has not only a financial dimension but also sustainability questions that must be taken into account. Practically, this study offers insights for companies engaged in international expansion so that they consider aspects beyond financial ones; governance, ESG (*Environmental, Social, and Governance*), efficiency, and sustainability can be among these considerations. For stakeholders, the study helps connect corporate expansion decisions with the sustainability measures that have been taken. The objective of this study is to analyse the role of M&A and FDI in sustaining Taiwanese companies, with TSMC as its

focus (M&A and FDI as means of international expansion, their relationship with sustainability, and TSMC practices that may reflect this relationship).

2. LITERATURE REVIEW

2.1. Mergers and Acquisitions (M&A)

Expansion through mergers and acquisitions (M&A) involves combining with or taking over other companies. For a company, the objectives it seeks and its condition at the time of the M&A help determine the outcome; a completed transaction alone is not enough to show that expansion has succeeded, because the way a company designs and manages the transaction also affects the benefits ultimately obtained. This can be seen in Rani et al. (2020), who examined M&A on the basis of the motives underlying 301 M&A transactions by companies in 11 Asian countries. They found that synergy-motivated transactions delivered better long-term post-M&A performance than agency-motivated transactions, and that the relationship between M&A motives and long-term performance can be strengthened by firm-level governance (Rani et al., 2020).

Another perspective is offered by Wong and Yang (2021), who discuss pre-M&A information disclosure in stock-financed deals by family firms. Successor CEOs in family firms were found to be more likely to disclose positive information before M&A. This tendency becomes more pronounced when family involvement is high and when firm performance falls below its aspiration level. Notably, firms that managed such positive disclosures in fact showed better post-M&A performance. Consequently, pre-M&A disclosure cannot simply be labelled opportunistic; it may also reflect a company's efforts to reduce information asymmetry with external parties (Wong & Yang, 2021). Looking at the broader literature, Chiaramonte et al. (2023) reviewed 174 studies and identified five themes, most of which concern the determinants of M&A, financial market dynamics, cross-border M&A, the banking sector, and post-deal management. Corporate *sustainability* has not been a principal focus of these studies (Chiaramonte et al., 2023).

The discussion of M&A can therefore also be directed towards corporate sustainability. In other words, attention is given not only to the economic performance that emerges after a transaction but also to the long-term sustainability of the company. On this basis, this study positions M&A as a foundation for examining the link between expansion strategy and sustainability in Taiwanese companies.

2.2. Cross-Border Mergers and Acquisitions

M&A does not occur only within a single country. M&A becomes *cross-border* M&A when the companies involved in a transaction come from different countries. The conditions are more complex than in domestic M&A because companies must understand the situation in the target's country; besides market conditions, they also need to weigh differences in politics, economics, culture, and applicable regulations. These differences can influence the process and decisions in a transaction, so expansion through cross-border M&A involves far more varied considerations and risks than domestic M&A.

Illustrating this, Wójcik et al. (2022) showed effects at a broader level by observing cross-border M&A transactions in the financial sector during 2000-2017 and the changing positions of *international financial centers* within the *Global Financial Network*. During this period, financial centres in the Asia-Pacific region gained prominence, while several other regions declined or shifted position. These findings position cross-border M&A not merely as transactions between two companies but as phenomena related to changes in economic relations and in the position of decision-making centres within the global financial network (Wójcik et al., 2022).

At the firm level, different issues arise. Chang and Cheng (2026) examined 1,106 international acquisitions undertaken by companies listed in the United States. They found that firms with high political risk tend to select targets that also have high political risk, and that such firms pay lower acquisition premiums. This tendency is stronger when the acquirer and the target share industry ties and cultural similarity. In other words, conditions in the target's country enter into the considerations when companies decide which acquisitions to undertake (Chang & Cheng, 2026).

The findings of these two studies indicate that *cross-border* M&A cannot be separated from the environment in which transactions take place. Wójcik et al. (2022) showed changes in the global financial network, whereas Chang and Cheng (2026) showed how political, industrial, and cultural conditions relate to firms' target selection. They differ in their level of analysis, but both treat the inter-country environment as part of cross-border M&A activity (Chang & Cheng, 2026; Wójcik et al., 2022).

The Asian context is relevant because Taiwan is included in Rani et al. (2020), which covers 11 Asian countries. That study focuses on M&A motives, governance, and long-term post-transaction performance. Nevertheless, the inclusion of firms from various countries in one study shows that M&A takes place within diverse institutional environments. This is important when M&A is used for expansion, especially when a company no longer operates solely within its home country (Rani et al., 2020).

Taken together, the three studies address different aspects. Wójcik et al. (2022) start from changes in the network of global financial centres. Chang and Cheng (2026) discuss political risk and the characteristics of targets selected in international acquisitions. Meanwhile, Rani et al. (2020) link M&A with motives, governance, and long-term performance. Prior research has thus explained many of the reasons and conditions related to expansion through M&A, but the relationship between this strategy and corporate *sustainability* has not been a primary focus (Chang & Cheng, 2026; Rani et al., 2020; Wójcik et al., 2022).

