

Advantage of foreignness in a digital world: role of long tail users

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a digital world

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Abstract

Purpose – This study aims to explore the advantage of foreignness in a digital world.

Design/methodology/approach – Usage data for 251 days of 32 travel mobile applications installed on a major mobile phone brand in China are examined. Results support the author's arguments.

Findings – Foreign mobile apps enjoy higher daily usage time than local apps. Next, the author consider how foreign apps can maximize their advantage, that is, increase daily usage time. The author argue that a multinational enterprise (MNE) can digitally enter a country that has numerous immigrants from its home country because of the high number of potential long tail users. A high level of diversity of international experience of MNEs increases the ability to understand and satisfy the specific needs of long tail users, thereby increasing daily usage time of foreign mobile apps. To maximize the advantage of foreignness in a digital world, MNEs can also carefully select business models that do not heavily rely on network effect, given the difficulty of generating network effect by long tail users.

Originality/value – Previous studies focus on the liability of foreignness or outsidership that MNEs encounter in the digital world, whereas this study argues that foreignness brings certain benefits, such as the capability to satisfy the specific needs of long tail users.

Keywords Advantage of foreignness, Digital world, Long tail user, Diversity of international experience, Business model, Mobile apps

Paper type Research paper

Introduction

Digital technologies, including the Internet and mobile technologies, are reshaping the business landscape for firms (Strange and Zucchella, 2017). This digital revolution offers companies worldwide unique opportunities to engage in global competition (Zeng *et al.*, 2019). Notably, firms like Facebook and Airbnb emerge as global players, leveraging platforms for worldwide user interaction (Brouthers *et al.*, 2016). Consequently, the ascent of digital technologies transforms the competitive dynamics confronting multinational enterprises (MNEs) and local firms alike, necessitating adaptation to evolving consumer preferences and competitive pressures.

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One hallmark of digitalization is the ubiquity of mobile applications (hereafter, apps), which have become integral to daily life for various tasks such as reading, gaming, shopping and socializing (Ghose and Han, 2014). Foreign mobile apps are also widely used, benefiting from global accessibility via online platforms at no additional cost. Consequently, internationalizing mobile apps focuses less on availability and more on attracting loyal foreign users with significant daily usage.

While scholars increasingly explore the internationalization of mobile apps, attention has predominantly centered on the liability of outsidership in the digital realm (Chen *et al.*, 2019; Shaheer and Li, 2020). Conversely, literature on foreignness suggests that foreignness may confer advantages over local firms, presenting it as an asset (Edman, 2016; Lu *et al.*, 2022). For instance, foreignness could grant MNEs access to preferential treatment unavailable to local counterparts (Kostova and Zaheer, 1999), particularly in emerging markets where host governments welcome foreign investment (Chen, 2007). In contexts marked by pervasive corruption, foreignness can yield positive outcomes, with MNEs from less corrupt nations earning greater trust from local partners compared to domestic firms (Calhoun, 2002).

Yet, scant attention has been paid to the advantage of foreignness for MNEs in the digital world's globalization. Although prior research on digital firms has explored various strategic and performance aspects such as market entry and platform governance, the advantage of foreignness remains overlooked (Zhu and Iansiti, 2012; Eisenmann *et al.*, 2011). Existing studies on the liability of outsidership have merely highlighted its persistence in the digital realm, with ibusiness firms struggling to transfer network effects across borders (Chen *et al.*, 2019). Understanding the advantage of foreignness in the digital realm and how MNEs can leverage it could aid in overcoming the liability of outsidership and thriving in digital globalization. Hence, examining the advantage of foreignness in the digital domain is imperative.

In this study, I assert that the advantage of foreignness over local firms stems from MNEs' ability to cater to the specific needs of long tail users, who are defined as a niche market with neglected needs in the traditional economy (Anderson, 2004). Long tail users span various product categories like music and books, and digitalization facilitates meeting their needs more efficiently (Brynjolfsson *et al.*, 2011). In this study, long tail users refer to those with demands akin to those in foreign countries. MNEs' adeptness in serving these needs enables them to attract such users in host countries, resulting in higher usage times for foreign mobile apps compared to local ones.

Building upon the notion of serving long tail users' needs, I identify three avenues through which foreign apps can boost users' daily usage times. Firstly, MNEs can target countries with sizable immigrant populations from their home country, offering access to a large pool of potential long tail users. Secondly, MNEs can leverage their international experience to enhance their capacity in meeting long tail users' needs. Diverse experiences across countries augment MNEs' ability to address long tail users' requirements in host countries. Thirdly, MNEs can adopt specific business models that do not heavily rely on network effects, recognizing the challenge of generating such effects among long tail users (Boudreau and Jeppesen, 2015). To optimize the advantage of foreignness, MNEs must eschew business models heavily reliant on network effects.

I empirically test these propositions using a sample of travel mobile apps in China, examining user data spanning 251 days across 32 mobile apps. My findings support the hypotheses. This study contributes to the foreignness literature in two ways. First, it focuses on the advantage of foreignness. Compared to the long-standing concept of the liability of foreignness (Zaheer, 1995; Scott-Kennel *et al.*, 2022), advantage of foreignness is a newly developed concept that receives relatively less attention (Lu *et al.*, 2022; Un, 2011). How

MNEs could benefit from foreignness is not clearly articulated or empirically examined. Different from most studies on advantage of foreignness, which focus on institutional theory, transaction cost or supply-side resources (Lu *et al.*, 2022), this study provides a demand-side mechanism through which MNEs could benefit from foreignness: the capability to serve long tail users. I further examine how foreign apps increase performance by focusing on variables related to long-tail users. This study thus enriches my understanding of how MNEs benefit from foreignness.

