Comparing and Finding the Linkage Between Indigenous-Operated and Foreign-Invested Hotels in Thailand

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Abstract

Since the 1997 economic crisis, tourism related industries have played one of the major roles in Thailand GDP. Despite the vigorous role, the empirical studies of firm's performances in the Thai hospitality industry are relatively limited. With firm-level data using the DEA (Data envelopment approach) efficiency estimating approach, this paper investigates FDI spillover effects in the hospitality industry. In addition, this paper backwardly examines the question of whether foreign-invested hotels actually outperform indigenously operated hotels. We find some evidence of labor productivity and efficiency gaps between these two groups of firms. Only foreign-operated resorts, not typical hotels, are found to have higher labor productivity and superior efficiency than their local counterparts. Results from spillover part indicate positive externalities from foreign-invested to locally operated hotels, especially in the non-tourist destinations and particularly through the labor mobility channel. Interestingly, a positive relationship between performance and foreign guest intensity of hotels are consistently found throughout our study.
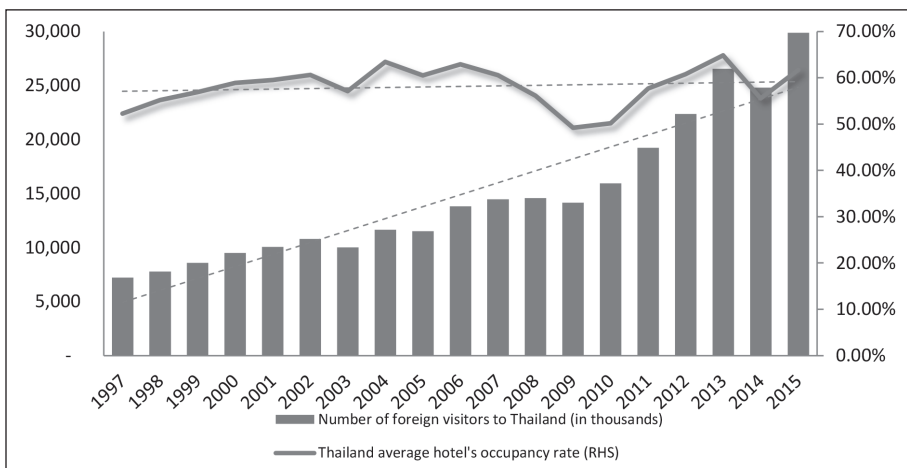
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1. Introduction

Multinational corporations have played a vital role in the recent globalization era. Many of host nations' authorities have participated in the fierce competition to attract the entrance or the presence of multinational corporations. Thailand has signed up as one of the athlete in this arena since 1990 and the provided incentives range from the deregulation of foreign employment act to exemption of corporate income tax. Moreover, Thailand's 12th National Economic and Social Development plan has clearly designated toursim as a target sector. Conceptually, an improvement in technical capability of a firm could be obtained either through technology transfer from foreign direct investment (FDI) or firm's in-house innovation, Wiboonchutikula, Phucharoen & Pruektanakul (2016). In contrast to firms in the manufacturing sector where product development is one of the crucial elements for the survival of companies, firms in the hospitality industry have relatively low investment in research and development. Hence, the second approach for capability advancement is relatively myopia for hotel operators. The published summary of National Statistic organization (NSO)'s surveys on hotels and guesthouses (2011), (2013) and (2015) in Thailand have consecutively revealed very low R&D expenditure in the hospitality industry. This is simply due to the nature of the business in this industry, which is extensively involved in process rather than product development. As a result, the advancement in productivity and efficiency of local firms in this industry would be mainly diffused from technology diffusion from FDI. This paper investigates the first mode of technical improvement (FDI spillover effects) in one of the Thailand's strategic industries. Despite the significant role of the hospitality industry in the economy of Thailand, firm level studies in the hospitality industry is very limited. This paper investigates the first mode of technical improvement (FDI spillover effects) in one of the Thailand's strategic industries. Hence, the primary aim of this paper has two objectives, [1] the investigation of labor productivity and efficiency differential between foreign-invested and locally operated hotels and [2] the examination of FDI spillover effects to the Thai hospitality industry. To the best of our knowledge, this gap examination and linkage studies between these two groups of firms does not empirically exist for the Thai hospitality industry.

Hospitality industry has played major role in the economy of Thailand since the economic crisis in 1997. According to World Travel and Tourism Council (WTTC) 2017 report, the size of tourism and travel industry in Thailand has been recently ranked as 15th in the world relative importance of travel and tourism industries to the nation's GDP. WTCC have also revealed that the total contribution from the travel and tourism industries could reach 25% of the Thai GDP by the year 2027. For some tourist destination province, e.g., Phuket, the contribution of hotel and restaurant industry is as much as 36% of the province's gross provincial product (GPP). The following table shows the number of tourist arrival to Thailand and the average occupancy of hotels incorporated in Thailand for the past two decades.

Figure 1. Number of foreign visitors to Thailand and Thailand average hotel's occupancy rate

Source: Bank of Thailand

Throughout the last two decades, the number of foreign tourist arrival in Thailand has increased at the average of 8.6% per annum, and the figure has nearly reached 30 million travellers in the year 2015. However, the average hotel's occupancy rate in Thailand has relatively constant at the rate of 60%. This unmatched growth raises our curiosity on the productivity of Thai hospitality providers. Vora-Sittha (2016) further finds that the sale growth of

the chain-operated hotels in Thailand has increased by 5.625% per annum during the 2010-2013, while the independently operated hotels' sales were growing at 4.925% per annum. These higher growths in revenue of chain-operated hotels, which mostly are foreign-invested hotels, additionally increase our curiosity on the productivity and efficiency gap between foreign-invested hotel and local-operated hotels.

