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INTERNALIZATION THEORY AND THE PERFORMANCE OF EMERGING-MARKET MULTINATIONAL ENTERPRISES

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ABSTRACT

Constrained by their peripheral position in the global factory system and underdeveloped institutions at home, emerging-market multinational enterprises (MNEs) are likely to achieve monopoly-based, rather than knowledge-based, financial gains from internationalization conditional on R&D. Emerging market MNEs need to engage in R&D to upgrade orchestration know-how within the global factory. This needs to be accompanied by the development of home-based enabling institutions. This article develops the argument based on internalization theory, and tests hypotheses against the experience of major emerging-market MNEs from 2004 to 2011.

KEYWORDS: Internalization theory; Multinational enterprise; Emerging market; Performance; Global factory.

1. PURPOSE

In the past two decades a most significant development in international business has been the rise of emerging-market multinational enterprises (hereafter MNEs). Emerging-market MNEs, especially Chinese MNEs, rapidly expanded production and service facilities overseas, and aggressively acquired established brands across the globe (Peng, 2012; Ramamurti, 2009). The rise of emerging-market MNEs has attracted growing scholarly attention, and led to a fierce debate on the relationship between internationalization (the extent to which a firm engages in value-creating activities across national borders) and the performance of emerging-market MNEs compared to advanced-market MNEs (Hennart, 2012; Contractor, Kumar, & Kundu, 2007; Rugman & Li, 2007; Lessard & Lucea, 2009; Narula, 2012).

This article develops a moderated mediation framework, based on internalization theory, to explicate the impact of internationalization on the profitability of advanced versus emerging market MNEs. In this framework, internationalization may lead to knowledge-based financial gains or monopoly-based financial gains conditional on R&D investment in MNEs and on the locational constraints that MNEs face in the global factory system and at home. In internationalization, advanced-market MNEs achieve knowledge-based financial gains partly due to their leadership position in the global factory system that allows them to develop a competitive advantage in orchestrating dispersed business activities in the system, and partly due to the enabling institutions at home that induce them to invest R&D resources in entrepreneurial experiments and risk-taking innovations. Emerging-market MNEs fail to do so and, instead, achieve monopoly-based financial gains partly due to their peripheral position in the global factory system that impedes their ability to learn global orchestration know-how, and partly due to the strong government intervention at home that induces them to invest R&D resources in monopolistic rent-seeking activities. The article derives hypotheses from the

framework, and tests them against the experience of major emerging-market MNEs compared to major advanced-market MNEs from 2004 to 2011.

Our contention thus is that internationalization is likely to enhance monopoly-based rent and have a positive direct effect on profitability conditional on R&D in emerging-market MNEs. In contrast, for advanced-market MNEs, internationalization is likely to affect profitability indirectly through its role in strengthening the competitive advantage in orchestration of a global value chain. The contribution of the study therefore is threefold. Drawing on and extending internalization theory, firstly, the study develops a coherent and consistent framework to compare emerging-market MNEs with advanced-market MNEs in internationalization and performance. In testing the framework, secondly, the study empirically reveals the crucial differences in internationalization and performance between emerging-market and advance-market MNEs. Thirdly, based on the findings, the study explicates the strategic approaches that emerging-market MNEs may take to catch up with advanced-market MNEs in knowledge-based financial gains from internationalization in the era of the global factory.

2. THEORETICAL FRAMEWORK AND HYPOTHESES

Early discussion focused on the direct relationship between internationalization and financial performance, and produced inconclusive findings (Nachum, 2004; Chiang & Yu, 2005; Elango, 2006; Contractor, Kumar, & Kundu, 2007; Kumar & Singh, 2008). Recent research pointed to the lack of theoretical bases in early discussion, and followed the eclectic paradigm to take into account additional variables that influence internationalization and profitability (Rugman, 2009; Lessard & Lucea, 2009; Ramamurti, 2012; Verbeke & Forootan, 2012). According to the eclectic paradigm proposed by Dunning (1988), a firm succeeds in internationalization because 1) it has knowledge-based advantages in proprietary technology,

management know-how and global brands over rivals in foreign markets, also named ownership advantages (Dunning 1988) or firm specific advantages (Rugman & Verbeke, 1992); 2) it benefits from location advantages in endowment in cross-border competition, and 3) it gains internalization advantages in minimizing transaction costs in imperfect markets. Some scholars invoked the eclectic paradigm to argue that internationalization is "really an intermediate variable, not an independent variable", and that knowledge-based advantages are "the true independent variable" which determines internationalization and profitability (Rugman & Verbeke, 2008: 169). Emerging-market MNEs do not have the kind of knowledge-based advantages that advanced-market MNEs possess, and therefore cannot succeed in internationalization and financial gains in the long-run. Their phenomenon international success is based on their location advantages in such endowments as cheap labour and natural resources, and is short-lived because endowments are available to all firms (Rugman & Li, 2007; Lessard & Lucea, 2009; Rugman & Verbeke, 2008; Rugman, 2009; Verbeke & Brugman, 2009). Some scholars also adhered to the eclectic paradigm, but argued that emerging-market MNEs do have knowledge-based advantages which differ from those possessed by advanced-market MNEs. Emerging-market MNEs have certain knowledge-based advantages that are developed in the specific tough environment at home, including "their deep understanding of customer needs in emerging markets, the ability to function in difficult business environments, their ability to make products and services at ultra-low costs, their ability to develop 'good enough' products with the right feature-price mix for local customers" (Ramamurti, 2012: 42). The home-born knowledge-based advantages enable emerging-market MNEs to outperform rivals in internationalization and profitability (Zeng & Williamson, 2007; Cuervo-Cazurra & Genc, 2008; Ramamurti, 2009).

Other scholars questioned the theoretical prediction of the eclectic paradigm that knowledge-based advantages determine a firm's internationalization and profitability. They

argued that internationalization can play an active role in augmenting knowledge and profitability. Mathews (2002; 2006) contended that emerging-market firms can develop knowledge-based advantages and profitability by linking with leading firms overseas, leveraging the linkage to access advanced technologies, and learning in the internationalization processes. Some firms in emerging Asia have managed to successfully internationalize "without any of the advantages of the incumbent industry leaders…. without skills and knowledge…by leapfrogging to advanced technological levels, for example, or by leveraging their way into new markets through partnerships and joint ventures" (Mathews, 2006: 6). Similarly, Luo and Tung (2007) suggested that emerging-market MNEs can use internationalization as a springboard to augment knowledge and profitability. Dunning (2006) endorsed the argument for the active role of internationalization in augmenting knowledge and profitability, and believed that this argument is complementary, rather than contradictory, to the eclectic paradigm. Thus a notion loomed large in the debate that internationalization can serve as an independent variable to enhance knowledge-based advantages and profitability (Dunning, 2006; Narula, 2006, 2012; Rugman, 2009; Ramamurti, 2012; Verbeke & Forootan, 2012)

Extant discussion has thus focused on two legs of the eclectic paradigm, i.e., knowledge-based advantages and location advantages. Internalization theory, the third leg in the eclectic paradigm, has been insufficiently discussed. Consequently, extant discussion has failed to link internationalization, knowledge augmentation, location, and profitability in a coherent manner, and to examine the relationship between them in the light of R&D investment in emerging-market MNEs and the constraints to entrepreneurial and innovative activities these MNEs face in the location where they are based. Recent developments in internalization theory help address this problem.

Internalization theory, originating in the pioneering work of Coase (1937), posits that it is the need to internalize imperfect markets that gives rise to firms including MNEs (Buckley & Casson, 1976; Hennart, 1982; Hymer, 1976; McManus, 1972; Swedenborg, 1979; and Rugman, 1981). There are different interpretations, if not schools, of internalization theory. We primarily draw on the internalization theory as explicated by Buckley and Casson in their 1976 book and subsequent writings to form the theoretical base of the paper. We extend the internalization theory to develop a moderated mediation framework to compare MNEs based in emerging economies with MNEs based in advanced economies in internationalization and performance.

In the moderated mediation framework, derived from internalization theory and shown in Figure 1, internationalization is projected to have a direct effect on financial performance as represented by the C path, and an indirect effect on financial performance through knowledge-based advantages in global orchestration as represented by the AB path. Both the direct effect and the indirect effect are conditional on R&D to creatively augment knowledge which is, in turn, influenced by the constraints MNEs face in the location where they are based. This theoretical framework is based on the core notions of internalization theory, including imperfect though competitive markets, rational choice, knowledge augmentation steaming from R&D, the transition to the network structure of the global factory, and the location of MNEs (Buckley & Casson, 1976; 2009; Buckley, 2009a, 2009b, 2011). These are explained below.

(Insert Figure 1 about here)

When markets for intermediate products (particularly knowledge) are imperfect, there is an incentive to bypass them by creating internal markets in a firm. Internalisation of markets for intermediate products across national boundaries generates MNEs. Under competitive

pressure, meanwhile, managers have to make rational decisions on MNE boundaries in order to maximize profit. They set the boundaries of a MNE "at the margin where the benefits of future internalization of market are just offset by the costs" (Buckley & Casson, 2009: 1564). Therefore, internationalization does not have any direct effect on profitability because the benefit and cost of the hierarchical governance model in a MNE as opposed to the price governance model in the marketplace will be equalized in a competitive environment, leaving the MNE with no advantages in financial performance whatsoever as compared to a domestic firm (Buckley & Casson, 1976, 2009). There should be no "direct relationship" between internationalization and profitability in competitive markets (Hennart, 2007: 423). Accordingly, a positive direct effect of internationalization on profitability must come from a **deviation** from competitive markets, and represent monopoly-based financial gains from internationalization. For the purpose of simplicity in analysis, we define monopoly-based financial gains as any financial returns based on deviation from competitive markets. Government intervention is a prime source of deviation from competitive markets since it distorts price signals in the marketplace.

