Platform-based Multinational Corporations (PMNCs): A Research Agenda in the Field of International Business

Kang[1], Z., Kou[2], H., Zhou[3], D., **Shi[4], X.**, Parente[5], R. and Rong[6], K.

Abstract

The rise of platform-based multinational corporations (PMNCs) driven by the digital economy has increasingly provided new implications for international business (IB) theories. IB scholars have begun to explore alternative research streams that provide a fertile ground for studying PMNCs. Through in-depth investigations on the definition, categorization, and distinctive characteristics of PMNCs, we develop a research framework to study PMNCs and shed light on IB theories. We propose different types of PMNCs that influence international businesses from both the consumption side and production side of global value chains, including transaction PMNCs and industry PMNCs. We also provide a research agenda that guides future studies on PMNCs, aiming to make insightful contributions to IB literature and provide practical implications for IB managers and policymakers.

Key words: *Platform; Platform-based Multinational Corporations (PMNCs); Internationalization; Global value chains; Ecosystem*

[1] University of Bristol Business School, Bristol, UK
[2] Tsinghua University, China
[3] School of Economics and Management, Tongji University, China
[4] **Durham University Business School, Durham University, Durham, UK**
[5] Florida International University, USA
[6] Tsinghua University, China

1. Introduction

Competition in today's digital economy has been reshaped by platform-based firms (Cennamo, 2021), contributing significantly to global innovation and economic development (Teece, 2018; UNCTAD, 2018). In this paper, we focus on platform-based multinational corporations (PMNCs) (Parente et al., 2024) and aim to integrate platform theory with international business (IB) theory. We define PMNCs as *multinational corporations that adopt digital platforms as integral elements of their business models to support interactions on the production and/or consumption side in the global value chains*. Many of the most valuable MNCs today are platform-based, achieving tremendous global success (e.g., Gawer, 2021). In 2023, six PMNCs—Microsoft, Apple, Nvidia, Alphabet, Amazon, and Meta—were ranked among the top ten largest companies in the world by market value (Statista, 2024), overtaking traditional giants like Walmart, Aramco, and Shell. Moreover, many traditional MNCs are transforming into PMNCs and launching platform-based ecosystems, such as Haier's COSMOPlat, Siemens' MindSphere, Midea Group's M.IoT, etc.

IB scholars have identified various types of internet-based firms that differ from traditional MNCs, including "ibusiness" (Brouthers et al., 2016; Chen et al., 2019), "sharing economy firms" (Parente et al., 2018), "born digital firms" (Yang et al., 2025), and "multinational multi-sided platform corporations" (Zeng et al., 2019). Despite these efforts, there remains a lack of a systematic and integrative framework for studying the internationalization of PMNCs. Although a growing number of IB literature attempting to address the issues related to the platform's internationalization (e.g., Banalieva and Dhanaraj, 2019; Deng et al., 2022; Moshe, 2017), most study platforms in a general manner, leading to an unclear understanding of how specifically platform-based firms engage in and influence current international business. This paper aims to provide a more comprehensive research framework to understand the defining characteristics of PMNCs and how PMNCs' internationalization provides new implications for classical IB theories. The main research question of this paper is: *how do PMNCs provide new insights for international business (IB)?*

We address this question by integrating platform theory with the global value chains (GVCs) concept on both the production and consumption sides. We provide a nuanced categorization of PMNCs into transaction PMNCs and industry PMNCs, each exhibiting distinct characteristics compared to traditional MNCs. Specifically, PMNCs differ in how they build competitive advantages in the international context, create value through collaboration with GVC partners, and transform both the structure and governance of GVCs. Additionally, we offer a detailed analysis of how PMNCs generate new insights and implications for existing IB theories.

Drawing from existing literature on platforms and IB, we develop a research framework to guide future research on PMNCs. We propose four research directions. First, PMNCs exhibit distinct internationalization patterns compared to traditional supply chain-based MNCs, necessitating the exploration of different types of PMNC internationalization. Second, the relationship with international complementors, both in home and foreign markets, is a crucial area for research on PMNCs. Third, platforms could connect interdependent actors and resources, evolving into platform ecosystems (Kretschmer et al., 2022). Fourth, we propose a new perspective of dynamic evolution to study PMNCs' continuing evolution with broader stakeholders and more complicated external environments.

Overall, this paper makes three key contributions. First, by integrating platform and IB theory, we better understand PMNCs' definition, categorization, and internationalization patterns. Second, we revisit existing IB theories and propose a research agenda to systematically study PMNCs' internationalization, offering guidance for future IB research on platform-based firms. Third, our research framework can also provide practical implications for managers and policymakers.

2. The rise of platform-based multinational corporations (PMNCs)

2.1 PMNCs in the international business context

With the widespread digital adoption and transformation, a growing body of research has begun to address the implications of digitalization and platform-based

firms for IB theories (Li et al. 2019, Nambisan et al. 2019, Stallkamp and Schotter 2021). A platform is "*an interface between different groups of users and facilitates value-creating exchanges*" (Cennamo and Santalo, 2013:1331), such as complementors and consumers. Complementors can provide products (e.g., software applications) that are complementary to the platform itself (Cennamo and Santalo, 2013; McIntyre and Srinivasan, 2017). Various complementary products and services can help enrich user experiences and strengthen the platform's position (Tiwana, 2015). Platforms derive their competitive advantages from their complementors to co-evolve and co-create value (Chen et al. 2022a).

Although platform models existed before digitalization, such as car renting and travel agencies, the emergence of digital technologies on the Internet, telecommunication, big data, GPS, etc., enable platforms to scale globally in an unprecedented way. For example, digital ride-sharing platforms such as Uber leverage advanced mobile applications, GPS technology, and real-time data processing to seamlessly connect passengers with available drivers worldwide, which the brick-and-mortar renting agency can never achieve (Furr et al., 2022). So this research will look at the digital platforms that serve as "*a standardized digital interface and utilizes digital technologies to facilitate interactions between different parties*" (Yi et al., 2023:26). Digitalization has boosted the development of successful platform-based firms that are among the wealthiest and most influential multinationals, such as Amazon, Apple, Google (Alphabet), Facebook (Meta), and Microsoft, which provide important implications for IB research. Consequently, IB scholars have begun integrating different theoretical perspectives from platform research into IB contexts. McIntyre and Srinivasan (2017) reviewed the platform literature using three main theoretical logics: industrial organization (IO) economics, strategic management, and technology management. Based on this theoretical categorization, we summarize existing IB research on platforms, exploring several research topics summarized in Table 1.

1) IO economics view: Network effects of international platforms

The platform literature has its foundation in IO economics, particularly in the research on network effects (Farrell and Saloner, 1985, Katz and Shapiro, 1985) and

two-sided markets (Rochet and Tirole, 2003, Armstrong, 2006, Rochet and Tirole, 2006). Unlike traditional firms competing in one-sided markets, platform firms rely heavily on network effects in multi-sided markets, where an increased user base leads to greater value (Rochet and Tirole, 2003; Tan and Zhou, 2021). These unique characteristics of platform-based firms have influenced IB research, prompting scholars to examine the cross-border network effects and subsequent new IB phenomena, such as the emergence of more born-global companies and "winner-take-all" dynamics[7], etc. IB scholars have introduced the concept of network effects into the international business literature and identified different types of network effects in an international context. They suggest that while some platforms exhibit highly international network effects that underpin non-location-bound firm-specific advantages (FSAs), others have highly localized network effects, thereby complicating their geographic expansion (Chen et al., 2018, Zhu and Iansiti, 2019, Stallkamp and Schotter, 2021).

