

ERIA Discussion Paper Series

## **Firm-level Analysis of Globalization: A Survey of the Eight Literatures**

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March 2010

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**Abstract:** This paper presents an extensive review of empirical studies that analyze the various impacts of the globalization phenomenon on corporate activities, using micro data. First, we set up a flow chart describing how globalization leads to national productivity enhancement. Secondly, we summarize the hypotheses and the methods explored in eight lines of literature on globalization, which this flow chart maps. Thirdly, we illustrate rich implication for economic consequences of trade liberalization and then discuss possible avenues for micro-data analyses

**Keywords:** Firm-level data; Globalization; Productivity.

**JEL Classification:** F15; F23

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<sup>§</sup> This is an updated version of ERIA Discussion Paper No.2009-05, published in March 2009. This research was conducted as a part of the Economic Research Institute for ASEAN and East Asia (ERIA) project “Deepening East Asian Economic Integration Part II: Firm-Level Analyses”. The first author would like to record his appreciation of Mr. So Umezaki’s hospitality during his stay at ERIA. The authors are deeply indebted to the members of this project for their invaluable suggestions. We also thank Ms. Fadriani Trianingsih, Ms. Zheng Ji and Ms. Ayako Obashi for their excellent research assistance. The opinions expressed in this paper are the sole responsibility of the authors and do not reflect the views of ERIA.

## 1. Introduction

Micro data analysis of corporate firms or establishments has totally redefined the scope of empirical policy studies since the latter half of the 1980s. It has been proved to be one of the most effective ways of investigating microeconomic causality and understanding macroeconomic consequences. Compared with traditional aggregated data at the macro or sectoral level, micro data at the establishment or firm level have a number of strong points. In particular, with micro data, econometric controls for industry characteristics are much easier. Furthermore, once we construct panel (longitudinal) data in which individual establishments or firms are traced over time, time-invariant characteristics of establishments/firms can be controlled, so as to analyze the dynamic heterogeneous transformation of corporate activities. In other words, micro data allow us to provide a versatile empirical basis for rigorous econometric exercises investigating the heterogeneity of firms.

In the context of international trade literature, empirical analysis of globalizing corporate activities certainly requires the viewpoint of individual corporate firms. Globalization<sup>1</sup> provides both enhanced competitive pressure and new opportunities in business for corporate firms. How they adapt to globalization depends heavily on the heterogeneous characteristics of individual firms. For example, the conclusion of a bilateral free trade agreement yields different impacts across firms. Some firms may start exporting or continue to export while others may stay in the domestic market. The use of firm-level data enables us to directly examine the relationship between firms' characteristics and their export status, and to investigate what characteristics would be

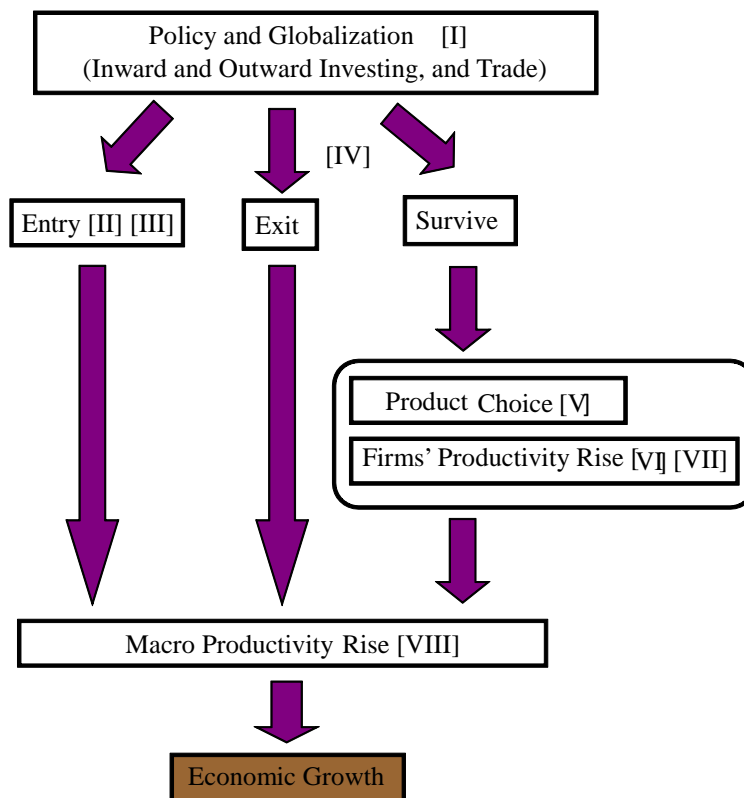
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<sup>1</sup> In this paper, "globalization" indicates the reduction of trade/investment costs or the process of increasing the interdependence of the world's markets and business.

the key in globalizing corporate activities.

The advance of globalization, or changes in policy measures related to globalization, lead to national productivity enhancement through various channels, of which an example is summarized in the form of a flow chart (Figure 1). As a consequence of the globalization, some existing firms will be forced to shut down, and some new firms will enter the domestic or international market. On the other hand, the surviving firms will change the variety of products they produce and/or expand their production, changing the primary productive factors they use intensively. As a result, these changes and expansions should raise the productivity of the surviving firms. In addition to the rise of such firms' productivity, due to the closure of firms with low productivity and due also to the new entrants, the national productivity should rise, which leads to significant economic growth.

**Figure 1. The Flow Chart on Globalization and Economic Growth**



The aim of this paper is to review a universe of empirical studies that analyze the impact of globalization on corporative firms by using micro data, and then to summarize their major findings. The eight literature lines surveyed lie in the flow chart shown above. The first four literature lines examine how different the responses to the measures are across firms. The first literature line examines what kind of firms export or invest abroad [I]. The second and third literature lines investigate the kind of countries that multinational enterprises (MNEs) invest in [II] and the mode(s) of entry they use [III]. The fourth literature line examines the characteristics of firms that survive or exit the domestic and international markets [IV]. The next three literature lines discuss the strategies employed by the surviving firms. The fifth one looks into the decisions made on the number of products produced, and investigates what kind of firms produce a larger number of varieties [V]. The sixth one examines the impacts of exporting/*outward* FDI on productivity at home [VI]. In contrast to the sixth literature, the seventh one analyzes the impacts of *inward* FDI on domestic firms' productivity [VII]. The last literature line analyzes the relationship of these changes in firms' behavior with macro economy (national production, employment, and productivity) [VIII].

It is worthwhile conducting a serious literature survey in an organized manner now, because micro data analysis on the impact of globalization has been substantially accumulated. Indeed, there already exist some notable review papers in *each* literature line on micro data analysis. In contrast to these existing review papers, this paper covers eight literature lines in an organized manner. Such a comprehensive survey has the following advantages. First, the whole picture of the consequences of globalization becomes clear. There are various kinds of global activities (e.g. FDI),

which differently affect the behavior and performance of heterogeneous actors (e.g. domestic firms and foreign firms). These actors may have complicated interactions among them. Economic causality of consequences would certainly be intricate. It is thus important to integrate and reorganize existing findings in those literatures. Second, our survey is useful in identifying shortfalls or missing links in the existing studies as well as finding possible synergy effects among literatures. We find the applicability of various methods and approaches across the literatures. Third, well-balanced insightful policy implication is drawn only from a comprehensive survey of multiple literatures. By doing so, useful feedbacks from policy arena to academic literature also become possible.