2. Literature review

The theory of multinational cooperation (MNCs) is originally devised by Hymer (1976), which fundamentally explain why this type of firms directly invests abroad. Multinational corporation or firm with foreign direct investment possesses unique element, the Firm specific advantage (FSA). This firm specific asset could allow MNCs to overcome the incremental cost of doing business abroad. FSA would enable them to compete with indigenous firms in unfamiliar markets, supply chain networks and rule and regulation during their entrance and their presence in host nations. Specifically, Dunning's (1977) clearly state that this advantage is feasible through the possession of resources like the reputation of their brands (marketing abilities), knowledge of technology, size, or efficient production process. In his firm-level study in Thailand, Ramstetter (2006) further clarify this FSA as foreign-invested firm hold this kind of firm specific assets, mostly in form of intangible production knowhow, marketing knowhow and management practice.

As the study of productivity gap in hospitality study is limited. The following content discusses some of the performance gap and spillovers empirical literatures in manufacturing sector. Among the first batch of empirical papers is the study by Lall (1976), which analyzed the performance gap between MNCs and local firms by using firm-level data through simple descriptive statistic. Through Translog production function, Ramstetter (2006) find greater number of industries with the reports of production technology differentials than the previous Cobb Douglas derived regressions. However, most of the industries were still reported with insignificant variances. With the updated dataset, Phucharoen et al. (2014) find similar conclusion. As the reader can observe from the aforementioned literatures, there is no consensus among researchers on the performance gap issue. The following section

discusses the conceptual framework and related empirical literatures on the spillover effects. Theoretically, there are 3 related channels[1] in which the technology or know-how of the foreign-controlled establishment could be diffused to the locally operated firms.

Through Imitation/Demonstration effects; Wang and BlomstrÖm(1992) illustrate that Domestic firms could either formally or informally learn from foreign competitors' product and service, process, and technology through imitation. *Through competition effect;* beside the market share stealing threat of foreign firms, Glass and Saggi, (2002) prove that the presence of foreign invested firms could pressurize the domestic firms to improve their existing offers, process, and technology. With other factors constant, the threats by foreign competitors would motivate local operators to lift their productivity and improve their technical efficiency. *Through labor mobility channel;* Fosfuri and Motta (2001) theoretically prove the existing of this channel. As foreign employed employee move to work in domestic firms or start their own business. Their movement would diffuse both proprietary and tacit knowledge they had acquired during their work in foreign firms.

Empirically, the FDI spillovers are less visible than their suggested frameworks. Aitken and Harrison (1999) firstly pointed out that the presence of foreign plants could benefit the local firms as FDI externalities could lower the unit production costs of local firms. However, their presence could also crowd out the demand of local firms' products, which indirectly force the local firms to produce at less efficiency scale. Because of these two dilemmas, the question on whether foreign presence can generates favorable externalities toward the local-operated plants is still ambiguous. Table1 summarizes the recent literatures in FDI spillover effects.

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[1] In fact, there are 4 channel of spillover effects however, this paper focus on the productivity spillovers, the effects of foreign presence on local firm' export perfor-mances (Export spillover channel) is not tested in this paper

Table 1. Summary of the recent literatures in FDI Spillover effects

Authors	Studied Country	Dependent variable	Measurement of foreign presence	Results
Ramstetter (2006)	Thailand	VA/working hour	Output ratio	No evidence of horizontal spillover
Du, Harrison & Jefferson (2012)	Hongkong, Macua, Taiwan	Output	Foreign equity, Output ratio	Non or weak in horizontal spillover but (+) in vertical spillover
Newman, Rand, Talbot & Tarp. (2015)	Vietnam	TFP	Output ratio	Non or weak in horizontal but (+) spillover from downstream industries
Yang and Mao (2015)	China	Output, TFP	Market Share	(+) HorizontalSpillover
Wiboonchutikula et al. (2016)	Thailand	TFP, Technical efficiency	Output, Labor share	(+) Spillover from downstream industries

Note: where TFP is Total factor productivity, VA is value added of firm.

Ramstetter (2006) finds no significant evidence of spillover effect, while the results from by Du, Harrison & Jefferson (2012), and Newman (2015) reveal more supportive evidences on vertical spillover rather than horizontal spillover. In addition, Wiboonchutikula et al. (2016) find the no evidence of horizontal spillover through the employment of the stochastic frontier analysis (SFA) to derive the technical efficiency (from obtained technical inefficiency) of each firm and utilize these estimated value in the second stage regression.

The most related study to our topic is by Yang and Mao (2015), which study the Total factor productivity gap between foreign and locally operated hotels. They confirm the existence of productivity externalities from the foreign-operated hotels toward Chinese indigenous hotels. These results further stimulate our curiosity on whether such FDI externalities is statistically exist in Thai hospitality industry.

In the methodology section, reader may find that this paper uses Data Envelopment (DEA) and Meta-Frontier approaches to estimate efficiency at the firm level. We further discuss the related literatures, which employed these

approaches. The DEA method has been recently applied to the analysis of hotel performances in various regions. For instance, Oukil, Channouf, & Al-Zaidi. (2016) use DEA approach to estimate the efficiency of hotel, and they find that hotels located in the capital city are more efficiency than the hotels in other areas. Previous study, conducted in Australia by Assaf & Agbola (2011), also employs DEA to find firm-level efficiency and hotels in the main cities are statistically are found to have better efficiency than hotels located in other regions. The study of firm-level efficiency in Thailand's hospitality industries is very limited, only the study by Untong (2013) is found. He adopts DEA method to compare the efficiency of hotels across various tourist destinations (location effects). However, the study that directly compares efficiency of hotels, which have different management characteristics, is not yet found in Thailand.

As stated in the end of section 1, the rigorous role of hospitality industry in Thai economy and our curiosities on the disparity and the linkage between the performance of local-operated and foreign controlled hotels. Table 2 summarizes all objectives and hypothesis of this study.

Table 2. Summary of the paper's objectives and their related hypothesis

Objective	Hypothesis (Foreign controlled VS locally operated hotels)	
	Null Hypothesis (HO)	Alternative Hypothesis (HA)
[1] Testing for performance differential between foreign and locally operated hotels	[HO.1] Equivalent in labor productivity	[HA.1] Foreign-controlled hotels have higher labor productivity than locally operated hotels.
	[HO.2] Equivalent in hotels' efficiency	[HA.2] Foreign-controlled hotels are more efficient than locally operated hotels.
[2] Testing for spillover effects from the presence of foreign operated hotels	[HO.3] There is no statistical linkage between these two groups of hotels.	[HA.3] The presence of foreign-controlled hotels in the region could enhance the performance of locally-owned hotels

In the next section, we discuss an estimation of each hotel's performance and the regression analysis of their derived performance.

