

**Conceptualising German MNEs' Sustainable Management Practices in China:  
A Maturity Model Approach**

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## Abstract

This conceptual paper proposes a corporate sustainability maturity model (CSMM) for German multinational enterprises (MNEs) operating in China. The model addresses the sustainability challenges faced by German MNEs in the Chinese business environment, considering economic, cultural, and regulatory differences. Drawing on existing sustainability maturity frameworks and stakeholder theories, the paper develops a context-specific CSMM with two components: a sustainable strategy element derived from business process maturity models, and a knowledge management element encompassing people, processes, and technology. The model aims to help German MNEs assess and improve their sustainability practices in China by providing a framework for evaluating maturity levels across key areas. This study makes a theoretical contribution by demonstrating how maturity model frameworks can be adapted to address challenges in an international context. It also highlights the importance of incorporating stakeholder value proposition theories into corporate sustainability strategies, which can drive leadership-led entrepreneurial initiatives.

Word count: 6473 (excluding tables and references)

## 1. Introduction

There is a growing expectation that corporations will take the lead in driving the United Nations' Sustainable Development Goals (SDGs) to succeed, addressing global topics such as climate change, social well-being, and responsible production. German MNEs are often at the forefront of setting sustainability standards via circular economic practices and decarbonisation strategies. The Chinese market plays a significant role in global expansion strategies and the performance of German MNEs (CIIPAG and FDI Centre, 2019). With approximately 5000 German firms operating in China, German FDIs are one of the most prominent ones in China and contribute significantly to their global results (GCCC, 2023). Nonetheless, our understanding of how German MNEs' sustainable practices and standards are modified, interpreted, and challenged in the Chinese environment remains limited.

An increasing number of studies have shown that corporate sustainability maturity models (CSMMs) offer a systematic approach for assessing an organisation's sustainability practices and performance across different dimensions. Unfortunately, few context-specific CSMMs are available to assist German MNEs in addressing their sustainability challenges (Marquis et al., 2015). This conceptual paper fills this gap by proposing a CSMM tailored to the specific economic, cultural, and regulatory environments of Germany and China. This model aims to assist German MNEs in assessing and improving their sustainability practices while operating in China. By developing this context-specific CSMM, the paper contributes to both theoretical understanding and practical management of sustainability challenges faced by German MNEs and similar multinational corporations in China.

## 2. Literature Review

This literature review aims to provide a comprehensive understanding of the theoretical and regulatory landscape surrounding the topic of corporate sustainability. The literature review then delves into the specific challenges faced by German MNEs in the Chinese business environment. It examines the cultural, economic, and regulatory differences between Germany and China, which may significantly impact the adoption and effectiveness of sustainability initiatives. This review then investigates the specific challenges reported by German companies in longitudinal surveys from the German Chamber of Commerce in China. It then explores the existing sustainability maturity models, frameworks, and theories and examines whether and how different sustainability maturity models and theories could be further combined and integrated to develop a customised maturity model, which could help German companies counter the specific challenges they face in China.

The leading search engines used in this review were Scopus and Google Scholar (GS). All searches were performed in English. The initial search words used were corporate sustainability, sustainability strategy, sustainability strategy implementation, maturity models, sustainability maturity models, FDIs in China, and German companies' challenges in China. The literature review is a continuous and dynamic process. Each new concept associated with the corporate sustainability and sustainability maturity models was selected and reviewed. That leads to extended search word lists based on the initial search words, e.g. literature review on "corporate sustainability" leads to further searches on sustainability-relevant legislation, sustainability reporting/disclosure, greenwashing etc. Maturity models lead to business process improvement, sustainability business models, stakeholder perspectives on business models, and so on. FDIs in China lead to cultural dialectics, customer perceptions (also from the stakeholder perspective), FDI green innovation, etc. All

search fields and their extensions were categorised and consolidated in MAXQDA to ensure clear structure and completeness.

## 2.1 The Development and Definition of Corporate Sustainability

Discussions and concepts regarding corporate sustainability have been abundant in recent decades. Brundtland (1987), the chairwoman of the World Commission on Environment and Development (WCED), defined sustainability as managing and advancing the economy, technology, and social organisation without compromising future generations' ability to meet their needs. Elkington (1998) established the Triple Bottom Line (TBL) model building business sustainability on three pillars: profit, planet, and people. Doane and MacGillivray (2001) refer to sustainability from a corporate or entrepreneurial perspective as a corporation's willingness and capacity to last in time, or the business to stay in business in terms of financial performance, resources, and shareholder management, without compromising its ability to meet the needs of future stakeholders. The European Union (EU) defines corporate sustainability as companies incorporating social and environmental considerations into their operations and stakeholder interactions (EU, 2002).

Among these sustainability frameworks, the TBL principle introduced by Elkington (1998) summarises corporate sustainability using a simple but comprehensive three Ps (Profit, Planet and People) to suggest that companies should not focus only on economic factors (profit). They should also consider their impact on the environment (planet) and society (people). This broader view helps companies assess their performance and sustainability efforts more comprehensively. Therefore, TBL is considered the most accepted and basic framework of the CSD-relevant literature (Ness et al., 2007; Kleine & von Hauff, 2009; Baumgartner & Ebner, 2010). Table 1 summarises the main definitions of the three pillars linked to sustainability concepts. Although different definitions and published literature might focus on certain pillar(s), there is a clear global alignment, whereas in China, a single-minded focus on economic sustainability would not succeed in the long run (Dyllick & Hockerts, 2002; Bai et al., 2015; Chow et al., 2021).

**Table 1**

*Summary of the Definitions of the Three Pillars of the TBL Model and CSR Concepts*

| TBL Model Pillars | CSR Concepts                 | Definitions                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Planet            | Environmental/Eco-efficiency | Eco-efficiency means offering goods and services that meet human needs, improve quality of life, and minimize ecological impact and resource use throughout their life cycle, all at a competitive price. This helps ensure resource consumption matches the earth's carrying capacity (DeSimone & Popoff, 1997). It deals with corporate activities' environmental impact (Baumgartner, 2010).      |
| People            | Socio-efficiency             | Socio-efficiency refers to the connection between a company's value-added and its social impact. Socially sustainable companies aim to maintain positive relationships with stakeholders now and in the future (Hockerts, 1996; Figge & Hahn, 2004). Socially sustainable organizations are conscious of their actions and are committed to the long-term well-being of society (Baumgartner, 2010). |
| Profit            | Economical sustainability    | Economically sound companies ensure enough cash flow to maintain liquidity while generating a consistent above-average return for their shareholders (Dyllick & Hockerts, 2002). The economic dimension of CSR is often discussed as the 'generic dimension' (Baedeker et al., 2002). Economic                                                                                                       |