As noted by many, deviation from competitive markets is particularly prevalent in emerging economies. In a summary of extant discussion on the institutional context of emerging-market MNEs, Xu and Meyer (2013: 1323) noted:

> Main challenges arise from the fact that the contexts of emerging-market economies vary from those of developed economies on a number of dimensions, typically including the following: 1. Markets are less efficient due to less transparency, more extensive information asymmetries, and higher monitoring and enforcement costs. 2. Governments and government-related entities are not only setting the rules, but are active players in the economy, for example, through state-owned or state-controlled firms. 3. Network-based behaviours are common, in part

> as a consequence of the less efficient markets, but arguably also due to social traditions, and they influence how firms interact with each other. 4. Risk and uncertainty are high due to high volatility of key economic, political, and institutional variables.

All the four dimensions are related to deviation from competitive markets. The deviation from competitive markets provides "the opportunity to generate rents through pseudomonopolies", and "created cash rich domestic firms that later were able to expand abroad through M & A" to leverage the monopoly power and government subsidies at home in competition at overseas markets (Narula, 2012: 198). It is therefore predicted that emerging-market MNEs are likely to acquire monopoly-based financial gains from internationalization.

To vindicate this prediction, we need to take into account locational constraints on creative knowledge augmentation steaming from R&D in theoretical modelling. The notion of location was proposed in Buckley and Casson's 1976 book to suggest that firms should locate each activity so that the firm minimises its overall costs (Buckley & Casson, 1976, 2009). Proponents of the eclectic paradigm developed this into the notion of a location specific advantage, and related internationalization and performance of emerging-market MNEs to their location specific endowments of cheap labour and natural resources in their home countries (Rugman, 2009; Rugman & Li, 2007; Rugman & Verbeke, 2008; Verbeke & Brugman, 2009). We extend the notion of location, contending that institutions are an important location component in understanding emerging-market MNEs for two reasons. Firstly, access to cheap labour and natural resources is not open to all firms, but is determined by formal institutions in the form of government regulations (Hennart, 2012, Narula, 2012). Secondly and more importantly, institutions influence the rational choice of MNE managers in making decisions on R&D resource allocation to creatively augment knowledge, and thus entrepreneurship and innovation (North, 1994). Entrepreneurship in emerging markets is a scarce resource (Buckley

2009a). Marshalling this resource into the most productive areas is a key challenge for the governments of emerging countries. This role is often undertaken by governments themselves as a means of creating a critical mass to foster innovative ideas. The role of domestic institutions is therefore central in directing entrepreneurial and innovative activities in emerging economies. As we shall see, this marshalling often has the effect of creating market imperfections, and guides R&D toward entrepreneurial and innovative activities for rent-seeking.[1]

R&D plays, according to internalization theory, a crucial role in supporting entrepreneurial and innovative activities to augment knowledge, and in enhancing MNE performance (Buckley & Casson, 1976, 2009; Buckley 2009a, 2009b). However, the role of R&D is influenced by the capital market, the skilled labour market, and the product market in the location where MNEs are based. Government intervention may distort all the three markets to influence R&D investment and MNE performance. In the capital market, for instance, MNEs based in emerging economies, particularly those owned by the government, are provided with loans at below market rates and other financial subsidies to engage in government-supported businesses (Peng, 2012; Narula, 2012). The distortion in the capital market encourages emerging-market MNEs to borrow to invest in R&D, to divert R&D investment to innovations in government-directed activities (e.g., acquisition of foreign assets for political and social purposes), and to seek rent from monopolies granted by the government. When Lenovo acquired IBM PC business in 2005, for example, the Chinese government, which held 57 per

[1] The paper is not intended to discuss in detail entrepreneurship in internationalizing firms form emerging markets. For those who are interested in this subject, please read Buckley (2009a ; 2009b). Innovation is the most important component of firm-level entrepreneurship (Anderson, Kreiser, Kuratko, Hornsby & Eshima, 2015). In this paper, we treat entrepreneurship and innovation as creative knowledge-augmenting activities supported by R&D. We thank an anonymous reviewer for making this point.

cent of stake in Lenovo at the time, provided various financial support and monopoly benefits to the go-global Lenovo (Buckley et al, 2007).

In skilled labour markets, similarly, government intervention may distort the costs of skilled labour through preferential salary schemes in favour of skilled workers engaged in government-directed R&D activities that generate monopoly-based rent. In product markets, by the same token, the government can grant domestic firms, especially SOEs, monopolies in some pillar industries, and thereby influence "the potential market for the product" and the direction of R&D activities (Buckley & Casson, 1976: 58). In China, SOEs or government-supported enterprises enjoy market monopolies in some pillar industries, especially service industries such as banking, securities, transport, and telecommunications. In Russia, SOEs enjoy market monopolies in the natural resource industry.

Government intervention in emerging economies thus distorts capital, labour and product markets. As rational agents, managers of emerging-market MNEs are induced to increase investment in R&D to leverage the cheap loans in the distorted capital market, and they have indeed done so as evidenced in the phenomenon increase in R&D expenditure in emerging-market MNEs in recent years. They are induced to invest the increased R&D resources in entrepreneurial and innovative activities that enhance monopoly-based rent. Under strong government intervention, the more investments are made in R&D, the more monopoly-seeking entrepreneurial and innovative activities, and the more monopoly-based financial gains from internationalization. The positive direct effect of internationalization on profitability is therefore conditional on R&D intensity in emerging-market MNEs. We thus propose hypothesis 1.

> Hypothesis 1. Internationalization has a positive direct effect on profitability conditional on R&D intensity in emerging-market MNEs.

International business operations have undergone significant changes in the process of accelerated globalization in recent years. Buckley (2009a, 2009b, 2011) proposed the notion of global factory to embrace these changes in internalization theory. This notion was rooted in the prediction Buckley and Casson made in their 1976 book that externalized activities would grow in time as external markets for intermediate products improve. Indeed, developments in digitalization, international technical standards, and intellectual property rights significantly improved the performance of external markets for intermediate products relative to internal markets of MNEs. Meanwhile, firms based in emerging economies actively participated in the global production system through "subcontracting production and service activities from the brand-owning MNEs", and reduced the cost and price of external market transactions against internalized activities of MNEs (Buckley, 2009b: 229). As a result, recent years witnessed "a significant growth in international licensing, franchising, and subcontracting", and a transition from "vertically integrated MNE to the global factory" in which externalized and quasi-internalized activities increase in importance (Buckley, 2009b: 229).

In this transition, MNE mangers need to look after not only internalized activities within MNEs but also externalized activities dispersed in various parts of the value chain across the globe. Global orchestration know-how becomes the cornerstone of competitive advantages of leading MNEs. Buckley (2011: 272) noted that "the competitive advantage of interconnected firms arises from the ability of the focal firm" to profit from assets that it does not necessarily own. Such assets may be quasi-internalized. In the era of global factory, therefore, MNE headquarters become "orchestrator of activities" in the global value chain, and MNE financial performance heavily relies on global orchestration know-how (Buckley, 2009b: 233). A MNE can develop global orchestration know-how through access to overseas knowledge needed for managing differentiated networks in host countries. Internalization theory thus started to shift focus from integrating internal markets in knowledge to "accessing external markets in

knowledge" (Buckley, 2009b: 226). The access to external knowledge can be achieved through internationalization, especially in the form international acquisition and joint venture. Internationalization plays an increasingly important role in enhancing the competitive advantage in global orchestration know-how and, through it, financial performance. Internalization theory thus predicts a positive indirect effect of internationalization on profitability through global orchestration know-how, and posits that the indirect effect stands for knowledge-based financial gains.

The indirect effect is dependent on the location where a MNE is based, however. We need to extend further the notion of location in the internalization theory to take into account the constraints to innovation posed by the position of MNEs in the global factory system. In the transition to global factory, more and more economic activities have indeed shifted from advanced to emerging economies such as China, India, Russia and Brazil. Nonetheless, "the control or orchestration of these activities remains very firmly within the metropolitan (advanced) countries" (Buckley, 2009a: 131-132). MNEs based in advanced countries have decreased their ownership of productive capacity and increased their stocks of the intangibles, particularly global orchestration know-how, which are difficult to copy (Buckley, 2009a: 136). This argument echoes, as Teece (2014) noted, with capability-based theory in strategic management. Emerging-market MNEs are located in the periphery of the global factory system, serving primarily as suppliers of labour-intensive manufacturing or services. Constrained by the periphery location, they find it difficult to effectively replicate the global orchestration know-how developed in advanced-market MNEs, not to mention engaging in innovation to develop a competitive advantage in the know-how.

The periphery constraint is coupled with the institutional constraints to which emerging-market MNEs are subject at home. Development of global orchestration know-how requires entrepreneurship, and is attributable to "the enabling institutions of the parent country

which nurture and foster the exercise of entrepreneurship and encourage risk taking and experimentation" (Buckley, 2009a: 137). These enabling institutions are well developed in advanced countries, but underdeveloped in emerging economies due to government intervention. The institutional underdevelopment, or "institutional void" in the words of Tarun and Palepu (2010: 25), induces emerging-market MNEs to seek monopoly-based rent and "temporary arbitrage opportunities", and limits their 'entrepreneurial abilities' to develop the intangibles needed for global orchestration (Buckley, 2009a: 140). Although they try to purchase the intangibles by acquisition of advanced-market MNEs, the acquired are often "owners of tired, dated or obsolescent brands" that are most likely to be takeover targets (Buckley, 2009a: 140). Moreover, it is unlikely that they secure global orchestration know-how through acquisition alone because the intangibles "require constant reinvestment (and reinvigoration)" and development of "a wide range of supporting skills" that are difficult to accomplish in countries without enabling institutions (Buckley, 2009a: 140). Due to these location constraints to innovation, therefore, internationalization is likely to generate a positive indirect effect on profitability through global orchestration know-how in advanced-market MNEs rather than emerging-market MNEs.

