How much does subnational region matter to foreign subsidiary performance? Evidence from Fortune Global 500 Corporations’ investment in China

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Abstract
What explains the heterogeneity of foreign subsidiary performance? Previous studies have emphasized the importance of industry, corporate parent, and home-country effects on the variation of foreign subsidiary performance. Building on recent international business and economic geography research, this study examines the extent to which subnational region effects can also explain such performance variation. We empirically decompose the variance of the performance of Fortune Global 500 Corporations’ subsidiaries in China during 1998–2006. Results show that not only are subnational region effects statistically significant in explaining the variation of subsidiary performance, but their interactions with industry, corporate parent, and home-country effects are also significant and economically important. We further show that subnational region effects tend to be stronger in the period prior to China’s WTO accession, and in the country’s less-developed subnational regions. Our findings highlight the importance of considering both the direct and indirect roles of subnational region in shaping firms’ strategy and performance in international business research.

Keywords: subsidiary performance; subnational region; multinational corporations (MNCs) and enterprises (MNEs); emerging markets/countries/economies; variance decomposition

INTRODUCTION
What explains the heterogeneity of foreign subsidiary performance? This echoes one of the big questions for the international business field: “What determines the international success and failure of firms?” (Peng, 2004). Grounded in the industry-based (Porter, 1980) and resource-based views (Barney, 1991), as well as an emerging institution-based view (Meyer & Peng, 2005; Peng, Wang, & Jiang, 2008), extant research decomposing the variance in firm profits has shown that industry, corporate parent, and country effects are all influential in explaining the variation in the performance of firms and their foreign subsidiaries (e.g., Khanna & Rivkin, 2001; Makino, Isobe, & Chan, 2004; McGahan & Victer,
2010; Tong, Alessandri, Reuer, & Chintakananda, 2008). More recently, Chan, Makino, and Isobe (2010) show that an additional class of effects—subnational region effects—also have a statistically significant impact on foreign subsidiary performance variation.

However, in the field of strategy and international business, we still know little about whether the observed industry (corporate parent, or home country) effects are contingent on, or independent of, a subnational region's local context. Questions of this nature have drawn growing theoretical interest in the variance decomposition literature, and in management research more generally (Edwards, 2010; Powell, 1996). Relatedly, there is also an increasing focus on the development of contingency frameworks, arguments, and hypotheses in strategic management and international business research (Boyd, Haynes, Hitt, Bergh, & Ketchen, 2012; Thomas, Cuervo-Cazurra, & Brannen, 2011). The main purpose of this study is therefore to join these streams of research by examining how subnational region effects may interact with other classes of effects in explaining foreign subsidiary performance variation.

Our study focuses on multinational corporations' (MNC) foreign subsidiaries in the context of a large emerging market. We develop our arguments by drawing insights from both economic geography (Beugelsdijk, McCann, & Mudambi, 2010) and international business literatures (Meyer, Mudambi, & Narula, 2011), which suggest that the performance of firms is to a considerable extent influenced by the conditions that prevail in their immediate environment (Porter, 1994). As an extension, we argue that the effect of subnational region on foreign subsidiary performance is derived from its embeddedness in the local context within the host country (Almeida & Phene, 2004; Andersson, Forsgren, & Holm, 2002; Dellestrand & Kappen, 2012). More importantly, we further theorize that, given the “multiple embeddedness” of foreign subsidiaries (Bartlett & Ghoshal, 1989; Meyer et al., 2011) and the heterogeneity of the local context within a large emerging economy, the industry, corporate parent, and country effects on subsidiary performance variation established in prior work will also be influenced by the subnational regions in which subsidiaries are embedded.

Our study has several important research implications. First, it combines the contingency approach, which involves studying interaction effects (Boyd et al., 2012), with specific theories (i.e., the industry-, resource-, and institution-based views) to better understand the application and prediction of these theories. This represents a useful step toward a better understanding of how subnational region effects may interact with other classes of effects, and thus the ways in which subnational region effects matter, in explaining subsidiary performance variation. Our study demonstrates that the relative importance of industry effects (and corporate parent effects and home-country effects) varies significantly across the subnational regions of a large emerging economy, and that the strength of subnational region effects on foreign subsidiaries’ performance also varies across regions with different levels of factors of production and institutions. This study therefore provides refined knowledge of the drivers of foreign subsidiary performance differences, and promises to help research better understand the boundaries of existing theories of performance heterogeneity in the MNC’s context.

Second, with its focus on the local context of subnational regions within a large emerging economy, our study is also consistent with a growing stream of research that explicitly recognizes the strategic roles and implications of geographic space (e.g., Chung & Alcacer, 2002; Dellestrand & Kappen, 2012; Nachum, 2000; Shaver & Flyer, 2000). Specifically, we argue that local contexts of a large emerging economy can vary significantly across its subnational regions (Hoskisson, Eden, Lau, & Wright, 2000; Wright, Filatotchev, Hoskisson, & Peng, 2005), in particular along three dimensions—factors of production, institutions, and agglomeration (Meyer & Nguyen, 2005; Porter & Sölvell, 1998; Wan & Hoskisson, 2003)—that affect the costs, opportunities, and ultimately the performance heterogeneity of foreign subsidiaries. One contribution of our study therefore lies in bringing together the international business and economic geography literatures (Beugelsdijk et al., 2010; Meyer et al., 2011; Ricart, Enright, Ghemawat, Hart, & Khanna, 2004).

Finally, this study also contributes to the variance decomposition literature. Our study responds to recent calls for researchers to utilize new international data sets and new variables to generate new insights into sources of performance heterogeneity (McGahan & Porter, 2002; McGahan & Víctor, 2010; Tong et al., 2008; Tong & Reuer, 2006). Specifically, we develop a comprehensive, longitudinal data set of Fortune Global 500 Corporations’ subsidiaries in China, and we focus on subnational region effects and their interactions with several established sources of firm performance heterogeneity.
In addition, we conduct our analyses by using a fixed-effects model and by controlling for serial correlation (e.g., Fitza, Matusik, & Mosakowski, 2009; McGahan & Porter, 2002), which represents a methodological improvement over prior related variance decomposition studies that have relied on random-effects models and thus on certain restrictive assumptions to examine the effect of geographic location on firms’ performance variation.

LITERATURE REVIEW

Variance Decomposition Studies of Firm Performance

The question of what explains the heterogeneity of foreign subsidiary performance is related to one of the big questions for the international business field “What determines the international success and failure of firms?” (Peng, 2004). This question is also related to one of the fundamental questions in strategic management (Rumelt, Schendel, & Teece, 1994), which seeks to understand the sources of performance difference across firms. Theoretically, two dominant perspectives have been proposed: the industry-based view, exemplified by Porter (1980), argues that conditions of an industry, to a large extent, determine firm performance; while the resource-based view, represented by Barney (1991), suggests that it is firm-specific characteristics that drive performance differences. Recently, as researchers increasingly probe into emerging economies whose institutions differ significantly from those in developed economies (Hoskisson et al., 2000; Meyer & Peng, 2005; Wright et al., 2005), there is increasing appreciation that institutions also significantly shape the strategy and performance of both domestic and foreign firms in a country. As a result, an institution-based view has emerged (Meyer & Peng, 2005; Peng, 2003; Peng et al., 2008).

Empirically, pioneered by Schmalensee (1985), an influential stream of research in strategic management seeks to decompose the variance in profitability across firms’ business units into various components associated with the year, the industry, the corporate parent, and the business unit effects. There has been converging evidence that, in addition to business unit effects, a large portion of the variance in business unit performance can be explained by industry effects and by corporate parent effects (McGahan & Porter, 1997; Roquebert, Phillips, & Westfall, 1996; Rumelt, 1991). These results are interpreted as being consistent with both the industry-based and resource-based views, but these studies have not given explicit attention to the role of a firm’s geographic environment, or the location effects.

Several recent studies have extended this stream of variance decomposition research by suggesting firms’ location as another important antecedent of firm performance heterogeneity. Specifically, these studies have begun to examine the importance of country effects, or the effects that can be attributable to the country in which firms are headquartered, compared with the other types of effects highlighted in earlier research. For instance, studies have reported that differences between the institutional environments of home countries matter importantly in explaining firms’ performance variation (e.g., Khanna & Rivkin, 2001; McGahan & Victer, 2010; Tong et al., 2008), and have essentially supported the institution-based view (Meyer & Peng, 2005; Peng et al., 2008). These studies, however, have not specifically examined the drivers of foreign subsidiary performance differences.

Drivers of Foreign Subsidiary Performance

In the 1990s, international business research began to investigate whether the performance of MNCs’ foreign subsidiaries varies among the host countries in which they operate. In one of the first studies on this question, Christmann, Day, and Yip (1999) examined a sample of 99 foreign subsidiaries owned by two American and two European MNCs and operating in 37 host countries, and they found that host-country-specific characteristics are the most important group of variables affecting foreign subsidiary performance. The relatively small sample size and cross-sectional nature of this study may have limited the generalizability of the findings, however. Makino et al. (2004) conducted the first variance decomposition study to systematically examine the drivers of foreign subsidiary performance differences. Their panel data set consisted of 5183 foreign subsidiaries formed by 616 Japanese MNCs in 159 industries in 79 countries over a 6-year period (1996–2001). Their analyses showed that host-country effects are as strong as industry effects in explaining the variation in subsidiary performance, following foreign subsidiary effects and corporate parent effects, and providing strong support for the three main perspectives of performance heterogeneity. While this study has made an important contribution in demonstrating the role of location (host country) in affecting foreign subsidiary performance, it assumes away the effect...
of subnational region within a country in explaining the variation in subsidiary performance.