2) Technology management view: Platform design and ecosystems in international business

Second, rather than focusing on the market structure and network effects, the technology management view emphasizes the platform design and architecture. Platforms are characterized by a modular and layered structure (Baldwin and Clark, 2000, Yoo et al., 2010), wherein components are provided to complementors, such as Apple iOS store's developing toolkits (Adner and Kapoor, 2010; Tiwana et al., 2010). Consequently, platforms are also conceptualized as technological architectures (Gawer, 2014) with the capability to nurture innovation ecosystems (Gawer and Cusumano, 2014). Based on this theoretical perspective, IB research has studied how platforms' structures influence internationalization. Research indicates that platforms can leverage their modular architecture to achieve scalability in international markets. However, they also need to acquire the necessary local resources to replicate a functional architecture stack across different layers (Ojala et al., 2018, Sturgeon, 2021). Unlike traditional

[7] "Winner-take-all" refers to the fact that "platform firms should embrace aggressive strategies to expand both their installed base of users and their stable of application providers so that benefits achieved on each side of the market are mutually reinforcing" (Cennamo and Santalo, 2013:1332)

multinationals driven by internalization logic, platforms are characterized by an externalization logic since they depend on external partners and resources to co-create an ecosystem. Small and medium-sized enterprises (SMEs) can use the "plug-and-play" infrastructures provided by global platforms such as Amazon and PayPal to accelerate their internationalization (Luo, 2021:2). Recent research has shown distinct relationships within the global platform-based ecosystem, characterized by alignment in value propositions but loose and flexible governance structures (Li et al., 2019, Nambisan et al., 2019, Cha, 2020, Nambisan and Luo, 2021, Rong et al., 2022).

3) Strategic management view: Platform internationalization strategy and influence

The strategic management view examines platforms from a firm-level perspective, focusing on the strategic initiatives undertaken by platform firms and the factors influencing their decision-making. In the IB field, this theoretical stream is reflected in research exploring platform firms' unique strategies and their influence on international markets. Studies have found that platform reputation systems and product quality signaling mechanisms mitigate information asymmetry and reduce the risks associated with rapid internationalization (Deng et al., 2022).

Researchers have also investigated the importance of platforms' localization strategies to adapt to local regulatory environments and cultural differences, contributing to their success in foreign markets (Zeng and Glaister, 2016, Wu and Gereffi, 2018, Shaheer and Li, 2020, Chen et al., 2022a, Rong et al., 2022). Recent research has turned toward the societal influence of digital platform internationalization, emphasizing the importance of their corporate social responsibility (CSR) initiative (Verbeke and Hutzschenreuter, 2021). With expanded partner networks and augmented control through advanced technologies such as algorithms, global platforms face social issues and impacts that are more complex than those addressed in traditional CSR literature (Yi et al., 2023). Additionally, new risks arising from digital interdependence, information security, and regulatory complexity pose unique challenges for digital platforms in a global context (Luo, 2022).

Table 1. Relevant IB literature on platforms

Theoretical views of platform	IB topics	Findings
IO economics	Network effects of international platforms	• Network effects drive the international expansion of platforms. While cross-country network effect underpins the non-location-bound FSAs, within-country network effect is highly localized and hard to transfer abroad (e.g., Chen et al., 2018; Stallkamp and Schotter, 2021; Zhu and Iansiti, 2019).
Technology management	platform design and ecosystems in international business	• Platforms' layered and modular architectures enable international scalability, but this requires access to local resources to effectively replicate the architecture stack in home country to foreign market (e.g., Ojala et al., 2018; Sturgeon, 2021). • Due to its externalization logic, platforms can support and organize their partners into a global ecosystem with integrated value propositions and loosely connected relationships (e.g., Cha, 2020; Li et al., 2019; Nambisan and Luo, 2021; Nambisan et al., 2019; Rong et al., 2022; Zeng et al., 2019).
Strategic management	Platform internationalization strategy and influence	• Platforms' unique strategies such as product quality control and signaling mechanisms, can help mitigate information asymmetry and alleviate the risk associated with internationalization (e.g., Deng et al., 2022; Luo, 2021) • Platforms need to adopt localization strategies to be locally integrated into the institutional environment in host countries. Institutional factors, including local regulatory environment, intellectual property protection, cultural and administrative differences, etc., significantly influence platforms' success in foreign markets. (e.g., Zeng and Glaister, 2016, Wu and Gereffi, 2018, Shaheer and Li, 2020, Chen et al., 2022a, Rong et al., 2022).

		• International platforms can lead to more complex social issues and unique risks, underscoring the importance of acknowledging different CSR initiatives (e.g., Luo, 2022; Verbeke and Hutzschenreuter, 2021; Yi et al., 2023).

Although the existing IB literature has begun to explore multiple topics of platforms, most perceive platforms in a general manner as an interface for interactions without specifying where and how platforms facilitate these interactions and transform international businesses. Especially this leads to an unclear understanding of how specifically platform-based firms engage in and influence the global value chains "through which goods and services are produced, distributed, and consumed on a global basis" (Kano et al., 2020). As pointed out by Sturgeon (2021), the digital economy can be basically segmented into industrial and consumer domains, and the same goes for platforms; there exist different types of platforms that focus on the consumption side and production side, also known as two-sided platforms and industry platforms (Cusumano et al., 2019). Providing a clear definition and more nuanced categorization of platform-based multinationals can better integrate platform literature with international business theories. This enhances our understanding of how platforms influence different segments and stages of global value chains. Thus, integrating IB theory and extending existing platform literature (Parente et al., 2024), our study defines PMNCs as *multinational corporations that adopt digital platforms as integral elements of their business models to support interactions on the production and/or consumption side in the global value chains*. The next section explains the details of different types of PMNCs, the classification criteria, and how different PMNCs internationalize.

2.2 Types of PMNCs

According to Cusumano et al. (2019), platforms can be categorized into three types. The first type is the transaction platform, which mainly matches different groups of

interacted users in consumption activities, in line with the economic view that highlights the network effect in multi-sided markets. The second is the innovation platform or industry platform based on the technology management view, focusing on supporting complementors in production activities. The third type is the hybrid platform, which is a combination of the first two types of platforms. However, extant IB research has not yet addressed the nuance of different types of platforms and their influence on international business. Following this definition, this paper uses transaction PMNCs, industry PMNCs and hybrid PMNCs to distinguish three types of PMNCs.