Second, this study contributes to the foreignness literature by extending it to the digital context. The impact of foreignness on MNEs largely depends on the specific context that an MNE faces. As Lu *et al.* (2022) posited “how foreignness is perceived and used in the digital economy holds great promise for advancing theory and practice” (Lu *et al.*, 2022, p. 466). Previous studies in digital firms only focused on the liability of foreignness and showed the negative effect of being foreign mobile apps (Shaheer and Li, 2020). The present study shows the existence of the advantage of foreignness in the digital world. I also considered factors that are specific in the digital context in driving advantage of foreignness, such as network effect and long-tail users. My study thus advances my understanding of foreignness in the digital context.

This study also contributes to the emerging literature on MNEs’ competitive strategy in the digital world. Previous studies mainly investigate ways to overcome the liability of outsidership (Johanson and Vahlne, 2009), such as by adopting social sharing and virtual community strategies (Shaheer and Li, 2020). The present study shows that maximizing the advantage of foreignness by satisfying the needs of long tail users can also serve as an effective competitive strategy that MNEs adopt to succeed in the digital world. Concentrating on the idea of long tail users, this study considers the ways that MNEs can adopt to maximize their advantage in the digital world, which MNEs can use to increase daily usage time and better compete with local firms.

Research background

Advantage of foreignness

The concept of foreignness has long been central to international business research, initially highlighted by Hymer (1960), who identified the costs associated with it. Subsequently, Zaheer (1995) expanded this notion, introducing the liability of foreignness, which researchers further explored in terms of measurement (Hennart *et al.*, 2002), categorization (Zhou and Guillen, 2016), and its impact on business strategies (Chen, 2006; Mezias, 2002).

While foreignness has often been perceived as a liability, scholars have recognized its potential as an asset (Kostova and Zaheer, 1999; Un, 2011). Foreign firms may possess advantages over local counterparts in various aspects, such as talent recruitment and R&D (Un, 2011; Edman, 2016; Siegel *et al.*, 2019). For instance, Siegel *et al.* (2019) argued that MNEs can enhance competitiveness and productivity by tapping into excluded talent pools, like women in South Korea. Similarly, Un (2011) found that foreign subsidiaries tend to be more innovative due to support from parent firms and pressure from both the MNE and host country.

A recent review underscores that institutional theory, the resource-based view and transaction cost theory dominate as theoretical frameworks for understanding the advantage of foreignness (Lu *et al.*, 2022). However, scholars have increasingly emphasized demand-side perspectives in exploring key firm strategies like innovation (Zhong *et al.*, 2021) and diversification (Ye *et al.*, 2012), yet such perspectives remain largely unexplored in the study of the advantage of foreignness. Thus, this study seeks to elucidate how MNEs derive advantages from foreignness by considering demand-side factors.

Moreover, the review paper suggests that whether foreignness is perceived as a liability or advantage hinges on specific contextual factors (Lu *et al.*, 2022). The digital world, with its distinct characteristics such as heightened connectivity and reduced physical interactions, represents a unique context worth examining. Integrating these digital-specific features into the study of the advantage of foreignness holds promise for advancing my understanding of foreignness in the digital realm and merits further investigation.

Internationalization in a digital world

With the pervasive trend of digitalization, research on digital applications has surged (Zhu and Liu, 2018; Wen and Zhu, 2020). While scholars have extensively explored strategies concerning mobile apps, such as governance (Zhang *et al.*, 2022) and growth (Agarwal *et al.*, 2023), internationalization in the digital realm has garnered relatively less academic attention. Existing literature predominantly delves into the liability of foreignness or outsidership encountered by MNEs when entering international markets digitally by releasing mobile apps in foreign countries. In this context, Chen *et al.* (2019) observed that online platform companies grapple with the liability of outsidership due to the limitations of international network effects. Firms can mitigate this liability by targeting countries with significant influence (country clout). Shaheer and Li (2020) investigated factors influencing the internationalization speed of digital innovations through tracking Apple apps. Cultural, administrative, geographic and economic distances emerge as barriers to user adoption, hindering app internationalization. Mobile apps can adopt social sharing and virtual community strategies to alleviate the negative impact of distance on international penetration speed.

While these studies shed light on the challenges MNEs (and their mobile apps) encounter during internationalization and propose solutions to overcome such hurdles in the digital realm, there remain unexplored areas warranting further research. Firstly, prior studies primarily focus on the adverse effects of foreignness when MNEs digitally penetrate foreign markets, particularly in terms of penetration speed (Chen *et al.*, 2019; Shaheer *et al.*, 2020; Shaheer and Li, 2020). Yet, there is a need to explore the advantage of foreignness in the digital domain and consider various dimensions of performance in assessing mobile app internationalization. Secondly, while several strategies to mitigate the liability of outsidership have been proposed, factors related to long tail users have been overlooked. Given the increasing significance of long tail users in the digital sphere (Brynjolfsson *et al.*, 2011), understanding how they influence firm strategy and performance is imperative.

This study seeks to address these research gaps by centering on the advantage of foreignness in a digital world and elucidating how MNEs can leverage this advantage for successful internationalization.

Hypothesis development

Advantage of foreignness in a digital world

I propose that the advantage of foreignness over local firms stems from MNEs capability to cater to the specific needs of long tail users in a digital environment. The term “long tail” refers to the phenomenon where niche products or services collectively constitute a significant portion of total sales (Anderson, 2004). In the digital realm, digitalization facilitates the satisfaction of these long tail users’ needs more easily (Adner *et al.*, 2019; Brynjolfsson *et al.*, 2011). For instance, Brynjolfsson *et al.* (2011) found that the Internet channel exhibits a less concentrated sales distribution compared to traditional channels, supporting the prevalence of long tail use in the digital world.

