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**Title:** Subsidiary capability upgrading and parent-subsidiary relationship: insights from a Chinese acquisition in the UK

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**DOI:** [10.1108/S1745-886220150000010012](https://doi.org/10.1108/S1745-886220150000010012)

**Example citation:** He, S. and Khan, Z. (2015) Subsidiary capability upgrading and parent-subsidiary relationship: insights from a Chinese acquisition in the UK. In: van Tulder, R., Verbeke, A. and Drogendijk, R. (eds.) *The Future of Global Organizing*. Bingley: Emerald. pp. 127-141.

It is advisable to refer to the [publisher's version](#) if you intend to cite from this work.

**Version:** Accepted version

**Official URL:** <http://www.emeraldinsight.com/doi/abs/10.1108/S1745-886220150000010012>

<http://nectar.northampton.ac.uk/7621/>



## **Subsidiary capability upgrading and parent-subsidiary relationship: insights from a Chinese acquisition in the UK**

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### **Abstract**

#### **Purpose:**

- This study aims to explore capability upgrading of EMNE's subsidiaries in developed countries and how the parent-subsidiary relationship influences such upgrading.

#### **Design/methodology/approach:**

- The study adopts an interdisciplinary approach to capability upgrading of EMNEs subsidiaries in developed countries. It employs a single case study to explore this under-research area.

#### **Finding:**

- the analysis challenges the orthodox view and suggests broad based capability upgrading has taken place in the EMNE acquired subsidiaries ranging from product, process, functional to intersectoral. In addition, the capability upgrading was contingent on the degree of subsidiary autonomy and subsidiary mandates.

#### **Originality/value:**

- This study represents one of the first to examine capability upgrading and parent-subsidiary relationship in the context of EMNEs' internationalisation activities.

**Key words:** emerging economy multinational enterprises, capability upgrading, subsidiary, China, parent-subsidiary relationship, autonomy, mandates

## 1. INTRODUCTION

The focus of this study is about capability upgrading of an EMNE's subsidiary in a developed country and how the parent-subsidiary relationship influences such upgrading. There has been a recent surge in the study of emerging economy multinational enterprises (EMNEs) and their OFDI activities (Mathews, 2006; Luo and Tung, 2007; Hennart, 2012). There is also a vast literature on subsidiary evolution and parent-subsidiary relationship, the vast majority of which, however, are written in the context of developed economy multinational enterprises (DMNEs) and their subsidiaries (e.g. Birkinshaw and Hood, 1998; Cantwell and Mudambi, 2005). In addition, recently the global value chains (GVCs) literature has attempted to understand upgrading potential of chain members focusing on governance structures. Although there is some limited interdisciplinary dialogue, we believe there is lot to gain by integrating insights from the aforementioned literature.

With this belief in interdisciplinary approach, we undertook a case study of a recent Chinese acquisition in the UK in order to gain a better understanding of capability upgrading and parent-subsidiary relationship in the context of EMNEs' internationalisation activities. Our findings challenge the orthodox view and suggest broad based capability upgrading has taken place in the EMNE acquired subsidiaries ranging from product, process, functional to intersectoral. In addition, the capability upgrading was contingent on the degree of subsidiary autonomy and subsidiary mandates.

## 2. THEORETICAL FOUNDATIONS

IB scholars have been interested in understanding subsidiary evolution for quite some time. Most studies have focused on the visible charter or mandate of the subsidiary, usually resulting in an emphasis on change in a hierarchy of roles or functional areas such as market, production and development or a simple two stage mandate evolution from competence-exploiting to competence-creating (see, for example, Cantwell and Mudambi, 2005; Collinson and Wang, 2012; Dörrenbächer and Gammelgaard, 2006; Hobday and Rush, 2007).

Despite the insights offered by these studies, it is the capability upgrading definition in the GVC literature that we choose to adopt. In this literature, upgrading involves organisational learning to improve the position of firms in global production networks (e.g., Gereffi, 1999). In particular, it specifies four types of upgrading: product upgrading where firms move into more sophisticated product lines increasing unit values, process upgrading so that firms produce more efficiently by re-organising the production system or introducing superior technologies, functional upgrading represents a move up into new functional areas in the value chain such as design or marketing, intersectoral upgrading exemplifies a horizontal move into new sectors applying existing competences (Humphrey and Schmitz, 2002; Giuliani et al., 2005).

