Does the Origin of Foreign Direct Investment Matter in Developed Host Countries? - Empirical Evidence from Firm-Level Data in Canada

ABSTRACT

Most of previous studies examined the impact of FDI on target firms in developing countries. This paper examines relationship between shares acquired by FDI and productivity of target firms when host countries are open and competitive markets. More importantly, it furthers the research by considering the moderation effect of two types of FDI origin: one is the origin of country and the other is FDI origin related with state ownership of parent companies (from SOEs or non-SOEs). Our empirical results in the oil and gas industry in Canada have found an inverted U-shaped relationship between shares acquired by FDI and target firm productivity. When the economic distance between the host country and home countries is large, the decline of productivity is more pronounced compared with smaller economic distance. However, the relationship between shares acquired by FDI and productivity of target firms does not differ between whether FDI is from SOEs or non-SOEs.

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INTRODUCTION

With increasing globalization, the flow of foreign direct investment (FDI) continues to play a key role in the global economy. Although global FDI patterns have long been dominated by trade between developed countries, FDI activities to and from developing countries have grown significantly over the past years. Indeed, global FDI statistics show that outward FDI from MNEs in developing countries is growing while outward FDI from developed countries is on the decline (UNCTAD, 2012). Several studies have examined the benefits that multinational enterprises (MNEs) from developed countries contribute with when engaging in FDI in developing countries, such as transfer of knowledge and other firm-specific-advantages (FSAs) (Buckley et al., 2002; Li et al., 2009). This literature stream has also examined FDI spillovers or crowding out effects on the economy in developing countries by using industry or country level aggregate data (Meyer & Sinani, 2009). However, less attention is given to the role and impact of FDI originating from developing country MNEs.

A growing stream of research has emerged around FDI from developing countries, often focusing specifically on MNEs from emerging countries (EMNEs). In general, EMNEs have been found to exhibit some differences in strategic behaviors compared to MNEs from advanced countries (AMNEs). In contrast to AMNEs, EMNEs have been found to internationalize into developed countries with the objective of developing their own firm-specific-advantages (FSAs) rather than exploiting their existing FSAs (Yiu et al., 2007). EMNEs are also more likely to prefer lower levels of control when acquiring foreign firms (De Beule et al., 2014).

Similar differences due to the origin of FDI have also been found in research on state-owned enterprises (SOEs). While many SOEs originate from developing countries, this is not always the case. SOE strategic behaviors are expected to differ when engaging in FDI due to the prevalence

of non-economic goals such as securing long term access to key resources (Bass & Chakrabarty, 2014; Eller et al., 2011). Although not conclusive, many empirical studies also suggest that SOEs on average perform weaker economically than non-SOEs (Goldeng, et al., 2008; Megginson & Netter, 2001; Wolf, 2009). Such differences can cause concern for host countries as SOEs are increasingly expanding their operations into open competitive host countries (OECD, 2014).

The identified differences based on the origin of FDI poses an important question: Do differences in origin of FDI influence the success of the target firm in developed host countries? While a number of studies have examined the impact of FDI on target firms in developing countries (Buckley et al. 2002; Li et al., 2009), it remains unclear whether the origin of FDI influences the performance of target firms in developed countries.

The question is pressing for several developed host countries as concern is growing about an increasing trend of inward FDI from SOEs and EMNEs. Canada, for instance, implemented policy changes at the end of 2012 that effectively increases the scrutiny of inward FDI where MNEs have to justify that the FDI will be of 'net benefit' to the host country (Government of Canada, 2012). The assessment of the 'net benefit' to Canada is largely related to the performance of the target firm. The policy change suggests that developed host countries assume that the origin of FDI may impact economic behavior that may in turn impact the host economy.

In this paper, we seek to examine if the origin of FDI matters for the success of the target firm in a developed host country. We focus specifically on inward FDI in the Canadian oil and gas industry for several reasons. First, Canada represents a developed open competitive host country. Second, the strategic importance of Canada's vast natural resources attracts a wide range of FDI, which creates a suitable context for comparison. We find that the origin of FDI matters for the target firm's productivity. This relationship is only significant for the level of development of the MNEs home country, not whether there is state-ownership.