In this study, long tail users denote individuals in the host country with needs that can only be met by foreign apps. They may include foreigners or immigrants residing in the host

country or locals with experiences in foreign countries or aspirations to travel or live abroad. MNEs hold an advantage over local firms in serving these long tail users in the digital realm for several reasons.

Firstly, long tail users may have accustomed themselves to using foreign apps while residing abroad, thus exhibiting inertia in their app usage behavior. In the digital context, inertia is defined as “user attachment to, and persistence in, using an incumbent system (i.e. status quo), even if there are better alternatives or incentives to change” (Polites and Karahanna, 2012, p. 24). Users tend to develop inertia in using mobile apps. Kim and Kang (2016) argued that users maintain a mobile app due to familiarity with its service content, such as features and functions, to avoid spending extra time and efforts to learn a new one. For example, many Chinese returnees continue to use Google as their primary search engine, despite alternatives available in their home country. Additionally, inertia may arise from switching costs imposed by firms, such as loyalty program benefits, which deter users from switching to alternative apps. For instance, returnees who have attained high-tier status in hotel loyalty programs may continue using those chains’ apps to maintain their benefits, such as free breakfast and lounge access.

Secondly, even if some long tail users may initially prefer local apps, they may be compelled to adopt foreign apps to communicate or connect with individuals in other countries who primarily use foreign apps. This is due to the direct network effect of online platforms, wherein the value of the platform increases as the number of users grows (McIntyre and Srinivasan, 2017; Katz and Shapiro, 1985). For instance, many Chinese people use WhatsApp, a foreign mobile app in China, to communicate with foreigners overseas. Similarly, many overseas Chinese use WeChat, a Chinese mobile app that is considered foreign in the USA, to communicate with their relatives and friends in China.

Thirdly, foreign apps may offer superior products or services in certain markets compared to local alternatives. When users require products or services from foreign countries, foreign apps are often preferred over local ones. For instance, global platforms like Airbnb offer a wider range of accommodation choices for travelers compared to local apps (Guttentag *et al.*, 2018).

These long tail users become an asset for MNEs when internationalizing in the digital world (Burton and Saelens, 1986). The capability to serve long tail users becomes a competitive advantage for foreign apps over local ones. Daily usage time serves as a crucial performance indicator to assess users’ attachment to a specific mobile app (Teo and Lim, 2000; Lee *et al.*, 2016). The advantage of foreign mobile apps can translate into higher average daily usage time than local apps because the products or services they offer to satisfy the needs of long tail users have no substitutes (McLean *et al.*, 2020). For instance, travelers planning holidays abroad may spend considerable time on foreign apps such as Airbnb and Expedia before their trips, resulting in higher daily usage times for these apps compared to local alternatives. I then predict that:

H1. Foreign mobile apps have higher average daily usage time per user than local mobile apps.

Multinational enterprise strategy to maximize advantage of foreignness

In the previous section, I compared the performance of MNEs and local firms in the digital world, highlighting that the advantage of foreignness in this context stems from MNEs’ ability to cater to the specific needs of long tail users in the host country. In this section, I shift my focus to MNEs and examine potential strategies to maximize the advantage of

foreignness, particularly in increasing their daily usage time. Given that several strategies are exclusive to MNEs, I solely consider MNEs without comparing them to local firms.

The selection criterion for the variables to be considered is their influence on the extent to which an MNE can benefit from the advantage of foreignness by serving long tail users, which is the proposed mechanism of the main result. Centering around the idea of meeting the needs of long tail users, three variables are considered: the number of potential long tail users in a host country, MNE's diversity of prior international experience and MNEs' business model.

The first variable, the number of immigrants from an MNE's home country in the host country, is linked to the total number of potential long tail users. The greater the number of potential long tail users, the higher the likelihood that an MNE will benefit from the advantage of foreignness. When MNEs enter a foreign country, location choice becomes one of the most crucial dimensions of their internationalization strategy (Cantwell, 2009; Dunning, 1998; Gu *et al.*, 2018), a principle that extends to the digital world (Shaheer *et al.*, 2020). Thus, I first examine location-specific factors influencing the availability of long tail users in a host country.

The second variable, an MNE's diversity of international experience, reflects its capacity to understand and serve long tail users. Previous international experience is widely acknowledged as a valuable resource upon which MNEs can rely when entering a new country (Guillen, 2003; Johanson and Vahlne, 1977; Soleimani and Yang, 2022). Therefore, I explore how the diversity of an MNE's prior international experience influences its ability to cater to long tail users.

The third variable, the business model, impacts the degree to which long tail users can generate network effects. Business model plays a critical role in firm strategy (Zott *et al.*, 2011; Cavallo *et al.*, 2020), particularly in the digital realm (Brouthers *et al.*, 2016). Different business models entail varying levels of network effects, which, in turn, affect the extent to which MNEs can benefit from serving long tail users.

Number of potential long tail users The availability of long tail users in the host country is a crucial determinant of an MNE's ability to leverage its advantage in the digital world. As the number of long tail users increases, so does the advantage of MNEs over local firms in the digital sphere.

Research suggests that firms tend to internationalize by following their customers (Chou and Shen, 2014; Kabongo and Okpara, 2019). Specifically, ethnic ties established by immigrants play a significant role in driving foreign market entries (Li *et al.*, 2019; Tong, 2005; Chung and Tung, 2013). Immigrants can function as transactional communities, facilitating international business between their countries of residence and origin (Chung and Tung, 2013). For instance, Li *et al.* (2019) observed that South Korean banks tend to establish a presence in Chinese provinces with substantial South Korean immigrant populations, as these immigrants facilitate transactions between foreign firms and local stakeholders. This phenomenon also holds true in the digital realm. Immigrants from an MNE's home country constitute many long tail users in the host country. These users either develop inertia and are reluctant to switch mobile apps in the host country, or they need to use foreign mobile apps to communicate with contacts in their home country. In either case, the foreign app remains prevalent when users reside in the host country. For example, Line, a Japanese communication app, emerged as one of the top 10 communication apps in Brazil, where there is a significant population of Japanese immigrants. Similarly, Trip.com, a Chinese online travel agency (OTA), has become one of the top 10 most downloaded OTA apps globally, benefiting from the widespread presence of Chinese immigrants worldwide.