The neglect of subnational region effects might not be that critical for MNCs that operate only in host countries with relatively homogeneous subnational environments. Such effects are likely to be much more important for MNCs operating in host countries with heterogeneous local conditions across these countries' subnational regions, however. More recently, Chan et al. (2010) examined the extent to which subnational region effects could explain the variation in foreign subsidiary performance in two host countries, the United States and China. They examined a panel data set with more than 45,000 foreign subsidiary-year observations that included 4931 foreign subsidiaries operating in 75 industries, formed by 1842 Japanese MNCs in 34 states in the United States and 21 provinces in China over a 10-year period (1996–2005). Their results suggested that, although relatively small in their magnitude, subnational region effects are statistically significant in explaining the performance variation of foreign subsidiaries, especially for those operating in China, whose subnational regions are more heterogeneous than the United States.

Despite its significant contributions, there are several limitations in Chan et al.'s (2010) study. First, with its primary focus on subnational region’s main effects, the study has not given much attention to the interactions between subnational region effects and the other classes of effects established in prior variance decomposition research (i.e., industry, corporate parent, and home-country effects). The lack of attention to such interaction effects may limit our understanding of the ways in which subnational regions matter. In addition, the sample of MNCs in the study is from a single home country – Japan – which does not allow one to examine the role of home-country effects in conjunction with subnational region effects, even though home-country effects have been emphasized in recent variance decomposition studies (e.g., Khanna & Rivkin, 2001; McGahan & Victer, 2010; Tong et al., 2008). Finally, the variance components technique that was employed in the study is not able to control for potential covariance between the individual effects and serial correlation problems that can distort the results (e.g., McGahan & Porter, 2002). We seek to address these limitations theoretically and empirically in this paper, and we develop specific hypotheses on the direct and interaction effects of subnational region on the performance variation of MNCs’ foreign subsidiaries in a large emerging economy below.

THEORY AND HYPOTHESES

Direct Effects of Subnational Region

Research in international business and economic geography has long studied the role of location, which provides a theoretical foundation for studying subnational region effects. For example, in a series of research on location and strategy, Porter (1990, 1994, 1998) suggests that “the relevant economic area is smaller than the nation” and that “the most decisive economic policy influences are often at the state and local level” (1994: 38). Recently, an increasing stream of research has investigated various attributes at the subnational level, with a focus on subnational agglomeration (e.g., Chung & Alcácer, 2002; Driffield & Munday, 2000; Shaver & Flyer, 2000; Tan & Meyer, 2011). According to these studies, there exist persistent differences in the local conditions of subnational regions that will influence the economic performance of these regions and the firms embedded there (Baptista & Swann, 1998; Porter & Sölvell, 1998).

As an extension, we argue that the effect of subnational region on foreign subsidiary performance is derived from the subsidiary's embeddedness in the local context of the subnational region (Almeida & Phene, 2004; Andersson et al., 2002; Meyer et al., 2011).

Specifically, the local context of a subnational region is composed of three key dimensions: factors of production, institutions, and agglomeration. Factors of production refer to the inputs necessary to produce goods or services, including endowed, advanced, and human factors (e.g., Dunning, 1993; Porter, 1990; Wan & Hoskisson, 2003). Institutions are humanly devised formal and informal rules of the game that shape economic transactions (e.g., Khanna & Palepu, 1997; North, 1990; Wan & Hoskisson, 2003). Formal institutions include economic, political, and legal institutions, which correspond to Scott’s (2008) regulative pillar of institutions; while informal institutions concern social institutions and rules embedded in values, norms, beliefs, and cultures, which correspond to Scott’s (2008) normative and cognitive pillars of institutions. Finally, with regard to agglomeration, as pointed out by Porter and Sölvell (1998: 441), “agglomeration economies have their roots in processes whereby links between firms, institutions and infrastructures within a geographic area give rise to economies of scale and scope.” We suggest that all the three dimensions are important at the subnational region level, and that their effects on foreign
subsidiary performance are likely to be interrelated to one another.

Subnational regions within a country can differ markedly in the abundance level of their factors of production (Cantwell, 2009; Meyer & Nguyen, 2005; Porter, 1990; Zhou, Delios, & Yang, 2002). We argue that foreign subsidiaries might achieve different levels of performance, owing to the differences in the location-specific advantages among the subnational regions where they operate (Dunning, 1998; Makino et al., 2004; McCann & Mudambi, 2005; Phelps & Fuller, 2000). First, while the abundance of endowed factors deriving from natural resources provides the basic requirements of production, and may facilitate firms’ production activities, regions with deficient supplies of endowed factors might put firms located there in a disadvantageous position to compete (Enright, 1998). Second, advanced factors involve the physical infrastructures, capital goods accumulation, and financial resources needed for the local economy to function (Wan & Hoskisson, 2003), and they relate to the nature of production. It is commonly recognized that regional investment in physical infrastructures such as transport services, telecommunication, power, and irrigation across different regions can affect the productivity of all inputs in the production process (Demurger, 2001; Driffield, 2002), and hence lead to foreign subsidiary performance differences. Third, human factors, referring to labor quality such as a highly educated workforce (Porter, 1990), may help to facilitate a region’s absorptive capacity with regard to the generation of new product ideas (Almeida & Phene, 2004; Cantwell & Iammarino, 2000; Frost & Zhou, 2005) and the acquisition of new knowledge (Almeida & Kogut, 1999; Saxenian, 1994). Such absorptive capacity is of particular importance to the performance of MNCs’ foreign subsidiaries in emerging economies, as they are routinely engaged in the transfer of technological and managerial knowledge from the home country to the host country (Hoskisson et al., 2000; Lyles & Balk, 1996; Wright et al., 2005).

Subnational regions within a country also differ in their institutions (Meyer & Nguyen, 2005; Porter, 1990, 1998). As suggested by the institution-based view (Meyer & Peng, 2005; Peng et al., 2008), it is economic, political and legal, and social institutions, along with technology, that determine transaction costs and the transformation costs of production, and thus the performance of foreign subsidiaries embedded in the local context (Makino et al., 2004; North, 1990). First, economic institutions embody the rules and standards that shape the region’s business transactions (Wan & Hoskisson, 2003). In particular, subnational regions in emerging economies exhibit significant heterogeneity in the development of their product, capital, and intermediate markets (He, 2003; Hill, 2002; Walder, 1995), with some regions suffering more from economic institutional voids than others (Kambhampati & McCann, 2007; Khanna & Palepu, 1997; Wei, Liu, Parker, & Vaidya, 1999). As a result, market transactions would be less efficient and firms face more uncertainty in doing business in less-developed subnational regions than in developed regions. Second, political and legal institutions are primarily related to the credibility and effectiveness of a region’s bureaucratic infrastructure and formal rules (Scott, 2008; Wan & Hoskisson, 2003), which are foundations for business transactions. For example, some subnational governments of a large emerging economy are often heavily involved in and have considerable power over FDI-related policies (Ma & Delios, 2010). In subnational regions with FDI-friendly policies, foreign firms are more likely to be able to exploit their firm-specific advantages. Third, regional social institutions may influence the benefits and costs of engaging in business activities in a region. For example, scholars of regional studies have examined how informal institutions such as business culture can contribute to the advantage of a subnational region and firms’ capability building (e.g., Saxenian, 1994). It has also shown that in Brazil, informal institutions, such as norms and values (Scott, 2008), differ considerably across its subnational regions, which have an important impact on business performance (Lenartowicz & Roth, 2001). In China’s FDI-prone regions (He, 2003; Wei et al., 1999), foreign subsidiaries confront less liability of foreignness compared with those located in inland provinces, which may help to improve their performance (Park, Li, & Tse, 2006).

Agglomeration economies are positive externalities that stem from the geographic clustering of a group of companies (Porter, 1998). According to Krugman (1991), there are three external economies that might stem from agglomeration:

1. Knowledge spillovers among competitors;
2. Industry demand that creates a pool of specialized labor; and
3. Industry demand that creates a pool of specialized input providers.

Recent studies have suggested that agglomeration may help foreign subsidiaries access local market
knowledge and resources, and gain legitimacy (Tan & Meyer, 2011). For example, positive externalities and scale economies derived from clustering of economic activities and co-location of related production facilities could significantly mitigate the liability of foreignness faced by foreign investors, and drive their subsidiaries’ performance variation (He, 2003). These positive externalities have the potential to enhance the performance of foreign subsidiaries embedded in the subnational region. Agglomeration, by definition, is likely to be at the subnational level. As suggested by Porter and Sölvell (1998: 440), “the growth and performance of firms seems to a considerable extent to be influenced by the conditions that prevail in its environment” and “conditions in the immediate proximity – in the local cluster – seem to be particularly important.” In a large emerging economy such as China, there usually exist different levels of agglomeration across different subnational regions (Fan & Scott, 2003; He, 2003). Therefore the benefits gained from agglomeration are likely to be different in different subnational regions, leading to the heterogeneity of foreign subsidiary performance.

