Foreign Investment and Firm Productivity:

A Meta-Analysis

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Abstract: Empirical estimates of the effects of foreign investment on productivity in both manufacturing and service firms vary widely between countries. A meta-analysis of the existing empirical estimates allows us to econometrically examine the between estimates variation. From this empirical analysis, we reach conclusions about the country-specific factors driving the variation found in the empirical studies while controlling for study and estimation characteristics. Our evidence suggests that those service firms likely to experience increases in productivity following foreign acquisition are located in more economically advanced, although less open economies with high human capital, more efficient financial markets, more product market competition and stricter employment protection legislation. In addition, R&D intensity measures such as the number of R&D personnel intensity and business expenditure on R&D intensity, and specialisation in high-tech exports are positively linked to productivity gains following foreign acquisitions. We find both similarities and differences between the effect of foreign acquisition on productivity in service and manufacturing firms.

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1. Introduction

Most of the literature on foreign investment considers productivity spillovers from foreign direct investment[1] (FDI) while more recent literature explores the direct impact of foreign acquisition on firm productivity. While many of these studies focus on the manufacturing sector, only recent studies focus on the impact of foreign acquisition on service firms. To our knowledge, only Kaitila et al. (2013) and Schiffbauer et al. (2009) examine the direct effect of foreign acquisition on productivity in service firms. These studies find a great deal of variation between countries. This paper examines the effect of foreign acquisition on productivity in both services and manufacturing using a meta-analysis to account for between estimate heterogeneity and controlling for methodology while also considering the variation of the effects between countries.

As mentioned above, previous empirical research on the effect of foreign acquisitions on firm productivity indicates a great deal of heterogeneity between countries (see Table 1). This paper is motivated by explaining this variation using the meta-analysis as an empirical examination of the estimates to give insight into variation and guide further research. Using the meta-analysis methodology allows us to explain the between estimate variation. In particular, we examine the determinants of country and study variation on the effect of foreign acquisition on productivity in service firms.

The motivation for performing a meta-analysis rather than a literature review lies in the advantage of using an empirical, quantitative and objective approach over a more subjective review of the literature.

Key to the understanding of the relationship between foreign acquisition and productivity is the absorptive capacity or the ability of acquired firms to assimilate knowledge or productive capabilities from the acquiring firm, as suggested by Meyer and Sinani (2009) and Girma (2005). An acquired firm can also increase productivity through imperfect copying or imitating the parent firm's practices. Meyer and Sinani (2009) describe a non-linear relationship with demonstration effects at low levels of economic development and decreasing with further economic development while absorptive capacity increases with greater economic development above a threshold level. Moreover, factors such as economic and financial development, human capital and the institutional framework of the acquired firm's country are also likely to determine the effect of foreign acquisitions on productivity. We investigate these relationships in this paper.

This paper focuses on country-specific variation of the existing empirical estimates on the effects of foreign acquisitions on firm productivity. In particular, our research seeks to answer the following research questions:

(1) Do study and estimate characteristics matter?
(2) Which particular country characteristics drive the variation found for the effect of foreign acquisition on firm productivity?

Using the meta-analysis methodology, we quantify the effects of country and study characteristics explaining the variation of empirical estimates across studies and countries. We also identify similarities and differences between service and manufacturing firms.

[Table 1 about here]

[1] For a review of this literature, see Meyer and Sinani (2009).

2. Theoretical Framework

Markusen (1984), Helpman (1984) and Markusen and Maskus (2003) classify in two broad categories (vertical and horizontal) the motivation for FDI. In the case of the vertical motivation, the objective of FDI is to enable the firm to produce in more competitive economies to reduce labour and operating costs. In contrast, in the case of the horizontal motivation, the firm is motivated by access to new markets. Other literature on FDI considers four key aims: resource, market, efficiency or strategic asset seeking (Dunning 1998). Given these motivations to engage in FDI, Meyer and Sinani (2009) discuss productivity spillovers linked to FDI and describe the role of economic and institutional development in a country's absorptive capacity. Absorptive capacity is important to the acquired firm's ability to realise gains from foreign acquisition. They describe the absorptive capacity of firms as the capacity to utilise acquired knowledge from FDI spillovers. Nevertheless, firms in countries with low economic and institutional development can benefit from FDI spillovers from imperfect copying of advanced practices known as demonstration effects. However, the productivity gains from demonstration effects decline with economic development. We build on these concepts and apply them to the direct transfer of productivity-enhancing knowledge from foreign to domestic firms through the channel of foreign acquisition. In particular, we examine the country-specific factors and how these affect firm absorptive capacity as in Meyer and Sinani (2009), Criscuolo and Narula (2008) and Borensztein et al. (1998).

We follow Meyer and Sinani (2009) and use GDP per capita as a direct measure of economic development controlling for the size of the economy. As described above, at low levels of economic development, absorptive capacity will be low and productivity gains are limited to copying the parent firm's practices through demonstration effects. However, absorptive capacity increases with economic development and may be greater at higher levels of income once a threshold level has been met. We examine human capital measured by tertiary educational attainment as in Meyer and Sinani (2009) and R&D intensity measured by R&D personnel per thousand and business expenditure on R&D as a percent of GDP (Barrios et al, 2004 and Kinoshita, 2001). We also consider high-tech industry specialisation measured by the share of exports relating to technology- intensive sectors.

Moreover, developed institutions tend to be associated with strong productivity (Acemoglu et al, 2005). In particular, we will examine broad institutional development through government effectiveness as well as the strictness of both product market regulation and employment protection legislation. Government effectiveness is a broad proxy for institutional development, with less developed institutions having inadequate legal protection of intangible assets, poor infrastructure and inefficient markets increasing firm costs (Bloningen 2005). The strictness of product market regulation is a proxy measure of competition covering barriers to trade, investment, entrepreneurship and state control, whereas employment protection legislation covers the strictness of labour market legislation and therefore labour market rigidities. The relationship between product market competition and firm productivity following foreign acquisition is expected to be negative (Nicoletti and Scarpetta, 2005). On the other hand, the relationship between employment protection legislation and firm productivity can be both positive and negative. Stricter employment protection legislation may encourage investment in human capital and thus increase absorptive capacity (Acemoglu and Pischke, 1999; Belot et al, 2007). Nevertheless, a negative effect is also possible in that stricter employment protection legislation make labour markets less flexible

and discourage productivity-enhancing restructuring of firms due to high firing costs (Martin and Scarpetta, 2011, Bentolila and Bertola, 1990).

