Outward FDI and Home Country Export Spillover Effects

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Abstract

The interrelationship between outward foreign direct investment (OFDI) and domestic export has been a subject of an unresolved debate on whether they substitute or complement each other. Different strand of studies has been developed with large numbers of existing empirical literatures endorsing the theory of substitution, which argues that OFDI flows have negative effects on exports, compares to the theory of complementarity. This study investigates the impact of OFDI on home countries' exports for different income classification for the period 2003–2019. To overcome problems associated with unobserved heterogeneity, potential endogeneity and omitted variable bias in dynamic panel model with dataset from 179 countries, this research paper employed the system Generalized Method of Moment (GMM) techniques. Estimation results shows mixed and significant effects for the two macroeconomic indicators. OFDI has positive and significant effects on home countries' export for countries with high income, but negatively significant for low income countries, indicating complementarity and substitutional effects respectively. Similarly, 'export-supporting' OFDI is significant, but the effect also varies with income cluster. Home countries' exports from low income economies do not facilitator OFDI. These results will provide useful information on market competitiveness to both policymakers, government agencies and investors.

Keywords: Outward FDI, International trade, complementarity, substitution, SYS GMM

JEL Code: F10; F15, F21

Introduction

Foreign direct investment (hereafter referred to as FDI) and trade are two major components in international economic relations. Over the past decade, the flow volumes of these factors have increased due to waves of globalization and liberalization of trade and investment. According to

statistics from the United Nations Conference on Trade and Development (hereafter referred to as UNCTAD, 2010), international trade on goods and services had increased from US$16 trillion U.S. dollars in 2000 to over US$37 trillion dollars in 2010. But in 2018, the overall world trade growth was 3.0 per cent, much lower than 4.6 per cent recorded in 2017. In the same way, the numbers of parent multinational corporation (hereafter referred to MNCs) had increased from 7000 in 1970 to 82000 in 2008, and its global gross output of foreign affiliate as at 2014 grew to US$20 trillion dollars from US$7 trillion dollars in 2000.

With the increase of MNCs foreign affiliates through greenfield and brownfield investment, global inward and outward foreign investment (hereafter referred to as IFDI and OFDI respectively) also continue to be on the rise, making it one of the largest form of cross border capital flows in recent decades. Whilst global IFDI grew from US$7.5 trillion to US$19 trillion between 2000 to 2010, OFDI increased by 16 per cent from US$1,429 billion as at 2010, to reach an estimated US$1.66 trillion in 2011 (UNCTAD, 2012). However, these flows fell by 49 per cent in 2020 compares to 2019 due to economic crisis caused by COVID-19 global pandemic. The recent decline in FDI flows was much more in developed economies where it plummeted by 69 per cent to an estimated US$229 compares to 12 per cent decrease to an estimated $616 billion for developing economies. These growth and contractions of FDI flows has attracted significant attention from researchers, international investors, and policy makers. And this has led to different strands of literatures, particularly studies which aim to examine the effect of OFDI flow on home country's exports.

However, earlier studies confirmed the usual view that OFDI replaces home exports for U.S. manufacturing firms for produce destined for Canadian market (Horst, 1972). But empirical analysis with the use of exogenous indicators of relative attractiveness showed that OFDI originating from U.S. stimulate home imports and exports (Grubert & Mutti, 1991). OFDI effects on home country's exports for advanced countries showed to be substitutional in the presence of externalities from financial system. These factors may have contributed significantly to international trade imbalances, (Zhao, Liu, Wei, & Andreosso 2017). Findings reveal that OFDI impacts negatively and significantly on home exports (Bhasin & Kapoor, 2020). This Shows that MNCs do not connect with domestic firms through forward and backward linkages. Empirical findings for OFDI effects on exports for the Chinese manufacturing firm productivity are significant and positive, indicating a complementarity relationship (Zhou, 2020). In the context of

Indian pharmaceutical sector, exports and outward FDI have bi-directional causation (Suri & Banerji, 2017). Similarly, OFDI flow and the intermediate exports from Japanese economy has shown to complements each other, but this is in contrast to the growing views that OFDI replaces exports from home countries.