Supported by the leadership position in global factory system and encouraged by the enabling institutions at home, managers of advanced-market MNEs make rational decisions to focus on entrepreneurial and innovation activities which enhance the competitive advantage in control and orchestration of dispersed businesses as they expand across the globe. They are induced to invest in R&D to foster this competitive advantage in order to achieve knowledge-based financial gains from internationalization, and to keep rival merging-market MNEs at bay. In advanced-market MNEs, therefore, the more investments are made in R&D, the more entrepreneurial and innovative activities to enhance global orchestration know-how, and the

more knowledge-based financial gains from internationalization. We thus propose hypothesis 2.

> Hypothesis 2. Internationalization has a positive indirect effect on profitability through the competitive advantage in orchestration conditional on R&D intensity in advanced-market MNEs.

3. METHOD

3.1 Sample

The annual World Investment Report, published by the United Nations' Conference on Trade and Development (hereafter UNCTAD), included two statistical tables: one contained information about the top 100 non-financial MNEs in the world ranked by foreign assets and the other contained information about the top 100 non-financial MNEs from emerging economies ranked by foreign assets.[2] We combined the two statistical tables from 2004 to 2011 to construct the sample. As some emerging-market MNEs in the first table were also included in the second table, they were excluded in the combined dataset to avoid repetition. The dataset contained the value of total sales revenue and the value of sales revenue from foreign markets, the number of total employees and the number of employees in foreign affiliates, and the value of total assets and the value of assets in foreign affiliates. The dataset did not include profit, equity, firm age, and R&D expenditure. The data of profit, equity, firm age, and R&D expenditure came from annual reports of each company. We deflated the value of profit, the value of equity, the value of R&D expenditure, the value of total sales revenue, the value of sales revenue from foreign market, the value of total assets and the value of assets in foreign

[2] The number of MNEs from emerging economies (named developing economies or transition economies in the Report) in the table varied from year to year. The table include 50 MNEs from 1994 to 1996, 75 from 1997 to 2002, 60 in 2003, 109 in 2004, and 100 from 2005 onwards.

affiliates using the 2000 constant price indexes compiled by UNCTAD. After deleting cases with missing information, we obtained an unbalanced panel dataset with 996 observations.

3.2 Variables

Profitability. Profitability was measured by the return on assets ratio (ROA). To exclude industry-specific effect, we industry-centred the ROA according to the industry classification provided by UNCTAD so that the variable referred to a firm's profitability relative to other firms in the industry. To minimize possible biases, we combined the UNCTAD data with the Fortune Global 500 company data to construct the industry-level measure of profitability in industry-centring the variable. Alternative measures of profitability included the return on sales ratio (ROS) and the return on investment ratio (ROI), and they were used in robustness tests.

Competitive advantage in orchestration. In the era of global factory, as discussed earlier, a key competitive advantage lies in the ability to orchestrate activities in the entire value chain dispersed across national borders (Buckley 2009a, 2009b, 2011). We used total factor productivity (TFP) as a proxy for the competitive advantage in global orchestration based on the assumption that enhanced global orchestration know-how is reflected in improved productivity of all resources used in a MNE. TFP is not directly observable, but can be estimated using a production function as expressed in Equation 1.

$$G_{ijt} = P_{ijt} {S_{ijt}}^{\beta 1} {A_{ijt}}^{\beta 2} , \quad (1)$$

where $_i$ represented firm, $_j$ represented industry, and $_t$ represented year. G represented the value of total sales revenue, S represented the number of total staff, and A represented the value of total assets. β_1 and β_2 represented marginal productivity of workforce and assets, respectively.

Both were constants determined by available technology. P represented TFP (Solow, 1956, 1957).

Taking the natural logarithm of Equation 1 produced Equation 2:

$$LgG_{ijt} = a + \beta_1 LgS_{ijt} + \beta_2 LgA_{ijt} + \epsilon_{ijt} \quad (2)$$

The constant a and the error term ϵ_{it} represented TFP (P_{ijt}), which was calculated using Equation 3.

$$P_{ijt} = LgG_{ijt} - \beta_1 LgS_{ijt} - \beta_2 LgA_{ijt} \quad (3)$$

We needed to address the simultaneity bias and the selection bias in estimating labour coefficient (β_1) and capital coefficient (β_2) in Equation 2 (Yasar & Baciborski, 2008). Olley and Pakes (1996) and Levinsohn and Petrin (2003), henceforth OP and LP, have developed two similar semi-parametric estimation procedures to overcome these biases using, respectively, investment and material costs as instruments for the unobservable productivity shocks. As data on material costs were not available, we followed the OP procedure, as illustrated by Yasar and Baciborski (2008), to use investment as the instrument for the unobservable productivity shock in calculating TFP.[3]

We industry-centred TFP according to the industry classification provided by UNCTAD so that TFP represents the competitive advantage in orchestration relative to other firms in the industry. As Sirmon, Hitt, Arregle and Campbell (2010: 1387) noted, that relative measures are "empirical correlates" of a competitive advantage. Meanwhile, industry-centring TFP also helped further minimize the simultaneity bias and the selection bias (Altomonte &

[3] We used the OP procedure, rather than lagged variables, because the OP procedure is specifically designed for Cobb-Douglass type production function, while the use of lagged variable is not. Meanwhile, the use of lagged variable will lead to a loss of observations as some firms appeared in the dataset only once. We thank an anonymous reviewer for making this point.

Pennings, 2009). We combined the UNCTAD data with the Fortune Global 500 company data to construct the industry-level measure of TFP in industry-centring the variable.

Internationalization. Internationalization was measured by the transnationality index provided by UNCTAD. This index was an average of three ratios: foreign asset to total asset, foreign employment to total employment, and foreign sales to total sales. We industry-centred internationalization according to the industry classification provided by UNCTAD to control for industry-specific influences.

R&D intensity. Firm-level R&D intensity was measured by the ratio of R&D expenditure to total sales revenue. Meanwhile, we obtained industry-level R&D intensity data from the EU Industrial R&D Investment Report compiled by the European Commission from 2004 to 2011. The industry-level R&D data were based on both EU firms and non-EU firms. Industries with an average R&D expenditure to total sales revenue ratio greater than 2% over the 2004-2011 period were considered as R&D intensive industries, and industries with the ratio smaller than 2% were considered as non R&D intensive industries.

Location constraints. We took location constraints as exogenous variables that influenced MNE innovation and performance. Buckley and Casson (2009: 1569) noted that "this classification of the exogenous variables is useful, because when data on individual exogenous variables are missing, the effect of the exogenous variables on firm behaviour can be captured by dummy variables representing …location characteristics, while firm-specific characteristics can be captured by residual effects estimated from regression equations". To capture the effect of location constraints, we constructed a dummy variable, named emerging-market MNEs, with one denoting MNEs from emerging economies and zero denoting otherwise.[4] Emerging-market MNEs were from 16 emerging economies, including Argentina,

[4] We would like to thank an anonymous reviewer for making this suggestion.

Brazil, China, Egypt, India, Kuwait, Malaysia, Mexico, Philippines, Qatar, Russia, South Africa, Thailand, Turkey, United Arab Emirates, and Venezuela. Advanced-market MNEs came from 18 "triad economies", including Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK and USA. They also came from the four newly industrialized economies of Singapore, South Korea, Taiwan, and Hong Kong for these Asian small dragon economies have closed the gap, or even caught up, with the triad economies in economic and institutional development, and were classified as advanced economies by IMF. Interpretation of location constraints varied depending on which theory an investigator took. In this study, we drew on the internalization theory to interpret location constraints primarily in relation to their influence on innovation, focusing on the position of a MNE in the global factory system and the institutions in a MNE's home country. Tables 1 and 2 present the country of origin and industry distribution of MNEs in the sample, respectively.[5]

(Insert Tables 1 and 2 about here)

Control variables. Financial slack was likely to influence orchestration know-how and profitability (Chang & Rhee, 2011). Following Bourgeois (1981) and Chang and Rhee (2011), we operationalized financial slack using the reversed leverage ratio (i.e., the ratio of equity to liability). A higher ratio indicated greater potential to raise additional fund and, thus, more slack financial resources. Large firms tended to act differently from small firms in international expansion, which might affect orchestration know-how and profitability (Kirca et al, 2011). We controlled for the effect of firm size using the logarithm of sales revenue of a firm, and named the variable firm size. Firm age may influence learning and performance (Xia et al, 2014). We constructed a firm age variable using the logarithm of the firms' founding year

[5] We would like to thank an anonymous reviewer for making this suggestion.

subtracted from the observation year.[6] We also included industry dummy variables to control for variation in industries. The control variables were included in all regressions.[7]

3.3 Estimation Strategy

We employed the bootstrapping approach to mediation analysis based on resampling the data 1000 times to produce not only a point estimate of the direct and indirect effects but also the standard errors and confidence intervals that were unbiased even if the error terms violated normal distribution. The bootstrapping approach is currently the most reliable approach to mediation test (Preacher, Rucker, & Hayes, 2007; Hayes, 2013). We used the mediation analysis software 'Process' provided by Hayes (2013). All estimates were corrected for heteroskedasticity using White's heteroskedastic-consistent standard errors.