Alfaro et al. (2004) argue that the absorptive capacity of firms achieving productivity gains following FDI derives from the development of financial markets. Efficient financial markets are necessary to lower transaction costs, ensure the efficient allocation of capital and hence drive firm technology and productivity growth as suggested by King and Levine (1993a,b), Beck et al (2000) and Levine et al (2000). We extend this argument testing whether developed financial markets are positively linked to productivity changes following acquisition. As a result, we include measures of financial market development and efficiency: domestic credit as a % of GDP as a measure of financial development and stock market capitalisation as a percent of GDP as a proxy for financial market efficiency.

Finally, trade openness may be an alternative channel to foreign acquisition through which links to the international economy may be achieved. Hence, for highly open economies there may be a substitution effect with foreign acquisition of firms. Thus, more open economies exhibit lower trade protection and the firm may substitute the decision to engage in FDI with international trade as suggested by Bloningen (2005) and Helpman (2003). We use a measure of trade openness to test what impact this relationship may have on firm productivity following acquisition.

3. Data Description

As the literature on the direct effect of foreign acquisition on firm productivity is very recent, data was collected from 24 papers including 22 studies which estimate the direct effect of foreign acquisition on productivity in manufacturing firms and two papers which estimate the effect in service firms. Data collected on study characteristics included the effect estimate, the number of observations used in estimations and either the standard error or the t-statistic. All estimated effects of foreign acquisition on service firms were extracted from each paper giving a total of 207 pooled observations for service firms and 636 pooled observations for manufacturing firms.

Table 4 shows the countries included in both the service and manufacturing firm samples. We include a range of country characteristics in our specification as described in Table A1.

In order to relate the country level data to the effect estimates, simple averages of the country characteristics were calculated over the time period of the studies. In some cases data was missing. Where missing data was limited, we used data for the nearest year available.

The samples include a large number of studies varying widely in methodology by the number of observations used in the estimation, the measurement of productivity and the econometric model used in estimation. Thus, we include a number of variables to control for this variation, namely: a variable for the number of observations, a dummy variable for the productivity measures and a dummy variable indicating the methodology used in estimation.

While only two studies are used to obtain estimates of the direct effect of foreign acquisition on service firm productivity, many estimates use variations of methodologies. For instance, while both studies use the propensity score matching methodology, many estimates in Kaitila et al. (2013) use the nearest neighbour matching methodology while also producing estimates using the epanechikov kernel matching methodology. Schiffbauer et al. (2009) used only the epanechikov kernel matching methodology. An efficiency-bias trade-off exists between these two matching methodologies with

nearest neighbour matching using the best match hence attaining least bias whereas kernel matching utilises all available information achieving minimum variance although with greater bias. It is ambiguous as to which matching method should be used, so we include a variable to control for kernel matching and test for a statistically significant difference from nearest neighbour matching. For the manufacturing sample there is more variation in the methodologies used allowing for the inclusion of a dummy variable indicating those studies which use a propensity score matching methodology.

Furthermore, Kaitila et al. (2013) produced estimates using two different measures of labour productivity: turnover per employee (LPT) and value added per employee (LPV), whereas Schiffbauer et al. (2009) uses both LPV and an estimate of total factor productivity (TFP) obtained by estimating the residual of a production function. While Kaitila et al. (2013) discuss some of the cross country differences, a more objective perspective of the existing research can be produced by empirical means. Hence, it is important to account for between estimate heterogeneity in the measurement of productivity with a dummy variable indicating LPT for the services sample and TFP in the manufacturing sample.

Tables 2 and 3 show summary statistics of the continuous variables for both services and manufacturing. The pooled average of the t-statistic for the services sample is negative and close to zero while the t-statistic for manufacturing firms is positive although with a slightly larger standard deviation. Summary statistics for country characteristics indicated a good deal of variation of country characteristics**.**

[Tables 2-4 about here]

4. Empirical Methodology

The meta-analysis has been increasingly used since the early model proposed by Stanley and Jarrell (1989). Stanley and Jarrell (1989) suggest a regression model with a number of study characteristics as independent variables and the effects estimates found in the literature as the dependent variable. However, the estimated effects are likely to be heteroscedastic given the variety of methodologies, samples and measurements in the literature. Therefore, Stanley and Jarrell (1989) suggest reducing the heteroscedasticity present in the model by using a Weighted Least Squares (WLS) model with the standard error as the weight. This implies that the effect estimate is divided by the standard error and it becomes the t-statistic. An additional advantage of using the t-statistic as the dependent variable is that it is dimensionless, i.e. it is a standardised estimate comparable across studies which use different units of measurement.

The meta-analysis has been used in the foreign investment and trade literature. For example, Görg and Strobl (2001) analyse productivity spillovers arising from the presence of multinational companies and apply an ordinary-least-square (OLS) model controlling for a number of study characteristics. As suggested by Stanley and Jarrell (1989), Görg and Strobl (2001) use the t-statistic as a dimensionless measure of effect as their dependent variable. More recently, Martins and Yang (2009) adopt a similar approach also using an OLS methodology examining both the effect estimate and the t-statistic as dependent variables in the exporting and firm productivity literature. Following

Görg and Strobl (2001) and Martins and Yang (2009), we use the standardised t-statistic in an OLS methodology as a dimensionless independent variable.

In addition, many studies focus on the characteristics of the countries included in their analysis. For instance, the International Study Group on Exports and Productivity (2008) considers country characteristics' variation across a number of studies estimating exporter premia. Similarly, Meyer and Sinani (2009), a meta-analysis of the literature on FDI productivity spillovers, also explore the variation in country characteristics. Meyer and Sinani (2009) extend the linear model to include non-linear effects of country variation controlling for study characteristics. Furthermore, they adopt a random effects meta-regression approach which accounts for heterogeneity between study effects again using the t-statistic as the dependent variable. If heterogeneity between estimates is not estimated to be large, then a fixed-effect meta-analysis estimator may be used, otherwise a random effects estimator is appropriate. Therefore, given the heterogeneity of varying methodologies used in the literature, Meyer and Sinani (2009) apply a random effects meta-regression to their data. We also use this methodology in our analysis.