In summary, many immigrants from an MNE's home country contribute to the advantage of foreignness in the digital world by increasing the number of long tail users in the host country. Therefore, I predict:

- H2. The average daily usage time of a foreign mobile increases with the number of immigrants from its owner MNE's home country in the host country.

Multinational enterprises' diversity of international experience The advantage of foreignness is derived from an MNE's ability to satisfy the specific needs of long tail users. Here, I argue that the diversity of foreign experience accumulated by an MNE affects its advantage of foreignness in a digital world. Firms learn to bridge the gap between their home and host countries by using prior international experience as a guide for future action (Guillen, 2003; Soleimani and Yang, 2022). For example, Zhou and Guillén (2015) argued that the diversity of prior international experience encourages firms to enter new countries.

MNEs' diversity of internal experience not only refers to the number of foreign countries in which they have invested but also to the diversity in institutional contexts wherein they operate (Barkema and Drogendijk, 2007). The institutional difference between developed countries and emerging markets creates substantial costs if MNEs fail to adapt (Verbeke and Yuan, 2016). The difference in institutional contexts further influences consumer demands and preferences in different countries (Berry *et al.*, 2010). In the context of foreign mobile apps, as the diversity of an MNE's prior foreign experience increases, their capability to serve the needs of long tail users in the host country also increases. The reason is that diverse foreign experiences expose MNEs to a wide variety of user knowledge. When firms face idiosyncratic consumer demands in a new foreign country, those with diverse foreign experiences are better equipped to satisfy such needs by learning from a large pool of consumer knowledge. The diversity of an MNE's experience in other countries enhances its ability to serve specific consumer needs in a particular host country. In the study context, diversity of an MNE's experience thus increases its ability to serve the needs of long tail users.

In addition, as the diverse international experience of the MNE increases, the likelihood that some users have used the mobile app in a foreign country and continue to do so when they move to the host country also increases. In other words, diversity of an MNE's international experience also increases the possible pool of long tail users in the host country.

In summary, diversity of an MNE's international experience not only helps it better serve the needs of long tail users but also increases the potential pool of long tail users. I predict that:

- H3. The average daily usage time of a foreign mobile app increases with the level of diversity of prior international experience of its owner, MNE.

Multinational enterprises' business model The advantage of foreignness in the digital realm also hinges on the chosen business model, defined as "a system of interdependent activities that transcends the focal firm and spans its boundaries" (Zott and Amit, 2010, p. 216) to generate value (McDonald and Eisenhardt, 2020). The advent of the Internet has opened new avenues for creating and delivering value, giving rise to diverse business models (Zott and Amit, 2010). These models vary in their value propositions and rely on different factors for success (Zott *et al.*, 2011).

In the digital domain, many business models depend on the network effect, where the value to users increases with the number of other users in the network (Zhu and Iansiti,

2012). However, the nature of this effect differs across different business models. Some online platforms operate on a one-sided network effect, such as those for online communication (e.g. WhatsApp), while others rely on a two-sided network effect, such as online transactions (e.g. Amazon). Notably, ibusiness firms, which leverage the Internet and computer-based information systems to provide interactive platforms, have emerged as prominent players in the digital landscape (Brouthers *et al.*, 2016). Similar terms include “platform firms” (Stallkamp and Schotter, 2021) or “sharing-economy firms” (Parente *et al.*, 2018). The success of ibusiness firms hinges on the network effects of two-sided markets (Zhu and Iansiti, 2012), where an increase in the user base on one side of the platform enhances the value for users on the other side (Katz and Shapiro, 1985).

Transferring network effects across borders presents a challenge, even in the digital realm. The liability of foreignness manifests in various forms, including heightened communication and transaction costs (Lu *et al.*, 2022; Shin *et al.*, 2022). One of the primary hurdles for ibusiness firms during globalization lies in establishing a sufficiently large user network in foreign markets, given their lack of local embeddedness in these markets’ user communities. Previous research has underscored the difficulty of extending network externalities across borders (Chen *et al.*, 2019). User heterogeneity across countries complicates the replication of successful strategies from the home country to acquire new users abroad (Stallkamp and Schotter, 2021). The absence of a sizable network diminishes the perceived value of foreign ibusiness firms to local users, exacerbating a chicken-and-egg dilemma (Caillaud and Jullien, 2003).

The advantage of foreignness stems from MNEs’ ability to cater to long-tail users in the host country. However, given that the number of long-tail users is typically small, MNEs encounter challenges in capitalizing on the network effect with this user segment. Consequently, as an MNE’s business model increasingly relies on the network effect, the likelihood of leveraging the advantage of foreignness diminishes. Given the heavy reliance of ibusiness firms on the network effect for success, their advantage of foreignness in the digital realm is comparatively weaker. I predict that:

- H4.* The average daily usage time of foreign mobile apps is shorter for ibusiness firms than for other firms.

Data and method

Previous studies on mobile apps have primarily relied on data from Apple or Google App stores (Chen *et al.*, 2019; Wen and Zhu, 2020). While such data offer comprehensive insights into the number of available apps and downloads, they lack detailed usage information such as the number of active users or average usage time. To address these limitations, I leverage unique proprietary data from one of China’s largest mobile phone manufacturers, a global player with significant sales in numerous countries, with over 70% of its sales originating from overseas markets.