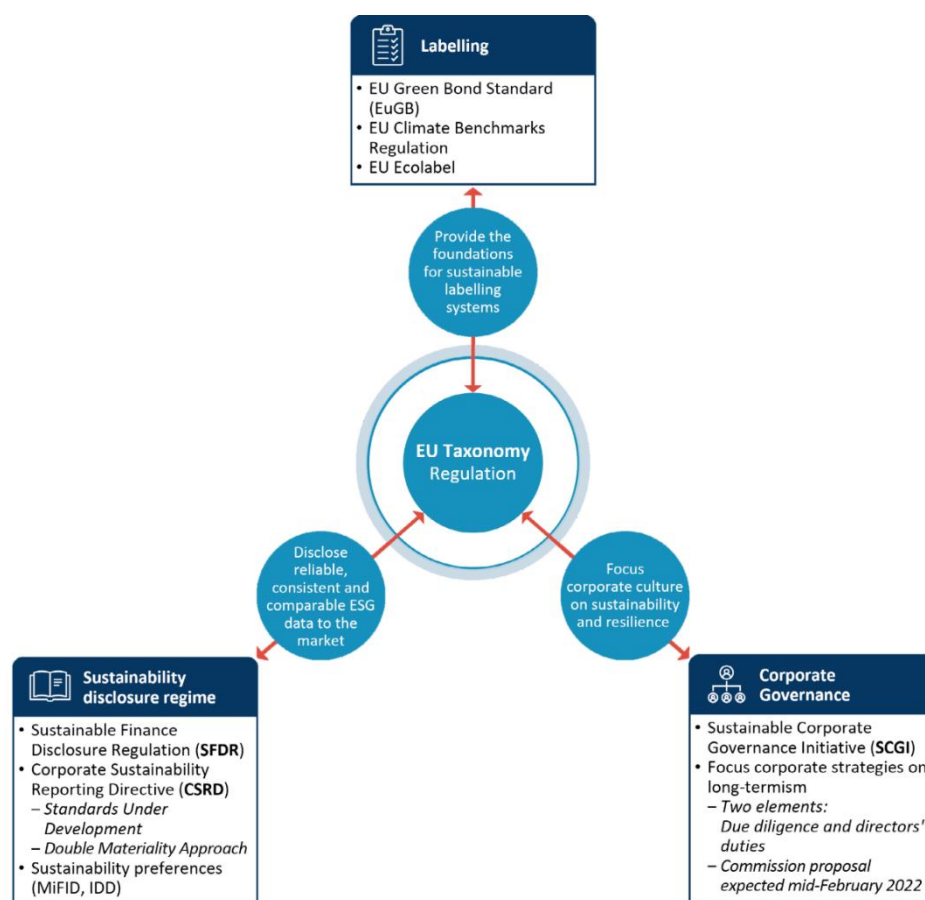
|  |  |                                                                                                                                                                                |
|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  | sustainability involves respecting the general aspects of an organization, including environmental and social aspects, to ensure long-term market success (Baumgartner, 2010). |
|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 2.2 Sustainability-relevant regulatory landscape in both Germany and China

The signing of the UN's Sustainable Development Goals (SDGs) in 2015 marked an important shift in countries' commitment to sustainability from voluntary to mandatory (UN, 2015). Since then, SDGs have played a significant role in shaping sustainability legislation and policy frameworks. The EU has been the frontrunner and has adopted legislation governing sustainability disclosure in multiple areas, including corporate sustainability reporting and disclosure; sustainability of economic activities; financial products; and environmental, social, and governance risks of credit institutions (Hummel & Jobst, 2024). Figure 1 provides an overview of the EU's taxonomy regulations, which have the target of standardising sustainability reporting and supporting the SFDR and CSRD. In 2021 and 2024, Germany and the EU passed the German Supply Chain Due Diligence Act and Corporate Sustainability Due Diligence Directive (CSDDD) respectively. Both directives focus on the environment and human rights due diligence in MNEs' supply chain operations (Weihrauch et al. 2022). These reporting mandates and standards are rapidly progressing and interconnected, making them increasingly complex for businesses to navigate (Alamillos and De Mariz 2022).

**Figure 1**

## *The EU Taxonomy Aims to Standardize Sustainability Reporting*



Source: Reprinted from “EU Taxonomy and the Future of Reporting” by Pettingale et al., 2022, Harvard Law School Forum on Corporate Governance.

Similarly, China has shown great commitment to adopting and implementing SDGs in its policy framework (Yu et al., 2020). The 13th (2020-2024) and 14th (2021-2025) five-year plans of China have established short- and medium-term development strategies linked to the 2030 Agenda. In 2014, the implementation of the new Environmental Protection Law pushed companies towards mandatory ESG disclosure (Zhang et al., 2023). The Guidance on Building a Green Financial System (PBOC, 2016), marked a significant breakthrough in China's green finance policy. This guidance positively impacts the ESG disclosure practices of listed companies, particularly those in high-pollution industries, state-owned enterprises, and economically developed regions (Zhang et al., 2024). In 2022, China's first guidance for Enterprise ESG Disclosure was issued by its State Council-backed think tank, the China Enterprise Reform and Development Society (China Enterprise Reform and Development Society, 2022), and several major Chinese firms. Although compliance with the Guidance is currently voluntary, it serves as a starting point for companies in China to explore the ESG standards developed in a local context.

As these frameworks continue to develop and interconnect, businesses face increasing complexity in navigating the evolving landscape of sustainability regulations and disclosure. German MNEs in China were hit twice. On the one hand, they must comply with the EU legislation. On the other hand, they need to ensure that they follow the guidance issued by

Chinese policymakers. Therefore, a thorough understanding of both regulatory environments, particularly in the host country, is crucial for German MNEs operating in China. This dual compliance challenge requires companies to develop robust sustainability strategies that can adapt to the nuances of both the markets.

### **2.3 Economic, cultural and regulatory highlights in China**

For German MNEs in China, a solid understanding of the host country's regulatory environment means that they also need to understand the economic and cultural highlights in China and, more importantly, how they differ from their home country. This understanding should encompass both formal and informal institutions. The ability to manage these differences can significantly impact technology transfer and firm performance and is a potential source of sustainable competitive advantage for MNEs (Buckley et al., 2006).

China's economic transformation since the 1980s has been characterized by a shift from a centrally planned economy to a market-based system through marketization, liberalization, and privatization (Hitt & Xu, 2015). Despite its economic success, China's institutional framework differs significantly from that of European countries. In contrast to the Union's democratic systems and market economies, China operates under the unique model of a state-permeated market economy (Nölke et al., 2014). This system is characterised by strong government involvement in economic affairs, with the state playing a crucial role in shaping market dynamics and business operations. While the EU emphasises formal institutions and the rule of law, China relies more on informal institutions to facilitate economic transactions and foreign direct investment (Wang, 2000). These differences have profound implications, especially for foreign direct investment, entrepreneurship, and overall economic development.

The formal and informal institutions between the EU countries and China can be partly explained using different cultural systems. According to the naive dialecticism perspective (Peng & Nisbett, 1999; Spencer-Rodgers et al., 2010), Western dialectical thinking is more synthetic, emphasising the laws of identity, non-contradiction, and excluded middle. According to Peng and Nisbett (1999), Chinese thinking comprises three key principles: change, contradiction, and holism. The Western approach, which emphasises non-contradiction in dialectics, may enhance people's ability to reason rationally, enabling them to either dismiss false claims or accept truthful ones. By contrast, Chinese individuals tend to favour dialectical solutions to societal conflicts and prefer dialectical reasoning over traditional Western logical arguments.

This cultural difference might explain why companies and scholars have found that corporate environmental disclosure-related guidelines and regulations released by the Chinese government are often unclear (Situ & Tilt, 2018). Even when some regulations mandate disclosure, the actual implementation and enforcement may vary. For instance, companies tend to provide general and vague information rather than specific and meaningful environmental data (Cai et al., 2024). This suggests that, even when regulations are technically mandatory, the standards, quality, and depth of disclosure may not be consistent. Consequently, it is difficult for western MNEs in China to comprehend these regulatory guidelines.

In summary, while China has been moving towards mandatory ESG disclosure regulations, the practical implementation and enforcement of these regulations remain complex. The transition from voluntary to mandatory disclosure is ongoing, with unclear and varying degrees of compliance and disclosure quality standards across different sectors and regions (Cai et al., 2024; Singhania & Saini, 2021; Zhang et al., 2024). Therefore, it is

advisable for German MNEs in China not to rely on their own understanding of these regulations, but to have dialectic exchanges with institutions and government agencies, who can help them clarify the regulatory requirements.