We follow the approach of Meyer and Sinani (2009) described above and use both OLS and random effects meta-regression models. In the context of a meta-analysis, fixed and random effects are based on assumptions about the heterogeneity of the effects across studies rather than the variation of firms across time (Hedges and Vevea, 1998). Thus, the fixed-effect model assumes that the effect size in the population is homogenous across estimates whereas the random effects model assumes that each effect estimate is heterogeneous and varies in size. Longhi et al. (2005) suggest quantifying heterogeneity and test whether the heterogeneity is statistically significant using the Chochran's Q statistics defined as:

$$Q = \sum_{i=1}^{K} \left[\frac{\left(c_i - \bar{c}\right)^2}{v_i} \right] \sim \chi^2_{k-1} ,$$

$$\bar{c} = \frac{\sum_{i=1}^{K} \frac{c_i}{v_i}}{\sum_{i=1}^{K} \frac{1}{v_i}}$$

Where K is the number of effect sizes, c_i refers to the estimated effects from the studies, and $\bar{c}$ is the average of these effects weighted by the inverses of the estimated variances v_i. Q is distributed following a χ^2 distribution with k – 1 degrees of freedom and tests the null hypothesis that the estimated effects are homogenous. If the test rejects this hypothesis in favour of a heterogeneous effect, then the heterogeneity may be explained by the use of study and country characteristics in the random effects model, otherwise a fixed-effect model is used. Nevertheless, Longhi et al. (2005) also suggest that Q is likely to be rejected in large samples of observations even when the individual effect sizes do not vary substantially.

Our estimates of Cochran's Q strongly reject the null hypothesis of no heterogeneity in both the services and manufacturing samples and we proceed in using the random effects model. In addition, the rejection of Cochran's Q suggests that we should not follow the WLS approach used in Stanley and Jarrell (1989) and Stanley (2005) as WLS is equivalent to the fixed-effect model.

The random effects model includes two additive estimates of variance; the variance within estimates σ^2, and also an estimate of the variance between estimates τ^2. If $\tau^2 = 0$, there is no between estimate variation and this is the fixed-effect model. While σ^2 can be obtained from the standard errors in the literature, the between estimate τ^2 must be estimated by restricted maximum likelihood from the fitted values of a regression weighted by ω, the between study variance where τ^2 is restricted to non-negative values with an initial iteration at $\tau^2 = 0$. The meta-regression model also estimates the covariates weighted by ω in the fixed-effect model and ϖ in the random effects model which includes both the within estimate variance τ^2 and the between estimate variance σ^2. Therefore, the fixed-effects model ignores the between estimate variance and is estimated as follows:

$$y_i = \alpha + \beta X_i + \beta Z_i + \varepsilon_i, where\ \varepsilon_i \sim N(0, \sigma_i^2),$$

$$\omega_i = \frac{1}{\sigma_i^2}$$

The random effects model includes an additive component of variance as described above. This random effects meta-analysis model extends the fixed-effect model by adding the between study variance:

$$y_i = \alpha + \beta X_i + \beta Z_i + \varepsilon_i + \mu_i, where\ \varepsilon_i \sim N(0, \sigma_i^2)\ and\ \mu_i \sim N(0, \tau^2),$$

$$\varpi_i = \frac{1}{\sigma_i^2 + \hat{\tau}^2}$$

where y_i refers to the estimated effect of foreign acquisition on productivity, X_i is a list of study controls, Z_i is a list of country variation variables (described in the data description above), ε_i is an error term normally distributed around mean zero with variance σ_i^2 and μ_i is an error term normally distributed around mean zero with variance τ^2 .

5. Results

Tables 5-7 show the results obtained with the random effects estimators.[2]

[Tables 5-7 about here]

As discussed above, τ^2's lower bound is zero at which point all the between study variation is explained by the covariates. We find that τ^2 is quite small and close to zero for the services sample suggesting that most heterogeneity is explained by the study and country characteristics included in the model specifications. Larger values for τ^2 are found for the manufacturing sample reflecting the larger number of studies included in the sample (22 studies in the full sample for manufacturing) and hence greater between study variance. Also shown in the random effects regressions is the value for I^2 defined as (Q-df)/Q. I^2 is interpreted as the percentage variation across an estimate which is due to heterogeneity and in all models this value indicates that a very large proportion of the variation between estimates (99.7% - 100%) is attributable to heterogeneity. Finally, as many of the variables are highly correlated, we test for multicollinearity using the variance inflation factor test. All models

[2] These results are consistent with the OLS estimates which are shown in Tables A2-A4 in the Appendix.

have variance inflation factors below five. However, multicollinearity between some of the country characteristic variables means that many of these variables may only be examined separately in different model specifications.

5.1 Study Controls

We control for a number of estimation characteristics to reflect sample, measurement and methodological approaches in the estimates. For instance, we control for the number of observations used in each study, the measurement of productivity and the methodology. In the case of manufacturing, we control for those studies which use the propensity score matching methodology. As all studies for service firms use the propensity score matching methodology we instead control for the matching type to test for a statistically significant difference.

Some of the estimate characteristics show a statistically significant relationship, mostly in the random effects rather than the OLS models. The results for study controls suggest that the number of observations used in each study estimate of the effect of foreign acquisition on firm productivity do matter although weaker evidence is found for the measurement of productivity. We find a positive relationship between the number of observations and the effect of foreign acquisition on firm productivity for manufacturing. In contrast, for the services sample we find a negative relationship although this is no longer significant when many country characteristics are included in the model. For both the services and manufacturing samples we find some evidence to suggest that the type of productivity has a statistically significant effect on the t-statistic, however this evidence is not strong. In the services sample, we control for productivity measured by turnover per employee (LPT) and find LPT has a statistically significant negative relationship with the t-statistic in many of the model specifications. Furthermore, the manufacturing sample shows a negative statistically significant link between the t-statistic and the TFP measure of productivity for some model specifications in the random effects models (only two models in the OLS models).

We do not find any evidence that the methodology used in the services sample, kernel matching, has any effect on the t-statistic of the studies. In contrast, the manufacturing regressions show some evidence that the propensity score matching methodology has a statistically significant negative link with the t-statistic. However, this is not present when many country characteristic covariates are included and in many of the models the links are no longer significant when the random effects methodology is used.

5.2 Country Variables

Our empirical findings suggest that absorptive capacity plays a role in the transfer of productivity-enhancing knowledge from the acquiring firm to the acquired firm in the services sector. In contrast, the evidence for manufacturing points towards demonstration effects as the mode of productivity growth. We find evidence to suggest a positive link between service firm productivity growth from foreign acquisition and the economic development of the country. However this is only significant when many other country covariates are included, as shown in Table 7. Nevertheless, we do not find any evidence to suggest a link between the size of the economy and service firm productivity. While the size of the economy does not matter, some evidence indicates that the level of development of the economy plays a role in the absorptive capacity of the firms being acquired. Moreover, we find mixed evidence for the link between firm productivity and human capital for service firms in the

post-acquisition period. However, when other country covariates are controlled for, the evidence shows a positive link between human capital and firm productivity following foreign acquisition. This adds further evidence to the positive role of absorptive capacity in service firms as suggested by Borensztein et al (1998).