Context

To investigate the advantage of foreignness in mobile apps, I focus on the travel category for several reasons. Firstly, this category is likely to involve significant contributions from long tail users, given the highly personalized and diverse demands associated with travel experiences (Lew, 2008). Secondly, the travel category in China boasts a substantial presence of foreign mobile apps, despite the dominance of local apps in other categories (Thomala, 2020). This prevalence of foreign apps is attributed to the increasing number of Chinese

travelers exploring international destinations for tourism and business. Thirdly, the travel category encompasses a diverse array of firms with varying business models, including traditional hotel chains such as Hilton and Marriot, and online platforms like Airbnb and Booking, enabling us to examine the role of business models in the advantage of foreignness.

Sample

I begin by identifying all foreign mobile apps in the “travel and transportation” category within the app store, totaling 1,993 apps, predominantly focused on local transportation. Among these, I discern 11 foreign apps originating from six different countries, classified into three types: traditional hotel chains, online platform apps (divided into business-to-customer (B2C) and customer-to-customer (C2C) segments) and online search engines. Subsequently, I select local apps of analogous types, employing two research assistants to identify similar local apps within the travel category. Apps that do not directly compete with foreign counterparts are excluded, while prominent middle- and high-end hotel chains with a substantial presence across China are included. The high consistency (Cohen’s Kappa coefficient = 0.96) between raters underscores the reliability of the categorization process. In instances of disagreement, the author adjudicates based on available data. The final sample comprises 32 apps, including 11 foreign and 21 local mobile apps of comparable types. Table 1 shows the name, country and type of the 32 mobile apps.

Daily usage data for these 32 mobile apps in the travel category were sourced from the mobile phone manufacturer, spanning September 24, 2019, to May 31, 2020. This proprietary data is augmented with variables obtained from publicly accessible sources, including the mobile manufacturer’s app store, a reputable third-party information provider, Qi Mai Data [1] and data published by the World Health Organization to account for the COVID-19 pandemic.

Variables

Dependent variables. The *daily usage time* is the average use time (in minutes) of each active user in a day. Active users are those who use the app on a particular day.

Independent variables To test *H1*, I set *foreign* as a dummy variable that equals one if a mobile app is provided by a foreign firm and zero otherwise.

To test *H2*, I measure the number of long tail users by *immigrant*, defined as the natural logarithm of immigrants in China from an MNE’s home country in 2019. The data are published by the National Bureau of Statistics in China.

To test *H3*, I measure the *diversity of international experience*, which is the natural logarithm of the number of countries where an MNE operates by the end of 2019. This variable is the number of countries in which a hotel chain has accommodations, or for online platforms, the number of countries in which the MNE operates. A high value indicates high diversity of experience.

To test *H4*, I use a dummy variable *ibusiness* to measure whether a mobile app belongs to an ibusiness firm or not. Both B2C and C2C platforms are identified as ibusiness firms, which rely on two-sided network effects.

Control variables I include a list of control variables at different levels. The first set is at the mobile app level, including *user rating* and *app size*. *User rating* is the average score received by a mobile app that reflects its perceived quality. As the perceived quality increases, the likelihood that users use the app also increases. *App size* is the total size of the mobile app. A large size can imply more functions, which can increase the time a user spends on the app.

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Name	Country	Type
Accor	France	Hotel chain
Agoda	Singapore	B2C
Airbnb	USA	C2C
Atour	China	Hotel chain
Booking	Netherlands	B2C
Ctrip	China	B2C
Dossen	China	Hotel chain
Elong	China	B2C
Fliggy	China	B2C
Green tree	China	Hotel chain
Hilton	USA	Hotel chain
Home Inn	China	Hotel chain
Huazhu	China	Hotel chain
Hyatt	USA	Hotel chain
iGola	China	Search
IHG	UK	Hotel chain
Mafengwo	China	C2C
Marriot	USA	Hotel chain
Meituan Minsu	China	C2C
OYO	India	Hotel chain
Podinns	China	Hotel chain
Qunar	China	B2C
Qyer	China	B2C
Shangri-la	China	Hotel chain
Skyscanner	UK	Search
Tongcheng	China	B2C
TripAdvisor	USA	C2C
Tujia	China	C2C
Tuniu	China	B2C
Wehotel	China	Hotel chain
WYN88	China	Hotel chain
Xiaozhu	China	C2C

Table 1.

List of app name, country and type

Source: Author's own work

The second set of control variables concerns time. Users may install and use a newly updated mobile app. Therefore, I control for this effect by *update time*, which is the number of days since a mobile app's latest update. Usage time is also influenced by proximity to a long holiday (more than two consecutive days), when people tend to travel. I control for this effect by using *time to holiday*, which is the number of days left to the next long public holiday. People also have extra time to spend on their mobile phones on holidays. I control for this effect using a dummy variable *rest*, which equals one for Saturday or Sunday and zero otherwise. The COVID-19 pandemic creates a huge environmental shock for all businesses worldwide (Donthu and Gustafsson, 2020; Van Assche and Lundan, 2020), but more so for the travel category. The pandemic outbreak prevents people from moving around both domestically and internationally. I measure the effect of COVID-19 by *infected number*, which is the number of newly confirmed cases in China in a day.

Cross-national distance also matters in the international penetration of mobile apps (Shaheer and Li, 2020). Following literature (Berry et al., 2010), I measure *cross-national distance* as the Mahalanobis distance in nine dimensions between a mobile app's home

country and China, including economic, financial, political, administrative, cultural, demographic, knowledge, global connectedness and geographic distance. Different distance dimensions are standardized, and then an average value as cross-national distance is computed. Home country dummies are also controlled for to avoid other potential home country effects.