CONCEPTUAL FRAMEWORK AND HYPOTHESES

In line with the eclectic theory of the firm (Dunning, 2001), we expect that MNEs choose to engage in FDI when they have competitive FSAs to overcome any liabilities of outsidership, find advantages of locating activities in a foreign country, and identify benefits of internalizing activities rather than utilize arms-length market contract. If FDI is conducted through an acquisition, the MNE is thus expected to add value to the target firm. One of key identified benefits that FDI has brought to target firms is productivity or efficiency (Eller et al., 2011; Li et al., 2009).

However, even when the MNE has strong FSAs, success in a foreign country most often requires sufficient location-specific knowledge. Based on dominant MNE theory, we can expect that successful MNEs combine their transferrable FSAs with local complementary resources and capabilities (Grøgaard & Verbeke, 2012; Hennart, 2009). In line with Li et al.'s (2009) findings from their study of international joint ventures in China, we expect that the benefit of the MNEs transferrable FSAs must be balanced with the location-specific advantages that the target firm has access to. Too much MNE influence in the local operations could potentially limit the ability to identify and tap into such valuable local complementary assets and capabilities. We therefore expect to see an inverted U-shaped relationship between ownership and performance, as summarized in Hypothesis 1 (H1) below:

H1: The number of shares acquired by MNE companies will have an inverted U-shaped impact on the target firm's productivity.

We furthermore argue that the influence on the performance of target firms will differ depending on the origin of the FDI. In their study of business unit performance among MNEs from developed countries, Makino et al. (2004) find that the origin of FDI does matter for an affiliate financial performance for MNEs from developed countries. However, it is unclear if this also applies to MNEs form developing countries.

A number of studies have examined the impact of FDI on target firms in developing countries. Buckley et al. (2002) identified significant differences based on the origin of ownership in spillover effects of FDI in Chinese manufacturing firms. Research also shows that FDI origins influence internationalization patterns, entry modes and location preferences (Li et al., 2014), suggesting that differences can also be expected in target firm performance. Given that EMNEs internationalize with the intent to develop FSAs rather than exploit their existing strengths (Yiu et al., 2007), this should consequently influence the performance of the target firm as summarized:

H2: The inverted U-shaped relationship in H1 will be more pronounced in cases where acquirer firms are from less developed countries (relative to where acquirer firms are from more developed countries).

Similar to the challenges discussed for EMNEs, it is also critical for SOEs that lack certain FSAs to tap into and utilize location-specific knowledge and resources to succeed in the local market. Too much control, in terms of shares of ownership, can thus have a negative impact on the recombination of the SOEs strengths and the necessary local complementary assets and capabilities. There are particularly two SOE characteristics that lead us to expect performance differences among target firms. First, SOEs have been found to enter host markets with non-economic motives (Musacchio & Lazzarini, 2014; Shapiro & Globerman, 2012). Second, if SOEs on average perform weaker than other firms (Goldeng et al., 2008; Megginson & Netter, 2001; Wolf, 2009) this is expected to impact the performance on target firms, particularly for targets where the SOE has secured larger ownership shares. Thus, we have:

H3: The inverted U-shaped relationship in H1 will be less pronounced in cases where acquirer firms are SOEs (relative to where acquirer firms are non-SOEs).

METHOD

The setting for this study is the oil and gas exploration and production companies operating in Canada. Oil and gas sector was one of the first sectors to be internationalized in terms of trade and

foreign direct investment (FDI) (Goldstein, 2009). In fact, some of the world's largest MNEs are in the oil and gas sector (Grant, 2003; Fortune, 2014). At the same time, both SOEs and non-SOEs in this sector actively attempt to acquire resources in the world (Bass & Chakrabarty, 2014). Also firms from both developed countries and developing countries actively search for acquisitions in this industry. Canada, with a rich natural resource base, has attracted substantial FDI in the oil and gas industry, from both SOEs and non-SOEs, from both EMNEs and AMNEs. According to Table 1, 112 FDI transactions took place in the oil and gas industry in Canada between 2005 and 2013, among them 22% and 27% were from developing countries and SOEs respectively. In terms of acquisition costs, the total FDI amount in the period reached 117.3 billion Canadian dollars, among them 43% and 54% were from developing countries and SOEs respectively. It seems that FDI amount from developing countries and SOEs was above the average. So to study whether origins of FDI matter to benefits enjoyed by target firms, the oil and gas industry in Canada is a desirable empirical context.