Before running the mediation analysis, we used 2SLS to address the problem of endogeneity (Sirmon & Hitt, 2009). In particular, internationalization was likely to be endogenous. In regressions with profitability being the dependent variable, internationalization might be a result of improvement in profitability. Similarly, in regressions with the competitive advantage in orchestration being the dependent variable, internationalization might be a result of improvement in the competitive advantage in orchestration. We therefore need find an instrument which should not be related to the dependent variable predicted in the second stage, but should be related to the endogenous variables predicted in the first stage. The foreign input intensity ratio met these criteria. The ratio was the average of foreign assets to foreign sales revenue ratio and foreign employment to foreign sales revenue ratio. The intuitive argument was that some variation in internationalization was due to the financial capacity to acquire input resources overseas, which should also show up in the foreign input intensity ratio (Hamilton &

[6] We would like to thank an anonymous reviewer for making this suggestion.
[7] It would be ideal to have a control variable regarding the equity or control structure of MNEs. We could not find such a control variable. We would like to thank an anonymous reviewer for making this point.

Nickerson, 2003; Murray, 2006; Bascle, 2008). The instrumental variable was included in the first-stage regression, but not in the second-stage regression. The descriptive statistics and correlation matrix of major variables are presented in Table 3.

(Insert Table 3 about here)

4. RESULTS

4.1 Hypothesis Tests

All the hypotheses can be tested through moderated mediation analyses. The conceptual and statistical models for hypothesis test are illustrated in Appendix 1. The results of test for the direct effect and the indirect effect of internationalization on profitability in the moderated mediation analyses are reported in Table 4. The results of regressions in the moderated mediation analyses are reported in Table 5.

(Insert Tables 4 and 5 about here)

Hypothesis 1 posits that internationalization has a positive direct effect on profitability conditional on R&D intensity in emerging-market MNEs. As shown in Table 4 and Figure 2A, the direct effect was negative though statistically insignificant when R&D intensity was at a low level ($\boldsymbol{\psi}$ = -0.1318, p >0.10), but turned positive and statistically significant when R&D intensity was at an average level ($\boldsymbol{\psi}$ = 0.0532 p < 0.05) and a high level ($\boldsymbol{\psi}$ = 0.2383, p < 0.05) in emerging-market MNEs. Moreover, the value of the direct effect was larger when R&D intensity was at a high level than when R&D intensity was at an average level. The results supported hypothesis 1, indicating that emerging-market MNEs achieved monopoly-based financial gains from internationalization, and such financial gains grew with the increase in R&D intensity. Meanwhile, the direct effect was statistically indifferent from zero at all levels of R&D intensity in advanced-market MNEs. The result suggested that advanced-market MNEs did not achieve monopoly-based financial gains from internationalization regardless of R&D intensity.

(Insert Figure 2 about here)

Hypothesis 2 posits that internationalization has a positive indirect effect on profitability through the competitive advantage in orchestration conditional on R&D intensity in advanced-market MNEs. As shown in Table 4 and Figure 2B, the indirect effect was positive though statistically insignificant when R&D intensity was at a low level (θ = 0.0025; LCI = -0.0011; UCI = 0.0068), but turned positive and statistically significant when R&D intensity was at an average level (θ = 0.0087; LCI = 0.0023; UCI = 0.0146) and a high level (θ = 0.0177; LCI = 0.0053; UCI = 0.0301) in advanced-market MNEs. Moreover, the value of the indirect effect was larger when R&D intensity was at a high level than when R&D intensity was at an average level. The results supported hypothesis 2, indicating that advanced-market MNEs achieved knowledge-based financial gains from internationalization, and such financial gains grew with the increase in R&D intensity. Meanwhile, the indirect effect was statistically indifferent from zero at all levels of R&D intensity in emerging-market MNEs. The result suggested that emerging-market MNEs failed to achieve knowledge-based financial gains from internationalization regardless of R&D intensity.

An examination of the regression results, which were the base to calculate the direct and indirect effects in the mediation analysis, revealed some interesting findings. As shown in column 1 of Table 5, the coefficient of internationalization, which represented the effect of internationalization on the competitive advantage in orchestration in advanced-market MNEs, was positive and statistically significant ($\beta = 0.17$, $p > 0.05$). The coefficient of interaction of internationalization with the emerging-market MNE dummy, which represented the differential effect of internationalization on the competitive advantage in orchestration in emerging-market MNEs was negative and statistically significant ($\beta = -1.27$, $p < 0.01$). The results suggested that internationalization led to improvement in the competitive advantage in orchestration in advanced-market MNEs, but failed to do so in emerging-market MNEs. The findings were

consistent with our argument that development of the competitive advantage in orchestration through internationalization is contingent on the location where a MNE is based.

Specifically, a 1 per cent increase in internationalization led to a 0.17 per cent increase in the competitive advantage in orchestration in advanced-market MNEs.

As shown in column 2, furthermore, the coefficient of the competitive advantage in orchestration, which represented the effect of the competitive advantage in orchestration on profitability in advanced-market MNEs, was positive and statistically significant ($\beta = 0.019$, $p > 0.01$). The coefficient of interaction between the competitive advantage in orchestration and emerging-market MNE dummy, which represented the effect of the competitive advantage in orchestration on profitability in emerging-market MNEs, was negative and statistically significant ($\beta = -0.038$, $p < 0.05$). The results indicated that advanced-market MNEs are more likely to leverage the competitive advantage in orchestration to enhance profitability than emerging-market MNEs. The findings were consistent with what were found in indirect effect of internationalization on profitability through the competitive advantage in orchestration in emerging-market and advanced-market MNEs.

4.2 Robustness Test

Firstly, it might be argued that some changes occurred during the period from 2004 to 2011.[8] To address this concern, we broke the sample into two subsamples: one covering the period from 2004 to 2007 and the other covering the period from 2008 to 2011. We ran moderated mediation test for the two subsamples, respectively. The results of test for the direct effect and the indirect effect of internationalization on profitability in the moderated mediation analyses are reported in Table 6. The results of regressions in the moderated mediation analyses are reported in Table 7. As shown in Tables 6 and 7, the results of the two subsamples were

[8] We would like to thank an anonymous reviewer for making this point.

both quite similar to those in the whole sample. It seemed, however, that both the direct and the indirect effects of internationalization on profitability were larger in the 2008-2011 period than those in the 2004-2007 period. The results indicated that internationalization led to increasing monopoly-based and knowledge-based financial gains over time over the 8 years.

(Insert Tables 6 and 7 about here)

Secondly, it might be argued that serial correlation in the dependent variables may bias the results. To address this concern, we used the first-differenced value of the dependent variables (ROA and TFP), and reran the moderated mediation analysis.[9] As shown in row 1 of Table 8 and columns 1 and 2 of Table 9, the results were quite similar to those in Tables 4 and 5. The test minimized our concern about possible biases related to serial correlation.

Thirdly, it might be argued that the results may be sensitive to measurement of profitability. To address this concern, we used ROS and ROI as a proxy for profitability, respectively, and reran the regression. As shown in rows 2 and 3 of Table 8 and columns 3-6 of Table 9, the results were quite similar to those in which ROA was used as a proxy for profitability. The test indicated that findings of the study were not sensitive to how profitability was measured.

Finally, it might be argued that the direct relationship between internationalization and profitability was nonlinear as suggested in some studies (Lu & Beamish, 2004; Contractor, 2007, 2012; Contractor, Kumar, & Kundu, 2007). A squared term of internationalization was introduced. The coefficient of the squared term was negative but statistically insignificant, indicating that the possibility of nonlinearity was rejected. We therefore removed the squared term from mediation analyses. It might be argued that lagged value need to be used in calculating TFP. We took this approach, and reached similar results.[10]

[9] We would like to thank an anonymous reviewer for making this point.
[10] We would like to thank an anonymous reviewer for making this point.

4.3 Control Variables

The coefficient of financial slack was positive and statistically significant in all regressions. The findings indicated that financial slack helped enhance both orchestration know-how and profitability. This was consistent with studies on the effect of financial slack on innovation and profitability (Bourgeois, 1981; Chang & Rhee, 2011). On the one hand, financial slack facilitated innovations as it provided "resources for creative and innovative experimentation" (Bourgeois, 1981: 35). Improvement in the competitive advantage in orchestration was based on innovations and creative experimentation and was therefore dependent on slack financial resources. On the other hand, a higher level of financial slack indicated a lower level of debt burden and, therefore, a lower level of "future interest payment obligations" (Bourgeois, 1981: 37). Accordingly, financial slack was expected to be positively related to profitability.

Evidence in the study supported a negative relationship between firm size and profitability, but a positive relationship between firm size and the competitive advantage in orchestration. The results seemed to indicate that as a MNE grew in size, economies of scale facilitated improvement in the competitive advantage in orchestration, but the added coordination costs led to short-term financial loss. The coefficient of firm age was negative and statistically significant in all regressions. The results were consistent with prior studies, indicating that older MNEs were likely to be constrained by past traditions (Xia et al, 2014). Although these variables were not the focus of the study, interested readers may investigate how financial slack and firm size affect orchestration know-how and profitability in greater detail in future research.

5. DISCUSSION

5.1 Theoretical Contributions

Our study draws on and extends internalization theory to develop a moderated mediation framework of financial gains from internationalization, and uses this framework to compare emerging-market MNEs with advanced-market MNEs. Constrained by the location where they are based, the framework suggests, emerging-market MNEs are likely to achieve monopoly-based financial gains from internationalization, but fail to obtain the competitive advantage in global orchestration know-how and knowledge-based financial gains. In contrast, advanced-market MNEs are likely to fail in monopoly-based financial gains from internationalization, but succeed in developing the competitive advantage in global orchestration know-how to achieve knowledge-based financial gains. R&D strengthens monopoly-based financial gains from internationalization in emerging-market MNEs, and knowledge-based financial gains from internationalization in advanced market MNEs.

