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# The moderating effect of technology and marketing know-how in the regional-global diversification link: Evidence from emerging market multinationals

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### ABSTRACT

In this study, we link regional diversification to global diversification of emerging market multinationals (EMNCs) and explore the importance of firm-specific technology and marketing know-how in that process. We develop our hypotheses and test them using a sample of 625 Chinese manufacturing multinationals across multiple industries. The results reveal that regional diversification predicts global diversification, and that firm-specific technology and marketing know-how both increase the likelihood of a firm's moving from regional to global operations. Technology know-how was found to be more influential than marketing know-how.

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## 1. Introduction

This study examines how emerging market multinationals (EMNCs) increase the extent of their internationalization. It built on the work of Rugman and his colleagues (e.g., Rugman & Verbeke, 2004; Rugman & Collinson, 2005) and examined to what extent regional diversification correlates with global expansion. The influence of marketing and technological know-how on the strength of the relationship between regional diversification and global diversification was also examined. The analyses were designed to shed light on how EMNCs resolve a dilemma as they grow.

Internationalization is one important growth strategy for EMNCs, but they have different internationalization paths to choose from. They can expand regionally and shun expansion outside the region (Rugman & Verbeke, 2004; Rugman & Collinson, 2005). Or they can gradually build up their capabilities as well as their portfolio of markets by regionalizing first and venturing beyond the region only after they have acquired some knowledge

and experience and beefed-up their networks, routines and capabilities (Johanson & Vahlne, 2009; Vahlne & Johanson, 2013). But EMNCs may feel pressure to catch up quickly with their global rivals in terms of costs, technology and other factors, which may be difficult to achieve through a gradual buildup from a regional to a global player (Child & Rodrigues, 2005; Mathews, 2006). Hence, some EMNCs might forego regional expansion and use springboard strategies with an intent to catch up with global rivals. Which path do EMNCs commonly adopt—rapid expansion into challenging and distant markets or gradual progression from regional to global markets? This question is worthy of research attention and will be particularly interesting in the context of China which is one of the largest emerging markets. While prior studies on EMNCs have formulated typologies of their growth strategies (Ramamurti, 2004) and identified strategies such as springboard to overcome competitive disadvantage versus global rivals (Guillén & Garcia-Canal, 2009; Luo & Tung, 2007). Scholars have often illustrated such typologies and strategies through case studies of EMNCs such as Lenovo, Haier and Tata Steel that boldly ventured into developed country markets and succeeded. It is not clear, however, that those firms are representative of the broader population of EMNCs (Luo & Tung, 2007; Mathews, 2005).

This study integrated the arguments about internationalization processes (IP) with learning theory in an attempt to shed light on the internationalization of a large sample of Chinese

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multinationals (MNCs), specifically the relationship between regional and global diversification. Intangible resources such as marketing and technological know-how were proposed to influence the process. The study's approach went beyond the deterministic argument implied in the Internationalization process (IP) literature that global diversification follows regional diversification by suggesting that this progression will be more likely under specific circumstances.

On a broad level, the idea that experience in culturally or institutionally familiar markets (regional markets in the context of this study) is needed to enter less familiar, more challenging global markets seems intuitive, and indeed it has been well established in prior studies (Johanson & Vahlne, 1977, 2009; Pogrebnyakov & Maitland, 2011). But there is also some empirical evidence for a progression from psychically (or institutionally) closer to psychically (or institutionally) more distant markets, though the evidence has been equivocal (e.g., Barkema, Bell, & Pennings, 1996; Delios & Beamish, 2001; Oviatt & McDougall, 1994; Pogrebnyakov & Maitland, 2011). There is also an extensive literature on the evolution and strategies of EMNCs (e.g., Guillén & Garcia-Canal, 2009; Luo & Tung, 2007; Mathews, 2006; Ramamurti, 2008). We would like to point out several key distinguishing characteristics of our study when compared to these two streams of literature. First, this study, in contrast to the IP perspective which focused on firms' discrete choices in their progression from psychically close and less challenging markets to more distant and challenging ones, focuses on the development of firms' expansion portfolios. Portfolios represent the cumulative effects of many discrete decisions. They may have some common antecedents such as in the selection of individual markets, but each firm's portfolio will have distinct drivers as well. A global portfolio requires an EMNC to have confidence in its ability truly to compete in internationally rather than simply operating in a single psychically distant market (Bartlett & Ghoshal, 1989). To benefit from a diverse portfolio, a firm needs additional skills than those required for competing in any individual market, specifically the ability to coordinate strategies across different markets (Guillén & Garcia-Canal, 2009; Martinez & Jarillo, 1989). Most of the prior work on this topic has focused on learning related to individual markets and the confidence gained from such learning to undertake greater commitment in entry mode choice or in entering more challenging markets. As noted earlier, this study introduces contingencies in the progression from regional to global presence, which IP literature has not done.

With regard to the second stream of research on EMNCs, as noted earlier, this literature has typically focused on the strategies of large, high profile EMNCs such as Lenovo, Haier and Tata Steel that have used internationalization as a springboard to become world-class competitors. Though Luo and Tung (2007) argued that buildup of capabilities may be less relevant to these EMNCs than catch-up, we submit that these EMNCs may not be representative of the broader class of EMNCs. Our analysis which is based on a large sample of Chinese MNCs and incorporate contingencies will be particularly valuable (and hopefully more generalizable) in this regard. In summary our modeling as well as empirics will add value over and above the cumulative insights yielded by the above two streams of literature.

## 2. Conceptual development and hypotheses

### 2.1. Regional versus global diversification

The conceptualization of regional versus global diversification in this study is similar to, but also distinct from that of Rugman and his colleagues (e.g., Collinson & Rugman, 2007; Rugman & Verbeke, 2004). It is similar in the sense that we consider regionally

diversified EMNCs as firms whose presence spans a region. It is distinct also from that in the way regional diversification is considered here as expansion beyond the home market to markets that are foreign but geographically contiguous, or at most separated by a body of water as in the case of China and Japan. This definition is different from that of Rugman and Verbeke who defined bi-regional diversification as "firms with at least 20% of their sales in each of two regions, but less than 50% in any one region" (Rugman & Verbeke, 2004, p. 7). A strong assumption behind that definition is that a firm must generate at least one-fifth of its sales from two separate regional markets in order to be considered bi-regionally diversified. This strong assumption certainly excludes many EMNCs which have not yet succeeded in two regional markets.

