International business, climate change and the energy transition: A commentary on the importance of business models and digitalization

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International business, climate change and the energy transition: A commentary on the importance of business models and digitalization

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Summary

This chapter provides a commentary on the article "A perspective on multinational enterprises and climate change. Learning from an 'inconvenient truth'?", published in *Journal of International Business Studies* (Kolk & Pinkse, 2008), with the purpose of updating the article's contribution, in view of the state of the art in both the international business literature and the policy/managerial reality 'on the ground'. However, it can also be read as a separate piece, as the authors took care to introduce the ideas behind the 2008 article as well as the updated and current thinking in such a way to also make it accessible to those unfamiliar with the original work. To this end, we first briefly frame the issue in a contemporary context, looking backward to the origins of the work on Multinational Enterprises (MNEs) and climate change. Subsequent sections deal with the recent developments from green firm-specific advantages (FSAs) to business-model related specific advantages (BMSAs); the evolution of salience considering sectors, business model (component) and the influence of digitalization; and finally, the locational dimensions, including MNEs' embeddedness in various institutional contexts, and the potential for transferability and recombination of BMSAs. Altogether, a clear and forward-looking agenda for research on international business, climate change and the energy transition, emerges.

Introduction

The Covid-19 pandemic has exposed a vulnerability of humankind reminding observers of another crisis they see looming: climate change. As Kupferschmidt (2020, p. 1397) put it in a reflective piece on SARS-CoV-2, looking back on "A divisive year":

> But a new crisis is coming that scientists have warned and worried about for years—one that is slower, yet even more menacing, and far easier to ignore or deny. "You know the biggest deal of this year?" Hanage [epidemiologist at the Harvard T.H. Chan School of Public Health] asks. "When it comes to climate change we are totally screwed."
>
> There will be no easy scientific fix for global warming. And if this pandemic has shown anything, it is that evidence without action is like a vaccine in a freezer: It is all potential. Scientists knew deaths would follow cases as sure as thunder follows lightning. And yet politicians and ordinary citizens alike found it hard to act until morgues were overflowing. Some refused to acknowledge reality even then. How much harder will it be to act on climate change?

Climate change is, indeed, not new at all, and its causes and (potential) consequences have been studied and discussed for many decades already, with contestation around the problem (the 'science') and the solutions. According to a historical account of a decisive decade (1979-1989), "nearly everything we understand about global warming was understood in 1979" (Rich, 2018). There is wide consensus that, in addition to the effects on biological and physical systems, including changing ecosystems, extinction of species, and more extreme weather, countries around the world face negative implications for health, economic growth and development. Some of these impacts can already be seen and their rapid and possible irreversible aggravation is feared if serious steps to reduce emissions will not be taken soon. Climate change measures have an impact on MNEs active in a wide variety of sectors and countries as they are affected by policies at the local, national and supranational levels. However, absent regulation can also be of influence, as MNEs may suffer from the consequences of climate change. Overall, climate change leads to increased risks of doing business and growing/lasting uncertainty, also for investors, shareholders and (central) banks. At the same time, MNEs can be important actors in furthering a transition to a cleaner and greener economy, with some benefitting more from a move to less/no reliance on fossil fuels, compared to others. To what extent they are vulnerable to climate change and/or can contribute to the energy transition depends heavily on factors such as the specific activities undertaken, locational peculiarities, and the energy base of MNE business models.