The rest of this paper is organized as follows: The next section reviews various literature lines. In Section 3, we illustrate rich implication for economic consequences of trade liberalization and then discuss possible avenues for micro-data analyses. Section 4 concludes the paper.

## **2. Reviews**

This section provides extensive surveys on the above-mentioned eight literature lines.

### **2.1. Selection in Investing and Exporting**

Over the past decade, numerous theoretical papers have been written on the

relationship between firms' overseas activities and their productivity.<sup>2</sup> The main theme of this line of research is "firm heterogeneity". The pioneering study of Melitz (2003) theoretically shows that exporting firms have relatively high productivity. Since firms with high productivity can obtain high operating profit, they obtain non-negative gross profit even if they incur sunk costs for export. The Melitz model has also been applied in the context of firms' outward investing by Helpman *et al.*, (2004), and the finding is that investing firms have relatively high productivity. These selections based on the level of productivity are called the "selection effect" in exporting and investing activities. As a result, the findings in this line of literature contribute to clarifying the appropriate target firms for policy intended to encourage exporting and investing abroad.

Recently, these theoretical studies have become complicated as there are multiple choices in the models the firms would employ. For example, the model of Helpman, *et al.*, (2004) has four options: exit, serving only the domestic market, serving not only the domestic market but also the international market through exporting, and serving not only the domestic market but also the international market through investing. Antras, Grossman, and Helpman examine what kind of partners the firms supply their products to<sup>3</sup>. There are two dimensions in partner firms: domestic/overseas and intra-firm group/inter-firm group (i.e., insourcing/outsourcing). For example, Antras and Helpman (2004) show that the firms with the highest productivity supply their products to the overseas intra-firm group partners (i.e., FDI). On the other hand, Grossman, *et al.*, (2006) extend the study of Helpman *et al.*, (2004) in terms of both the economic

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<sup>2</sup> Greenaway and Kneller (2007) is an important survey paper in this literature.

<sup>3</sup> See Antras (2003, 2005), Antras and Helpman (2004), Grossman and Helpman (2002, 2003, 2004, 2005), Grossman, *et al.*, (2005), Helpman (2006), and Nunn (2007).

development of potential host countries (developed and developing countries) and the production processes of goods (finished goods and intermediate goods). According to not only the firms' productivity but also the trade costs of each good, there are many different variations in the firms' production location patterns.

These theoretical propositions have been tested in many empirical studies. The Melitz hypothesis (2003) has been tested in many countries. In those studies, the following equation is estimated:

$$\Pr(\text{Export}_{it} = 1) = \beta_0 + \beta_1 \text{Productivity}_{i,t-1} + \gamma \mathbf{X}_{i,t-1} + \varepsilon_{it}.$$

$\text{Export}_{it}$  is an indicator variable taking unity if firm  $i$  starts to get engaged in exporting activity at time  $t$ , and taking zero otherwise.  $\text{Productivity}_{i,t-1}$  denotes firm  $i$ 's productivity at time  $t-1$ .  $\mathbf{X}$  is a vector of the several control variables. *Within this literature, the direction of causation between productivity and internationalisation has been controversial* (Greenaway and Kneller, 2007). As mentioned in Section 2.8, there is a reverse causality in the relationship between firms' exporting and their productivity; exporting per se raises their productivity. In order to examine only the existence of the selection effect, it is useful to restrict analysis to those firms which do not get engaged or do start to get engaged in exporting. Furthermore, independent variables such as productivity should be ones at a pre-exporting period. As a result, in this equation,  $\beta_1$  is expected to be positively estimated by the probit/logit estimation method.

The representative papers are as follows: Bernard and Jensen (1999) for the US; Clerides *et al.*, (1998) for Colombia, Mexico, and Morocco; Bernard and Wagner (2001) for Germany; Delgado *et al.*, (2002) for Spain; Greenaway and Kneller (2004) for the United Kingdom; Hallward-Driemeier *et al.*, (2002) for East Asian countries (Indonesia, Korea, Malaysia, the Philippines, and Thailand); Aw and Hwang (1995), Liu *et al.*,

(1999), *Aw et al.*, (2000), and *Aw et al.*, (2007) for Taiwan; *Aw, et al.*, (2000) and *Hahn* (2004) for Korea; *Baldwin and Gu* (2003) for Canada; and *Kimura and Kiyota* (2006) and *Murakami* (2005) for Japan. Most of these studies find evidence that more productive producers self-select into the export market.<sup>4</sup>

There are two directions in the departure from the simple analysis. The first one is to examine the selection effect in importing or the selection effects in exporting and importing simultaneously. For example, *Castellani et al.*, (2008b) found that firms involved in both importing and exporting are better performers than those involved only in exporting. Also, their finding includes the statement that firms involved only in importing activities perform better than those involved only in exporting. The other direction is to investigate the relationship between the selection effect and a trading partner country. *Damijan et al.*, (2004) found that a higher productivity level is required for firms starting to export to advanced countries as opposed to starting to export to developing countries.

The hypothesis by *Helpman, et al.*, (2004), i.e., the selection of investing, has also been empirically tested by several papers such as *Murakami* (2005) and *Kimura and Kiyota* (2006). As well as the hypothesis by *Melitz* (2003), for example, the following equation is estimated:

$$\Pr(\text{FDI}_{it} = 1) = \beta_0 + \beta_1 \text{Productivity}_{i,t-1} + \gamma \mathbf{X}_{i,t-1} + \varepsilon_{it}.$$

$\text{FDI}_{it}$  is an indicator variable taking unity if firm  $i$  starts to be engaged in FDI at time  $t$  and taking zero otherwise. As a result, the previous studies obtain results supporting the selection of investing. In addition, although *Helpman et al.*, (2004)

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<sup>4</sup> *Wagner* (2007) provides a synopsis of findings from 54 empirical studies covering 34 countries on the firm-level relationship between exports and productivity. Most of the findings for pre-entry differences surveyed present evidence in favor of the self-selection hypothesis.



consider outward FDI, there are numerous papers analyzing inward FDI and showing that foreign-owned firms are more productive than domestic firms. These papers include the following: Doms and Jensen (1998) for the US; Girma *et al.*, (2002) for the UK; Hallward-Driemeier, *et al.*, (2002) for East Asian countries (Indonesia, Korea, Malaysia, the Philippines, and Thailand); and Fukao and Murakami (2005), Fukao *et al.*, (2005), and Kimura and Kiyota (2007) for Japan.

Recently, more complicated theoretical hypotheses have also come to be tested by empirical analysts. The theoretical works of Antras, Helpman, and Grossman are partly supported by the empirical analysis of Tomiura (2007). Tomiura empirically shows that, in Japan, investing firms are more productive than exporting firms, and that the firms trading with overseas intra-firm group firms (i.e., FDI firms) are more productive than those trading with overseas inter-firm group firms (i.e., foreign outsourcing firms).<sup>5</sup> However, Murakami (2005) finds that the latter type of firms is more productive. Furthermore, the theoretical prediction by Grossman *et al.*, (2006) is also partly supported by Aw and Lee (2008).