The GVC approach to capability upgrading therefore enables a comprehensive understanding and examination of the phenomenon with the ability to capture capability development beyond functional upgrading. In addition, it also insightfully points out that the upgrading outcome is affected by the

governance structure of the value chains, i.e. the nature of relationships among various actors in the value chain (Humphrey and Schmitz, 2002). However, this literature has rarely opened the ‘black box’ of the hierarchy structure and therefore has little to say on the relationship between parent firms and subsidiaries and its impact on subsidiary upgrading.

Studies in other strands of literature, however, suggest that the relationship between the parent firm and its subsidiary is far more complicated than a simple hierarchy structure could describe. Ghoshal and Nohria (1989) and Gupta and Govindarajan (1991), for example, argue that there are different control and coordination mechanisms under the single label of hierarchy suggesting different relationships between parent firms and their subsidiaries and this affects subsidiary growth and performance. Recent literature indicates that there are circumstances in which subsidiaries enjoy certain degrees of autonomy and that parent firms either find it hard to control and monitor subsidiaries or they intentionally encourage local entrepreneurship and innovation (Ambos et al., 2010; Birkinshaw et al., 2010; Forsgren & Holm, 2010; Mudambi, 2011).

We therefore believe that there are a variety of parent-subsidiary relationships. At one extreme is the traditional ‘hierarchical monolith’ MNE where the parent exerts tight control over its subsidiaries (Mudambi, 2011). At the other is an interorganisational network of loosely coupled entities where subsidiaries enjoy a high level of autonomy (Birkinshaw and Hood, 1998). Between them are, however, an array of other relationships where subsidiaries are neither tightly controlled by the parent nor do they enjoy absolute autonomy. These different relationships between parent firms and the subsidiaries hence represent different governance structures which in turn have different implications for capability upgrading as suggested by the GVCs literature. We therefore propose that it is important to examine the role of parent-subsidiary relationship and, in particular, the degree of subsidiary’s autonomy, in influencing upgrading outcomes.

Building upon the above literature, below we present a single case study in order to understand the upgrading outcomes that an EMNE may bring to their subsidiaries in developed countries. Data were collected from primary interviews and publicly available secondary sources.

### **3. COMPANY BACKGROUND**

The UK is one of the leading destinations of Chinese OFDI in developed countries (Clegg and Voss, 2012). Over the last few years there have been a number of Chinese acquisitions in different industries in the UK including Shanghai Automotive Industry Corporation’s (SAIC) take-over of MG Rover in the engineering industry, Bright Food’s acquisition of a majority stake in the cereal maker Weetabix and Dalian Wandai’s purchase of the yacht maker Sunseeker International. In many of these cases, the acquired British firms were internationally well-known and held renowned brands. Many of them had a long tradition and proud history and they were technology leaders in their sub-sectors. They tend to be medium-sized enterprises while their Chinese parent companies were considerably larger.

This is also the case for the companies we are studying. The origin of Dynex began in 1956 in Lincoln of the UK manufacturing some of the first silicon based semiconductor components in the world. Over the years the business has become one of the world’s leading suppliers of specialist, high power

semiconductor products. It designs and manufactures high power bipolar discrete semiconductors, power modules including insulated-gate bipolar transistors (IGBTs), and high power electronic assemblies. Its products are widely used in power electronic applications including electric power generation, transmission and distribution, marine and rail traction drives, aircraft, industrial automation and controls.

In October 2008 the Chinese-based Times Electric bought 75% of stake and became its majority owner. It is mainly engaged in the research, development, manufacture and sales of locomotive train power converters, control systems and other train-borne electrical systems, as well as the development, manufacturing and sales of urban railway train electrical systems. It is also engaged in the design, manufacturing and sales of electric components including power semiconductor devices for the railway industry, urban transit and non-railway purposes. Times Electric is listed on the Hong Kong stock exchange and majority owned by CSR China, one of the largest railway equipment supplier in the world. CSR China is quoted in Shanghai and Hong Kong but is itself majority owned by the Chinese State-owned Asset Supervision and Administrative Commission.