While climate change had long been studied in the environmental, policy and natural sciences, it took many years before International Business (IB) scholars joined the debate and started to add important insights on the role of MNEs, considering how MNEs may cause/aggravate the problem and/or help bring solutions closer; and how the issue can affect their strategies, performance and growth. Having followed the evolution of the science and (inter)national politics of climate change since the early 1990s, the first author (Ans Kolk) wrote an initial piece in 1998 (an award-winning essay, in Dutch, submitted to a contest organised in the Netherlands to identify underexposed aspects in international climate research) to explicate the importance of considering the influence of MNE strategies and interests in international policy-making (for the key tenets in English, see Kolk, 2000). While she continued to publish on MNEs' strategic responses to climate change (also with David Levy, and later with her PhD student Jonatan Pinkse, e.g., Kolk & Levy, 2001, 2004; Kolk & Pinkse, 2004, 2005; Levy & Kolk, 2002), the first article in an IB journal only appeared in 2008 (Kolk & Pinkse, 2008), after a plenary pitch by Kolk at the 2005 JIBS/AIB/CIBER Invitational Conference on Emerging Research Frontiers in IB. At that time, the topic of climate change as such was not uncontested given the political ramifications, which might explain, to some extent, why it did not take off easily. Concurrently, her work was directly aimed at advancing IB theory (see further below), also based on an earlier inventory of the complex mix of factors influencing MNEs' responses (see Table 1). There are inherent trade-offs and distributional issues involved, but MNEs face the day-to-day reality of consecutive international climate agreements and a pending energy transition, and we will below reflect on the 2008 article in light of the state of the art, to update it to our current business environment.

However, this commentary can also be read as a separate piece that introduces new and original ideas building on, and updating, the 2008 article. Subsequent sections deal with, respectively, the recent development from green firm-specific advantages (FSAs) to business-model related specific advantages (BMSAs); the evolution of salience considering sectors, business model (component) and the influence of digitalization; and finally, the locational dimensions, including MNEs' embeddedness in various institutional contexts, and the potential for transferability and recombination of BMSAs. Altogether, a clear and forward-looking agenda for research on international business, climate change and the energy transition, emerges.

Table 1. Factors that influence corporate positions on climate change

Factors	***Components***
Issue-specific factors	Impact of the issue on sectors, countries, locations Institutional infrastructure for addressing the issue Degree to which issue and regulation are global Complexity and uncertainty associated with the issue
Sector-specific factors	Nature and extent of threat posed by climate change Availability and cost of alternatives Degree of globalization and type of supply chain Political power of the industry Technological and competitive situation Growth and concentration levels
Firm-specific factors	Position within the supply chain; nature of value chain Economic situation and market positioning History of involvement with (technological) alternatives Degrees of (de)centralization and internationalization Availability and type of internal climate expertise Nature of strategic planning process Corporate culture and managerial perceptions Ability to anticipate risks, spread vulnerabilities and manage stakeholders
Country-specific factors	Societal concerns about climate change National policies on climate change National industrial promotion policies Geography / natural capital (e.g., in relation to possibilities for renewables) Societal views on the roles and responsibilities of firms Regulatory culture (litigation or consensus-oriented)

Source: Kolk & Pinkse (2012), p. 474; based on published work from Kolk (et al.) since 1998

From green FSAs to climate induced BMSAs

The 2008 article introduces two frameworks to explore the nature and geography of climate-induced firm-specific advantages (or more broadly, green FSAs), using illustrative information from the 2003-2005 period. Stemming from Rugman & Verbeke (2003), Kolk and Pinkse (2008, p. 1362) note that "the FSA concept is strongly aligned with that of a capability". Two main developments since suggest the importance of reflecting on, and updating, the conceptualization of green FSAs. First, recent IB literature on internalization theory points at an increasing divergence between ownership and control (Narula et al., 2019). Notably, technological developments have led IB scholars to place emphasis on the importance of external parties, with the conceptualization of "network advantages" (Banalieva &

Dhanaraj, 2019), “ecosystem-specific advantages” (Li et al., 2019), increasing attention also for the recombination and bundling of an MNE’s FSAs (Narula et al., 2019) with “complementary assets held by local owners” (Hennart, 2009, p. 1436).