Our study makes important contribution to the literature in several ways. To begin with, it considers internationalization as an independent variable that can enhance knowledge-based competitive advantages and, through it, financial performance conditional on R&D intensity, and thereby improves 1) the research that focuses on the direct relationship between internationalization and financial performance (Contractor, Kumar & Kundu, 2007), 2) the research that examines the direct relationship between internationalization and knowledge-based competitive advantage (Mathews, 2006), and 3) the research that takes internationalization as a mediator between knowledge-based competitive advantages and financial performance (Rugman & Verbeke, 2008).[11] Moreover, it focuses on the location constraints to innovation emerging-market MNEs face in the global factory system and at home to explain their performance, and thereby improves prior research that totally neglects the location constraints to innovation that emerging-market MNE face in their catch-up drive

[11] We thank an anonymous reviewer for making this point.

(Mathews, 2002, 2006). Furthermore, it subjects the predictive power of our theoretical framework to empirical testing against a sample of major emerging-market MNEs in comparison with a sample of major advanced-market MNEs in recent years, and provides robust evidence on the crucial performance differentials between emerging-market and advanced-market MNEs. This is an important improvement over extant theoretical research on emerging-market MNEs.

In particular, the study extends the notion of location in internalization theory to point to two major location constraints to innovation that emerging-market MNEs face. First of all, the control and orchestration of globally dispersed activities is firmly in the hands of technology leaders in advanced countries. Emerging-market MNEs are constrained in the periphery of the global factory system, and have little chance to learn system integration and global orchestration know-how needed to manage dispersed business activities in the global value chain. Secondly, emerging-market MNEs find themselves constrained by home institutions that induce them to seek monopoly-based rent.[12] Faced with the two location constraints, managers of emerging-market MNEs make rational decisions to divert R&D investment to entrepreneurial and innovative activities that help enhance monopoly-based rather than knowledge-based financial gains from internationalization. The theoretical explanation of location constraints has important managerial implications.

5.2 Managerial Implications

In the global factory system, advanced-market MNEs leverage the control of difficult-to-copy orchestration know-how to keep emerging-market MNEs at bay. As Buckley (2009a: 142) noted, the "crucial elements of control in the system may not be easily replicable", and

[12] Although some large cities in emerging economies have experienced rapid development and become the regional headquarters of some large MNEs, domestic firms in these cities are still constrained by their home country's periphery position in the global factory system and institutions. We thank an anonymous reviewer for making this point.

"provide formidable entry barriers to new entrants". Although emerging-market MNEs have made extraordinary efforts to break into the global factory system by the acquisition of established global brands and associated strategic assets, it is very difficult for them to obtain and develop, due to their periphery position in the global factory system, the global orchestration know-how and skills that have led to the success of these global brands. The challenge faced by emerging-market MNEs is not to what extent they internationalize, but to what extent they can acquire and develop global orchestration know-how in the internationalization process. The findings of this study suggest that they are not successful in this regard.

To acquire and develop global orchestration know-how, emerging-market MNEs have to work out ways to overcome the periphery constraints they face in the global factory system. As it is currently beyond their ability to create global factories in their own rights, emerging-market MNEs need to upgrade from this periphery position gradually through a series of steps of incremental transition within the current global factory system. This involves the transition from original equipment manufacturer (OEM) to original design manufacturer (ODM), and then to original brand manufacturer (OBM). Each of the transitions is incredibly challenging, requiring "entrepreneurial ability of a high order" that varies over time (Buckley, 2009a: 141). Emerging-market MNEs need to engage in R&D to experiment innovative approaches to the gradual upgrading. In so doing, they may eventually develop, as MNEs from newly industrialized economies did, the ability to control and orchestrate globally dispersed business activities, and achieve knowledge-based financial gains from internationalization.

However, the incremental transition must go hand in hand with the transition at home toward developing enabling institutions that encourage entrepreneurial experimentation and risk-taking in R&D. Governments of emerging economies tend to focus on technology catch-up with advanced economies and delay, due to the resistance of interest groups, the necessary

institutional transformation that supports sustained technology advance as evidenced in China today. Without enabling institutions such as well-established private property rights, freedom in market entry and exist, and democracy to protect free speech and curb corruption, it is very hard for individuals and enterprises to excel in entrepreneurship and innovation that enhance global orchestration know-how. Emerging-market MNEs need to work with the government, international organizations, and local communities to promote the institutional transformation at home.

5.3 Limitations and Directions for Future Research

The study attributes the failure of emerging-market MNEs in obtaining global orchestration know-how and knowledge-based financial gains from internationalization to their peripheral position in the global factory system and the underdeveloped institutions in their home countries. The study does not further discuss detailed elements of these location constraints to innovation, and the specific channels by which these elements may interact with one another to influence internationalization and performance in emerging-market MNEs. Future research may integrate internalization theory with other theories, such as institutional economics, to extend the study in this direction.

Moreover, empirical findings of the study are based on statistical likelihood analysis and are reflective of a general trend. Individual emerging economies, and their domestic institutions, are diverse, but there is a general pattern of market imperfections to which firms will react. That is the effect that we capture. Accordingly, the empirical findings cannot be extended to argue that no emerging-market MNEs have enhanced global orchestration know-how and knowledge-based financial gains from internationalization.[13] There may be some emerging-market MNEs that have made progresses in this regard. As noted by Mathews (2006),

[13] We thank an anonymous reviewer for making this point.

for instance, Mittal Steel (formerly Ispat) started as a tiny steel producer in Indonesia. It expanded overseas in 1989 by a number of international acquisitions of steel plants in the world periphery, and then in the triad economies in Europe and the United States. It leveraged "a new feedstock technology termed Direct Reduced Iron (DRI)" in combination with "mini-mills and electric arc technology", developed "integrated management systems" to run a global supply chain, and "utilized its global presence to attract important global customers like GM" (Mathews, 2006: 12). It has now been publicly listed in New York and Amsterdam, and has become a successful global steel company.[14] Future research may investigate in detail how these MNEs have managed to rise above their peripheral position in the global factory system and the institutional constraints they face at home to achieve the progresses.

Furthermore, the study does not discuss possible influences of the constraints to entrepreneurship and innovation in MNEs' host countries on their performance. In theory, the difference in institutional configurations between host countries influences R&D investment, entrepreneurship, innovation, and financial gains from internationalization in MNEs operating in these host countries. In the era of global factory when MNEs' business activities and networks spread globally, however, the influence of host-country institutions on MNE behaviour and performance tends to be neutralized as all MNEs typically have business activities or networks in both emerging economies and advanced economies. In empirics, meanwhile, it is very difficult to estimate the host country impact because data on MNEs' investment, employment and sales in individual host countries are rarely available. Future research may move in this direction to examine the host country impact when data become available.

[14] We thank an anonymous reviewer for making this point.

Finally, we need to be aware of possible biases related to sample and variables. The sample in the study includes large emerging-market and advanced-market MNEs only. It is not clear whether the findings apply to small and medium-sized MNEs. Moreover, recent research suggested that industry-level competition, firm age, and product diversification may affect direct financial gains from internationalization, and these variables are not included in the study (Bausch & Krist, 2007; Kirca et al, 2011). Furthermore, patents and brand names may influence internationalization and firm performance, and were not included in the study due to data constraints.[15] R&D at the country level may also influence internationalization and performance, as do regional activities of MNEs.[16] It would be helpful to see whether the findings of the study remain unchanged when the sample and variable biases are addressed. Future research may move in this direction.

6. CONCLUSION

Drawing on and extending internalization theory, this study develops a moderated mediation framework to examine the performance of emerging-market MNEs compared to advanced-market MNEs, and tests hypotheses against recent experience of the two groups of MNEs. The study unveils crucial differences in performance between emerging-market MNEs and advanced-market MNEs in internationalization, and explains the performance differentials in the light of the variation in R&D investment and, more importantly, in the variation in the constraints faced by the two groups of MNEs in the location where they are based. The study contributes to the literature on determinants of performance of MNEs, and reaches findings that have important implications for MNE managers.

TABLES AND FIGURES

TABLE 1. Country of Origin of MNEs in the Sample

[15] We thank an anonymous reviewer for making this point.
[16] We thank an anonymous reviewer for making this point.