In sum, subnational regions within a large emerging economy are likely to be heterogeneous in factors of production, institutions, and agglomeration. We argue that such heterogeneity can provide foreign subsidiaries with differential opportunities and constraints, which shape the cost and return potential of their business activities, and ultimately lead to performance differences. Therefore we expect subnational region effects to matter importantly in explaining the performance variation of MNCs’ subsidiaries operating in a large emerging economy, leading to the following hypothesis:

**Hypothesis 1**: A significant portion of the variation in foreign subsidiary performance within a host emerging economy is attributable to subnational region effects.

**Interaction Effects of Subnational Region**

In addition to its direct effects, subnational region may also have important indirect effects on the variation in foreign subsidiary performance. Based on the industry-, resource-, or institution-based views, previous variance decomposition studies have analyzed the extent to which industry, corporate parent, or home-country effects can shape subsidiary performance variation. We now go a step further by taking a contingency approach, which suggests that in most cases the relationship between two variables is influenced by other variables, to develop hypotheses arguing that subnational region may exert its indirect effects through interactions with industry effects, corporate parent effects, and home-country effects, respectively.

**Interaction effects between subnational region and industry**

We believe that the interaction effects between subnational region and industry will matter importantly in explaining the performance variation of multinational firms’ subsidiaries in large emerging economies such as China, for several reasons. First, economic geography research has recognized that comparative advantages based on factors of production exist at the subnational region level (Kambhampati & McCann, 2007; McCann & Mudambi, 2005). The forces of such factor-based comparative advantages, which derive from differences in factor munificence and production intensity (Makino et al., 2004; McGahan & Vicer, 2010), may push firms in a subnational region to specialize in certain industries, owing to the relative abundance of some specific factors of production that can support the growth of these industries (Driffield & Munday, 2000; Enright, 1998; Porter, 1998). Foreign subsidiaries embedded in this region and operating in these industries are likely to benefit from the industry-specific agglomeration economies and clustering effects (Gordon & McCann, 2000; Head, Ries, & Swanson, 1995). For instance, they can tap a highly skilled workforce that serves a large number of similar firms within a locality (Porter, 1990). As a result, these foreign subsidiaries may have a competitive advantage over others in the same region but operating in other industries, or those competing in the same industry but in other regions.

Second, recent research in international business and economic geography has highlighted institution-based comparative advantages in subnational regions of emerging economies (Kambhampati & McCann, 2007; Meyer & Nguyen, 2005). In particular, a subnational government agency within an emerging economy may play an active role in promoting the development of particular industries in the region through various policy measures (He, 2003). For instance, special policy packages or tax breaks can be offered to incentivize infrastructure investment, research and development, and firm collaborations in particular industries in the region, thus providing an institutional environment conducive for such industries to grow (He, Wei, & Xie,
These government-driven industry agglomeration effects can be found in many emerging economies. As one example, in India, some state governments have created software technology parks with high-class infrastructure for commercial as well as residential inhabitation, which is vastly superior to that found elsewhere in the country, and have offered attractive packages of both fiscal and non-fiscal incentives for promoting FDI in these industries, leading to the rise of Bangalore’s Electronic City and Hyderabad’s HITEC City (Kapur & Ramamurti, 2001). As a result, the phasing of a subnational region’s development is likely to be industry-specific, and subnational regions can vary greatly in the types of industries they focus on as well as the competitiveness of firms in these industries (Gordon & McCann, 2000; Head et al., 1995).

Third, institutional transition in large emerging economies has led to local protectionism of specific industries. Many emerging economies have been experiencing institutional transitions (Hoskisson et al., 2000; Peng, 2003), and in the case of China the essence of the institutional transition is a process of decentralization from the central government to local governments (Montinola, Qian, & Weingast, 1995). Fiscal decentralization has contributed greatly to the rise of local protectionism and regionalism (Cannon & Zhang, 1996), leading to an upward trend of agglomeration in some industries favored by the local subnational governments (Fan & Scott, 2003). For example, local governments often implement a variety of measures to protect profitable and high-value-added industries, as well as the so-called pillar industries and those with strong industrial linkages (He et al., 2008). As a result, the competitive intensity of industries varies across subnational regions (Young, 2000), which, in turn, may shape the structure of these industries and affect the performance of foreign subsidiaries.

Taken together, our discussion above suggests that subnational region–industry interaction effects may influence foreign subsidiaries’ performance variation, because different subnational regions provide different sets of opportunities and constraints for different industries. Thus we propose a hypothesis on the interactive effects of subnational region and industry on subsidiary performance variation below:

**Hypothesis 2:** A significant portion of the variation in foreign subsidiary performance is attributable to subnational region–industry interaction effects.

**Interaction effects between subnational region and corporate parent**

Prior research in international business recognizes the significant effect of the corporate parent on foreign subsidiary performance, and we suggest that the interaction between subnational region effects and corporate effects may also explain an important part of the variation in subsidiary performance in a large emerging economy. To begin with, a foreign subsidiary can be considered an integrated part of its parent firm, because its core resources are often transferred from the parent firm (Dunning, 1993; Makino et al., 2004). Indeed, MNCs must transfer some advantages in order to give their operations in the host country a competitive edge (Dunning, 1993). However, some MNC advantages are more transferable than others to certain locations than to others (Hu, 1995). In the meantime, a foreign subsidiary can also be considered a local firm embedded in the local environment. We argue that, given the “multiple embeddedness” of foreign subsidiaries (Almeida & Phene, 2004; Meyer et al., 2011), the extent to which the MNC’s firm-specific advantages can be transferred to and create value for its foreign subsidiaries (Caves, 1996; Dunning, 1993) may largely depend on the nature of the MNC advantages to be transferred, the local context where MNC foreign subsidiaries are embedded, and the fit between these two.

First, international transferability of some MNC advantages varies according to the abundance level of the factors of production offered by the subnational region. For example, MNCs often intend to transfer their intangible assets such as technological skills and managerial expertise to their foreign subsidiaries in emerging markets (Delios & Beamish, 2001; Lyles & Salk, 1996). The transfer of such tacit knowledge is difficult and costly, and requires a high-quality local workforce with high levels of absorptive capacity (Gupta & Govindarajan, 2000; Tallman, Jenkins, Henry, & Pinch, 2004; Zhang, Li, Li, & Zhou, 2010). Thus, given the uneven development levels of human factors across different locations within a large emerging economy, some subnational regions may provide the MNC foreign subsidiary with a highly educated workforce that helps to facilitate the transfer of such advantages, while regions lacking such a workforce may limit the knowledge transfer.
Second, international transfer of some MNC advantages may fail to take place if these advantages lose their value in the institutional environment of the subnational region. For instance, MNCs often have well-known brand names and trademarks as well as proprietary technologies, and the successful transfer of such advantages can make MNC foreign subsidiaries more competitive in the host country (Feinberg & Majumdar, 2001; Markusen, 2001). However, the value of these advantages can be neutralized by piracy and imitation (Hu, 1995). In particular, when the intellectual property protection is weak in a subnational region of a large emerging economy, or when there is laxity in enforcing the law, the value of well-known brand names, trademarks, or technological advantages will be not only neutralized, but also severely destroyed.

Third, agglomeration in the subnational region may also shape the international transferability of some MNC advantages. For example, knowing how to establish and manage the relationships with suppliers or buyers is often regarded as an advantage that can be transferred to a foreign location. The implicit assumption for the transferability of this advantage is the availability of large numbers of existing or potential suppliers or buyers in the host location. However, there are arguably different levels of agglomeration across different subnational regions of a large emerging economy (He, 2003; Tan & Meyer, 2011), leading to differences in the availability of upstream or downstream industry players. For example, when there are few suppliers or buyers in a subnational region, the MNC cannot make good use of this advantage. Therefore the transferability of this advantage will be largely discounted by the low degree of agglomeration in this subnational region, which may further influence the performance of MNC foreign subsidiaries embedded there. Taken together, these lines of argument lead to our next hypothesis on the interactive effects of subnational region and corporate parent on foreign subsidiary performance variation:

**Hypothesis 3:** A significant portion of the variation in foreign subsidiary performance is attributable to subnational region–corporate parent interaction effects.

**Interaction effects between subnational region and home country**

Recent economic geography and international business research has identified the main effect of MNCs’ home country, or country of origin (He, 2003), on firm strategy and performance (e.g., Holburn & Zelner, 2010; McGahan & Victer, 2010; Tong et al., 2008; Wan & Hoskisson, 2003). In particular, prior research has found that an MNC’s home country affects its foreign subsidiary performance through mechanisms such as learning and imprinting (Holburn & Zelner, 2010; McGahan & Victer, 2010). Through learning and experience accumulation in the home country, MNCs can transfer their knowledge about the home country’s institutions to their foreign subsidiaries (Henisz & Delios, 2002); cognitive imprinting further leads home-country managers to develop mental models for use to interpret the environment and guide their actions under different conditions (Denzau & North, 1994; Holburn & Zelner, 2010). We suggest that there also exists a significant home-country–subnational-region interaction effect on foreign subsidiary performance variation, for several reasons.