[INSERT TABLE 1 HERE]

Sample and Data

We mainly utilized two sources of data. The first source is *COMPUSTAT* and the second source is *CanOils and Evaluate Energy*. *CanOils and Evaluate Energy* are specialized databases in oil and gas industry provided by Evaluate Energy. They have details of all oil and gas M&A transactions, all public oil and gas firms operating in Canada, 300 biggest global oil and gas firms, and state-owned oil companies.

First, we downloaded operational and financial data of E&P firms in Canada from *COMPUSTAT*. We used the GICS codes 10102020 and 10102010 to make sure that downloaded companies are E&P companies. Then from *CanOils* we obtained transaction data of all FDI into Canada oil and gas industry between 2008 and 2013. We matched firms in *COMPUSTAT* and FDI deals in *CanOils* by target firms' names and tic information. This matching method follows common practice that links firm-level data with transaction-level data (Bernard et al., 2007; Lu et

al., 2014). The state ownership structure of the acquirer firms was collected from *Evaluate Energy* and annual reports. Data on GNI per capital for the acquirer countries were obtained from World Bank reports.

After checking outliers and missing values, our sample for the main analysis includes an unbalanced panel dataset of 88 observations involving 32 Canada-based E&P companies between 2008 and 2013. For another sample to do supplementary analysis, it included unbalanced panel dataset of 703 observations involving 202 Canada-based E&P companies.

Measurement of Variables

Our dependent variable is *productivity* calculated as the ratio of daily production divided to the total number of employees in firm *i* at year *t*, in contrast to using revenue per employee as in Eller et al. (2011), since we do not want the price fluctuation of oil prices to influence our results.

Most of our independent variables are drawn from *CanOils*, such as *shares acquired*, *ACSOE*, *state ownership %*. *Shares acquired* measures the percentage of shares acquired by the FDI and was downloaded from *CanOils*. To test the curvilinear relationship, *square shares acquired* was created by squaring the mean-centered *shares acquired*. To measure the development level of the home countries of FDI, we constructed two types of variables: *Developed* as a dummy variable with 1 indicating a developed country and a continuous variable *GNI per capita*. GNI per capita data are obtained from the World Bank report. Countries with a GNI per capita of US$ 11,905 and less are categorized as developing (specified by the World Bank, 2013). To test H 3, we also created two types of variables. First it is a dummy variable *ACSOE*: 1 indicates that the acquirer firm is an SOE. We also used the continuous variable *state ownership %* to indicate the involvement of government in the acquirer companies. The results do not differ a lot from using different types of variables.

We include debt ratio, firm size, FDI age and inverse Mills ratio as control variables. Firm size has been shown to be related to productivity (Li et al., 2009). For oil and gas industry, either

employee number or reserves serves as proxy for firm size. Reserves have been shown to be related with the future potential for oil and gas companies and influence the efficiency (Hartley & Medlock, 2008). So we use the total proved reserves for oil, gas and NGL to measure *firm size*. Since the distribution of this variable is skewed, we used a log transformation of reserves. *Debt ratio* is a proxy for financial risk and calculated by long-term debt divided by total assets. *FDI age* measures the years by the number of years since the first inflow of FDI into the target firm between 2008 and 2013. The calculation of inverse Mills ratio is covered in the next session since it is a variable generated from Heckman selection method.

Analysis

For our main analysis, we used panel data regression based on the Hausman-Taylor method, a frequently used approach in the literature (Hausman & Taylor, 1981). In our study, shares acquired by FDI may be correlated with some omitted or unobservable individual effects, which could give rise to potential endogeneity problems. So it is not appropriate for random-effects method as its basic assumption is that all the explanatory variables should be exogenous to the individual effects (Greene, 2003). Also, the fixed effects method could not be employed for our study either. Because some of our independent variables such as *shares acquired* generally did not change with time for an individual firm within the period (or time invariant), the fixed-effects method would drop these variables of interest from the regressions. In the Hausman-Taylor method, time-invariant explanatory variables (*shares acquired* in our case) are allowed to be correlated with the latent individual effects. To correct for the endogeneity problem, the Hausman-Taylor method utilizes time varying explanatory variables to serve as instruments for endogenous time-invariant variables. Compared with fixed-effects and random-effects models, the Hausman-Taylor not only can allow estimation of the impacts of time-invariant variables (*shares acquired* and *square shares acquired* in our case), but also tackles potential endogeneity problem (Dixit & Pal, 2010; Hausman & Taylor, 1981).