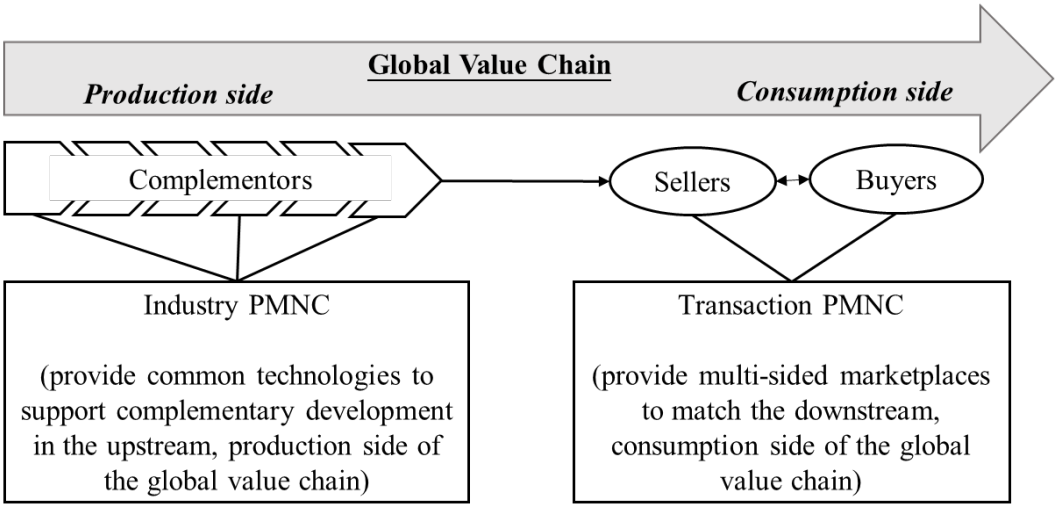
First, we define transaction PMNCs as *multinational corporations that provide digital platforms as multi-sided marketplaces across international markets in the global value chains.* Transaction PMNCs facilitate the matching and transactions on the downstream consumption side of the global value chains by providing sets of market rules and architectures that help match two or more groups of entities such as sellers and buyers (e.g., Rochet and Tirole, 2003, 2006; McIntyre and Srinivasan, 2017; Afuah, et al., 2021). Such platformization on the consumption side has changed how products and services are delivered to customers. For example, on Amazon's platform, sellers and buyers from diverse corners of the world are connected. Similarly, Airbnb matches travelers with accommodations worldwide, offering a marketplace where hosts from different countries can showcase their properties to an international pool of guests. This shift towards platform-based consumption has not only streamlined processes but has also democratized access to products and services, empowering both sellers and consumers with better choice, flexibility, and efficiency in the international marketplace.

Recent studies have extended the scope of the platform to the production side (Gawer et al., 2014; Xing et al., 2016). Gawer et al. (2014) conceptualize industry platforms as modular architectures constituting a shared set of components, technologies, services, and other intangible assets that can support innovation and value creation of complementors. Accordingly, focusing on the upstream production side of the global value chain, industry PMNCs refer to *multinational corporations that adopt digital platforms as common technology providers to support complementary development in the global value chains*. Different from transaction PMNCs aiming to

match users and develop network effects, industry PMNCs focus more on building solid common technologies and supporting the complementors, thus building an interdependent ecosystem. They offer technology-based common building blocks and modules to global complementors, enabling them to develop complementary products or services based on common technologies (Cusumano et al., 2019; Economides and Katsamakas, 2006). For instance, ARM licenses its chip architecture to various tiers of producers in the global smartphone supply chain. The ARM's architecture-based chips generate great cross-country network effects and finally help build a diversified ARM platform globally.

Hybrid PMNCs have penetrated both the downstream consumption and upstream production sides in the global value chains. This enables the functionality of transaction PMNCs and the capability of industry PMNCs. For example, on the consumption side, Alphabet/Google operates two-sided platforms, such as YouTube, which connects global creators and audiences, and Google Play Music, which allows users to access a wide range of digital content. On the production side, Google boasts industry platforms, including Android, a mobile operating system that powers a substantial portion of the world's smartphones.

Therefore, we categorize PMNCs into three types: transaction PMNCs, industry PMNCs, and hybrid PMNCs. Figure 1 shows the different positioning and structure of industry PMNCs and transaction PMNCs. Table 2 offers some representative cases under each category, with PMNCs from different sectors.



- Provide common technology to complementors in the production activities of the global value chain
- Complementors are in different tiers of the supply chain
- Platformization in the production side (upstream part).

- Coordinate the matching among users from different sides of the platform
- Different groups of users are in different sides of the platform
- Platformization in the consumption side (downstream part).

Figure 1. A comparison between transaction PMNCs and industry PMNCs.

Table 2. Cases for the three types of PMNCs

Type	Name	Sector	Platform services	International performance
Transaction PMNC	Airbnb	Room-sharing	Two-sided market between landlords and tenants.	Available in over 220 countries and regions with more than seven million listings globally.
	Amazon	E-business	Two-sided market between online sellers and buyers.	Operates in over 180 countries with significant market shares in North America, Europe, and Asia-Pacific.
	TikTok	Short video	Multi-sided market among video creators, video viewers, and advertisers.	Available in over 160 countries, TikTok is one of the most downloaded apps globally, with a significant user base in the U.S., India, and Europe.
	Uber	Sharing ride	Two-sided market between drivers and passengers.	Operates in over 70 countries and 10,000 cities worldwide.
	Uber Eats	Sharing ride	Multi-sided market among restaurants, drivers and eaters	Available in over 45 countries and 6,000 cities globally.
	YouTube	Video	Multi-sided market among video creators, video viewers, and advertisers	Accessible in over 100 countries and supports 80 languages.
Industry PMNC	ARM	Integrated circuit	Chip industry based on ARM architecture.	ARM-based chips are used in over 95% of the world's smartphones.
	Google	Search engine	Ads industry based on Google.	Dominates the global search engine market with over 90% market share and operates in over 200 countries.
	TensorFlow	AI algorithm	AI industry based on TensorFlow math library.	Widely adopted globally across industries and academia, with applications in numerous countries for various AI developments.

Hybrid PMNC	Android	Operating system	Two-sided market between android apps and users (Android app store such as Google Play) Apps development based on Android architecture.	Holds a global market share of over 70% in the global mobile operating system market, with Android users spreading across 190 countries.
	iOS	Operating system	Two-sided market between iOS apps and users (iOS app store) Apps development based on iOS architecture.	Commands approximately 27% of the global mobile operating system market, with a significant presence in North America, Europe, and Asia.
	Windows	Operating system	Two-sided market between software and users (Microsoft Store). Software development based on Windows architecture.	Windows is used in over 75% of desktop computers globally, making it the leading desktop operating system worldwide.
	AWS (Amazon Web Services)	Cloud service	Two-sided market between private cloud users (AWS Marketplace) Cloud solutions based on AWS cloud architecture and toolkits.	AWS is the leading cloud service provider with data centers in 33 geographic regions worldwide

2.3 Characteristics of PMNCs

Table 3 summarizes the differences in international business between traditional MNCs, transaction PMNCs and industry PMNCs. The traditional MNCs mostly derive their competitive advantages from product development and penetration into global markets. Successful MNCs such as McDonald's and Coca-Cola leverage their brand recognition and supply chain capabilities to dominate international markets. However, the emergence of PMNCs has introduced a paradigm shift with two distinct categories: transaction PMNCs and industry PMNCs. These new players derive their competitive advantages from different spheres: facilitating global network effects in consumption and supporting global complementors in production.