First, there are likely to be institutional differences (Kostova & Zaheer, 1999), in formal and informal institutions (North, 1990), or regulative, normative, and cognitive institutions (Scott, 2008), between the MNC’s home country and the host country’s subnational region in which its foreign subsidiaries operate (Chan et al., 2010; Meyer & Nguyen, 2005). When facing larger differences in formal institutions, MNCs have to adapt their business practices in the legal context of the subnational regions, which may reduce the benefits from their institutional experiences in the home regulatory environment through the exportation of knowledge about policymaking and political processes (McGahan & Victer, 2010). On the other hand, knowledge about informal institutions is often tacit (Boyacigiller, Goodman, & Phillips, 2004), so that engagements across culturally different environments require intensive cross-cultural communication and new organizational learning, which will further reduce the effects of home-based imprinting and learning mechanisms on foreign subsidiary performance.

Second, there often exist historical ties between an MNC’s home country and the subnational region where a foreign subsidiary is located in a large emerging economy. Historical ties, in our setting, refer to historical relations between an MNC’s home country and a specific subnational region of the host emerging economy (Makino & Tsang, 2011). For instance, in the case of China, even though China was never fully colonized, the 19th-century global
system, with its military-backed Western colonization activities, forced on Qing China a series of “unequal treaties” that deprived China of much of its sovereignty (Thomas, 1984). As a result, some subnational regions of China were once colonized, occupied, or dominated by different foreign countries, with some of them having special interest and maintaining particular ties in specific subnational regions in China. Such historical ties may lead to the rise of country-of-origin agglomeration (Tan & Meyer, 2011), which can reduce foreign firms’ search and assessment costs of business activities, facilitate information flow, make the ongoing operations more efficient, improve the legitimacy of the foreign subsidiary, and enhance the social relations (Ghemawat, 2001; Jones & Khanna, 2006). To the extent that historical ties matter, they provide another source of the interactive effects between subnational region and home country on subsidiary performance difference.

Third, variations in geographic and linguistic distances between an MNC’s home country and the subnational regions of the host country where its foreign subsidiaries are located affect the difficulty and costs of verbal communication between the MNC parent and its subsidiaries (Ghemawat, 2001; Slanger, 2011), which may further influence the likelihood of successful transfer of home-grown “cognitive frames” or “mental models.” For example, China’s Guangdong Province is geographically closer to Hong Kong than other provinces of China, and Cantonese has been widely used in both Guangdong and Hong Kong. The geographic proximity and the zero linguistic distance may help Hong Kong-based MNCs intensify the interactions and information exchanges between parent firms and subsidiaries in Guangdong, making it easier for them to transfer knowledge, interpret local environments, and guide actions in the subsidiaries there. This, however, might not be the case for other provinces. Taken together, these arguments suggest that the value of the mechanisms through which MNCs’ home country impacts foreign subsidiary performance may depend on the local context of the subnational region in a large emerging economy, leading to the following hypothesis:

**Hypothesis 4**: A significant portion of the variation in foreign subsidiary performance is attributable to subnational-region–home-country interaction effects.

### METHODS

#### Data and Sample

Our empirical analyses focus on MNCs’ subsidiaries operating in China’s emerging economy. Focusing on a single host country helps to control for potential heterogeneity at the host-country level while allowing for meaningful differences across the MNCs’ home countries. China offers an appropriate setting for our study, for several reasons. It is the world’s largest emerging economy as well as the largest FDI recipient among all the emerging economies (UNCTAD, 2007). Given China’s substantial market size, strong economic growth, and increasing openness to FDI, a large number of multinational firms have entered into the country, and have established subsidiaries in many of its subnational regions over the last decade. However, subnational regions in China are highly heterogeneous in terms of their factors of production, institutional development, and agglomeration levels (e.g., He et al., 2008; Ma & Delios, 2010).

We developed a unique data set for empirical analysis by drawing from two official databases in China: the MOFCOM (Ministry of Commerce) database for *Fortune* Global 500 Corporations’ investment in China, and the NBS (National Bureau of Statistics) database for the financial and other information of manufacturing firms registered in China. Because some Chinese companies were ranked among the list of *Fortune* Global 500 Corporations, we included only non-Chinese companies for this study. Also, because MNCs entered and exited the *Fortune* Global 500 list, we kept an MNC in our sample as long as it entered the list during 1998–2005, which is also consistent with the MOFCOM data set. These sampling screens were satisfied by 428 MNCs, and these firms had established 4303 foreign subsidiaries in China by the end of 2005. The profiles of these subsidiaries contained detailed information, including the subsidiary’s identification, founding year, location, and industry. We then matched these subsidiaries to the manufacturing firms reported in the NBS database in order to retrieve their financial and other information. The NBS database, based on data collected from an annual census, provides comprehensive information on firms’ various financial and accounting indicators. The NBS database has been shown to be reliable and internally consistent in prior economics research (Chow, 1993), and a number of recent studies in strategy and management have used the database, including Buckley,
Clegg, and Wang (2002), Park et al. (2006), and Zhang et al. (2010).

From the merged data set, we excluded cases lacking complete information required for the empirical analysis (e.g., unclear profitability measures, ambiguous industry affiliations etc.). We also dropped industries (subnational regions, and multinational firms) that had only one subsidiary for which data were available, since in these instances industry (subnational region, and corporate) effects cannot be distinguished from subsidiary effects. In mainland China, 22 provinces, 5 autonomous regions, and 4 municipalities constitute the first level of administration. Consistent with prior research in economics and management (e.g., Chan et al., 2010; Cheng & Kwan, 2000), we treat this level of administration as the subnational region for this study. As a result of the data-cleaning steps described above, five subnational regions (Gansu, Ningxia, Qinghai, Tibet, and Xinjiang) were dropped from the data set, because they contained only one subsidiary each with available data. The final sample consisted of 8043 subsidiary-year observations, which included 1625 subsidiaries spanning 148 three-digit Chinese SIC industries, and were established by 228 Fortune Global 500 Corporations based in 19 home countries (i.e., Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Italy, Japan, Malaysia, the Netherlands, Norway, Singapore, South Korea, Sweden, Switzerland, Taiwan, the United Kingdom, and the United States). Our data set is an unbalanced panel, and the use of unbalanced panel data sets is common in prior variance decomposition studies.

There are several unique features of the data set that distinguish the focus of our study. First, our study focuses on the foreign subsidiary of the multinational firm as the primary unit of analysis, and we seek to understand the sources of the variation of subsidiary performance. By contrast, most prior variance decomposition studies have focused on the line of business level (defined by the Federal Trade Commission) or business segment level (defined by Compustat) (e.g., McGahan & Porter, 1997; Roquebert et al., 1996; Rumelt, 1991; Schmalensee, 1985); however, because reporting at this level aggregates data (profits and costs) of more than one subsidiary or division of a corporation, it is difficult to ascertain the true magnitudes of individual subsidiary or division effects. Second, recent variance decomposition studies have begun to examine the importance of home- and host-country effects in explaining firm performance variations (e.g., Makino et al., 2004; McGahan & Victer, 2010; Tong et al., 2008), and our study extends their focus on the country level to the subnational region level within a country (Chan et al., 2010). Our data set covers MNCs’ manufacturing subsidiaries located in 26 subnational regions (see Table 1) within the host country, China, allowing us to quantify the importance of subnational region effects. Third, the MNCs represented in our data set originated from 19 home countries, which represents a departure from Makino and colleagues’ (i.e., Makino et al., 2004; Chan et al., 2010) focus on the MNCs from one home country, Japan. Our study can therefore capture both subnational region effects and home-country effects, as well as their interaction effects, providing an attempt to examine the two types of location effects simultaneously in a single study.

Table 1 reports characteristics of the data set by subnational region, the key variable of our interest. The first column indicates that the average ROA (return on assets) of the sampled MNCs’ subsidiaries is about 4.8%; however, large performance variations exist among subsidiaries located in different subnational regions. The next five columns report the number of observations, number of subsidiaries, number of corporate parents (MNCs), number of industries, and number of home countries represented by the MNCs that invest in each subnational region, respectively. The next two columns report the indices for factors of production and institutions for each region. Following procedures similar to those used in prior studies (e.g., Wan & Hoskisson, 2003), we first standardized the variables that were used for measuring factors of production and institutions. We then summed and averaged the variables within six groupings, each of which represented either one of the three components of factors (endowed, advanced, and human factors) or one of the three components of institutions (economic, political and legal, and social institutions). Then we took the average value for the three components of factors, and also for the three components of institutions. Data for the variables were obtained from China’s Sustainable Development Strategy Reports (compiled annually by the Chinese Academy of Sciences) and China Statistical Yearbooks (compiled annually by the NBS) for the study period. We note that the indices for factors of production and institutions were calculated annually, but the numbers reported in the two columns are the averages for each subnational region during our study period.
Variables and Measures

In keeping with prior variance decomposition research (e.g., McGahan & Porter, 1997; McGahan & Victer, 2010; Rumelt, 1991), we used ROA to measure foreign subsidiary performance, which serves as the dependent variable in our study. We included in our analyses six independent variables to examine their main effects on foreign subsidiary performance. All the six variables are categorical:

- the Year effect captures the extent to which the differences across the 9 years within the study period 1998–2006 can explain the variation in ROA;
- the Subnational Region effect denotes the portion of the variance in ROA that can be attributed to the differences among the subnational regions in which the subsidiaries are located;
- the Industry effect denotes the portion of the variance in ROA that can be attributed to the differences among the three-digit Chinese SIC industries in which the subsidiaries operate;
- the Corporate Parent effect denotes the portion of the variance in ROA that can be attributed to the differences among the MNCs (parent firms) that operate the subsidiaries;
- the Home Country effect denotes the portion of the variance in ROA that can be attributed to the differences among the home countries from which the MNCs originated; and
- the Subsidiary effect denotes the portion of the variance in ROA that can be attributed to the differences among the foreign subsidiaries themselves.