As with other leading Chinese firms, CSR China also accelerated its internationalisation in recent years. It only recorded overseas revenue of \$59m in 2001. This, however, quickly jumped to \$1bn in 2011. In the first half of 2012, its overseas revenue doubled the same period a year ago and represents 11.3% of its total revenue. CSR China has established R&D centres in the UK and USA respectively, with the former achieved by Times Electric's acquisition of Dynex in Lincoln. In 2013, the company started to build manufacturing facilities in both Turkey and Malaysia. Table 1 shows important information about the company.

Table 1 Basic company information before the acquisition:

	Sales revenue (£)	Gross profit (£)	Fixed assets (£)	Employees
Times Electric	154.2m	67.6m	77m	2,830
Dynex	14.1m	3.3m	0.6m	250 (in year 2008)

Source: companies' 2008 annual reports (Times Electric's finance figures are based on £1=10RMB)

#### 4. ANALYSIS AND RESULTS

The acquisition by Times Electric in 2008 gives Dynex much improved access to the Chinese market which is less affected by the financial crisis. Mainly because of this, Dynex is still thriving whilst many other businesses are struggling. The number of employees at Dynex, for example, has grown from fewer than 250 in 2008 to 315 in 2013.

One of the most significant impacts is the financial stability the new parent company brought to Dynex. With financial support from Times Electric, Dynex built a 12 million pounds new R&D centre to focus on developing IGBT technology. Times Electric also helped Dynex to secure finance and build two new IGBT fabrication lines with £12 million investment, upgrading its production facilities. In addition, the parent company helped to acquire the freehold of land and buildings used by Dynex in Lincoln, giving it greater operational flexibility which help the company to decrease its overhead costs.

All these steps proved to be transformational for Dynex in the last few years. Its sales revenue has grown from \$30.2 million in 2007 to \$39.6 million in 2012 despite the wider unfavourable economic environment. This also resulted in major changes in its revenue by region. Strong demand in China has seen the country's share of revenue increased from less than 10% in 2007 to 38% in 2012 whilst the share of Europe dropped from 68% to 38% in the same period.

#### **4.1. Evidence of capability upgrading**

##### ***4.1.1. Process upgrading***

Since the take-over in 2008, Dynex has been able to upgrade its production facilities with significant help and investment from Times Electric. Dynex installed a new 6-inch bipolar thyristor wafer fabrication line in 2009 which enabled it to produce high power thyristor products. These products are suitable for use in high voltage direct current (HVDC) converter valves which are preferred for use in long distance electric power transmission and for the interconnection of national grid networks. (Dynex, 2011).

In 2011 Dynex completed a £12 million project to install two new 6-inch IGBT wafer fabrication production lines to upgrade and expand its fabrication facility for silicon chips to be used in IGBT modules. The new IGBT lines replaced its existing production line, which was originally set up over 20 years ago and processed 4-inch diameter silicon. With increased technology ability, they enabled Dynex to increase production capacity approximately tenfold with resultant large volume chip manufacturing for the first time in the company's history.

##### ***4.1.2 Product upgrading***

Product upgrading was also evident in Dynex. The 6-inch bipolar thyristor wafer fabrication line installed in 2009, for example, has helped the company to increase capacity and extend power rating of its i2 thyristor products, leading to the release of the larger 125mm 8.5kV HVDC thyristors. The extension of the i2 range of thyristors continued through 2011 with the development of a 150mm thyristor which will lead the company into a new generation of high performance products. With the new wafer fabrication facility, the improved thyristor technology and new purpose built high voltage test centre, Dynex is well positioned to develop leading edge thyristor technology for many years to come (Dynex, 2013).

During the second half of 2011, Times Electric transferred production of lower power (and therefore lower margin) bipolar products from Dynex to the parent company. This enabled Dynex to concentrate its bipolar business on the production of higher power, higher margin parts in future (Dynex, 2012).