Corporate expansion abroad is not limited to M&A. Another form is *Foreign Direct Investment* (FDI), in which a company invests directly to establish or expand its business activities in another country. A discussion of international expansion is incomplete if it considers only cross-border M&A; FDI must also be discussed to capture this other form of expansion. The discussion can then be directed towards the relationship of M&A and FDI with *sustainability*, particularly for the Taiwanese companies that are the focus of this study.

2.3. The Dynamics of Mergers and Acquisitions (M&A) and Their Contribution to Corporate Sustainability under an ESG Approach

In mergers and acquisitions (M&A), sustainability and ESG are no longer mere complements but crucial factors that determine how valuable and efficient a transaction is. At the same time, geographical proximity helps shape how transaction networks are formed at the global level.

Regarding efficiency, Hsu and Liu (2024) highlighted that the gap between accounting and taxable income (*book-tax difference*) at target firms can substantially reduce M&A efficiency. Encouragingly, this risk can be mitigated if the target has a strong ESG track record. A solid ESG reputation effectively reduces uncertainty and information asymmetry, making the buyer feel more secure (Hsu & Liu, 2024).

Conversely, poor ESG conduct can immediately affect firm valuation. Maung et al. (2020), who studied cross-border M&A transactions, found that targets frequently involved in negative ESG incidents typically receive low acquisition premiums. Interestingly, the offer can fall even further if the target's ESG record is worse than the acquirer's. The logic is that acquirers view such irresponsible behaviour as a contagious reputational risk and therefore apply a higher discount rate to offset the risk to potential synergies (Maung et al., 2020).

From a broader perspective, Qin et al. (2026) mapped how the global technology M&A network evolved from 1997 to 2022. The network gradually changed into a multi-centred structure with *small-world* characteristics and a *core-periphery* pattern. Partner selection is strongly influenced by economic class: developed and least-developed countries tend to seek partners at a similar economic level, whereas developing countries are far more flexible because they can act as both conduits and recipients of investment. Beyond this, shared language, institutions, and geographical proximity proved to be the main forces binding the M&A network together (Qin et al., 2026). Another study confirms that acquirers' ESG performance affects the long-term performance of cross-border M&A (Zou et al., 2025), while board experience and the institutional quality of the acquirer and target countries also determine value creation in cross-border acquisitions (Oehmichen et al., 2022).

2.4. Foreign Direct Investment (FDI) Flows and Their Role in Green Productivity

In the realm of foreign direct investment (FDI), investment flows now play a far more meaningful role. Capital flows no longer merely pursue financial returns; they have also become drivers of environmentally friendly productivity and responsible governance.

Soto and Zambrano-Monserrate (2026) demonstrated this through their research on FDI *spillover* effects on sectoral green productivity in Taiwan. They found that both inward (IFDI) and outward (OFDI) foreign capital flows genuinely increased productivity in manufacturing, mining, and electricity, particularly when accompanied by the use of renewable energy. This sustainability improvement occurs because IFDI brings in new technology transfer, while OFDI filters operational efficiency through capital relocation. Notably, these green spillover effects were strong only for renewable energy use and did not affect the use of nuclear energy at all (Soto & Zambrano-Monserrate, 2026). Evidence from other contexts likewise shows that outward direct investment can stimulate firms'

green technological innovation (Shao et al., 2024) and influence environmental quality in host countries, depending on the emission-reduction systems of the investors' home countries (Zhao et al., 2024).

Building on this, Yang et al. (2024) highlighted the importance of institutional ownership in Taiwan's investment ecosystem. Using SASB standards as a lens for financial materiality, they found that institutional investors proactively push firms to improve ESG performance and transparency, regardless of whether the information directly affects financial metrics. This shows that investors are concerned not only with profit but also act in the common interest, in line with the principles of the *stewardship code*. This progressive role is led mainly by domestic investors, who are believed to possess local information advantages that enable them to drive sustainability improvements more efficiently than foreign investors (Yang et al., 2024).

In addition, regarding capital stability during crises, Melnarowicz (2024) examined trends in the banking M&A market when confronted with major unexpected shocks (*black swan events*). Drawing on data from the pandemic period, the study demonstrated that the market for corporate control has distinctive adaptive capacity and adjustment characteristics, both at its peak and as the market enters the recovery phase (Melnarowicz, 2024).

Research Focus

1) How can companies use M&A and FDI to support *sustainability*?
2) How do M&A and FDI contribute to *sustainability* in companies in Taiwan?
3) How is the relationship between M&A and FDI in supporting *sustainability* reflected in TSMC as a Taiwanese company?

Problem Statement

Mergers and acquisitions (M&A) and *Foreign Direct Investment* (FDI) have rarely been discussed together in relation to *sustainability*; they are still explained separately. The context of Taiwanese companies has likewise seldom been addressed in an integrated manner.

3. RESEARCH METHOD

3.1. Research Design

This study employs a literature review method with a descriptive qualitative approach. The qualitative approach is used to obtain a better and deeper understanding of a phenomenon based on the available scope and information, while the literature review is used to identify and synthesise knowledge obtained from previous studies. The study focuses on *mergers and acquisitions* (M&A), *cross-border* M&A, *foreign direct investment* (FDI), and *sustainability*, and their relationship with Taiwan Semiconductor Manufacturing Company (TSMC).