Ghemawat (2005) argues that firms will increasingly identify novel ways to identify regions based on many factors beyond cultural similarity or geographic proximity. In this study global diversification was simply a firm's expanding across multiple regions globally. This is similar to Rugman's approach of considering global strategy as dealing with a more geographically-diverse footprint than either single-region or bi-regional strategy (Rugman & Verbeke, 2004). But in this study globalization reflected a global presence in Asia, Europe, Oceania, North America, Latin America, and Africa. This definition is obviously broader than Rugman and Verbeke (2004)'s, but it more accurately reflects the degree of global diversification of today's emerging market multinationals as they expand not only into three parts of the triad, but also into less-developed markets.

Regional diversification offers EMNCs several advantages (Collinson & Rugman, 2007; Ghemawat, 2005). They can gather scale and drive down costs (Lu & Beamish, 2001). Since operating in international markets is a complex task, the learning perspective is highly relevant for identifying additional benefits from regional diversification. By operating in regional markets, firms can learn about dealing with host country institutions and regulations, managing employees from a different culture and satisfying customers who might have different preferences than customers in their home market. Institutionally as well as otherwise (in terms of customer preferences, for example), regional markets tend to pose less of a challenge than a truly global presence spanning distant countries and multiple continents because the differences within a region may be less troublesome (Ghemawat, 2005; Kostova & Roth, 2002; Pogrebnyakov & Maitland, 2011). For instance, Asian countries have many similarities in terms of per capita income levels, infrastructure quality, the role of the government and state-owned enterprises, and business practices (especially the importance of informal relations and trust) (Rugman & Collinson, 2005; Yip, 1989). EMNCs may also learn to coordinate across their portfolio of markets by sharing stories of success and failure within the region and best practices. EMNCs with global aspirations may be able to exploit what they have learned in regional expansion to enter more challenging and less familiar markets beyond the region.

### 2.2. The regional-global diversification link

We propose that regional diversification will have a positive impact on a firm's global diversification for three key reasons. First of all, regional expansion is a sort of incremental learning process through which firms learn from experience as they gradually increase their international involvement (Benito & Gripsrud, 1992; Johanson & Vahlne, 1977). Expanding first to proximate countries, firms gradually gain experience in dealing with foreign markets, their political and economic institutions, and their cultures and ethics (Kostova & Roth, 2002; Pogrebnyakov & Maitland, 2011). These accumulated experiences help MNCs overcome barriers

such as cultural or institutional differences for further expansion into more distant countries. [Barkema et al. \(1996\)](#), for instance, demonstrated that firms gradually expand to more culturally distant locations by leveraging their previous experience in proximate cultures. The development of this knowledge is tacit, as it is accumulated through learning by doing, which can often be applied more broadly ([Contractor, Kundu, & Hsu, 2003](#)). [Pennings, Barkema and Douma \(1994, 616\)](#) have shown that, “Firms with successful track records in regard to expansions are more likely to be successful in the future.” But more specifically, firms are more likely to succeed closer to home because of lower psychic distance, greater familiarity with the local institutions and a greater likelihood of being able to exploit economies of scale and their home-country networks ([Johanson & Vahlne, 2009](#)). This success, in turn, can then be leveraged beyond the region. Or, as [Pennings’](#) group have suggested, regional success might beget global success ([Pennings et al., 1994](#)).

Second, regional expansion also helps firms develop routines relevant for subsequent expansion beyond the region and helps them overcome any organizational constraints on expansion. When a firm becomes internationalized, its managers are exposed to a new environment, providing them rich opportunities for learning ([Walsh, 1995; Wu & Zhao, 2015](#)). To effectively aggregate the new knowledge into a richer knowledge structure, a firm needs to foster mutual learning among employees and encourage them to share knowledge across different geographic divisions as well as between headquarters and the divisions ([Huber, 1991; Nadolska & Barkema, 2007](#)). Organizational routines and processes which support more frequent interaction, closer cooperation and better information flow between sub-units may be quite useful in this regard ([Nelson & Winter, 1982; Zollo & Winter, 2002](#)). Operating in regional markets might stimulate a firm to fortify its internal routines, which should help it gain more benefit from its exposure to a broader range of markets ([Barkema & Vermeulen, 1998](#)). This should leave the firm better able to address the greater challenges of venturing farther afield or into a larger number of markets.

Third, regional diversification often facilitates exploiting economies of scale. That promotes cost competitiveness when the firm ventures beyond the region. Regional expansion also make a firm better able to recognize opportunities in distant markets, either because it has honed its ability regionally, or because its regional network facilitates such identification ([Andersson, Holm, & Johanson, 2005; Johanson & Vahlne, 2009; Teece, 2007](#)). Indeed, a firm’s regional network of distributors, customers and financiers may extend beyond the region to distant markets ([Dicle & Dicle, 2014; Johanson & Vahlne, 2009; Vahlne & Johanson, 2013](#)). This can help alleviate the liabilities of outsidership, which may be especially critical in psychically distant or challenging markets ([Johanson & Vahlne, 2009](#)).

Taken together, the above arguments suggest a strong linkage between regional diversification and global diversification. To test this summary prediction, we advance the following hypothesis:

**Hypothesis 1.** There is a positive association between regional diversification and global diversification.

### 2.3. The contingent role of intangible resources

There is extensive prior literature relating firm-level intangible resources and with its incentives to internationalize ([Buckley & Casson, 1976, 2009](#)). But beyond the direct relationship, intangible resources might be expected also to moderate any relationship between regional and global diversification. EMNCs operating in regional markets will tend to have an enhanced ability to assimilate diverse knowledge, and when this ability is coupled with strong intangible resources, they may be more

capable of recognizing opportunities arising in new markets or from technological trends ([Barkema & Vermeulen, 1998](#)). And since learning through regional diversification tends to enable overcoming organizational limits, especially related to the processing of information and decision-making in the face of ambiguity ([Wu & Wu, 2014; Wu, Wang, Hong, Piperopoulos, & Zhuo, 2016](#)), geographic diversification may help a firm to better exploit any strengths in terms of intangible resources ([Cohen & Levinthal, 1990](#)). Technological and marketing know-how have been shown to be particularly important for internationalization ([Kotabe, Srinivasan, & Aulakh 2002; Lu & Beamish, 2004](#)).

#### 2.3.1. Technology know-how

Firms often spend much time and enormous resources developing novel technologies and products. The economics of information would suggest that since technology is mostly information, the marginal costs of sharing it with a sister unit such as an international affiliate are low. Additionally, a firm can reap greater returns by increasing the geographic scope for exploiting any novel technologies and products it has developed. In this regard, [Morck and Yeung \(1998\)](#) have shown how firms can more fully realize economies of scale and scope by exploiting their know-how in a broad range of markets. [Kotabe et al. \(2002\)](#) have also suggested that firms with intangible resources should be able to generate abnormally high returns from trading their intangible resources (especially technology) and exploiting market imperfections across various markets. Moreover, intangible resources tend to be firm-specific and thus difficult for local firms in host countries to imitate ([Xie & O’Neill, 2014](#)). For example, Huawei Technologies from China has become a global leader in providing telecommunications equipment because its advanced technology has proven difficult for local firms (as well as for many multinational rivals) to match or imitate ([Lee & He, 2009](#)). When strength in technology is combined with the learning available from regional diversification, firms are more likely to venture into more culturally and institutionally distant, and possibly more challenging markets. This is how technological know-how can enhance the relationship between regional and global diversification.

