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**SOMETHING OLD, SOMETHING NEW: LOCALIZED KNOWLEDGE  
SEARCH AND RE-DISCOVERY BY MNE SUBSIDIARY**

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**INTRODUCTION**

The international business literature in the past three decades has stressed the importance of accessing, sharing and leveraging knowledge at a global-local scale (Buckley, 2014; Buckley & Casson, 2003, 2009). However, the organizational learning literature has highlighted various hurdles in knowledge search and absorption (Cohen & Levinthal, 1990; Lichtenthaler, 2009; Zollo & Winter, 2002), and the international R&D literature has revealed the challenges to access the source of host-country knowledge and localized knowledge flows. The role and the competencies of subsidiaries have been the center of this debate (Ambos, Andersson, & Birkinshaw, 2010; Cantwell & Mudambi, 2005; Rugman & Verbeke, 2001), surrounded by insights from sociological perspectives, focusing in particular on embeddedness and legitimacy (Kostova, Roth, & Dacin, 2008; Kostova & Zaheer, 1999).

Our research intends to answer the call to investigate further institutions (Cantwell, Dunning, & Lundan, 2010) and history (Jones & Khanna, 2006) in international business (IB). We draw upon the innovation and temporal knowledge search literature

on the social and technological value of old technologies (De Massis, Frattini, Kotlar, Messeni Petruzzelli, & Wright, 2016; Katila, 2002; Nerkar, 2003). We present temporal knowledge search as a novel strategy to further the subsidiary knowledge search and absorption in the host country environment. In particular, it can help to redress three possible limitations of subsidiaries' knowledge search, i.e. subsidiaries' knowledge search is (1) inadvertent due to the ignorance of past knowledge trajectories, (2) illegitimate due to the lack of tacit "taken-for-granted" knowledge, and (3) inefficient because of the lack of dyadic absorptive capacity.

Aged knowledge in the host country — the old wisdom — dwells deep in the collective memory of local organizations and mnemonic communities. These aged pieces of knowledge form the tacit components in local knowledge networks (Tallman, Jenkins, Henry, & Pinch, 2004), representing originality (Jung & Lee, 2016) and bridging new knowledge (Cohen & Tripsas, forthcoming). MNE subsidiaries that operate based on foreign institutional logics and knowledge elements tend to overlook old wisdom, which is valued and taken for granted by local parties. The explicit and newest knowledge is particularly sought after by MNE subsidiaries. However, the negligence of the aged and tacit knowledge is likely to preclude the access and absorption of the latest and explicit.

Awareness of old local wisdom is critical for foreign subsidiaries to participate in local technological communities. Foreign subsidiaries face the liability of foreignness when attempting to access local knowledge sources (Frost, 2001; Ho, 2014). The recognition and assimilation of important old wisdom of the host countries would be the key to overcome the liability of foreignness and gain access to the last technological development in local knowledge sources. In other words, knowing old local wisdom also grants foreign subsidiaries the legitimacy for further knowledge searching.

However, because the value and visibility of this old wisdom are locally constructed, the search and absorption — recognition and assimilation — of these aged pieces of wisdom demands extraordinary efforts on the part of the MNE subsidiary. From the viewpoint of local organizations, such old wisdom is taken for granted and practiced unassumingly. However, the divergent institutional logics and knowledge base of foreign MNEs inhibits its absorption. This is particularly the case for emerging

countries MNEs (EMNE) as the immense institutional distance makes the appreciation and absorption of aged knowledge pieces arduous yet extraordinarily important.

## PROPOSITIONS

**Knowledge of past technological development.** Studies generally advise firms to focus on emerging trends and latest technological breakthroughs (De Massis et al., 2016; Messeni Petruzzelli & Savino, 2014). Latest technologies offer both greater recombinant potentials for inventors and greater market potentials for early adopters (Heeley & Jacobson, 2008). This “social norm” to focus on latest technologies (Nerkar, 2003) is also present in the IB literature. There appears to be a general belief that EMNEs must access or acquire the latest technological knowledge in order to achieve upgrading or leapfrogging development in technological and manufacturing capabilities (Piperopoulos, Wu, & Wang, 2018). Local firms in the meanwhile must rely on public research institutes and MNEs from advanced economies as channels to information, knowledge, and resources (Buckley, 2009; McDermott & Corredoira, 2009).

