Estimating the impact of inward offshore industry outsourcing on developing economies*

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Abstract

The purpose of this paper is to provide the first empirical study on the impact of outsourcing in the non-natural-resource-related industrial sector on the economy of the host country. Due to the lack of data on outsourcing, this study uses proxy measures and utilizes static and dynamic econometric models to estimate the nature and magnitude of the impact of outsourcing in 115 developing countries in the period 2000-2012. The effects of outsourcing are compared to those of inward FDI. Results obtained for developing countries in Asia, Latin America, Eastern Europe, the Middle East and Africa are compared. The findings show that outsourcing has positive impact on the recipient economies, but Asia stands out as receiving most benefits while outsourcing has no significant effects on Latin American economies. Eastern European economies benefit from FDI as much as they do from outsourcing. Considering the results and existing theories, potential policies are formulated.

JEL Classification : F14, F21, F43

Key words: offshoring, outsourcing, FDI, developing economies

1. Introduction

Despite the attention that offshore outsourcing currently demands in the public media, there is little empirical evidence on its economic impact. As a consequence of rising fears of job losses associated with the phenomenon, most existing research on the subject is primarily concerned with addressing the perceived job losses in the country of origin, most commonly the USA. The impacts on recipient economies, however, have remained under-researched. This paper surveys the empirical literature on international (also called offshore) outsourcing and attempts to estimate its effects on the opposite

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end, namely recipient developing economies, defined as non-high income by the World Bank. The leading research questions were (1) how to provide a valid measure of inward outsourcing, including how to disentangle it from FDI, (2) how do the effects of outsourcing differ from those of FDI, (3) how do these effects differ across the major regions and income groups and why this is the case. Our focus is on outsourcing in the industry sector (excluding natural-resource-related industries), as opposed to overall outsourcing or outsourcing in services. The motivations are that (1) similar to Alfaro and Charlton's argument, by restricting the analysis to the industrial sector the results can be straightforwardly compared to the existing theories and findings which are more focused on manufacturing than services, (2) industry indicators can be measured relatively easily due to the availability of data, (3) so far no country has skipped the industrialization stage in its development and this is relevant considering that the focus of this study is developing economies, where the industrial sector is usually more important to the economy than it is in developed ones, at least in relative terms. Consequently, the rest of this paper is structured as follows: section two discusses the definition of outsourcing and previous research on its effects in recipient economies, section three presents our contribution to the outsourcing calculation methodology, section four deals with the data, sample and variables used in the empirical analysis, section five contains descriptive statistics and the results of the empirical analysis, section six discusses the implications of these results, section seven outlines policy recommendations based on the analysis, and section eight concludes the paper and suggests paths for future research.

2. Theoretical background

2.1. Offshoring, Outsourcing and FDI: conceptual framework

According to the WTO, there is no accepted definition of "offshoring" in the public debate nor in the economic literature. According to the definition accepted by the WTO, offshoring is defined by firm activities being geographically relocated from the firm's domestic country to a lower-cost foreign country (Sako 2006; Farrell 2004; Levy 2005; Conductor et al. 2010). However, there is variation as to whether offshoring activities are relocated within the same company (see Marin 2006; Miroudot, Lanz, and Ragoussis 2009), or whether they may are outsourced to another firm (see Sako 2006; Contractor et al. 2010). According to Park et al. (2013), in conjunction with the Institute of Developing Economies, and the Japan External Trade Organization (IDE, JETRO), WTO uses the term offshoring to refer to intra-firm trade, foreign direct investments (such as mergers and acquisitions or "greenfield" investment), while international outsourcing is used to refer to arm's length sub-contracting, as presented in Table 0 based on Miroudot (2009).

Table 0. Movement of activities in outsourcing and offshoring

		Geographical location	
		Domestic	Abroad
Organizational location	Within the firm	*(in-house domestic production)*	Foreign Direct Investment (vertical or horizontal)
	Outside the firm	Domestic Outsourcing	Offshore or International Outsourcing

OECD relies on UN's very similar definition, whereby outsourcing means acquiring products or services from an outside (unaffiliated) domestic company or an offshore supplier, whereas offshoring involves either an unaffiliated foreign company (offshore outsourcing) or investing in a foreign affiliate (offshore in-house sourcing, or FDI).[1] Feenstra, who together with Hanson authored the most influential study on measuring the impacts of outward outsourcing, also uses a similar definition (see Table 1).

Table 1. Organization choices for the firm by Feenstra (2010)

		Location of production process	
		Home country	Foreign country
Ownership of production process	In-house	Integration	Multinational
	Outsource	Domestic outsourcing	Foreign outsourcing

Based on these definitions, in this study we use the term offshore outsourcing, or international outsourcing, to designate the partial relocation of a firm's production to an unaffiliated company located in a foreign country, in other words foreign arm's length transactions. We use the term offshoring to designate the combined practices of FDI (relocation production to a foreign affiliate, i.e. a branch of the same company located abroad or a different company controlled by the former) and international outsourcing.

Providing a definition of outsourcing is one thing, but disentangling offshore outsourcing from FDI is not so easy in practice. This is mainly due to the fact that there are two main kinds of FDI – vertical (VFDI) and horizontal (HFDI). Using the skill level required for these different wealth creation practices provides a simple way of classifying them. Considering the skill levels typically required, Alfaro and Charlton (2007) rank the various wealth creation practices in global production sharing in the following way:

(a) Most skill-intensive: Horizontal FDI

(b) Medium skill-intensive: Vertical FDI

(c) Least skill-intensive: Outsourcing

Miroudot (2009), who provides an excellent definition framework for the different kinds of sourcing, points outs that while in theory it is easy to differentiate between vertical FDI and outsourcing, in practice outsourcing and vertical FDI are so similar in their intent and purpose, that a number of authors have argued that there exist few differences between VFDI and outsourcing from the firm's perspective, for example Antràs (2003, 2005), Grossman and Helpman (2002, 2004, 2005). Therefore, when measuring outsourcing the risk of including some VFDI is always present.

2.2. Studies on offshoring to developing countries

While there is a general consensus that FDI is largely beneficial to the host country, especially in terms of productivity gains (see Amiti, and Wei, 2006, Görg and Hanley, 2004, 2005, Egger and

[1] Glossary of statistical terms, OECD.

Egger, 2006, and Calabrese and Erbetta, 2005) there has been no genuine empirical research on how outsourcing affects the recipient economy.

The most relevant study seems to be by Grover (2005), who examines theoretically the benefits of a host country that can be attributed to outsourcing vis-à-vis FDI. Grover claims that the host country is affected in a different way depending on whether production sharing arrangement is internalized by the parent firm in the form of a VFDI relationship or transacted externally through outsourcing contracts. Grover theorizes that a recipient county's ability to maximize benefit in these two regimes is contingent on its absorptive capacity. If the host country's absorptive capacity is above a threshold level, outsourcing is more beneficial to the economy as compared to VFDI and even with an absorptive capacity below this threshold, outsourcing is still as beneficial as VFDI. Grover defines absorptive capacity in terms of the skill level of the labor force. Based on evidence from existing literature, he hypothesizes that an unaffiliated supplier employs a higher skill intensive technique of production vis-à-vis a subsidiary. In other words, ceteris paribus, outsourcing is more skill-intensive than VFDI, partly because local firms use older and less productive technology than foreign subsidiaries, which means that in order to stay competitive they have to employ workers with better skills, who can compensate for the lack of modern technology. One purpose of the present study is to test this hypothesis by comparing the effects of FDI versus outsourcing on various aspects of the economy of the host country.

One of the few papers to engage in an empirical analysis of offshore outsourcing and its impact on productivity was authored by Egger and Egger (2001) who studied the impact of outsourcing on the productivity levels of low-skilled workers using data on 22 manufacturing industries (2-digit NACE) in 12 EU countries over the period 1992-1997. Estimating a production function with CES properties, they found that in the short run, a one percentage increase in the outsourcing intensity would lead to a 0.18% decrease in labor productivity of low-skilled workers. In the long run, which was estimated by excluding specific effects from the regression, this effect was reversed to a 0.53% increase.

This effect is to some extent supported by Siegel and Griliches (1991) while Amity and Wei (2004) find that there is no clear effect on productivity from material offshore outsourcing, but that there are large positive effects from offshore outsourcing in services.

3. Measuring manufacturing outsourcing

3.1. Existing methodologies and issues

A major problem with the definitions outlined in the previous section is that they do not concord easily with officially collected economic data. Outsourcing decisions are made at the micro level of plants or firms, while the official data are generally collected at the sectorial and national level. Despite that, there have been numerous attempts at measuring outsourcing, all of them focusing on outward outsourcing.