Furthermore, R&D intensity measures such as R&D personnel intensity, business expenditure on R&D as a percent of GDP (BERD) as well as the share of technology-intensive exports show a positive link with service firm productivity as suggested by Barrios et al (2004) and Kinoshita (2001).

In addition, strong evidence is found to suggest a negative link with the trade openness of the economy suggesting lower productivity gains to foreign acquisition in more open economies with lower trade protection.

Some evidence is found for a positive link between financial development and the effect of foreign acquisition on service firm productivity although this is no longer significant when other country characteristics are included in the model. We find that the efficiency of financial markets is positively linked with firm productivity following foreign acquisition. This suggests that the efficiency of the financial markets is linked to service firm's ability to absorb productivity increases following foreign acquisition.

With respect to institutions, we found that less competitive product markets were linked to decreases in service firm productivity following foreign acquisition, consistent with Nicoletti and Scarpetta (2005). Furthermore, overall government effectiveness showed a positive link with service firm productivity following foreign acquisition, again suggesting that effective institutions play an important role in the absorptive capacity and productivity of service firms (Acemoglu et al, 2005). On the other hand, stricter employment protection legislation showed a positive relationship with productivity in foreign acquired firms. Stricter employment protection increases the incentives for firms to invest in human capital and thus increases both absorptive capacity and firm productivity through this channel (Acemoglu and Pischke, 1999, Belot et al., 2007).

We also find that the share of technology-intensive exports shows a positive link with service firm productivity following foreign acquisition demonstrating further evidence for the role of absorptive capacity in increasing productivity following acquisition, similar to empirical evidence provided by Barrios et al. (2004).

The effect of foreign acquisitions on the productivity of manufacturing firms differs a good deal from service firms. Unlike service firms, the evidence for manufacturing firm productivity following foreign acquisition shows a strong negative link with the economic development of the country and some evidence shows a positive relationship with the size of the economy. This would suggest productivity increases through demonstration effects (Meyer and Sinani 2009) and a vertical motivation for foreign acquisition i.e. acquiring firms in less developed but more competitive countries in terms of cost (Markusen and Maskus 2003). While some evidence does suggest a negative relationship between trade openness and manufacturing firm productivity as in the services sample, the evidence for this is not strong and loses significance when other country covariates are included. Also, human capital shows contrasting relationships between services and manufacturing with the evidence indicating that manufacturing firm productivity is negatively linked to human capital. This would seem to suggest that foreign acquisition increases the productivity of manufacturing firms located in lower human capital countries through demonstration effects as

opposed to the service sector where evidence suggests existing levels of high human capital increase the firm's ability to absorb the transfer of knowledge. Furthermore, measures of R&D intensity capital such as BERD intensity and R&D personnel intensity also show a negative link for manufacturing differing from the positive link found for services.

While manufacturing firm productivity following foreign acquisition show evidence of a positive link with financial development, the evidence is weak for services and is no longer significant when other country characteristics are included in the model. In contrast, manufacturing firms show evidence of a negative link with firm productivity following acquisition and the efficiency of the financial system whereas services show a positive link.

In contrast to services, we find that employment protection legislation has a negative link with manufacturing firm productivity hindering productivity-enhancing labour restructuring as suggested by Martin and Scarpetta (2011) and Bentolila and Bertola (1990). This suggests that a flexible labour market allowing firm restructuring is important for manufacturing firm productivity growth following foreign acquisition.

Finally, in countries with a high share of technology-intensive exports, foreign acquisition led to higher firm productivity for both manufacturing and service firms.

6. Conclusions

We used a meta-regression model to explain the variation of the estimates on the effects of foreign acquisition on firm productivity across studies and countries. Our results suggest that those service firms most likely to experience increases in productivity following foreign acquisition are located in more economically developed countries, in countries with large human capital and higher R&D intensity (measured by R&D personnel intensity and business expenditure on R&D intensity) as well as greater high-tech export specialisation. In addition, productivity appears to increase following acquisition in countries with more efficient financial markets, more competitive product markets, more effective government and stricter employment protection legislation. These results indicate that absorptive capacity is an important factor in achieving productivity gains following foreign acquisition in service firms, similar to the argument suggested by Meyer and Sinani (2009) in their meta-analysis of the literature on productivity spillovers from FDI. However, service firm productivity gains are lower in more open economies.

The effect of foreign acquisitions on firm productivity varies between service and manufacturing firms as well as between countries of different economic development. As a result, effective policy design should be targeted to account for differences between the two sectors and between countries.

For service firms, absorptive capacity is greater in more developed economies with higher human capital. Investment in R&D intensity will increase absorptive capacity and hence the productivity gains experienced by foreign acquired service firms. In these countries, increasing product market competition and increasing both the effectiveness of government and the strictness of employment protection legislation will enable foreign acquisitions to achieve greater productivity increases. Nevertheless, the productivity gains will be lower in more open economies. In addition, enhancing the efficiency of the financial system will also stimulate service firm productivity.

Similar to the service sector, it appears that in manufacturing firms, greater technology-intensive export specialisation enables productivity following foreign acquisition with larger economies gaining the most.

Better access to credit will increase productivity gains following acquisition for manufacturing firms. Moreover, a policy trade-off exists with respect to employment protection legislation in that stricter EPL is likely to increase productivity in service firms following acquisition but decrease productivity in manufacturing firms. Hence the policy approach should be tailored to each sector with less strict EPL for manufacturing industries to allow increased productivity growth through restructuring.

Productivity is one measure of firm performance; another policy relevant firm performance measure is employment. Indeed, productivity gains and losses may be made through reducing or increasing employment. As with the empirical estimates on the effect of foreign acquisitions on productivity, the effect on employment also varies widely between countries. A meta-analysis of empirical estimates of the effects of foreign acquisitions on employment would help to explain this heterogeneity controlling for country and estimation characteristics.

Once again, further research could use the meta-analysis methodology to provide a more objective analysis of the empirical estimates and distinguish between services and manufacturing firms.

However, the existing analyses of the effect of foreign acquisition of service firms on employment are limited to only a small number of countries, mostly small open advanced economies and further research needs to be completed for a wider variety of countries including middle and low income countries.