Country of origin	Number of firms	Percentage
Advanced economies		
Australia	2	0.90
Canada	3	1.36
Denmark	1	0.45
Finland	1	0.45
France	16	7.24
Germany	14	6.33
Ireland	1	0.45
Italy	4	1.81
Japan	11	4.98
Luxembourg	1	0.45
Netherland	4	1.81
Norway	2	0.90
Span	4	1.81
Sweden	3	1.36
Switzerland	5	2.26
UK	16	7.24
U.S.A	27	12.22
Hong Kong	19	8.60
South Korea	6	2.71
Singapore	9	4.07
Taiwan	13	5.88
Subtotal	162	73
Emerging Economies		
Argentina	2	0.90
Brazil	4	1.81
China	9	4.07
Egypt	1	0.45
India	7	3.17
Kuwait	3	1.36
Malaysia	4	1.81
Mexico	4	1.81
Philippines	1	0.45
Qatar	1	0.45
Russia	9	4.07
South Africa	8	3.62
Thailand	1	0.45
Turkey	2	0.90
United Arab Emirates	2	0.90
Venezuela	1	0.45
Subtotal	59	27
Total	221	100

TABLE 2. Industry Distribution of MNEs in the Sample

Industry	Emerging-market MNEs	Advanced-market MNEs
Wholesale and retail	2	10
Transportation	4	4
Mining & quarrying	2	3
Entertainments, hotel and restaurants	2	7
Food, beverages and tobacco	4	10
Utilities and energy	1	11
Non-metalic mineral, wood, paper and building material	2	7
Construction	3	7
Metal and metal products	4	5
Petroleum expl./ref./distr.	9	7
Trading and diversified	6	12
Machinery and equipment	3	6
Chemical	2	6
Computer and related office equipment	1	3
Motor vehicles and parts	1	9
Electrical & electronic equipment	3	29
Telecommunication	5	11
Pharmaceuticals	2	8
Other	3	8
Total	59	163

TABLE 3. Basic Statistics of Major Variables [a, b]

Variable	Mean	SD	1	2	3	4	5	6	7
1.Competitive advantage in orchestration	0.662	0.474							
2.Internationalization	0.519	0.230	0.042**						
3.Profitability	0.0512	0.072	0.155**	-0.031					
4. Firm size	9.241	1.600	0.327**	-0.056**	-0.053				
5. Financial slack	1.360	0.221	0.051*	-0.02	0.050**	0.001			
6. R&D intensity	0.0354	0.042	-0.060	0.032*	0.022*	-0.148**	-0.017		
7.Emerging-market MNE dummy	0.23	0.041	-0.05**	-0.353**	0.044**	-0.389**	0.043*	-0.095**	
8. Firm age	2.62	1.18	-0.19**	-0.05	-0.14*	0.08	0.10	0.02*	-0.11

[a] Except for mean, all statistics are based on industry-centred values.
[b] * <0.05; ** <0.01.

TABLE 4. Hypothesis Test for the Direct and Indirect Effects of Internationalization on Profitability [a]

Emerging-market MNE dummy	R&D Intensity		Direct Effect		Indirect Effect		
			Effect(ψ) [b]	SE	Effect(θ) [c]	95% LCI [d]	95% UCI [d]
0	Low	(-0.0069)	0.0084	0.0149	0.0025	-0.0011	0.0068
0	Mean	(0.0359)	-0.0005	0.0103	0.0087#	0.0023	0.0146
0	High	(0.0786)	-0.0094	0.0159	0.0177#	0.0053	0.0301
1	Low	(-0.0069)	-0.1318	0.0673	0.0326	-0.0464	0.1185
1	Mean	(0.0359)	0.0532*	0.0287	-0.0277	-0.1198	0.1042
1	High	(0.0786)	0.2383*	0.1242	-0.0845	-0.3562	0.9743

[a] The direct effect and indirect effect are calculated according to the regression results in Table 5 as explained by Hayes (2013).
[b] † if $p < 0.10$, * if $p < 0.05$; ** if $p < 0.01$; *** if $p < 0.001$.
[c] ♯ indicates statistical significance at the 95% confidence interval.
[d] LCI indicates lower confidence interval, and UCI indicates upper confidence interval.

TABLE 5. Results of Moderated Mediation Regression Analysis for Hypothesis Test [a, b,c] .

Variables	Competitive advantage in orchestration	Profitability
Intercept	-0.09	-0.00
	(0.06)	(0.00)
Firm size	0.088***	-0.007***
	(0.021)	(0.003)
Financial slack	0.004**	0.002**
	(0.002)	(0.000)
Firm age	-0.012**	-0.004*
	(0.006)	(0.002
Competitive advantage in orchestration		0.0192**
		(0.007)
Internationalization	0.17*	0.007
	(0.093)	(0.014)
Emerging-market MNE dummy	0.48	0.054**
	(0.11)	(0.015)
Internationalization x Emerging-market MNE dummy	-1.27***	-0.10*
	(0.29)	(0.056)
R&D intensity	-1.09	0.14
	(1.18)	(0.16)
Internationalization x R&D intensity	1.31	-0.20
	(1.79)	(0.27)
Emerging-market MNE dummy x R&D intensity	5.84	-2.90
	(5.85)	(1.76)
Internationalization x Emerging-market MNE dummy x R&D intensity	-0.58	4.53
	(13.44)	(3.25)
Competitive advantage in orchestration x Emerging-market MNE dummy		-0.038*
		(0.017)
Competitive advantage in orchestration x R&D intensity		0.58***
		(0.15)
Competitive advantage in orchestration x Emerging-market MNE dummy x R&D intensity		0.72
		(1.13)
Adjusted R^2	0.28	0.20

[a] . Coefficients obtained from the regressions are the basis for calculating the direct and indirect effects of internationalization on profitability as explained by Hayes (2013).
[b] † if $p < 0.10$; * if $p < 0.05$; ** if $p < 0.01$; *** if $p < 0.001$.
[c] . All regressions included industry dummies, though the coefficients of these dummy variables were not reported in the table due to space constraints.

TABLE 6. Robustness Test for the Direct and Indirect Effects of Internationalization on Profitability (Different samples) [a]

Sample	Emerging-market MNE dummy	R&D Intensity		Direct Effect		Indirect Effect		
				Effect(ψ) [b]	SE	Effect(θ) [c]	95% LCI [d]	95% UCI [d]
2004-2007	0	Low	(-0.0074)	0.0171	0.0166	0.0031	-0.0005	0.0089
	0	Mean	(0.0355)	0.0056	0.0116	0.0100#	0.0034	0.0182
	0	High	(0.0784)	-0.0059	0.0179	0.0184#	0.0042	0.0360
	1	Low	(-0.0074)	-0.0873	0.0964	0.0304	-0.0614	0.1860
	1	Mean	(0.0355)	0.0602*	0.0306	-0.0723	-0.2122	0.1725
	1	High	(0.0784)	0.2077*	0.1052	-0.1437	-0.5512	1.5414
2008-2011	0	Low	(-0.0090)	0.0135	0.0211	0.0010	-0.0039	0.0077
	0	Mean	(0.0336)	-0.0070	0.0149	0.0109#	0.0021	0.0214
	0	High	(0.0762)	-0.0275	0.0242	0.0254#	0.0050	0.0500
	1	Low	(-0.0090)	-0.0573	0.1015	0.0275	-0.1521	0.2125
	1	Mean	(0.0336)	0.1560*	0.0801	-0.0840	-0.3144	0.1906
	1	High	(0.0762)	0.3694*	0.1835	-0.0322	-1.0008	1.8341

[a] The direct effect and indirect effect are calculated according to the regression results in Table 6 as explained by Hayes (2013).

[b] † if $p < 0.10$, * if $p < 0.05$; ** if $p < 0.01$; *** if $p < 0.001$.

[c] ♯ indicates statistical significance at the 95% confidence interval.

[d] LCI indicates lower confidence interval, and UCI indicates upper confidence interval.

TABLE 7. Results of Moderated Mediation Regression Analysis in the Robustness Test (Different samples) [a, b,c]

	2004-2007		2008-2011	
Variables	Competitive advantage in orchestration	Profitability	Competitive advantage in orchestration	Profitability
Intercept	0.00	0.00	0.01	0.00
	(0.02)	(0.00)	(0.02)	(0.00)
Firm size	0.084***	-0.007***	0.11***	-0.006**
	(0.013)	(0.002)	(0.018)	(0.003)
Financial slack	0.005**	0.002**	0.004**	0.002**
	(0.002)	(0.000)	(0.002)	(0.000)
Firm age	-0.013**	-0.005*	-0.012**	-0.007*
	(0.006)	(0.003	(0.006)	(0.004
Competitive advantage in orchestration		0.018**		0.010*
		(0.007)		(0.006)
Internationalization	0.23**	0.015	0.26*	0.009
	(0.10)	(0.015)	(0.13)	(0.018)
Emerging-market MNE dummy	-0.23**	0.004	-0.28***	0.015
	(0.096)	(0.015)	(0.11)	(0.017)
Internationalization x Emerging-market MNE dummy	-1.49***	-0.08	-1.76***	-0.022
	(0.36)	(0.07)	(0.41)	(0.073)
R&D intensity	-0.24	0.018	-0.43	-0.003
	(0.29)	(0.042)	(0.39)	(0.053)
Internationalization x R&D intensity	0.67	-0.27	1.81	-0.21
	(1.97)	(0.29)	(2.76)	(0.72)
Emerging-market MNE dummy x R&D intensity	5.48	-0.87	9.27	-0.83
	(5.13)	(0.75)	(8.18)	(1.24)
Internationalization x Emerging-market MNE dummy x R&D intensity	3.44	3.71	15.85	5.49
	(20.89)	(5.16)	(31.32)	(5.13)
Competitive advantage in orchestration x Emerging-market MNE dummy		-0.026*		-0.004*
		(0.015)		(0.002)
Competitive advantage in orchestration x R&D intensity		0.59***		0.69***
		(0.16)		(0.21)
Competitive advantage in orchestration x Emerging-market MNE dummy x R&D intensity		1.46		1.85
		(1.76)		(2.15)
Adjusted R^2	0.26	0.18	0.28	0.21

[a] . Coefficients obtained from the regressions are the basis for calculating the direct and indirect effects of internationalization on profitability in Table 5 as explained by Hayes (2013).

[b] † if $p < 0.10$; * if $p < 0.05$; ** if $p < 0.01$; *** if $p < 0.001$.

[c] . All regressions included industry dummies, though the coefficients of these dummy variables were not reported in the table due to space constraints.

