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The choice between standard and non-standard FDI production strategies for Taiwanese multinationals

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ABSTRACT

In modeling the foreign direct investment (FDI) behavior of firms, existing studies tend to classify multinational enterprises' (MNEs) production activities into two broad strategies, namely, standard vertical integration and horizontal integration. In practice, the production behavior of multinational enterprises is much more complex. Based on the production relations between parent firms and their foreign subsidiaries, this study divides MNEs' production behavior into five strategies: vertical integration, foreign concentration, home concentration, horizontal integration, and heterogeneous horizontal integration. We then propose three sets of interesting hypotheses associated with the five different production strategies. A uniquely compiled firm-level data set of Taiwanese manufacturing firms over the 2004–2007 period is adopted to empirically verify the proposed hypotheses. The empirical estimates are in general consistent with the proposed predictions and suggest that the various production behaviors of MNEs depend on the foreign market size, trade costs, factor advantage, fixed investment costs and firm characteristics. Moreover, each production strategy is influenced by different determinants as implied by our hypotheses.

1. Introduction

The overseas production strategies of multinational enterprises (MNEs) are becoming increasingly complicated nowadays. It is therefore not sufficient to describe a firm's foreign direct investment (FDI) behavior by simply dividing it into horizontal and vertical integration strategies. In particular, horizontal multinationals include not only the "replicators" that are involved in producing replicas of the home plants in foreign countries, but also those that produce different final products in different countries. Head (2007) refers to these types of overseas production strategies as consisting of "polycentric" and "polymorphic" forms, where foreign subsidiaries produce different final products for the parent firms.[2] The decision between pure replication and heterogeneous production could depend on firm-specific factors (such as firm size and productivity) or demand-side variables (such as market size and consumer preferences), and the determinants of each production strategy might also differ.[3] Likewise, vertical multinationals may include not merely firms that geographically fragment production by stages, but also those which concentrate their production in the home (or foreign) country, and set up sales offices in the foreign (or home) country. Head (2007) labels this fragmented production as "vertical specialization", home production/foreign sales as "home centralization", and foreign production/home sales as "foreign centralization". Hence, it would be interesting and important to further categorize horizontal as well as vertical multinationals into more detailed production patterns and to conduct a comprehensive comparison of the various production strategy patterns of MNEs, thereby helping us gain a more thorough understanding of the behavior of multinationals.

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[2] According to Head (2007), the difference between "polycentric" and "polymorphic" lies in the pattern of final shipments. The "polycentric" form involves cross-border trade, while the "polymorphic" form does not.

[3] For example, foreign market size might be the key factor in the formation of pure replication multinationals, while firms engaging in product differentiation in different markets might place more emphasis on consumer preference differentials between the home and foreign markets, and the costs induced by product differentiation.

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Following the FDI production strategies in Head (2007), this paper first classifies the potential production strategies of MNEs into three vertical and two horizontal choices, namely, vertical integration, foreign concentration, home concentration, horizontal integration, and heterogeneously horizontal integration. The definitions of two vertical-type integration strategies, foreign concentration and home concentration, will be introduced in Section 3. It is not an easy task to empirically disentangle the factors that influence firms' decision regarding these different integrated production strategies. The difficulty arises since a typical firm-level data set does not allow us to uncover which production strategy a firm is adopting among the five alternatives. This article compiles a firm-level data set (also by collecting and constructing data on industry-level and country-level variables) of Taiwanese multinational manufacturers during the years from 2004 to 2007. This rich and unique data set enables us to control for country-level, industry-level, and firm-level determinants and to analyze the firms' various production strategies in FDI.

The data of this paper are taken from the annual survey on the outward FDI of Taiwanese manufacturing firms by the Ministry of Economic Affairs (MOEA) of Taiwan. The targets of the survey include firms that undertake green-filed outward investment or M&A. In addition, the survey does not distinguish between outward FDI firms and multinationals (MNEs or MNCs), since the operational definition of an MNE (or MNC) may not be relatively standard compared to that of FDI (Aggarwal et al., 2011). The MNCs may be defined on the basis of firm characteristics, such as the proportion of foreign sales and foreign assets, the number of foreign subsidiaries, or on the basis of the degree of international activities, such as operating across national borders, employing foreign capital, people and processes. Because of the implementation of the national policy of economic liberalization and internationalization, Taiwanese firms are not required to apply for permission to undertake outward FDI unless the investment is above a certain amount of money. According to the Regulation for Companies Overseas Investment by the MOEA of Taiwan, a firm is required to apply for permission if the amount of overseas investment exceeds NT$1.5 billion (around US$50 million); if the amount of investment is below that level, a firm can report to the Investment Commission of the MOEA within 6 months. Furthermore, according to the statistics report of 2012 from the Investment Commission of the MOEA, the average amount of overseas investment is US$25,229,412, which is much higher than the average business scale in Taiwan (around US$266,667). This means that Taiwanese business entities are very active in overseas investment.[4]