Second, triggered by a rising interest in the “business model” construct in strategic management research (e.g., Massa et al., 2017; Prescott & Filatotchev, 2020), corporate sustainability scholars have supported the adoption of a business model perspective to investigate firms’ social and environmental impact. Departing from a focus on specific resources, processes or products, the business model lens captures the integration of sustainability in the whole “design or architecture of the value creation, delivery and capture mechanisms” (Teece, 2010, p. 179) of a firm. It also enables apprehension of the engagement of external parties in the creation of social and environmental value, as highlighted by recent studies on collaborative sustainable business models (Ordonez-Ponce et al., 2020; Pedersen et al., 2020). This is relevant for climate change, as involving and collaborating with multiple external parties, such as customers, suppliers and (non-)governmental organisations, is seen as necessary for effective action (Kolk, 2015; Pinkse & Kolk, 2012a). A body of work exploring sustainable business models, including climate-induced ones, has emerged, for example in the context of electric vehicles (Bohnsack et al., 2014) and energy (Richter, 2013; Tolkamp et al., 2018). This business model view is valuable, because it allows for capturing climate-induced value co-creation and the network of actors involved in attaining the climate and energy-related sustainable development goals (7 and 13).

The article we recently published in Journal of International Business Studies, co-authored with Rene Bohnsack, builds on these trends: by connecting FSAs to the business model construct, it conceptualizes the business model-related specific advantage (BMSA) and investigates it in the context of the energy transition. The BMSA adds to FSAs a “higher-order configurational character”, by capturing the bundle of activities that create and capture value and the array of actors contributing to them (Bohsack et al., 2020). Although the 2008 article did not explicitly adopt a business model lens, it hinted at the need to adopt a more comprehensive perspective that does not just include a change in technology or in marketing, but a transformation that involves different components. In particular, by highlighting that green FSAs may relate to a firm’s entire value chain, the 2008 paper suggests that green FSAs may not only be embedded in a specific technology or capability, but also encompass a "configuration" of activities. Yet, this idea was still *in nuce* and the study did not develop it further into a systemic approach to FSA, which the 2020 article proposed with the BMSA concept.

The business model perspective also effectively integrates the dynamic view of FSA proposed by the 2008 article, which underlined that "MNEs have to constantly adjust their FSAs for deploying these resources, or even create new FSAs to maintain fit with changes in the global sustainability issue" (p. 1360). Figure 1 (in Kolk and Pinkse, 2008, p. 1364) encompasses three main FSA reconfiguration mechanisms, i.e., evolution, transformation or substitution. FSA reconfiguration resonates with the "business model innovation for sustainability" concept, which indicates "innovations that create significant positive and/or significantly reduced negative impacts for the environment and/or society, through changes in the way the organization and its value-network create, deliver value and capture value (i.e., create economic value) [and/] or change their value propositions" (Bocken et al., 2014, p. 44). While business model innovation for sustainability has been overlooked in the IB literature, it is key to appraise a climate induced BMSA reconfiguration.

Linking Kolk and Pinkse (2008) JIBS article with the sustainable business model literature and, in particular, with the BMSA concept, leads to a reinterpretation of Figure 1. A *new* Figure 1 (which includes the 2008 Figure 1 at the top and our adjusted one below it) has as horizontal axis the "business model components", which, in aggregate, form a firm's BMSA. This dimension builds on the "FSA value chain orientation" of Figure 1 from 2008, but it adds a configurational element to show that a firm's competitive advantage is not located downstream *or* upstream, but it is embedded in the whole business model architecture. The vertical axis, i.e., "climate-induced BMSA innovation mechanisms" builds on the view, present in the 2008 Figure 1, that the intensity of the FSA transformation that MNEs are prompted to undertake may vary. This dimension thus incorporates the perspective of the (sustainable) business model literature (Foss & Saebi, 2017; Lüdeke-Freund et al., 2016; Wirtz et al., 2016), which sees change as intervening within a system of value creation and capture.

