



# Understanding MNEs' decline in the adoption of locally developed technology standard in China: A positioning and cognitive perspective



Xudong Gao<sup>a,\*</sup>, Martina Gerst<sup>b</sup>, Rongling Sun<sup>b</sup>

<sup>a</sup> Tsinghua University Research Center for Technological Innovation, School of Economics and Management, Tsinghua University, Beijing 100084, China

<sup>b</sup> School of Economics and Management, Tsinghua University

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## ABSTRACT

Asian countries are becoming more and more active in participating technology standard development. In this paper we study the impact of this change on multinational enterprises (MNEs) using the case of TD-SCDMA, an international technology standard of 3G mobile communications. During the development of this technology standard, MNEs' market share dropped dramatically. A major contribution of this study is analyzing the underlying mechanism governing MNEs' interpreting TD-SCDMA as a threat rather than an opportunity by integrating two streams of literature. We also discuss the possible strategies for MNEs to maintain their market leadership position when local firms are able to lead international technology standard development.

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## 1. Introduction

Asian countries such as Korea and China are becoming more and more active in participating technology standard development (Choung, Hameed, & Ji, 2011; Ernst, 2009; Jho, 2007; Lee & Oh, 2006; Suttmeier, Yao, & Tan, 2006). For example, TD-SCDMA (time division synchronous code division multiple access) is based mainly on technologies from Datang Telecom Technology and Industry Group (Datang), a local Chinese firm, and was accepted as a 3G international technology standards by the International Telecommunications Union (ITU) in May 2000. TD-LTE ADVANCED, the next generation technology of TD-SCDMA, became a 4G technology standard in 2012.

The extant literature has studied in detail the achievements of Asian countries' participating technology standard development (Fomin, Su & Gao, 2011), the background and motivations (Chen, Fan, & Lu, 2002; Vialle, Song, & Zhang, 2012; Yu, Zhang, & Gao, 2012), the processes (Hu, Wan, Lv, & Xu, 2012; Kshetri, Palvia, & Dai, 2011), and challenges (Yan, 2007). However, an under-researched area is the impact of the development of home grown technology standards from Asian countries on MNEs.

For example, with the official adoption of TD-SCDMA in 2009, MNEs' market share in the telecom equipment market declined significantly.<sup>1</sup> Before TD-SCDMA, the Chinese telecom equipment market, especially the wireless equipment

\* Corresponding author.

E-mail address: [gaoxudong@sem.tsinghua.edu.cn](mailto:gaoxudong@sem.tsinghua.edu.cn) (X. Gao).

<sup>1</sup> The telecom industry is a complex eco-system, including the service providers such as China Mobile, equipment makers such as Ericsson and Huawei, who provide base stations, switches, routers, servers, and other kinds of equipment, handset makers such as Apple, Samsung, and Nokia, and integrated

market, was dominated by MNEs (Lou, 2008): Leading local telecom equipment firms such as Huawei, ZTE, and Datang were not the key players in China, and accounted for a small percentage of the market (for GSM, about 5%; for CDMA, about 10%) (Li, 2006). After TD-SCDMA, local firms' market share rose dramatically in 2009: in TD-SCDMA, more than 80%, and in the overall 3G (TD-SCDMA+WCDMA+CDMA2000) market, more than 75%. Table 1 shows key equipment suppliers' market share in TD-SCDMA and TD-LTE in China. Please note that the figure for 2009 is the accumulated market share of TD-SCDMA equipment up to 2009, and the figure for 2010 is the market share for newly increased equipment in that year.

In this paper we aimed to explore the question of why MNEs failed to keep their market leadership position in TD-SCDMA, and develop some insights into the following questions: Is it inevitable that MNEs' market share would decline with the development of technology standards from host countries? If not, what strategies should MNEs take to maintain their competitiveness?