**Hypothesis 2a.** Better technological know-how will positively moderate the relationship between regional and global diversification.

#### 2.3.2. Marketing know-how

Marketing know-how might be expected to have a similar effect on the relationship between regional and global diversification, though the mechanics may be somewhat different. Firms might undertake considerable investment to develop strong brands which can be made available to their international affiliates at no or low cost. The resulting competitive advantage and higher profits could serve as powerful incentives for firms with strong brands to expand into as many countries as possible, possibly beyond their home region.

Of course, marketing know-how includes factors other than a valuable brand ([Wu, 2013; Zhou & Li, 2012](#)). It might reflect the learning that a firm has accumulated about customer needs and preferences, channels, pricing and promotion through its international expansion ([Xie & O’Neill, 2014; Wu & Ma, 2014](#)). This learning may be useful, albeit with modifications, to succeed in other markets. Additionally, a firm might have built network links with multinational distributors through regional expansion. Their presence worldwide should then help an EMNC penetrate markets outside its home region. Even if a distributor doesn’t have a global presence, it may be able to introduce new partnership opportunities to a firm aspiring to venture beyond the region. So because



of learning and network effects, marketing know-how will tend to strengthen the relationship between regional and global diversification. Formally,

**Hypothesis 2b.** Better marketing know-how will strengthen the relationship between regional and global diversification.

### 2.3.3. Moderating effect of technological know-how versus marketing know-how

Both technology and marketing know-how are intangible resources, but there are key differences between them, including different implications for international expansion (Benito & Gripsrud, 1992; Johanson & Vahlne, 1977). Technological know-how refers to a firm's ability to develop new products and processes (Afuah, 2002; Wu, Wu, & Zhuo, 2015). It interacts only weakly with specific market environments (Johanson & Vahlne, 1977) and so can be relatively easily transferred from one country to another. Since their know-how is portable and not market-specific, firms with strong technology know-how are well positioned to expand into geographically diverse countries. Lenovo's Yoga series of ultrabooks which can serve as either a notebook computer or a tablet can be sold with few modifications not only in Asia, but in any country around the world. Indeed, a firm with outstanding technology might be able to augment its competitive advantage by teaming up with local firms who are attracted by its technological strength. They can then provide useful local knowledge (Hitt, Hoskisson, & Kim, 1997).

Marketing know-how, in contrast, is usually knowledge about the characteristics of specific national markets in terms of the business climate, cultural patterns, the structure of the distribution system (Johanson & Vahlne, 1977, 28) and, most importantly about customers and their preferences. Such knowledge is closely associated with a particular set of circumstances and hence may be difficult to transfer elsewhere without substantial modification (Szymanski, Bhardwaj, & Varadarajan, 1993; Zucchella, Palamara, & Denicolai, 2007). Marketing know-how is accumulated largely through activities that are associated with building and maintaining relationships with partners and customers in a specific market setting. Since marketing environments such as customer preferences, culture, and social and legal systems differ across countries, prior accumulated knowledge may not be relevant, or useful, in a new country. For example, promotions and pricing not only have to be modified in a new country because of differences in customer and competitor profiles, but also need the cooperation of numerous local partners such as retailers and distributors. Being closely tied to the specific context, marketing knowledge gained in a country is unlikely to be useful without modifications, and possibly significant enhancements, in another country (Ryans, Griffith, & White, 2003). The differences between technology and marketing know-how suggest that the moderating effect of technology know-how may be stronger than that of marketing know-how.

**Hypothesis 3.** The moderating effect of technology know-how on the relationship between regional diversification and global diversification will be stronger than that of marketing know-how.

## 3. Methods

### 3.1. Data and sampling

The empirical analysis exploited data from a large survey conducted by the World Bank in collaboration with the Enterprise Survey Organization of China's National Bureau of Statistics. The survey administrators adopted a rigorous and robust procedure for

obtaining a representative sample of one thousand and fifty firms across five major cities and ten industries in 1998–2000.<sup>1</sup> The random sample was selected based on participation in certain selected industries and on firm size. A survey questionnaire was sent to the selected firms. The survey's administrators expended considerable effort to ensure a high response rate. Their initial approach involved hand-delivering a letter of introduction explaining the purpose of the study and inviting participation. It was followed by telephone calls to the CEO or General Manager requesting their firm's participation in the study. Those efforts resulted in a response rate of more than 90%. Prior to data entry, each completed questionnaire was also checked by a supervisor to ensure that it had been completed in accordance with the instructions. Moreover, considerable care was taken to address common issues with survey data such as common method variance. The survey administrators sent two separate questionnaires for completion by two different groups of respondents, with each group focusing on providing the type of information it was most familiar with. Personnel (HR) managers provided basic profile information such as ownership and revenue, R&D and marketing expenditure and labor force size. Senior line managers (e.g., head of manufacturing or a general manager) provided information about strategic matters such as regional or global expansion and the market environment. Give the reputation of the organization administering the survey, we are confident (though not completely sure) that instructions (e.g., completion of the two surveys by the appropriate respondents) were adhered to.

A subset of the data collected in the survey were used in this study. Though the survey covered manufacturing and service firms, only the manufacturing firm data were used, for two reasons. First, many key pieces of information such as geographic dispersion of sales, R&D expenditures and marketing expenditure were not provided by service firms, which could have limited operationalization of several key constructs used in this study such as regional diversification, marketing know-how and technology know-how. Second, as Coviello and Martin (1999) have noted, manufacturing and service firms exhibit different patterns in their internationalization, so a mixed sample of manufacturing and service firms might have produced confounded results. (See Appendix A for the final sample distribution by industry and city).

