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Does the use of multiple FTAs force firms to raise local input share?: Evidence of the spaghetti bowl phenomenon☆

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ABSTRACT

This paper empirically investigates the firm-level relationship between the local input share and the number of used FTAs by employing the data on FTA utilization in Japanese affiliates in ASEAN. As a result, we do not find a robust linear relationship. However, affiliates using a large number of FTAs (seven or eight) have an extremely higher share of local inputs. This result might be interpreted as the first evidence of the "spaghetti bowl phenomenon".

1. Introduction

The surge of free trade agreements (FTAs) in each country has publicly yielded concerns on firms' inactive use of FTAs. According to the World Trade Organization (WTO) website, as of January 2012, around 500 regional trade agreements have been notified to the WTO. In order to use FTA schemes, firms need to meet the rules of origin (ROOs). To do that, the users may need to change their procurement sources from the optimal pattern of procurement. In particular, for the use of multiple FTA schemes, firms may raise the share of local inputs in total inputs because local inputs can always meet ROOs in any kinds of FTAs. If so, though the net benefits from such multiple-FTA use must be positive, some amount of benefits will be offset by the change of procurement sources from the optimal pattern of procurement. We may say that this offset is one form of the "spaghetti bowl phenomenon".[1]

This paper empirically investigates whether the use of multiple FTAs forces firms to raise their local input share in total inputs. To do that, we employ the unique dataset, which has been collected by the Japan External Trade Organization (JETRO) in 2011 and 2012. In that survey, the very detailed firm-level information on FTA use is available according to FTA partner countries, in addition to some basic information on firms' activities such as employment, the breakdown of their export destinations, and their procurement sources. In the academic literature on FTAs, there are few studies on firm-level FTA utilization. Demidova and Krishna (2008) is the theoretical study which demonstrates that only the productive firms can use FTA schemes in exporting. To our best knowledge, Takahashi and Urata (2010) is the only empirical study at the firm level. They examine FTA usage by Japanese firms at the firm level by employing a questionnaire survey, finding that larger firms are more likely to use FTA schemes. Against this literature on firm-level FTA utilization, our paper is the first one that examines the firm-level use of multiple-FTAs.

The rest of this paper is organized as follows. The next section provides our conceptual framework on the relationship of firms' multiple-FTA use with their local input share. Section 3 explains our empirical framework and data structure and presents an overview on firms' use of multiple FTAs. After providing the results of econometric analysis in Section 4, Section 5 concludes on this paper.

2. Conceptual framework

This section presents a conceptual framework describing the relationship between firms' local input shares and the FTAs they use. For this purpose, we first consider firms' decisions concerning use of an FTA for exporting. We then extend consideration to the context of use of multiple FTA schemes.

A firm will use an FTA when exporting its output if the gain from using the FTA is greater than the cost of using it. The gain depends on how much the firm can save on its tariff payment. Roughly speaking, the reduction in the tariff payment depends on the following two

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[1] As for the more precise concept of the spaghetti bowl phenomenon, see Bhagwati et al. (1998).

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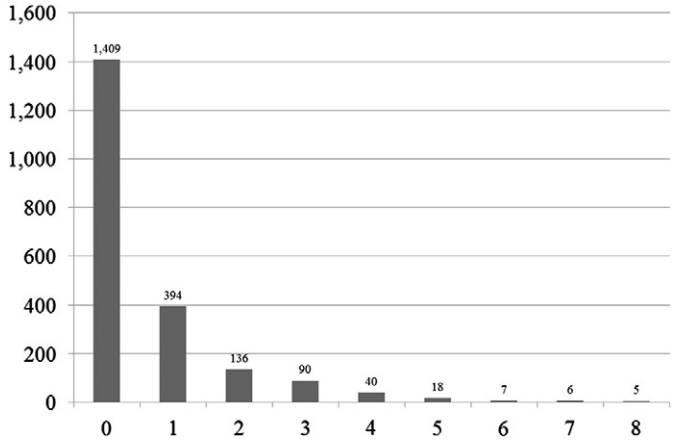

Fig. 1. Number of sample affiliates according to the number of FTAs. *Source*: Survey of Japanese-affiliated firms in ASEAN, India, and Oceania (JETRO).

elements: One is tariff margin, which is the difference between the FTA rate and the most-favored nation rate; the larger the tariff margin, the larger the reduction in the tariff payment. The second element is the size of exports because the use of FTA schemes for the larger size of exports, which is likely in the case of larger-sized firms, leads to a bigger reduction of tariff payment. On the other hand, the cost for the use of an FTA is the "procurement adjustment cost," in addition to any administrative cost. To use an FTA, a firm needs to comply with the rules of origin of its product. In order to comply with the ROOs requirements, a firm may need to change its procurement sources from optimal pattern of procurement. We call such extra procurement costs the "procurement adjustment cost"; the lower the procurement adjustment cost, the greater the incentive for a firm to use an FTA.