By far the most widespread measure of outward offshore outsourcing used in the literature is derived from the model proposed by Feenstra and Hanson (1996a, 1996b, 1999). They estimate outward offshore outsourcing from the USA as the share of imported intermediate inputs over total

costs, which for each industry *i* can be denoted as:

$$\text{Outsourcing}_i = \sum_{j=0}^{n} \left(\frac{X_i^j}{Y_i}\right)\left(\frac{M_i^j}{C_i^j}\right)$$

where X stands for input purchases of good *j* by industry *i*, Y is total non-energy input used by industry *i*, M is import of good *j*, and C is the consumption of good *j*. By restricting their calculation to those inputs that are purchased from the same industry as that in which the good is being produced (using 2-digit SIC industry codes), Feenstra and Hanson calculate a "narrow" measure of outsourcing. They also develop a second measure called "differential outsourcing", which represents as the difference between their total outsourcing estimate and narrow outsourcing.

Although the narrow measure defined by Feenstra and Hanson is widely used, and is in line with the WTO definition of international outsourcing, there is no consensus that it is the most appropriate measure. For instance, as also noted by Olsen (2006), Girma and Görg (2004), argue that the measure is too wide, particularly as far as analyses at the establishment level are concerned.

In the same vein, Abraham and Taylor (1996) suggest an even narrower measure which only includes the contracting out of machine maintenance services, engineering and drafting services, accounting services, computer services, and janitorial services. Egger and Egger's (2001) paper discussed in the previous section, and Helg and Tajoli (2004) also use a narrower measure restricting offshore outsourcing to outward processing. This measure includes only the intermediate exports for processing that are re-imported.

Sitchinava (2008) summarizes outward outsourcing measurement methods and identifies three major types of existing measures using intermediate goods, namely (1) Trade in parts and components, (2) Proxies based on input-output relationships and (3) Others, i.e. processing trade. According to Sitchinava, the first method, trade in parts and components, has been the most common approach to assess the trade in intermediate inputs or global production sharing. Pioneered by Yeats (2001), this line of methodology has focused on the trend of cross-border fragmentation of production, which initially began as North-North trade, but rapidly transitioned into trade between the developed and developing countries. The second input-output approach which estimates trade in intermediate goods combining data on total imports with output data to determine the extent of an industry's purchases of intermediate inputs from overseas suppliers. This is the measure proposed by Feenstra and Hanson (1996). The third group of measures tend to focus on a subset of trade in intermediates. They usually use highly industry-specific and product-specific disaggregated data which is the reason why they are usually greatly limited in the scope of their country, commodity, and year coverage. Studies using this third method seem to be the most common in existing literature.

Despite the differing methodologies, one common thing is the use of trade in intermediates and the related intra-industry trade as a proxy for outsourcing. Since outsourcing operates on the principle of comparative advantage and involves a lot of trade of intermediate as well as final goods, trade in intermediates is obviously related to outsourcing but then the issue of disentangling the effects of trade in intermediates and those of outsourcing comes into question, discussed next.

3.2. Measurement issues

It can be seen that in addition to the ambiguity surrounding the disentanglement of outsourcing and VFDI, when it comes to measuring, disentangling outsourcing from trade in intermediate goods is equally relevant. In relation to the latter, there is also the issue of directionality: seminal studies like the ones by Feenstra and Hason, Hsieh and Woo (2005), Lawrence (1994), Slaughter (2000), Berman et al (1994) and Geishecker and Görg (2005) all rely on data on *imported* intermediate inputs in order to measure *outward* outsourcing. This in itself means that a very strong assumption has been made about the relationship between the direction of outsourcing and that of trade in intermediates, which could cast doubts about the validity of what is 'inward' and 'outward'.

As is well known, the label "Made in country X" implies that the last stage of production, usually the assembly, happened in country X, but it provides neither information about the origin of the components contained in the final product nor information about their added value. The assembly, or the least skill-intensive, most labor-intensive part of the production process, and thus, supposedly, the link of the value chain that has the least amount of value added, is in fact the final step in the production cycle, and following the skill intensity hierarchy discussed in section 2.1 it would be assumed that it is likely to be the part of the value chain that is outsourced abroad, rather than kept at home, which is the assumption of the methodology in question. Therefore, it could easily claimed that outward outsourcing does not in fact involve importing intermediate inputs, but instead, final goods. In this way using intermediate imports to measure outward outsourcing is not completely consistent with the skill intensity hierarchy discussed in section 2.1.

Especially in the case of manufacturing it is logically the country of assembly, which is usually the labor-intensive low-wage country that is the recipient of outsourcing, that needs to import the unfinished goods from either the country where the final good is to be exported, or from a third country that has better technology. Hence, using intermediate imports as the sole factor in calculating outsourcing, involves the risk of calculating the total amount (inward plus outward) outsourcing instead of outward outsourcing only, while at the same failing to include outsourcing of the final assembly stage of the valued chain, whose output is usually final goods. There is also the risk of not taking into account outsourcing that uses inputs originating in the recipient country, and of including intermediate imports from companies in the recipient country not engaging in outsourcing practices.

Most importantly, however, there is the issue of FDI-outsourcing distinction, which is problematic if only intermediate input data is used when proxying for outsourcing. Following the initial seminal study of Feenstra and Hanson, in his 2010 study Feenstra in fact changed the word outsourcing to offshoring in order to include FDI and he uses the term 'offshoring' when he cites his previous studies on outsourcing. He proposes a classification of international production sharing activities summarized in Table 2.

Considering this, while still relying on intermediate good statistics and on the same assumptions about the directionality of trade, the calculation method we propose in the next section tries to partly solve the issue by addressing the crucial distinction of outsourcing vs. FDI.

3.3. Our methodology

In order to measure the total international inward manufacturing outsourcing activity in the recipient economy i for year t we propose the following equation and use it to calculate outsourcing in the empirical part of the study:

$$\omega = \sum_{i=1}^{n} \varepsilon_i - \varphi\alpha_i$$

where ω stands for international inward industry outsourcing, ε is the intermediate exports in industry i, φ is the inward FDI stock and α is the percentage of foreign affiliates of total firms in industry i.

Following the logic of the Feenstra-Hanson method, which uses intermediate imports to account for outward outsourcing, we use intermediate exports to account for inward outsourcing. The United Nations Broad Economic Categories (BEC) 121, 22, 42 and 53 were used to define the term 'intermediate manufactured good' based on Ueki (2011) and Gaulier et al. (2005) who provide a definition of intermediates, according to which products with the following BEC codes can be considered intermediate goods. In fact, their definition also includes category 32, but since we consider this category as related to natural resource industries, it was excluded. Refer to Table 2 for detailed descriptions of the BEC categories. The UN Broad Economic Categories (BEC) classification, which defines the main end-use of products (primary, intermediate, capital or consumption goods) is utilized by a number of other related empirical studies such as Fontagne (2006).

Table 2. Definition of intermediate goods by Ueki (2011) and Gaulier et al. (2005)

3-stage product classification	5-stage product classification	BEC code	Title in BEC
Intermediate goods	Semi-finished goods	121	Foods and beverages mainly for industry
		22	Processed industrial supplies not elsewhere specified
		32	Processed fuels and lubricants**
	Parts and components	42	Capital goods (except transport equipment), and parts and accessories thereof
		53	Transport equipment and parts and accessories thereof

***Not included in outr definition.*

Once the amount of intermediate industrial exports, which is supposed to capture offshoring in its entirety including outsourcing and VFDI, is calculated, the amount of FDI is subtracted from it in order to isolate outsourcing. Since no data is available concerning the amount of FDI for each of these industries, we proxied by multiplying the percentage of foreign affiliates in the non-natural-resource industries by the relative weight of the non-natural-resource industrial sector in the economy, and then by the total amount of FDI stock. Despite seeming far-fetched, the face value of the results is more than satisfactory, as will be discussed in section 5.

In our estimation, we would have liked to account for intermediate exports by local firms not engaging in offshoring practices, as well as non-exported intermediate and final products of outsourcing activities intended for domestic consumption. Unfortunately, due to data constraints, accounting for these was at this stage beyond our capabilities, so it had to be assumed that the opposite

effects of these two potentially existent phenomena would cancel each other out[2]. Future research would be necessary to ascertain the validity of this assumption.