Different categorizations of business model innovations have been developed, e.g., Foss and Saebi (2017, p. 217) denote its scope as "modular" (when changes intervene in one or more business model components) or “architectural” (when the change “affects the business model in its entirety”). We find the incremental versus radical innovation categorization (Egfjord & Sund, 2020; Lüdeke-Freund et al., 2016; Wirtz et al., 2016) most suitable as it captures different configurations of business model innovation, which may involve a limited adaptation of one component and the disruptive change of (an)other one(s). This is in line with the last section of the 2008 article which indicated that few industries will experience a radical, competence-destroying configuration due to climate change.

Figure 1. A reinterpretation of the FSA development through a business model lens

		FSA Value Chain Orientation	
		Downstream FSA	**Upstream FSA**
FSA Reconfiguration Mechanism	**FSA Evolution**	1	2
	FSA Transformation	3	4
	FSA Substitution	5	6

		Business model components (∑ → BMSA)		
		Value proposition	**Value Network**	**Revenue-cost model**
Climate-induced BMSA innovation mechanism	**Incremental BMI**	1	2	3
	Radical BMI	4	5	6

Source: The upper Figure is taken from Kolk & Pinkse (2008), p. 1364.

Refining salience: The influence of business models and digitalization

Towards the end of Kolk and Pinkse (2008, p. 1374), the observation was made that type of industry matters. As elaborated later (Kolk, 2015; Kolk & Mulder, 2011; Kolk & Pinkse, 2012), this involves a distinction between (1) firms operating in "high-salience industries", i.e. whose core activities are directly affected by climate change (policy) and an energy transition; (2) "firms specialized in goods or services that are instrumental in the mitigation of climate change impacts, or in anticipating, influencing or responding to public policy developments"; and (3) the "remaining firms", which are not affected by climate change, but their (early) actions in the climate change realm may subsequently increase their legitimacy and reputation (see Table 2A).

Table 2A. Relevance of climate change for different categories of firms

Category of firms	**Impact of climate change issue**
Firms in high-salience sectors	● Strongly affected in view of energy intensity and dependence ● Early change in business models might be source of competitive advantage
Firms specialized in climate-relevant goods and services	● Can profit by helping other companies to mitigate their climate change impacts or to anticipate, influence or respond to climate policy
Remaining firms with low-emission activities	● No main source of profitability/growth, but may gain legitimacy from acting visibly ● Can deal with the issue via external markets, possibility for internalization arbitrage

Source: Kolk & Pinkse (2012), p. 475; cf. Kolk (2015); Kolk & Mulder (2011)

Interestingly, this distinction can be refined and made more dynamic and up to date by accounting for the large-scale entry of novel digital technologies (e.g., digital platforms, Artificial Intelligence (AI), blockchain, cloud computing, big data) and their critical influence on the pathway and speed of the energy transition. As highlighted by ITU (2019), digital technologies "offer solutions to monitor, mitigate and adapt to the impacts of climate change"; they can thus be critical for firms to become "agents of global change" (Kolk & Pinkse, 2008). Digital technologies may also lead to substantially higher energy consumption, thus increasing CO_2 emissions. The interplay between climate change and digitalization has implications for the BMSAs of different actors, summarized in Table 2B.

Table 2B. Impact of digitalization on climate-induced BMSAs

Category of firms	**Impact of climate change issue**
Firms in high-salience sectors	● Incumbents' business model innovation to reduce climate impact ● Digital technology MNEs' business model innovation to reduce climate impact ● Design/adoption of novel business models to provide climate-relevant goods and services
Firms specialized in climate-relevant goods and services	● Entry of firms from high-salience sectors ● Entry of digital technology MNEs ● Entry of digital technology ventures
Remaining firms with low-emission activities	● Minor incremental climate-induced business model innovations