Table 1. Number of Literature Search Results

Database	Observation Date	Period	Keywords	Total
Google Scholar, ScienceDirect, SpringerLink, and TSMC's official website	19 September 2026	2017-2026	Merger and Acquisition, M&A, cross-border M&A, foreign direct investment, FDI, M&A and sustainability, M&A and ESG, FDI and sustainability, Taiwan, TSMC, TSMC Annual Report and Sustainability Report.	31
	22 September 2026	2017-2026	Removal of articles unrelated to the focus of the discussion or not containing the required keywords.	8
Final sample				23

Source: Processed data (2026)

3.2. Data Collection

The data were obtained from academic sources and from official documents of the selected company, assessed for their fit with the focus of this study. The academic sources consist of journal articles discussing M&A, *cross-border* M&A, FDI, ESG, and *sustainability*, while the company documents consist of TSMC's *annual report* and *sustainability report*, which serve as sources of information on the

company's activities, international expansion, *investment*, and *sustainability* practices. The literature was gathered from several academic databases, such as Google Scholar, using the keywords merger and acquisition, M&A, cross-border M&A, *foreign direct investment*, FDI and *sustainability*, M&A and ESG, *sustainability*, and Taiwan. The literature obtained was then screened and selected according to its relevance to the objectives and focus of the study. Selection was carried out by reviewing titles, abstracts, article contents, research objects, and findings related to the topic under study.

3.3. Data Analysis

After screening the literature, the authors grouped it into four main themes: first, M&A; second, *cross-border* M&A and international expansion; third, M&A and *sustainability*; and fourth, FDI and *sustainability*. The selected articles were analysed according to their research objectives, research objects, methods, focus or *variables*, and final results. The purpose was to obtain an overview of the development of research previously conducted by earlier scholars and to identify issues closely related to M&A, FDI, and *sustainability*. Information was grouped and compared so that the literature review would be more systematic. The company documents used are presented in Table 3.

Table 2. Identity of Journal Articles and Other Sources

No.	Title, Authors, and Journal Name	Results
1	"FDI Spillover Effects on Sectoral Green Productivity in Taiwan". (Soto & Zambrano-Monserrate, 2026). Journal of Environmental Management	Using data for Taiwan over 1994-2022, the study found sustainable spillover effects of FDI operating through renewable energy use. IFDI and OFDI raise sectoral productivity through mechanisms related to renewable energy, technology transfer, and productive restructuring.
2	"Political Risk, Bargaining Power, and the Target Selection of Cross-Border Acquisitions". (Chang & Cheng, 2026). Management International Review	Using 1,106 international acquisitions by US-listed firms, the study found that firms with higher political risk tend to select targets that also have higher political risk and pay lower acquisition premiums. This relationship is moderated by industry relatedness and cultural similarity.
3	"The Evolutionary Mechanism of Global Cross-border Technology M&As: A Network Perspective Analysis". (Qin et al., 2026). Technology Analysis & Strategic Management	The study found that cross-border M&A has grown increasingly complex and has become a multi-centred network. Relationships between countries are influenced by shared language, institutions, and geographical proximity, so that cross-border M&A decisions are shaped by the characteristics of the countries involved as well as by the firms' own needs.
4	"Merger & Acquisition Idea Field Lab - Advanced Micro Devices' Acquisition of GlobalFoundries". (Alcobia, 2025). Master's Thesis, Universidade Nova de Lisboa	This study discusses the strategic implications of M&A in the semiconductor industry through the case of AMD and GlobalFoundries. The analysis covers vertical integration, supply chain resilience, operational flexibility, innovation capacity, pre- and post-merger valuation, deal structure, synergies, and value creation.
5	"Book-tax Differences, ESG Performance, and Acquisition Efficiency". (Hsu & Liu, 2024). Journal of Accounting Review	Based on international data from 32 countries/regions, the study showed that the larger the target's book-tax difference, the lower the acquisition efficiency. However, better ESG performance can mitigate this negative effect because ESG helps reduce information asymmetry risk in the acquisition process.
6	"Whether Post-Merger Higher Education Institutions Operate Efficiently in the Long-Run? A Follow-up Study in Taiwan". (Chen, 2024). International Journal of Learning and Teaching	Applying DEA to three university merger cases in Taiwan over 2012-2020, the study showed that the effect of mergers on efficiency is not uniform. Some mergers improved pure technical efficiency, but scale and scope benefits were not always sustained in the long run.
7	"Institutional Investor Stewardship and Material Sustainability Information: Evidence from Taiwan". (Yang et al., 2024). Pacific-Basin Finance Journal	Research in Taiwan shows that institutional investors promote ESG disclosure and performance quality for both material and less material ESG information. This influence is driven mainly by domestic institutional investors with information advantages.
8	"The Impact of Catastrophic Events of The Black Swan Type on The Merger and	The study shows that M&A activity in the banking sector changed in the face of black swan events (the