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Table 1: Literature review on post-acquisition impact of foreign acquisition on firm productivity

Study	Country	Sample Period	Methodology	Productivity Type	Effect on Productivity
McGuckin and Nguyen (1995)	US	1977-1987	OLS	Labour productivity with some TFP	+
Outlon (1998)	UK	1995	OLS	Labour productivity	+
Aitken and Harrison (1999)	Venezuela	1976 through 1989, except 1980	OLS	TFP	+
Griffith (1999)	UK	1980-1992	OLS, Difference in Difference and Systems GMM	TFP	+
Conyon, Girma, Thompson and Wright (2002)	UK	1989-1994	OLS and Instrumental variable estimation to control for the endogeneity of wages	Labour productivity	+ for foreign acquisition, Not significant for domestic acquisition
Harris and Robinson (2002)	UK	1987–1992	Systems GMM	TFP	-
Gioia and Thomsen (2002)	Denmark	1990-1997	Selection-adjustment factor (inverse Mill's ratio) from probit, and controlled for this in OLS	TFP	+ - for selection adjusted estimates
Fukao, Ito and Kwon (2005)	Japan	1994–2000	Propensity score matching and difference-in-difference	TFP	+ for US and European-acquired firms Not significant for MNEs from other regions have no effect.
Fukao and Murakami (2005)	Japan	1994–1998	OLS	Labour productivity and TFP	+ for foreign acquisitions. Not significant for domestic acquisition and other independent firms

Table 1: Literature review on post-acquisition impact on foreign acquisition on firm productivity (ctd.)

Study	Country	Sample Period	Methodology	Productivity Type	Effect on Productivity
Girma (2005)	UK	1989-1996	Propensity score matching and difference-in-difference	Industry TFP	+
Harris, Siegel and Wright (2005)	UK	1994-1998	Panel data using systems GMM	TFP and labour productivity	+
Piscitello and Rabbiosi (2005)	Italy	1994– 1997	OLS	Labour productivity	+
Girma, Kneller and Pisu (2007)	UK	1988-1996	Propensity score matching and difference-in-difference	TFP index	+
Hanley and Zervos (2007)	UK	1990-1996	OLS and instrument for wages using a two stage least squares estimator	Labour productivity as a function of a skills proxy	-
Karpaty (2007)	Sweden	1986–2002	Propensity score matching and difference-in-difference	TFP	+
Bertrand and Zitouna (2008)	France	1993-2000	Propensity score matching and difference-in-difference	TFP	+
Damijan, de Sousa and Lamotte (2008)	Bosnia-Herzegovina, Bulgaria, Croatia, Macedonia, Romania and Slovenia	1994-2002	GMM	TFP	+ for four out of six countries

Table 1: Literature review on post-acquisition impact of foreign acquisition on firm productivity (ctd.)

Study	Country	Sample Period	Methodology	Productivity Type	Effect on Productivity
Fukao, Ito, Kwon and Takizawa (2008)	Japan	1994- 2001	Propensity score matching and difference-in-difference	TFP	+
Salis (2008)	Slovenia	1994-1999	Propensity score matching and difference-in-difference matching	TFP	Not significant
Arnold and Javorcik (2009)	Indonesia	1983-2001	Propensity score matching and difference-in-difference	TFP and labour productivity	+
Greenaway. Guaraglia and Yu(2009)	China	2000-2005	First-difference Generalized Method of Moments	TFP	+ for Joint-ventures + initially for foreign ownership - once foreign ownership reaches beyond 64%
Schiffbauer et al. (2009)	UK	1999-2007	Propensity score matching and difference-in-difference	TFP and labour productivity	Not significant from foreign acquisitions on TFP in the aggregate. + for R&D-intensive manufacturing acquirer and - for marketing-intensive manufacturing acquirer + for labour productivity in manufacturing Not significant in services
Balsvick and Haller (2010)	Norway	1992-2004	OLS	TFP and labour productivity	- for domestic acquisition, + for foreign acquisition
Bandick (2011)	Sweden	1993–2002	Propensity score matching and difference-in-differences	TFP	+ after vertical foreign acquisition only but not significant after a horizontal foreign acquisition
Kaitila, Mc Quinn, Siedschlag, and Zhang (2013)	Austria, Belgium, the Netherlands, Denmark, Finland and Sweden	2000-2009	Propensity score matching and difference-in-differences	Labour Productivity	- although heterogeneity between countries

Table 2: Summary Statistics - Services

	Obs	Mean	Std. Dev.	Min	Max
t-statistic	207	-0.23	1.67	-4.65	4.45
Number of Observations	207	299	198	25	767
Trade Openness (% of GDP)	207	106.65	28.64	54.18	154.10
GDP Size (Billions, PPP)	207	309.00	289.00	138.00	1,590.00
GDP (PPP) per Capita	207	34,293	1,605	31,759	36,196
Human Capital	207	21.65	4.44	13.93	25.17
Financial Development	207	147.46	30.37	111.00	182.44
Market Cap as a % of GDP	207	73.13	28.29	30.22	146.67
Government Effectiveness	207	1.88	0.16	1.65	2.15
Employment Protection Legislation	207	1.98	0.33	0.72	2.19
Product Regulation	207	1.34	0.19	0.91	1.61
BERD as a % of GDP	207	1.81	0.66	0.98	2.77
R&D Personnel per '000	207	15.16	4.41	10.18	23.50
Technology share of Exports	207	10.31	8.74	2.30	36.75

Table 3: Summary Statistics - Manufacturing

	Obs	Mean	Std. Dev.	Min	Max
t-statistic	636	1.76	4.04	-3.97	46.58
Number of Observations	636	22,377	40,482	5	225,954
Trade Openness (% of GDP)	636	66.80	36.80	17.80	154.00
GDP Size (Billions, PPP)	636	1,030.00	1,430.00	4.51	4,560.00
GDP (PPP) per Capita	636	27,587	8,301	2,541	41,757
Human Capital	604	17.70	7.08	2.13	26.40
Financial Development	636	133.89	72.71	19.13	298.00
Market Cap as a % of GDP	559	72.01	32.33	3.00	146.67
Government Effectiveness	390	1.56	0.61	-1.08	2.15
Employment Protection Legislation	564	1.73	0.79	0.60	3.49
BERD as a % of GDP	589	1.70	0.64	0.37	2.77
R&D Personnel per '000	589	13.01	3.69	4.28	23.50
Technology Share of Exports	589	26.92	23.04	0.14	78.10

Note: Due to substantial missing values, data on product market regulation was not available for the manufacturing dataset

Table 4: Countries included in sample

Manufacturing Sample	Services Sample
Austria	Austria
Belgium	Belgium
Bosnia & Herzegovina	Denmark
Bulgaria	Finland
Croatia	Netherlands
Denmark	Sweden
Finland	UK
France	
Indonesia	
Italy	
Japan	
Netherlands	
Norway	
Romania	
Slovenia	
Sweden	
UK	
Venezuela	