3. Methodology and Data

The basic production function with factor-neutral could be depicted as

$$Y_i = A_i f (K_i , L_i , M_i) \qquad (1)$$

where Y_i is the output of the *i*-th establishment

         K_i is the capital input of the *i*-th establishment

         L_i is the labor input of the *i*-th establishment

         M_i is the material input of the *i*-th establishment

         A_i is the total factor productivity of the *i*-th establishment

With the basic production platform, the labor productivity of the firm could be observed as the division of firm's output and firm's number of labor, this $[Y_i/L_i]$ have been widely used as the proxy for labor productivity of firm i.

In addition, hotel's efficiency is also employed as another measurement of firm performance in this study. However, the challenge is to find firm- level's efficiency of each hotel. Since our employed dataset is cross-sectional data then, the disparity of the firm's productivity within the given collected time period is attributed to difference of firms' technical efficiency, which is called efficiency throughout this study. We use Data Envelopment Approach (DEA) to obtain efficiency level of each establishment. The following part briefly discusses the Data Envelopment Approach (DEA), which is employed to assess technical efficiency of our studied hotels. For full derive of DEA, reader are invited to explore Joseph Farrell (1957)[2].

DEA is nonparametric technique to measure efficiency of the firm. The efficiency frontier is determined through linear programming method given with firm's output and firm's input (raw material, labor, capital) data of the firms. Then each firm's efficiency is determined based on the drawn frontier, which represents the best practice of the firm in the area. Under return to scale assumption, Hwang and Chang (2003), Untong (2013) had applied DEA approach to estimate hotels 'efficiency, which establishment's efficiency could be estimated under the following platform.

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[2]   For extension discussion of Data Envelopment Approach, readers are invited to explore Farrell (1957)

$$\text{Min}_{\theta,\lambda}\,\theta$$

$$\text{Subject to -}\, y_i + Y\lambda \geq 0 \qquad\qquad (2)$$

$$\theta\, xi - X\lambda \geq 0 \qquad\qquad (3)$$

$$N1'\lambda \leq 1 \qquad\qquad (4)$$

$$\lambda \leq 0 \qquad\qquad (5)$$

Where   X   is input matrix (compose of 3 inputs which are capital, labor and raw material used)

   Y   is output matrix

   y_i is vector of outputs of i-thhotel

   θ is a scalar (Efficiency)

   λ is vector of constant

   N1 is vector of ones (Non-Increasing Returns Scale)

DEAP v.2.1 application is used to estimate individual hotel's efficiency from the firm level data on output and vector of inputs of hotels. These obtained hotels' efficiency scalar would be coded as dependent variable in the main regressions. As our employ dataset is cross sectional data and the previous study of service operators in Thailand, conducted by Wongchai, Liu and Peng (2012), we further employ the Meta-frontier approach (META) to calculate the efficiency of each service provider[3] for the robustness checking purpose.

To investigate our first and second hypotheses, the labor productivity [HO.1] and efficiency [HO.2] comparisons between foreign-invested and locally operated hotels, the following function is illustrated.

$$PERFOM_i = f\,(MNC_i\,,Z_i) \qquad\qquad (6)$$

Where $PERFOM_i$ is the performance of hotel i, in which labor productivity and hotel's technical efficiency are used as dependent variables. While, MNC_i is the foreign-controlled status of the hotel (1 if that particular hotel is foreign-controlled hotel, 0: otherwise). The vector of control variables Z_i consists

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[3] The META efficiency index is obtained through the nonparametric method similar to DEA approach, the META efficiency index is calculated based on nationwide basis rather than regional basis. Reader can find detailed explanation in Wongchai et al. (2012)

of variables, which represent hotels' characteristics, which could affect performance of the hotel.

For the third hypothesis in which, we test whether the spillover effects from the presence of foreign-controlled hotel are statistically different from 0, the following function is used.

$$PERFOM^L_{ij} = f\left(FP_j, Z^L_{ij}\right) \tag{7}$$

Where $PERFOM^L_{ij}$ is the performance of locally operated hotel i in province j, FP_j is the presence of foreign hotels in the *j*-th province[4]. Z^L_{ij} is the vector of control variables representing characteristics of local hotels.

As stated in (6), performances (labor productivity and efficiency of hotel) is a function of multinational status of hotel and the set of hotel characteristics. Hence, the testing regression for performance gap could be written as

$$
\begin{aligned}
PERFOM_i =\ & \alpha_0 + \alpha_1 ROOM_i + \alpha_2 STAFFINTENSITY_i + \alpha_3 AGE_i + \\
& \alpha_4 FIXEDASSET_i + \alpha_5 AVERAGEWAGE_i + \alpha_6 FORGUESTRATIO_i + \\
& \alpha_7 CONTROLINTENSITY_i + \alpha_8 DMNC_i + \varepsilon_i
\end{aligned}
\tag{8}
$$

From equation (7), which aims to verify the spillover effects, the following regression is employed

$$
\begin{aligned}
PERFOM^L_{ij} =\ & \beta_0 + \beta_1 ROOM^L_i + \beta_2 STAFFINTENSITY^L_i + \beta_3 AGE^L_i + \\
& \beta_4 FIXEDASSET^L_i + \beta_5 AVERAGEWAGE^L_i + \beta_6 FORGUESTRATIO^L_i + \\
& \beta_7 CONTROLINTENSITY^L_i + \beta_8 FP_j + \xi_i
\end{aligned}
\tag{9}
$$

Where superscript L represents locally operated hotel, subscript j represents the province in which hotel i is incorporated. It should be noted that equation (9) is applied only to the local- operated hotels as we are testing for the impacts of foreign presence. While the previous regression recruits all type of hotels and the variable, which identify whether the hotel is foreign and local hotel, is our key variable. The key variables could be summarized as follow