## **2.2. To Which Countries/Regions**

The literature in this subsection investigates which countries or regions the MNEs invest in. This is a well-known location choice analysis, the findings of which present clues about location elements encouraging inward FDI. Employing the usual new economic geography model (i.e., CES utility function, Dixit=Stiglitz monopolistic competition, and iceberg trade costs), the literature derives the profit function, which is

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<sup>5</sup> Tomiura (2007) is the extended version of Tomiura (2005). Using Japanese firm-level data, Tomiura (2005) distinguishes foreign outsourcing from domestic outsourcing. His finding is that only a few firms (less than three percent) outsource their production abroad and that productive firms or firms with labor-intensive products outsource more.

estimated using maximum likelihood procedures. The recent references are as follows: Head *et al.*, (1999) for Japanese MNEs in the US; Belderbos and Carree (2002) for Japanese MNEs in China; Head and Mayer (2004) for Japanese MNEs in Europe; Disdier and Mayer (2004) for French MNEs in Europe; for MNEs in Great Britain; Castellani and Zanfei (2004) for large MNEs in the world; Mayer *et al.*, (2007) for French MNEs in the world; Crozet *et al.*, (2004) for MNEs in France; and Basile, Castellani, and Zanfei (2008) for MNEs in Europe.

There are two topics in this literature stream. The first introduces various location elements as independent variables. The above-mentioned model usually yields the profit function, which is a function of market size, productive factor prices, price of intermediate goods, and trade costs. As a proxy for the price of intermediate goods, the measure of agglomeration is often used, particularly the number of manufacturing firms (e.g., Devereux *et al.*, 2007). Some studies employ more disaggregated numbers of manufacturing firms, for example, the number of manufacturing firms with the same nationality as firms choosing a location (e.g., Head *et al.*, 1999; Crozet *et al.*, 2004) or the number of firms belonging to the same firm-group (e.g., Belderbos and Carree, 2002). As a part of trade costs, some investment climate measures are examined: free trade zones in the US (Head *et al.*, 1999), special economic zones and opening coastal cities in China (Belderbos and Carree, 2002), discretionary government grants in Great Britain (Devereux, Griffith, and Simpson, 2007), and Objective 1 structural funds and cohesion funds in Europe (Basile *et al.*, 2008).

The second topic is to explore the substitution of location by examining inclusive values in the nested-logit model. For instance, using firm-level data on French investments both in France and abroad over the 1992-2002 period, Mayer *et al.*, (2007)

investigate the determinants of location choice and assess empirically whether the domestic economy is losing attractiveness over the recent period or not. The estimated coefficient for inclusive value is strongly significant and near unity, indicating that the national economy is not different from the rest of the world in terms of substitution patterns. Similarly, Disdier and Mayer (2004) investigate whether French multinational firms consider Western Europe and Eastern Europe as two distinct groups of potential host countries by examining the coefficient for the inclusive value in nested-logit estimation. They confirm the relevance of an East-West structure in the country location decision and show that this relevance decreases.

### **2.3. Entry Mode Choice**

The third literature line examines by probit or logit analysis which entry mode the MNE chooses. In producing abroad, MNEs need to choose not only host countries but also their entry modes. There are two main types of entry mode: greenfield and merger with or acquisition of an existing firm in the foreign country (M&A). The former sets up a new production facility, while the latter acquires an existing firm. The greenfield investment is further decomposed according to the MNEs' share of ownership. Some subsidiaries are wholly owned (WOE), whereas joint ventures share ownership with domestic firms (JV). In the literature, greenfield FDI is perceived as adding to the capital stock of the host country and creating jobs. On the other hand, while only the merged domestic firms enjoy a direct transfer of foreign firms' technology (see section 2.7.1), M&As are often seen as a less beneficial mode than greenfield FDI because of their simple ownership transfer.

The theoretical framework employed in this literature is often based on the

“transaction cost theory” (e.g., Asiedu and Esfahani, 2001) and more recently on the “incomplete contract theory” (e.g., Raff *et al.*, 2008a). In this literature, despite a large number of empirical papers in management or commercial science journals (e.g., Gomes-Casseres, 1990; Tse *et al.*, 1997; Hennart and Larimo, 1998; Makino and Neupert, 2000; Asiedu and Esfahani, 2001; Chang and Rosenzweig, 2001; Wei *et al.*, 2005), only a few can be found in economics journals. Recently, however, studies in this literature have been increasing in economics too (Girma, 2002; Raff *et al.*, 2008b; Chun, 2008). At present, this literature seems to suggest two directions of analysis.

The first is to take a number of entry modes into consideration. Most of the studies in this literature examine the binary choice of entry modes: WOE versus JV (Hennart and Larimo, 1998; Makino and Neupert, 2000; Asiedu and Esfahani, 2001) and Greenfield versus M&A (Chang and Rosenzweig, 2001; Girma, 2002). More recently, by employing a nested-logit or multinomial logit model, the multinomial choice of entry modes has been explored. Wei *et al.*, (2005) establish a multinomial logit model in which foreign-invested firms are allowed to choose among four entry modes of FDI in China: WOE vs. equity JV vs. contractual JV vs. joint stock companies. Employing a three-stage nested-logit model, Raff *et al.*, (2008b) examine which strategies a firm will use to enter a foreign market: exporting, M&A, WOE, and JV.

The second direction is to explore the many elements affecting entry mode choice. Three kinds of characteristics are introduced as independent variables: host country/regional characteristics, industrial characteristics, and firm (MNE) characteristics. Examples of country characteristics include host country’s experience in attracting FDI, country risk, infrastructure, FDI policy, scale of market, technological capabilities of domestic firms, and cultural ties with investing countries. Industry

characteristics are asset intensity, technology intensity, resource intensity, the extent of input-output relationships with local firms, and so on. Lastly, firm characteristics often taken into consideration are the amount of investment and international experience. More recently, the role of MNEs' productivity in entry mode choice is examined (Raff *et al.*, 2008a, b; Cieslik and Ryan, 2008).

It is difficult to derive conclusions on what elements are crucial for the entry mode choice of MNEs. One reason is that, as argued above, there is only a limited number of previous papers in economics. The other reason is that the theoretical framework for empirical analysis differs from paper to paper. This leads to the use of different independent variables among papers. At this moment, Raff *et al.*, (2008b) is one of the invaluable papers because it analyzes firms' entry mode choice comprehensively and provides clear theoretical predictions and their empirical results: MNEs tend to choose a form of greenfield in investing in countries with the larger markets and smaller sunk costs rather than M&A, and further to choose a form of JV in investing in those markets with a lower industrial concentration, rather than WOE. In addition, Raff *et al.*, (2008b) find the ranking of firms' TFP to be as follows: domestic firms, exporters, cross-border M&A MNEs, JV MNEs, and WOE.

#### **2.4. Selection in Dead or Surviving Firms**

The advance of globalization and the policy measures on globalization have great impacts on firms' survival. The survival and exit of firms result in change to a more efficient industrial structure, but if policy makers intend to mitigate such adjustment, it is important to know which kinds of firms are likely to be able to survive.