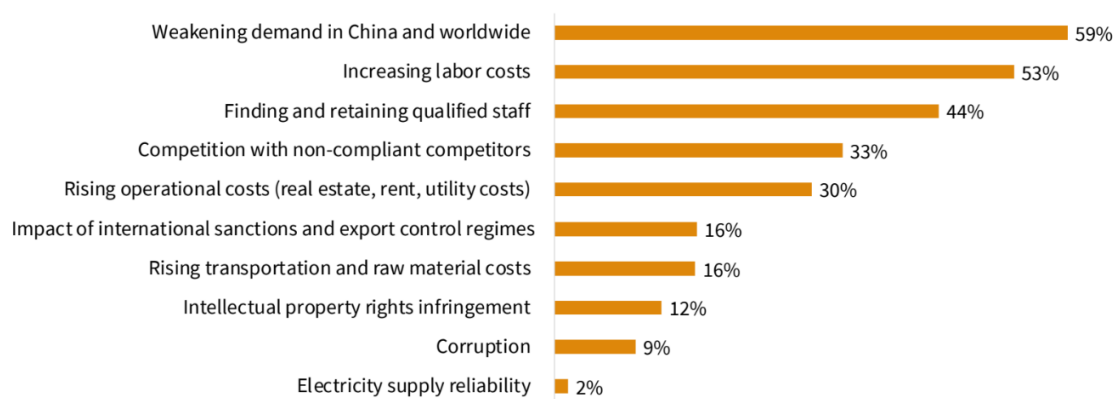
## 2.4 The business sustainability challenges German MNEs face in China

The Chinese market plays a significant role in German MNEs' and SMEs' global expansion strategies and performance (China International Investment Promotion Agency Germany & Foreign Direct Investment Center, 2019). German foreign direct investment (FDI) stocks in China have more than tripled since 2010, reaching 90 billion euros in 2020, with decent double-digit profits and returns (Jungbluth et al., 2023). The two pandemic years and the rigid "Zero-COVID" policy in China massively impacted FDI operations, the global supply chain, and economic growth. Even after the "Zero-COVID" policy was lifted in December 2022, China saw lower than expected recovery and growth, impacting the business confidence of FDI in China.

This is evidence from a longitudinal survey conducted by the German Chamber of Commerce in China (GCCC), representing over 50% of approximately 4,000 German MNEs in China. In the business confidence survey results from 2023 (Figure 2) and 2024 (Figure 3), weakening demand in China tops German MNE's business challenges, followed by rising costs, fierce location competition, and price pressure as the top domestic challenges. In addition, weakening worldwide demand, international sanctions, and export control regimes are top global challenges. These geopolitical uncertainties have affected China's economic development as an export-oriented economy heavily reliant on FDI (GCCC, 2024).

**Figure 2**

*Operational & Macroeconomic Business Challenge Survey in 2023 (566 Participants)*



Source: Reprinted from "Business Confidence Survey 2023/24", by the German Chamber of Commerce in China, 2023, p.44.

Furthermore, it is interesting to note that for the first time in the 2024/2025 business confidence survey (Figure 3), access to green energy and obtaining relevant data from their suppliers are mentioned as the environmental and carbon footprint relevant challenges. As mentioned in the previous paragraph regarding the sustainability-relevant regulatory landscape, the EU has been at the forefront of implementing mandatory sustainability disclosure legislation (Hummel & Jobst, 2024). German MNEs in China and their suppliers are required to comply with both EU/German and Chinese legislative frameworks. However,

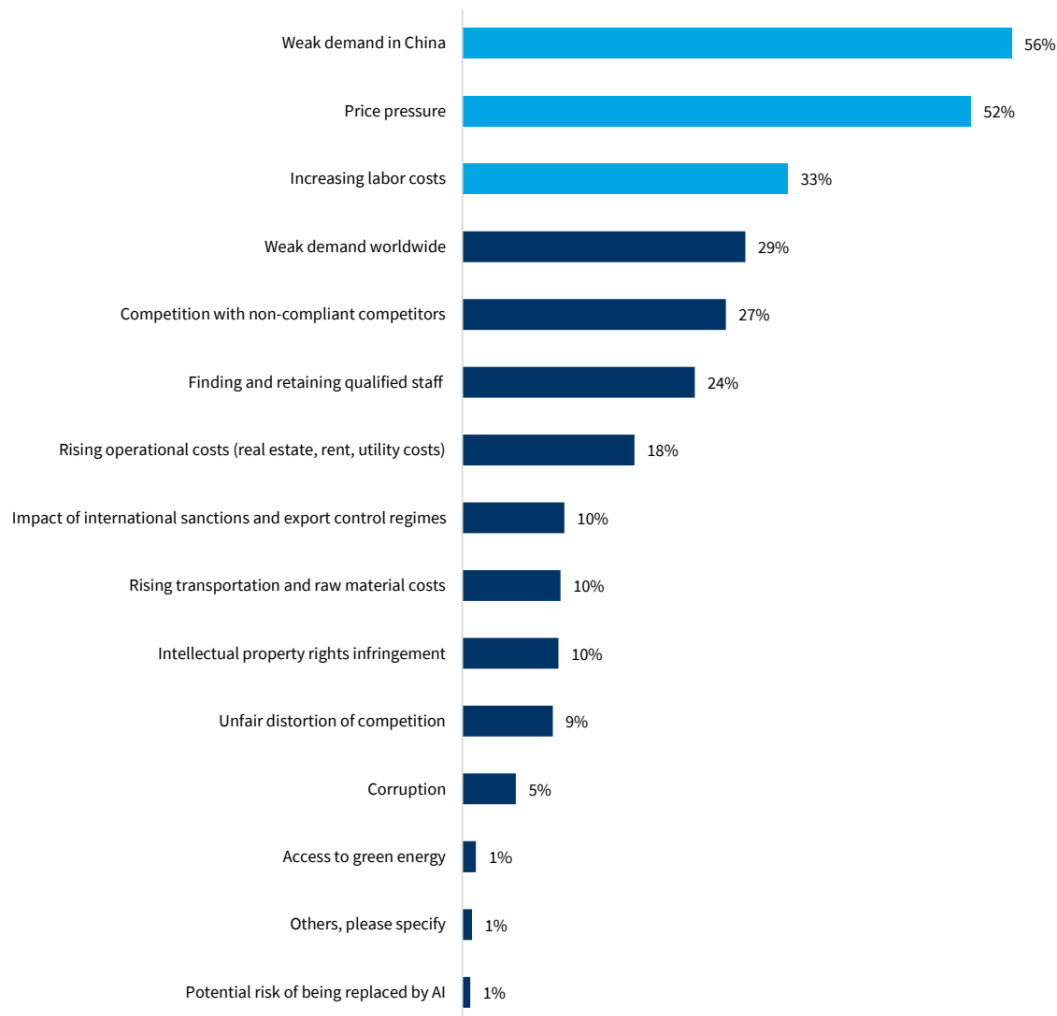
the awareness and understanding of new regulations and the availability of transparent and reliable sustainability disclosure relevant data, especially for suppliers, are among the top sustainability challenges of German MNEs in China (GCCC, 2024).

According to recent studies, the complexity and interconnectedness of the various reporting mandates and standards are one of the primary challenges (Hummel & Jobst 2024), especially for MNEs operating across multiple continents. Although the UN's SDGs offer a standard set of 17 goals, the 163 supporting targets and monitoring indicators are highly complex. This complexity is further compounded because companies often struggle to relate sustainability to their business operations and thus incorporate it into their core strategies (Baumgartner & Ebner, 2009; Ajmal et al. 2017). Companies often find it challenging to effectively communicate the contributions of their sustainability initiatives to the SDGs (Costa et al., 2022). In addition, companies today are immersed in a very complicated ESG reporting landscape, with rising pressure from environmental, social, governance, ESG, and net-zero commitments (GRI, 2022). Unfortunately, all of these challenges have led to increasing cases of greenwashing in recent years, as companies struggle to balance the need for environmental compliance with their actual efforts to achieve it (de Freitas Netto et al., 2020; Black et al., 2021; Montgomery et al., 2023). The word "greenwash" is defined as "misleading publicity or propaganda disseminated by an organization, etc., so as to present an environmentally responsible public image." (Oxford English Dictionary, 2024).