4. Data, sample and variables

4.1. Data

In the data assembly process attention was paid to the following factors: the reputability of the data source, the availability of data over at least a decade for as many countries as possible to ensure a valid panel data analysis, and the standardization of data using units of measurements that ensure comparability without excessive data manipulation in order to ensure a reliable cross-country analysis. For various reasons not discussed here for considerations of space, data which would otherwise be useful to the present study, such as the one provided by ILO, UNIDO, OECD, the World Input-Output Tables and several consultancies was eventually not used. Instead, data was primarily sourced from COMTRADE, UNCTAD, IMF, ITC and the World Bank.

Specifically, data on imports of intermediate goods, which was used to construct the key independent variable in this analysis, was sourced from the COMTRADE unit of the UN. Data on international trade, FDI and other macroeconomic indicators was taken from UNCTAD and IMF. Data on various aspects of economic and social development was obtained from the World Bank. Data on the number of foreign affiliates in a country was taken from ITC. Additionally, data on various aspects of the quality of a country's institutions and political situation was sourced from the Heritage Foundation.[3]

4.2. Sample

Data was sourced between June and September 2014, and it was assembled into a panel consisting of 176 countries, including representatives of all income groups and geographic regions of the world, small and large states alike, considered to be a representative sample, including more than 90% of the 193 UN member states. Some of the relatively large countries not present in the analysis include Uzbekistan, Tajikistan, North Korea, the DRC, Chad, Liberia, as well as some UN non-members with disputed sovereignty (e.g. Western Sahara, Somalia, Kosovo, the Vatican) and countries that only came into being recently and do not report independent data for the entire period of the study (East Timor, South Sudan etc.). It should be noted that since ITC provides data on the number of foreign affiliates only for developing countries, and since the focus of this study is inward outsourcing, which is believed to occurs mainly in low-wage countries, only non-high-income states were used in this analysis, amounting to a total of 115 counties for which key data was fully available (refer to Table B in the appendix).

The time period covered is the years 2000 through 2012. The resulting panel consists of over

[2] Excluding non-exported outsourcing-related production would underestimate the actual intensity of outsourcing practices, whereas including non-outsourcing exports of intermediates would bias it upwards.

[3] The latter was used for constructing instruments using principal component analysis but those were used in the preliminary tests not reported in this paper. It is available on request. Table A in the appendix provides the respective source for each variable in this study.

60 relevant variables, rendering a total of about 150,000 country-year-variable observations. Unfortunately, not every single cell contains data, but STATA defines the panel as strongly balanced, and unit-root tests (in this case, the Fisher unit-root test based on the augmented version of Dickey-Fuller test was used) did not suggest the presence of stationary data. Therefore, the sample data was deemed appropriate for the purposes of the study.

4.3. Variables

Apart from the amount of inward offshore outsourcing, the main independent variable of interest, measured in relative terms as a percentage of a country's GDP and in absolute terms, as outsourcing per employee in manufacturing, using the authors' calculation method, as specified in the previous section, Table A in the appendix provides a list of the control variables used in the empirical part of this study along with their sources. Those include standard factors widely controlled for in related empirical literature such as macroeconomic, demographic and social indicators.

Several dummy variables were also used to control for the income groups and the geographical region of a country with respect to the main locations of outsourcing, namely developing Asia, Latin America, Africa, the Middle East and Eastern Europe in the broad sense. Table B in the appendix contains a full list of the countries in the analysis according to their region.

The selection of dependent variables, on the other hand, was aimed at pinpointing factors that could be used as proxies for the hypothesized beneficial effects of outsourcing on the host economy. Two variables were used, mainly because this would allow for additional robustness tests:

(1) Output (GDP) per employee in non-natural-resource-related industries in constant 1990 USD

(2) Output (GDP) per employee in the entire economy

These dependent variables were expected to capture the direct positive effects of outsourcing on the economy, particularly on manufacturing, without focusing excessively on spillover effects, which are harder to measure. The first one was calculated by subtracting natural-resource rents from the industrial GDP of the country, and then dividing that amount by the number of industry employees. Since the number of employees in natural-resource-related industries, we focus on the more general effects of outsourcing rather than effects on skill levels, and industry-specific effects. One of the main motivations to use these independent variables is also consideration of demographic factors. In countries with high percentage of children (sometimes over 50%) or/and high unemployment/low labor participation/grey economy rates statistics such as GDP per person might provide a very distorted picture of actual productivity levels, which we hope to correct for by using the abovementioned dependent variables.

5. Empirical analysis

Based on the theoretical framework and previous literature discussed in the previous sections, we hypothesize that since outsourcing is the least skill-intensive of the offshoring practices, its amount will be the largest in low-skilled labor-abundant countries, while FDI would be concentrated in countries with a high level of skill concentration. Additionally, we expect positive effects for

outsourcing on the recipient economy. We expect that since outsourcing is relatively a more recent and less skill-intensive phenomenon than FDI, its size will be smaller than FDI, but following Grover, we expect that its benefits on recipient economies might be equal or larger than FDI, though it depends on the absorptive capacity of the country.

5.1. Estimating the size of offshoring

The results from our calculation concerning the intensity of outsourcing in non-high-income economies are presented in Table C in the appendix. After the total amount of outsourcing was calculated, outsourcing was also calculated as percentage of GDP and also per employee in the manufacturing sector.

It can be observed that China is by far the largest recipient of outsourcing with an average annual value added of 341 billion USD, followed by Mexico, Malaysia, Thailand, India, Brazil, Indonesia etc. As a percentage of a country's GDP, outsourcing seems to play a large role in Malaysia, Hungary, Guyana, Papua New Guinea etc.

Especially with regard to the total amount of outsourcing, it can easily be seen that our findings to a large extent coincide with the rankings of major consultancies, which publish annual reports on top performing outsourcing locations[4] (refer to Table D in the appendix). The correspondence is even more striking when it is taken into consideration that we are only estimating outsourcing in industries while consultancies and institutes include services as well.

The rankings also live up to our hypotheses: in contrast to FDI whose amount is positively correlated with the development and industrialization level of a country, we do not see this trend as far as outsourcing is concerned. In addition, the numbers seem fairly plausible, considering the serious shortcomings of our estimation method discussed above.

Having established the satisfactory validity of our estimation, we proceed with the empirical analysis of the effects of outsourcing on developing regions.

5.2. Econometric models

The model was formulated in the following pattern:

(1) $lny_{ij} = \alpha + \beta_1 lnOutsourcing_{ij} + \beta_2 lnInwardFDI_{ij} + \beta_3 lnX_{ij} + \beta_4 AsiaDummy_{ij} + \beta_5 EasternEuropeDummy_{ij} + \beta_6 LatinAmericaDummy_{ij} + \varepsilon_{ij}$

where y represents GDP per employee in constant 1990 USD, 'Outsourcing' and 'InwardFDI' respectively stand for the two dependent variables of interest, inward outsourcing and FDI, 'X' is a vector of control variables, whose number was adjusted for every model with a view to maximizing the amount of explained variance and minimizing multicollinearity. The full list included in the analyses discussed below include gross fixed-capital formation ('GCF') as percentage of GDP, tertiary enrollment ratios, the GINI coefficient of inequality, the percentage of labor force having obtained tertiary education qualification ('TertiarEduLaborForce'), savings as percentage of GDP.

[4] Some consultancies which provide similar rankings are AT Kearney, Clutch, Tholons, Gartner, Inc., Sourcing Line (see references).

The GDP deflator which reflect the relative price levels of a country (including labor costs) and the importance of natural resources calculates as rents as a ratio of GDP ('NatResRents'). 'AsiaDummy', 'EasternEuropeDummy' and 'LatinAmericaDummy' are self-explanatory dummy variables denoting whether a country belongs to the respective region. Eastern Europe in this context includes also all ex-USSR countries.

The model was estimated using ordinary least squares, fixed effects (excluding the dummy variables) and finally using the Arellano-Bond-developed 'xtabond' method using variable lags to correct for endogeneity. All calculations were run using robust standard errors and adjusted R-square. In order to reduce the probability of multicollinearity and to standardize the indicators, all variables used in the analyses reported here are in their natural log format (ln), following the practice in empirical literature.

5.3. Pooled OLS

The results from the OLS regression (Table 3) show that outsourcing does have significant, positive and very large effects on GDP per employee. When FDI is included in the model, the effect of outsourcing diminished slightly but is still 50% larger than that of FDI. When further control variables are added, the effects of FDI become insignificant in contrast to those of outsourcing, which remain robustly significant in every specification and they retain almost the same value, ranging between 0.14 to 0.18, which in logarithmic terms means that 1% increase in the amount of inward outsourcing is related to 0.14 – 0.18 increase in GDP per employee.