On the one hand, from the viewpoint of importing countries, trade liberalization,

e.g., tariff reduction, in a country induces the closure of some firms within that country. For example, trade cost reduction leads to an increase in imports of more foreign-made varieties. The increase in varieties available in the domestic market forces firms to decrease production volume per firm and thus the operating profit in each firm. As a result, the threshold of productivity payable for sunk cost rises, and thus domestic firms with lower productivity will be forced to shut down (Melitz, 2003; Bernard *et al.*, 2007). Previous studies investigating the survival of firms in importing countries include Baggs (2005), Bernard and Jensen (2007), Bernard *et al.*, (2006a, b), and Greenaway *et al.*, (2008). By employing a probit model using firms' death as a dependent variable, these papers investigate whether firms/plants under high pressure from globalization (e.g., trade cost or import penetration) are more likely to shut down or not. For example, Bernard *et al.*, (2006a) find that as trade costs (the sum of duty and freight and insurance rates) fall, plant closure is more likely to happen. Furthermore, they introduce trade costs multiplied by plant's productivity and find its coefficient to be negative as implied by theory.

On the other hand, from the viewpoint of exporting countries, trade liberalization in a target country decreases the threshold of productivity for exporting and will enhance the probability of the survival in both domestic and export market for existing exporters. The exporters' survival is often examined by employing a Cox proportional hazards model. The examples include Baggs (2005), Esteve Pérez, *et al.* (2004), and Kimura and Fujii (2003), though these papers do not explicitly distinguish the survival in domestic markets from that in foreign markets.<sup>6</sup> In particular, the latter two papers

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<sup>6</sup> Sabuhoro, *et al.* (2006) focus on the firms' survival in export markets, but do not examine its relationship with trade costs with target countries. In addition, Kimura and Fujii (2003) found a lower probability of exit for multinational firms.

found a lower probability of exit for exporting firms.

## 2.5. Selection in the Number of Varieties

This literature stream examines whether or not the more productive firms introduce a larger number of products. The logic underlying this hypothesis is basically the same as the Melitz model. Bernard *et al.*, (2006c) present a theoretical model on the relationship between firms' productivity and the number of varieties. They extend the Melitz model to a general equilibrium model of multi-product firms. In their model, firm productivity in a given product is modeled as a combination of firm-level "ability" and firm-product-level "expertise", both of which are stochastic and unknown prior to the firm's payment of a sunk cost of entry. Higher firm-level ability raises a firm's productivity across all products, lowering the zero-profit cutoff for expertise which the firm finds profitable to enter a product market, thereby expanding the range of products manufactured by the firm. The introduction of new varieties raises national welfare. Thus, it is important for policy makers to know which kinds of firms produce a larger number of varieties.

There are a few previous studies in this literature set. First, employing the U.S. data, Bernard *et al.*, (2006d) regress the following equations:

$$\text{Multi}_{it} = \beta_0 + \beta_1 \text{Performance}_{it} + \boldsymbol{\gamma}\mathbf{X}_{it} + \varepsilon_{it},$$

$$\text{Pr}(\text{Add}_{it} = 1) = \delta_0 + \delta_1 \text{Performance}_{it} + \boldsymbol{\eta}\mathbf{X}_{it} + \varepsilon_{it}.$$

$\text{Multi}_{it}$  is an indicator variable taking unity if firm  $i$  produces more than one variety at time  $t$  and zero otherwise.  $\text{Add}_{it}$  is also an indicator variable taking unity if firm  $i$  adds varieties between times  $t$  and  $t+5$  and zero otherwise. Performance represents several firm characteristics: output, employment, probability of export, labor

productivity, and TFP. Implied by the theoretical model, both  $\beta_1$  and  $\delta_1$  are estimated to be positively significant.<sup>7</sup> Second, using firm-level data for the Chinese manufacturing sector during 1998-2000, Brambilla (2006) compares the performance of foreign and domestic firms in terms of introduction of new varieties. His empirical result suggests that firms with more than 50 percent of foreign ownership create more than twice as many new varieties of products as private domestic firms. Such a larger number of new varieties in foreign firms would be attributed to their higher productivity.

## 2.6. Impacts of Exporting and Outward FDI

In contrast to the first group of literature (see Section 2.1), i.e., selection of investing and exporting, this literature set examines whether or not those overseas activities give a positive impact on productivity at home.<sup>8</sup> Such a positive effect is called the “learning effect”. Exporting firms may obtain new and superior knowledge. While the MNEs investing in developed countries might obtain superior technology or knowledge, those investing in developing countries may achieve total cost reduction by utilizing low-priced production factors. As a result, those firms may succeed in raising their productivity at home.<sup>9</sup> The findings in this literature are useful in knowing the micro-level consequences of globalization. If there are no rewards from exporting or FDI, then policies designed to increase the numbers of exporters/investors may be

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<sup>7</sup> Although they find a positively significant coefficient for TFP, they point out that measuring the TFP of multiple-product firms is problematic if separate data on output, prices, and inputs at the firm-product level are unavailable.

<sup>8</sup> See Greenaway and Kneller (2007), which is an important survey paper in this literature stream.

<sup>9</sup> In distinction to the selection effect, the learning effect has not been fully examined theoretically in the literature. The major exception is Clerides *et al.*, (1998). It examines both selection and learning effects in exporting by specifying and simulating the general optimization problem of firms, in which each firm faces stochastic cost and foreign demand processes.



wasting resources.

To examine the learning effect of exporting and investing, the following equations are estimated:

$$\Delta\text{Productivity}_{it} = \beta_0 + \beta_1 \text{Export}_{it} + \gamma\mathbf{X}_{it} + \varepsilon_{it},$$

$$\Delta\text{Productivity}_{it} = \eta_0 + \eta_1 \text{FDI}_{it} + \rho\mathbf{X}_{it} + \varepsilon_{it},$$

where  $\text{Export}_{it}$  and  $\text{FDI}_{it}$  are indicator variables taking unity if firm  $i$  starts to export and to invest at time  $t$ , respectively.  $\Delta\text{Productivity}_{it}$  is firm  $i$ 's productivity growth between times  $t$  and  $t+1$ . In this literature, there are severe endogeneity issues. First, as mentioned in Section 2.1, firms' international activities have selection effect, which yields selection-bias in the OLS estimates. Second, since a firm's decision to export/invest abroad and its performance should be jointly determined, the OLS estimates suffer from simultaneity bias. To tackle these endogeneity issues and examine only the learning effect, previous studies use instruments or the matching method<sup>10</sup>. In particular, the propensity score matching method of Rosenbaum and Rubin (1983) is often employed because there are enough matching pairs in using firm/establishment-level data.