This highlights the urgent need for a more practical approach to guide companies towards transparency in sustainability-related disclosures and reporting (Costa et al., 2022; Kücükgül et al., 2021). One may argue that certified bodies and auditing and rating firms should act as intermediaries, which scrutinise or endorse the firm's ESG messages or activities. However, very often, these intermediaries share similar interests with firms, and the dividing line between greenwashers and intermediaries has become a gray area (Wang et al., 2021; Strauss, 2022). In fact, the rapid development of ESG rating agencies to help firms obtain ESG capital market funding was found in many cases to have made ESG ratings a form of greenwash (Boiral and Henri, 2017; Barrymore, 2021). Therefore, the mitigation measures must come from the firms, which would need to recheck their business strategy and processes and ensure that ESG is integrated and synchronised from the top management to the working levels, avoiding symbolic and selective communications or reporting without fundamental ESG actions.

### **Figure 3**

*Operational & Macroeconomic Business Challenge Survey in 2024 (500 Participants)*



Source: Reprinted from “Business Confidence Survey 2024/25”, by the German Chamber of Commerce in China, 2024, p.21.

## 2.5 The theoretical frameworks of the cooperate sustainability maturity models (CSMMs)

An increasing number of recent studies have shown that business sustainability maturity models can help firms cope with these challenges by providing a framework for them to evaluate their current sustainability practices and identify areas for improvement. These models can assist firms in aligning their business strategies with ESG principles, integrating sustainability criteria into traditional business processes, and thus ensuring a more holistic approach to sustainability (Meza-Ruiz et al. 2017; Camelo & Nogueira, 2024). By applying and leveraging such models, companies can assess their progress in integrating sustainability into their organizational culture and strategy, which contributes to achieving SDGs and is crucial for long-term success (Aldowaish et al., 2024; Sun et al. 2024).

A maturity model is a theoretical framework that outlines a series of distinct maturity levels for a particular set of processes in one or more business domains (Becker et al., 2009). Although maturity models were initially developed for software development engineering, they have been adapted and applied to a wide range of domains, such as education, project management, knowledge management, business process management, and sustainability.

(Wendler, 2012; Tocco-Cano et al. 2020). One main reason may be that maturity models provide a systematic approach for assessing an organisation's current state and guiding the process of improvement (Bititci et al., 2014; Boer et al., 2015; Tarhan et al. 2016). In the case of sustainability maturity models, they help companies evaluate their current sustainability performance and identify areas for improvement (Meza-Ruiz et al., 2017).

However, scholars also mention that practitioners should be aware that many maturity models lack sufficient validation (Wendler, 2012; Ferraro et al. 2023). Furthermore, the applicability of these models to individual contexts must be addressed (Wendler, 2012). The purpose of this section is to check whether existing CSMMs can be applied to the specific context of German MNEs in China, considering China's economic, cultural, and regulatory highlights and German MNEs' sustainability challenges. Five theoretical CSMM frameworks and one sustainable business model framework were identified in the literature review.

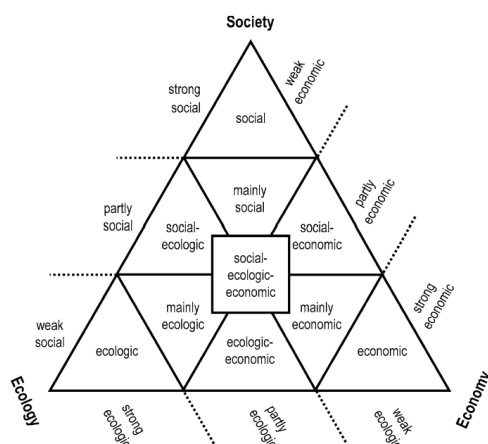
#### Category 1: TBL-based MM

Derived from the three pillars of TBL/CSR, these models developed sub-category indicators for the pillar(s) of profit, planet/environment, and people/society, and measured the maturity levels. Figure 4 shows an example of an integrative sustainability triangle.

- **Strengths:** The strength of these models is that they aim for a balanced approach to corporate sustainability and are widely applicable in multiple areas, for example, for the overall company (Kleine & Hauff, 2009; Gouvinhas et al., 2016) or certain areas, such as manufacturing systems (Ahmad et al. 2019) and supply chains (Correia et al. 2017).
- **Challenges:** The challenge with this type of model is to find a balance between the domain complexity and simplicity of the maturity models (Correia et al. 2017). Moreover, new maturity models are frequently presented as preliminary conceptualisations that are not sufficient for practical applications (Poeppelbuss et al., 2011).

**Figure 4**

*Example of an integrative sustainability triangle*



Source: Reprinted from "Sustainability-Driven Implementation of Corporate Social Responsibility: Application of the Integrative Sustainability Triangle", by Kleine & Hauff, 2009, Journal of Business Ethics, p. 523.

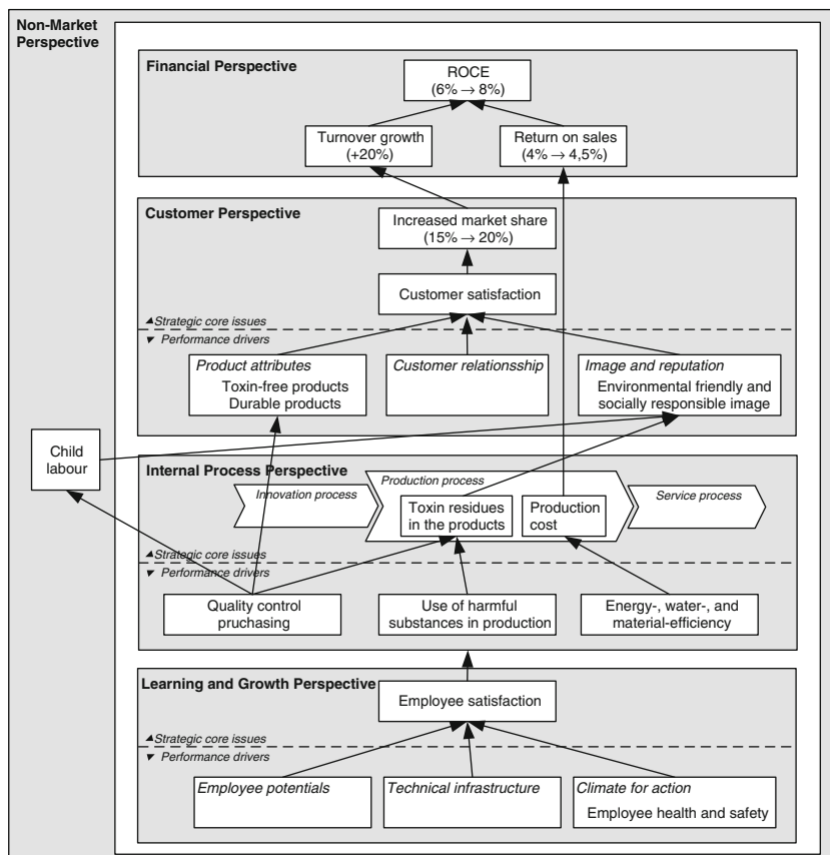
## Category 2: Business Process Management (BPM)-based MMs

Developed by Watts Humphrey at IBM in the late 1980s, BPM maturity models have the longest history and have been in use for several decades (Szelągowski & Berniak-Woźny, 2021). These models have played a significant role in assessing and guiding the development of BPM capabilities in organisations. In recent years, sustainability has been integrated into existing BPM frameworks. For example, Corporate Sustainability Strategies (Baumgartner & Ebner, 2009), Total Quality Management (Meza-Ruiz et al., 2017), Balance Score Card (Weber, 2008; Hansen & Schaltegger, 2014), Business MMs for SMEs (Virkkala et al., 2020). Figure 5 shows a sample sustainability balance score card.