In order to investigate how the effect of Subnational Region may interact with other variables of interest, and to test Hypotheses 2–4, we incorporated into our analyses the following three interaction effects variables: Subnational Region–Industry effect, Subnational Region–Corporate Parent effect, and Subnational Region–Home Country effect. We also included a Subnational Region–Year effect variable in

Table 1  Descriptive statistics of the data set by subnational region

<table>
<thead>
<tr>
<th>Subnational region</th>
<th>Average ROA (%)</th>
<th>No. of observations</th>
<th>No. of subsidiaries</th>
<th>No. of corporations</th>
<th>No. of industries</th>
<th>No. of home countries</th>
<th>Factor index</th>
<th>Institution index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anhui</td>
<td>5.98</td>
<td>55</td>
<td>12</td>
<td>10</td>
<td>13</td>
<td>5</td>
<td>–0.02</td>
<td>–0.21</td>
</tr>
<tr>
<td>Beijing</td>
<td>4.73</td>
<td>581</td>
<td>122</td>
<td>70</td>
<td>62</td>
<td>12</td>
<td>1.74</td>
<td>1.26</td>
</tr>
<tr>
<td>Chongqing</td>
<td>2.79</td>
<td>122</td>
<td>20</td>
<td>17</td>
<td>15</td>
<td>7</td>
<td>–0.32</td>
<td>–0.17</td>
</tr>
<tr>
<td>Fujian</td>
<td>8.14</td>
<td>179</td>
<td>33</td>
<td>25</td>
<td>20</td>
<td>5</td>
<td>0.19</td>
<td>0.60</td>
</tr>
<tr>
<td>Guangdong</td>
<td>5.78</td>
<td>1251</td>
<td>234</td>
<td>100</td>
<td>80</td>
<td>14</td>
<td>0.81</td>
<td>1.08</td>
</tr>
<tr>
<td>Guangxi</td>
<td>5.27</td>
<td>41</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>4</td>
<td>–0.31</td>
<td>–0.32</td>
</tr>
<tr>
<td>Guizhou</td>
<td>–3.01</td>
<td>10</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>–0.64</td>
<td>–0.72</td>
</tr>
<tr>
<td>Hainan</td>
<td>3.16</td>
<td>31</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>2</td>
<td>0.08</td>
<td>–0.05</td>
</tr>
<tr>
<td>Hebei</td>
<td>5.06</td>
<td>90</td>
<td>18</td>
<td>17</td>
<td>18</td>
<td>5</td>
<td>–0.15</td>
<td>0.18</td>
</tr>
<tr>
<td>Heilongjiang</td>
<td>1.40</td>
<td>41</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>4</td>
<td>0.48</td>
<td>–0.16</td>
</tr>
<tr>
<td>Henan</td>
<td>5.33</td>
<td>49</td>
<td>8</td>
<td>8</td>
<td>10</td>
<td>3</td>
<td>–0.09</td>
<td>–0.29</td>
</tr>
<tr>
<td>Hubei</td>
<td>5.75</td>
<td>84</td>
<td>16</td>
<td>12</td>
<td>10</td>
<td>4</td>
<td>0.15</td>
<td>–0.28</td>
</tr>
<tr>
<td>Hunan</td>
<td>4.43</td>
<td>51</td>
<td>14</td>
<td>13</td>
<td>13</td>
<td>8</td>
<td>0.02</td>
<td>–0.39</td>
</tr>
<tr>
<td>Jiangsu</td>
<td>4.28</td>
<td>1251</td>
<td>273</td>
<td>112</td>
<td>98</td>
<td>16</td>
<td>0.66</td>
<td>0.81</td>
</tr>
<tr>
<td>Jiangxi</td>
<td>6.90</td>
<td>21</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>3</td>
<td>–0.13</td>
<td>–0.15</td>
</tr>
<tr>
<td>Jilin</td>
<td>4.95</td>
<td>59</td>
<td>15</td>
<td>14</td>
<td>11</td>
<td>5</td>
<td>0.34</td>
<td>0.11</td>
</tr>
<tr>
<td>Liaoning</td>
<td>3.81</td>
<td>494</td>
<td>93</td>
<td>42</td>
<td>60</td>
<td>6</td>
<td>0.41</td>
<td>0.45</td>
</tr>
<tr>
<td>Neimengu</td>
<td>1.77</td>
<td>20</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>–0.43</td>
<td>–0.27</td>
</tr>
<tr>
<td>Shaanxi</td>
<td>9.88</td>
<td>29</td>
<td>5</td>
<td>5</td>
<td>7</td>
<td>4</td>
<td>–0.22</td>
<td>–0.43</td>
</tr>
<tr>
<td>Shandong</td>
<td>2.69</td>
<td>388</td>
<td>76</td>
<td>45</td>
<td>50</td>
<td>9</td>
<td>0.31</td>
<td>0.43</td>
</tr>
<tr>
<td>Shanghai</td>
<td>5.31</td>
<td>1810</td>
<td>351</td>
<td>134</td>
<td>99</td>
<td>13</td>
<td>1.74</td>
<td>1.59</td>
</tr>
<tr>
<td>Shanxi</td>
<td>7.15</td>
<td>31</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>–0.55</td>
<td>–0.09</td>
</tr>
<tr>
<td>Sichuan</td>
<td>6.15</td>
<td>144</td>
<td>25</td>
<td>16</td>
<td>25</td>
<td>5</td>
<td>–0.33</td>
<td>–0.38</td>
</tr>
<tr>
<td>Tianjin</td>
<td>3.89</td>
<td>740</td>
<td>165</td>
<td>63</td>
<td>70</td>
<td>9</td>
<td>0.76</td>
<td>0.85</td>
</tr>
<tr>
<td>Yunnan</td>
<td>2.82</td>
<td>42</td>
<td>6</td>
<td>4</td>
<td>7</td>
<td>3</td>
<td>–0.56</td>
<td>–0.64</td>
</tr>
<tr>
<td>Zhejiang</td>
<td>4.66</td>
<td>429</td>
<td>98</td>
<td>52</td>
<td>53</td>
<td>11</td>
<td>0.40</td>
<td>0.87</td>
</tr>
<tr>
<td>Total</td>
<td>4.84</td>
<td>8043</td>
<td>1625</td>
<td>798</td>
<td>759</td>
<td>163</td>
<td>0.88</td>
<td>0.93</td>
</tr>
</tbody>
</table>
order to capture the transient subnational region effect.

**Analytical Model**

As discussed earlier, our study examines the effect of subnational region on the variability in performance of MNCs’ subsidiaries in China, as well as other classes of effects established by prior variance decomposition studies. We followed McGahan and Porter (2002) and used a simultaneous ANOVA approach to determine the sizes of the individual classes of effects. Specifically, we estimate the following equation:

\[
\text{ROA}_{o,i} = \mu + x_i + \beta_j + \gamma_k + \theta_m + \delta_l + \nu_{j,i} + \zeta_{j,k} + \eta_{j,j} + \zeta_{j,m} + \tau_o + \epsilon_{o,i} \tag{1}
\]

The dependent variable \( \text{ROA}_{o,i} \) on the left-hand side denotes the ROA of subsidiary \( o \) in year \( i \). On the right-hand side, the first term \( \mu \) is a constant, equal to the grand mean. The term \( x_i \) captures the Year effect, \( \beta_j \) the Subnational Region effect, \( \gamma_k \) the Industry effect, \( \theta_m \) the Home Country effect, \( \delta_l \) the Corporate Parent effect, \( \nu_{j,i} \) the Subnational Region–Year interaction effect, \( \zeta_{j,k} \) the Subnational Region–Industry interaction effect, \( \eta_{j,j} \) the Subnational Region–Corporate Parent interaction effect, \( \zeta_{j,m} \) the Subnational Region–Home Country interaction effect, \( \tau_o \) the Subsidiary effect, and \( \epsilon_{o,i} \) the residual. We estimate the model for the full sample as well as for several subsamples, as will be described in detail below.

A key advantage of our simultaneous ANOVA approach over methods used in the past (e.g., Chan et al., 2010; Hawawini, Subramanian, & Verdin, 2003; Makino et al., 2004; Roquebert et al., 1996; Rumelt, 1991; Schmalensee, 1985; Tong et al., 2008) is the ability to control for covariance between individual effects. Most previous variance decomposition studies used either a nested ANOVA or a variance components technique. These types of variance decomposition analyses, however, rely on some restrictive assumptions. In both methods, a set of dummys are used to represent an individual effect. In a nested ANOVA, these dummy sets are introduced into the model in a stepwise fashion. This approach assumes that no covariance exists between the individual effects. \(^2\) Similarly, the variance components technique is based on a random-effects model, and it assumes that each individual effect is independent of the other effects in the model (hence called a “random-effects” model). These assumptions may be overly optimistic, however. For example, McGahan and Porter (1997) found a strong covariance between industry and corporate effects, because a given corporation may operate only in certain industries. Although authors in the past acknowledged these shortcomings, they used these methods partly because of limited computational resources at that time. In this study, we address these shortcomings by following McGahan and Porter (2002) and McGahan and Victer (2010) to employ the simultaneous ANOVA approach.