### 3.2. Measures

#### 3.2.1. Dependent variable

**3.2.1.1. Global diversification.** Prior studies have often used an entropy measure to proxy for international diversification (Aulakh, Kotabe, & Teegeen, 2000; Hitt et al., 1997; Zahra, Ireland, & Hitt, 2000), and this study followed that lead. The Chinese firms' overseas markets were into six regions: Asia, Europe, Oceania, North America, Latin America and Africa. The entropy measure of global diversification (GLOBAL) was then defined as:

$$GLOBAL_i = \sum_{i=1}^6 [P_i \times \ln(1/P_i)] \quad (1)$$

where  $P_i$  is the firm's sales to the  $i^{\text{th}}$  regional market as a proportion of its total overseas sales.  $i$  (1, 2, 3, 4, 5, 6) indexes the regions.  $\ln(1/P_i)$  is then a weighting given to the  $i^{\text{th}}$  region. As Hitt et al. (1997) have noted, this measure accurately reflects the level of a

<sup>1</sup> The five cities were Beijing, Chengdu, Guangzhou, Shanghai and Tianjin. The ten industries were in five manufacturing sectors (electronic equipment, electronic components, consumer products, vehicles and vehicle parts, and apparel and leather goods) and five service sectors (accounting, advertising and marketing, business logistics, communications and information technology).

firm's global diversification, as it considers both the number of regions in which it operates and the relative importance of each region to its total overseas sales. One potential concern with the measure could be that it does not exclude the proportion of sales in Asia, the home region for Chinese firms. To address this concern, as a robustness check, the entropy measure was reconstructed using only a firm's sales in Europe, Oceania, North America, Latin America and Africa.

### 3.2.2. Independent variables

**3.2.2.1. Regional diversification.** Regional diversification was quantified by calculating the percentage of sales in each Asian country for each firm. The percentages were then deployed in the following formula.

$$REGION_{jk} = \sum_{j=1}^n [S_j \times \ln(1/S_j)] \quad (2)$$

Where  $S$  is annual sales,  $j$  indexes Asian countries and  $k$  indexes firms. This variable was lagged by two years in testing whether or not global diversification follows regional diversification.

**3.2.2.2. Technology know-how.** R&D intensity has been widely adopted by scholars as a measure of firms' technological know-how (Caves, 2007; Lu & Beamish, 2004; Morck & Yeung, 1991). In his review, Caves (2007) pointed out that R&D intensity is one of the most robust measures of a firm's technological know-how. In this study a firm's technology know-how was quantified using the ratio of its R&D expenditure to its total sales. Since this study focused on a firm's activities in international markets, a firm's overseas R&D spending was used, and it was divided by the firm's overseas sales. This variable was also lagged by two years.

**3.2.2.3. Marketing know-how.** Following the lead of prior studies (Lu & Beamish, 2004; Morck & Yeung, 1991), a firm's marketing know-how was proxied by using marketing intensity, which was calculated as the ratio of marketing expenditure to total sales. Only overseas marketing expenditures were used, divided by overseas sales revenue. This variable too was lagged by two years.

### 3.2.3. Control variables

We included several control variables that might influence the extent of global diversification independent of the key variables used in the present study. First, we included a firm's *foreign ownership* measured by the overall percentage of foreign ownership including foreign individuals, foreign institutional investors, foreign firms and foreign banks. Firms with greater foreign ownership might exhibit a greater level of global diversification because of reasons such as availability of their owners' resources including information and contacts (Lyles & Salk, 1996). Second, we also included a firm's *R&D collaborations with domestic universities and research institutes* (R&D collaboration) as a control variable because participation in R&D collaborations with universities and research institutes enhances a firm's technological capabilities, which can be leveraged in international markets. This measure is coded as a dummy variable taking a value of 1 if a firm had a contractual or long-standing relationship with either a local university or a government research institute, and 0 otherwise. Third, we included lagged *firm performance* measured by return on sales (ROS) to control for firm heterogeneity in terms of financial resources that can be devoted to international expansion. Fourth, because large firms have more resources to pursue global expansion, we included *firm size*, measured as the logarithm of the number of employees. Fifth, we also included *firm age* as age might be correlated with accumulation of international experience

and higher levels of internationalization. Sixth, we controlled for public versus private ownership (*publicly listed company* = 1; 0 otherwise) because some private firms might lack access to sufficient capital to expand internationally. Because competitive intensity in domestic market will affect a firm's propensity to expand globally, we also included the total number of firms in the industry to proxy the competitive intensity. We applied logarithmic transformation to this variable.

We also accounted for the possibility that cultural differences between home and host countries will affect the extent of a firm's global diversification. We included cultural distance, measured in two steps. We first computed cultural distance between China and each foreign country to which a focal firm expanded based on Kogut and Singh's (1988) formula. We then calculated the variation of cultural distance across all foreign markets to which a focal firm expanded. Since Institutional differences will also affect a firm's global diversification, we controlled for them as well. Similar to cultural distance, we measured institutional distance in two steps. We first computed institutional distance between China and each targeted foreign country based on institutional indicators (including Voice and Accountability, Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption) from the Worldwide Governance Indicators (2010) (Kaufmann, Kraay, & Mastruzzi, 2003; Kaufmann, Kraay, & Mastruzzi, 2010). Given that a focal firm would expand to multiple foreign countries, each of which has different institutional distance from its home country, one of the most challenging task for EMNCs is to effectively manage the differences and conflicts among various institutional distances from the home country. Therefore, we calculated the variation of institutional distance across all foreign markets to which a focal firm expanded.

In addition, since our sample was multi-industry, we created four *industry dummy* variables using the apparel and leather goods industry as the base group. Finally, since the sampled firms are drawn from five Chinese cities, we also included four *city dummy* variables to control for the location effect. Shanghai was used as the base group in the analysis.

### 3.3. Statistical modeling

GLOBAL was a continuous variable with a ratio ranging from zero to a positive number. Such a non-negative dependent variable violates an assumption underlying classic linear regression, so a Tobit model left censored at zero was considered appropriate for predicting it. A Tobit model expresses the observed response ( $y$ ) in terms of an underlying latent variable:

$$y^* = \beta_0 + \alpha\beta + u, \text{ where } u|x \sim \text{Normal}(0, \sigma^2) \quad (3)$$

$$y = \max(0, y^*) \quad (4)$$

The latent variable  $y^*$  is normally and homoscedastically distributed with a linear conditional mean. Eq. (2) suggests that the observed variable  $y$  (GLOBAL in this case) equals  $y^*$  when  $y^* \geq 0$ , but  $y=0$  when  $y^* < 0$ . Because  $y^*$  is normally distributed,  $y$  is continuously distributed over strictly positive values (Wooldridge, 2009).