Transaction PMNCs, such as Airbnb, Uber, and YouTube, have developed global network effects on the consumption side. Rather than focusing solely on producing goods or services, transaction PMNCs serve as intermediaries; they act as marketplace facilitators, matching diverse sets of global users, enabling transactions across borders, and creating value through the volume of transactions facilitated (Evans and Schmalensee 2010, Zhao et al. 2020). On the other hand, industry PMNCs, such as ARM, AWS, and Android, leverage global complementors in production. These firms operate as digital infrastructure and common technology providers, creating value by supporting global partners' development of complementary products or services (Gawer and Cusumano, 2014). Much of the value creation of PMNCs stems from their ability to access and manage data across countries. Transaction PMNCs acquire and analyze user data from various regions, allowing them to offer localized services tailored to different user preferences and regulatory environments. Industry PMNCs, on the other hand, leverage cross-border data and tap into innovation resources provided by their global network of complementors. This enables them to better coordinate the complementary development across regions in a globally integrated innovation ecosystem. For example, Amazon Web Services (AWS) enables developers around the world to customize their offerings to meet local demands. By leveraging the data

collected from various regions, AWS can identify emerging trends, optimize its cloud infrastructure, and enhance its ecosystem support.

The structure and governance within global value chains (GVCs) vary significantly across these different types of MNCs. Traditional MNCs typically rely on formal contracts and hierarchical structures to govern their GVCs, ensuring compliance and control over spatially dispersed operations into a linear and closed structure. In contrast, PMNCs evolved into more non-linear and open structures (Nambisan and Luo, 2021) and developed more flexible and dynamic governance modes (Kretschmer et al., 2022, O'Mahony and Karp, 2022). Transaction PMNCs operate through a marketplace model, which features an open structure designed to match geographically dispersed users in the global value chain, such as Airbnb's global housing network and TikTok's global community of creators. To govern effectively, these firms establish marketplace rules and leverage algorithms allowing global standardization and localized adaptation. For example, Airbnb must navigate cross-border payment systems and adapt to varying data transfer regulations in different countries.

Similarly, industry PMNCs leverage common technology and supporting infrastructure to govern their GVCs, fostering industry-wide standards and collaboration among partners (Chen et al., 2022a). Rather than dictating terms through contracts, they focus on providing a technological foundation that ensures compatibility and integration across the global value chain, giving them control over technology assets without direct ownership (Gawer, 2021). For instance, developers from different countries can build upon the Android operating system, creating regionally customized applications, thus contributing to a globally interconnected innovation ecosystem.

Table 3. Comparison of different types of multinational corporations (MNCs)

	Traditional MNCs	Transaction PMNCs	Industry PMNCs
Sources of competitive advantages	Product development and penetration in global markets	Global network effect on the consumption side	Global complementors and ecosystem on the production side
Role of the focal firm	As a producer or primary supplier in global supply chains	As a marketplace facilitator, matching different sides of global users, enabling global transactions across borders	As a common technology provider that supports development of complementary products/services by global partners
GVC value creation	Through the production and delivery of goods or services, often with a single revenue stream	Facilitating the transactions in global markets by exploiting user data and providing tailored services in different regions (e.g., Amazon ecommerce's recommendation system)	Empowering the complementary development by leveraging data and innovation resources across regions (e.g., Amazon Web Services (AWS)'s cloud infrastructure and ecosystem support)
GVC structure	Integrating spatially dispersed firms into a linear and tightly controlled structure	Matching geographically dispersed users, suppliers, and service providers in a non-linear, borderless value chain, and enabling cross-border transactions and the exchange of information across markets (e.g., Airbnb's global housing network or TikTok's global community of creators).	Creating a globally integrated innovation ecosystem where complementors from various regions build on the platform's core technology, integrating localized and global solutions in a non-linear and open structure (e.g., ARM's different tiers of solutions in the global semiconductor market, AWS's global network of developers in diverse industries)
GVC governance	Through formal contracts and hierarchy	Through marketplace rules and algorithms that enable localized adaptation (e.g., navigating the cross-border payment	Through common technology and supporting infrastructure ensure compatibility and seamless integration

		systems and regulations)	across global regions (e.g., Android's open source enables developers worldwide to create other compatible operation systems and applications)
Examples	McDonald's, Coca-Cola, Rolex, Boeing, etc.	Airbnb, Uber, YouTube, etc.	ARM, AWS, Android, etc.

3. How do current IB theories explain PMNC internationalization?

IB theories traditionally rely on the premise of the physical movement of products and services, the limited availability of shared resources, financial transactions across countries, and competition among major organizations in a context characterized by physical obstacles. Current IB operations are becoming more defined by intangible streams of data and information, greater access to essential open resources such as technologies, and the growing significance of digital infrastructure, which enables the rise of digital platforms and ecosystems (Nambisan et al., 2019). These require reevaluating how IB theories can be applied to these emerging PMNCs. Rugman et al. (2011)' s review of the evolution of IB theories provides a useful and comprehensive framework for evaluating whether PMNCs introduce new insights to IB theories. First, in line with Rugman et al. (2011), we reflect on the progression of IB theories from the static internalization theory to the more dynamic internationalization process theory. Second, Rugman et al. (2011) summarized IB research streams from two levels: a firm level, which is "consistent with the view espoused by most mainstream resource-based view (RBV)" (Rugman, 2011: 768) and the country level that adopts an institutional analysis. Based on it, we explore two primary perspectives: the resource-based view (RBV), which emphasizes firm-level internal resources, and the institution-based view, which focuses on external factors. This also echoes recent IB research on platforms emphasizing increasing attention on quasi-internalization or externalization perspective (Strange and Humphrey 2019, Chen et al. 2022).

3.1 Internalization theory: static perspective

Since Hymer's (1960) seminal work laid the foundation for modern IB research by focusing on firm-level activities of MNCs, internalization theory has emerged as a central framework, assuming that firms possess firm-specific advantages (FSAs) when expanding internationally (Buckley and Casson, 1976; Rugman, 1981). This framework continues to be a theoretical cornerstone for understanding internationalization in the digital era, including for platform firms (Li et al., 2019). However, PMNCs also add

new insights to the internalization theory. First, in essence, platform firms must grant more platform access to external actors to make the network effects work (Boudreau, 2010). Namely, platform firms tend to more closely follow externalization logic (Banalieva and Dhanaraj, 2019; Chen et al., 2019) and depend on the bundling of assets owned and controlled by externals and autonomous complementors (Parker et al., 2017). In other words, PMNCs' installed assets are not firm-specific. Second, a platform also aims to leverage the potential of distributed innovators and then achieve benefits from partners on economies of co-specialization (Nambisan et al., 2018). External partners or complementors not only assist in promoting an industry PMNC's technology development in the target country but also strengthen how the platform serves local customers and meets immediate demands.

Further development on internalization theory suggests that firms need to recombine their current FSAs with country-specific advantages (CSAs) available in the target country (Hennart, 2009; Verbeke, 2009), which results in two different types of FSAs - location-bound (LB) and non-location-bound (NLB) FSAs (Rugman and Verbeke, 1992:763). The NLB FSAs and LB FSAs for PMNCs, driven by transferable or non- transferable network effects across geographical locations, show differences with traditional MNCs (Stallkamp and Schotter, 2021). Brouthers et al. (2016) also argue that ibusiness firms' values produced by existing users and user networks are non-transferable to a new market. In that case, both transaction and industry PMNCs in the host countries need to accumulate LB FSAs, referring to whether there will be some critical partners or complementors to help them co-create values. The two types of PMNCs would face different LB situations as well. Different from the industry PMNCs, transaction PMNCs may face even bigger challenges, as they directly face local customers who are highly LB-oriented (Rong et al., 2020).