A temporal knowledge search with sufficient search depth may discover the original knowledge pieces hidden deep in the local technological communities. Primitive and uncertain in nature, original knowledge represents unrefined ideas, unsolved problems, untested technologies, and underexplored opportunities; thus the search of original knowledge is highly explorative and boundary-spanning and could increase the overall chance of generating path-breaking novelty (Jung & Lee, 2016). The preference for the new and latest affects the innovation decision and knowledge search path of MNE subsidiaries to overwhelmingly focus on contemporary solutions and eschew the exploration of distant wisdom.

***Proposition 1 Knowledge of past technological trajectories can optimize the choice of knowledge resources and technological opportunities***

**Legitimacy in host country knowledge community.** To fit into the technological communities in the host country, subsidiaries must consider not just the technical environment but also the regulative, normative, and cultural-cognitive forces in the institutional environment (DiMaggio & Powell, 1983; Scott, 2004). Revisiting older technologies could be a way to review past discursive activities in the field and learn about the shared frames and narratives, which are the elements of the cognitive-cultural dimension of a social field (Coraiola, Suddaby, & Foster, 2018).

Moreover, searching and remembering past could be a political act. Remembering means regaining membership of a group, reconnecting with members and their way of deploying specific categories to make sense of one's own reality. (Coraiola et al., 2018). Respecting the presence and value of local prior knowledge may also defeat the stereotype that MNEs subsidiaries were beneficiaries of unintended knowledge spillover and rid the suspicion of business espionage.

*Proposition 2 Subsidiaries may obtain legitimate access to present and future knowledge flow by temporal knowledge search*

**Relative absorptive capacity.** Although MNEs may have developed strong firm-level absorptive capacity at the home base, it is likely that subsidiaries need to re-build its relative absorptive capacity anew when seeking knowledge locally. This localized absorptive capacity requires differentiated and specialized knowledge bases to acquire and assimilate external knowledge with improved perception, scope and speed (Lichtenthaler, 2009; Zollo & Winter, 2002).

In this research, we suggest that temporal knowledge search could be an effective way to build the relative absorptive capacity at the subsidiary level. Subsidiaries may search for old and established knowledge in the local community that has been well articulated and explicated and use it as the basis for a localized knowledge base. Secondly, to remember past knowledge is also to embrace a particular way of looking at the world from the viewpoint of a particular group's past knowledge (Coraiola et al., 2018). The process of searching and familiarizing with old local wisdom also shapes a localized cognitive scheme through which subsidiaries may further communicate and connect with local technological communities. Lastly, older technologies could also serve as a bridge to new knowledge (Cohen & Tripsas, forthcoming). Subsidiaries that have compiled a knowledge base of older technologies will be capable of discerning and fathoming the latest development in local technological communities.

*Proposition 3 Subsidiaries may develop dyadic absorptive capacity by temporal knowledge search*

## **DATA AND METHOD**

Our analysis is based on 28 world leader corporations specialized in Integrated Circuits (IC) design. These include multinational enterprises such as ARM and Qualcomm, the leading suppliers of IC products for mobile devices globally. Leading IC design companies tend to operate a global network of design centers in the service of local

business clients. For instance, the renowned Sophia Antipolis cluster in France as well as the Scottish semiconductor cluster used to attract the investment of some of these companies. We track and analyze the patenting records of these 28 corporations from the early 1970s to 2017 and profile their R&D globally.

The research is organized in two stages (I & II). In stage I, we compile a novel dataset of world-leading semiconductor design MNEs and their global subsidiaries. In stage II, we turn our attention to the knowledge sourcing and knowledge dynamics in the semiconductor design industry, which is of great strategic importance to the future development of the Taiwanese economy. In the following section, we explicate the data collection scheme and our approaches to various empirical challenges.

### **INTENDED CONTRIBUTIONS**

1. While empirical investigation on the implications of old technologies remains scarce (Capaldo, Lavie, & Messeni Petruzzelli, 2017; Heeley & Jacobson, 2008), we contribute to this literature by employing a novel dataset from the semiconductor design industry. We compile and chronicle the patenting and citation records of world-leading semiconductor design MNEs. Our empirical analysis provides insights on the social and technological value of temporal knowledge search.
2. An important stream of the IB literature has developed towards a combination of sociological and economic approaches in analyzing subsidiary knowledge search and creation. Through the investigation of the social and technological value of old technologies, this research intends to participate and contribute to this ongoing discussion.
3. The current innovation literature overwhelmingly focuses on the pharmaceutical and biotechnology industry (see e.g. Kapoor & Klueter, 2015; Khanna, Guler, & Nerkar, 2016). However, semiconductor manufacturing and design remain the strategic industry of significant importance to the Taiwanese economy. Hence, this research intends to renew the interests among management scholars on the development of the semiconductor industry.