One could argue that not all the firms have the same opportunities to engage in international expansion and that firms involved in international expansion may differ systematically from those which are not. Heckman's selection model was used to account for this self-selection effect (Heckman, 1979; Shaver, 1998). Heckman modeling involves two stages. In the first stage, a probit regression was used to estimate the probability that a firm engages in international expansion as a function of its age, size,

foreign ownership and industry. The predicted value derived from the first stage was transformed into a Mills ratio ( $\lambda$ ), the inverse of which is a monotonically decreasing function of the probability that a firm engages in international expansion. The inverse of the Mills ratio was then included as a regressor in the second stage least squares model estimating the probability of global diversification (Heckman, 1979; Shaver, 1998). This two-stage procedure tends to generate consistent and asymptotically efficient estimates (Heckman, 1979). All the right-hand-side variables were lagged by two years in the second stage modeling.

#### 4. Results

##### 4.1. Main results

Table 1 reports descriptive statistics describing the variables. None of the correlations among the independent variables are large enough to raise concerns about potential multicollinearity. This was confirmed through analyses of variance of inflation which yielded values below the suggested cut-off values (Hair, Anderson, Tatham, & Black, 1998).

The geographical breakdown of sales for the sampled companies is reported in Table 2. It is clear from Table that the average Chinese MNC is not leapfrogging by bypassing entering Asian countries to enter more developed ones. In fact, across all sectors, Asia and North America accounted for comparable proportions of sales. This suggests that most Chinese MNCs were adopting a mixed internationalization strategy where they expanded to regional as well as psychically distant markets.

To check whether the data was impacted by heteroscedasticity, the survey data were subjected to White's generalized test (Bowen & Wiersema, 1999). The Breusch-Pagan test statistics suggested that heteroscedasticity was not a concern ( $\chi^2 = 11.33, p = 0.62$ ). The estimated residuals were also plotted against the independent variables and no systematic patterns of heteroscedasticity were found (Wooldridge, 2009).

Table 3 presents the coefficient estimates from the regression analyses testing hypotheses 1, 2 and 3. Starting with a bare bones model, the main effect and moderator variables were introduced successively. The three key independent variables were mean-centered to avoid the scaling issue (Aiken & West, 1991), especially because the aim was to compare the coefficients. This was especially important for testing Hypothesis 3 which compares the moderating effects of technology know-how and marketing know-how.

Hypothesis 1 predicts that regional diversification predicts global diversification. In Models 2 and 6 (Table 3), the coefficient of

the regional diversification is positive and significant ( $\beta = 1.27$  and  $\beta = 1.08$ , both  $p \leq 0.01$ ), providing support for the hypothesis. It may be worthwhile to reiterate that the regional diversification variable was lagged by two years. To facilitate interpretation, this effect is plotted in Fig. 1 using the method of Aiken and West (1991). Since the slope of the line in Fig. 1 is positive, the level of global diversification does indeed increase linearly with the increasing regional diversification. Hence Hypothesis 1 is supported.

Hypotheses 2 a and 2b predict that R&D and marketing know-how will both positively moderate the relationship between the level of regional diversification and the level of global diversification. In Models 4 and 6, the interactive effect of technology know-how and regional diversification is positive and significant ( $\beta = 66.57, \beta = 67.22$ , both  $p \leq 0.05$ ), suggesting that good technology know-how does indeed strengthen the relationship between regional and global diversification. Hence Hypothesis 2a is supported. Similarly, in Models 5 and 6 the interactive effect of marketing know-how and regional diversification is positive and significant ( $\beta = 6.13, p \leq 0.01$  and  $\beta = 6.17, p \leq 0.05$ ), lending support to Hypothesis 2b.

Interestingly, the direct effects of intangible assets on the progression to global diversification are inconsistent and, for marketing know-how, not significant. This suggests that the argument for a direct effect of intangible assets on internationalization may be incomplete. It doesn't account for the effect of the interaction between learning and intangible assets (Buckley and Casson, 1976).

Hypothesis 3 predicts that the moderating effect of technological know-how on the relationship between regional diversification and global diversification is stronger than that of marketing know-how. In Model 6, the coefficient of the interaction term involving technology know-how and regional diversification is indeed greater than that of the term between marketing know-how and regional diversification. Wald's  $F$  statistic = 4.69 ( $p \leq 0.05$ ), providing further confirmation that the coefficients are significantly different (see Fig. 2). Hence, Hypothesis 3 is also supported.

##### 4.2. Robustness checks

The robustness of these results was tested in several ways. First, as noted above, the measure of global diversification was reconstructed to include only sales in Europe, Oceania, North America, Latin America, and Africa. The analyses using that alternative measure of global diversification are shown in Table 4. All of the hypotheses still received strong support.

**Table 1**  
Descriptive statistics and correlation matrix.

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Global diversification	0.10	0.25	1.00												
2 Regional diversification	0.08	0.25	0.44*	1.00											
3 Technology know-how	0.06	0.07	0.15*	0.12*	1.00										
4 Marketing know-how	0.05	0.09	0.06*	0.05*	0.02*	1.00									
5 Firm age	16.25	15.48	0.06	-0.01	-0.03	-0.05	1.00								
6 Firm size	5.48	1.41	0.22*	0.16*	-0.09*	-0.01	0.35*	1.00							
7 Public listed	0.02	0.15	0.03	-0.03	-0.01	0.16*	-0.02	0.19*	1.00						
8 Firm performance	0.28	4.05	-0.03	0.10*	0.12*	-0.04	0.04	-0.04	-0.02	1.00					
9 Number of competitors	2.87	1.69	-0.01	-0.02	-0.01	0.02	0.06	-0.07	0.01	-0.05	1.00				
10 R&D collaboration	0.20	0.40	-0.02	-0.03	-0.01	0.09*	0.06	0.29*	0.12*	-0.04	-0.03	1.00			
11 Foreign ownership	16.86	29.30	0.13*	0.25*	0.10*	-0.09*	-0.24*	0.02	-0.05	0.07	-0.10*	-0.14*	1.00		
12 Cultural distance	1.05	1.74	0.34*	0.26*	-0.01	-0.05	0.07	0.09*	-0.01	0.01	0.00	-0.05	0.22*	1.00	
13 Institutional distance	0.69	1.23	0.39*	0.26*	-0.02	0.00	0.02	0.16*	0.01	-0.02	0.03	0.00	0.10*	0.17*	1.00

Note: N = 625. \* indicates a correlation significant at the  $p \leq 0.05$  level of confidence.

**Table 2**

Geographic breakdown of sales for the sampled companies.