3.2 Eclectic paradigm (OLI theory): static perspective

Integrating several theoretical streams, including internalization theory, the eclectic paradigm (i.e., OLI theory) (Dunning, 1978, 1980, 2000) has subsequently become an integrative framework for investigating an MNC's international value-adding activity.

O advantages explain why firms engage in cross-border activities; *L* advantages suggest which country firms should target; and *I* advantages relate to the feasible approaches firms should follow to engage in international activities. In short, MNCs need to keep the competitive advantages that enable them to engage in cross-border activities.

Given the context of digital globalization, extant literature suggests that digitalization has changed digital service MNCs' firm-specific advantages (FSAs) from traditional asset-based and transaction-based advantages to network advantages (Banalieva and Dhanaraj, 2019; Strange and Zucchella, 2017). As such, Luo (2022) proposed new OLI advantages for multinational firms in digital globalization that the new *O* refers to as 'open resource advantage', new *L* means 'linkage advantage', and *I* highlight the 'integration advantage'. This provides further implications for PMNCs.

While PMNCs leverage local network effects by enlarging both users' and suppliers' adoption, novel *O* advantages (i.e., digital infrastructure) and *L* advantages (i.e., data-driven AI algorithms) are accumulated, which may be redeployed internationally. Differences may occur for different types of PMNC. Transaction PMNCs may need to develop new advantages, such as data-driven algorithms to facilitate personalized interactions, while industry PMNCs strive to establish advantages as digital infrastructure providers, such as cloud computing. Both PMNCs will follow a more externalization logic, so transaction PMNCs may need less internalized local activities in the target country while industry PMNCs will let upstream and downstream players own the transacted assets.

Moreover, Li et al. (2019) believe that digital PMNCs need to address extra costs and challenges of transferring domestic ecosystem-specific advantages.[8] In this sense, future research should explore how platforms develop ecosystem-specific advantages in order to compete with local platforms and platform-centric ecosystems in a foreign market.

[8] Ecosystem-specific advantages refer to a composite construct including three components: "First, the number of complementary resources; second, the cooperation among ecosystem participants; third, the governance that platform firms manage the interdependent relationships of ecosystem participants and align their behaviours" (Li et al., 2019:8).

3.3 Internationalization theory (Uppsala models): dynamic perspective

In parallel with the development of internalization theory and eclectic paradigm that focuses on the static choices of MNCs, internationalization theory (Uppsala model) (Johanson and Vahlne, 1977; Johanson and Wiedersheim-Paul, 1975) focuses on internationalization as a dynamic, cumulative process. It suggests that firms tend to target countries that are close in the psychic distance (i.e., measuring the differences between countries involved with the cost of information transfer). The model indicates that managers should select the entry mode that is of the lowest risk, following an incremental internationalization phase. Existing IB scholars have suggested that the characteristics of the Uppsala model have been challenged by digital platforms and emerging digital technologies (Bhatti et al., 2022; Monaghan, Tippmann and Coviello, 2020). Notably, there are some differences between platform-based networks and conventional interfirm networks. On one side, online platforms may show a more rapid and radical internationalization process. They provide a low-cost medium that facilitates firms' internationalization (Jean and Kim, 2020) and supports more born-global firms. On the other hand, platform firms' value, to some extent, depends on their partners, and these may decay along with the platform's proprietary assets (Zhang and Sarvary, 2015) in the process of international expansion. The platform's nature, low entry barriers and easily imitable information-based resources are pushing platform firms to emphasize the building of wider networks in order to leverage knowledge-based resources and stimulate innovation.

Consequently, PMNCs tend to rely more on their network effects while internationalizing. Therefore, their concern for foreign market selection is more about market potential than psychic or institutional differences. Digital firms are also limited to internet access to achieve relevant resources for developing businesses (Monaghan, Tippmann and Coviello, 2020). Transaction PMNCs may suffer more challenges in establishing the user base in the target market. In addition, digital infrastructure is essential for a digital firm, especially for industry PMNCs. As discussed above, industry PMNCs are more technology-oriented and have to address more formal institutional challenges when going to internationalization.

Based on the revised Uppsala model (Johanson and Vahlne, 2009), platforms also suffer from liabilities of outsidership (LOO) due to the lack of direct platform users in the target market. The LOO refers to the discrimination of being foreign or providing a similar platform (Brouthers et al., 2016). Furthermore, drawing from Banalieva and Dhanaraj (2019), we believe that the network will play a dual role as a strategic source of providing complementors and, in a governance mode, on PMNCs in target countries. Thus, research on PMNC internationalization can further extend Uppsala models (e.g., Bhatti et al., 2022).

3.4 Resource-based view: internal perspective

According to Rugman et al. (2011), the stream of firm-level analysis in IB research aligns with the resource-based view (RBV), which emphasizes that a firm needs to rely on a bundle of valuable resources to sustain competitive advantages (Barney, 1991). These strategic resources typically stem from the firm's inter-related assets or capabilities. In the context of IB literature, RBV theory suggests that a traditional multinational corporation's (TMNC's) value-adding activities are primarily conducted within the firm itself (Buckley and Casson, 1976), and its internationalization is commonly seen as driven by its internal strategic planning and dependent on experiences (Dunning and Lundan, 2008). Similarly, Tallman and Fladmoe-Lindquist (2002) argue that firm-specific complex resources are critically important for maintaining competitive positions in international markets by appropriately implementing international expansion and global integration strategies. Moreover, corporate or architectural capabilities can be regarded as sources of competitive advantage (Tallman and Fladmoe-Lindquist, 2002).

However, as Brouthers et al. (2016) found that ibusiness firms' value creation depends on their new network building and established user networks, the study of PMNCs also highlights the influence of platform network effects in the target countries on the development of resources and knowledge, which may extend the RBV theory. The importance of the network effect also addresses the demand-side perspective, since users co-create the internationalization process for innovations in PMNCs, which extends from the resource-based view while considering digital innovations (Shaheer,

Kim and Li, 2022). This drives PMNCs to focus on developing advantages that are more dependent on local complementors and related ecosystem partners.

In the increasingly complex business context, PMNCs' stakeholders, in general, are required to address the uncertainties of product design, demand, and the potential partners of suppliers (Rong et al., 2015). Industry platform owners have to face more complicated issues, including identifying the right partners to add value to the platform and designing and developing end products. Transaction-based platforms alone cannot create and deliver value. For instance, Uber does not own cars and depends heavily on drivers to provide customer service via the platform. Consequently, transaction PMNCs tend to rely more on network effects to create and capture values. In contrast, industry PMNCs largely depend on their external cooperative partners, users, and other stakeholders for co-creating values. Moreover, PMNCs' locus of value creation has changed from platform-level network effects to ecosystem-level cooperation and coevolution (Kapoor and Agarwal, 2017). As a result, PMNCs' competitive advantages (i.e., core value creation) depend more on their external network effect (e.g., domestic complementors and other ecosystem partners). Thus, the PMNCs' value-creation in the international context, has increasingly extended from relying on firm-specific, proprietary resources to external, shared resources from networks and ecosystems, which provides new perspectives to classical.