#### ***4.1.3 Functional upgrading:***

At the first glimpse, functional upgrading seems impossible for Dynex as the company has already had a decent record in R&D and design and already fulfilled functions such as marketing and designing before the acquisition. However, the take-over by Times Electric has also brought changes into how R&D is undertaken in Dynex. A detailed examination of the company's annual reports suggests that prior to the acquisition the company struggled to maintain strong and consistent investment in R&D. The take-over by Times Electric has seen not only the establishment of a brand-new R&D centre, but also a significant and stable growth in R&D expenditure. The company spent 3.9% of its revenue on R&D in 2009 and this has increased to 10.6% in 2012 (Dynex, 2012, 2013). Since then the company has also expanded its R&D team for instance from merely 12 in 2008 to 40 in 2012.

The company's expanded R&D team has not only developed new sophisticated products such as the 3300v IGBT modules and prototypes of a 250 mm x 89 mm module but also made significant advances in the fundamental research for thyristors and IGBT technology for HVDC applications. Research is also undertaken on new materials for power devices (Dynex, 2013).

The investment in R&D not only helped the company to sustain and strengthen research and development activities but also reflects the parent-firm's (Times Electric) ambition to develop Dynex into a world leading industrial high power semiconductor. In a recent interview, the President and CEO of Dynex, commented that Dynex is now able to compete on an equal footing with the world's top semiconductor makers, including Infineon of Germany, ABB of Switzerland, and Mitsubishi of Japan (China Daily, 2013).

#### ***4.1.4 Intersectoral upgrading***

Historically Dynex's power modules mainly found their applications in the marine drive sector. The acquisition by Times Electric, however, has meant Dynex is increasingly applying existing competences in new sectors. We reported earlier the staggering growth in the IGBT modules which itself is a result of Dynex's shift to the railway industry. In 2011, the company successfully qualified and demonstrated, through field trials, the suitability of Dynex high power IGBT modules for use on China national locomotives and urban metro systems. This will open a massive market for the company to exploit for years to come.

The last two years has also seen the strategic focus of the company's R&D activity shift to develop new applications in the low carbon sectors such as railway transportation, renewable energy, smart grids and electric cars. For example, with the support of Times Electric, Dynex now plans to produce IGBT and diode processes and designs using the 8-inch silicon production base recently established in Times Electric. The intention is to increase capacity and ability in order to service higher volume markets such as electric vehicles, wind turbines and solar power systems (Dynex, 2012).

## **4.2 The impact of parent-subsidiary relationship on Dynex's capability upgrading**

Evidence presented above demonstrated significant upgrading in Dynex since the acquisition. This is counter-intuitive as it contradicts with the orthodox view. Below we try to make sense of this upgrading. There are, of course, a range of factors that influence upgrading in Dynex. For example, there is a strong link between Times Electric's competence in grafting innovation (He and Fallon, 2013), the ability to apply and 'twist' existing technologies and designs to develop new products and solutions for additional industries, and the fact that Dynex is now developing new applications in areas such as wind turbines, smart grids and electric cars, representing a shift to intersectoral upgrading. Our focus in this study, however, is on the parent-subsidary relationship and in particular the intertwined issues of subsidiary autonomy and mandates.

#### **4.2.1 Subsidiary autonomy**

In the context of acquisition, tight control implies that the acquiring firm imposes its systems and rules on the acquired subsidiary (Birkinshaw et al., 2010). The parent imposes detailed monitoring on the acquired subsidiary, 'not just exposing failures, but also showing how these failures can be overcome' (Schmitz, 2006: 506). This higher degree of control would result in an improvement in the acquired subsidiary's production process, responsiveness to customer needs and consistency and quality via detailed knowledge and instructions coming from the parent-firm to the acquired subsidiary.

The Times Electric senior manager we interviewed confirmed that Dynex's strategy needed to be aligned with the parent company. Times Electric also directed the markets that Dynex was to enter and provided detailed product specifications for IGBT power modules. In addition, it also arranged and completed field trials to ensure compliance of Dynex high power IGBT modules with required standard and therefore suitability for the Chinese market. Moreover, the two parties signed a R&D agreement which is renewed every three years. This agreement ensures the funding of R&D in Dynex but also delineates directions of its R&D effort. During the interview, the Dynex's President and CEO confirmed that R&D work in the area of silicon carbide devices was Times Electric's intention. Times Electric's control and coordination thus help to explain product and process upgrading in the latter.