	Asia	North America	Europe	Oceania	Latin America	Africa
Apparel and leather goods	34.34	23.19	16.11	10.66	15.04	0.67
Consumer products	26.14	28.21	21.94	6.38	9.84	7.48
Electronic components	27.05	25.21	15.98	9.95	18.64	3.16
Electronic equipment	23.91	24.86	12.15	8.12	18.65	12.31
Vehicles and vehicle parts	21.01	30.07	16.59	11.22	9.79	11.33

Second, there might be systematic differences between regulated industries (e.g. the transportation industry) and unregulated ones (e.g. electronic equipment) as the Chinese government imposes more constraints on the former. To address this potential concern, the automotive (vehicles) sector was excluded from the sample and the regressions were re-estimated. The results remained the same. Third, we had employed the Tobit estimation for regression analyses and the standard errors were derived from maximum likelihood estimation. However, there are several alternative estimators (e.g., the Huber/White/Sandwich estimator) which may produce different estimates (Wooldridge, 2009). To verify whether the results were robust to different types of estimators, the Huber/White/Sandwich estimator of the

variance was used, but the results (not reported) remained the same.

## 5. Discussion and concluding remarks

### 5.1. Theoretical implications

In this study, we argued for, and found, a positive relationship between regional and global diversification. Our study lies at the intersection of three streams of research: research based on the IP theory, research on EMNCs, and research on global and regional strategy. The results address issues not addressed by any of those three streams by analyzing a large, multi-industry sample. That

**Table 3**

Results of Tobit regression analyses.

DV: Global diversification	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.08 (0.88)	0.08 (0.96)	0.10 (1.06)	0.10 (1.07)	0.11 (1.19)	0.11 (1.19)
Firm age	-0.01 (-0.63)	-0.00 (-0.40)	-0.01 (-0.64)	-0.01 (-0.61)	-0.01 (-0.66)	-0.01 (-0.62)
Firm size	0.03*** (4.24)	0.02** (3.19)	0.02** (3.03)	0.02** (3.11)	0.02** (2.90)	0.02** (2.98)
Publicly listed	-0.01 (-0.19)	0.01 (0.17)	-0.01 (-0.10)	-0.01 (-0.09)	0.01 (0.13)	0.01 (0.15)
Firm performance	-0.15 (-0.73)	-0.30 (-1.49)	-0.30 (-1.43)	-0.27 (-1.28)	-0.27 (-1.32)	-0.24 (-1.17)
Competitive intensity	0.01 (1.34)	0.01 (1.32)	0.01 (1.01)	0.01 (1.07)	0.01 (1.22)	0.01 (1.28)
Research collaboration	-0.03 (-1.57)	-0.03 (-1.42)	-0.02 (-0.95)	-0.02 (-1.01)	-0.03 (-1.11)	-0.03 (-1.17)
Foreign ownership	-0.14* (-2.31)	-0.16** (-2.80)	-0.16** (-2.69)	-0.16** (-2.66)	-0.17** (-2.83)	-0.17** (-2.80)
Inverse mills	-0.36* (-2.22)	-0.33* (-2.12)	-0.32† (-1.92)	-0.33* (-2.02)	-0.34* (-2.07)	-0.36* (-2.17)
Cultural distance	0.04*** (7.63)	0.03*** (6.40)	0.03*** (5.81)	0.03*** (5.83)	0.03*** (5.74)	0.03*** (5.75)
Institutional distance	0.07*** (9.86)	0.06*** (8.55)	0.06*** (8.30)	0.06*** (8.08)	0.06*** (8.24)	0.06*** (8.01)
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
City dummy	Yes	Yes	Yes	Yes	Yes	Yes
Regional diversification		0.28*** (7.91)	0.29*** (7.71)	0.32*** (8.08)	0.26*** (6.85)	0.29*** (7.28)
Technology know-how			0.32 (0.63)	4.31* (2.43)	0.31 (0.61)	4.34* (2.46)
Marketing know-how			0.27 (0.62)	0.29 (0.65)	0.21 (0.44)	0.20 (0.42)
Regional diversification ×Technology know-how				66.57* (2.35)		67.22* (2.39)
Regional diversification ×Marketing know-how					6.13** (3.04)	6.17** (3.07)
Log-likelihood	91.44	122.29	96.50	99.35	101.26	104.21
F	16.87	20.66	17.42	17.00	17.27	16.90
Prob. > F	0.00	0.00	0.00	0.00	0.00	0.00
d.f.	18	19	21	22		23
Adjusted. R square	0.28	0.34	0.35	0.36	0.36	0.37

Notes: N = 625. Standard errors are given in parentheses. \* signifies significance at the  $p \leq 0.05$  (\*\* $p \leq 0.01$ ; \*\*\*  $p \leq 0.001$ ) level of confidence (two-tailed tests).



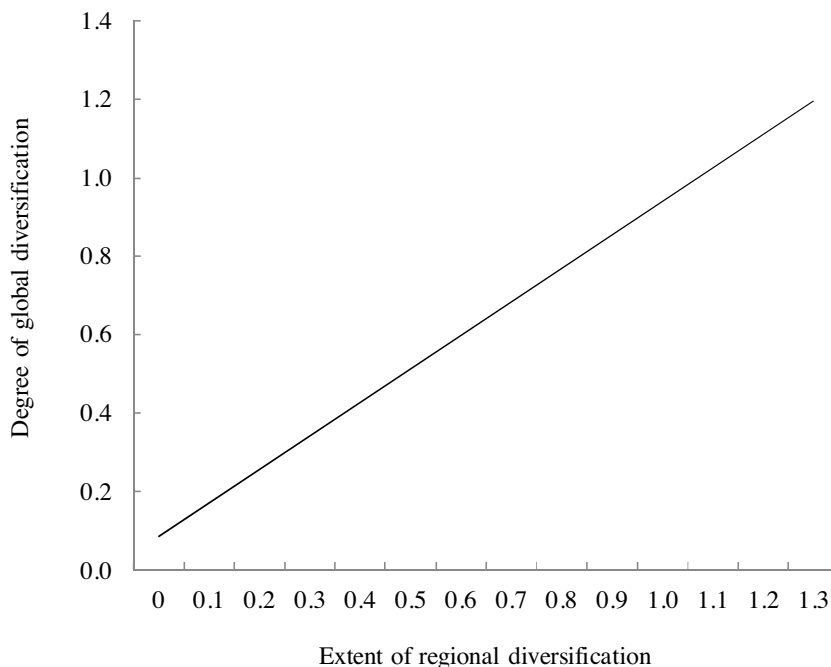


Fig. 1. Regional diversification and global diversification.

technique provides confidence in the generalizability and robustness of the study’s findings.