Table 3. Pooled OLS

Sample: all countries	Dependent variable: GDP per employee in 1990 USD					
lnOutsourcing (% of GDP)	0.184	0.148	0.177	0.137	0.137	0.146
	(0.015)**	(0.017)**	(0.018)**	(0.021)**	(0.021)**	(0.037)**
Asia	-0.610	-0.549	-0.564	-0.597	-0.597	-0.774
	(0.065)**	(0.068)**	(0.069)**	(0.066)**	(0.066)**	(0.116)**
Latin America	-0.099	-0.128	-0.078	-0.130	-0.130	-0.319
	(0.062)	(0.062)*	(0.063)	(0.068)	(0.068)	(0.119)**
Eastern Europe	-0.179	-0.187	-0.194	-0.341	-0.341	-0.470
	(0.061)**	(0.060)**	(0.060)**	(0.056)**	(0.056)**	(0.093)**
Africa	-1.755	-1.748	-1.644	-1.211	-1.211	-1.376
	(0.057)**	(0.057)**	(0.059)**	(0.083)**	(0.083)**	(0.167)**
lnFDI (% of GDP)		0.091	0.091	0.037	0.037	0.066
		(0.024)**	(0.024)**	(0.024)	(0.024)	(0.035)
lnGCF (% of GDP)			0.158	0.183	0.183	0.476
			(0.057)**	(0.073)*	(0.073)*	(0.111)**
lnTertiaryEnrollment				0.303	0.303	0.263
				(0.031)**	(0.031)**	(0.060)**
lnGINI						0.415
						(0.213)
_cons	9.510	9.124	8.585	7.842	7.842	5.520
	(0.047)**	(0.112)**	(0.196)**	(0.245)**	(0.245)**	(0.902)**
R^2	0.74	0.75	0.75	0.83	0.83	0.75
N	719	708	686	495	495	235

** p<0.05; ** p<0.01; standard errors in brackets; OLS, robust standard errors*

To no surprise, apart from outsourcing, the factors that seem to contribute most to a higher GDP per employee across countries are tertiary education, GCF and inequality (higher inequality meaning higher GDP per employee, as a higher GINI index reflects higher inequality levels). Although preliminary correlations tests revealed no significant correlations, VIF tests were run to confirm the absence of multicollinearity. Considering this, the results are deemed valid and models have a very high explanatory power overall, reaching adjusted R-square of 0.83, further validating our selection of control variables.

5.4. Fixed-effects

In order to explore the effects of outsourcing at the individual country level, the fixed-effects estimation was applied (results in Table 4). In fact, the Hausman test reveals that fixed effects are more appropriate than random effects, which is reasonable considering the huge inter-country variation.

At the country level too, the effects of outsourcing are unwaveringly positive, large and significant at the 0.01 level, regardless of how many control variables are added. The robustness of the results is further supported by the fact that the size of the effects are quite similar in the OLS (0.14 – 0.18) and fixed-effects models (0.08 – 0.15).

The effects of FDI, on the other hand, seem larger and more consistently significant in the fixed-effects model. In fact, at the individual country level, FDI seems to have larger effects than outsourcing in almost all specifications. This is highly plausible since the scale of FDI is larger than that of outsourcing, as revealed by our calculations concerning the size of outsourcing in the previous section. Here too, the explanatory power of the various specifications is quite high, with adjusted R-square of up to 0.81.

Table 4. Fixed-effects

Sample: all countries	Dependent variable: GDP per employee in 1990 USD							
lnOutsourcing (% of GDP)	0.147 (0.013)**	0.077 (0.013)**	0.123 (0.019)**	0.119 (0.019)**	0.095 (0.017)**	0.075 (0.015)**	0.080 (0.022)**	0.091 (0.023)**
lnFDI (% of GDP)		0.144 (0.011)**	0.161 (0.017)**	0.153 (0.017)**	0.146 (0.015)**	0.075 (0.017)**	0.077 (0.022)**	0.086 (0.022)**
lnTertiarEduLabor Force			0.089 (0.032)**	0.098 (0.032)**	0.037 (0.028)	0.030 (0.025)	-0.001 (0.030)	-0.028 (0.034)
lnGCF (% of GDP)				0.074 (0.035)*	0.114 (0.039)**	0.078 (0.035)*	0.050 (0.044)	0.052 (0.044)
lnSavings (% of GDP)					-0.005 (0.022)	-0.009 (0.019)	-0.017 (0.025)	-0.020 (0.025)
lnGDPdeflator						-0.275 (0.041)**	-0.296 (0.051)**	-0.286 (0.051)**
lnGINI							-0.090 (0.121)	-0.097 (0.120)
lnNatResRents (% of GDP)								-0.027 (0.017)
_cons	8.880 (0.011)**	8.291 (0.048)**	8.431 (0.080)**	8.216 (0.128)**	8.320 (0.131)**	9.062 (0.159)**	9.610 (0.524)**	9.687 (0.522)**
R^2	0.17	0.33	0.69	0.70	0.71	0.77	0.81	0.81
N	719	708	241	240	206	206	126	126

** p<0.05; ** p<0.01; standard errors in brackets; fixed-effects, robust standard errors*

5.5. Across regions

We proceed to compare the effects of outsourcing across regions, by including only the countries belonging to the region of interest (Table 5). In order to preserve the degrees of freedom a simple regression with only outsourcing was run. The results show that outsourcing seems to be most beneficial for Asian economies (0.37%), followed by African and Eastern European economies (about 0.20%), with moderately large effects in Middle Eastern economies (0.11%). Finally, in contrast to other regions, outsourcing appears to be irrelevant to Latin American economies.

Table 5. Outsourcing effects across regions

	Asia	CEE	Africa	ME	LA
lnOutsourcing (% of GDP)	0.367	0.203	0.214	0.112	-0.010
	(0.033)**	(0.034)**	(0.032)**	(0.024)**	(0.030)
_cons	8.707	9.308	7.739	9.521	9.542
	(0.050)**	(0.054)**	(0.041)**	(0.036)**	(0.034)**
R^2	0.52	0.17	0.18	0.20	0.00
N	115	170	204	94	136

** p<0.05; ** p<0.01; standard errors in brackets; OLS; robust standard errors*

Adding FDI does not change the conclusions – the values are almost the same, the significance and signs are consistent (Table 6). Interestingly, Eastern Europe seems to be the only region where economies experience significant effects from FDI. The results for the rest of the regions, where outsourcing seems to take precedence, are not significant. Eastern Europe is also the only region where the effects of FDI are larger than those of outsourcing. Assuming that skill levels in Eastern Europe are similar to those in the old advanced economies, while there is a gap in terms of skill endowments between advanced economies and the other regions, the results fit out hypothesis. As already discussed, FDI is considered more skill intensive than outsourcing. Geographical proximity might also be more important for FDI than for outsourcing.

Table 6. Outsourcing and FDI effects across regions

	Asia	CEE	Africa	ME	LA
lnOutsourcing (% of GDP)	0.386	0.165	0.200	0.074	-0.001
	(0.055)**	(0.033)**	(0.038)**	(0.031)*	(0.034)
lnFDI (% of GDP)	-0.032	0.192	0.036	0.083	-0.032
	(0.074)	(0.044)**	(0.049)	(0.042)	(0.061)
_cons	8.799	8.432	7.586	9.171	9.690
	(0.244)**	(0.209)**	(0.206)**	(0.183)**	(0.285)**
R^2	0.53	0.26	0.18	0.23	0.00
N	105	170	203	94	136

** p<0.05; ** p<0.01; standard errors in brackets; OLS; robust standard errors*

Overall, it could be concluded that outsourcing has very large impacts on Asian economies, FDI and outsourcing both have large impacts on Eastern European economies, and outsourcing alone has above-average impacts on African economies (considering the average impacts are about 0.08 – 0.15), and moderate to modest effects on Middle Eastern economies, while neither FDI nor outsourcing

seem to benefit Latin American economies.

5.6. Across income groups

As a further robustness check, we compared the effects of these two phenomena across various income groups (Table 7). Various income classifications were tried out, including the classic World Bank method, but the following one (GDP per capita of under 5,000, between 5,000 and 10,000 and over 10,000 USD per capita), seems to provide the best results in terms of effects and significance. Albeit with a low explanatory power, the model does provide an insight of outsourcing beneficiaries' experiences depending on their income/development level. Namely, poorer developing countries appear to benefit more from outsourcing than wealthier ones, which is again very understandable considering that one of the main factors driving outsourcing is low labor costs. This also provides some support for our assumption that outsourcing tends to focus on lower-skill tasks such as assembly, than FDI.