- **Strengths:** BPM maturity models have been widely applied to assess and improve organizational processes. These models help organisations evaluate their current BPM capabilities, benchmark against industry standards, and guide the development of process management capabilities (Niehaves et al., 2014).
- **Challenges:** BPM maturity models are accused of not meeting the design principles for prescriptive use; thus, they are limited in their ability to provide guidance for identifying desirable maturity levels and implementing improvement measures (Röglinger et al., 2012). To improve this, BPM maturity models need to adapt to knowledge-intensive and dynamic processes (Szelągowski & Berniak-Woźny, 2019).

**Figure 5**

*Example Sustainability Balance Score Card*



Source: Reprinted from “The Sustainability Balanced Scorecard: A Systematic Review of Architectures”, by Hansen & Schaltegger, 2014, Journal of Business Ethics, p. 193.

### Category 3: Knowledge Management (KM)-based MMs

Knowledge management theories refer to the process of identifying and leveraging collective knowledge in an organisation to help the organisation compete (Alavi & Leidner, 2001). Knowledge management MMs evaluate the extent to which KM is explicitly defined, managed, controlled, and affected in the different development stages of an organisation (Pee & Kankanhalli, 2009). Existing KMMMs identify people, processes, and technology dimensions as three key process areas (KPAs) and have wide application fields, such as environmental knowledge, sustainability strategies, and operational capabilities (Pee & Kankanhalli 2009; Khatibian et al. 2010; Szelagowski & Berniak-Woźny 2019). Table 2 presents an example of such a model.

- **Strengths:** KMMMs provide a structured approach to identifying organizational strengths and weaknesses in knowledge management practices and guide organisations to compare their performance against industry benchmarks (Jugdev & Thomas, 2002; Khoshgoftar & Osman, 2009). Certain KMMMs have been validated as useful diagnostic tools that can assess and guide direct KM implementation in organisations (Pee & Kankanhalli, 2009).
- **Challenges:** Existing KMMMs have been criticised as ad-hoc in their development owing to unspecified assessment tools (Kulkarni and St. Louis, 2003). In addition, the lack of standardisation among various maturity models (for example OPM3, CMMI, P3M3) can make it challenging for organisations to choose the most suitable model for their needs (Khoshgoftar & Osman, 2009). Table 2 shows a KMMM with applicable maturity levels and respective criteria for companies’ key process areas.

**Table 2**

*Proposal of a General Knowledge Management Maturity Model*

| Table 8. Proposed G-KMMM |            |                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                   |
|--------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Maturity Level           |            | General Description                                                                                                                                                                                        | Key Process Areas                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                   |
|                          |            |                                                                                                                                                                                                            | People                                                                                                                                                                                                                                                                                                         | Process                                                                                                                                                                                                                                                               | Technology                                                                                                                                                                                                                        |
| 1                        | Initial    | Little or no intention to formally manage organizational knowledge                                                                                                                                         | Organization and its people are not aware of the need to formally manage its knowledge resources                                                                                                                                                                                                               | No formal processes to capture, share and reuse organizational knowledge                                                                                                                                                                                              | No specific KM technology or infrastructure in place                                                                                                                                                                              |
| 2                        | Aware      | Organization is aware of and has the intention to manage its organizational knowledge, but it might not know how to do so                                                                                  | Management is aware of the need for formal KM                                                                                                                                                                                                                                                                  | Knowledge indispensable for performing routine task is documented                                                                                                                                                                                                     | Pilot KM projects are initiated (not necessarily by management)                                                                                                                                                                   |
| 3                        | Defined    | Organization has put in place a basic infrastructure to support KM                                                                                                                                         | <ul style="list-style-type: none"> <li>- Management is aware of its role in encouraging KM</li> <li>- Basic training on KM are provided (e.g., awareness courses)</li> <li>- Basic KM strategy is put in place</li> <li>- Individual KM roles are defined</li> <li>- Incentive systems are in place</li> </ul> | <ul style="list-style-type: none"> <li>- Processes for content and information management is formalized</li> <li>- Metrics are used to measure the increase in productivity due to KM</li> </ul>                                                                      | <ul style="list-style-type: none"> <li>- Basic KM Infrastructure in place (e.g., single point of access)</li> <li>- Some enterprise-level KM projects are put in place</li> </ul>                                                 |
| 4                        | Managed    | KM initiatives are well established in the organization                                                                                                                                                    | <ul style="list-style-type: none"> <li>- Common strategy and standardized approaches towards KM</li> <li>- KM is incorporated into the overall organizational strategy</li> <li>- More advanced KM training</li> <li>- Organizational standards</li> </ul>                                                     | Quantitative measurement of KM processes (i.e., use of metrics)                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>- Enterprise-wide KM systems are fully in place</li> <li>- Usage of KM systems is at a reasonable level</li> <li>- Seamless integration of technology with content architecture</li> </ul> |
| 5                        | Optimizing | <ul style="list-style-type: none"> <li>- KM is deeply integrated into the organization and is continually improved upon</li> <li>- It is an automatic component in any organizational processes</li> </ul> | Culture of sharing is institutionalized                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>- KM processes are constantly reviewed and improved upon</li> <li>- Existing KM processes can be easily adapted to meet new business requirements</li> <li>- KM procedures are an integral part of the organization</li> </ul> | Existing KM infrastructure is continually improved upon                                                                                                                                                                           |

Source: Reprinted from “A Model of Organisational Knowledge Management Maturity Based on People, Process, and Technology”, by Pee & Kankanhalli, 2009, Journal of Information & Knowledge Management, p. 17.

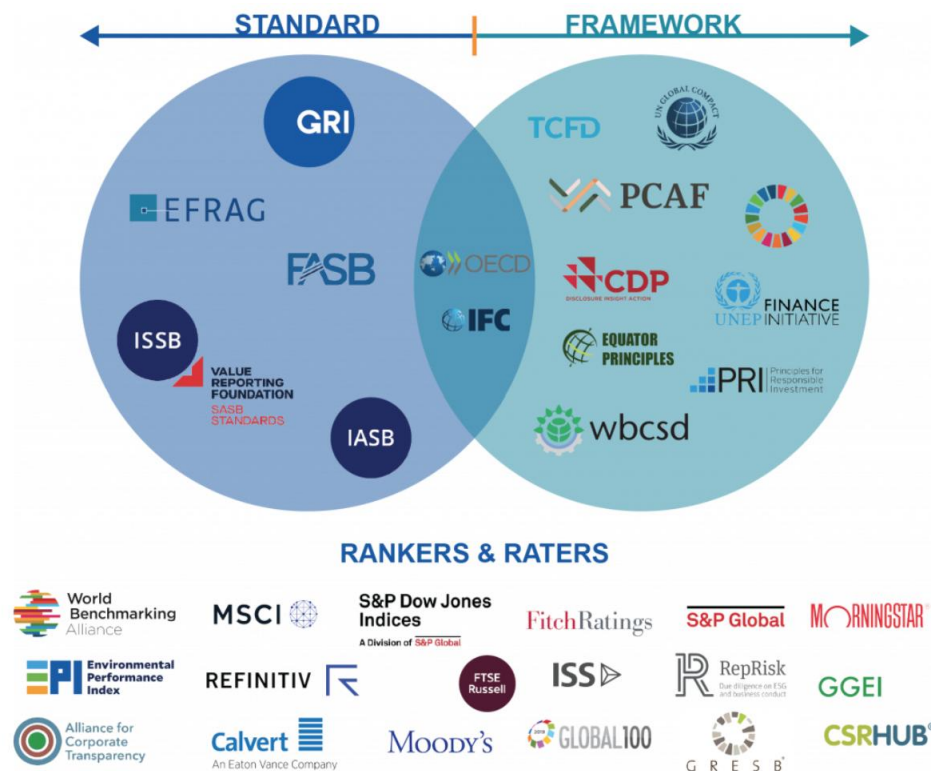
#### Category 4: ESG ranking or ratings

ESG ratings first emerged in the 1980s in the United States as a way for capital market investors to screen companies for environmental, social, and corporate governance performance. The market for ESG ratings has grown rapidly with sustainable investments. (Berg et. al., 2019). ESG ratings have become increasingly important in indicating and assessing corporate performance and sustainability both globally and in China (Tan & Zhu, 2022; Wang et al., 2023). It is also noticeable that many ESG rating agencies use BPM maturity models as their rating schemes (Escrig-Olmedo et al., 2019), for example, Sustainable Supply Chain Management to track supplier ESG performance from EcoVadis (year) and Circular Economy Waste-to-Resource Workflows by IBM Envizi (year). However, ESG ratings are often criticised for their scope and rating criteria intransparency, raters’ subjectivity, divergence, and inconsistency among rating providers (Dimson et al. 2020; GRI, 2022). Muñoz-Torres et al. (2018) suggests that these agencies primarily focus on short-term results than integrating environment, social and governance (ESG) criteria

holistically. Figure 6 shows the complex landscape of sustainability-relevant standards, frameworks, rankers, and raters.