With regard to our study’s distinct approach versus the substantial literature based on the IP theory, we moved away from modeling discrete choices in the form of market selection or mode of entry to address the degree of regional and global diversification, which represent the cumulative effect of discrete choices. Specifically, instead of the progression from psychically

closer to psychically more distant markets, we considered the development of portfolio of international operations of EMNCs. We argued that a firm with a regionally diversified portfolio is more likely to have a more diverse portfolio beyond the region (that is higher level of global diversification). It is noteworthy that though learning about operating in individual markets is one of the key tenets of the IP theory, it does not consider learning in a broader sense—specifically in terms of coordinating across a

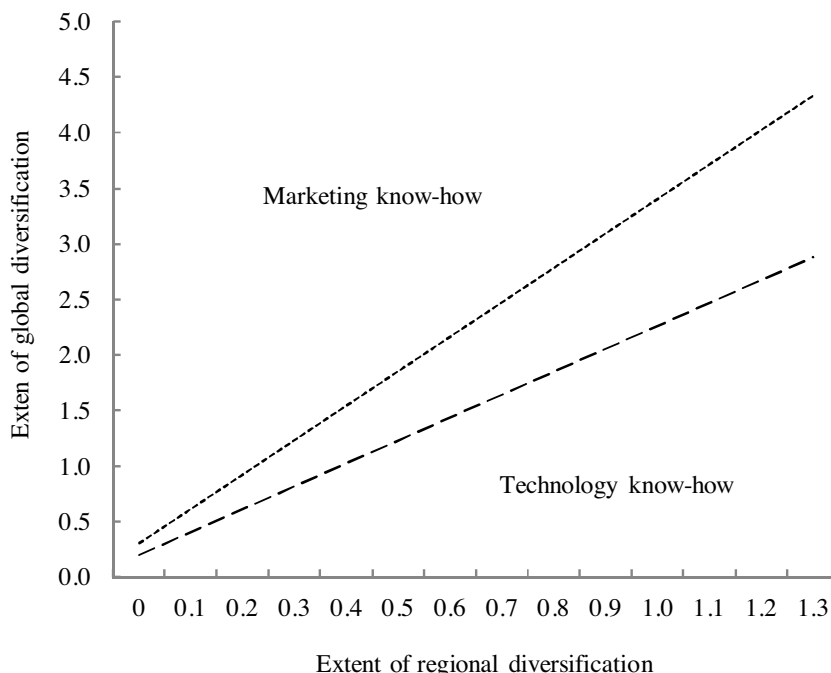


Fig. 2. The moderating effects of technology and marketing know-how on the relationship between regional and global diversification.



**Table 4**  
 Results of robustness tests (Tobit regression analyses).

DV: Global diversification	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.09 (1.02)	0.09 (1.12)	0.11 (1.24)	0.11 (1.24)	0.12 (1.34)	0.12 (1.35)
Firm age	-0.01 (-0.61)	-0.00 (-0.38)	-0.01 (-0.64)	-0.01 (-0.61)	-0.01 (-0.66)	-0.01 (-0.63)
Firm size	0.03*** (4.17)	0.02** (3.09)	0.02** (2.93)	0.02** (3.01)	0.02** (2.82)	0.02** (2.89)
Publicly listed	-0.01 (-0.17)	0.01 (0.20)	-0.00 (-0.04)	-0.00 (-0.03)	0.01 (0.16)	0.01 (0.17)
Firm performance	-0.14 (-0.72)	-0.29 (-1.49)	-0.29 (-1.44)	-0.26 (-1.30)	-0.27 (-1.34)	-0.24 (-1.19)
Competitive intensity	0.01 (1.43)	0.01 (1.42)	0.01 (1.09)	0.01 (1.15)	0.01 (1.27)	0.01 (1.33)
Research collaboration	-0.03 (-1.49)	-0.03 (-1.34)	-0.02 (-0.86)	-0.02 (-0.92)	-0.02 (-0.99)	-0.02 (-1.05)
Foreign ownership	-0.14* (-2.46)	-0.16** (-2.96)	-0.17** (-2.87)	-0.17** (-2.84)	-0.17** (-2.99)	-0.17** (-2.96)
Inverse Mills ratio	-0.37* (-2.34)	-0.34* (-2.24)	-0.33* (-2.06)	-0.35* (-2.16)	-0.35* (-2.18)	-0.36* (-2.29)
Cultural difference	0.04*** (7.74)	0.03*** (6.49)	0.03*** (5.89)	0.03*** (5.90)	0.03*** (5.82)	0.03*** (5.83)
Institutional difference	0.07*** (9.91)	0.06*** (8.59)	0.06*** (8.31)	0.06*** (8.09)	0.06*** (8.25)	0.06*** (8.03)
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
City dummy	Yes	Yes	Yes	Yes	Yes	Yes
Regional diversification		0.27*** (8.11)	0.28*** (7.92)	0.31*** (8.26)	0.26*** (7.13)	0.29*** (7.53)
Technology know-how			0.33 (0.67)	4.13* (2.41)	0.32 (0.65)	4.15* (2.44)
Marketing know-how			0.16 (0.36)	0.17 (0.40)	0.24 (0.54)	0.23 (0.52)
Regional diversification ×Technology know-how				63.49* (2.32)		64.03* (2.35)
Regional diversification ×Marketing know-how					5.11** (2.62)	5.15** (2.64)
Log-likelihood	115.40	147.76	117.60	120.38	121.13	123.98
F	17.11	21.16	17.81	17.36	17.47	17.07
Prob. > F	0.00	0.00	0.00	0.00	0.00	0.00
d.f.	18	19	21	22	22	23
Adjusted R squared	0.29	0.35	0.36	0.36	0.36	0.37

Notes: N = 625. Standard errors are given in parentheses. \* signifies significance at the  $p \leq 0.05$  (\*\* $p \leq 0.01$ ; \*\*\*  $p \leq 0.001$ ) level of confidence (two-tailed tests).

portfolio of markets. In fact, neither the new IP theory which has networks as a key theme, nor the network theory (Ahuja, 2000; Bell & Zaheer, 2007), have addressed issues of how multinational firms may be able to learn about managing their network of affiliates and how this learning might affect their growth strategy. By introducing contingencies in the form of moderators, this study moved away from the determinism implied by IP theory. The results confirm that the progression from a regional portfolio to a global portfolio is more likely to occur when a firm has strong intangible assets.

Second, this study adds insight into firms' regional strategies. Typically, such research has attempted to identify which is more prevalent, regional or global diversification. It has shown that regional and global diversification influence firm performance differently (e.g., Collinson & Rugman, 2007; Ghemawat, 2005; Rugman & Verbeke, 2004). Few studies, however, have examined the direct link between regional and global diversification. This study fills that gap by moving beyond an either-or perspective categorizing firms as either regionally or globally diversified. It has shown that regional and global diversification are linked, and both are influenced by firm-level moderators. Conceptually, regional diversification might provide firms opportunities to fortify their routines for handling diverse environments, but also enhance their networks and their ability to recognize good opportunities. In this respect the findings support the new IP theory discussed by Johanson and

Vahlne (2009) and Vahlne and Johanson (2013). It seems that theory may indeed be useful for explaining the progression of even EMNCs. The analysis suggests that future research might fruitfully move away from categorizing strategies or examining their prevalence to recognizing that strategy development is dynamic and that firms can move among categories (including regional to global). In fact, the contingent approach can be further developed by including, for example, industry characteristics or home country conditions to better define the conditions under which such switching is likely to take place.