Table 7. Outsourcing and FDI effects across income groups

Dependent variable: GDP per employee in 1990 USD	PPP GDP per capita < $5,000	PPP GDP per capita $5-10,000	PPP GDP per capita >$10,000	PPP GDP per capita < $5000	PPP GDP per capita $5-10,000	PPP GDP per capita >$10,000
lnOutsourcing (% of GDP)	0.076	0.063	0.040	0.094	0.046	0.054
	(0.033)*	(0.025)*	(0.016)*	(0.036)*	(0.028)	(0.018)**
lnFDI (% of GDP)				-0.060	0.052	-0.053
				(0.047)	(0.033)	(0.035)
_cons	8.200	9.458	9.764	8.436	9.249	10.013
	(0.041)**	(0.032)**	(0.029)**	(0.192)**	(0.143)**	(0.167)**
R^2	0.02	0.03	0.04	0.02	0.04	0.05
N	331	228	160	330	218	160

** p<0.05; ** p<0.01; standard errors in brackets; OLS; robust standard errors*

5.7. Factoring in prices

As a final robustness check, we investigate the factor in price levels, only to have the results confirmed, that is to say, countries with lower price levels tend to benefit more from outsourcing than countries with higher price levels, and that the latter benefit disproportionately more from FDI than the former (Table 8).

Table 8. Outsourcing and FDI effects across price-level groups

	GDP deflator >3	GDP deflator >2	GDP deflator > 1
lnOutsourcing (% of GDP)	0.185	0.160	0.158
	(0.042)**	(0.032)**	(0.030)**
lnFDI (% of GDP)	0.028	0.152	0.207
	(0.058)	(0.044)**	(0.040)**
_cons	8.542	8.112	7.936
	(0.224)**	(0.185)**	(0.172)**
R^2	0.08	0.10	0.13
N	276	594	693

** p<0.05; ** p<0.01; standard errors in brackets; OLS; robust standard errors*

To sum up, from the results in this section, it appears that the typical developing country that benefits most from outsourcing is a low-priced Asian country on the lower end of the income scale, while the typical country that does not is a relatively higher-income and relatively expensive Latin American economy.

5.8. Robustness checks: Using an alternative dependent variable

Additional robustness test, whereby PPP GDP per employee in non-natural-resource-related industries was used as a dependent variable instead of GDP per employee in the entire economy, reveal that the results obtained in the previous section are highly robust, the sole difference being that FDI's effects are two to three times larger than those of outsourcing, as compared to equally large to 50% larger in the previous section (Table 9). Numerically, the size of outsourcing remains unchanged. Another interesting difference concerning the control variables is that while in the economy as a whole GFC seems to be quite important, when it comes to non-natural-resource-related industries inequality seems to have greatly damaging effects and savings – a very large positive impact.

Table 9. Robustness check: using an alternative dependent variable

	ln PPP GDP per employee in non-natural-resource-related industries							
lnOutsourcing (% of GDP)	0.179	0.108	0.109	0.105	0.089	0.085	0.049	0.065
	(0.020)**	(0.019)**	(0.019)**	(0.020)**	(0.018)**	(0.017)**	(0.017)**	(0.017)**
lnFDI (% of GDP)		0.235	0.266	0.259	0.225	0.147	0.183	0.214
		(0.022)**	(0.029)**	(0.031)**	(0.030)**	(0.039)**	(0.046)**	(0.045)**
lnTertiarEdu LaborForce			0.135	0.138	0.252	0.235	0.264	0.225
			(0.052)**	(0.052)**	(0.060)**	(0.059)**	(0.080)**	(0.077)**
lnGCF (% of GDP)				0.068	0.062	0.017	-0.000	-0.009
				(0.075)	(0.081)	(0.080)	(0.099)	(0.094)
lnSavings (% of GDP)					0.247	0.242	0.343	0.319
					(0.048)**	(0.047)**	(0.057)**	(0.054)**
lnGDPdeflator						-0.290	-0.299	-0.266
						(0.095)**	(0.108)**	(0.103)*
lnGINI							-0.671	-0.737
							(0.264)*	(0.252)**
lnNatResRents (% of GDP)								-0.113
								(0.035)**
_cons	7.769	6.733	6.281	6.097	5.331	6.159	8.201	8.583
	(0.019)**	(0.100)**	(0.146)**	(0.249)**	(0.278)**	(0.384)**	(1.189)**	(1.138)**
R^2	0.15	0.32	0.54	0.55	0.64	0.66	0.76	0.79
N	518	508	256	256	217	217	135	135

** p<0.05; ** p<0.01; standard errors in brackets; fixed-effects, robust standard errors*

On a regional level (Table 10), Asia again stands out as the single largest beneficiary of the positive impacts of outsourcing, while in the rest of the regions outsourcing appears as having no significant effects. Meanwhile, in the rest of the regions, except Latin America, FDI seems to play the role that outsourcing is playing in Asia. Conspicuously, the only region where neither FDI nor outsourcing has positive effects on seems to be Latin America.

Table 10. Robustness check: across regions

Dep. var: ln PPP GDP per empl. in non-nat. resource industries	Asia	CEE	Africa	ME	LA
lnOutsourcing (% of GDP)	0.440	-0.012	0.188	-0.227	0.058
	(0.055)**	(0.044)	(0.105)	(0.077)**	(0.033)
lnFDI (% of GDP)	0.032	0.421	0.371	0.355	0.021
	(0.072)	(0.066)**	(0.132)**	(0.088)**	(0.056)
_cons	7.112	5.890	5.877	6.688	7.803
	(0.245)**	(0.308)**	(0.547)**	(0.373)**	(0.271)**
R^2	0.65	0.26	0.33	0.20	0.02
N	79	135	57	69	167

** p<0.05; ** p<0.01; standard errors in brackets; OLS; robust standard errors*

So far the results are very consistent and in line with our assumptions and hypotheses. In order to ascertain the presence of causality, however, we proceed with a lagged-variable estimation.

5.9. Dynamic models: across regions

The Arellano-Bond estimation confirms the presence of causality in the case of FDI, as evidenced from the significant positive effects of the one-lag FDI independent variable, but it fails to do so in the case of outsourcing.

At a region-specific level, FDI seems to generate higher levels of income and productivity in Eastern Europe, Africa and Latin America, but not in Asia or the Middle East (Table 11).

Table 11. Xtabond dynamic models: across regions

	All	Asia	CEE	Africa	LA	ME
L1.lnGDPperemployee	0.832	0.941	0.800	0.901	0.885	0.694
	(0.021)**	(0.022)**	(0.040)**	(0.039)**	(0.069)**	(0.076)**
lnOutsourcing (% of GDP)	0.026	0.051	0.077	0.019	0.012	-0.013
	(0.005)**	(0.015)**	(0.013)**	(0.008)*	(0.012)	(0.010)
L1. lnOutsourcing (% of GDP)	0.002	-0.026	-0.025	0.006	0.008	0.022
	(0.006)	(0.015)	(0.013)	(0.008)	(0.015)	(0.015)
lnFDI (% of GDP)	-0.015	0.041	-0.049	-0.041	-0.010	0.031
	(0.010)	(0.026)	(0.025)*	(0.016)*	(0.025)	(0.020)
L1.lnFDI (% of GDP)	0.036	-0.017	0.051	0.041	0.053	0.029
	(0.009)**	(0.024)	(0.020)*	(0.015)**	(0.024)*	(0.019)
_cons	1.423	0.457	1.890	0.781	0.889	2.676
	(0.172)**	(0.168)**	(0.318)**	(0.297)**	(0.610)	(0.662)**
N	570	87	140	163	109	71

* $p<0.05$; ** $p<0.01$; xtabond

5.10. Dynamic models: across income groups

At the income-group level, (Table 12), in line with results in the previous section, FDI seems to cause higher levels of productivity and income, again, in relatively higher-income economies with PPP GDP per capita of over 5,000 USD.

Table 12. Xtabond dynamic models: across income groups

	PPP GDP per capita < $5,000	PPP GDP per capita $5-10,000	PPP GDP per capita >$10,000
L1.lnGDPperemployee	0.901	0.765	0.700
	(0.032)**	(0.041)**	(0.060)**
lnOutsourcing (% of GDP)	0.016	0.053	0.007
	(0.007)*	(0.013)**	(0.009)
L1. lnOutsourcing (% of GDP)	0.001	-0.002	-0.009
	(0.008)	(0.013)	(0.012)
lnFDI (% of GDP)	-0.020	-0.032	-0.004
	(0.015)	(0.020)	(0.016)
L1.lnFDI (% of GDP)	0.024	0.061	0.039
	(0.014)	(0.018)**	(0.015)**
_cons	0.815	2.091	2.783
	(0.255)**	(0.349)**	(0.518)**
N	257	170	143

* $p<0.05$; ** $p<0.01$; xtabond

6. Discussion

6.1. The extent and impact of outsourcing: summary

To summarize, Asian economies receive the largest amount of outsourcing relative to their economies, closely followed by Eastern European economies. Although Latin America ranks third, and Africa and the Middle East are at the bottom, with half of the relative amount of outsourcing that Asia and Eastern Europe attract (Table 13).