Given the nature of our tested hypotheses, our sample does not represent a random sample of firms. To be included in our sample, the firm needs to receive FDI in any year between 2005 and 2013. The common method to correct for this sample selection bias is to include the inverse Mills ratio from Heckman selection method. In our case, we first estimated the likelihood of the firms receiving FDI. This sample was inclusive of all E&P firms based in Canada from *COMPUSTAT* and *CanOils* for which all explanatory data could be gathered (N = 703). Multiple variables were used to predict the possibility of receiving FDI, and all explanatory variables were lagged by one year. The selection model of the first step probit regression generated the inverse Mills ratio, which was included as an additional explanatory variable in our Hausman-Taylor regression predicting productivity. Prior research shows that whether a firm receives FDI or not is related to a variety of factors which may include financial performance and future potential. The inclusion of the inverse Mills ratio addresses the endogenous choice by acquirers companies. The results of the first stage probit regression are available from authors upon request.

To address the collinearity issues, we used mean-centered variables for all continuous variables. The variance inflation factors (VIFs) values for both Hausman-Taylor analysis and probit analysis to get the inverse Mills ratio are not larger than 10. So it can be assumed that our models do not have serious multicollinearity issues (Hair et al., 2006).

RESULTS

Table 2 lists the descriptive statistics and correlations among variables except year dummies. Shares acquired, firm size, and debt ratio are significantly correlated with productivity. Based on the VIF values in Table 3, there is no serious multicollinearity issue in the analysis.

[INSERT TABLE 2 HERE]

The regression results based on the Hausman-Taylor method are summarized in Table 3. All the models included the inverse Mills ratio for possible selection bias. Models 1 and 2 represent the main effects of shares acquired by the FDI on productivity. In Model 1, the positive coefficient

of *shares acquired* is not significant. In Model 2, the positive coefficient of *shares acquired* and significant negative coefficient of *square shares acquired* suggest that shares acquired by FDI has a positive effect on productivity in the beginning. But such benefit effect decreases as shares acquired by FDI becomes too high. Hence, H1 is supported. That is, shares acquired by FDI has an inverted U-shaped impact on the productivity.

The interaction effects in H2 and H3 are tested using Models 3 and 4. Model 3 shows a strong significant interaction term for *square shares acquired* and *GNI per capita*, suggesting strong evidence to support H2. The interaction term between the squared term of shares acquired and home country development has a positive effect on productivity of FDI recipient firms, which means that when the development of a home country is high, the decline of productivity (when shares acquired are extremely high) is less rapid. Stated differently, the inverted U-shaped curve is less pronounced if home countries have high GNI per capita and more pronounced otherwise. It could suggest that acquirer firms from more developed countries have stronger recombination capabilities (Verbeke, 2013). As a result, when shares acquired by FDI are quite high, the decline in productivity for FDI with origins in developed countries is slower than for FDI with origins in developing countries. We draw Figure 2 based on the method in Dawson (2014) to better illustrate the differences in the shapes of the inverted U-shaped curve in different situations.

[INSERT FIGURE 1 HERE]

In Table 3, Model 4 shows an insignificant interaction term for *square shares acquired* and *ACSOE*, suggesting that the curve shape for the relationship between shares acquired by FDI and productivity does not differ significantly between FDI with SOE origin and FDI with non-SOE origin. As a result, H3 is not supported. In our study, we used production volumes instead of revenues as input to calculate productivity. So if revenues were used, we could have tested whether SOEs may use control to redistribute rents in favor of home countries (Eller et al., 2011). As a result, triple agency conflicts of rents redistribution (Cuervo-Cazurra et al., 2014) is not

considered. However, the empirical results suggest that in terms of pure production efficiency, the performance of target firms with SOE investments are no worse than the performance of target firms with non-SOE investment.

Table 3 also presents the impact of other control variables. In all the four models, the signs of coefficients of these control variables do not change. But mainly, the impacts of *firm size*, *debt ratio* and *FDI age* are significant. Consistent with our expectation, FDI age has positive effects on productivity. It implies that the productivity improvement from FDI inflow increases with number of years since the target firms received FDI. It is consistent with Frost and Zhou (2005) that it takes time to integrate and share benefits that we would expect from recombination. Contrary to our expectation that larger firms with higher reserves should have higher productivity, *firm size* has a negative impact on productivity. This could indicate that larger firms perhaps only enjoy the size of the empire but not the efficiency gains. We also ran an analysis to test the relationship between size and return on assets in all the E&P firms in Canada. It still shows a significant negative relationship between size and return on assets.