With the identified FDI strategies from multinational firms, five interesting strategy-pairs are explored and three sets of hypotheses are thus proposed to reveal the crucial factors for each strategy-pair. In particular, this study addresses the following questions. First, what are the strengths and weaknesses of each overseas production strategy in terms of our targeted five strategy-pairs? In addition to the traditional choice between horizontal integration and vertical integration, we mainly investigate the choice among two types of horizontal integration and the choice among three types of vertical integration strategies. Second, which aggregate (e.g., country-level and industry-level) variables differentiate the choices among various production strategies for multinational enterprises? Can each multinational production strategy have different aggregate determinants? Third, which firm-specific characteristics affect the integration production strategies? Are these firm-level determinants specific to various production strategies for MNEs? These questions are empirically evaluated in this paper.

The remainder of this paper is organized as follows. The next section consists of a brief literature review on horizontal and vertical FDI activities. We introduce the firm's choices among different production strategies in FDI and propose three sets of hypotheses that will be tested in this paper in Section 3. Section 4 describes the data sources. The empirical specifications and estimation strategies are presented in Section 5. Section 6 demonstrates and discusses the empirical results. The final section concludes the paper.

2. Literature review on FDI

Boosted by trade liberalization and the economic integration of the world economy, trade and foreign direct investment have been among the fastest growing economic activities around the world over the past two decades. Specifically, multinational sales have grown at high rates and have outpaced the expansion of trade in manufacturing products, highlighting the importance of FDI for firms to maintain their competitiveness in the global market and receiving wide attention from policy-makers, researchers, and practitioners.[5]

Based on a two-country equilibrium model, most existing FDI theories, e.g., Helpman (1984), Markusen (1984), Helpman and Krugman (1985), Markusen and Venables (1998, 2000), and Carr et al. (2001), classify multinationals into two broad types, namely, *vertical* integration and *horizontal* integration, and examines firms' endogenous choice between vertical and horizontal production structures. Markusen and Maskus (2001) also offer a nice review of the FDI literature that adopts a general-equilibrium trade-theoretic view of multinationals. For vertical multinationals, firms aim to exploit factor price differences across countries by fragmenting the production process internationally and moving production lines to foreign countries where the production cost is lower. On the other hand, horizontal multinationals avoid trade costs by producing the same goods and services in various countries in order to get closer to customers.

In practice, the choice between vertical and horizontal integration for a multinational depends mainly on country-level characteristics, such as relative market size, factor prices, and trade and investment costs. Most empirical studies show that: (1) the relative size of the host market has a negative (positive) impact on the formation of vertical (horizontal) multinationals, (2) trade costs have a negative (positive) impact on the propensity of being a vertical (horizontal) multinational, and (3) vertical multinationals engage in production in countries having significant factor price differentials, whereas horizontal multinationals are more prevalent in countries having similar factor prices (see Shatz and Venables, 2000; Markusen and Maskus, 2001; Lipsey, 2003; Barba-Navaretti and Venables, 2004; Bandinger and Egger, 2008 for more detailed discussions). Recent studies on the determinants of FDI and trade alternatively emphasize the role of firm *heterogeneity* (Antrás and Helpman, 2003; Buch et al., 2005; Castellani and Zanfei, 2007; Head and Ries, 2003; Helpman et al., 2004; Kimura and Kiyota, 2006), and especially focus on how productivity affects firms' overseas integrated production strategies, e.g., Kimura and Kiyota (2006) and Castellani and Zanfei (2007).

The overseas production strategies of multinational enterprises, however, are essentially quite complex, suggesting that the rough classification on FDI into vertical and horizontal integration may prevent us from gaining more insights into the choice of production strategies undertaken by MNEs. Using a sample of U.S.

[4] We owe the discussion on Taiwanese MNEs and FDI to an anonymous referee.

[5] According to the United Nations Conference on Trade and Development (UNCTAD) World Investment Report 2009, global FDI flows have grown at least twice as fast as trade over recent decades. In 2008, the global FDI flows were about US$1697 billion, and the total FDI stock reached US$14,909 billion.