Third, this study contributes to the global diversification literature by modeling the relationship between regional and global diversification as a contingent one, based on the strength of a firm's intangible resources. In this regard, the progression from regional to global is not deterministic, which has been one of the common criticisms of the original version of IP theory (Petersen, Pedersen, & Sharma, 2003). There are important firm-level factors that moderate the relationship. The data show that the moderating effect of technological know-how tends to be stronger than that of marketing know-how. This supports the predictions of both the internationalization process theory and the internalization theory. Just as work on "born globals" has identified a contingency under which IP theory's predictions need to be modified, so this study's findings suggest a different set of contingencies under which IP theory's predictions are stronger.

The results suggest that even though they have been late movers in global markets, many Chinese MNCs seem to be taking the measured approach of regionalizing before globalizing. In this regard, our analysis lends support to the numerous benefits of gradual internationalization identified by the literature, especially by the recent additions to the IP theory (Johanson & Vahlne, 2009; Vahlne & Johanson, 2013). In addition to enhanced learning ability manifested in refined routines, regionalization might strengthen the networks of firms and also improve opportunity recognition, which would improve their likelihood of success in more distant markets. In this regard, we would like to make the observation that big-bang global expansion exemplified by companies such as Huawei and Lenovo, the latter through the acquisition of IBM's PC business, may be the exception rather than the norm. A similar observation was made by Collinson and Rugman (2007) about the prevalence of global strategies. They suggested that the oft-discussed global strategy examples in popular press as well academic research are the exceptions rather than the norm of firms following regional strategies.

Though the primary focus of our paper was empirical, our analyses and research suggest several enhancements to the existing theories. With regard to the IP theory which is an important perspective in the internationalization literature and has been enhanced through incorporation of the network perspective, our analysis suggests that this theory could further incorporate learning at the portfolio level. Our analysis further suggests that there may be important contingencies influencing the path of internationalization. While one such contingency (young firms in high tech industries) has previously been identified in the work on "born globals", the analyses of this study lend further support to the importance of intangible assets, not only as influencing the likelihood of internationalization, but also as moderating factors that strengthen the likelihood of internationalization beyond the home region. The analyses also suggest that future research may find it useful to move beyond an either-or, global or regional categorization to an approach which deals with them in tandem. Secondly, the literature on EMNCs may find it useful to be more inclusive with regard to identifying strategies adopted by EMNCs—in other words, the literature needs to move beyond large, high-profile companies that may not be representative of the broader population of EMNCs.

### 5.2. Managerial implications

Our findings also have important implications for managers. First, managers need to carefully design their paths of international expansion such that they can maximize the learning and other benefits from international expansion while minimizing the costs and uncertainty associated with their lack of knowledge in foreign markets. A clearly-conceived location strategy accompanied by a conscious agenda emphasizing skill acquisition and development may help a firm's international diversification in the long term. Second, managers need to pay close attention to developing their intangible resources (technology and marketing know-how in this study), since such resources positively impact the likelihood of success in more challenging (and possibly more rewarding) global expansion. Successfully stepping up from a regional to a global firm is more likely for firms with strong resources, and development such resources should be a high priority for firms with global aspirations. Managers of firms with marketing skills might look at expanding into markets where their knowledge and skills may be relevant. Managers of firms with technology skills may look at a wider range of possibilities.

### 5.3. Limitations and future research

We acknowledge several limitations of our analysis which suggest interesting avenues for future research. First, as in most secondary data based analyses, we need to be cautious about inferring the direction of causality among the key constructs. Though this study protocol was developed based on existing theory and the independent variables were lagged in the empirical analysis, research using longitudinal data would be needed to conclusively demonstrate the causal link as well as the role of the contextual factors influencing the relationship. Second, since our sample was from one country, caution needs to be exercised while generalizing the results. Although the similarities between China and other emerging markets may be sufficiently strong to make the results more generally applicable, that needs to be empirically verified. Thirdly, we examined only the aggregate changes in levels of global diversification—specifically the dispersion of revenues derived from different regions. A disaggregated view could better distinguish between the various ways through which an increase in revenues from international markets may be achieved: through increased exports, entering new markets through foreign direct investment and increasing participation and commitment in existing markets. The factors driving each of these types of international expansion may be different, and future studies might find it fruitful to examine those differences in detail.

Furthermore, while we examined how firm-specific technology and marketing know-how moderate the relationship between regional and global diversification, it would be interesting to examine how contextual differences between home and host countries affect regional and global diversification and their relationship. Technological know-how might, for example, help in penetrating developed country markets (which are mostly outside the home region and hence more distant for Chinese firms), while marketing know-how might help in penetrating countries that are at a similar stage of development (for China, most likely regional markets that are geographically proximate).

Moreover, while the survey was well designed (e.g., providing separate questions to different persons in the organization who in the best position to answer these particular questions), some common method bias still exists (e.g., the answers to IV and DVs are not segregated). This too suggests the need for caution in interpreting the results. It also calls for future research designed to solve such difficulties. In addition, the available data did not reveal the performance of the global diversifications. It would be interesting to confirm that the firms which diversified globally eventually exhibited better performance than before and better performance than those which did not. This is not at all certain for Chinese firms, and a fruitful area for future research. Finally, this study did not examine which resource-acquisition strategy might best facilitate the progression from a regionally-diversified to a globally-diversified firm. Future research could look at resource acquisition as another factor facilitating that progression.

### 5.4. Conclusions

The findings of this study link regional and global diversification and help elucidate the moderating role of technology and marketing know-how in that relationship. They provide valuable empirical evidence about those relationships. These efforts and results represent a useful first step toward a more nuanced understanding of the internationalization process for firms from an emerging economy.

**Table A1**

Sample distribution by industry and city.

	No. of firms	Percentage
<b>Sectors</b>		
Electronic equipment	112	18%
Electronic components	125	20%
Consumer products	137	22%
Vehicles and vehicle parts	119	19%
Apparel and leather goods	132	21%
<b>Cities</b>		
Beijing	123	20%
Shanghai	136	22%
Guangzhou	145	23%
Chengdu	118	19%
Tianjin	103	16%
<b>Total</b>	<b>625</b>	<b>100%</b>

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## Appendix A.

Table A1

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