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[4] The detailed explanation is available in table shown in the subsequent page

Table 3. Explanation of key variables used in equation (8) and (9)

Variable	Proxies	Measurement
$PERFOM_i$ (in equation8)	Labor productivity	Operating revenue per labor (LP)
	Efficiency of hotel i	Efficiency from DEA approach (DEA) Efficiency from Meta-frontier approach (META)
$DMNC_i$ (in equation8)	Foreign-controlled status of hotel i	1 if the foreign equity participation is more than or equal to 10%, otherwise 0.[5]
FP_j (in equation9)	Foreign presence in industry j	Demonstration effect (measured as foreign-invested hotel's output share in province j)
		Labor mobility effect (measured as foreign-invested hotel's labor share in province j)[6]

For other control variables, $STAFFINTENSITY_i$ represents the intensity of labor per each hotel room (in log form). Variable $AVERAGEWAGE_i$ is measured as the log of average salary of the hotel i's employee. The variable named as $CONTROLINTENSITY_i$ is the log of manger to total staff ratio. $FIXEDASSET_i$ is the log of ended value of hotel's fixed asset in the year 2012 (surveyed year). These set of variable is included in order to control for the differences in staff's and capital capabilities among hotels that could directly affect both labor productivity and efficiency of the hotel. $FORGUESTRATIO_i$ denotes the portion of foreign guests in the hotel establishment i, as suggested in the previous empirical finding, Hu et al. (2010). In which, they find hotels that mainly serve international travellers tend to have higher productivity than hotel that mainly serve domestic travellers. While AGE_i is the age (year) of the hotel. The variable $ROOM_i$ is number of room hotel i possess. These

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[5] As widely used as definition of FDI, researcher follow an UNCTAD's (United Nation conference on Trade and Development) standardized definition of Foreign Direct Investment as an 10% or above equity participation by foreign entity.

[6] Similar to the empirical work in manufacturing sectors, Taki (2001), Wiboonchutikula et al. (2016) use foreign establishment's labor share in the industry j as the proxy for labor mobility. As the questions of whether the employee has an experience with multinational firm are not available in either the firm level census or survey.

characteristics are accounted in order to control for the size and age effect of the hotels on the establishment's performances. The detailed measurement of these control variables is outlined in the appendix Table A1.

We use unpublished firm-level data from National Statistic Organization, NSO, (2013) survey of hotel and guesthouse[7]. It should be noted that there are 7,566 observations. As every productivity and efficiency assessment techniques require output data, cost or expenditure in the estimation. There are observations filled with zero revenue, zero labor employment in this survey. Hence, these incongruity observations could not be used. To avoid disproportional number of foreign-invested firms in the small hotel categories, we also scope our analysis on the hotels that have at least ten employees. With the scoped sample and the elimination of duplicated series and other anomalies, the number of hotel's establishments in our dataset is 1,356 observations located nationwide. It is noted that, at each province, our used dataset yield similar information as original dataset, except the variance of original dataset is larger than our cleaned dataset.

4. Results

As stated in the beginning of methodology section, the firm-level estimated efficiencies through both DEA and Meta-Frontier are firstly derived, and table 4 shows the summary of firm- level estimated efficiencies categorized by type of the hotels and their incorporated locations. The full lists of each hotel's efficiencies are available upon the request.

Interestingly, foreign controlled hotels have higher average labor productivity and larger DEA estimated efficiency than locally operated hotels. However, the reverse is found in META- frontier estimated efficiency.

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[7] The hotel and guesthouse's survey was conducted throughout the kingdom in 2012, undisclosed firm-level data is available on the request basis. Reader can further find the detail sampling techniques which NSO had employed from full report of NSO 2013 hotel and guesthouse survey, available on www.nso.go.th

Table 4. Mean value of labor productivity (LP), efficiency estimated through DEA and through META approaches, categorized by type and location of hotels

Foreign or Local	Destination	LP (Baht)	Hotel efficiency	
			DEA	META
Foreign-controlled hotels	in tourist destination	679,065	76.32%	17.16%
	in non-tourist destination	677,801	75.09%	15.28%
	All destinations	**678,523**	**75.79%**	**16.36%**
Locally operated hotels	in tourist destination	591,926	65.93%	20.47%
	in non-tourist destination	459,718	52.69%	23.77%
	All destinations	**510,669**	**57.79%**	**22.50%**

Hence, we wonder whether this pattern of results still validate under regression testing; in which, other influencing factors are controlled. From table 4, we also find that foreign- invested hotel in tourist destinations exhibits better efficiency than foreign-invested hotels in non-tourist destinations. However, the gap between these foreign operators across two locations is relatively narrow.

On the other hand, the labor productivity and DEA-estimated efficiency of locally operated hotels in tourist destinations are considerably higher than locally operated hotels in non- tourist destinations. These descriptive results raise our spillover effects objectives. As foreign- operated hotels intensively operate in the tourist destinations, the plausible explanation of this superior performance of local operated hotels in tourist destination could actually derived from the FDI spillovers.

4.1 Labor productivity and efficiency gap

Table 5 shows the result from regression (8), where the dependent variable *(PERFORM$_i$)* is separately measured as labor productivity (LP), DEA estimated efficiency (DEA), and Meta- Frontier estimated efficiency (META). Regardless of technical efficiency estimation techniques and confidence interval, the coefficients of DMNC variable illustrated in table5 do **not** exhibit any evidence of performance differential between foreign-invested

hotels and locally operated hotels. This result implies that the null hypothesis of zero disparity in labor productivity (HO.1) and equivalent efficiency (HO.2)) between foreign and local hotels could not be rejected. In short, foreign-invested hotels do not statistically possesses higher performances, either in term of labor productivity or overall efficiency term. The absence of productivity gap is not a surprising news to Thai authority; as, Ramstetter (2006), Phucharoen (2014) have also found that productivity gap between foreign and local establishments does statistically exist only in few manufacturing industries.