Given that our data set contains multiple years of data for the same subsidiary company, we control for the possibility of first-order serial correlation, which is the effect that year \( t-1 \) can have on year \( t \) (see McGahan & Victer, 2010; Fitza et al., 2009). This effect is captured by the new parameter \( \rho \), which represents the rate of persistence. Thus:

\[
\epsilon_{o,i} = \rho \epsilon_{o,i-1} + \epsilon_{o,i} \tag{2}
\]

With serial correlation, the value of the error term \( \epsilon_{o,i} \) in the current year is not independent of the value of the error term in the previous year \( \epsilon_{o,i-1} \). The parameter \( \rho \) captures the persistence of all classes of effects, independent of the source of this persistence \( \epsilon_{o,i} \), represents the error term of Eq. (2). The parameters on the right-hand side of Eq. (1) capture the effects that \( Year, Subnational Region, Industry, Corporate Parent, Home Country, and Subsidiary, \) as well as the four interaction terms involving \( Subsidiary Region \), have on the variance in performance of subsidiaries during the study period. To discern the portion of effects that are stable and that are not influenced by the previous round, we subtract \( \rho \) from Eq. (1), leading to the equation below:

\[
\text{ROA}_{o,i} = \rho \text{ROA}_{o,i-1} + (1 - \rho) \mu + (1 - \rho) x_i + (1 - \rho) \beta_j + (1 - \rho) \gamma_k + (1 - \rho) \theta_m + (1 - \rho) \delta_l + (1 - \rho) \nu_{j,i} + (1 - \rho) \zeta_{j,k} + (1 - \rho) \eta_{j,j} + (1 - \rho) \zeta_{j,m} + \tau_o + \epsilon_{o,i} \tag{3}
\]

As in Eq. (1), the left-hand side represents the ROA of subsidiary \( o \) in year \( i \). The first term on the right-hand side is the rate of persistence multiplied by the ROA of the same subsidiary in the previous year. The other terms on the right-hand side represent the various effects of interest, as described earlier. Note that because we needed to calculate
Table 3 reports the percentages of the total variance explained by each class of effect in our study, and it also offers a comparison of our results with prior variance decomposition studies with an international focus (i.e., Chan et al., 2010; Khanna & Rivkin, 2001; Makino et al., 2004; McGahan & Victer, 2010; Tong et al., 2008) in terms of the samples and methods used.

**RESULTS**

Table 3 reports the percentages of the total variance in subsidiary performance explained by each class of effect in our study, and it also offers a comparison of our results with prior variance decomposition studies with an international focus. Specifically, results in the last column show the magnitudes of the effects of Year, Subnational Region, Industry, Corporate Parent, Home Country, and Subsidiary, as well as the interaction effects.

Table 2 offers a comparison of our study with all major variance decomposition studies with an international focus (i.e., Chan et al., 2010; Khanna & Rivkin, 2001; Makino et al., 2004; McGahan & Victer, 2010; Tong et al., 2008) in terms of the samples and methods used.

First, while we have estimated the percentages of variance explained by year effects as well as by Subnational Region–Year interaction effects, we are also interested in whether the effects studied may vary across different time periods of China’s institutional transition. In particular, China’s accession to the World Trade Organization (WTO) at the end of 2001 was a significant event in our study’s time period, which may influence the effect of subnational region on subsidiary performance. For instance, with the WTO accession, the Chinese domestic market became more open to foreign investors, and the level of competition in many industries has intensified (Luo, 2007). Some of the barriers to the mobility of various factors of production (e.g., talented workers) are either removed or reduced, leading to a greater flow of inputs and outputs across different provinces in China (Chow, 2003). As a result of many of the measures that China undertook to make its economy more market-driven, subnational region differences generally became smaller in the post-WTO period. We therefore conducted separate analyses for the subsample of firms in the pre-WTO period (1998–2001) and for the subsample in the post-WTO period (2002–2006). The results are reported in Models 2 and 3. Comparing the results across the two models reveals several interesting differences. First, Subnational Region effects decrease from 4.40% in the pre-WTO period to 3.02% in the post-WTO period, consistent with the idea of reduced subnational heterogeneity after China’s WTO accession. Second, Industry effects decrease too, from 11.21% to 7.28%, perhaps because of increased industry competition that suppresses industry effects. Third, Corporate effects also become smaller, from 10.57% to 6.89%. Other classes of effects are relatively similar across the two time periods.

Second, we also performed subsample analyses of less-developed subnational regions vs more-developed regions within China, following in the spirit of recent variance decomposition studies that use multiple-country samples and break countries into less-developed and more-developed ones (e.g.,
Table 2 Comparison of sample and methods

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of analysis</td>
<td>Firm level</td>
<td>Foreign affiliate level</td>
<td>Firm level</td>
<td>Firm level</td>
<td>Firm level</td>
<td>Foreign affiliate level</td>
</tr>
<tr>
<td>Types of industry</td>
<td>All sectors</td>
<td>All sectors</td>
<td>All sectors (excluding public administration)</td>
<td>All sectors</td>
<td>All sectors</td>
<td>Manufacturing</td>
</tr>
<tr>
<td>Definition of industry</td>
<td>Two-digit SIC (manuf.) and one-digit SIC (others)</td>
<td>Line of business defined by METI Survey (Japan)</td>
<td>Four-digit SIC</td>
<td>NAICS</td>
<td>Line of business defined by METI Survey (Japan)</td>
<td>Three-digit Chinese SIC</td>
</tr>
<tr>
<td>Definition of country</td>
<td>Home country</td>
<td>Host country</td>
<td>Home country</td>
<td>Home country</td>
<td>Host country</td>
<td>Home country</td>
</tr>
<tr>
<td>Number of firms</td>
<td>4861</td>
<td>616 (parent firms)</td>
<td>2352</td>
<td>4551</td>
<td>1842 (parent firms)</td>
<td>228 (parent firms)</td>
</tr>
<tr>
<td>Number of foreign subsidiaries</td>
<td>N/A</td>
<td>5183</td>
<td>N/A</td>
<td>N/A</td>
<td>4931</td>
<td>1625</td>
</tr>
<tr>
<td>Number of industries</td>
<td>Varies across countries</td>
<td>159</td>
<td>334</td>
<td>295</td>
<td>75</td>
<td>148</td>
</tr>
<tr>
<td>Number of countries</td>
<td>14 home countries</td>
<td>79 host countries</td>
<td>12 home countries</td>
<td>43 home countries</td>
<td>2 host countries (the US and China)</td>
<td>19 home countries</td>
</tr>
<tr>
<td>Number of subnational regions</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>34 in the US; 21 in China</td>
<td>26</td>
</tr>
<tr>
<td>Number of observations</td>
<td>19,570</td>
<td>28,809</td>
<td>6655 (5516 for ROA)</td>
<td>35,450</td>
<td>16,227 in the United States; 13,051 in China</td>
<td>8043</td>
</tr>
<tr>
<td>Method and analysis</td>
<td>OLS</td>
<td>Variance components (random-effects)</td>
<td>Variance components (random-effects)</td>
<td>Simultaneous ANOVA (fixed-effects)</td>
<td>Variance components (random-effects)</td>
<td>Simultaneous ANOVA (fixed-effects)</td>
</tr>
<tr>
<td>Data source</td>
<td>Datastream and other sources</td>
<td>METI Survey (Japan)</td>
<td>Stern Stewart, Compustat, Datastream, Worldscope</td>
<td>Compustat Global</td>
<td>METI Survey (Japan)</td>
<td>MOFCOM database (China), NBS database</td>
</tr>
</tbody>
</table>
Makino et al., 2004; Tong et al., 2008). We followed prior research and defined how well developed a subnational region is in terms of its factors of production and its institutions (Wan & Hoskisson, 2003). The first set of analyses involved two subsamples of subnational regions with below-median and above-median factor indices (Models 4 and 5, respectively). A comparison of the results in the two models reveals some interesting patterns. First, we see that Subnational Region effects are much larger in Model 4 (5.77%) than in Model 5 (0.40%); in addition, Subnational Region–Year interaction effects and Subnational Region–Industry interaction effects are much larger in Model 4 (4.28% and 12.25%, respectively) than in Model 5 (0.30% and 7.89%, respectively). These findings suggest that subnational regions with less advanced factor conditions present greater heterogeneity to MNCs’ subsidiaries operating in these regions, and that such heterogeneity is more important in explaining the subsidiaries’ performance variations. Second, Corporate effects are larger in regions with more advanced factor conditions in Model 5 (8.91%) than in Model 4 (6.88%); Subsidiary effects are also larger in Model 5 (14.15%) than in Model 4 (7.61%). These two sets of findings are consistent with Makino et al. (2004), who reported greater corporate parent effects and subsidiary effects for Japanese MNCs’ subsidiaries operating in more-developed host countries than subsidiaries in less-developed countries. Our second set of analyses involved two subsamples of subnational regions with below-median and above-median institution indices (Models 6 and 7, respectively). A comparison of the results in Models 6 and 7 shows patterns similar to those in Models 4 and 5, despite some differences in the sizes of the different classes of effects.