No.	Title, Authors, and Journal Name	Results
	Acquisitions Market Illustrated by The Banking Sector". (Melnarowicz, 2024). Bank i Kredyt	pandemic) and did not always proceed steadily, so changes in external conditions affect the development of the merger and acquisition market.
9	"Independent Board Members and Financial Performance: ESG Mediation in Taiwan". (Pham & Ho, 2024). Sustainability	Research on 174 Taiwanese companies (2009-2021) revealed that the proportion of independent board members is related to financial performance, with ESG mediating this relationship.
10	"Does Family Ownership Matter? Evidence of the Payment Method and Market Reaction to M&A Deals in Taiwan". (Ahmed et al., 2023). International Journal of Accounting and Information Management	Based on M&A by Taiwanese listed companies during 2008-2018, the study shows that family firms are more likely to use cash as the M&A payment method to avoid dilution of control rights. Family firms also obtain more positive market reactions around M&A announcements than non-family firms.
11	"Mergers and Acquisitions in The Financial Industry: A Bibliometric Review and Future Research Directions". (Chiaramonte et al., 2023). Research in Internal Business and Finance	The study identified five main streams of M&A literature by analysing 174 articles (1987-2021), demonstrating the literature's focus on economic consequences, determinants, and cross-border dynamics.
12	"Buying Taiwan? The Limitations of Mainland Chinese Cross-Strait Direct Investments as a Tool of Economic Statecraft". (Lee & Knoerich, 2024). The China Quarterly	Research on cross-Strait direct investment shows that mainland Chinese investment in Taiwan cannot simply be regarded as an instrument of economic statecraft. Political sensitivity has led to resistance from the Taiwanese government, bureaucracy, and society to large and sensitive investments.
13	"Bank Mergers and Acquisitions Trends Under Recent Crises". (Hasan, 2022). Iconic Research and Engineering Journals	Observing banking M&A across several crisis periods, the study found that around 80% of the crises examined were followed by an increase in M&A transactions, especially in the country where the crisis originated. Conversely, M&A declined when many banks were liquidated or nationalised.
14	"The Changing Landscape of International Financial Centers in the Twenty-First Century: Cross-border Mergers and Acquisitions in the Global Financial Network". (Wójcik et al., 2022). Economic Geography	The study analyses cross-border M&A in the financial sector over 2000-2017 and shows changes in the positions of international financial centres within the global financial network. The Asia-Pacific region gained prominence, while New York and London retained important positions; Singapore and Hong Kong serve as regional financial centres in Asia.
15	"An Analysis of Determinants of Foreign Direct Investment in Banking Industry from Taiwan to ASEAN Countries with Gravity Model". (Pan et al., 2022). Asia-Pacific Financial Markets	Using data on FDI by Taiwanese banks in ASEAN countries over 2000-2019, the study found that Taiwanese banks tend to choose countries with larger market size, greater economic freedom, shorter geographical distance, larger bilateral trade, and higher levels of Taiwanese outward FDI.
16	"Disclosures Strategy of Family Succession CEOs Prior to Stock-financed M&As". (Wong & Yang, 2021). Journal of Organization and Management	The study reveals that family successor CEOs tend to disclose goodwill before stock-financed M&A. This tendency is stronger when family involvement in management is higher and firm performance is below the expected level. Such good-news disclosure is also associated with better post-M&A performance.
17	"Motives, Governance, and Long-Term Performance of Mergers and Acquisitions in Asia". (Rani et al., 2020). Cogent Business & Management	Based on 301 M&A transactions in 11 Asian countries, the study shows that synergy-motivated M&A produces higher long-term performance than agency-motivated M&A. This positive effect is stronger when firms have better governance quality.
18	"Does Reputation Risk Matter? Evidence from Cross-border Mergers and Acquisitions". (Maung et al., 2020). Journal of International Financial Markets, Institutions and Money	Based on 248 cross-border M&A transactions during 2007-2017, targets with more negative ESG incidents tend to receive lower acquisition premiums. The effect is larger when the target's ESG reputational risk is worse than the acquirer's.
19	"Merger and Acquisition Research in the Asia-Pacific Region: A Review of the Evidence and Future Directions". (Faff et	A review of more than 90 M&A studies in the Asia-Pacific region shows that research has focused largely on Australia, China, and India, whereas research on Taiwan and several other Asia-Pacific countries

No.	Title, Authors, and Journal Name	Results
	al., 2019). Research in International Business and Finance	remains relatively limited. The study also identifies research gaps and directions for future M&A research.
20	"Why Is There a Lack of Evidence on Knowledge Spillovers from Foreign Direct Investment?". (Rojec & Knell, 2018). Journal of Economic Surveys	The review shows that evidence on knowledge spillovers from FDI remains mixed—positive, neutral, and negative. The differences relate, among other things, to firm heterogeneity, the type of spillover (horizontal/vertical), host-country absorptive capacity, and the distinction between technology, knowledge, and productivity spillovers.
21	"Insider Trading and Institutional Holdings in Mergers and Acquisitions". (Wu et al., 2018). Universal Journal of Accounting and Finance.	The study finds that the link between insider trading and institutional ownership in M&A transactions is clearly stronger. Institutional ownership itself shows spillover effects on other firms in the same industry.
22	"Corporate Acquisitions and Mergers in Taiwan". (Yeh et al., 2022). Wolters Kluwer, Corporate Acquisitions and Mergers	This source discusses M&A practice and legal provisions in Taiwan, including the acquisition process, due diligence, deal structure, contractual protection, payment considerations, and aspects of corporate, competition, tax, intellectual property, environmental, and data protection law. It provides an overview of the M&A framework and practice in Taiwan.