3.5 Institution-based view: external perspective

Country-level analysis of IB research aligns with the institution-based view (IBV), which suggests that firms have to comply with external rules and belief systems to achieve organizational legitimacy (Scott, 1995). MNCs are often driven by the need for resource stability, further incentivizing their external legitimacy-seeking activities. Since PMNCs need access to domestic complementary assets and resources to survive, they tend to suffer more hurdles of international expansion, such as platform monopoly boycotts, media relations, and user data and privacy concerns owning to differing institutional effects. In addition, while internationalizing, PMNCs may suffer more unique institutional challenges regarding data-related aspects, such as data privacy and

protection. A prominent example is the European Union's General Data Protection Regulation (GDPR), which imposes strict data privacy and security requirements, leading to heavy fines for PMNCs that fail to comply[9].

Furthermore, following an externalization logic (Li et al., 2019), transaction PMNCs rely on the local participants and industry PMNCs need to control the production resources without owning them in the host country. In that case, PMNCs have to govern and address more ecosystemized organization structures and more complex internal and external institutional challenges (Parente et al., 2024). In other words, PMNC internationalization will largely extend institutional theory in IB research. Collectively, the institutional effects on PMNCs' value creation during the internationalization process are relatively underexplored; scholars should pay more attention to these in future research.

Above all, the rise of PMNCs, as shown in Table 4, has new implications for current IB theories and views. The next section proposes a general research agenda with four specific research directions for studying PMNCs.

[9] The General Data Protection Regulation (GDPR), effective since May 25, 2018, imposes strict guidelines on how personal data should be processed and protected. For instance, in 2021, Amazon was fined €746 million for GDPR violations, and Google was fined €50 million in 2019.

Table 4. How IB theories explain PMNC internationalization

IB Theories	Principles	Transaction PMNC	Industry PMNC	New implications by PMNC
Internalization theory	A firm needs to recombine its current FSAs with CSAs available in the target country, which results in two different types of FSAs, including location-bound (LB) and non-location-bound (NLB) FSAs	The installed assets are not firm-specific; need to accumulate location-bounded firm-specific advantages	The installed assets are not firm-specific; need to accumulate location-bounded firm-specific advantages; External partners or complementors promote industry-based PMNC's technology development	The drivers of LB and NLB FSAs for PMNCs may be different, i.e., they may be derived from the transferability of network effects across locations.
Eclectic Paradigm (OLI theory)	When internationalizing, firms need to keep their competitive advantages, including ownership advantage, location advantage, and internalization advantage	Need new advantages such as data-driven algorithms to facilitate personalized interactions; need external participants so less need to internalize local activities in the target country	Need new advantages in digital infrastructure such as cloud computing to provide and nurture an ecosystem, where upstream and downstream players own the transacted assets	PMNCs' advantages transform from traditional asset-based and transaction-based advantages to a more externalization logic, such as network and ecosystem-specific advantages
Internationalization theory (Uppsala models)	When selecting countries to enter, managers minimize risk and cost by first selecting those that are close in psychic distance to the home country	More concern on the local users (i.e., market size, user preferences) in the target market	More focus on the local complementors while considering the provisions of digital infrastructure in the target market	PMNCs may adopt more rapid and radical internationalization process. They tend to rely more on their network effects while internationalizing; therefore, their concern about foreign market selection is more about users' and complementors' local

				markets rather than psychic or institutional differences
Resource-based view	Firms rely on a bundle of firm-specific valuable resources to maintain competitive position	Rely more on external network effects generated by multi-sided participants they connect, to create and capture value	Rely more on external network effects generated by local complementors and ecosystem partners, such as cooperative production partners, users, etc., through providing local digital infrastructure	PMNCs' competitive advantages (i.e., core value creation) extend beyond the firm-specific, proprietary resources, which are dependent more on the external network effect (e.g., domestic complementors and other ecosystem partners), combined with data-based asset
Institution-based view	To gain organization legitimacy, firms in target countries are required to comply with local rules and institutions	More confined by the local network effects; more data-related institutional challenges such as personal data privacy and security	Have to address more ecosystemized organizations and institutional legitimacy in the local market; more data-related institutional challenges such as security in industry data transfer and sharing	PMNCs rely on local complementors' assets and resources so they may suffer fewer challenges from the home countries but more from the host countries such as local regulations and competitors; More institutional legitimacy in terms of new and unique issues brought by PMNCs' control of big data

4. Proposed framework and future research agenda for PMNCs

Drawing on IB theories, the development of PMNCs provides unique and new implications for the internationalization patterns and competitive dynamics in multinational contexts, presenting rich opportunities for future IB research. To enhance understanding of the internationalization phenomenon of PMNCs, we propose a research framework and develop four specific perspectives as a future research agenda (see Figure 2). This framework aims to provide a comprehensive framework to study how PMNCs strategically operate and dynamically evolve internationally.

The first perspective is from the supply chain to the platform. It aims to explore the specific internationalization patterns and mechanisms of different PMNCs unique to traditional supply-chain-based multinationals. The second perspective is from home complementors to international complementors. This direction will focus on how PMNCs build and manage relationships and interactions with complementors in home and foreign markets to gain global competitiveness. The third perspective is from platform to platform ecosystems. As PMNCs connect with more diversified complementors, platform ecosystems—communities supported by interacting organizations and individuals (Moore, 1993; Iansiti and Levien, 2004a; Rong et al., 2015) —will emerge. This research direction explores how PMNCs address related opportunities and challenges in the evolution of their ecosystems both domestically and internationally. The fourth perspective is the PMNCs' dynamic evolution in the international landscape, and it calls for a new view of PMNCs' continuing dynamic evolution with broader stakeholders and more complex external environments, providing new implications to the incremental steps suggested by the Uppsala model (1977, 2009).

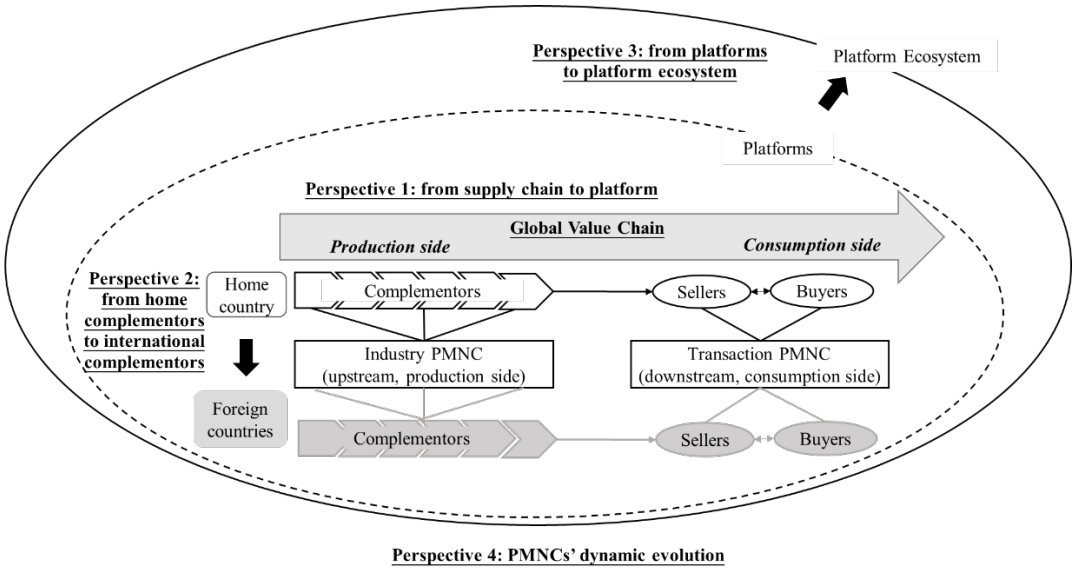


Figure 2. Research framework on PMNCs in international business

As shown in Figure 2, this framework provides a general research agenda for studying the internationalization of PMNCs from four future research perspectives. We next elaborate on the four future research directions, with Table 5 listing example research questions for future studies.