Model

The unit of analysis is the mobile app-day, yielding a panel data structure. Fixed effect estimation may be preferred to mitigate biases due to unobserved factors that vary across mobile apps and may influence usage. However, this estimation appears infeasible in my context, given that the sample has a relatively short time span (251 days) and several key variables, such as my independent variable, remain constant. Therefore, the random effect model estimations are used in my main analyses. Stata command *xtreg* with random effect is used to run the regressions.

Results

Tables 2 and 3 present the means, standard deviations and correlations for the variables used in the regressions, encompassing the full sample and the subsample of foreign mobile apps, respectively. I use the full sample to test *H1* and the subsample of MNEs to test *H2–H4*. All correlations between independent and control variables are below 0.50, indicating no significant multicollinearity issues. Additionally, the variance inflation factor (VIF) of each regression model is examined, with an average VIF of 3.11, well below the threshold of 10, indicating no severe multicollinearity concerns.

Table 4 lists the main regression results in six models. The dependent variable of the models is *daily active user*. Models 1 and 2 use the full sample, and Models 3–6 use the subsample of foreign mobile apps. Models 1 and 3 are the baselines, which include only control variables. In Model 1, *app size* is positive and significant, suggesting that users spend more time on large apps. *Rest* and *infected number* are negative and significant, showing that users are less likely to spend considerable time on travel mobile apps during nonworking days when the number of potential COVID-19 infected people is high. In Model 3, *app size* and *infected number* remain significant and with the same sign. *User rating* is positive and significant, which means that users spend greater time on foreign apps with a high level of quality. *Update time* and *time to holiday* are negative and significant, which

No.	Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9
1	Daily usage time	4.99	2.56	1.00								
2	Foreign	0.33	0.47	0.14	1.00							
3	User rating	55.16	22.79	0.32	0.02	1.00						
4	App size	18.22	22.76	0.19	0.25	−0.06	1.00					
5	Update time	0.33	0.47	−0.03	0.00	0.00	0.03	1.00				
6	Time to holiday	14.88	12.66	−0.01	−0.02	0.03	0.02	0.06	1.00			
7	Rest	4.27	0.54	0.12	−0.33	−0.13	−0.16	0.00	0.01	1.00		
8	Infected number	407.51	1,311.81	−0.14	0.00	0.00	0.10	0.00	−0.20	−0.01	1.00	
9	Distance	0.60	0.85	0.16	0.49	0.02	0.22	−0.02	−0.01	−0.25	0.00	1.00

Table 2.

Descriptive statistics
and correlation
matrix (full sample)

Notes: *N* = 6,233. Pearson correlations, two-tailed. Correlations with an absolute value >0.03 are significant at the 0.01 level of confidence

Source: Author's own work

Table 3.
Descriptive statistics
and correlation
matrix (foreign
mobile apps only)

No. Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11
1 Daily usage time	5.49	3.19	1.00										
2 Immigrants	0.37	1.02	0.06	1.00									
3 Diversity of experience	3.14	1.73	0.15	-0.45	1.00								
4 ibusiness	0.46	0.50	-0.45	0.13	0.34	1.00							
5 User rating	55.65	22.94	0.55	-0.11	-0.37	-0.28	1.00						
6 App size	26.32	31.81	-0.28	0.14	0.00	-0.03	-0.04	1.00					
7 Update time	0.33	0.47	-0.01	0.01	0.00	0.01	0.00	0.02	1.00				
8 Time to holiday	14.61	12.48	0.03	-0.02	-0.04	-0.03	0.07	0.00	0.06	1.00			
9 Rest	4.02	0.75	0.31	-0.25	-0.01	-0.78	-0.13	-0.13	-0.01	0.03	1.00		
10 Infected number	406.87	1,311.30	-0.08	0.02	0.01	0.03	0.00	0.09	0.00	-0.19	-0.03	1.00	
11 Distance	0.79	1.19	0.28	-0.41	0.02	-0.40	0.06	-0.25	-0.22	0.06	0.27	-0.05	1.00

Notes: $N = 2,077$. Pearson correlations, two-tailed. Correlations with an absolute value > 0.04 are significant at the 0.01 level of confidence
Source: Author's own work

implies that users are likely to spend more time on a foreign app that is newly updated and when a holiday is near. *Distance* is negative and significant, indicating that users spend less time on foreign mobile apps from distant countries.

In Model 2, the independent variable *foreign* is added, and the results show that the coefficient is positive and significant ($\beta = 9.64$; $p < 0.000$). Thus, foreign mobile apps have longer daily usage time than local ones. Therefore, *H1* is supported. Using parameters in Model 2 and holding all other variables constant, users spend 9.64 min longer on foreign apps than on local ones each day.

Models 3–6 focus on foreign mobile apps. In Model 3, I add the independent variable *immigrants*, which is positive and significant ($\beta = 2.03$; $p < 0.000$). One unit increase in the log number of *immigrants* can increase daily usage time by 2.03 min. Therefore, *H2* is supported. In Model 4, I add the independent variable *diversity of experience*, which is positive and significant ($\beta = 0.10$; $p = 0.007$). One unit increase in the log number of *diversity of experience* can increase daily usage time by 0.10 min. Therefore, *H3* is supported. In Model 5, I add the independent variable *ibusiness*, which is negative and significant ($\beta = -5.64$; $p < 0.000$). The average daily usage time of foreign ibusiness firms' mobile apps is 5.64 min shorter than that of other types of firms. Therefore, *H4* is also supported. Model 6 is the full model. All three independent variables remain significant with the same sign.

Robustness checks

The robustness of the results is assessed through various model specifications, as outlined in Table 5. Due to space constraints, only the full model is reported. First, instead of using random-effect panel analysis, I used pooled ordinary least square regression clustered by mobile apps. Models 1 and 2 summarize the results. Second, I use the generalized least square regression model, and the results are summarized in Models 3 and 4. Next, the global pandemic in 2020 can lead to bias in my results, given that global travel is heavily influenced by COVID-19. I then restrict my sample to the pre-pandemic period, which is before Jan. 11, 2020, when China first started to publicly report the number of infected people. Models 5 and 6 summarize the results. The reference models for these robustness checks are Models 2 and 6 of Table 4, which are consistent with those in Table 5. Overall, the key empirical results are robust across different model specifications and time periods.