However, evidence also suggests that Dynex enjoyed certain degree of autonomy. In a recent interview with a Chinese newspaper, the President of Dynex, greatly appreciated the fact that he is trusted by Times Electric to run Dynex as he sees fit:

*"What surprised all of us is the high level of employee care. They genuinely want to make us a part of the company, so they try very hard to make sure they're always very thoughtful in dealing with the people here ... They gave us a high degree of autonomy, and they did not place a Chinese manager at the top after the acquisition."* (China Daily, 2013, emphasis added)

The President of Dynex also appreciated this autonomy during the interviews. Indeed, among the eight board members after the acquisition, only four were from Times Electric despite its majority stake in Dynex. At the time of writing (May 2015) the parent company only occupies one seat in the four-member board. Dynex also maintains its name and structure after the acquisition. With the intention to strengthen and further develop Dynex's technology capability, Times Electric not only invested significantly in the new R&D centre, but also clearly recognised the importance of allowing autonomy for its newly acquired subsidiary to take initiatives as well as developing mutual trust between the British side and the Chinese side. This autonomy indeed encouraged Dynex to increase its R&D staffing and improve engineering skills which not only helped to develop quickly new



sophisticated products including the recent 3300v IGBT modules but also led to significant advances in the fundamental research for thyristors and IGBT technology.

Extant literature indicates that autonomous subsidiary is likely to foster organisational learning (Luo, 2003) and has strong ability to learn from the local system of innovation and develop new capabilities applicable to local markets (e.g., Cantwell and Mudambi, 2005; Birkinshaw et al., 1998). The case of Dynex seems to confirm that the autonomy it enjoyed did encourage it to continue and strengthen its innovative activities, leading to functional upgrading.

#### ***4.2.2 Subsidiary mandate***

A subsidiary's mandate depends not only on its internal capabilities and development potential but also strategies of its parent firm (Cantwell and Mudambi, 2005). In order to understand Time Electric's motives and strategies, we have to switch the clock back to a few years prior to the acquisition. Back then, Times Electric and its own parent company, CSR China, were already the main suppliers of China's railway equipment. However, Times Electric, despite it being the leading player in China regarding electric traction drives technologies, was not able to design and manufacture its own IGBT modules and silicon chips – the 'heart' of Electric Traction Drives – and had to rely on import. This constrained not only Times Electric and CSR China's expansion in the railway industry but also their more recent penetration into the urban transit, wind power and electric vehicle industries as IGBT and its modules are also widely used in these industries.

In 2007, Times Electric initiated an 'acquisition – integration – innovation' strategy in order to develop a core competence in IGBT technology. Once it learnt that the Dynex owner wanted to sell the company, it acted quickly and completed the acquisition in 2008. Times Electric was clearly interested in Dynex's technology know-how in IGBT and thyristors. Times Electric's strategic asset-seeking motive and the competence-creating mandate it assigned to Dynex is clear from, for example, the following comments of President of Times Electric after the completion of the acquisition:

*“We expect Dynex to develop high power technology, R&D capability, and proven reliability and quality, thus to complement the rapidly growing manufacturing capability and power electric system know-how of Times Electric”* (Dynex, 2008).

Times Electric finds it a winning formula by combining Dynex's technology capability and its own manufacturing advantage and system know-how. But the acquisition also gives Dynex an ideal platform to apply their technologies in the expansive market in China and therefore allow it to further improve its technologies. The last few years have seen Dynex's role in R&D and development of new products and technologies further reinforced - a manifestation of functional upgrading - confirming the prediction of Cantwell and Mudambi (2005) for competence-creating subsidiaries.