The use of matching techniques to distinguish post-exporting effect from selection effect, pioneered by Wagner (2002) for Germany and Girma *et al.*, (2004) for the UK, has stimulated a number of empirical studies testing such a learning-by-exporting effect. The leading papers include Arnold and Hussinger (2005) for Germany, Yasar and Rejesus (2005) for Turkey, and Alvarez and López (2005) for Chile. According to a

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<sup>10</sup> The economic application of matching estimators has grown in various fields in recent years: the evaluation of policy intervention in the labor market (Heckman *et al.*, 1997; Blundell and Costa Dias 2002) and the effects of environmental regulation on the birth ratio of plants at the county level (List *et al.*, 2003). The propensity score matching method becomes one of the most useful methods for analyzing the impact of an event, along with the traditional instrument variable method.

comprehensive survey by Wagner (2007), supportive evidence of the learning-by-exporting hypothesis is detected only in some of the previous studies.<sup>11</sup> However, a significant positive effect of export experience on firm's productivity has been found in several recent studies such as Van Biesebroeck (2005) for sub-Saharan African countries, De Loecker (2007) for Slovenia, and Lileeva and Trefler (2007) and Serti and Tomasi (2008) for Italy. In particular, as well as in one new direction of the analysis on the selection effect of exporting (see Section 2.1), De Loecker (2007) examines the learning effect of exporting according to destinations of exports, by employing firm-level data in Slovenian manufacturing in the period 1994-2000. Interestingly, the author finds that the productivity gains are higher for firms exporting to high-income regions.<sup>12</sup>

On the other hand, empirical studies do not necessarily succeed in detecting a positive causal effect of investing on firms' productivity. Papers analyzing the learning effect in investing include Navaretti and Castellani (2004) for Italian MNEs, Hijzen *et al.*, (2006) and Navaretti *et al.*, (2006) for French MNEs, and Hijzen *et al.*, (2007) and Ito (2007) for Japanese MNEs. Navaretti and Castellani (2004) find significantly positive impacts, but Hijzen *et al.*, (2007) and Ito (2007) do not.

One possible reason why we cannot obtain significantly positive results is the qualitative differences in the impacts between two types of FDI: horizontal FDI (HFDD)

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<sup>11</sup> The accumulated empirical findings of the relationship between exports and productivity are summarized by Wagner (2007) as follows: there is evidence in favor of self-selection of more productive firms into export markets, but nearly no evidence in favor of the learning-by-exporting hypothesis. International Study Group on Exports and Productivity (ISGEP) (2008) further explores the selection and learning effects of exporting by using comparable micro-level panel data for 14 countries and employing identically-specified empirical models and find evidence in line with the big picture of the literature clarified by Wagner.

<sup>12</sup> As well as in the case of the selection effect, the learning effect of importing on firms' performance is also examined. Examples include Vogel and Wagner (2010), which found its significantly positive impact.

and vertical FDI (VFDI). While HFDI is a strategy to avoid broadly defined trade costs by setting up plants within the targeting country rather than by exporting from the home country, VFDI is the one that exploits low-price production factors of the host country. The VFDI firms relocate the activities in which the host country has comparative advantage and domestically specialize in those in which the home country has comparative advantage. From a theoretical point of view, the resulting impact of HFDI on productivity at home is ambiguous. Its positive impact comes from excellent knowledge or technology for producing products in the host country. The resulting impact of HFDI becomes positive if this positive impact is larger than the negative impact due to the loss of economies of scale. On the other hand, due to the total cost reduction through international vertical division of labor between home and host countries, the impact of VFDI should be positive. Thus, if most of the FDIs are HFDI, we might not really obtain a significantly positive impact.

To take into consideration such a qualitative difference in learning effect, Hijzen *et al.*, (2006) and Navaretti *et al.*, (2006) examine the learning effects according to FDI type separately. Navaretti *et al.*, (2006) classify the FDI in developing countries and that in developed countries as VFDI and HFDI, respectively. In Hijzen *et al.*, (2006), the VFDI is defined as investments in developing countries by firms in comparative disadvantage industries while the HFDI is defined as investments in developed countries by firms in comparative advantage industries. Contrary to the above predictions, however, both Navaretti *et al.*, (2006) and Hijzen *et al.*, (2006) find positively significant enhancements in productivity in the French HFDI but not in its VFDI.<sup>13</sup>

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<sup>13</sup> The unexpected empirical results may be due to the unit of observation: firm-level/plant-level or

There are two further points to note. First, in addition to productivity, there are numerous empirical papers analyzing the impacts of FDI on production and employment. The references include the following: Hijzen *et al.*, (2007) for Japanese MNEs; Castellani *et al.*,(2008a), Navaretti and Castellani (2004) and Navaretti *et al.*, (2006) for Italian MNEs; and Navaretti and Castellani (2004) and Hijzen *et al.*, (2006) for French MNEs. While these papers found significantly positive impacts on production, most of the studies analyzing the impacts on employment have failed to obtain significantly positive results. In addition, Castellani *et al.*, (2008a) and Hijzen *et al.*, (2006) examine whether the ratio of skilled labor to unskilled labor rises or not. Although VFDI is expected to raise the ratio, most of the results in these papers are insignificant.

Second, it is natural to apply such an analysis of the learning effect into the context of (foreign) outsourcing, which plays a role alternative to FDI, i.e., foreign insourcing, as mentioned in Section 2.1. Papers analyzing the learning effect in outsourcing include Girma and Görg (2004), Gorg *et al.*, (2008), and Hijzen *et al.*, (2009). As confirmed in Section 2.1, like the case of FDI, outsourcing has a selection mechanism, which yields an endogeneity issue in analyzing the learning effect of outsourcing. By applying the GMM estimation technique for Japanese firm-level data, for example, Hijzen *et al.*, (2009) investigate the impacts of international outsourcing on corporate performance and find significantly positive impacts.

## **2.7. Impacts of Inward FDI**

This section reviews the studies that analyze the impacts of inward FDI on domestic

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production activity/non-production activity. For more details, see Obashi *et al.*, (2009) and Matsuura *et al.*, (2009).

firms' performance. Impacts are either direct or indirect. Acquisition by foreign-owned firms results in the direct transfer of those firms' superior knowledge to the acquired domestic firms, ending up with a rise in performance of the domestic firms after the acquisition. Meanwhile, domestic firms may benefit from the presence of foreign firms due to some positive externalities accruing from FDI and the presence of multinational firms. These positive impacts of inward FDI on the host economy encourage policy makers to implement policies aimed at attracting inward FDI. In this section, we discuss the studies analyzing these two impacts separately.

### **2.7.1. Cross-border M&A**

This subsection examines the impacts of cross-border M&A on the performance of target domestic firms. As mentioned in Section 2.3, foreign-owned firms choose a form of M&A in their entry when sunk costs for entry are high enough in the host country. As introduced in the first literature stream, while they are more productive than domestic firms (even though cross-border M&A MNEs are less productive than greenfield MNEs, as confirmed in Section 2.3), domestic firms possess a locational advantage, years of experience in the local market, and an ability to navigate the local institutional environment. Thus, on the one hand, the M&A MNEs are motivated to acquire the assets of a domestic target firm, combine such assets with their own assets, and raise their competitiveness in the host market. On the other hand, however, integrated with the superior know-how of foreign firms, the local advantages of the target domestic firm could translate into enhanced productivity.