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Independent variables</i>						
Foreign		9.64 (2.19) [0.000]				
Immigrants			2.03 (0.12) [0.000]			0.76 (0.22) [0.000]
Diversity of experience				0.10 (0.04) [0.007]		0.29 (0.04) [0.000]
ibusiness					-5.64 (0.38) [0.000]	-6.64 (0.000) [0.000]
<i>Control variables</i>						
User rating	1.05 (0.77) [0.171]	0.95 (0.79) [0.230]	1.52 (0.10) [0.000]	1.34 (0.12) [0.000]	5.94 (0.31) [0.000]	6.17 (0.30) [0.000]
App size	0.02 (0.00) [0.000]	0.02 (0.00) [0.000]	0.06 (0.00) [0.000]	0.05 (0.01) [0.000]	0.14 (0.01) [0.000]	0.12 (0.01) [0.000]
Update time	-0.01 (0.00) [0.191]	-0.01 (0.00) [0.000]	-0.01 (0.00) [0.000]	-0.01 (0.00) [0.000]	-0.01 (0.00) [0.000]	-0.01 (0.00) [0.000]
Time to holiday	-0.00 (0.00) [0.191]	-0.00 (0.00) [0.255]	-0.00 (0.00) [0.000]	-0.00 (0.00) [0.000]	-0.01 (0.00) [0.001]	-0.01 (0.00) [0.003]
Rest	-0.15 (0.03) [0.000]	-0.19 (0.04) [0.000]	-0.14 (0.07) [0.062]	-0.14 (0.07) [0.063]	-0.20 (0.07) [0.006]	-0.20 (0.07) [0.003]
Infected number $\times 10^{-3}$	-0.25 (0.01) [0.000]	-0.25 (0.01) [0.000]	-0.17 (0.00) [0.000]	-0.17 (0.00) [0.000]	-0.19 (0.00) [0.000]	-0.20 (0.00) [0.000]
Distance	-0.30 (0.49) [0.542]	-1.01 (0.57) [0.075]	-2.39 (0.35) [0.000]	-2.38 (0.35) [0.000]	-3.09 (0.34) [0.000]	-3.20 (0.33) [0.000]
Home country dummies	Included	Included	Included	Included	Included	Included
Constant	0.98 (0.25) [0.000]	-0.25 (3.52) [0.943]	-4.52 (0.70) [0.000]	-1.88 (1.11) [0.090]	-32.94 (2.03) [0.000]	-31.40 (1.98) [0.000]
Number of observations	6,223	6,223	2,077	2,077	2,077	2,077
Wald's chi-squared	673.16	694.16	n.a.	8,004.30	9,067.66	n.a.
R-square (between)	0.31	0.55	0.98	0.98	0.99	0.99
Model significance	0.000	0.000	n.a.	0.000	0.000	0.000

Notes: Two-tailed tests. Standard errors are in parentheses. *p* values are in brackets
Source: Author's own work

Table 4.
Coefficients of
random-effect panel
regression predicting
daily usage time

Table 5.
Robustness checks

Model specification Variables	Pooled OLS			GLS		Pre-pandemic period	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	
<i>Independent variable</i>							
Foreign	8.50 (1.01) [0.000]						
Immigrants		6.63 (1.90) [0.007]	8.19 (0.67) [0.000]	1.68 (0.43) [0.000]	6.75 (2.28) [0.003]	1.00 (0.39) [0.011]	
Diversity of experience		0.29 (0.14) [0.047]		0.36 (0.08) [0.000]		0.47 (0.03) [0.000]	
ibusiness		-6.64 (2.02) [0.009]		-5.66 (0.80) [0.000]		-5.58 (0.76) [0.000]	
Control variables							
User rating	0.40 (0.87) [0.649]	6.17 [1.97] [0.012]	0.69 (0.16) [0.000]	5.51 (0.62) [0.000]	0.92 (0.82) [0.261]	4.77 (0.66) [0.000]	
App size	0.02 (0.01) [0.166]	0.12 (0.05) [0.050]	0.02 (0.00) [0.000]	0.09 (0.01) [0.000]	0.03 (0.00) [0.000]	0.08 (0.01) [0.000]	
Update time	-0.01 (0.01) [0.071]	-0.01 (0.01) [0.361]	-0.00 (0.00) [0.032]	-0.01 (0.00) [0.001]	-0.00 (0.00) [0.062]	-0.00 (0.00) [0.000]	
Time to holiday	-0.00 (0.01) [0.606]	-0.01 (0.01) [0.481]	-0.00 (0.00) [0.353]	-0.01 (0.00) [0.089]	-0.00 (0.00) [0.029]	-0.01 (0.00) [0.000]	
Rest	-0.06 (0.12) [0.626]	-0.20 (0.13) [0.155]	-0.06 (0.02) [0.001]	-0.11 (0.06) [0.050]	-0.14 (0.04) [0.000]	0.44 (0.08) [0.000]	
Infected number $\times 10^{-3}$	-0.26 (0.00) [0.000]	-0.20 (0.02) [0.003]	-0.02 (0.00) [0.025]	-0.04 (0.02) [0.023]	/	/	
Distance	-3.44 (2.89) [0.243]	-3.20 (0.62) [0.001]	-0.17 (0.29) [0.543]	-1.32 (0.46) [0.004]	-0.96 (0.62) [0.125]	-5.15 (0.46) [0.00]	
Home country dummies	Included	Included	Included	Included	Included	Included	
Constant	2.35 (4.08) [0.569]	-31.40 (14.43) [0.058]	0.88 (0.76) [0.248]	-22.32 (3.84) [0.000]	-0.17 (3.67) [0.963]	-25.36 (4.44) [0.000]	
Number of observations	6,223	2,077	6,223	2,077	2,020	703	
Wald's chi-squared	/	/	698.05	1,975.31	n.a.	n.a.	
R-square	0.45	0.82	/	/	0.41	0.99	