TABLE 8. Robustness Test for the Direct and Indirect Effects of Internationalization on Profitability (First-differenced dependent variables) [a]

Dependent variable	Emerging-market MNE dummy	R&D Intensity		Direct Effect		Indirect Effect		
				Effect(ψ) [b]	SE	Effect(θ) [c]	95% LCI [d]	95% UCI [d]
First-differenced ROA & TFP	0	Low	(-0.0069)	0.0088	0.0148	0.0026	-0.0010	0.0077
	0	Mean	(0.0359)	-0.0002	0.0101	0.0089#	0.0031	0.0154
	0	High	(0.0786)	-0.0091	0.0158	0.0180#	0.0053	0.0313
	1	Low	(-0.0069)	-0.1309	0.0772	0.0313	-0.0431	0.1241
	1	Mean	(0.0359)	0.0546*	0.0268	-0.0283	-0.1397	0.1095
	1	High	(0.0786)	0.2401*	0.1352	-0.0876	-0.3553	0.9884
First-differenced ROS & TFP	0	Low	(-0.0069)	0.0067	0.0150	0.0020	-0.0015	0.0066
	0	Mean	(0.0359)	-0.0019	0.0104	0.0076#	0.0019	0.0140
	0	High	(0.0786)	-0.0105	0.0159	0.0160#	0.0040	0.0291
	1	Low	(-0.0069)	-0.1349	0.0674	0.0344	-0.0391	0.1356
	1	Mean	(0.0359)	0.0518*	0.0285	-0.0287	-0.1364	0.1526
	1	High	(0.0786)	0.2386*	0.1241	-0.0883	-0.3928	1.3113
First-differenced ROI & TFP	0	Low	(-0.0069)	0.0075	0.0149	0.0021	-0.0016	0.0070
	0	Mean	(0.0359)	-0.0013	0.0103	0.0078#	0.0015	0.0141
	0	High	(0.0786)	-0.0100	0.0158	0.0162#	0.0037	0.0293
	1	Low	(-0.0069)	-0.1336	0.0673	0.0336	-0.0367	0.1387
	1	Mean	(0.0359)	0.0524*	0.0282	-0.0290	-0.1187	0.1451
	1	High	(0.0786)	0.2384*	0.1240	-0.0886	-0.3345	1.2032

[a] The direct effect and indirect effect are calculated according to the regression results in Table 8 as explained by Hayes (2013).
[b] † if $p < 0.10$, * if $p < 0.05$; ** if $p < 0.01$; *** if $p < 0.001$.
[c] ♯ indicates statistical significance at the 95% confidence interval.
[d] LCI indicates lower confidence interval, and UCI indicates upper confidence interval.

TABLE 9. Results of Moderated Mediation Regression Analysis in the Robustness Test (First-differenced dependent variables) [a, b, c]

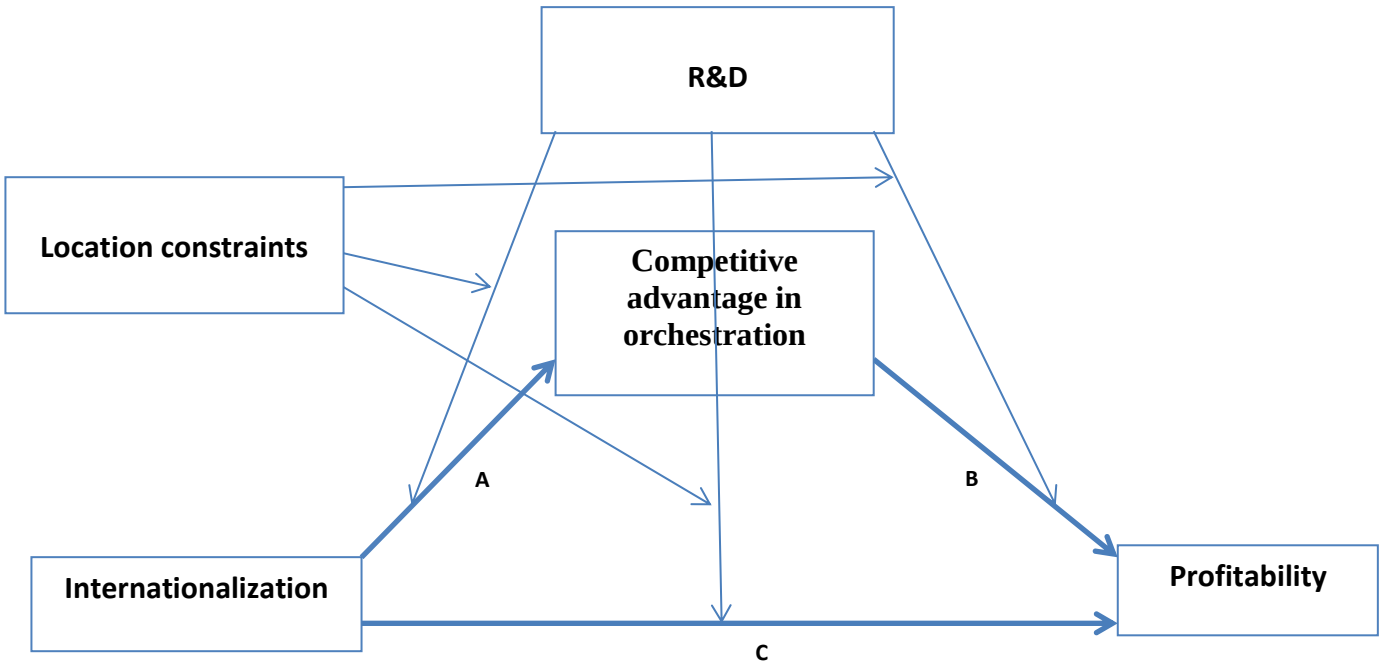
Variable	Competitive advantage in orchestration	Profitability (ROA)	Competitive advantage in orchestration	Profitability (ROS)	Competitive advantage in orchestration	Profitability (ROI)
Intercept	0.10	-0.01	-0.04	-0.03	-0.05	-0.02
	(0.07)	(0.01)	(0.03)	(0.03)	(0.04)	(0.04)
Firm size	0.081***	-0.007***	0.09***	-0.007***	0.089***	-0.007***
	(0.014)	(0.002)	(0.02)	(0.003)	(0.021)	(0.002)
Financial slack	0.004**	0.002**	0.005**	0.002**	0.004**	0.002**
	(0.002)	(0.000)	(0.002)	(0.000)	(0.002)	(0.000)
Firm age	-0.011**	-0.006*	-0.013**	-0.005*	-0.012**	-0.004*
	(0.005)	(0.003	(0.006)	(0.003	(0.006)	(0.002
Competitive advantage in orchestration		0.019**		0.019**		0.019**
		(0.007)		(0.007)		(0.006)
Internationalization	0.177*	0.007	0.143*	0.005	0.148*	0.006
	(0.092)	(0.013)	(0.083)	(0.014)	(0.083)	(0.012)
Emerging-market MNE dummy	0.491	0.055**	0.56	0.059**	0.57	0.06***
	(0.298)	(0.023)	(0.32)	(0.024)	(0.33)	(0.024)
Internationalization x Emerging-market MNE dummy	-1.265***	-0.11	-1.27***	-0.11	-1.28***	-0.11
	(0.289)	(0.07)	(0.29)	(0.06)	(0.29)	(0.07)
R&D intensity	-1.08	0.15	-1.21	0.14	-1.18	0.14
	(1.172)	(0.17)	(1.17)	(0.16)	(1.17)	(0.18)
Internationalization x R&D intensity	1.32	-0.21	1.37	-0.20	1.35	-0.20
	(1.78)	(0.26)	(1.79)	(0.27)	(1.79)	(0.27)
Emerging-market MNE dummy x R&D intensity	6.12	-2.91	6.13	-2.90	6.15	-2.90
	(5.81)	(1.77)	(5.84)	(1.76)	(5.83)	(1.79)
Internationalization x Emerging-market MNE dummy x R&D intensity	-1.25	4.55	-0.65	4.57	-0.71	4.54
	(13.38)	(3.24)	(13.3)	(3.25)	(13.44)	(3.28)
Competitive advantage in orchestration x Emerging-market MNE dummy		-0.039*		-0.04*		-0.04*
		(0.018)		(0.02)		(0.02)
Competitive advantage in orchestration x R&D intensity		0.57***		0.56***		0.56***
		(0.15)		(0.15)		(0.14)
Competitive advantage in orchestration x Emerging-market MNE dummy x R&D intensity		0.71		0.74		0.74
		(1.14)		(1.13)		(1.13)
Adjusted R^2	0.28	0.20	0.27	0.19	0.26	0.18

[a] . Coefficients obtained from the regressions are the basis for calculating the direct and indirect effects of internationalization on profitability in Table 7 as explained by Hayes (2013).

[b] † if $p < 0.10$; * if $p < 0.05$; ** if $p < 0.01$; *** if $p < 0.001$.

[c] . All regressions included industry dummies, though the coefficients of these dummy variables were not reported in the table due to space constraints.