Source: Processed data (2026)

Table 3. Company Documents Used

No.	Name and Type of Document	Relevant Information
1	TSMC *Annual Report* (2025). Corporate annual report. (TSMC, 2025a)	TSMC's global *manufacturing footprint*, including the expansion of manufacturing facilities in the United States, Japan, and Germany, and the development of facilities and technology in Taiwan, supported by information on mergers and acquisitions in the company's activities.
2	TSMC *Sustainability Report* (2025). Corporate sustainability report. (TSMC, 2025b)	TSMC's commitments and actions relating to "Net Zero, Water Positive, and No Net Loss of Nature and Biodiversity", which help manage energy emissions, water, biodiversity, human rights, the workplace environment, and sustainable actions.

Source: Processed data (2026)

At the analysis stage, this study used *content analysis* to identify, group, and interpret information contained in the research articles and TSMC documents. This technique served as a tool to identify information closely related to the four predetermined main themes: M&A activity, *cross-border* M&A, FDI and international expansion, and *sustainability*. The findings of previous studies on these topics were then compared with, and matched against, the facts reported in TSMC's *Annual Report* and *Sustainability Report*. The results were subsequently synthesised to determine how M&A and FDI relate to *sustainability* at TSMC.

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. M&A as an Expansion Strategy and Its Challenges for Corporate *Sustainability*

Companies seeking growth have long used mergers and acquisitions to obtain new resources, expand market reach, and improve operational efficiency. However, studies show that the foundation of M&A success lies in the motivation behind the transaction and how well corporate governance executes it; the agreement on paper is not the only component that determines the success of such a major step. According to Rani et al. (2020), transactions driven by a genuine desire to create synergy have been shown to deliver better long-term results and performance than transactions motivated by short-term agency interests. For the smooth integration of two companies, cultural and industry fit as well as pre-deal information disclosure are essential (Rani et al., 2020).

Behind the large opportunities, growth through M&A poses real challenges for corporate *sustainability* and ESG (*Environmental, Social, and Governance*) records. Information errors frequently occur during the acquisition process. For example, acquisition efficiency can be affected by book-tax

differences, that is, differences between accounting and taxable income at the target firm (Hsu & Liu, 2024). Interestingly, this risk can be offset because a good ESG record at the target provides a clearer and more credible picture. Conversely, if the target ignores sustainability principles or is involved in ESG problems, prospective buyers tend to price in this uncertainty by offering lower acquisition premiums (Maung et al., 2020). This shows that sustainability has become important from the very beginning of the acquisition process rather than being merely a bonus at the end of the transaction.

4.1.2. FDI as a Driver of Expansion and Improved Corporate Sustainability

In the literature reviewed, FDI is not seen merely as the inflow of capital from one country to another. Beyond additional capital, FDI can also bring technology and knowledge that affect productivity. For several sectors in Taiwan, Soto and Zambrano-Monserrate (2026) found FDI *spillover* effects on green productivity. IFDI and OFDI are associated with productivity gains supported by renewable energy use, technology transfer, and changes in production activities (Soto & Zambrano-Monserrate, 2026).

Decisions on FDI are also inseparable from the conditions of the host country. Pan et al. (2022), who examined Taiwanese banking investment in ASEAN countries, found that market size, economic freedom, geographical distance, bilateral trade, and the level of Taiwanese outward FDI are associated with firms' decisions on investment location (Pan et al., 2022). In other words, companies do not choose host countries arbitrarily, because conditions in those countries shape investment decisions. The benefits of FDI are not always the same either. Rojec and Knell (2018) found that *knowledge spillovers* from FDI can have positive, neutral, or negative effects (Rojec & Knell, 2018). Thus, investment does not necessarily produce the same benefits under all conditions.

Besides productivity, ESG aspects are also related to the investment environment in Taiwan. Yang et al. (2024) found that institutional investors encourage companies in Taiwan to improve ESG disclosure and performance (Yang et al., 2024). Combined with the study by Soto and Zambrano-Monserrate (2026), the relationship between investment and *sustainability* can be viewed from two sides. Soto and Zambrano-Monserrate (2026) show the relationship through green productivity, whereas Yang et al. (2024) show attention to ESG disclosure and performance (Soto & Zambrano-Monserrate, 2026; Yang et al., 2024). Hence, *sustainability* in investment activities concerns not only the environment but also how companies manage and disclose their activities.

Overall, FDI can bring capital, technology, and knowledge, but its direction and benefits remain contingent on host-country conditions and the investment undertaken (Pan et al., 2022; Rojec & Knell, 2018). In Taiwan, its link with *sustainability* is visible through green productivity and attention to ESG (Soto & Zambrano-Monserrate, 2026; Yang et al., 2024). The mere presence of investment is therefore not sufficient to assess its benefits for *sustainability*. The literature also still largely discusses FDI and *sustainability* through productivity, spillovers, and ESG separately, while its connection with M&A has seldom been examined jointly. This provides the basis for considering M&A and FDI together in the context of Taiwanese companies.