Table 5. Results from regression (8) [Comparing the performance between foreign and locally operated hotels]

Variable	LP	DEA	META
C	4.83248***	-0.877742***	1.738265***
	(13.3342)	-(7.7721)	(10.9105)
LOG(ROOM)	-0.05213**	0.22588***	0.046833***
	-(2.007)	(27.9212)	(4.2028)
LOG(STAFFINTENSITY)	0.166952***	-0.183512***	-0.042963***
	(6.0633)	-(21.3873)	-(3.7087)
LOG(AGE)	-0.00947	0.000304	-0.009146
	-(0.4554)	(0.0468)	-(1.0133)
LOG(FIXEDASSET)	0.116581***	-0.026541***	-0.075073***
	(7.8606)	-(5.7427)	-(11.1826)
LOG(AVERAGEWAGE)	0.516441***	0.092472***	-0.032691***
	(17.2268)	(9.8985)	-(2.4948)
FORGUESTRATIO	0.369063***	0.096181***	0.010953
	(7.5871)	(6.3451)	(0.5252)
CONTROLINTENSITY	0.44722***	0.149394***	0.064141
	(2.6245)	(2.8134)	(0.8873)
DMNC	**-0.040232**	**0.020612**	**-0.002149**
	-(0.4627)	**(0.7607)**	**-(0.0706)**
R-squared	0.348913	0.586841	0.234698

Note: ** and ***indicate that the coefficient is statistically differently from zero at 0.05 and 0.01 levels, respectively. The value in parenthesis is the t-statistic value. Total observations used in the testing are 1,356.

For other control variables, coefficients of FORGUESTRATIO variable are consistently reported as statistically significant. In addition, the reported coefficients of CONTROLINTENSITY shown positive relationship between hotels' supervising level (measured as manager to total labor ratio) and the hotel measured performances. If we further scope the analysis to the hotels, which located in the tourist destination province[8], the following results could be obtained.

Table 6. Results from regression (8) [Comparing the performance between foreign and locally operated hotels classified by the tourist and non-tourist destination provinces]

Variable	Hotels in Tourist-Destination (n=533)			Hotels in Non-Tourist destination (n=823)		
	LP	DEA	META	LP	DEA	META
C	4.344045***	-0.657076***	1.738265***	5.12931***	-0.97778***	2.62048***
	(7.0903)	-(3.2520)	(10.9105)	(11.2187)	-(7.2947)	(23.4931)
LOG(ROOM)	-0.05893	0.20365***	0.047338***	-0.04554	0.24570***	-0.00753
	-(0.7012)	(14.4100)	(4.2028)	-(1.3418)	(24.6964)	-(0.9096)
LOG(STAFFINTENSITY)	0.097322**	-0.183142***	-0.042963***	0.20748***	-0.18625***	0.00699
	(2.1847)	-(12.4657)	-(3.7087)	(5.8078)	-(17.7832)	(0.8020)
LOG(AGE)	-0.024338	-0.011469	-0.009146	-0.00681	0.001666	-0.00257
	-(0.7012)	-(1.0020)	-(1.0133)	-(0.2587)	(0.2160)	-(0.4008)
LOG(FIXEDASSET)	0.099355***	-0.046429***	-0.075073***	0.12450***	-0.01769***	-0.07944***
	(3.8485)	-(5.4532)	-(11.1826)	(6.8537)	-(3.3214)	-(17.9249)
LOG(AVERAGEWAGE)	0.592587***	0.115126***	-0.032691***	0.47311***	0.08038***	-0.0878***
	(11.7601)	(6.9277)	-(2.4948)	(12.5367)	(7.2656)	-(9.5364)
FORGUESTRATIO	0.38813***	0.086373***	0.010953	0.37359***	0.102831***	0.05864***
	(4.8397)	(3.2657)	(0.5252)	(5.7134)	(5.3641)	(3.6759)
CONTROLINTENSITY	0.669786***	0.219637***	0.064141	0.352407	0.093776	-0.12761***
	(2.4094)	(2.3957)	(0.8873)	(1.6220)	(1.4722)	-(2.4074)
DMNC	**-0.111427**	**-0.008099**	**-0.002149**	**0.037293**	**0.054016**	**-0.00449**
	-(0.9519)	**-(0.2098)**	**-(0.0706)**	**0.2832**	**1.3994**	**-0.1399**
R-squared	0.368923	0.506462	0.234698	0.312801	0.625992	0.480126

Note: ** and ***indicate that the coefficient is statistically different from zero at 0.05 and 0.01 significant levels, respectively. The value in parenthesis is the t-statistic value. Total observations used in the testing for hotels in tourist destination province and hotels in non-tourist destination province are 533 and 823 respectively.

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[8] Bangkok, Phuket, Chiangmai, Chonburi, Nakhonratchasima, Kanchanaburi, Pectchaburi, Ayuthaya, Rayong Songkla

Results from table 6 indicate that even in the tourist destination provinces, the null hypothesis of equivalent in labor productivity (HO.1) and efficiency (HO.2) between foreign-invested and locally operated hotels still shall not be rejected. Again, hotel's foreign guest ratio has a positive relationship with both labor productivity and efficiency of the hotel regardless of their incorporated locations.

Table 7. Results from regression (8) [Comparing the performance between foreign and locally operated hotels across different destinations when efficiency is measured through DEA approaches]

Variable	DEA		
	All destinations	Non-Tourist Destination	Tourist destination
C	-0.8821***	-0.9781***	-0.6455***
	-(7.8300)	-(7.3248)	-(3.2029)
LOG(ROOM)	0.2267***	0.2459***	0.2023***
	(28.0534)	(24.7894)	(14.3513)
LOG(STAFFINTENSITY)	-0.1826***	-0.1849***	-0.1824***
	-(21.2831)	-(17.6946)	-(12.4438)
LOG(AGE)	-0.0002	0.0014	-0.0113
	-(0.0335)	(0.1825)	-(0.9918)
LOG(FIXEDASSET)	-0.0265***	-0.0176***	-0.0469***
	-(5.7483)	-(3.3204)	-(5.5182)
LOG(AVERAGEWAGE)	0.0926***	0.0803***	0.1153***
	(9.9262)	(7.2795)	(6.9558)
FORGUESTRATIO	0.0954***	0.1011***	0.0875***
	(6.3497)	(5.3098)	(3.3355)
CONTROLINTENSITY	0.1501***	0.0892	0.2112***
	(2.8302)	(1.4055)	(2.3099)
DMNC*DRESORT	**0.1313***	**0.1738***	**-0.2989**
	(2.0058)	**(2.6506)**	**-(1.4408)**
R-squared	0.587894	0.628301	0.508368
Observation	1,356	823	533

Note: ** and ***indicate that the coefficient is statistically different from zero at 0.05 and 0.01 level, respectively. The value in parenthesis is the t-statistic value.