To explore the impacts of cross-border M&A on target domestic firms' productivity empirically, their productivity is examined before and after the M&A. The references include Arnold and Javorcik (2005) and Petkova (2008) for Indonesia, Conyon *et al.*,

(2002), Girma (2005b), Girma *et al.*, (2007), and Harris and Robinson (2002) for the UK, Bertrand and Zitouna (2008) for France, Salis (2008) for Slovenia, Piscitello and Rabbiosi (2005) for Italy, Fukao Ito *et al.*,(2006) for Japan, and Chen (2008) and McGuckin and Nguyen (1995) for the US. As well as in other literature referred in this paper, there is an endogeneity issue attributed to selection bias: the higher productivity in the acquired domestic firms may simply be due to the fact that foreign investors are likely to acquire the more productive domestic firms. In order to tackle this selection bias, most of the recent papers use instruments or the matching method. As a result, most of the above-introduced studies find significantly positive impacts. Furthermore, some of them compare the impacts of cross-border M&A with those of local M&A and find larger impacts in the case of cross-border M&A.

This literature suggests two directions for analysis. One is to explore which MNEs give larger positive impacts. Chen (2008) finds in the US that the country of origin plays an important role: the impacts of acquisition by developed countries on profits are larger than those by developing countries. The other is to examine which domestic firms receive larger positive impacts. The key role of the absorptive capacity of domestic firms is highlighted in Girma (2005b) and Girma *et al.*, (2007). The rate of productivity change is sensitive to the pre-acquisition productivity level of the acquired firm. Furthermore, beyond some critical level of initial productivity, the rate of technology transfer through foreign acquisition starts to decline. Girma (2005b) interprets this result as indicating that UK-owned firms that had been operating nearer the domestic technology frontier have less to gain from their association with foreign multinationals.<sup>14</sup>

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<sup>14</sup> Branstetter *et al.*, (2006) examine the relationship between intellectual property rights (hereafter

### 2.7.2. Spillover

This subsection investigates whether or not the presence of inward FDI raises domestic firms' productivity. Such positive impacts are called "spillover effects". Conceptually, there are two kinds of spillover effects: intra-industry spillover and inter-industry spillover. Four paths of spillover effect are suggested in the literature<sup>15</sup>: imitation, skill acquisition and proliferation, competition, and exports. Imitation is the method of raising productivity by imitating MNEs' superior products and technology. Skill acquisition and proliferation is the route whereby the MNE's know-how and technology are directly transferred to domestic firms, say, by the shift of labor from MNEs to domestic firms. Competition is the phenomenon whereby the MNEs put pressure on domestic firms to use existing technology more efficiently. Exports refer to the means of raising productivity by learning information from MNEs on penetrating the export market and starting export activities (see learning effects of exports in Section 2.8). Through these various routes, domestic firms are expected to be able to obtain positive impacts from MNEs.

Although the spillover effect is tested by a large number of papers, previous studies do not necessarily obtain significantly positive effects. A simple way to test the spillover effect is to regress the following equation:

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IPRs) and international technology transfer. They investigate the impacts of IPRs on technology transfer from U.S. multinational enterprises to their affiliate firms in 16, mostly medium developing countries. Their finding is that the stronger the IPR environment in a country, the more technology is transferred to affiliates locating in the country. Also see Keller (2004), which provides a very useful summary, helping us to understand the cause and consequences of several pathways (imports, learning by exporting, and FDI) of cross-border technology transfer.

<sup>15</sup> "Spillover" in this literature line indicates intrinsically "technological spillover" from FDI rather than "pecuniary spillover". While the imitation path is a typical example of the former type of spillover, the pecuniary spillover, for example, can stem from buyer-seller linkage between an MNE and an indigenous firm. However, it is difficult to differentiate empirically those two types of spillover, as found below.

$$\text{Productivity}_i = \beta_0 + \beta_1 \text{MNEs}_i + \gamma \mathbf{X}_i + \varepsilon_i,$$

where MNEs represents the mass of MNEs in the industry to which a domestic firm  $i$  belongs. The significantly positive estimate of  $\beta_1$  indicates the existence of spillover effect. Although Chuan and Lin (1999) obtain significantly positive impacts in Taiwan, Haddad and Harrison (1993) for Morocco and Kokko *et al.*, (1996) for Uruguay do not. Furthermore, Aitken and Harrison (1999) obtain significantly negative results. Table 2 in Gorg and Greenaway (2004)<sup>16</sup> summarizes the results of many previous studies on the spillover effect and shows that most of these studies do not obtain robust positive impacts.

One reason for such unexpected results pertains to another aspect of the competition path. The fiercer competition due to the massive entry of MNEs decreases production per firm and thus economies of scale are reduced (Aitken and Harrison, 1999). This reduction works as a negative impact of inward FDI. As a result, if such a negative impact is greater than the above-mentioned positive impacts of the competition path, a significantly negative result is likely to be obtained.

Other reasons are due to the heterogeneity of the spillover effect. Both MNEs and domestic firms are heterogeneous in several points. Therefore, all types of MNEs do not necessarily become sources of spillover effect, and all types of domestic firms do not necessarily obtain a spillover effect. The present literature on the spillover effect tries to clarify what kinds of heterogeneity in MNEs or domestic firms are crucial.

Studies analyzing the heterogeneity of MNEs in offering the spillover effect are as follows. First, Todo and Miyamoto (2002, 2006) show that, in Indonesia, while the

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<sup>16</sup> Crespo and Fontoura (2007) and Smeets (2008) are further important survey papers in this literature. Smeets (2008) provides a comprehensive overview of the empirical literature on FDI knowledge spillovers and its mixed results of magnitude, direction and existence of knowledge spillovers from FDI.



MNEs conducting human resource development on site give positive influence on domestic firms' productivity, the MNEs that are not conducting such development do not. Second, Banga (2003), Girma and Wakelin (2002), and Karpaty and Lundberg (2004) have investigated the source countries (nationality) of MNEs. For instance, Banga (2003) has confirmed that Japanese FDI is more likely to create spillover for Indian domestic firms than US FDI. One possible reason of this result is that Japanese technology is the more widely used one, and thus it is easier to be imitated than the US technology. Third, Girma (2005a) and Girma *et al.*, (2008) have studied the type of FDI. For instance, Girma *et al.*, (2008) classify FDI into export-oriented and market-oriented, and show that only the former type has positive impacts on domestic firms' productivity. The negative aspect of the competition path is also interpreted as small in the export-oriented type of FDI but large in the market-oriented type.

The other is the heterogeneity of domestic firms in terms of their responses in receiving the spillover effect. One point of difference lies in the level of absorption capability of domestic firms as studied by Kokko *et al.*, (1996), Girma (2005a), Girma *et al.*, (2001), Girma and Gorg (2003), and Kinoshita (2001). For instance, Kinoshita (2001) finds that R&D-intensive domestic firms enjoy more benefits from the spillover effect. Another is the domestic firms' geographical proximity to MNEs (Sjoholm, 1999; Aitken and Harrison, 1999; Girma and Wakelin, 2002; Halpern and Murakozy 2007). However, the robust geographical locality of the spillover effect has not been necessarily detected in the literature. The last is the heterogeneity of domestic firms' input-output relationships with MNEs as studied by Javorcik (2004), Blalock and Gertler (2008), Driffield *et al.*, (2002), and Harris and Robinson (2004). These papers found that the closer the input-output relationship with MNEs, the larger the benefits

from the spillover effect the domestic firms enjoy.