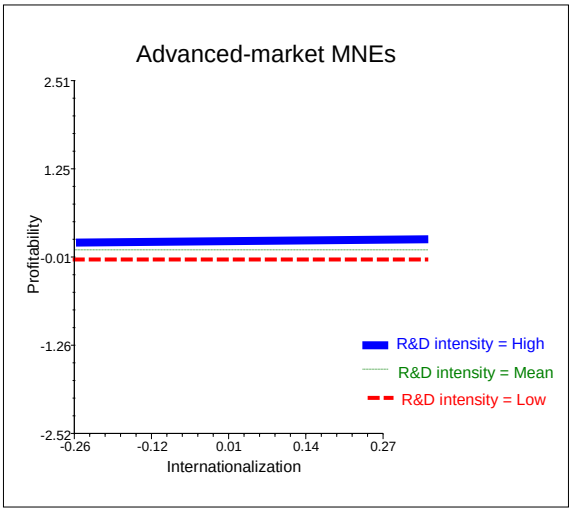
FIGURE 1. Moderated Mediation Model of Internationalization and Performance

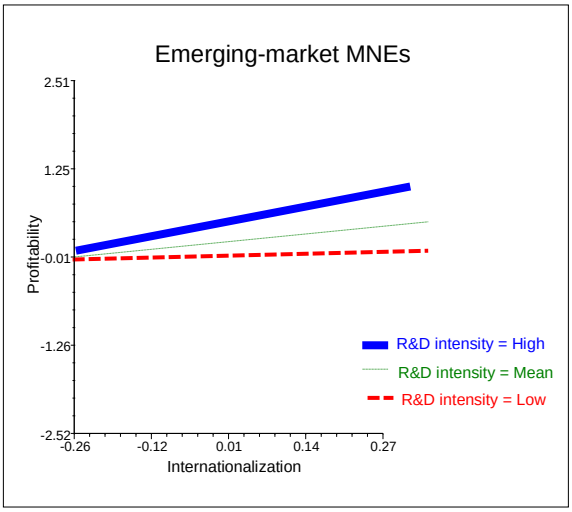


Note: AB represents the indirect effect of internationalization on profitability through the competitive advantage in orchestration. C represents the direct effect of internationalization on profitability. Both the direct and indirect effects of internationalization on profitability are moderated by R&D in a MNE and constraints to innovation in the location where a MNE is based.

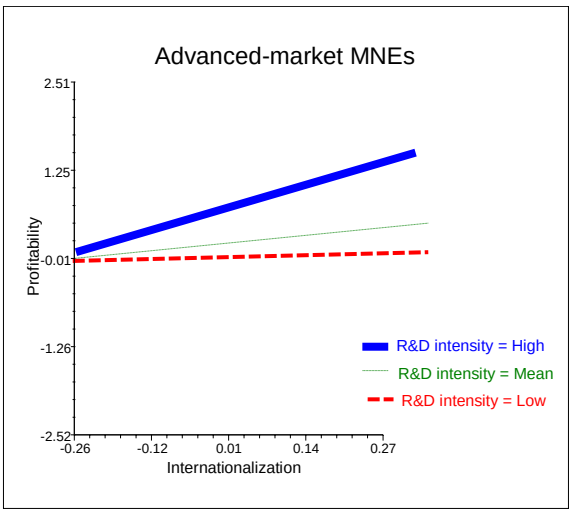
Figure 2. The direct effect and the indirect effect of internationalization on profitability conditional on R&D intensity in emerging-market MNEs and advanced-market MNEs

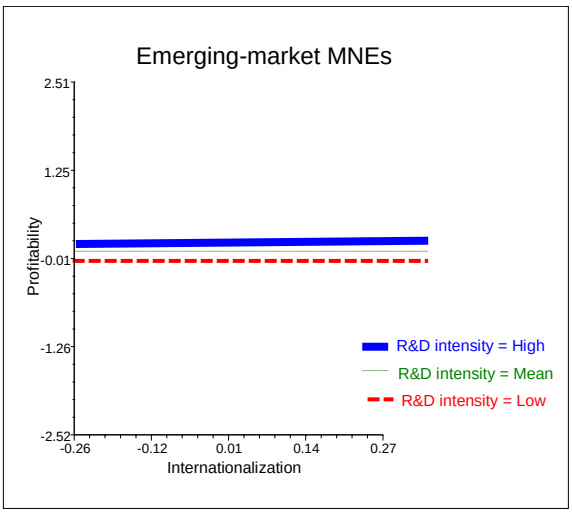
A. Direct Effect





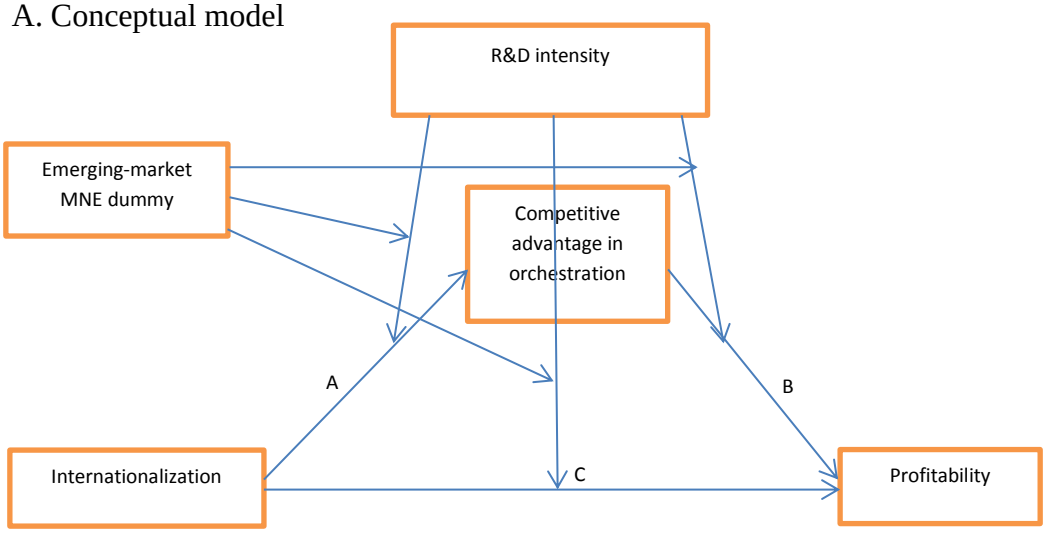
B. Indirect Effect





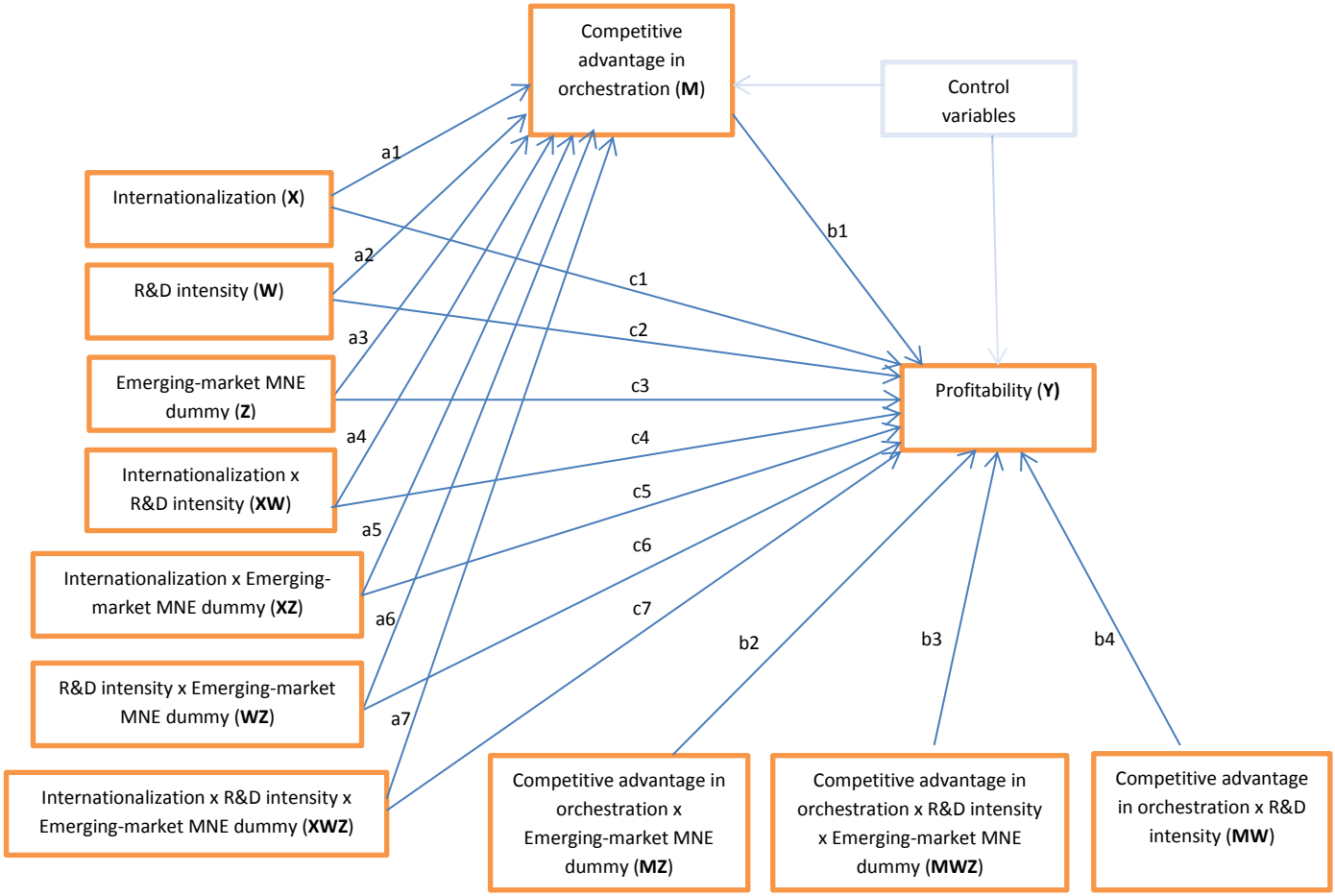
APPENDIX 1. Conceptual and Statistical Mediation Models of Hypothesis Test

A. Conceptual model



Note: C represents the direct effect of internationalization on profitability. AB represents the indirect effect of internationalization on profitability through competitive advantage in orchestration.

B. Statistical model



Notes:

1) Conditional indirect effect of internationalization (X) on profitability (Y) through competitive advantage in orchestration (M)= $(a1 + a4W + a5Z + a7WZ)(b1 + b4W + b2Z + b3WZ)$
2) Direct effect of internationalization (X) on profitability (Y) = $c1 + c4W + c5Z + c7WZ$

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