Table 5: The Effect of Country Characteristics on the Productivity of Firms following Foreign Acquisition in Manufacturing, Random Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Ln No. of Observations	0.473***	0.544***	0.430***	0.537***	0.586***	0.463***	0.625***	0.593***	0.607***	0.617***
	(0.094)	(0.092)	(0.094)	(0.089)	(0.094)	(0.094)	(0.099)	(0.095)	(0.099)	(0.099)
Productivity (TFP) Dummy	-0.181	-1.018**	-0.769*	-0.466	-0.775*	-0.114	-0.390	-0.585	-0.701*	-1.066**
	(0.413)	(0.436)	(0.428)	(0.382)	(0.415)	(0.414)	(0.412)	(0.414)	(0.424)	(0.455)
Methodology (PSM) Dummy	-0.735	-0.910*	-0.372	-0.098	-0.663	-0.977**	-0.759	-0.710	-0.991**	-0.779
	(0.484)	(0.470)	(0.494)	(0.452)	(0.515)	(0.475)	(0.483)	(0.511)	(0.488)	(0.561)
Ln GDP size	0.235**									
	(0.114)									
Ln GDP per Capita		-1.413***								
		(0.308)								
Trade Openness			-0.023***							
			(0.006)							
Human Capital				-0.086***						
				(0.021)						
R&D Personnel per '000					-0.112**					
					(0.045)					
Financial Development						0.005**				
						(0.002)				
Market Capitalisation as a % of GDP							-0.008*			
							(0.005)			
BERD as a % of GDP								-0.607**		
								(0.255)		
Technology share of Exports									0.046*	
									(0.023)	
Employment Protection Legislation										-0.455*
										(0.257)
Constant	-7.601**	13.055***	0.706	-0.637	-0.518	-1.852**	-1.578*	-1.080	-2.755***	-1.171
	(3.118)	(3.252)	(0.994)	(0.759)	(0.890)	(0.854)	(0.925)	(0.828)	(0.946)	(0.862)
Observations	636	636	636	604	589	636	559	589	544	564
τ^2	13.56	13.22	13.36	10.36	12.49	13.51	13.38	12.50	13.15	12.90
REML Log	-1157	-1148	-1155	-1021	-1049	-1160	-1018	-1048	-984.6	-1012
F-statistic	34.68***	39.75***	37.74***	34.99***	39.28***	35.33***	35.20***	39.12***	38.45***	36.52***
Q	2.580e+08***	2.440e+08***	2.600e+08***	1.640e+08***	1.850e+08***	3.450e+08***	1.820e+08***	1.850e+08***	1.820e+08***	1.830e+08***
I^2	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Dependent Variable: T-statistic

Table 6: The Effect of Country Characteristics on the Productivity of Firms following Foreign Acquisition in Services, Random Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Ln No. of Observations	-0.523***	-0.513***	-0.093	-0.327*	-0.507***	-0.458***	-0.778***	-0.532***	-0.479***	-0.513***	-0.577***	-0.590***
	(0.145)	(0.144)	(0.131)	(0.181)	(0.142)	(0.142)	(0.152)	(0.135)	(0.138)	(0.125)	(0.142)	(0.138)
Productivity (LPT) Dummy	-0.412*	-0.398*	-0.298	-0.339	-0.381*	-0.322	-0.474**	-0.403*	-0.384*	-0.162	-0.480**	-0.316
	(0.228)	(0.227)	(0.193)	(0.229)	(0.223)	(0.223)	(0.219)	(0.212)	(0.217)	(0.198)	(0.223)	(0.217)
Kernel Matching Dummy	0.093	0.132	-0.089	0.083	0.165	0.115	-0.048	0.195	0.017	0.181	0.221	-0.026
	(0.240)	(0.235)	(0.200)	(0.234)	(0.231)	(0.229)	(0.229)	(0.220)	(0.226)	(0.203)	(0.231)	(0.225)
Ln GDP size	0.117											
	(0.222)											
Ln GDP per Capita		1.789										
		(2.406)										
Trade Openness			-0.032***									
			(0.004)									
Human Capital				-0.054*								
				(0.032)								
R&D Personnel per '000					0.072***							
					(0.025)							
Financial Development						0.012***						
						(0.004)						
Market Capitalisation as a % of GDP							0.018***					
							(0.004)					
BERD as a % of GDP								0.876***				
								(0.161)				
Technology share of Exports									0.075***			
									(0.017)			
Government effectiveness										5.008***		
										(0.602)		
Employment Protection Legislation											0.663***	
											(0.207)	
Product Market Regulation												-2.674***
												(0.572)
Constant	-0.301	-15.986	3.874***	2.856***	1.545*	0.594	2.926***	1.191	1.198	-6.855***	1.515*	6.716***
	(5.772)	(25.152)	(0.702)	(0.812)	(0.895)	(1.023)	(0.782)	(0.809)	(0.850)	(1.348)	(0.877)	(1.154)
Observations	207	207	207	207	207	207	207	207	207	207	207	207
τ^2	2.626	2.622	1.885	2.593	2.527	2.497	2.417	2.291	2.400	1.956	2.501	2.371
REML Log	-209.8	-207.3	-180.4	-210.4	-208.1	-208.8	-205.4	-196.3	-203.3	-179.1	-205.0	-198.6
F-statistic	3.897***	3.971***	25.16***	4.586***	6.023***	6.699***	8.552***	11.81***	8.984***	22.41***	6.584***	9.705***
Q	143789***	138841***	98359***	143410***	143681***	143270***	122239***	121448***	125428***	108584***	121450***	130250***
I^2	0.999	0.999	0.998	0.999	0.999	0.999	0.998	0.998	0.998	0.998	0.998	0.998

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Dependent Variable: T-statistic

Table 7: The Effect of Country Characteristics on the Productivity of Firms following Foreign Acquisition in Services and Manufacturing, Random Effects