Incumbent MNEs in traditionally high-salience sectors are confronted with the need to innovate their existing business models to integrate digital technologies that help curb their carbon emissions and increase energy efficiencies. In the electricity sector, for example, the "Internet of Things" (IoT) enables the monitoring of emissions produced in electricity production and the detection of inefficiencies along the value chain, while machine learning and AI can help optimize energy systems. The most radical BMSA innovation undertaken by incumbents, however, entails becoming active agents in the energy transition by leveraging digital technologies to shift, at least partially, from operating in high-salience sectors to providing climate-relevant goods and services. This is the example of electric utilities that have leveraged digital technologies to design novel business models focused on offering energy efficiency services and devices to their customers. Such BMSA innovation triggered by digitalization (Bohnsack et al., 2020), has had a relevant impact on the location-boundedness of electric utilities' BMSAs in the framework of the energy transition, making them easily transferable and adaptable across countries.

Notably, with the diffusion of digitalization in various domains - which escalated due to Covid-19 - digital technology MNEs are increasingly seen as a high-salience sector given their high energy use. In particular, thriving digitalization is tied to the international proliferation of data centres, which require considerable amounts of energy for their operations and account for "1% of global electricity use in 2019" (IEA, 2020). Large Tech MNEs have expressed their commitment to maximize energy efficiency and use renewables (Facebook, n.d.; Google, n.d.), and mentions to carbon-free or even green data centres abound. The critical role of "Big Tech" MNEs regarding energy consumption is epitomized by Google, "the world's largest corporate purchaser of renewable energy" (Pinchai, 2020). To reduce their environmental impact, digital technology MNEs have to innovate their BMSA, particularly the value network, and to recombine their BMSAs with local assets. Indeed, Google (2020, p. 3) stated that it "[wi]ll need to work with others. Google will only be able to reach 24/7 carbon-free energy in partnership with governments and industry, our customers, and the communities in which we operate". Climate-induced BMSA innovations are more complex for big Tech MNEs whose BMSAs have, besides a data-based component, also a core physical one, like Amazon and Apple. In the case of Apple (n.d.), for example, climate-induced BMSA innovation entails, among others, the design of energy-efficient devices, "transitioning hundreds of […] manufacturing suppliers to 100% renewable sources of electricity" and the shift to a circular value creation system.

While having to reduce their negative environmental impact, digital technology MNEs have leveraged novel technologies to design climate-relevant value propositions and business models. This is the case of Google and its Nest Learning thermostat, which is based on IoT and AI to help consumers increase energy savings. Nest is just an example of digital solutions that contribute to realise consumers' active engagement in the energy transition, which has been emphasized as a priority by policymakers and practitioners (Accenture & Eurelectric, 2020; European Commission, 2020) (although to what extent this can be done while respecting data privacy remains to be seen). Also notable is Microsoft's recent pledge to become carbon *negative* by 2030 - to achieve this goal, the business model innovations undertaken by the MNE involve, among others, creating "carbon removal technologies" and "co-innovating with customers and partners to develop low-carbon solutions" (Smith, 2020).

Finally, digital ventures with climate-relevant business models have been burgeoning over the last years (Kolk & Ciulli, 2020). New entrants have designed their BMSAs around digital technologies to fight climate change and accelerate the energy transition. An award-winning venture is BL!XT (n.d.), which turned the mechanical circuit breaker into a digital smart device, with the potential to trigger a disruptive transformation in the electricity system and enable a significant reduction of CO_2 emissions. Another awarded venture is Enerbrain (n.d.), which developed an energy retrofit system leveraging IoT, cloud computing, as well as the algorithm designed by Enerbrain, to monitor building parameters (e.g., temperature, humidity and CO_2) in real time and to automatically intervene to improve energy efficiency. These are just some examples to illustrate how a business model perspective and the emergence of digitalization have influenced the sector salience put forward in Kolk and Pinkse (2008).