Thus, ROOs are among the crucial elements affecting a firm's decision to use an FTA. There are several types of ROOs. "Change in tariff classification criterion" and "value added content criterion" are the major ones. The former criterion determines the country of origin of a good according to whether the tariff classification assigned to the final goods produced in a country differs from the tariff classification of the input goods. The latter criterion determines the country of origin according to whether output production in the country adds sufficient value to the inputs used, usually 40% of the price of final goods. In FTAs concluded by ASEAN, an optional criterion tends to be adopted, which determines the country of origin of a good according to whether it meets *either* a value-added content criterion *or* a change in tariff classification criterion. Some FTAs, such as the ASEAN–China FTA, adopt a value-added content criterion.

When firms export their products to multiple countries and further use FTA schemes when exporting to those countries, they need to satisfy ROOs in all FTAs that they use. If firms try to satisfy a value-added content criterion in all FTAs, it is difficult for them to use many imported inputs. For example, suppose that firms in Country A export to Countries B and C, which are, respectively, *bilateral* FTA partners for Country A. In addition, ROOs in those FTAs are assumed to use a value-added content criterion. Then, inputs imported from Country B cannot be regarded as having originated in Country A under the bilateral FTA between Countries A and C. Therefore, the higher share of inputs from Country B makes it more difficult for firms in Country A to satisfy ROOs when exporting to Country C. The same is true for the case of using inputs from Country C when exporting from Country A to Country B. The use of local inputs (i.e., inputs from Country A) is more likely to enable firms to satisfy ROOs under the FTAs with both Countries B and C, since inputs from Country A are regarded as having originated there under both bilateral FTAs. As a result, when multiple, bilateral FTA schemes are in place, firms are likely to use a relatively high share of local inputs.

Table 1
Average employment according to number of used FTAs.

Number of used FTAs	IDN	KHM	LAO	MMR	MYS	PHL	SGP	THA	VNM	All
0	966	128	60	439	393	899	265	599	752	615
1	1406	350	440	875	457	1322	187	413	471	597
2	1268	601		600	429	1019	214	759	691	742
3	688				610	584	71	1394	674	917
4	360				405		259	2738	1625	1553
5	364				719		141	1812	515	994
6					4135		264	550		1492
7					1274		113	3102		998
8					89		95			93

Source: Survey of Japanese-affiliated firms in ASEAN, India, and Oceania (JETRO).

3. Empirical framework

This section explains the empirical framework we use to investigate the relationship between the share of local inputs in total inputs and the FTAs used. Specifically, we estimate the following simple equation.

$$\text{Local Input Share}_{ijct} = \beta_1 \text{ Number of FTAs}_{it} + \beta_2 \ln \text{Employment}_{it} + \beta_3 \ln \text{Age}_{it} + u_j + u_{ct} + \varepsilon_{ijct}. \quad (1)$$

Our dependent variable is the share of local inputs in total inputs in affiliate i in year t. Its industry and host country are denoted by j and c, respectively. Our main interest is the coefficient of "Number of FTAs$_{it}$," which is the number of FTAs that affiliate i uses in exporting in year t. Employment$_{it}$ and Age$_{it}$ are affiliate i's employment and operation duration in year t, respectively. u_j and u_{ct} are industry dummy and host country-year dummy variables, respectively. ε_{ijct} is an error term.

There are some papers examining the determinants of the share of inputs that overseas affiliates import. Hanson et al. (2005) investigate the roles of host countries' factor prices and trade costs while controlling for overseas affiliates' output volumes. While lower factor prices lead to lower prices for local inputs, raising local input shares, lower trade costs also encourage multinationals to use more imported inputs. In addition, Kiyota et al. (2008) examine the role of affiliate age, which is expected to be positively correlated with local input share because of accumulation of knowledge concerning host economies.

In our specification, Eq. (1), we use employment as a proxy for output volumes. Following Kiyota et al. (2008), affiliate age is also included. All host country characteristics, such as factor prices or trade costs, are controlled for by introducing host country-year dummy variables. Industry dummy variables control for the remaining variation across industries. The industry dummy variables also help control for differences in difficulty meeting ROOs across industries, and the host country-year dummy variables help control for differences in the number of available FTAs among countries.

Table 2
Average share of local inputs according to number of used FTAs (%).

Number of used FTAs	IDN	KHM	LAO	MMR	MYS	PHL	SGP	THA	VNM	All
0	0.41	0.12	0.00	0.06	0.42	0.29	0.23	0.54	0.27	0.44
1	0.38	0.30	0.00	0.01	0.43	0.22	0.31	0.56	0.28	0.45
2	0.44	0.01		1.00	0.43	0.21	0.26	0.52	0.20	0.44
3	0.64				0.48	0.22	0.53	0.58	0.23	0.49
4	0.35				0.40		0.42	0.51	0.07	0.42
5	0.90				0.31		0.76	0.47	0.08	0.44
6					0.68		0.63	0.57		0.62
7					0.51		0.75	0.50		0.63
8					0.37		0.82			0.64

Source: Survey of Japanese-affiliated firms in ASEAN, India, and Oceania (JETRO).