The size of outsourcing and its impacts, however, are not necessarily related. In fact, our results show they are, with the notable exception of Latin America. Depending on the model, our results robustly suggest that 1% increase in outsourcing leads to an average of 0.08-0.15% increase in per-employee non-natural-resource GDP, which is strikingly similar to the average effects of FDI stock, 0.08-0.16%.

The impact of outsourcing is positive in all specifications and ranges from a very large 0.37-0.39% in Asian economies to an above-average 0.17-0.21% in Eastern Europe and Africa, an average 0.10% in the Middle East and below-average insignificant virtually zero effects in Latin America. The corresponding FDI numbers range from 0.20% in Eastern Europe to no effect for other regions, which change to 0.36-0.42% for Eastern Europe, Africa and the Middle East if per capita instead of per employee GDP is used as a dependent variable, the effects remaining zero in Asia and Latin America.

The dynamic tests suggest that the effects of FDI are indeed causal, while outsourcing fails the causality tests, implying that those effects are to a certain extent endogenous, which is inevitably related to the imperfect outsourcing estimation method. Nevertheless, the numbers seem to be valid when compared to existing research. For example, in their analysis of the benefits of offshoring to India, the McKinsey Global Institute (2003) estimates a directly related benefit to the sending US economy of USD 0.09 per corporate dollar invested in offshoring.[5] Benefits to the recipient Indian

[5] This is mainly due to additional exports to India and profits transfers by India-based US providers. Estimating additional benefits of saving USD 0.58 per dollar spent due to lower production costs, as well as approximately USD

economy, in turn, are estimated at USD 0.33 per dollar (Olsen 2006), which is comparable to our results concerning Asian economies, although we use a ln scale.

Table 13. Mean amount of outsourcing for developing economies as % of GDP

year	All countries	Asia	Eastern Europe	Africa	Latin America	Middle East
2000	2.0	4.8	3.3	1.4	2.5	1.3
2001	2.0	4.0	3.1	1.7	2.2	1.3
2002	2.0	4.1	3.1	1.6	2.2	1.4
2003	2.2	4.0	3.7	1.7	2.3	1.6
2004	2.5	4.6	4.4	1.9	2.4	1.8
2005	2.5	4.6	4.6	2.2	2.5	1.7
2006	2.8	5.0	4.9	2.5	2.9	1.9
2007	2.9	5.3	5.5	2.6	3.5	2.4
2008	2.9	5.1	6.1	2.7	3.7	3.1
2009	2.3	4.1	3.9	2.1	3.0	2.2
2010	2.5	4.7	5.0	3.0	3.3	2.3
2011	3.6	5.3	6.5	3.7	3.8	2.6
2012	3.5	5.5	6.1	3.6	3.8	2.7
Average	2.6	4.7	4.6	2.4	2.9	2.0

6.2. Outsourcing: growth and contribution to overall growth

Factoring in the actual growth of outsourcing, as calculated using our method, we are able to calculate its total contribution to the growth of developing economies: an average outsourcing annual growth of 6.2% would translate to an average growth contribution (productivity gain) of 0.49% to 0.93% per industry-employee GDP per annum, which could be as high as 1.3% in Eastern Europe (due its annual growth of 6.9% and average impact of 0.17-0.20%), 0.5% in the case of Asian economies (due its annual growth of 1.3% and average impact of 0.37-39%), 0.9% in the Middle East, and 0.6% in Africa (Table 14).

Table 14. Mean growth of outsourcing for developing economies as % of GDP

year	All countries	Asia	Eastern Europe	Africa	Latin America	Middle East
2001	-1.4%	-17.1%	-5.8%	22.2%	-12.2%	0.1%
2002	0.9%	3.5%	-0.3%	-4.9%	-3.2%	9.3%
2003	8.2%	-3.0%	17.3%	7.0%	6.1%	15.2%
2004	14.7%	13.6%	20.7%	17.9%	3.4%	10.7%
2005	3.6%	0.3%	7.5%	21.1%	5.6%	-0.8%
2006	13.1%	8.3%	9.4%	22.0%	15.3%	14.0%
2007	3.3%	5.9%	18.2%	7.4%	23.3%	32.7%
2008	1.2%	-4.3%	16.8%	4.2%	5.9%	55.1%
2009	-30.7%	-21.5%	-65.7%	-46.4%	-26.8%	-66.7%
2010	10.3%	13.2%	33.7%	66.5%	12.0%	10.0%
2011	56.5%	11.5%	45.1%	51.7%	18.4%	20.3%
2012	-5.2%	4.9%	-13.4%	-7.7%	1.5%	5.3%
Average	6.2%	1.3%	6.9%	13.4%	4.1%	8.8%

0.46 stemming from re-employment of workers who lost their job in the process, they estimate an overall implied economic benefit to the United States of between USD 1.12 and USD 1.14 per corporate dollar spent (updated with 2005 figures the benefit is estimated between USD 1.14 and USD 1.17).

In particular, the low growth of outsourcing in Asia deserves some discussion. Clearly, higher overall level of outsourcing implies slower growth in the first place and as it was seen in the previous section, Asia does engage in outsourcing most actively of all regions. In addition to that, however, there is another aspect to slower growth – absorptive capacity. Whereas the standard argument says that in the presence of positive spillovers offshoring should be promoted and subsidized in the recipient economy, Desmet et al. (2008) argue that temporarily restricting offshoring (FDI) might be necessary for the successful absorption of the spillovers. The authors' argument is based on two features of spillovers, namely they are limited by the economy's absorptive capacity on the one hand, and they take time to materialize on the other. By letting in capital more gradually, Desmet et al. (2008) claim that initial investment has the time to create spillovers and upgrade the economy's absorptive capacity before further investment occurs. Thereby, the economy converges to a steady state with a superior technology and a greater capital stock, which seems to be the appropriate description of the Asian experience.

Furthermore, the figures concerning the contribution of industrial outsourcing to growth reported here will be significantly lower and will vary depending on the overall importance of the industry sector, and employment therein, for the economy of the specific country, as well as the demographics. Countries with a demographic window like China, where people in working age (15-65) account for over 72% of the population and industry is of primary importance (43% of GDP) will evidently benefit more from outsourcing, whereas countries like Guatemala where the population under 15 represents over 40% and industry accounts for no more than 24% will not benefit as much.[6] In this sense, in Eastern Europe where industry typically accounts for 20-35% of the economy the 1.3% additional growth will be in reality similar to the 0.5% contribution in the case of Asia, where industry typically accounts for 30-45% (up to 47% in Indonesia).

6.3. Why Asia? Government policies, geographical factors and origins of FDI

Why Asia is the largest recipient of outsourcing and why its impacts are most visible there is a complex consequence. The question of why Latin America is on the opposite side of the spectrum is equally interesting. In view of the GDP growth trends in the past few decades, in which Asian developmentalism has proved more successful than Latin American one, various pieces of literature have compared and assessed economic developments in these two regions (Hosono and Rivano (1998)). Proactive state action is considered to be one of reasons for success to developments.

Special economic zones

Indeed, special economic zones, one of the main effects of direct government action, abound in Asia, they can hardly be found in Latin America. The exports coming from SEZ in the year 2006 accounted for a staggering 83% of total exports in Malaysia and 80% in Vietnam, while the top performers of Latin America only approximate half that amount: Mexico - 47% and Colombia - 40%.

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[6] Data: Central Intelligence Agency, World Factbook.

Stability

Focusing on stability and risk as major factors influencing FDI, Montero (2008) runs a time-series analysis of fifteen Latin American economies from 1985 to 2003 and concludes that past performance on the current account provides foreign investors with proof of sufficient commitment to stability by regional governments and that the type of political regime, good governance, and reform variables are inconsistent predictors of FDI in the region.

Indeed, a quick look at the current account balance statistics reveals that Asian emerging economies have been performing better than the average for emerging economies, while the opposite is true for Latin America and Eastern Europe. The Middle East and North Africa show wild fluctuations, but this might be attributed to the fact that the region is heavily dependent on natural resource exports.