"Bringing it all together"? On embeddedness, transferability and recombination

A location-related *fil rouge* connects Kolk and Pinkse (2008) with the following works published by Kolk et al. in JIBS, in 2012 and 2020 respectively. The 2008 article introduced the "geography of climate change-induced FSA development", discussing different types of CSAs that may facilitate a climate-induced reconfiguration of FSAs, as well as the CSA pattern, which affects FSAs' transferability. Later in 2012, a new paper further reflected on the climate-related institutional dimension affecting green FSAs, by unpacking it into institutional failures and embeddedness (or lack thereof) in home, host and supranational contexts (see Pinkse & Kolk, 2012b). It contended that all these institutional factors can create both opportunities and challenges for climate-induced FSAs. The more recent 2020 article zoomed in on MNEs' host countries and conceptualized "BMSA recombination barriers", as regulatory, infrastructural or market factors, inherent to a foreign location, that hamper the recombination of a firm's BMSA with local assets and applied it to the energy transition (Bohnsack et al., 2020). These studies offer a wealth of possible areas for further research on issues related to the degree and nature of transferability, considering different MNEs, the salience of climate change, and the energy transition for a particular firm and its business model (components).

We note that crucial for studying and understanding climate change and the energy transition are the inherent intricate *locational specificities*. Pinkse and Kolk (2012) made an important first step by delineating MNEs' "balancing act" regarding their interactions with (non-)market actors in home, host and supranational contexts, exposing multiple types and levels of embeddedness. Interestingly, however, with the progression of climate/energy policy, the local nature of measures that are often taken regardless of national/regional levels (e.g., cities or states within federal systems) —be it emission reduction (stick) or incentives for a transition (carrot)— have become more prominent. Consequently, a fine-tuned analysis of the origin and destination of MNE activity in relation to green market development (see Table 3), opportunities for, and/or barriers to, recombination is needed, with the role of digital technologies in relation to climate induced BMSAs deserving special attention. Our most recent article (see Bohnsack et al., 2020) showed that, in the context of the energy transition, electricity firms relying on digital technologies tend to benefit from "limited impediments to BMSA recombination, coupled with low adaptation costs". Indeed, a digital product can be adjusted relatively easily to fit the needs and distinctive features of local markets, and digitalization in general enables interconnections and widespread, in-depth types of "control" that were unthinkable in the "old" electricity system. On the other hand, increased concerns for data protection, safety and ethics, as well as pressures towards techno-nationalism (Petricevic & Teece, 2019), may elicit novel recombination barriers. In summary, this commentary shows that the Kolk and Pinkse (2008) JIBS article on MNEs and climate change has much relevance today, in itself and when extended to cover BMSAs, digital technologies and the energy transition as a whole.

Table 3. Main institutional factors in relation to green market development

Institutional factors	*Possible advantage in green market development*	*Possible disadvantage in green market development*
Provision of public subsidies, knowledge, and infrastructure	Firms may be able to profit if they can utilize corporate political activities and/or institutional entrepreneurship	Foreign firms may not be able to profit if localization clauses hamper leverage of country-specific advantages
Proximity of country to technological frontier	Firms from a technologically leading country on the issue may leverage country-specific advantages	Firms from countries that are not at the technological frontier may be locked in institutional and technological development trajectories
Degree of institutional change	Foreign firms may be able to more easily adjust to new institutional arrangements due to low involvement in past trajectories	Home firms may not be able to adjust to new institutional arrangements due to constraints resulting from high involvement in institutional trajectories
Degree of political contestation of issue	Foreign firms may be able to break more easily with local consensus and leverage country-specific advantages from other locations	Home firms may have difficulty to break with historical positions and suffer from complex domestic debates around the issue
Political stance of country in global issue arena	Firms from a country that supports global climate policy may be able to profit from easier access to supranational stakeholders and spread global norms	Firms from a country that is less favorable to global climate policy may suffer from a liability of origin when operating in countries more supportive of the issue

Source: Pinkse & Kolk (2012), p. 339.

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