DISCUSSION

This study contributes to our understanding whether the performances of target firms in open competitive developed host countries are influenced the origin of FDI. Policy changes, such as those seen in Canada (Government of Canada, 2012), suggest that host markets are concerned about the impact that FDI origin may have on target firm performances. Our study enriches our theoretical understanding of the impact of FDI on target firms in a different context from previous studies (Buckley et al., 2002; Li et al. 2009). The inverted U-shaped relationship between equity share and productivity previously found in a developing country is also supported when the host country is a developed economy. More importantly, it furthers the research by considering the moderation effect of two types of FDI origin: one is the origin of country (level of economic development) and the other is state involvement in MNE ownership (SOEs versus non-SOEs). We

find that the economic distance between the host and home country matters for the productivity of the target firm. We attribute this to the recombination skills of the investing MNE. Because MNEs from developed countries are expected to engage in FDI to exploit existing strong FSAs, these MNEs may also have stronger recombination capabilities including the ability to identify and tap into necessary complementary local assets. MNEs from developing countries that engage in FDI to access and develop new FSAs (Yiu et al., 2007), however, may suffer from too much control in the foreign markets as this may alienate necessary location-specific advantages. MNEs from developing countries must therefore ensure that the organization is sufficiently integrated and embedded in the local context to successfully tap into necessary local resources and capabilities (Hennart, 2009; Chen, 2010; Grøgaard & Verbeke, 2012).

The productivity decline from higher shares acquired by FDI is less pronounced in these cases when FDI is from high GNI per capita countries. That means that the development level of the home countries matters. However, our empirical analysis does not suggest significant differences in productivity of target firms between FDI from SOEs and non-SOEs. This is aligned with a recent study on SOE investments into the Canadian oil and gas industry where significant differences were not found between the strategic behavior of SOEs and non-SOEs (Grøgaard et al., 2014). Combined, it is implied that SOEs and non-SOEs do not differ either in their strategic behavior into a country or in their impacts on target firms' productivity.

In sum, the origin of FDI matters, but only in terms of economic development of the home country, not origin of state ownership of acquirer companies. It seems that the tighter restrictions on inward FDI from SOEs by the Canadian government cannot be supported empirically in the business sense. As Cuervo-Cazurra et al. (2014) point out that we may need to modify the classical view that SOEs are inefficient since many SOEs have experienced tremendous change through pro-market reforms. As a result, more empirical studies into SOEs, especially state-owned MNEs need to be carried so that these state-owned MNEs can serve as a laboratory to extend our theories.

Limitations

This study has several limitations. First, our study focuses exclusively on oil and gas industry in Canada. Although this context is deliberately selected to limit variations resulting from differences across industries and countries, it does limit the generalizability of our results. Second, because of missing data for productivity, only 88 observations out of 185 observations are used for the analysis. The small sample size endangers the external validity of our results. Third, although we used longitudinal data to study the impact of shares acquired on productivity, the average year of data available for a target firm in our sample is 2.8 years. As a result of the limitations posed by the sample, we did not use lagged explanatory variables. Although the Hausman-Taylor method addresses endogeneity issue by utilizing time varying explanatory variables to serve as instruments, lagging explanatory variables will better capture the impact on productivity brought about by shares acquired by FDI. Fourth, controlled variables did not include acquirer firm characteristics such as international experience and different motives of FDI. Especially there is great organizational diversity for SOEs (Li et al., 2014). Inclusion of acquirer firm characteristics will capture more accurately the differences brought by origin of FDI. This should be based on a larger sample size.

Future studies should therefore test the models on target firms operating in other open and competitive markets, such as the United States. With the increase of sample size, lagging explanatory variables can also be used. These will increase the validity of our research results.