Results from table 7 indicate that if we interact dummy variable which indicate whether the observation i is categorized as resort-hotel[9] (1 if hotel i is classified as resort, 0 otherwise) to the DMNC variable. Through DEA measurement of hotel's efficiency, we find that foreign- controlled status of the hotel does statistically matter in this sample, especially in the non-tourist destination. The plausible explanation for the question of why the labor productivity and efficiency gap between these two groups of establishments only exist in resort category rather the hotel category could be attributed to the skill and quality assurance features of foreign- invested resorts. As the employed dataset does not contain the number of skilled labor, the number of manager is employed as the proxy for skilled-labor. We find that foreign-invested resorts has manager to room (number of manager/number of room) ratio as (16.5%), three time larger than manager to room ratio of locally operated hotel (5.40%). This difference is relatively narrow in typical hotel group. This implies the skill intensity is relatively more rigorous in the foreign-invested resort samples than typical hotels. This skill intensity could potentially yield their superior performance over than local counterparts. The results of other control variables are relatively similar to the DEA columns in the previous findings in table 5 and table 6.

In general, the evidence of labor productivity and efficiency gap between foreign and local-operated hotels in Thailand is relatively weak. Only foreign-operated resorts, not typical hotels, are found to have higher labor productivity and better efficiency (DEA) than their local counter parts. This result further motivates us to verify whether the spillover effects from foreign-controlled hotels have successfully narrowed the gap between foreign and local hotels.

4.2 Spillover effects

Table 8 reveals the result from the regression (9), the testing for spillover effects, that the presence of foreign-invested hotels could statistically increase the economic performance of locally operated hotels through labor mobility channel. The significance of this foreign presence's coefficient implies

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[9] For definition of resort categories, readers are invited to Hotel and Motel management by Henkin, T.C. (1979)

that the higher employment share by foreign-invested firms in province j could increase not only labor productivity but their presence could also boost efficiency (both DEA and META estimated efficiencies) of the hotels. For other control variables, results are similar to the findings from previous section. Again, we found that local hotels, which have high foreign to total guest ratio, not only possesses higher labor productivity but they also have better efficiency than the local hotels with low foreign to total guest ratio. For manager-to-staff variable, the coefficients are positively reported in both labor productivity and firm-efficiency (DEA estimated measurement) at 99% confidence interval. As previous section, we also find that the more number of rooms hotel has, the higher efficiency of the hotel regardless of how firm's efficiencies are estimated.

The results from the testing for spillover effects nationwide are illustrated in table 8. To serve the policy implication objective, we further limit our spillover analysis in non-tourist destination provinces. Then, table 9 is obtained. However, through labor-mobility channel, we find stronger externalities, particularly in term of efficiency, from the presence of foreign-invested hotels in the non-tourist destination. These implies *that the foreign presence in non-tourist destination generate more positive externalities* toward the locally operated hotels *than their spillover effects in tourist destination*.

For other control variables, we still find that an one percentage increase in the number of rooms could statistically lead to an increase in local hotel's efficiency. The share of foreign guest to total guest variable is statistically significant throughout every measurements of hotels' economic performances. For example, we find that, on average, a percentage increase in foreign to total guest ratio could cause the hotel's efficiency by 8% to 10%. The result from this group of local hotels also reveals that the larger number of rooms hotel possess, the higher scale of efficiency. Interestingly, we find that the role of manager to staff ratio are less visible in this group of local hotels. We could not find a positive relationship between manager to staff intensity and labor productivity; instead, negative coefficients are reported in both efficiency models. Unlike the tourist destination, in which the labor pooling exist, capable manager are relatively rare in the non-tourist destination province. This intermittent of managerial level could actually deteriorate locally operated hotels in these non-tourist destination provinces.

Table 8. Results from regression (9) [Testing for spillover effects from the presence of foreign-invested hotels]

Variable	LP		DEA		META	
	Market share	Labor share	Market share	Labor share	Market share	Labor share
C	4.924038***	4.984569***	-0.84001***	-0.816731***	2.393207***	2.401588***
	(12.9360)	(13.1265)	-(7.1258)	-(6.9491)	(24.5455)	(24.7038)
LOG(ROOM)	-0.043877*	-0.040976	0.231154***	0.23232***	0.015172**	0.01648***
	-(0.5786)	-(0.5973)	(28.0107)	(28.1234)	(2.2228)	(2.4116)
LOG(STAFFINTENSITY)	0.15916***	0.160942***	-0.188249***	-0.187505***	-0.011681	-0.01049
	(5.6283)	(5.6982)	-(21.4953)	-(21.4491)	-(1.6126)	-(1.4508)
LOG(AGE)	-0.012218	-0.012602	0.000581	0.00043	-0.004563	-0.004677
	-(0.5786)	-(0.5973)	(0.0889)	(0.0658)	-(0.8435)	-(0.8658)
LOG(FIXEDASSET)	0.113578***	0.113068***	-0.027819***	-0.028029***	-0.079611***	-0.079915***
	(7.5184)	(7.4908)	-(5.9462)	-(5.9995)	-(20.5741)	-(20.6804)
LOG(AVERAGEWAGE)	0.510377***	0.504314***	0.088989***	0.086664***	-0.0745***	-0.075242***
	(16.0263)	(15.9058)	(9.0230)	(8.8311)	-(9.1330)	-(9.2695)
FORGUESTRATIO	0.360429***	0.34274***	0.092221***	0.085284***	0.037157***	0.03252***
	(6.9972)	(6.5481)	(5.7811)	(5.2643)	(2.8162)	(2.4268)
CONTROLINTENSITY	0.415675***	0.412395***	0.16014***	0.158808***	-0.089005**	-0.090603**
	(2.4083)	(2.3912)	(2.9959)	(2.9751)	-(2.0132)	-(2.0521)
FPOUTPUT or FPLABOR	**0.239986**	**0.432175***	**0.103226**	**0.175992****	**0.21093*****	**0.218882*****
	(0.8113)	**(1.7049)**	**(1.1268)**	**(2.2432)**	**(2.7838)**	**(3.3729)**
R-squared	0.344259	0.345398	0.591645	0.59283	0.378096	0.379827