The literature findings are visualised in Figure 1, which shows not only the results of the literature review presented in subsections 4.1.1 and 4.1.2 but also the relationships between the results of these two parts. The five relationships in Figure 1 can be explained as follows. Relationship ① shows the link between host-country conditions and FDI location decisions (Pan et al., 2022). Relationship ④ is conditional, because the benefits of *knowledge spillovers* from FDI do not always emerge in the same direction (Rojec & Knell, 2018). Relationship ② shows that ESG challenges and corporate risks concerning the link between M&A and *sustainability* need to be assessed from the early stages of a transaction. Relationship ③ depicts the link between FDI and *sustainability* through green productivity and ESG disclosure and performance (Soto & Zambrano-Monserrate, 2026; Yang et al., 2024). Relationship ⑤ marks the research gap, namely that M&A and FDI have so far been discussed separately when linked to *sustainability*. Both are subsequently examined together in the TSMC analysis (Subsection 4.2.2). The arrows in Figure 1 represent linkages and the flow of synthesis of findings, not direct causal relationships.

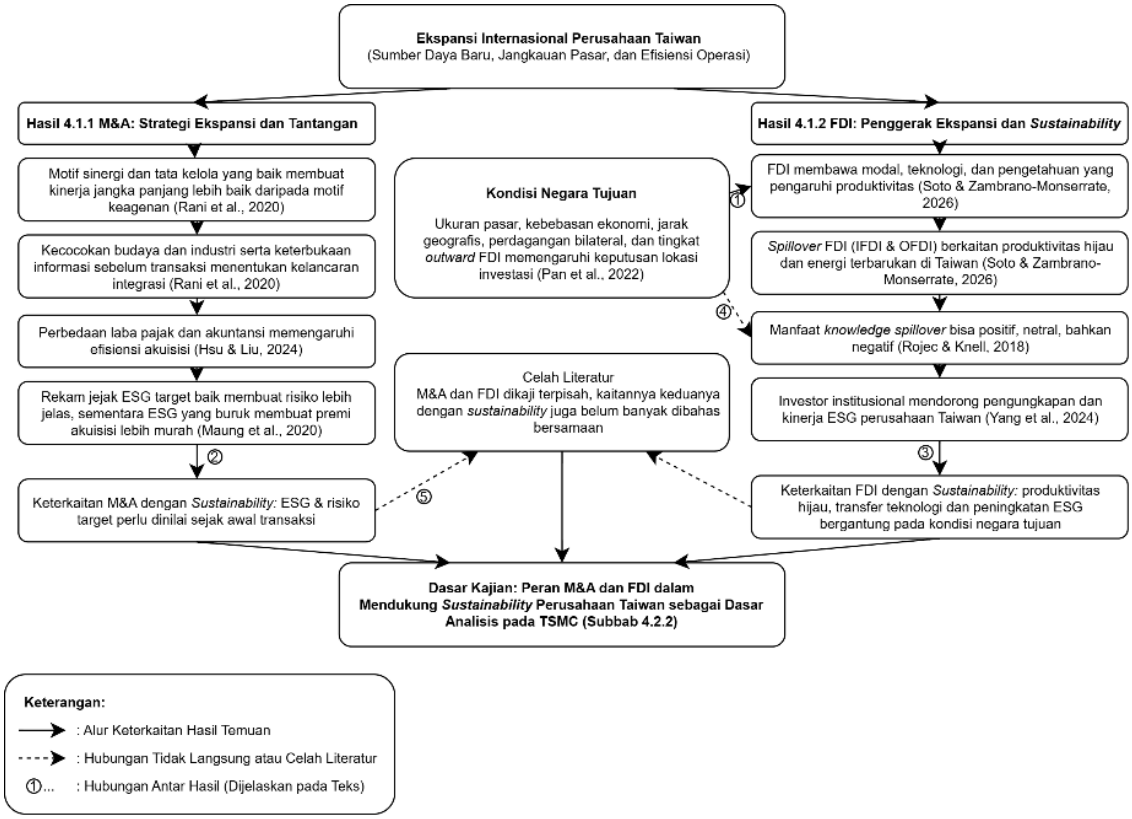


Figure 1. Map of Relationships among Literature Findings on M&A, FDI, and *Sustainability*
Source: Processed from the literature review using Draw.io (2026) - in Bahasa Indonesia

4.2. Discussion

4.2.1. The Interconnection between Mergers and Acquisitions (M&A) and Foreign Direct Investment (FDI) in Facilitating Sustainable Companies in Taiwan

M&A and FDI are related because both apply sustainability principles to the expansion of business processes, even though they follow different routes. In this scenario, once an M&A process has been successfully completed in the market in which the business operates, several points need to be emphasised; in particular, the host country's capacity to absorb knowledge and technology must be considered separately.

For M&A, the findings of Rani et al. (2020) and Chen (2024) reveal that the benefits of a merger or takeover are not necessarily sustained in the long run, so the ability to sustain results differs from M&A success itself (Chen, 2024; Rani et al., 2020). ESG aspects reinforce this issue. Hsu and Liu (2024) and Maung et al. (2020) reveal that transaction efficiency and valuation are influenced by ESG conditions (Hsu & Liu, 2024; Maung et al., 2020). Risk assessment of the target company before the transaction, followed by post-M&A evaluation, helps predict success; thus, through ESG and M&A, corporate sustainability can be enhanced as long as the company is able to manage the risks associated with the target. ESG is related to firm performance in terms of long-term survival through its relationship with corporate governance performance (Pham & Ho, 2024).