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FIGURE AND TABLES

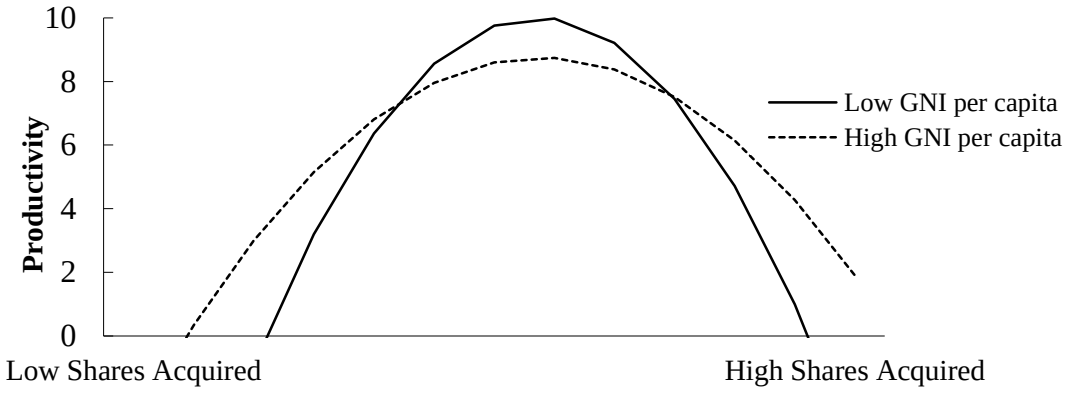

Figure 1 Productivity and Shares Acquired under Low vs. High GNI per capita

Table 1 Characteristics of FDI Inflows into Canada Oil & Gas Industry

	No. of Deals	%	FDI Amount	%
Distribution of FDI deals by country of origin				
Developing	25	22%	50,500	43%
Developed	87	78%	66,800	57%
Distribution of FDI deals by state ownership				
NOC	30	27%	63,500	54%
NSOE	82	73%	53,800	46%

Note: 112 market-based FDI deals. Amount is in the unit of million Canadian dollars

Table 2. Mean, Standard Deviations and Correlations

	1	2	3	4	5	6	7	8
1. Productivity	1							
2. Shares Acquired	0.34**	1						
3. FDI age	0.10	-0.19*	1					
4. ACSOE	0.10	0.10	0.06	1				
5. GNI per capita	-0.14	0.05	0.08	-0.63***	1			
6. Firm Size	0.53***	0.01	0.03	0.23	-0.19	1		
7. Debt ratio	0.54***	0.21*	0.12	0.14	-0.10	0.66***	1	
8. Inverse Mills ratio	-0.04	0.13	-0.17	-0.10	0.05	-0.51***	-0.48***	1
Mean	3.60	0.61	2.61	0.31	10.16	19.56	0.41	0.87
Std. Dev.	1.76	0.34	1.66	0.46	0.99	3.07	0.18	0.23

*** if $p < .01$, ** if $p < .05$, * if $p < .10$

Table 3. Shares acquired by FDI and productivity per employee: the Hausman – Taylor estimation

	Model 1			Model 2			Model 3			Model 4		
	Coeff.	SE	VIF	Coeff.	SE	VIF	Coeff.	SE	VIF	Coeff.	SE	VIF
Shares Acquired	3.65	2.92	1.41	2.60	3.97	1.45	6.31	6.66	1.49	3.86	5.77	2.71
Square Shares Acquired				-31.88*	17.66	4.32	-48.60*	16.79	4.69	-14.21	16.80	5.78
Shares Acquired ×GNI per capita							-1.81	1.86	1.48			
Square Shares Acquired ×GNI per capita							15.73***	5.76	3.61			
Shares Acquired ×ACSOE										-4.28	6.13	2.41
Square Shares Acquired ×ACSOE										11.93	16.90	7.76
FDI age	0.07**	0.03	3.42	0.08**	0.03	3.5	0.05	0.03	4.48	0.08**	0.03	3.59
ACSOE	0.01	0.30	1.75	0.07	0.32	2.18	0.07	0.29	2.85	-0.77	0.78	6.22
Developed	0.99	1.27	2.53	1.65	1.72	3.85	0.36	2.05	6.99	1.50	1.85	4.47
Firm Size	-0.14	0.18	1.74	-0.47*	0.25	2.12	-0.80***	0.27	2.58	-0.33	0.23	2.52
Debt ratio	1.60***	0.57	1.45	1.66***	0.61	1.46	0.91	0.58	1.59	1.65***	0.58	1.54
Inverse Mills ratio	0.43	0.42	1.81	0.41	0.44	1.83	.11	0.40	1.94	0.41	0.42	2.00
Constant	3.22***	1.01		6.24***	2.16		9.18***	3.45		4.40***	1.54	
Number of observations		88			88			88			88	
Wald chi^2		18.43			19.72			37.39			20.15	

Note: Dependent variable is productivity per employee in terms of barrels of oil equivalent. Two-tailed co-efficient tests. VIF = variance inflation factor. *** if $p < .01$, ** if $p < .05$, * if $p < .10$