Note: * , ** , and *** indicate that the coefficient is statistically different from zero at 0.10, 0.05 and 0.01 levels, respectively. The value in parenthesis is the t- statistic value. Total observations used in the testing are 1,300.

Table 9. Result from regression (9) [Testing for spillover effects from the presence of foreign-invested hotels in non-tourist destination]

Variable	LP		DEA		META	
	Market share	Labor share	Market share	Labor share	Market share	Labor share
C	5.32117***	5.458922***	-0.97117***	-0.926126***	2.7371***	2.761902***
	(11.3276)	(11.6153)	-(7.0793)	-(6.7470)	(23.6728)	(23.8685)
LOG(ROOM)	-0.02355	-0.018353	0.25197***	0.253612***	-0.00484	-0.003730
	-(0.6861)	-(0.4405)	(25.13827)	(25.3473)	-(0.5725)	-(0.4422)
LOG(STAFFINTENSITY)	0.193571***	0.19562***	-0.1908***	-0.190512***	0.00631	0.007699
	(5.2782)	(5.3655)	-(17.8145)	-(17.8911)	(0.6992)	(0.8576)
LOG(AGE)	-0.01164	-0.011559	0.00123	0.001291	-0.00275	-0.002828
	-(0.4417)	-(0.4405)	(0.1601)	(0.1684)	-(0.4243)	-(0.4376)
LOG(FIXEDASSET)	0.120457***	0.118752***	-0.01896***	-0.019494***	-0.0812***	-0.081559***
	(6.6047)	(6.5306)	-(3.5592)	-(3.6705)	-(18.0885)	-(18.2170)
LOG(WAGE/TOTALLABOR)	0.455195***	0.443175***	0.07960***	0.075606***	-0.09698***	-0.098985***
	(11.6125)	(11.3099)	(6.9533)	(6.6063)	-(10.0519)	-(10.2600)
FORGUESTRATIO	0.354348***	0.306572***	0.10003***	0.085461***	0.049333**	0.037988**
	(5.2109)	(4.3491)	(5.0373)	(4.1510)	(2.94742)	(2.1888)
CONTROLINTENSITY	0.33920*	0.328181	0.09778	0.094449	-0.13434***	-0.137041***
	(1.5638)	(1.5180)	(1.5436)	(1.4958)	-(2.51612)	-(2.5746)
FPOUTPUT or FPLABOR	**0.41539**	**0.743178*****	**0.07670**	**0.19956*****	**0.230259****	**0.247899*****
	(1.2628)	**(2.6957)**	**(0.7983)**	**(2.4784)**	**(2.84385)**	**(3.6522)**
R-squared	0.31034	0.315248	0.630452	0.633008	0.488026	0.491372

*, ** and *** indicate that the coefficient is statistically different from zero at 0.10, 0.05 and 0.01 levels, respectively.
The value in parenthesis is t-statistic value. Total observations used in the testing are 799.

To conclude the spillover effects section, we find the empirical evidences of productivity and efficiency externalities from the presence of foreign-invested hotels toward locally operated hotels incorporated in the same territory. In addition, these effects are more prevalence in the non-tourist destination.

5. Limitation

It should be noted that the foreign-controlled hotel in our study strictly follows the WTO's definition of foreign direct investment (FDI); in which, the entity would be counted as foreign- controlled entity if foreign equity participation exceed or equal to 10% of total equity. This criterion is widely employed in most of the firm-level FDI studies. However, the management practice in hotel industries is relatively sophisticate as there are number of local hotels (by definition of WTO) which managed by foreign company through hotel-chain management system. Unfortunately, the data obtained in NSO's 2013 survey does not enable researchers to identify whether the observation is locally owned & operated hotels, or foreign chain operated but indigenous owned hotels. Hence, the interpretation of foreign-controlled hotels in this study is limited to hotels with foreign equity participation above or equal to 10% of total equity. The national statistic organization should further collect the information, which enable researcher to identify whether particular establishment is "local owned and operated hotel" or "local owned but foreign chain operated hotel", as the management structure in the hospitality industry could be significantly different from manufacturing structure.

6. Conclusion and Policy implication

Despite the vital role of service sector in economy of Thailand. The empirical studies on firms 'characteristics, firms 'behaviors or the performances of firms in Thai tourism industry are relatively limited. This paper is dedicated to study a backbone group of firms in tourism industry, hotel operators. From the review of literatures, foreign-invested hotel shall exhibits higher productivity and possess better efficiency than locally operated hotel. In addition, locally operated hotel's performance can be enhanced by the externalities, diffused by foreign-invested hotels.

Hence, the objective of this paper has twofold, namely productivity & efficiency comparison between foreign-controlled and locally operated hotels. Secondly, we study the spillover effects from the presence of foreign-controlled hotels. With the firm-level data from 2013 National Statistic Organization of Thailand's hotel and guesthouse survey, we employ Data Envelopment approach and Meta-frontier technique to estimate efficiency of each establishment. Then, we separately employ the obtained firm-level efficiency and calculated labor productivity as dependent variables in our regression analysis. The evidence of labor productivity and efficiency gap between foreign and local owned hotels is relatively weak. Multinational status of the hotel could statistically enhance performances of hotels only in resort category, rather than typical foreign-owned hotel types. Interestingly, we find that the skilled-labor intensity gap between foreign-invested and locally operated hotels is relatively large in resort category. This larger intensity could fuel the superior labor productivity and efficiency of foreign resort operators over their local competitors.