	Services					Manufacturing				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Ln No. of Observations	-0.523***	-0.519***	0.001	-0.226	-0.216	0.473***	0.491***	0.478***	0.443***	0.500***
	(0.145)	(0.146)	(0.128)	(0.153)	(0.153)	(0.094)	(0.091)	(0.093)	(0.093)	(0.098)
Productivity (TFP) Dummy						-0.181	-1.189***	-1.293***	-0.941**	-0.859**
						(0.413)	(0.431)	(0.450)	(0.405)	(0.407)
Methodology (PSM) Dummy						-0.735	-0.416	-0.335	-0.033	-0.019
						(0.484)	(0.474)	(0.484)	(0.479)	(0.478)
Productivity (LPT) Dummy	-0.412*	-0.406*	-0.256	-0.327*	-0.311*					
	(0.228)	(0.229)	(0.185)	(0.184)	(0.186)					
Kernel Matching Dummy	0.093	0.113	-0.056	0.013	0.011					
	(0.240)	(0.243)	(0.197)	(0.196)	(0.196)					
Ln GDP size	0.117	0.076	-0.034	-0.093	-0.078	0.235**	0.610***	0.528***	0.475***	0.301*
	(0.222)	(0.232)	(0.188)	(0.186)	(0.188)	(0.114)	(0.125)	(0.161)	(0.150)	(0.179)
Ln GDP per Capita		1.552	9.969***	13.952***	13.763***		-2.200***	-2.081***	-1.574***	-1.404***
		(2.519)	(2.188)	(2.633)	(2.647)		(0.343)	(0.373)	(0.394)	(0.405)
Trade Openness			-0.039***	-0.043***	-0.042***			-0.006	-0.005	0.000
			(0.004)	(0.004)	(0.004)			(0.008)	(0.007)	(0.008)
Human Capital				0.085***	0.081**				-0.029	-0.080**
				(0.032)	(0.033)				(0.028)	(0.040)
Financial Development					0.003					0.007*
					(0.003)					(0.004)
Constant	-0.301	-15.456	-99.171***	-139.356***	-138.236***	-7.601**	4.943	6.481	2.882	4.995
	(5.772)	(25.260)	(21.915)	(26.437)	(26.502)	(3.118)	(3.603)	(4.070)	(4.847)	(4.984)
Observations	207	207	207	207	207	636	636	636	604	604
τ^2	2.626	2.634	1.712	1.662	1.665	13.56	12.78	12.79	9.963	9.933
REML Log	-209.8	-208.7	-170.7	-170.8	-176.2	-1157	-1138	-1143	-1015	-1019
F-statistic	3.897***	3.184***	22.15***	20.55***	18.02***	34.68***	37.64***	31.46***	24.85***	22.20***
Q	143789***	137145***	81107***	80128***	80082***	2.580e+08***	2.440e+08***	2.160e+08***	1.620e+08***	1.620e+08***
I^2	0.999	0.999	0.998	0.998	0.998	1.000	1.000	1.000	1.000	1.000

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Dependent Variable: T-statistic

Table A1

Name	Description	Source
Country size	GDP in US dollars, 2000 constant prices	World Development Indicators 2011 (http://data.worldbank.org/)
Economic development	GDP per capita (Purchasing Power Parity) in US dollars, 2005 constant prices	Heston, Summers and Aten, (2011) Penn World Tables
Trade openness	Total of exports and imports divided by GDP, in US dollars, 2005 constant prices	Heston, Summers and Aten, (2011) Penn World Tables
Human capital	The percent of the population over 25 with tertiary education	Barro and Lee (2010) dataset
R&D intensity	R&D personnel per thousand employed	OECD Main Science and Technology indicators, 2011 (www.oecd.org/sti/msti)
R&D intensity	Business expenditure on R&D as a percent of GDP	OECD Main Science and Technology indicators, 2011 (www.oecd.org/sti/msti)
Financial development	Domestic credit provided by the banking sector as a percent of GDP	World Development Indicators 2011 (http://data.worldbank.org/)
Efficiency of the financial markets	stock market capitalisation of listed companies as a percent of GDP	World Development Indicators 2011 (http://data.worldbank.org/)
Government effectiveness	Ranging from -2.5, indicating weak government performance, to +2.5, indicating strong government performance. This captures public perception of the quality of public services, the civil service, the degree of independence from political pressure, the quality of policy formulation and implementation and the credibility of the government to such policies.	World Governance Indicators 2010 (http://info.worldbank.org/governance/wgi/index.asp)
Strictness of employment protection	Ranging from 0 to 6 with higher values indicating stricter employment protection legislation. This summarises employment procedures, notice, severance pay and difficulty of dismissal.	OECD 2010 (www.oecd.org/employment/protection)
Product market regulation	Ranging from 0 to 6 with higher values indicating more regulated product markets. This variable summarises barriers to entrepreneurship, trade, investment and state control	OECD 2011 (www.oecd.org/economy/pmr)
High-tech industry specialisation	export share of technology-intensive industries (aerospace, electricity, instruments, office and computers and pharmaceuticals)	OECD Main Science and Technology indicators, 2011 (www.oecd.org/sti/msti)

Table A2: The Effect of Country Characteristics on the Productivity of Firms following Foreign Acquisition in Manufacturing, OLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Ln No. of Observations	0.474***	0.551***	0.429***	0.551***	0.599***	0.466***	0.627***	0.610***	0.606***	0.634***
	(0.083)	(0.090)	(0.079)	(0.086)	(0.094)	(0.082)	(0.107)	(0.093)	(0.105)	(0.113)
Productivity (TFP) Dummy	-0.284	-1.143*	-0.897	-0.624	-0.899	-0.221	-0.514	-0.681	-0.820	-1.181*
	(0.571)	(0.627)	(0.649)	(0.577)	(0.618)	(0.585)	(0.582)	(0.607)	(0.610)	(0.706)
Methodology (PSM) Dummy	-0.733*	-0.908***	-0.351	-0.087	-0.609**	-0.993***	-0.769**	-0.637**	-0.994***	-0.664**
	(0.390)	(0.315)	(0.361)	(0.295)	(0.301)	(0.333)	(0.307)	(0.324)	(0.307)	(0.322)
Ln GDP size	0.259									
	(0.164)									
Ln GDP per Capita		-1.466***								
		(0.354)								
Trade Openness			-0.024***							
			(0.006)							
Human Capital				-0.092***						
				(0.026)						
R&D Personnel per '000					-0.124***					
					(0.032)					
Financial Development						0.005*				
						(0.003)				
Market Capitalisation as a % of GDP							-0.009*			
							(0.005)			
BERD as a % of GDP								-0.699***		
								(0.166)		
Technology share of Exports									0.049**	
									(0.019)	
Employment Protection Legislation										-0.556***
										(0.205)
Constant	-8.234*	13.577***	0.860	-0.591	-0.447	-1.877***	-1.496***	-1.063**	-2.794***	-1.126**
	(4.637)	(3.834)	(0.582)	(0.552)	(0.615)	(0.702)	(0.542)	(0.509)	(0.716)	(0.563)
Observations	636	636	636	604	589	636	559	589	544	564
R^2	0.181	0.203	0.196	0.192	0.215	0.184	0.202	0.215	0.222	0.212
Adjusted R^2	0.176	0.198	0.191	0.187	0.209	0.178	0.196	0.210	0.216	0.206
F-statistic	35.83***	38.66***	41.21***	53.08***	53.77***	43.29***	28.71***	52.66***	31.55***	40.40***
RMSE	3.671	3.621	3.637	3.205	3.517	3.666	3.650	3.516	3.617	3.568