To our knowledge, this study is the first to explore the phenomenon of MNEs' decline in TD-SCDMA, and we chose to focus on identifying the underlying mechanism driving this phenomenon through the examination of a series of 'why' and 'how' questions (Yin, 1989: 15–20), so we used a case study method (Eisenhardt, 1989; Glaser, 1978; Glaser & Strauss, 1967; Strauss & Corbin 2008). As will be analyzed in the following, we found that MNEs did not perceive TD-SCDMA as an opportunity and played very limited roles in the development of this technology (Gao & Liu, 2012; Xia, 2011, 2012; Zhan & Tan, 2010), and this contributed to their decline. We also found that it is necessary to integrate two streams of literature (how to position themselves as MNEs go global, and the cognitive explanation of leading firms' failure in radical changes) to understand why MNEs did not perceive TD-SCDMA as an opportunity.

The paper is organized as follows. First, we review the theoretical background, focusing on the two most relevant streams of literature for this study. We then introduce the research methods, report the key findings, and discuss why MNEs failed to interpret TD-SCDMA as an opportunity for them. Finally, we conclude with a discussion of the contributions and limitations of the study, and opportunities for additional research.

## 2. Theoretical background

The development of technology standards has been dominated by advanced countries and MNEs (Su & Fomin, 2010; Updegrove, 2007), and the increasingly active participation of Asian countries represents a big change for MNEs. To deal with the changing environment, the extant literature recognizes the importance for MNEs to learn continuously, develop global dynamic capabilities, and deploy effective strategies (Easterby-Smith & Prietow, 2008).

The extant literature also recognizes that correctly making sense of the environmental changes is an important condition to address the changes. For example, in the photolithographic industry incumbent firms failed because they did not realize that an architectural innovation is really different from their existing technology and would be a real threat (Henderson, 1993; Henderson & Clark, 1990). Gilbert (2005) finds that most firms in the newspaper industry failed to respond to the emerging of digital publishing because they did not perceive this change at the early stage as a big threat for them.

However, there is a research gap in the extant literature. Specifically, there are mixed answers to the following question: how could MNEs correctly make sense of the nature of environmental changes? For example, is the development of TD-SCDMA an opportunity or a threat for MNEs? Should MNEs adopt a reactive strategy, an anticipatory strategy, a defensive strategy, or a proactive strategy (Oliver & Holzinger, 2008)? To guide our research and close this research gap mentioned above, we selected two streams of literature that are closely related to the interpretation of environmental changes such as the development of TD-SCDMA as opportunity or threat for MNEs after broadly examining the extant literature.

The first stream of literature is about how MNEs position themselves in the globalization process, and contains two contrasting perspectives. The first perspective could be described as positioning MNEs as outsiders of the host country, and is heavily influenced by Stephen Hymer (1976), whose central argument is that MNEs entering a foreign market must possess an internally transferable 'advantage', which could offer quasi-monopolistic opportunities to outcompete local firms in host countries. Accordingly, MNEs' international expansion is a process of exploiting its home developed superior resources such as core technologies and advanced management capabilities (Kogut & Zander, 1995). Hymer's study actually indicates an uneven development with MNEs and advanced countries as the dominant side, and local firms and developing host countries as the subordinate side. If MNEs take this perspective, it is more likely for them to perceive TD-SCDMA as a threat.

The second perspective could be described as positioning MNEs as insiders of the host country, and recognizes not only the role of MNEs' superior resources but also the importance of local complementary assets. For example, Hennart (2009) argues that MNEs entering foreign markets to exploit their firm specific advantages must bundle these advantages with local complementary assets. MNEs' internationalization is theorized as an entrepreneurial process that emphasizes the identification of opportunities and taking advantage of these opportunities through learning of the host country market, creating new knowledge, and building relationships and trust with partners. This process is influenced by not only MNEs'

(footnote continued)

circuits providers such as Qualcomm, TI, and MediaTek. In this industry, technology standards play a crucial role in governing the industrial evolution. When a new technology is emerging, the development of equipment usually leads that of handsets. For this reason, in this paper we focused more on MNEs in the equipment segment.

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