The results from the spillover section strongly suggest that the presence of foreign-invested hotels could statistically enhance both labor productivity and efficiency of local operated hotels that incorporate in the same provinces. Especially, in the non-tourist destination provinces, where the initial evidences of efficiency gap are relatively vivid. This result coincides with the findings in the manufacturing sector [for example, Wiboonchutikula et al. (2016) and Phucharoen (2014)]. In which, the evidences of spillover effects are prevailed through labor mobility channel and in the industries with existing performance gap between foreign and local firms.

For other control variables, we found robust evidences of positive relationship between average wage of the hotels and their efficiency rather than their labor productivity. Regardless of the testing models and incorporated area of hotels, hotels that have high foreign guest to total guest ratio statistically outperform hotels which have low foreign guest intensity. We suggest that The Thailand Productivity Institute should further conduct an in-depth competitiveness analysis on foreign-controlled resorts in order to identify their underlying Firm Specific Advantage (FSA). The insignificant of managerial control intensity in the group of hotels in non- tourist destination deserve

authorities' attention to upgrade the managerial skills of hospitality employee in those provinces. The results from second part of this study remind the vital role of knowledge spillover mechanism in external economies of scale model. Since, the evidence from our study indicates that the externalities from the presence of foreign-invested hotels are only conveyed through labor mobility channel. Nonetheless, we strongly suggest authority to empower local hotel operators to extend their foreign guest proportion, since we found consistent evidences of positive relationship between foreign patronizing guests and the performance of operated hotels. It seems that the aspect of "to whom this hotel serves" is statistically more visible than the question of "who operate this hotel".

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Appendix I

As stated in the methodology part, the following table summarizes measurements of other control variables appeared in equation 8 and 9 beside the key variables.

Table A1. Summary of control variables

Variable	Explanation	Measurement
$ROOM_i$	Number of rooms possessed by hotel i (Unit: number of room)	Log value of number of rooms offered by hotel I
$STAFFINTENSITY_i$	Staff intensity per room of hotel i (Unit: number of staff)	Log value of (Total number of employee / number of room) of hotel i
AGE_i	Year(s) of operation (Unit: number of year)	Log value of (Operating year) of hotel i
$FIXEDASSET_i$	Size (as measured by their fixed asset) of hotel i (Unit: Baht)	Log value of (Net fixed asset) of hotel i
$AVERAGEWAGE_i$	Salary per employee per year of hotel i (Unit: Baht)	Log value of (Total wages/Total number of employee) of hotel i
$FORGUESTRATIO_i$	Foreign to total guest ratio (Unit: %)	(Number of foreign guests/Total number of guests of hotel i)
$CONTROLINTENSITY_i$	Manager to total staff ratio of hotel i (Unit: %)	(Number of manger/ Total number of employees) of hotel i

Note: Key variables are described in the main text.

In order to check the multicollinearity, which could potentially incur in multiple regression analysis, the correlation matrixes of all independent variables are provided in next page. As the reader can observe from the table, the correlation of each paired variable are relatively low, except, the variables $FPOUTPUT_j$ and $FPLABOR_j$ which represent the foreign-invested firms' market share and employment share in province j. It should be noted that both of these variables are separately entered into regression (9) so the concern over multicollinearity alleviated. In addition, all of the R^2 in regression results in the main content do not exhibit any symptoms of multicollinearity concern.

Table A2. Correlation matrix of independent variable of regression (8)

	ROOM	STAFF INTENSITY	AGE	FIXASSET	WAGE/ TOTALLABOR	FORGUE STRATIO	CONTROL INTENSITY	DMNC
ROOM	1.00	0.03	0.22	0.46	0.23	0.08	-0.09	0.08
STAFFINTENSITY	0.03	1.00	0.05	-0.15	-0.09	-0.13	0.07	-0.05
AGE	0.22	0.05	1.00	0.03	0.00	-0.11	-0.05	-0.05
FIXASSET	0.46	-0.15	0.03	1.00	0.30	0.14	-0.04	0.12
WAGE/TOTALLABOR	0.23	-0.09	0.00	0.30	1.00	0.30	0.10	0.11
FORGUESTRATIO	0.08	-0.13	-0.11	0.14	0.30	1.00	0.03	0.19
CONTROLINTENSITY	-0.09	0.07	-0.05	-0.04	0.10	0.03	1.00	0.02
DMNC	0.08	-0.05	-0.05	0.12	0.11	0.19	0.02	1.00

Table A3: Correlation matrix of independent variable of regression (9)

	ROOM	STAFF INTENSITY	AGE	FIXASSET	WAGE/ TOTALLABOR	FORGUEST RATIO	CONTROL INTENSITY	FPLABOR	FPOUTPUT
ROOM	1.00	0.03	0.22	0.46	0.23	0.08	-0.09	0.04	0.08
STAFFINTENSITY	0.03	1.00	0.05	-0.15	-0.09	-0.13	0.07	-0.12	-0.05
AGE	0.22	0.05	1.00	0.03	0.00	-0.11	-0.05	-0.04	-0.02
FIXASSET	0.46	-0.15	0.03	1.00	0.30	0.14	-0.04	0.13	0.09
WAGE/TOTALLABOR	0.23	-0.09	0.00	0.30	1.00	0.30	0.10	0.33	0.33
FORGUESTRATIO	0.08	-0.13	-0.11	0.14	0.30	1.00	0.03	0.40	0.35
CONTROLINTENSITY	-0.09	0.07	-0.05	-0.04	0.10	0.03	1.00	0.05	0.05
FPLABOR	0.04	-0.12	-0.04	0.13	0.33	0.40	0.05	1.00	0.72
FPOUTPUT	0.08	-0.05	-0.02	0.09	0.33	0.35	0.05	0.72	1.00