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Dependent Variable: T-statistic

Table A3: The Effect of Country Characteristics on the Productivity of Firms following Foreign Acquisition in Services, OLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Ln No. of Observations	-0.523***	-0.513***	-0.095	-0.328*	-0.507***	-0.460***	-0.779***	-0.532***	-0.481***	-0.515***	-0.575***	-0.592***
	(0.128)	(0.127)	(0.121)	(0.175)	(0.124)	(0.118)	(0.148)	(0.122)	(0.117)	(0.112)	(0.127)	(0.126)
Productivity (LPT) Dummy	-0.413*	-0.399*	-0.299	-0.340	-0.382*	-0.323	-0.475**	-0.404*	-0.385*	-0.164	-0.480**	-0.317
	(0.226)	(0.227)	(0.197)	(0.227)	(0.224)	(0.223)	(0.216)	(0.212)	(0.219)	(0.208)	(0.218)	(0.218)
Kernel Matching Dummy	0.093	0.131	-0.090	0.083	0.164	0.115	-0.048	0.194	0.017	0.180	0.220	-0.026
	(0.241)	(0.236)	(0.206)	(0.235)	(0.232)	(0.228)	(0.230)	(0.222)	(0.227)	(0.205)	(0.231)	(0.229)
Ln GDP size	0.115											
	(0.178)											
Ln GDP per Capita		1.756										
		(2.007)										
Trade Openness			-0.032***									
			(0.004)									
Human Capital				-0.054*								
				(0.031)								
R&D Personnel per '000					0.072***							
					(0.023)							
Financial Development						0.012***						
						(0.004)						
Market Capitalisation as a % of GDP							0.018***					
							(0.004)					
BERD as a % of GDP								0.876***				
								(0.160)				
Technology share of Exports									0.075***			
									(0.017)			
Government effectiveness										5.002***		
										(0.608)		
Employment Protection Legislation											0.659***	
											(0.227)	
Product Market Regulation												-2.668***
												(0.507)
Constant	-0.255	-15.639	3.889***	2.853***	1.548**	0.603	2.933***	1.192*	1.211*	-6.829***	1.515*	6.721***
	(4.602)	(21.071)	(0.646)	(0.687)	(0.724)	(0.786)	(0.686)	(0.675)	(0.654)	(1.299)	(0.784)	(1.142)
Observations	207	207	207	207	207	207	207	207	207	207	207	207
R^2	0.0721	0.0733	0.333	0.0837	0.107	0.118	0.145	0.190	0.151	0.308	0.115	0.162
Adjusted R^2	0.0537	0.0549	0.320	0.0655	0.0895	0.100	0.128	0.174	0.134	0.294	0.0979	0.145
F-statistic	5.099***	5.357***	27.12***	6.102***	7.208***	6.332***	9.050***	12.64***	8.651***	25.11***	7.452***	10.31***
RMSE	1.622	1.621	1.375	1.611	1.591	1.581	1.556	1.515	1.551	1.400	1.583	1.541

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Dependent Variable: T-statistic

Table A4: The Effect of Country Characteristics on the Productivity of Firms following Foreign Acquisition in Services and Manufacturing, OLS

	Services					Manufacturing				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Ln No. of Observations	-0.523***	-0.519***	0.000	-0.226	-0.217	0.474***	0.493***	0.479***	0.448***	0.510***
	(0.128)	(0.129)	(0.124)	(0.162)	(0.162)	(0.083)	(0.082)	(0.079)	(0.078)	(0.082)
Productivity (TFP) Dummy						-0.284	-1.279**	-1.390**	-1.069*	-0.970
						(0.571)	(0.625)	(0.665)	(0.594)	(0.603)
Methodology (PSM) Dummy						-0.733*	-0.390	-0.303	-0.001	0.014
						(0.390)	(0.346)	(0.345)	(0.273)	(0.275)
Productivity (LPT) Dummy	-0.413*	-0.406*	-0.258	-0.328*	-0.313*					
	(0.226)	(0.226)	(0.191)	(0.186)	(0.185)					
Kernel Matching Dummy	0.093	0.112	-0.056	0.012	0.011					
	(0.241)	(0.244)	(0.198)	(0.194)	(0.194)					
Ln GDP size	0.115	0.075	-0.035	-0.094	-0.079	0.259	0.638***	0.545***	0.498***	0.307***
	(0.178)	(0.185)	(0.173)	(0.169)	(0.169)	(0.164)	(0.151)	(0.148)	(0.127)	(0.118)
Ln GDP per Capita		1.523	9.925***	13.916***	13.728***		-2.270***	-2.136***	-1.619***	-1.430***
		(2.048)	(2.160)	(2.515)	(2.574)		(0.311)	(0.312)	(0.326)	(0.286)
Trade Openness			-0.039***	-0.043***	-0.042***			-0.007	-0.005	0.000
			(0.004)	(0.004)	(0.004)			(0.005)	(0.004)	(0.004)
Human Capital				0.085**	0.081**				-0.031	-0.086***
				(0.033)	(0.034)				(0.032)	(0.024)
Financial Development					0.003					0.008*
					(0.003)					(0.004)
Constant	-0.255	-15.120	-98.695***	-138.948***	-137.831***	-8.234*	4.913	6.610	2.795	5.087
	(4.602)	(21.028)	(22.332)	(26.084)	(26.551)	(4.637)	(5.262)	(5.271)	(3.554)	(3.738)
Observations	207	207	207	207	207	636	636	636	604	604
R^2	0.0721	0.0738	0.399	0.420	0.421	0.181	0.236	0.237	0.234	0.239
Adjusted R^2	0.0537	0.0507	0.381	0.399	0.398	0.176	0.230	0.230	0.225	0.229
F-statistic	5.099***	4.286***	28.90***	26.32***	23.00***	35.83***	35.53***	34.30***	33.50***	33.35***
RMSE	1.622	1.624	1.311	1.292	1.293	3.671	3.548	3.549	3.129	3.122

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Dependent Variable: T-statistic