## 2.8. Decomposition

As a next step, it is certainly meaningful to examine the impacts of changes in firm-level behavior on aggregate performance indices such as production, employment, and productivity.<sup>17</sup> Specifically, the increases of a performance index during a period are decomposed according to its increase in the following two types of firms: (1) firms that exist in both years and increase its amount (continuers); (2) firms that do not exist in the former year (entering firms). Similarly, we can decompose its decreases according to the following two types of firms: (3) firms that exist in both years and decrease its amount (continuers); (4) firms that do not exist in the latter year (exiting firms). These decomposition analyses clarify the relative contribution of active firms' entry and exit on the national growth of performance index. That is to say, they uncover country-level impacts of globalization, which will be essential in evaluating policy effects. In this subsection, we review the papers decomposing the growth of the national production, employment, and productivity separately.

First, Bernard *et al.*, (2006d) examine the sources of US production growth during 1987-1997. They further decompose the production growth in type (1)-firms into two types of firms: firms that produce the product in both years (incumbents); firms that do not produce the product in the former year (adders). The production decrease in type (3)-firms is also decomposed into: firms that produce the product in both years (incumbents); firms that do not produce the product in the latter year (droppers). In

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<sup>17</sup> Harris and Li (2008) presents a clear and rigorous description of the aggregate growth impacts of intra-, inter-industry changes in continuing firms, and entering and exiting firms. This paper borrows their exposition.

the cases of both the increase and decrease of production, they find that roughly two-thirds of the average product's output is changed by incumbents. The remaining output is more or less evenly split between adders/droppers and type (2)/(4) firms. On the other hand, Bernard and Jensen (2004a) utilize the above decomposition method to investigate sources of US export growth during the period 1987-1992. As a result, they find that total direct exports reported by plants in the Census of Manufactures increased by \$80.9 billion from 1987 to 1992. Of that total increase, 87% came from type (1) plants. The further decomposition of the contributions by type (1) plants show that 61% came from plants that exported in both years.

Second, growth of aggregate employment also could be decomposed into active entry of new firms and expansion of employment in incumbent firms as well as the decomposition of production. Davis *et al.*, (1996) found in the US manufacturing during 1973-1988 that both the increase and decrease of national employment are mainly driven by types (1) and (2) firms.<sup>18</sup> As pointed out in Bernard and Jensen (2004a), one important advantage of the decomposition method is that we can group firms/plants into categories. For instance, Biscourp and Kramarz (2007) analyze the relationships among export, import, and employment. Their evidence from French manufacturing suggests that there is a strong correlation between increasing imports of finished goods and decrease of production jobs. They also find that such a tendency is stronger for larger firms. Moreover, recent studies on labor economics also suggest the importance of disaggregation in clarifying the relationship between job creation/destruction and organizational reform within a firm, such as horizontal transfers/promotion of employees across ranks and the birth/death of the job

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<sup>18</sup> Blanchflower and Burgess (1996) found that about 50% of each of job creation and destruction is accounted for by just 4% of continuing businesses.

categories.<sup>19</sup>

Finally, we review the papers on the decomposition of aggregate productivity, which has been one of the central themes in empirical economics.<sup>20</sup> Foster *et al.*, (2001) decompose industry level labor (or multifactor) productivity. There are three novel points, compared with the decomposition in production and employment. First, since productivity is not a measure representing a kind of volume, we need to aggregate each plant's productivity by using a plausible weight. In Foster *et al.*, (2001), a share of plant's outputs or inputs is used as such a weight. Secondly we need to distinguish between the reallocation effect and the own effect. The reallocation effect is the productivity growth stemming from the more rapid expansion of high productivity plants relative to low productivity plants. The own effect quantifies the importance of productivity growth at individual plants. Productivity growth of continuing firms could be decomposed into a within-plant component based on plant-level changes (own effect); a between-plant component that reflects changing shares (reallocation effect); their cross term effects between own and reallocation effects. Finally the between-plant term and the entry and exit terms involve deviations of plant-level productivity from the initial industry index.

Based on this method of decomposition, Foster *et al.*, (2001) show in US manufacturing during 1977-1987 that the within-component accounts for about half of average industry productivity growth, the between-plant component is negative but

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<sup>19</sup> Ariga (2006) finds that jobs and units are constantly created and destroyed in this firm, and that the job creation and destruction cause horizontal transfers of employees within the firm. Corseuil and Ichimura (2006) finds: it turns out that job mix component accounts for 30% of total job creation and 40% of total job destruction; the job mix component of both job creation and destruction are concentrated among non-production/managerial jobs.

<sup>20</sup> Syverson (2009) surveys more than 100 papers on determinants of productivity at the micro level, including external drivers of productivity differences (spillovers, competition, and deregulation).

relatively small, and the cross term is positive and large and accounts for about a third of the average industry change. Net entry accounts for 26% of the average industry change. A number of similar studies of other countries including the United States (Baily *et al.*, 1992), Israel (Griliches and Regev, 1995), Chile and Colombia (Liu 1993), Australia (Bland and Will, 2001), and Denmark (Lentz and Mortensen, 2008)<sup>21</sup> find that entry and exit of firms or plants within an industry contribute little to productivity growth. On the other hand, Olley and Pakes (1996) for the US, Van Biesebroeck (2008) for China, and Aw, Chen, and Roberts (2001) for Taiwan highlight that firm and/or plant turnover is an important source of industry productivity growth, as well as the higher productivity of the continuing firms and/or plants.<sup>22</sup>

### 3. Discussion

The extensive review of the literatures in section 2 provides rich information on economic consequences of globalization and policy changes. To apply these multiple economic logics to the real world, we must have clear mind on the interaction among literatures. Based on the findings summarized in the previous section, this section first

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<sup>21</sup> Lentz and Mortensen (2008) find that the importance of the selection effect as a source of aggregate growth, using a firm growth model, is driven by innovation. The net contribution of entry is 21% of the model's implied growth. The selection component accounts for 53% of growth, which captures the evidence that more productive firms crowd out less productive firms in terms of labor input. The contribution of reallocation impact to growth in this paper is sharply contrasting with Baily *et al.*, (1992) in terms of resource reallocation among incumbent firms.

<sup>22</sup> Similar to the decomposition of employment, we can group plants into categories, e.g., by export status or FDI status. Bernard and Jensen (2004b) focus on continuing firms that exist in both years and find that *exporting* continuing plants are the most important group for the national-level TFP growth.

presents cases of trade liberalization in foreign and home countries and illustrates rich implication for economic consequences drawn by a universe of the literatures. We will notice that the collective literature has already yielded a number of important policy implications. Then, we discuss directions of future research in an organized manner.