**Figure 6**

*Landscape of Sustainability Relevant Standards, Framework, Rankers and Raters*



Source: Reprinted from “ESG standards, frameworks and everything in between”, by Global Reporting Initiative, (2022), p. 1.

## Category 5: Sustainable Business Models

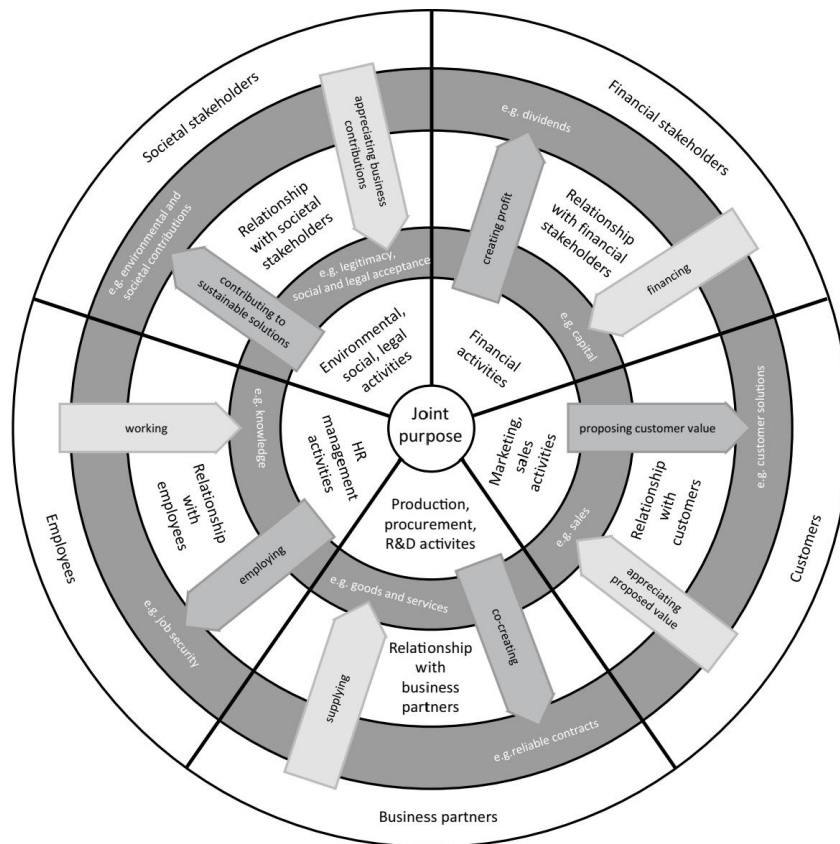
Based on the most widely used Osterwalder's Business Model Canvas which focuses on customer value proposition, several studies have proposed modifications to better capture sustainability aspects (Stork et al. 2023). The term value proposition refers to the bundle of products and services offered to satisfy customers' needs and thus create value for them (Al-Debei & Avison, 2010; Chesbrough 2007). In addition to capturing economic value for the business without endangering environmental and social aspects, sustainable business model frameworks use stakeholder theory and focus on offering value propositions to customers and all other stakeholders (Schaltegger et al., 2016). This is a key differentiator for companies which focus only on shareholder profit maximisation. A business model is sustainable when it combines stakeholders, sustainable development, and social and ecological values (Breuer et al. 2018).

As Figure 7 shows, the value created through a business model is a portfolio of different forms of value, instead of a single outcome. According to stakeholder theory, all stakeholder groups and the business itself should be recipients of value (Freudenreich et al. 2019). This

shift requires businesses to consider stakeholders in their value propositions and to engage in collaborative processes to align stakeholder interests and create sustainable value (Konietzko et al. 2023). Interestingly, while the importance of multi-stakeholder alignment is recognised, there is often a disconnect between intended sustainable value propositions and customer-perceived value (Laukkanen & Tura, 2022). For many businesses, this is a significant shift from the traditional focus on shareholders or customers. Furthermore, this highlights the need to manage sustainable value propositions and stakeholders' perceived value simultaneously which might be complex for businesses.

**Figure 7**

*Stakeholder value creation framework for business model analysis*



Source: Reprinted from “A Stakeholder Theory Perspective on Business Models: Value Creation for Sustainability”, by Freudenreich et al., 2022, Journal of Business Ethics, 166(1), p. 9.

## 2.6 Summary of the literature review

The literature review identified several key challenges for German MNEs operating in China, indicating the need to develop a customised sustainability maturity model:

- **Regulatory complexity:** German MNEs face dual compliance challenges and need to adhere to both EU and Chinese sustainability regulations. The evolving and interconnected nature of these frameworks creates complexity in navigating the disclosure requirements.

- Cultural differences: The contrast between Western and Chinese dialectical thinking affects the interpretation and implementation of sustainability regulations, necessitating a model that accounts for these cultural nuances.
- Specific challenges: German MNEs in China face unique operational challenges, including weakening demand, rising costs, and difficulties accessing green energy and obtaining supplier data for sustainability reporting.

Despite the abundance and diversity of CSMMs and their strong theoretical and practical strengths, no ready-to-use models can be applied to the specific sustainability challenges and needs of German MNEs in China. However, the current CSMM theories and frameworks provide a solid basis for content-specific CSMM for German MNEs in China. There is no need to create a new model from scratch because researchers should carefully search for existing models before developing new ones (Wendler, 2012). Moreover, in addition to the necessity for MMs to be validated in business operations and tailored to fit specific contexts and strategic needs, researchers have suggested that user-friendly self-assessment tools can enhance their recognition and application in the business sector (Vance et al., 2023; Pino et al., 2024). Those criteria are the basis for approaching the right CSMM for the current study.

### 3 Discussion

The foundation for developing a content-specific CSMM for German MNEs operating in China stems from their unique challenges. These challenges have been categorised and summarised based on preceding discussions.

#### 3.1 German MNEs' specific challenges in sustainable development in China:

- R - Regulatory Challenges
  - R1 - The fast-evolving interconnected and complex sustainability-relevant legislative requirements of the EU and Germany.
  - R2 - China's sustainability regulations with varying degrees of compliance and disclosure quality standards are difficult for German MNEs to comprehend.
- C - Cultural challenges
  - C1 - China's economic system is characterised by strong government involvement and reliance on informal institutions, while the EU emphasises formal institutions and the rule of law.
  - C2 - Chinese individuals tend to favour dialectical solutions to societal conflicts and prefer dialectical reasoning over traditional Western logical arguments.
- E - Economic challenges (German MNEs' profits under pressure)
  - E1 - Macro-Economic Challenges: slow market recovery in the post-Covid time in China and weakening global demand, increasing international sanctions, export control regime top the global challenges.
  - E2 - Business and operative challenges: rising costs, fierce location competition, and price pressure.

- S - Sustainability Integration, Implementation, and Reporting Challenges

S1 - Awareness and understanding of new regulations for both German MNEs and their suppliers.

S2 - Integrate sustainability into companies' core strategies.

S3 - Link companies' sustainability strategies with key business operations.