In addition to these subsample analyses, we conducted several additional analyses to examine the robustness of the results. For example, while our study followed prior variance decomposition

### Table 3  Comparison of variance decomposition results

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</thead>
<tbody>
<tr>
<td></td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>% (the United States)</td>
<td>% (China)</td>
</tr>
<tr>
<td>Year</td>
<td>0.1 n.s.</td>
<td>0.12</td>
<td>1.26</td>
<td>0.3 n.s.</td>
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<tr>
<td>Subnational Region</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Industry</td>
<td>5.0</td>
<td>4.56</td>
<td>6.01</td>
<td>12.8</td>
<td>5.9</td>
</tr>
<tr>
<td>Corporate Parent (or Firm)</td>
<td>8.2</td>
<td>48.68</td>
<td>25.39</td>
<td>18.8</td>
<td>19.5</td>
</tr>
<tr>
<td>Home (or Host) Country</td>
<td>4.3</td>
<td>8.63</td>
<td>2.72</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Subnational Region × Year</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>2.3</td>
</tr>
<tr>
<td>Subnational Region × Industry</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Subnational</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Region × Corporate Parent</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Subnational Region × Home</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Country</td>
<td></td>
<td>28.2</td>
<td>—</td>
<td>—</td>
<td>16.8</td>
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<tr>
<td>Subsidiary</td>
<td></td>
<td>46.7</td>
<td>22.66</td>
<td>48.66</td>
<td>46.9</td>
</tr>
<tr>
<td>Error</td>
<td></td>
<td></td>
<td></td>
<td>0.2599</td>
<td>—</td>
</tr>
<tr>
<td>μ (rate of persistence)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

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*All effects are significant at p<0.05 or better, except for those marked as nonsignificant by n.s.*

*Khanna and Rivkin (2001) report results by individual home country (14 home countries), which cannot be aggregated to be consistent with the table format here.*

*Only Chan et al. (2010), and this study examine effects at the subnational level region.*

*Corporate Parent: Makino et al. (2004), Chan et al. (2010), and this study. Firm: Tong et al. (2008) and McGahan and Victer (2010); these two studies do not report a separate class of subsidiary effects.*

*Home Country: Tong et al. (2008), McGahan and Victer (2010), and this study. Host Country: Makino et al. (2004). Chan et al. (2010) report results by individual host country (the United States and China), and thus do not report a separate class of host-country effects.*

*Only McGahan and Victer (2010) and this study control for serial correlation and report estimated rate of persistence.*

*Results reported in Table 2, Model 3.*

*Results reported in Table 7, Model 1 (all firms, ROA as the dependent variable).*

*Results reported in Table 2, Model 4.*

*Results reported in Table 1, Model 3.*

*Results reported in Table 1, Model 4.*
studies of cross-country samples to focus on accounting profitability measures (e.g., Chan et al., 2010; Makino et al., 2004; McGahan & Victer, 2010), it is possible that accounting measures might not truly reflect subsidiary performance, owing to multinational firms’ internal transfer pricing and other practices. Prior research on firm performance in China suggests that productivity measures are less likely to be subject to such distortions (see Li, 2004): thus we also performed the same variance decomposition analyses on the subsidiaries’ productivity in order to check the sensitivity of our results. Following prior studies (e.g., Li, 2004; Park et al., 2006; Zhang et al., 2010), we calculated subsidiary’s productivity as the natural log of annual sales per employee. Using this measure as the dependent variable, our analyses reveal that Subnational Region effects are still statistically significant, thus supporting our Hypothesis 1, although the percentage of variance explained is somewhat smaller, at 1.98%. Subnational Region–Industry, Subnational Region–Corporate Parent, and Subnational Region–Home Country interaction effects are all significant, accounting for 14.54%, 4.08%, and 1.40% of the variance of subsidiary productivity, respectively. These results support Hypotheses 2–4, and are consistent with the results for ROA reported earlier.

In another robustness analysis, we examined whether our results might be affected by the geographically adjacent provinces that are more similar in their factor and institutional conditions. To do so, we aggregated the 26 subnational regions in our sample into eight main “areas” according to the Development Research Center of the State Council of China (Li & Hou, 2003), and then performed the same variance decomposition analyses by focusing on the “subnational area” level instead of the subnational region level defined earlier. We find that subnational area effects are significant, accounting for 1.99% of the variance of subsidiary performance. Subnational area–industry and subnational area–corporate parent interaction effects are significant, accounting for 1.99% of the variance of subsidiary performance. Subnational area–industry and subnational area–corporate parent interaction effects are significant, accounting for 1.99% of the variance of subsidiary performance. Subnational area–industry and subnational area–corporate parent interaction effects are significant, accounting for 1.99% of the variance of subsidiary performance. Subnational area–industry and subnational area–corporate parent interaction effects are significant, accounting for 1.99% of the variance of subsidiary performance. Subnational area–industry and subnational area–corporate parent interaction effects are significant, accounting for 1.99% of the variance of subsidiary performance.

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<td>Year</td>
<td>0.04 n.s.</td>
<td>0.06 n.s.</td>
<td>0.03 n.s.</td>
<td>0.22 n.s.</td>
<td>0.10 n.s.</td>
<td>0.17 n.s.</td>
<td>0.13 n.s.</td>
</tr>
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<td>4.40</td>
<td>3.02</td>
<td>5.77</td>
<td>0.40</td>
<td>5.41</td>
<td>0.19 n.s.</td>
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<tr>
<td>Industry</td>
<td>5.65</td>
<td>11.21</td>
<td>7.28</td>
<td>7.68</td>
<td>7.90</td>
<td>8.09</td>
<td>8.09</td>
</tr>
<tr>
<td>Corporate Parent</td>
<td>5.28</td>
<td>10.57</td>
<td>6.89</td>
<td>6.88</td>
<td>8.91</td>
<td>6.92</td>
<td>8.60</td>
</tr>
<tr>
<td>Home Country</td>
<td>0.90</td>
<td>1.23</td>
<td>1.25</td>
<td>0.79</td>
<td>1.59</td>
<td>0.38</td>
<td>1.75</td>
</tr>
<tr>
<td>Subnational Region*Year</td>
<td>2.44</td>
<td>2.67</td>
<td>1.73</td>
<td>4.28</td>
<td>0.30 n.s.</td>
<td>4.16</td>
<td>0.36 n.s.</td>
</tr>
<tr>
<td>Subnational Region*Industry</td>
<td>10.08</td>
<td>13.68</td>
<td>13.12</td>
<td>12.25</td>
<td>7.89</td>
<td>11.69</td>
<td>5.98</td>
</tr>
<tr>
<td>Subnational Region*Corporate Parent</td>
<td>5.24</td>
<td>5.46</td>
<td>6.03</td>
<td>4.58</td>
<td>5.75</td>
<td>4.77</td>
<td>4.61</td>
</tr>
<tr>
<td>Subnational Region*Home Country</td>
<td>1.34</td>
<td>2.12</td>
<td>2.33</td>
<td>1.92</td>
<td>1.16</td>
<td>1.19</td>
<td>0.77 n.s.</td>
</tr>
<tr>
<td>Subsidiary</td>
<td>8.87</td>
<td>10.16</td>
<td>10.69</td>
<td>7.61</td>
<td>14.15</td>
<td>5.80</td>
<td>12.78</td>
</tr>
<tr>
<td>Error</td>
<td>57.07</td>
<td>61.56</td>
<td>52.37</td>
<td>51.98</td>
<td>48.15</td>
<td>48.58</td>
<td>43.26</td>
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<tr>
<td>ρ (rate of persistence)</td>
<td>0.2237</td>
<td>0.1828</td>
<td>0.1971</td>
<td>0.2293</td>
<td>0.2179</td>
<td>0.2250</td>
<td>0.2203</td>
</tr>
<tr>
<td>N</td>
<td>6570</td>
<td>2794</td>
<td>3776</td>
<td>3311</td>
<td>3259</td>
<td>3448</td>
<td>3122</td>
</tr>
</tbody>
</table>

*All effects are significant at ρ<0.05, except for those marked as nonsignificant by n.s.
Lastly we conducted a robustness check wherein we included agglomeration, measured as the natural log of the number of firms in an industry in a given subnational region in a given year (Li, 2004), as an additional variable in our variance decomposition analysis. We included this variable because recent research in economic geography and in international business has emphasized the effect of agglomeration on firm strategy and performance (e.g., Chung & Alcácer, 2002; Driffield & Munday, 2000; Shaver & Flyer, 2000; Tan & Meyer, 2011). While our results above consistently show significant and large subnational region–industry interaction effects, which capture the cluster effect at the subnational region level, including agglomeration allows us to determine the extent to which the variance in subsidiary performance is further explained by the aggregation of similar firms within a region. Including agglomeration as a continuous variable into our analyses follows the precedent in recent variance decomposition studies such as McGahan and Victer (2010), who added a variable degree of multinationality in their analyses. We find that agglomeration explains a significant but small percentage (i.e., 0.08%) of the variance in subsidiary performance, and that including this variable produces little change of the results of other variables. By way of comparison, McGahan and Victer (2010) reported that degree of multinationality, which has been shown in numerous studies to impact firm performance levels, has a significant but small effect (i.e., 0.04%) on the variance in firm profitability.