### **3.1. Findings and Implications**

Trade liberalization in *foreign* countries has different impacts on domestic firms in the home country according to their productivity. First, lower productivity domestic firms start to export to the foreign countries, which results in raising their productivity. Furthermore, the relatively more productive firms among them can export to developed countries and achieve a greater degree of productivity improvement than firms starting exports to developing countries. Second, firms who have previously exported to those countries (they should have higher productivity than the above-mentioned first type of firms) raise their survival probability. Exports and productivity in this kind of firm play a quantitatively important role in determining *national* exports and productivity, respectively. Third, more productive firms start to outsource a part of their production process to the foreign countries and achieve productivity improvement. Fourth, the most productive firms start to get engaged in FDI in the foreign countries. In particular, they are more likely to invest in countries with larger market size and industrial agglomeration, and lower trade/investment barriers. Furthermore, among such highly productive investors, the firms with lower productivity choose the entry mode of cross-border M&A, those with medium level of productivity the entry mode of joint-venture, and those with higher productivity the entry mode of wholly-owned enterprises. Although FDI is expected to change investors' production, skill-intensity,

and productivity, the empirical studies have not obtained convincing results.

Next, consider trade liberalization in *home* country. This has the following two kinds of impact. The first is on domestic firms. While domestic firms with lower productivity are likely to shut down, the productive domestic firms continue to survive. In fact, such firms' turnover is an important source of national productivity growth. Furthermore, some domestic firms start to get engaged in importing activities, leading to an improvement of their productivity. The second kind of impact is on foreign firms. They start to outsource some production to domestic firms or start to locate their overseas affiliates in the home country. In particular, such entry of foreign firms in terms of FDI is beneficial to the home economy. There are various kinds of channel through which this benefit occurs. The first channel is that, since foreign-owned firms produce a larger number of varieties and are more likely to produce new varieties, consumer welfare rises through the love-of-variety argument. The second channel is that, if foreign firms merge with domestic firms when they enter the market, then the merged domestic firms achieve productivity improvement. If the merging-foreign firms come from developed countries, or if the merged domestic firms have a medium level of productivity, such productivity improvement becomes greater. The third channel is that the existence of MNEs *per se* raises domestic firms' productivity, i.e., through spillover effects. In particular, the magnitude of such effects differs according to the existence of MNEs' human resource development, MNEs' nationality, FDI types (export-oriented or market-oriented), the level of absorption capability of domestic firms, and the existence of input-output relationships between MNEs and domestic firms.

As a result, our summary here suggests it important for policy makers to assist

domestic firms' global activities (e.g. exporting, outsourcing, and FDI) or to attract foreign firms with high productivity. These policies contribute to raising productivity in various kinds of domestic firm, and to increasing national productivity, and thus economic growth. Moreover, it will be important to raise "policy efficiency". On the one hand, it might be relatively effective to encourage foreign firms (particularly those from developed countries) to choose the mode of cross-border M&A in their entry because it enhances the merged firms' productivity, although a massive greenfield FDI increases the national employment at least in the short run. Also, we already know which kinds of MNEs (or domestic firms) offer (obtain) the greater degree of spillover effect. On the other hand, however, it remains unknown which global activities raise domestic firms' productivity more. Thus, in the academic field, it is important to compare the magnitude of learning effects among possible global activities. The results of such analyses clarify the level of productivity at which the policy makers should more intensively support firms.

### **3.2. Directions of Further Research**

Although a large number of research papers on the impact of globalization have already been published, we believe that vast room still exists for a further extension of the literature, with strong interest held not only by academics but also by policymakers. The following five lines of future research are suggested.

The first is the replication of previous studies in countries/regions which have not been fully explored. In particular, because most of the existing studies have analyzed developed countries, it is invaluable to replicate them by using developing countries' micro data. As demonstrated by Hsieh and Klenow (2009), developing countries such



as China and India have more serious market distortions than developed economy. Such market distortions may generate different consequences of globalization on corporate activities. Comparative studies between developed and developing countries will surely contribute to constructive policy discussions.

The second line of future research is to extend and develop the previous studies along the research line of each literature stream. For example, there is still room for deepening the knowledge spillover literature. We already know that MNEs' source country or nationality is one of the sources of heterogeneity in the magnitude of knowledge spillover that domestic firms receive, but we do not know why. As a next step, we need to examine what sort of firm nationality characteristics yields such heterogeneity. In addition, previous studies have analyzed the heterogeneity of spillover effects in domestic firms' input-output relationship with MNEs. However, they define such input-output relationships at the industry level, rather than pinpointing firm-to-firm vertical linkages, due to data limitation. Once required data become available, we can directly examine whether or not domestic firms that supply their products to or purchase inputs from foreign-owned firms obtain larger spillover effect.

The third line of future research is to make a breakthrough in an existing literature so as to develop new literature streams. We have introduced selection effects in the relationship between the number of varieties and the firms' productivity in the fifth literature set. Similar to the relationship in overseas activities between selection (the first literature set) and learning effects (the sixth literature set), on the other hand, starting to produce one more variety might raise firms' productivity due to, say, a complementary relationship between an existing variety and a newly added variety. The examination of such a learning effect may open a new area of literature if we can

take care of endogeneity issues due to the selection effect. Furthermore, it may be more interesting to investigate whether differences in the learning effect among added varieties exist or not. Clarifying the cause of such differences becomes an important research topic.

The fourth line of future research is to integrate some of the literature streams. Indeed, as introduced in Section 2.3, we can find the integration of the first and third literature lines. Raff *et al.*, (2008b) incorporate the firms' choice between FDI and exporting into their choice of FDI modes such as WOE, JV, and M&A. Such an examination contributes to clarifying the overall picture of the substitution of overseas activities. The integration of the third and the sixth literature lines is another possible example in this direction. At present, in the sixth literature line, the learning effects are examined according to FDI types (HFDI and VFDDI). In addition to this FDI-type dimension, the learning effects of FDI seem to differ according to the entry modes. In particular, the JV and the M&A may yield larger positive impacts on MNEs' performance than the WOE due to combining location advantages of the domestic firms with the know-how of the MNEs.

Last, since we already have a sufficient number of previous papers, meta-analysis should be conducted in each literature set. Such meta-analysis would uncover the possibilities of research design bias and publication bias. The former bias comes from differences in estimation techniques, variable definition, and so on. In particular, it is recognized that the smaller the analytical unit (e.g., firm-level), the more serious the research design bias becomes. For example, in the previous papers on the spillover effect from MNEs, Holger and Eric (2001) find some research design biases resulting from the definition of multinationals and from the functional specification, in addition

to the publication bias. More recently, on the other hand, Martins and Yang (2009) collect more than 30 papers on the learning-by-exporting effect and find neither research design bias nor publication bias. The accumulation of such a meta-analysis certainly leads to not only a methodological improvement but also a deeper understanding of globalization impacts at the micro level.

#### **4. Concluding Remarks**

This paper has extensively reviewed empirical studies that analyze the globalization phenomenon by using micro data. First, we set up a flow chart describing how the advancement of globalization or changes in policy measures on globalization would lead to national productivity enhancement. Secondly, we list the hypotheses and the methods explored in eight literature streams on globalization, mapped by our flow chart. Third, we illustrate rich implication for economic consequences of trade liberalization and then discuss possible avenues for micro-data analyses. With rigorous econometric treatment, we hope that these literature streams in micro data analysis will develop even further, offering strong policy guidance, particularly for economic development.

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