Import substitution versus export-oriented industrialization

The current account balance as a stability proxy theory can be related to the import substitution versus export-oriented industrialization argument. Academic literature has noted the conscious effort of Asian governments to direct economies towards the latter development path. In the context of Latin American development, the period from the 1950s until the 1980s was characterized by import substitution industrialization in many Latin American countries and those policies came to be referred to as "Latin American structuralism" (Pfefferman, 1997). Export-oriented industrialization, in turn, was particularly characteristic of the development of the economies of the Asian Tigers: Hong Kong, South Korea, Taiwan, and Singapore in the post-World War II period, who set the example for other Asian countries to follow.

Lower costs

Besides exports being directly linked to offshoring, the lower wages in Asia seem to have been an additional factor for attracting outsourcing activities, given that one of the main motivations of outsourcing is to save on labor costs. The nominal GDP per capita is a good proxy for wages and costs (Table 15).

Table 15. Nominal GDP per capita to proxy for wages in 2000-2012

Asia	Eastern Europe	Latin America	Africa	Middle East
3526.29	6523.36	5043.39	1320.09	12388.33

The region looks even more attractive considering that the real GDP per industry employee is larger than the other regions, suggesting higher productivity (Table 16).

Table 16. Average Non-natural resource industry GDP per employee, 2000-2012

Asia	Eastern Europe	Latin America	Africa	Middle East
4907.97	4092.13	3309.81	3002.992	8013.941

Spatial factors

Ivarsson and Alvstam (2005) explore how agglomeration and spatial proximity contribute to the establishment of technology linkages between foreign transnational corporations and suppliers in developing countries. using firm-level data, collected at the bus and truck plants of AB Volvo in China, India, Brazil and Mexico, their main finding is that geographic proximity to an international company is far more important than transaction and communication costs when it comes to opportunities for local firms to absorb external technology. In this regard, Asia certainly holds an advantage over the rest of the regions. This becomes evident if population density is used as a proxy for the agglomeration of local companies (Table 17).

Table 17. Population density as a proxy for agglomeration of local firms

Asia	Eastern Europe	Latin America	Africa	Middle East
320.08	79.98	75.81	87.48	87.30

The origin of FDI and outsourcing and their nature (what industries)

Since outsourcing is to a large extent driven by distance due to high transportation costs, it can be assumed that the origin of offshoring in the various developing regions differs significantly. According to the 'triad' theory of investment blocs (Poon et al., 2000), it would be expected that the major source of outsourcing activities in Asian countries would be Japan, the respective sources for Latin America would be the USA, and for Eastern Europe it would be Western Europe, Africa and the Middle East being mixed, but mostly associated with Western Europe or developed Asia. The origin of offshoring activity is also related to the nature of the industrial necessities of the country of origin. In the case of Asia, the classical example of outsourcing is the production of car parts and assembly of electronic goods, while in Latin America it is the maquiladora-related industries. Thus, the origin of offshoring activities might vastly determine the size of the impact on the recipient economy.

All the factors glossed over in this section are only a brief overview and their importance has been widely researched and are subject to further research. The reason their overview is presented here is mainly to provide a basis for policy recommendations discussed in the next section. Especially in the case of manufacturing it is logically the country of assembly, which is usually the labor-intensive low-wage country that is the recipient of outsourcing, that needs to import the unfinished goods from either the country where the final good is to be exported, or from a third country that has better technology. Hence, using intermediate imports as the sole factor in calculating outsourcing, involves the risk of calculating the total amount (inward plus outward) outsourcing instead of outward outsourcing only, while at the same failing to include outsourcing of the final assembly stage of the valued chain, whose output is usually final goods. There is also the risk of not taking into account outsourcing that uses inputs originating in the recipient country, and of including intermediate imports from companies in the recipient country not engaging in outsourcing practices.

7. Policy implications and concluding remarks

Based on the results of our analysis, as well as on the Asian experience and the theoretical framework concerning the skill intensity of offshoring practices, the following policy recommendations can be formulated:

(1) Countries with a relatively highly skilled labor force should focus on attracting FDI rather than outsourcing. This mainly concerns Eastern Europe and upper-middle income economies.

(2) Countries with skill-scarce labor force should focus on attracting outsourcing contracts rather than FDI. This mainly concerns lower-middle and low income economies.

(3) Economies should focus on building up their absorptive capacity (skill levels) rather than on attracting large amounts of offshoring quickly.

(4) Comparative advantage export-oriented industrialization is preferred over import-substitution practices.

(5) Creating special economic zones and economies-of-scale-style economic 'agglomerations' is recommended for all developing countries.

(6) Maintaining a stable current account balance in order to convince investors and offshoring companies that the economic environment is stable.

Although this study has made a step towards estimating the effects of inward offshore outsourcing in developing economies by developing a methodology trying to resolve the definitional and estimation issues of existing methodologies and to provide the first piece of empirical evidence on a global scale, thereby suggesting policy paths for ensuring sustained productivity and economic growth, the results and estimation methodologies are far from complete and precise, and future research is crucial in order to understand better the implications of outsourcing for the recipient economies.

In particular, future research should account for intermediate exports by local firms not engaging in offshoring practices, as well as non-exported intermediate and final products of outsourcing activities intended for domestic consumption. Grasping the range of outsourcing more appropriately also remains an issue. Although we have challenged the arbitrary assumptions used by previous empirical studies, we still rely on them in the present study, thereby running the risk of calculating the total amount (inward plus outward) outsourcing instead of outward outsourcing only, while at the same failing to include outsourcing of the final assembly stage of the valued chain, whose output is usually final goods. Solving such estimation issues will be the task of future investigations.

According to our research, it turned out that receiving outsourcing could be a driving force of success to economic development. However, since some groups might get loss in the process of promoting outsourcing, they might oppose its prevalence. But it would be necessary for a country's welfare as a whole, to advance free trade.

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Appendix

Table A. List of variables and their sources

Variable	Source
Intermediate imports in BEC 22, 32, 42, 53, 121, total	COMTRADE
Intermediate imports in BEC 22, 32, 42, 53, 122, percentage of total imports	COMTRADE (calculated)
Number of foreign affiliates in manufacturing	ITC (calculated)
Merchandise exports, total value	UNCTAD
Manufacturing, value added in GDP	World Bank
GDP, total (nominal)	World Bank
Inward FDI stock, total	UNCTAD
GDP per employed person in the economy	World Bank (calculated)
GDP per employed person in manufacturing	World Bank (calculated)
GDP, total (nominal)	World Bank
GDP, total (purchasing power parity standards)	World Bank
GDP, per capita (nominal)	World Bank
GDP, per capita (purchasing power parity standards)	World Bank
GDP growth rate, total	World Bank
GDP growth rate, per capita	World Bank
GNI, total	World Bank
GNI, total per capita	World Bank
Inflation rate	IMF
Corporate tax rates	World Bank
Inward FDI stock, total	UNCTAD
Inward FDI stock, per capita	UNCTAD
Inward FDI stock, as a percentage of GDP	UNCTAD
GDP per square kilometer in USD	World Bank (calculated)
Total imports and exports, total	UNCTAD
Total imports and exports, per capita	UNCTAD (calculated)
Total imports and exports, as a percentage of GDP	UNCTAD

Merchandise trade as a percentage of GDP	UNCTAD
Import volume index (2000 = 100)	UNCTAD
Import value index (2000 = 100)	UNCTAD
Export volume index (2000 = 100)	UNCTAD
Export value index (2000 = 100)	UNCTAD
Gross national savings as a percentage of GDP	World Bank
Net migration	World Bank
GINI index	World Bank
GDP percentage generated by the extraction of natural resource	World Bank
Logistics index by the World Bank	World Bank
Gross fixed capital formation as a percentage of GDP	World Bank
GDP per unit of energy	World Bank
Electricity consumption per capita	World Bank
Tertiary enrollment ratio	World Bank
Intellectual property payments (USD)	World Bank
Intellectual property receipts (USD)	World Bank
R&D technicians per million people	World Bank
Patent applications by residents	World Bank
Labor force participation rates	World Bank