S4 - Availability of transparent and reliable data from suppliers.

Drawing upon established CSMM frameworks and theories, this study aims to develop a CSMM model that addresses the challenges faced by German MNEs operating in China. Drawing on existing frameworks and discussions pertaining to sustainability-relevant maturity models, the primary criteria for validation and applicability were employed (Table 3). The content-specific criteria are tailored to address sustainability/ESG considerations. An evaluation scale with three levels - "low," "moderate," and "high" - is applied to identify the appropriate CSMM for addressing the sustainability challenges faced by German multinational enterprises in China.

**Table 3**

*Summary of the Important Corporate Sustainability Maturity Model Criteria*

| Criteria      | Content-specific Criteria                                                     | TBL-based MMs | BMP-based MMs | KM-based MMs | ESG-Rating Scheme | Sustainable Business Model |
|---------------|-------------------------------------------------------------------------------|---------------|---------------|--------------|-------------------|----------------------------|
| Validation    | Sufficient validation in business operations                                  | Low           | High          | High         | Moderate          | High                       |
| Applicability | Applicability or adaptability to a specific context                           | Low           | High          | High         | Moderate          | Moderate                   |
| Applicability | MMs consider the key issues of sustainability/ESG                             | High          | Moderate      | High         | High              | Moderate                   |
| Applicability | MMs ensure a systematic integration of sustainability/ESG in the corporations | Low           | High          | Low          | Low               | Low                        |
| Applicability | Are MMs user-friendly and can improvement awareness                           | High          | Moderate      | High         | Low               | High                       |

Table 3 reveals that both BMP-based MMs and KM-based MMs achieve the highest scores in terms of validation and applicability, complementing each other in specific areas such as the systematic integration of sustainability. Consequently, the proposed model incorporates two primary components from these MMs: firstly, a sustainable strategy element

derived from business management process MMs, which integrates stakeholder theories for value creation; and secondly, knowledge management MMs that encompass the three key process areas of people, processes, and technology. In the following paragraphs, we will examine how the proposed corporate sustainability MM can assist German companies in China with their sustainability challenges.

### 3.2 Part I – Strategy Maturity: Apply sustainable strategy business process MMs integrating stakeholder theories for value creation for challenges R1, R2, C1, C2, and S2.

Many MNEs pursue sustainability issues without a clear strategy (Baumgartner and Ebner 2009). This increases the risks of “greenwashing” as companies struggle to balance the need for environmental compliance with their actual efforts to achieve it (de Freitas Netto et al., 2020). Consequently, it is crucial to incorporate sustainability into the core business strategy and operations of companies. This integration extends beyond superficial environmental initiatives and encompasses a holistic approach that considers economic, social, and environmental factors in all aspects of business operations. A mature sustainable strategy aligns sustainability goals with the company's overall objectives (Baumgartner & Ebner, 2010), ensuring that sustainability is not treated as a separate entity, but as an integral part of the organisation's decision-making processes, product development, supply chain management, and stakeholder engagement (Bratt et al. 2021).

Organisations with a high level of maturity in their sustainable strategy demonstrate a long-term commitment to sustainability, which is often reflected in their mission statements, corporate values, and key performance indicators. They proactively address sustainability challenges, innovate to create sustainable solutions, and view sustainability as a source of competitive advantage rather than as a compliance requirement (Schönwälder & Weber, 2022). These companies typically have robust governance structures to oversee sustainability initiatives, engage in transparent reporting of their sustainability performance, and actively collaborate with stakeholders to drive positive environmental and social impacts throughout their value chain.

The next question is how to integrate sustainability into a business strategy. As discussed in the previous section, a fundamental change in this integration would be the focus on offering value propositions to customers and all other stakeholders (Schaltegger et al., 2016) instead of just focusing on shareholder profit maximisation. Companies must engage in comprehensive stakeholder analysis to identify key groups such as customers, employees, suppliers, local communities, and governmental bodies. By mapping out these stakeholders and their respective interests, organisations can develop targeted strategies to address their needs while aligning with sustainability goals.

Cultural context plays a crucial role in this integration process, particularly when operating in diverse markets such as China. Building and maintaining connections with informal networks, including local government entities and representative associations, can help mitigate risks and ensure the longevity of the operations of foreign multinational enterprises (Zhang, 2020). For other stakeholder groups such as employees, suppliers, and customers, employing dialectical solutions can be effective in uncovering expectations and resolving potential conflicts. This approach involves open dialogue, active listening, and finding a common ground to create mutually beneficial outcomes. By adopting these strategies, companies can effectively integrate sustainability into their business models, while fostering positive relationships with all stakeholders, ultimately leading to long-term success and resilience in a rapidly changing business landscape.

The maturity of a sustainable strategy can be assessed by evaluating the extent to which sustainability themes are embedded in the core business strategy (Table 4). Leveraging on stakeholder theory, the maturity levels for sustainability strategy are defined by the degree to which stakeholders' value propositions are considered, implemented, optimized, and verified for fulfillment as perceived by the stakeholders. This maturity level can be evaluated using various frameworks and indicators, which likely offer specific criteria or benchmarks for assessing the depth of sustainability integration within an organization's strategy.

**Table 4**

*Proposed Content-Specific CSMM – Sustainable Strategy Maturity Levels*

|                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sustainable Strategy:<br/>generates long-term value and benefits for all stakeholders,<br/>considering environmental (E), social (S), and governance (G).</b> |
| 1. Initial: Unclear vision and/or mission, strategy only considers profit.                                                                                       |
| 2. Defined: Sustainable strategy considering stakeholders' value propositions developed.                                                                         |
| 3. Managed: Sustainable strategy considering stakeholders' value propositions deployed to the key business and process areas.                                    |
| 4. Optimizing: Sustainable strategy considering stakeholders' value propositions optimised in the key business and process areas.                                |
| 5. Creating Value: Sustainable strategy fulfills stakeholders' value propositions.                                                                               |

3.3 Part II - Knowledge Management Maturity: Apply knowledge management MMs to key business areas for challenges E1, E2, S1, S3, and S4.

The previous section discussed the development of sustainable strategic initiatives based on the value proposition needs of all stakeholders. This section focuses on the implementation of sustainable strategic initiatives within organisations across key business areas, such as R&D and purchasing. Drawing on the General Knowledge Management Maturity Model (G-KMMM) of Pee and Kankanballi (2009) as shown in Table 2, the proposed model incorporates the stakeholder value-creation concepts. The maturity levels were largely kept except for the lowest and highest maturity levels (Table 5). The proposed maturity model combines Level 1 & 2 from the G-KMMM as the initial Level 1 and added Level 5 as value creation for the stakeholders. These modifications can also be extended to G-KMMM's three key process areas of people, process and technology. The target is to provide a framework for organisations to assess and improve their knowledge management practices of corporate sustainability in their strategic key areas, ultimately achieving value creation for their respective stakeholders.

As outlined in paragraph 3.1, E1 and E2 represent common challenges faced by all foreign direct investments in China, according to the summary of German MNEs' specific challenges. The key areas of the knowledge management maturity model—technology (for E1 and E2) and processes (for S3)—can aid German MNEs in sustaining or regaining their competitive advantage, for example, through sustainable circular product innovation or

optimized manufacturing processes. In this context, German MNEs benefit from a well-preserved legacy advantage. In contrast, their Chinese counterparts, especially those in heavily polluting industries, are more likely to focus on corporate environmental strategies and green innovation (Wang et al., 2023).

Addressing the significant challenges of S1 and S4, sustainability and its related regulations and standards introduce new knowledge that requires learning and management. This is relevant for both German multinational enterprises (MNEs) operating in China and their suppliers, primarily Chinese companies. In this scenario, the knowledge management MM can evaluate maturity levels in specific areas and offer guidance for progressing to higher maturity levels. Potential leverage might be derived from sustainability consulting and free online training resources, such as those available on the official Global Reporting Standards website.