Table 5. A research agenda of studying PMNCs from the four research directions.

Research direction	Transaction PMNC	Industry PMNC
1. From supply chain to platform	● How do transaction PMNCs' internationalization patterns differ from traditional supply chain-based MNCs, especially in terms of network effects and user interaction? ● How does the platform design of transaction PMNCs affect their speed and mode of internationalization compared to traditional MNCs? ● How do transaction PMNCs use data analytics to customize their platform offerings across diverse global markets?	● How do industry PMNCs' internationalization strategies differ from traditional MNCs, focusing on their reliance on common technologies and global complementor networks? ● How do industry PMNCs ensure compatibility and innovation when expanding their platform technologies into new international markets? ● How do industry PMNCs utilize data-driven insights to manage international complementor networks?
2. From home complementors to international complementors	● How do transaction PMNCs build and sustain network effects between local and global users when entering foreign markets? ● What role do institutional factors (e.g., law, taxation, culture) play in the ability of transaction PMNCs to leverage global user networks in foreign markets? ● How do transaction PMNCs navigate the challenges of user base development and retention in markets with differing regulatory and social contexts?	● How do industry PMNCs identify and choose suitable international complementors as the leading or key partners in different overseas markets? ● How do industry PMNCs promote their common technologies among international complementors? How do industry PMNCs overcome local barriers to build strategic partnerships with key complementors in new markets? ● What is the optimal pricing strategy or pricing structure to nurture international supply chains based on the common technologies in the overseas markets? Is it necessary to subsidize the international complementors? Which part of the international supply chains need to

		be subsidized? ● What mechanisms facilitate effective co-creation between PMNCs and international complementors across different cultural and geographical contexts?
3. From platforms to platform ecosystems	● How do transaction PMNCs exploit their existing user base and ecosystem advantages to explore new foreign markets? ● How do transaction PMNCs embed and integrate themselves into the local markets, given the demand uncertainty, user heterogeneity, culture diversity, and so forth? ● To what extent local institutions and policies determine transaction PMNCs' performance?	● How do industry PMNCs integrate and coordinate global and local ecosystem resources to achieve global competitive positions? ● How do industry PMNCs measure and evaluate the success of their platform ecosystems in foreign markets, particularly in technology-driven industries? ● To what extent domestic ecosystem-based advantages influence industry PMNCs' performance?
4. Platforms' continuing dynamic evolution	● How do transaction PMNCs dynamically adapt their business models in response to changing regulatory environments and societal pressures in host countries? ● How do geopolitical tensions and shifts in trade policies influence the strategic realignment of transaction PMNCs' global operations? ● What role do cross-border data transfer policies play in shaping the global expansion and operational flexibility of transaction PMNCs?	● How do industry PMNCs leverage global-local partnerships to foster innovation and coordinate ecosystem growth in diverse regulatory environments? ● To what extent emerging technologies (i.e., AI, 5G/6G, blockchain, IoT) determine industry PMNCs' evolutions in global markets? ● How do institutional pressures (e.g., national security concerns, antitrust regulations) drive the long-term strategic evolution of industry PMNCs in their international expansion? ● In what ways do evolving global data privacy regulations shape the governance and operational strategies of industry PMNCs?

4.1 Research direction 1: From supply chain to platform

Existing IB theories are mainly based on the internationalization of traditional supply chain-based multinationals. The stage model (also known as the Uppsala model) is rooted in the concepts of psychic distance and learning, thus viewing internationalization as a sequential process starting from no exports to regular exports, sales subsidiaries, and then overseas production (Johanson and Vahlne, 1977, 2009; Johanson and Wiedersheim-Paul, 1975). Compared to traditional MNCs, the characteristics of PMNCs are more closely related to the network economy (Shapiro, Varian, and Becker, 1999), which makes the internationalization of PMNCs largely different.

So, the first research direction aims to investigate the new internationalization pattern of PMNCs and the essential differences between different types of PMNCs and traditional MNCs. Research topics worth exploring include the following: First, more literature is needed to systematically discuss the main factors affecting the success of the internationalization of different PMNCs. Precisely, the key features of two-sided platforms lie primarily in the network effects and the mutual interaction between different sides accessing the platforms (Rochet and Tirole, 2003), while the critical features of industry platforms focus more on the common technologies and complementor network (Economides and Katsamakas, 2006). Moreover, PMNCs' internationalization also necessitates differentiated decision-making informed by diverse sectors and markets. For example, after Alipay, the payment platform was built, Alibaba had to consider different internationalization strategies for both Alipay and its e-commerce platform Taobao. Similarly, for industry PMNCs, Apple and Android need to consider different internationalization strategies in overseas markets such as Europe, China, India, and Africa. Furthermore, many PMNCs are built on digital interfaces with users and engage with a data-intensive business compared with traditional MNEs. Thus, using data to establish dynamic connections within their ecosystems, PMNCs can improve operational efficiency, promote collaboration among global stakeholders, and

broaden their value proposition beyond traditional supply chain management. Furthermore, new resources and capabilities drive platform growth, including data analytics and artificial intelligence (Sun et al., 2024). Future research is needed to examine how PMNCs utilize data-driven learning for decision-making and supporting their operation abroad.

4.2 Research direction 2: From home complementors to international complementors

Network relationships have been recognized as critically important for market exploitation or growth development in the host markets (Johanson and Vahlne, 2003). For traditional MNCs, the network-based perspective in IB theories studies economic actors into one or more networks (Chen and Chen, 1998; Chen, 2003). Under this approach, international production networks (IPN) link manufacturing firms and create pull-and-push factors that facilitate foreign expansion (Ferdows, 1997; Shi and Gregory, 1998). The IPN focuses on the networks in the macro environment, including the networks with the government and the manufacturing partners in the host market. To some extent, the IPN could be explained by the OLI framework (Dunning, 1980, 2000) or the LOF concept (Zaheer, 1995) since network sources can be regarded as a kind of disadvantage PMNCs, will encounter in the host market. However, the network effect of transaction PMNCs and the complementary network of industry PMNCs show differences from the IPN mentioned above (Täuscher and Laudien, 2018), which leads to the second research direction aiming to explore how PMNCs interact with global users and complementors.

For example, for transaction PMNCs, network effects could play a positive role during internationalization. Indeed, after entering into a host market, the new users may be able to generate network effects with other global users. For example, Facebook users in the U.S. can freely interact with users in the U.K., leading to the cross-country network effect (Stallkamp and Schotter, 2021). However, not all network effects can transfer abroad (Zhu and Iansiti, 2019). In sum, the driving force of cross-border network effects, including the relationship with international complementors and institutional factors such as law, taxation, and culture in the overseas markets, will all

need further research (see Table 3).