Given that foreign investment does not automatically generate *sustainability*, its contribution may run through capital, technology, knowledge, and productivity (in the case of FDI). The effects of FDI on green productivity in several sectors in Taiwan have been discussed by Soto and Zambrano-Monserrate (2026), but they are not always uniform, particularly regarding knowledge spillovers from FDI, as noted by Rojec and Knell (2018) (Rojec & Knell, 2018; Soto & Zambrano-Monserrate, 2026). Productivity improvements depend on the absorptive capacity of the recipient firm or country and its understanding of the technology.

Cross-border acquisitions arise because of differences between the two countries and because of the influence of the environment in which the target operates. Mergers and acquisitions cannot be regarded as stand-alone processes, since the external environment in which a company exists affects

how they develop; as previous research shows, target selection is determined by firms' decisions regarding political risk, industry ties, and culture (Chang & Cheng, 2026). Meanwhile, Wójcik et al. (2022) offer a broader perspective, showing that cross-border mergers and acquisitions can influence the global financial system through shifts in the positions of financial centres (Wójcik et al., 2022).

The issues relevant to mergers and acquisitions are organisational integration, changes in governance, and concern for and risks of ESG at the target company, whereas in the case of FDI the firm's absorptive capacity becomes crucial. Sustainability and green productivity have become key elements of the investment process in Taiwan, which makes it important to study M&A and FDI beyond the context of financial performance. These issues are usually studied separately, even though both processes may be linked to corporate sustainability strategy. This is particularly pertinent to Taiwan because sustainability and green productivity have become inherent parts of the investment process in the country. From this perspective, it is essential to examine the relationship between M&A and FDI in the context of Taiwanese industry, which this study does using TSMC as an illustration.

4.2.2. The Application of M&A and FDI in Supporting *Sustainability*: An Analysis of TSMC

Taiwan Semiconductor Manufacturing Company (TSMC) is a semiconductor company from Taiwan that pursues international expansion by developing production facilities in various countries. With regard to M&A, TSMC's approach is relatively selective. According to TSMC's 2024 *annual report*, no merger or acquisition was undertaken during 2024 up to the report date, and this was confirmed in the latest 2025 annual report, whose section "*Risks Associated with Mergers and Acquisitions*" explicitly states that from 2025 up to the report's publication date TSMC did not conduct any merger or acquisition transaction (TSMC, 2025a). This indicates that M&A was not the main benchmark used by TSMC in its expansion during that period. This relates to the earlier study by Rani et al. (2020), which analysed 301 M&A transactions in 11 Asian countries and showed that M&A is grounded in synergy motives and in corporate governance closely tied to sound corporate management (Rani et al., 2020). Accordingly, TSMC tends to choose an expansion strategy that gives it direct control over its current technology and future production activities.

In TSMC's expansion, FDI is the more visible strategy, through the construction of production facilities in various countries such as the United States, Japan, and Germany. Data from the 2025 *Annual Report* confirm that TSMC Arizona Corporation (United States) continues to expand its capacity towards an independent GIGAFAB cluster; JASM (*Japan Advanced Semiconductor Manufacturing*) in Kumamoto, Japan, began volume production at its first fab in late 2024 and has been building a second fab for the 3nm process; while ESMC (*European Semiconductor Manufacturing Company*) GmbH in Dresden, Germany, is constructing a specialised fab for automotive and industrial applications (TSMC, 2025a). These investments aim not only to increase production capacity but also to bring operational and technological standards to the host countries. This is consistent with research on FDI by Taiwanese firms showing that overseas investment decisions can be influenced by *factors* such as market conditions, trade, and host-country characteristics (Pan et al., 2022). This expansion is also financed internally, as capital expenditure rose from NT$956.01 billion in 2024 to NT$1,272.41 billion in 2025, while operating cash flow of NT$2,275 billion still far exceeded investing cash flow. Moreover, Soto and Zambrano-Monserrate (2026) reveal that FDI in Taiwan can be closely linked to *green productivity* through technology transfer and renewable energy use (Soto & Zambrano-Monserrate, 2026).

Table 4. TSMC Financial Performance Indicators

Indicator	2024	2025
Revenue (NT$ billion)	2,894.31	3,809.05
Operating Margin	45.7%	50.8%
Net Income (NT$ billion)	1,173.27	1,717.88
Net Profit Margin	40.5%	45.1%
ROA	17.53%	21.65%
ROE	27.36%	31.70%

Source: TSMC Annual Report 2025

Based on Table 4, TSMC's revenue increased by 31.6% and its *net income* by 46.4% in 2025, accompanied by higher margins as well as higher ROA and ROE. This indicates that large-scale FDI expansion did not reduce the company's efficiency, and this condition underpins TSMC's ability to

finance sustainable investment. TSMC's sustainability indicator achievements are presented in Table 5.