Finally, implementing a KMMM evaluation and proposal typically involves a change management process within the organization. This process requires altering attitudes and mindsets among management and employees, as noted by Bougoulia and Glykas (2022). Effective people management in three key process areas is crucial for the success of the change management initiatives. The key process area (KPA) of “People” is the foremost and most vital KPA in the KMMM. Organizations must focus on employee engagement, communication, and leadership support throughout the implementation and improvement phases.

**Table 5**

*Proposed Content-Specific CSMM – Sustainable Knowledge Management Maturity*

| G-KMMM Maturity Level<br>General Description (Pee & Kankanhalli, 2009)                                                                                                                                                | Maturity Levels Modified for Current Model                                                                                                                                                     | Modification Reasoning                                                                                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 1. Initial: Little or no intention to formally manage organizational knowledge<br>2. Aware: Organization is aware of and has the intention to manage its organizational knowledge, but it might not know how to do so | 1. Initial: Organization is aware of this knowledge/topic. Projects/tasks in initiating phase.                                                                                                 | Current maturity will exclude the “no intention” as a maturity level.                                                           |
| 3. Defined: Organization has put in place a basic infrastructure to support KM<br>4. Managed: KM initiatives are well established in the organization                                                                 | 2. Defined: Organization has put in a basic infrastructure to achieve the knowledge.<br>3. Managed: Organization has installed a functioning infrastructure to manage and apply the knowledge. | Same maturity levels for 3,4 & 5. Description for each level adapted to the knowledge management Chart (Bougoulia&Glykas, 2022) |
| 5. Optimizing: KM is deeply integrated into the organization and is continually improved upon - It is an automatic component in any organizational processes                                                          | 4. Optimizing: Organization is reviewing and optimizing the infrastructure to innovate and create new knowledge.                                                                               |                                                                                                                                 |
| Sustainable Business Model: Stakeholder Value Creation (Freudenreich et al., 2019)                                                                                                                                    | 5. Creating Value: Organisation is using the knowledge to create value for its stakeholders.                                                                                                   | Apply value creation for stakeholders from stakeholder theories.                                                                |

Note: Modified based on “A Model of Organisational Knowledge Management Maturity Based on People, Process, and Technology”, by Pee & Kankanhalli, 2009, Journal of Information & Knowledge Management, p. 17.

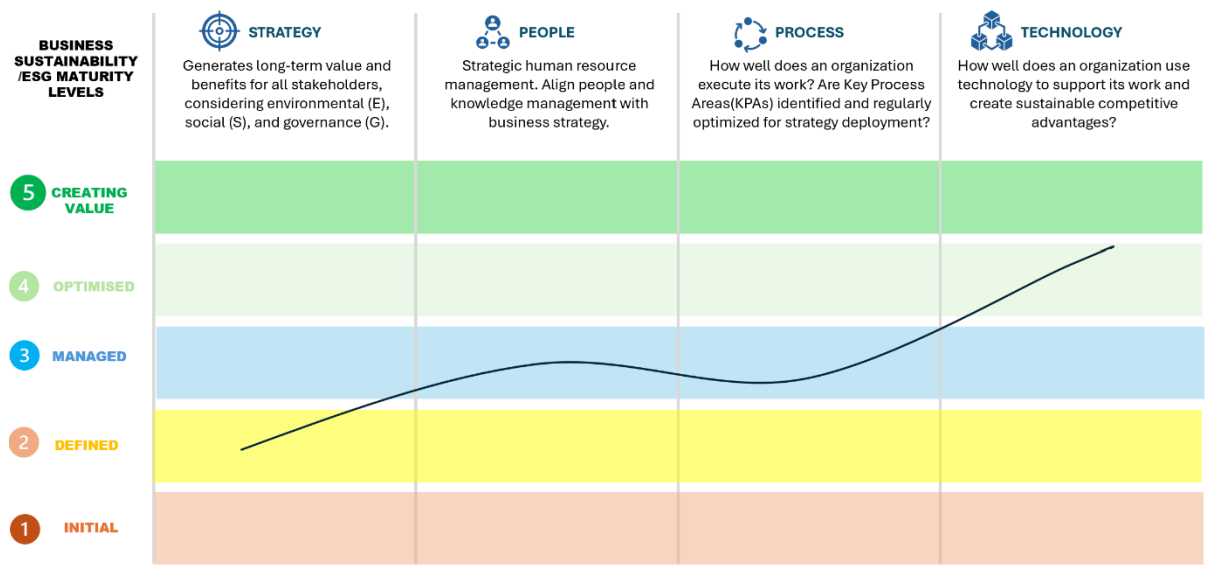
### 3.3 Proposed Corporate Sustainability Maturity Model combining Part I - Strategy Maturity and Part II - Knowledge Management Maturity.

Table 6 presents the sample result of the proposed CSMM, combining the modified strategy and knowledge management maturity models. This demonstrates a user-friendly approach for sustainability maturity evaluation. It is recommended that this model be applied at either the company-wide level or within specific business areas, providing flexibility in its implementation. The decision to avoid cross-level applications stems from the potential for overly complex results, which could hinder effective interpretation and action. The model's structure incorporates five distinct maturity levels for both strategy and Knowledge Management Maturity Model (KMMM), grounded in and adapted with the established theoretical frameworks. This approach provides a comprehensive assessment of an organisation's sustainability practices.

The strength of the model lies in its adaptability to the maturity level definitions of the three key process areas. They can be tailored to align with a company's unique circumstances and operational contexts. This customisation feature enhances the practicality and ease of use of the model, allowing organisations to focus on the most relevant aspects of sustainability for their particular situation while maintaining a structured evaluation framework.

**Table 6**  
*Example of the Customised Sustainability Maturity Model*

## Sustainability Maturity Evaluation Model



### 4 Conclusion

This conceptual paper offers a thorough analysis of the challenges German multinational enterprises (MNEs) encounter when implementing sustainable management practices in China, and it introduces a customized corporate sustainability maturity model (CSMM). It integrates existing literature on sustainability frameworks, stakeholder value proposition theories, and maturity models, while taking into account China's unique economic, cultural, and regulatory landscape to develop a context-specific model addressing the sustainability challenges faced by German MNEs.

Overall, this study demonstrates how an approach grounded in existing maturity model frameworks and theories, which targets the specific challenges and needs of MNEs in an international context, can contribute to theory development. Cross-national comparisons are valuable because broader cultural, political, and institutional contexts can shape different outcomes. This holistic approach is crucial for achieving global development goals or addressing challenges (Sud & Thelwall 2015; Chin et al., 2021). In addition, to incorporate those development goals and challenges into companies' sustainability strategies will have significant impact on leadership-driven entrepreneurial initiatives. Besides the mindset shift from traditional profit-driven models to more socially responsible and environmentally conscious approaches, the global leadership team needs to make sure that their sustainability initiatives ultimately create value for the respective stakeholders. This fosters a culture of sustainable innovation, with which companies can contribute to global development and at the same time, create new opportunities for growth and competitive advantage in an increasingly complex and conscious marketplace.

## 5 Limitations and Indication for Future Studies

Although we utilised secondary data from the longnitude survey from the German Chamber of Commerce, the paper is mainly conceptual. The proposed maturity model is of theoretical nature. The study could benefit from empirical validation and testing in real-world settings. For example, more specific examples or case studies illustrating how the challenges impact German MNEs in China, or how to apply the proposed maturity model could provide concrete evidence and make this study more relatable.

For future studies, researchers could conduct in-depth interviews or surveys with German MNE executives operating in China to gather firsthand insights on their experiences with the identified challenges. Additionally, case studies could be done to apply this proposed CSMM with selected German MNEs. Longitudinal studies tracking the implementation and outcomes of the CSMM could provide valuable data on its effectiveness and potential areas for refinement. Future research could also explore how the proposed maturity model might be adapted for MNEs from other countries operating in China or for German MNEs in different emerging markets, considering their unique economic, cultural, political and institutional contexts.

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