Notes: Two-tailed tests. Standard errors are in parentheses, *p* values are in brackets
Source: Author's own work

Discussion and conclusion

This study delves into the advantage of foreignness in the digital realm, particularly focusing on mobile apps. My findings reveal that foreign mobile apps tend to attract more usage from long tail users compared to local apps, indicating a distinct advantage. Furthermore, I uncover how MNEs can optimize this advantage by strategically leveraging factors such as the presence of immigrants from their home country, diverse international experience and judicious selection of business models.

My research contributes to existing literature in several ways. Firstly, I extend the concept of the advantage of foreignness to the digital domain, shedding light on a novel mechanism through which foreign firms gain competitive leverage (Chen *et al.*, 2019; Shaheer *et al.*, 2020). While prior studies primarily focused on traditional firms (Edman, 2016; Nachum, 2010), I highlight the significance of demand-side factors in driving the advantage of foreignness in the digital sphere. I argue that the ability to serve the needs of long tail users is the key advantage of MNEs over local firms in a digital world. We further examine three variables related to the extent to which an MNE could benefit from satisfying the needs of long tail users. This study thus advances my understanding of advantage of foreignness.

Secondly, my study enriches our understanding of MNEs' internationalization in the digital age. Contrary to the prevailing notion that MNEs face challenges due to the liability of foreignness (Chen *et al.*, 2019; Shaheer *et al.*, 2020), I demonstrate that there are indeed advantages to be gained in the digital realm. The results show that the performance implication of foreignness in the digital world is indeed complex, and I need to be specific about which dimension of performance to focus on. By offering a balanced view of the performance implications of foreignness, I provide valuable insights for navigating digital globalization.

Thirdly, I contribute to the literature on competitive strategy in the digital landscape. While previous research often centered on mitigating the negative effects of foreignness (Chen *et al.*, 2019; Shaheer *et al.*, 2020), my study emphasizes the importance of maximizing the advantages available to MNEs. Through location selection, diverse international experience and strategic business model choices, MNEs can effectively capitalize on their foreignness in the digital arena. This study therefore also helps us better understand the competitive strategy of MNEs in a digital world.

Additionally, my findings have implications for ibusiness firms, highlighting the unique challenges they face in global expansion (Brouthers *et al.*, 2016). The success of ibusiness firms depends on the direct and indirect network effects of two-sided markets. My findings suggest that the globalization of ibusiness firms is even harder than that of other MNEs due to the difficulty of generating network effect by long tail users in a foreign country.

Apart from its contributions to academic literature, this study presents important practical implications. Managers of foreign mobile apps should be aware of and prepared to overcome difficulties in attempting to internationalize in a digital world. Moreover, they must also acknowledge the benefits of being foreign in such context and capitalize on their valuable long tail users in a host country. For example, additional value may be extracted from their existing users by providing extra services or products. Moreover, the internationalization strategy can be carefully selected to maximize their advantage of foreignness. Managers can select appropriate location and business model to better serve long tail users. Moreover, learning from their diverse knowledge on users in different countries can also help them increase customer loyalty in the host country. From the perspective of local mobile apps, managers need to be prepared when foreign apps enter the

market. Despite their certain benefits as local firms, local firms must pay attention to the needs of long tail users to better compete with foreign apps.

This study also has policy implications. For policymakers in the host country, they should be aware of the advantage of foreignness in the digital world. They could help domestic firms to compete with MNEs by focusing on the needs of long tail users. For example, the government could gather information on the demands of long tail users and share it with domestic firms so that they could better serve these customers. Likewise, policymakers in the home country could help its country's MNEs internationalize by connecting them with long tail users in foreign countries. For example, the government could organize activities for immigrants in foreign countries to interact with MNEs from the home country.

Nevertheless, this study has a few inherent limitations that provide opportunities for future research. First, my sample is derived from only one category, that is, travel. Although this is a common practice in the study of mobile apps to focus on one specific category (Chen *et al.*, 2019; Shaheer and Li, 2020), the generalizability of the findings is thereby limited. I call for future studies to explore new data that allow a larger sample with multiple categories to help confirm the robustness of the findings for my arguments and hypotheses.

Second, I focus on a sample of mobile app users in only one host country, namely, China. Although the arguments and hypotheses are not country-specific, China has unique characteristics, such as diverse consumer demands. Future studies must exercise caution when attempting to generalize the findings to other contexts. Further research can explore mobile apps from multiple host countries.

Although attempts have been exerted to attain comprehensiveness and include several control variables, other motivations may exist for the user adoption of mobile apps, which I cannot control in my data. For example, users may adopt a mobile app owing to its certain features. To overcome the lack of information, future studies may consider using primary data, such as surveys or interviews, rather than secondary data to provide better control for other key drivers of user adoption of mobile apps.

This study significantly contributes to the literature on the performance implications of foreignness in the digital realm by empirically examining the advantages enjoyed by foreign mobile apps compared to local ones. By highlighting the potential benefits of foreignness and elucidating strategies for MNEs to maximize such advantages, my research enriches my understanding of globalization dynamics and competitive strategies in the digital age. Consequently, my study serves as a catalyst for further exploration in this area, presenting ample opportunities for ongoing investigations to delve deeper into the complexities of digital globalization and its implications for MNEs.

Note

1. Website of the Qi Mai Data: <https://www.qimai.cn/>

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