Correspondingly, industry PMNCs also need to address the changes from home complementors to international complementors. Since industry platforms rely heavily on common technology, identifying the right international complementors can help industry platforms better establish a foothold in overseas markets. For example, ARM's leading partner strategy aims to find international complementors with strong competitiveness or innovation capability in key links of the industry chain. Besides, ARM proactively cooperates with local universities to develop teaching materials and train more students who know ARM's common technologies (Rong et al., 2015). Consequently, future research needs to explore the strategies of how industry PMNCs choose and nurture their international complementors.

4.3 Research direction 3: From platform to platform ecosystems

The ecosystem perspective has been increasingly adopted in studying platforms in cent IB literature (Li et al. 2019, Nambisan et al. 2019, Cha 2020). As ecosystems representing communities of multiple stakeholders who depend on their mutual interactions for value creation (Adner, 2017; Iansiti and Levien, 2004a, b; Moore, 1993), platforms can connect with a broader network of interdependent actors and resources, transforming to platform ecosystems as meta-organizations (Chen et al., 2022b, Kretschmer et al., 2022). As for PMNCs operating in foreign markets need to explore and exploit relationships with local partners and resources, evolving them into ecosystems (Rong et al., 2022). Therefore, PMNCs face the challenge of establishing, nurturing, and governing their platform ecosystems' diversified and complicated partnerships in host markets (Ceccagnoli et al., 2012). This research direction aims to better understand PMNCs' evolution into platform ecosystems in international markets and their ecosystem integration into host countries.

Platform ecosystems can access key resources such as technologies or knowledge, enabling value creation for participants or complementors (Tavalaei and Cennamo, 2021). The exploration of resources is moving from intra-platform to outside stakeholders, including customers, research institutions, business partners, and other

universities (Linder et al., 2003). Meanwhile, to build a competitive and dominant platform ecosystem in host countries, PMNCs are required to take a more proactive approach to address the uncertainties of customer demand and institutional environments. For instance, it took around ten years for ARM, a leading semiconductor company, to nurture its ecosystem partners after stepping into China in 2001, before its first business deal (Rong et al., 2015). Sharing economy platforms (such as Uber) influence and shape local institutions to gain legitimacy in less time (Uzunca et al. 2018). Few studies have attempted to quantify and evaluate PMNCs' ecosystem performance abroad or explore the antecedents behind it. Therefore. an important research direction is to study the internationalization strategies, mechanisms, and performance of different types of PMNCs in building ecosystems in foreign markets.

Moreover, as Li et al. (2019) suggest, while PMNCs own ecosystem-specific advantages (ESAs), various factors - including user heterogeneity, the market, the infrastructure, regulations, and policies - pose challenges for PMNCs to transfer their ESAs from home countries to host countries (Hennart 2019, Nambisan 2020, Rietveld and Schilling, 2020). As a result, PMNCs may encounter a different liability of ecosystem integration (LOEI), compared with the traditional liabilities of foreignness and liabilities of outsidership (Rong, Kang and Williamson, 2022). In addition, different types of PMNCs may encounter different LOEI: transaction PMNCs are more related to the user base and user network, while industry PMNCS are more linked with technology development and promotion (Brouthers et al., 2016; Chen et al., 2019). Therefore, investigating how different PMNCs respond to challenges and overcome the LOEI and how these processes shape their global competence and influence their overseas performances will provide new insights into IB theories and platform ecosystem research.

4.4 Research direction 4: PMNCs' dynamic evolution

While the first three research directions focus on organization-level activities, platforms evolve through dynamic and interactive relationships with the external environment (Moore, 1996; Rong et al., 2018). This research direction explores the

continuing dynamic evolution of PMNCs in their interactions with broader stakeholders and external environments. This evolution is not limited to global users and complementors but also involves more complex interactions with national governments, societal stakeholders, and institutional frameworks.

Traditional evolutionary theories on MNCs, such as the Organizational Capability Theory (OCT), emphasize that a firm's specific advantages and capacities shape its managerial activities within complex social interactions (Dunning, 2001). The dynamic evolution of PMNCs requires expanding this view to account for the diverse ecosystem partnerships they build in different international contexts. For example, Uber has had to continually adapt its business model in response to interactions with stakeholders ranging from traditional taxi companies to regulatory bodies, consumer protection groups, and union representatives in various countries (Marano et al., 2020).

Furthermore, institutional challenges such as data privacy, digital sovereignty, and cybersecurity concerns present unique hurdles for PMNCs' internationalization (Shaheer, Kim and Li, 2022). Unlike traditional MNCs, which typically face regulatory issues centred around tangible goods, PMNCs must navigate a complex web of digital regulations that vary widely across regions. For instance, TikTok has faced bans and severe restrictions in several countries, including the U.S. and India, due to concerns over data privacy and national security.

The transition toward platform-based models also introduces novel regulatory obstacles, particularly in areas such as cross-border data transfer, global anti-trust regulations, and international trade. These issues are becoming more pronounced as digital platforms grow in scale and influence, demanding further research attention (Coche et al., 2023). Cross-border data transfer regulations, such as the EU's GDPR and China's Data Security Law force PMNCs to develop more sophisticated compliance mechanisms that cater to each jurisdiction. In addition, global anti-trust investigations have posed serious challenges to the largest PMNCs, as PMNCs such as Google, Amazon, and Apple have been subject to anti-trust investigations and fines in the European Union. These external pressures underscore the importance of studying how PMNCs evolve in response to macro-environmental shifts, including geopolitical

tensions, shifting trade policies, and emerging regulations on digital platforms.

5. Conclusion

This study contributes to the IB literature in several ways. First, by integrating platform and IB theory, our definition and categorization of platforms provide a basis for studying the internationalization of PMNCs. Based on how platforms influence the international activities on different sides of global value chains, we categorize PMNCs into transaction PMNCs (Rochet and Tirole, 2003) on the consumption side and industry PMNCs (Gawer et al., 2014; Xing et al., 2016) on the production side. Our paper also shows that emerging IB research on platforms reflects the importance of PMNCs for current IB theories (Parente et al., 2024). We revisit current IB theories and find that, while they help explain PMNC internationalization activities, they can be further extended by incorporating PMNC-specific theoretical developments and empirical investigations.

In addition, the study offers insightful guidance to platform managers and local government policymakers. New start-ups can invest abroad more quickly via digital platforms to become MNCs (Coviello et al., 2017). Digital platforms have more opportunities to expand overseas rapidly (Ojala et al., 2018). It may also bring "springboard" opportunities for domestic platform firms to develop abroad (Luo and Tung, 2007, 2018). The emergence of PMNCs has presented governments across the globe with a series of regulatory obstacles. Understanding PMNCs can help policymakers better balance efficiency, fairness, innovation, and safety. Additionally, local governments need to understand how institutions facilitate PMNCs' value creation and contribute to the local community.

Above all, this research provides a research agenda by drawing on four new directions for PMNC research in the IB field: (1) from supply chain to platforms; (2) from home complementors to international complementors; (3) from platforms to platform ecosystems; and (4) platforms' dynamic evolution. Our study hopes to open the possibility of bringing PMNCs to the forefront of IB studies.

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