**DISCUSSION**

Our study makes several contributions. First, it contributes to the strategy and international business literature by showing that, in addition to the direct effects of subnational regions, their interactions with industry, corporate parent, and home-country effects also have important influences on foreign subsidiaries’ performance variations. Previous studies, based on the industry-, resource-, or institution-based views, have established three important classes of effects on firm or foreign subsidiary performance heterogeneity (Makino et al., 2004; McGahan & Victer, 2010; Tong et al., 2008). Our study takes a contingency approach to develop three new hypotheses on the interaction effects of subnational regions. Our results suggest that the industry (as well as corporate parent and home country) effects on subsidiary performance variance documented in prior research are in fact contingent on the subnational region in which the subsidiaries are embedded. Our contingency-based framework makes a unique contribution to the variance decomposition literature, and more generally it is also a response to calls for more management research to provide refined understandings of existing theories and their predictions (e.g., Boyd et al., 2012; Edwards, 2010; Powell, 1996).

Second, this study extends the contingency approach to further demonstrate that the strength of subnational region effects on foreign subsidiaries’ performance variance also varies under other interesting contingencies. For instance, our results show that subnational region effects are more important in the pre-WTO period than in the post-WTO period, and in areas with less abundant factors of production or less advanced institutions than in areas with more abundant factors of production or more advanced institutions. These findings are consistent with the idea in prior research that external influences, such as the subnational region effects in our study, matter more in explaining performance heterogeneity in less munificent environments (Chan et al., 2010; Makino et al., 2004; Tong et al., 2008). Overall, the contingency approach adopted in this study, with a focus on the interactions between subnational region effects and other contingencies, may help in advancing existing knowledge about important antecedents to foreign subsidiary performance.

Third, this study highlights the value of considering both the direct and interaction effects of subnational region on firms’ strategy and performance. In particular, our findings support a core argument in regional studies in the economic geography literature (Beugelsdijk et al., 2010; Boschma & Iammarino, 2009; Kambhampati & McCann, 2007) that the local context of subnational regions does influence firm behavior and performance. Therefore we join extant research contending that borrowing insights from the economic geography literature may shed new light on international business research (Meyer et al., 2011). Our results on the importance of subnational region effects, as well as that of home-country effects, also confirm predictions from the institution-based view, suggesting that strategy and international business research can benefit by taking a broader perspective of institutions operating in different location contexts and levels (Meyer & Peng, 2005; Peng et al., 2008). Moreover, given the interaction effects of subnational region reported in our study, future studies may follow the “multiple embeddedness” perspective (Almeida & Phene, 2004; Andersson
et al., 2002; Meyer et al., 2011) to further investigate the mechanisms by which MNCs' foreign subsidiaries may achieve performance benefits in the local context of a large emerging market.

Our findings also carry several implications for managers and policymakers. Global integration is now the mantra of MNC corporate strategists in developed countries (Bartlett & Ghoshal, 1989), but when MNCs enter emerging economies, managers are often advised to adapt their strategies to the characteristics of a given local context (Hoskisson et al., 2000; Wright et al., 2005). However, a question faced by MNC managers is: in large emerging economies such as BRIC countries, how local is local? Our findings on the significant subnational region effects suggest that, within a large emerging economy, MNC managers should configure their strategies to achieve local responsiveness at a more fine-grained level, namely the subnational region level. Accordingly, they should recognize significant within-country differences and the subsequent influences on their location choice, business strategy, and performance outcomes (e.g., Ma & Delios, 2010; Meyer & Nguyen, 2005).

Performance of MNCs' foreign subsidiaries is also often influenced by their home-country and corporate parent effects (Christmann et al., 1999; Makino et al., 2004), yet such effects are highly subnational region bound, as shown by our findings on the significant interactions between home-country effects and subnational region effects, as well as between corporate parent effects and subnational region effects. Similarly, our finding on the importance of industry–subnational region interaction effects also suggests that subsidiary performance is a function of the interplay between industry- and subnational region-level characteristics. Thus foreign subsidiary managers might consider how they can proactively shape the local conditions their firms experience, and how they can align home country, corporate parent, and industry characteristics with traits of the local, subnational context where their firms are embedded, so that they can help their firms move from foreign entrants to strategic insiders and achieve higher performance (Luo, 2007).

There are several implications for policymakers. First, the finding that different MNCs have heterogeneous influences on foreign subsidiary performance across different subnational regions suggests that policymakers consider the specific types of MNCs to be attracted to a specific region for FDI activities. In particular, it is essential that region-level policymakers identify the types of MNCs that fit the local context of the region by understanding the sources of their subsidiaries' performance variance. Second, our findings also show that different industries have different impacts on foreign subsidiary performance across different subnational regions, suggesting that regional policymakers may need to consider FDI policies and industry policies simultaneously. In particular, it is important for them to reconsider the alignment between industry policies and the subnational region's advantages. However, whether region-level policymakers should target MNCs of a specific industry to fit local conditions of the region or develop special packages to attract MNCs of a specific industry should be explored in future policy-oriented studies. Third, our finding of the significant interplay between subnational region effects and MNCs' home-country effects suggests that, at the subnational region level, policymakers may pay greater attention to the formal and informal bilateral relationships between the administrative regions they govern and the MNCs' home countries.

We would like to note several limitations in this study that can provide opportunities for future research. First, the findings we report in this study might be generalizable only to MNCs' subsidiaries in China, the largest emerging economy in the world, which exhibits substantial differences across its subnational regions. However, we also believe that the theory we draw from and the arguments we develop can be applicable to a number of other developed and emerging economies, such as the G20 developing countries and in particular other BRIC countries, since factors of production, institutions, and agglomeration can also vary significantly across the subnational regions in these countries. Future work can therefore extend our study to other countries and examine how much subnational region matters to firm or subsidiary performance variation. It would be particularly interesting to examine whether subnational region matters more or less in certain countries than in others, and link such differences to the differential levels of factors of production, institutional development, and agglomeration across subnational regions in these countries.

Second, our study examines location effects at the subnational region (i.e., province) level, yet location might matter at other levels. For example, prior economic geography and international business research suggests that industrial clusters might span several provinces or states within a country, or they might reside in certain cities or areas within a
province or state (Enright, 1998; Goodman, Bamford, & Saynor, 1989; Storper, 1993). Clusters might also develop across certain regions of several neighboring countries (e.g., Amin, 2000; Porter, 1998). While developing empirical measures to operationalize location effects at these different levels and across different countries can be challenging, future research working in this direction holds great promise to significantly enhance our understanding of the link between location and firm performance (Ricart et al., 2004).

Third, our study focused on MNCs’ manufacturing subsidiaries to understand the sources of the variation of subsidiary performance. Future research may extend our study in two ways. Given the important roles played by MNCs’ various non-manufacturing subsidiaries such as R&D and service centers (Birkinshaw, 2001), it would be interesting for future studies to examine whether and how subnational regions influence the performance variation of these different types of subsidiaries. In addition, as MNCs increasingly compete against and cooperate with domestic firms in the host country (Luo, 2007), future studies may examine the relationship between domestic and foreign firms at the subnational region level by comparing how subnational region-level characteristics affect foreign and domestic firms differently, and how such effects may change over time.

Finally, in keeping with traditional variance decomposition studies in strategy, our study aims to quantify subnational regional effects relative to other established classes of effects (McGahan & Porter, 1997, 2002; Rumelt, 1991; Schmalensee, 1985), and we conduct our analyses by using a fixed-effects model and by controlling for serial correlation (e.g., Fitza et al., 2009; McGahan & Porter, 2002). Although our analyses represent an improvement over prior studies that have relied on a random-effects model, the nature of variance decomposition analyses does not allow one to isolate the specific sources of variation in performance within each effect. In addition, because subsidiary or subunit performance may be subject to certain environmental shocks that cannot be systematically measured (McGahan & Porter, 1997), there is a large portion of variance unexplained by our model. Following McGahan and Porter (2002), we take the view that variance decomposition research is complementary to other types of theoretical and empirical work on firm performance. Given the important interactions between subnational region effects and industry effects, corporate parent effects, and home-country effects, it would be very valuable if future research could identify particular firm resources, corporate capabilities, industry conditions, and home-country traits, and examine how they affect foreign subsidiary performance interactively with subnational region characteristics.

In conclusion, this study examines the extent to which subnational region effects matter in explaining foreign subsidiary performance variation, and our distinctive focus is on the specific ways in which subnational region effects matter. It is our hope that the theory development and empirical results reported in this study provide a useful step toward a better understanding of the direct and indirect roles of subnational region in shaping firms’ strategy and performance in future research.

ACKNOWLEDGEMENTS
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NOTES
1In the interest of consistency, we followed prior research to use the term “home country” throughout the paper to refer to these countries and political administrative regions.
2If covariance exists, the size of the measured effects will depend on the order in which the effects are introduced.
3We thank the anonymous reviewers for these ideas.

REFERENCES


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