Table B. Countries included in the sample

Asia (17 countries)	Latin America (22 countries)	Eastern Europe (25 countries)	Africa (34 countries)	Middle East (17 countries)
Bangladesh	Argentina	Albania	Benin	Algeria
Bhutan	Bolivia	Armenia	Botswana	Egypt
China	Brazil	Azerbaijan	Burundi	Iran
Hong Kong**	Chile	Belarus	Cameroon	Jordan
Macao**	Colombia	Bosnia	CAR	Kuwait
India	Costa Rica	Bulgaria	Congo	Lebanon
Indonesia	Domin. Rep.	Croatia	Cote d'Ivoire	Libya
Malaysia	Ecuador	Czech Rep.	Eritrea	Morocco
Mongolia	El Salvador	Estonia	Ethiopia	Oman
Nepal	Guatemala	Georgia	Gabon	Pakistan
Philippines	Guyana	Hungary	Gambia	Qatar
Rep. of Korea	Honduras	Kazakhstan	Ghana	Saudi Arabia
Singapore**	Jamaica	Kyrgyzstan	Guinea	Syria
Sri Lanka	Mexico	Latvia	Guinea-Bissau	Tunisia
Thailand	Nicaragua	Lithuania	Kenya	Turkey
Timor-Leste	Panama	Montenegro	Lesotho	UAE
Viet Nam	Paraguay	Poland	Madagascar	Yemen
	Peru	Moldova	Malawi	
	Suriname	Romania	Mali	
	Tr. & Tobago	Russia	Mauritania	
	Uruguay	Serbia	Mauritius	
	Venezuela	Slovakia	Mozambique	
		Slovenia	Namibia	
		Macedonia	Niger	
		Ukraine	Nigeria	
			Rwanda	
			Senegal	
			South Africa	
			Sudan	

			Togo Uganda Tanzania Zambia Zimbabwe	

***Excluded from empirical analysis due to being outliers*

Table C. The value added of offshore outsourcing using the authors' methodology

Average annual value added of inward offshore industry outsourcing as % of GDP, 2000-2012		**Average annual value added of inward offshore industry outsourcing, in USD, 2000-2012**	
Malaysia	16.99	China	341,000,000,000
Hungary	15.03	Mexico	80,900,000,000
Guyana	9.57	Malaysia	77,100,000,000
Papua N.G.	8.73	Thailand	55,600,000,000
Zambia	8.19	India	55,100,000,000
Thailand	7.94	Brazil	48,100,000,000
Costa Rica	7.48	Indonesia	38,500,000,000
Ukraine	7.35	Turkey	34,400,000,000
Philippines	6.65	Hungary	28,200,000,000
Belarus	6.46	Philippines	25,400,000,000
Bosnia	6.38	South Africa	25,200,000,000
Mozambique	6.33	Ukraine	23,900,000,000
Bulgaria	6.10	Argentina	19,600,000,000
Mali	5.74	Romania	14,800,000,000
Mexico	5.57	Peru	9,610,000,000
Romania	5.54	Viet Nam	9,430,000,000
Zimbabwe	5.40	Egypt	9,360,000,000
Macedonia	5.14	Belarus	7,330,000,000
South Africa	4.95	Kazakhstan	6,610,000,000
Tunisia	4.28	Bulgaria	5,630,000,000
Peru	4.22	Iran	5,260,000,000
Jamaica	4.15	Morocco	5,210,000,000
Ghana	4.09	Pakistan	5,100,000,000
Kyrgyzstan	3.87	Colombia	4,620,000,000
China	3.80	Tunisia	3,840,000,000
Turkey	3.56	Costa Rica	3,420,000,000
Jordan	3.50	Zambia	3,070,000,000
Fiji	3.48	Ghana	2,680,000,000
Mauritius	3.36	Venezuela	2,460,000,000
Togo	3.27	Sudan	2,380,000,000
Cote d'Ivoire	3.25	Bosnia	1,960,000,000
Morocco	3.03	Jordan	1,890,000,000
Viet Nam	2.78	Cote d'Ivoire	1,560,000,000
Armenia	2.74	Sri Lanka	1,380,000,000
Kazakhstan	2.65	Guatemala	1,300,000,000
Indonesia	2.53	Panama	1,270,000,000
Guinea	2.51	Lebanon	1,210,000,000
Panama	2.48	Syria	1,180,000,000
Senegal	2.44	Papua N.G.	1,140,000,000
Botswana	2.44	Domin. Rep.	1,100,000,000
Rep. of Moldova	2.28	Mozambique	1,090,000,000
Lebanon	2.20	Zimbabwe	1,090,000,000

Brazil	2.16	Mali	1,070,000,000
Bolivia	2.01	Tanzania	1,010,000,000
El Salvador	1.85	Bangladesh	973,000,000
Tanzania	1.82	Macedonia	951,000,000
Paraguay	1.82	Bolivia	889,000,000
Sudan	1.77	Jamaica	860,000,000
Honduras	1.66	Ecuador	795,000,000
Guatemala	1.53	El Salvador	749,000,000
Nicaragua	1.49	Kenya	678,000,000
Georgia	1.35	Paraguay	672,000,000
India	1.31	Botswana	596,000,000
Dominican Rep.	1.22	Senegal	581,000,000
Sri Lanka	1.16	Cameroon	496,000,000
Egypt	1.16	Kyrgyzstan	493,000,000
Colombia	1.14	Mauritius	488,000,000
Cameroon	1.11	Honduras	460,000,000
Malawi	1.11	Armenia	408,000,000
Burundi	1.05	Guyana	362,000,000
Pakistan	0.87	Nepal	329,000,000
Kenya	0.86	Nicaragua	329,000,000
Gambia	0.85	Georgia	312,000,000
Albania	0.81	Uganda	276,000,000
Venezuela	0.76	Moldova	273,000,000
Uganda	0.75	Guinea	256,000,000
Gabon	0.71	Togo	222,000,000
Nepal	0.67	Albania	192,000,000
Ecuador	0.64	Fiji	184,000,000
CAR	0.62	Ethiopia	168,000,000
Iran	0.55	Gabon	155,000,000
Benin	0.53	Madagascar	133,000,000
Madagascar	0.53	Algeria	125,000,000
Niger	0.48	Congo	103,000,000
Congo	0.47	Malawi	90,500,000
Bangladesh	0.35	Benin	71,200,000
Ethiopia	0.25	Burundi	60,100,000
Rwanda	0.08	Niger	52,500,000
Algeria	0.05	Gambia	22,200,000
Yemen	0.00	CAR	16,300,000
Nigeria	0.00	Yemen	10,800,000
Azerbaijan	0.00	Rwanda	10,400,000

Table D. Top Rated Outsourcing Countries according to major consulancies (2014)

AT Kearney (2014)	Clutch (2014)	Tholons (2014)	Gartner, Inc. 2010-11 (not ranked)	Sourcing Line Rankings (2014)
India	India	India	Argentina	India
China	Indonesia	Philippines	Brazil	Indonesia
Malaysia	Estonia	Poland	Chile	China
Mexico	Singapore	Ireland	Colombia	Bulgaria
Indonesia	Bulgaria	China	Costa Rica	Philippines
Thailand	China	Costa Rica	Mexico	Jordan
Philippines	Philippines	Czech Rep	Panama	Singapore

Brazil	Lithuania	Vietnam	Peru	Thailand
Bulgaria	Thailand	Malaysia	Bangladesh	Lithuania
Egypt	Malaysia	Sri Lanka	China	Egypt
Poland	Chile	Brazil	India	Malaysia
Viet Nam	Egypt	South Africa	Indonesia	Estonia
Chile	Jordan	Chile	Malaysia	Chile
US	Czech Rep	Hungary	Philippines	Hungary
Lithuania	Hungary	Argentina	Sri Lanka	Poland
Sri Lanka	Poland	Singapore	Thailand	Czech Rep
Germany	Argentina	Russia	Vietnam	Ukraine
Romania	Latvia	Canada	Bulgaria	Romania
UAE	Sri Lanka	Uruguay	Czech Rep	Latvia
Jordan	Vietnam	Romania	Egypt	Vietnam
Russia	Costa Rica	Mexico	Hungary	
Estonia	Mexico	Ghana	Mauritius	
Latvia	Jamaica	UK	Morocco	
Costa Rica	Romania	Slovakia	Poland	
Pakistan	Russia	Colombia	Romania	
Bangladesh	Ukraine	Ukraine	Russia	
UK	Ghana	Bulgaria	Slovakia	
Tunisia	Israel	Estonia	South Africa	
Ghana	South Africa	Slovenia	Turkey	
Panama	Kenya	Peru	Ukraine	
Hungary	Canada	Indonesia		
Spain	Panama	Morocco		
Czech Rep	Senegal	USA		
Morocco	Pakistan	Puerto Rico		
Slovakia	USA	Turkey		
Mauritania	UAE	Taiwan		
Canada	Tunisia	Egypt		
Argentina	Brazil	South Korea		
Turkey		Australia		
Senegal		Thailand		
Ukraine		Nicaragua		