In a ceremony to celebrate the completion of Dynex's new R&D centre, which also became its parent firm's R&D centre after integrating with Time Electric's existing R&D team, Mr. Changhong Zheng, President of CSR China, emphasised that the R&D centre will focus on developing new technologies and products to expand the high power semiconductor product portfolio of both Dynex and Times Electric noting that these products are key to a wide range of industries including rail transportation, electric vehicles, wind power generation, solar power, electric power grids and high voltage power conversion (Dynex, 2011). Because of the intention to strengthen and further develop Dynex's technology capability, Times Electric deliberately gave it sufficient autonomy after acquisition so that

existing capabilities could be strengthened and new and advanced capabilities be developed in Dynex. These, combined with the parent firm's existing competences in large-scale manufacturing and system know-how, would create new advantages for Times Electric and CSR China.

Despite Times Electric's strategic asset-seeking motive behind the acquisition and the resultant competence-creating mandate it assigned to Dynex, we can also observe some elements of the asset-exploitive motive behind the acquisition and the associated competence-exploiting mandate that Dynex has. For example, part of the reasons for Times Electric to help Dynex to upgrade its production facilities and move to sophisticated products – manifestation of product and process upgrading - is to capitalise on the parent company's system know-how of the Chinese railway system and its strong market position. The asset-exploitive motive is also reflected in the concentration of lower power products in Times Electric and higher power ones in Dynex.

What we have observed is a mixed mandate assigned to Dynex which reveals Times Electric asset-exploiting and asset-seeking related motives of acquisition . This mixed acquisition motives and mixed mandates assigned to Dynex help to explain why we observe functional but also product and process upgrading. Previous research suggests that competence-creating subsidiaries enjoy higher degree of decision-making autonomy (Birkinshaw and Hood, 1998; Andersson et al., 2007; Cantwell and Mudambi, 2005). The fact that Dynex has both competence-creating and competence-exploiting mandates therefore suggests that it neither enjoys full autonomy nor is tightly controlled by the parent firm. Following previous discussions, we believe Dynex's competence-creating mandate is likely to lead to functional upgrading as its competence-creating effort is likely to be reinforced. In addition, its competence-exploiting mandate is likely to lead to product and process upgrading as required and helped by the parent firm.

## 5. CONCLUSION

Most of the extant research has focused on understanding the investment motives of EMNEs or whether existing IB theories explains the internationalisation behaviour of EMNEs. There is a paucity of research investigating the EMNEs' acquired subsidiaries evolution. Drawing upon evidence from a case study of a recent acquisition in the UK by a Chinese firm, this paper suggests that EMNEs' acquisition could help firms in developed countries to upgrade their range of capabilities (i.e., product, process, functional and intersectoral), therefore challenging the orthodox view that upgrading can only happen in firms in developing countries. Our findings also suggest that the acquired subsidiary's upgrading is dependent on the degree of subsidiary autonomy and subsidiary mandates.

Our study also illustrates the importance of understanding parent-subsidiary relationships in the context of EMNEs' internationalisation. In the context of DMNEs' acquisitions in developing countries, the parent DMNEs act as an orchestrator of resources and knowledge (Foss and Pedersen, 2002), exercising varying degrees of coordinating power over their subsidiaries (Ambos et al., 2010). Despite the fact that DMNEs are dispersing non-strategic innovation activities into leading emerging economies, they still tend to retain strategic innovation activities in-house (Bruche, 2009). We may, however, observe a different power relationship between the subsidiary and parent firms in the context of EMNEs' acquisitions in developed countries. Recent research indicates that some EMNEs are rising to acquire coordinating power within a number of GVCs (Lema et al., 2013). However, they may still lack the ability to create cutting-edge innovations (Altenburg et al., 2008) and therefore not

in a position to own and control strategic innovation and technology. A large volume of recent studies thus indicate that EMNEs tend to engage in knowledge asset seeking in developed countries in order to compensate this disadvantage (Luo and Tung, 2007; Mathews, 2006). This suggests that new power relationships may develop between the EMNE parent firms and their subsidiaries in developed countries, involving a hitherto unprecedented separation of control of technology from the coordination power (e.g., Gupta and Govindarajan, 1991, 2000). These new governance structures are likely to be very different from those within the DMNEs network, in which DMNEs enjoy control of technology and the coordination power at the same time. This may help to explain why Dynex enjoyed relative high degree of autonomy and strong competence-creating mandate which resulted in various upgrading outcomes.

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