Table 5. TSMC *Sustainability* Indicators, 2025

Indicator	2025 Achievement
Renewable energy	5,789 GWh (20.1% of total)
Renewable energy at overseas subsidiaries and offices	100% (8th consecutive year)
Total recycled water	318.94 million m^3 (+12% from 2024)
Water consumption per unit of product	153.3 L (down 4.8% from 2024)
Global water positive rate	21% (target 17%)
JASM, Kumamoto	Groundwater recharge of 8 million m^3
TSMC Arizona	14.6 MWp solar panels; water reclamation plant under construction; Verde River restoration project
ESMC, Dresden	Relocation of >350 sand lizards to 12 new habitats

Source: TSMC Annual Report 2025 and Sustainability Report 2025

In terms of water efficiency, the amount of water recycled across all recycling systems in 2025 was 318.94 million m3, 12% more than in 2024, and water consumption per unit of product fell by 4.8% to 153.3 litres per 12-inch-equivalent wafer per mask layer. This reduction was still held back by new fabs at the qualification stage, while JASM's Kumamoto plant also runs a groundwater recharge project as part of local water management (TSMC, 2025b). These facts indicate that foreign direct investment can be regarded as a tool for introducing sustainability into newly built production facilities. These findings are supported by Yang et al. (2024), who reveal a link between institutional investor involvement and ESG disclosure and performance among companies in Taiwan, and by Maung et al. (2020), who show that ESG risk can affect *cross-border* M&A transactions. It can therefore be concluded that, in the case of TSMC, FDI serves both as an instrument of expansion and as a vehicle for *sustainability*, whereas M&A was not the main mechanism of expansion during the period analysed (Maung et al., 2020; Yang et al., 2024).

5. CONCLUSION

Research has shown that M&A can help secure corporate sustainability. In M&A, this contribution involves managing the risks and ESG (Environmental, Social, and Governance) conditions of the target company, whereas in foreign direct investment the contribution takes the form of technology transfer, green productivity, and improved ESG. Taiwanese companies use both M&A and FDI, in differing proportions. In the case of TSMC, it is confirmed that M&A was not the main strategy for its international expansion during the research period. Instead, FDI has been the company's main strategy for overseas development, as evidenced by the establishment of production facilities in the United States, Japan, and Germany. Furthermore, TSMC's FDI is aligned with the company's sustainability principles through renewable energy use, efficient water utilisation, and emission reduction. These results answer the three research questions: how M&A and FDI help ensure sustainability, how the contributions of M&A and FDI are revealed in Taiwanese companies, and how this relationship is manifested in the case of TSMC.

5.1. Implications

Theoretically, this study extends research on M&A and FDI by placing both together in relation to *sustainability*, rather than treating them as two separate topics as in previous studies. Practically, the findings can inform companies planning international expansion not to pursue financial outcomes alone but also to consider the governance, ESG, and sustainability aspects of the chosen expansion strategy. For stakeholders, the study helps them understand how corporate expansion decisions, whether through M&A or FDI, relate to efforts to maintain long-term sustainability.

5.2. Research Limitations

This study has several limitations. First, because it reviews a limited number of references, it cannot cover all developments in research on M&A, FDI, and sustainability issues. Second, its object is TSMC, so the results describe TSMC's situation but cannot be generalised to other Taiwanese companies, let alone companies in other industries. Third, as a descriptive qualitative study, it relies only on the

company's Annual Report and Sustainability Report without quantitative data to analyse the relationships among M&A, FDI, and sustainability. Future research should use quantitative as well as qualitative data and extend the sample to other Taiwanese companies. Nevertheless, this study shows that M&A and FDI play complementary roles in achieving corporate sustainability, particularly in the case of TSMC.

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Abbreviations
M&A: Mergers and Acquisitions
FDI: Foreign Direct Investment
ESG: Environmental, Social, and Governance
TSMC: Taiwan Semiconductor Manufacturing Company
IFDI: Inward Foreign Direct Investment
OFDI: Outward Foreign Direct Investment
JASM: Japan Advanced Semiconductor Manufacturing
ESMC: European Semiconductor Manufacturing Company
SASB: Sustainability Accounting Standards Board
DEA: Data Envelopment Analysis
ASEAN: Association of Southeast Asian Nations.

Author Contributions
MZ designed the research framework, coordinated the preparation of the article, analysed and interpreted the literature, and drafted the final manuscript. BPM collected secondary data from TSMC's *Annual Report* and *Sustainability Report* and assisted with the *content analysis*. VANR prepared the *literature review* and assisted in interpreting the results. FNR classified the literature themes, helped prepare Table 1 and Table 2, and edited the language of the manuscript. FHS formulated the research method section, assisted in discussing the results, and performed the final check of the manuscript. YLK is responsible for revising and proofreading the final manuscript. All authors have read and approved the final published manuscript.

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Data Availability
The data used in this study were obtained from scientific journal articles retrieved through academic databases such as Google Scholar, ScienceDirect, and SpringerLink, as listed in Table 1 and Table 2, as well as from official company documents, namely the TSMC *Annual Report* (2025) and TSMC *Sustainability Report* (2025), which are publicly accessible through TSMC's official website (https://www.tsmc.com). All data and research materials are publicly available, enabling replication and reuse by other researchers.

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