Not too few studies have also examined the effects of OFDI on exports for groups of countries at regional level, for instance, the grouping of Asian economies - ASEAN (Association of Southeast Asian Nations) i.e Malaysia, Philippines, Singapore and Thailand, may provide useful insight for trade and growth performance for the region. OFDI impact on ASEAN countries exports are positive and significant, hence supports the complementary argument (Ahmad, Draz, & Yang, 2016). Other are include, the MENA region economies (Miniesy & Elish, 2017). Empirical results for impact of Chinese OFDI on export sophistication for partners at different regions such as North America, Latin America and Caribbean, Europe and Central Asia, East Asia and Pacific, South Asia, and sub-Saharan Africa, are significant and positive (Rehman & Noman, 2021), Developed and Developing countries - Kang (2012); etc.

Nevertheless, whilst studies such as Joshua, Rotimi, & Sarkodie (2020) examined IFDI and income groups, very little attention has been paid to examining the effects of OFDI on country's exports with regards to income economies clusters. And to the best of our knowledge, no empirical studies have examined the nexus between OFDI and country's exports across world's Bank income economies classification. Therefore, this study contributes to the existing literature by examining not only OFDI-Export nexus but also determine whether export-supporting FDI exist among world's Bank income economies classification.

Methodology and data

We use a panel data of 179 (economies) countries and classify them using world bank income-level classification for the period 2003 – 2019. All data are obtained from both UNCTAD and World Development Indicators (WDI). Data includes, OFDI, IFDI, exports (EXP) of goods and services, Gross Domestic product (GDP), Trade tariff (TRDT), Time spend dealing with export requirements as part of government regulations (TEXP), Human development indicator (HDI), Quality of infrastructure (QINF) and state debts (DEBT). This study contributes to literature by exploring the pattern of causal effects between outward FDI and international trade in World Bank country income clusters such as the low income, lower-middle income, upper-middle income, and

High income. Other income economies groups examined include the middle-income and the world (all income) income economies. Equation (1) shows export dependent regression model which measures the estimated results for effects of OFDI on EXP, and Equation (2) is the investment model which shows the reversed spillover effects of OFDI on EXP (i.e. the effects of EXP on OFDI). To overcome problems associated with unobserved heterogeneity, potential endogeneity and omitted variable bias in the dynamic panel model, the system GMM techniques is employed. The model specifications are,

Model I

$$X_{i,t} = \beta_i + \beta_1 X_{(i,t-1)} + \beta_2 Y_{(i,t)} + \beta_3 Z_{(i,t)} + u_i + \varepsilon_{it} \quad (1)$$

Where X is the log of EXP dependent variable, variable of interest Y is the log of $OFDI$, Z is the set of other explanatory variables such as log $IFDI$, log GDP, log $TEXP$, HDI, log $TRDT$, log $QINF$, log $DEBT$, $\varepsilon_{i,t}$ indicates the error term, (i,t) indicates country $'i'$ in year $'t'$, β_i and u_i are country and time specific-effects respectively.

Model II

$$Y_{i,t} = \beta_i + \beta_1 Y_{(i,t-1)} + \beta_2 X_{(i,t)} + \beta_3 Z_{(i,t)} + u_i + \varepsilon_{it} \quad (2)$$

Where Y is the log of $OFDI$ dependent variable, variable of interest X is the log of EXP, Z is the set of other explanatory variables such as log $IFDI$, log GDP, log $TEXP$, HDI, log $TRDT$, log $QINF$, log $DEBT$, $\varepsilon_{i,t}$ indicates the error term, (i,t) indicates country $'i'$ in year $'t'$, β_i and u_i are country and time specific-effects respectively.

Empirical Results

Table 1 reports the effects of OFDI flow on country's export in equation 1, Table 2, model II shows the results for the reverse causal effects of OFDI on export (export supporting FDI) for different income economies classifications such as the low income, lower-middle income, upper-middle income, and High income. Other income group examined include, the middle and world (all-income) income. We conduct a pre-analysis tests, which includes statistical properties of data, multicollinearity, panel data unit root and endogeneity tests. The correlation matrix and variance inflation factor (VIF) tests detect no multicollinearity among the independent variables in the regression model. The Wu Hausman test revealed absence of endogeneity problem in the models, and based on panel unit roots tests, the null hypothesis of common unit roots is rejected for all

variables across sample data. For the sake of brevity, the pre analysis tests are not displayed but will be available on request.

We employed Blundell & Bond, (1998) two-step System Generalized Method of Moment (hereafter after referred to as SYS GMM) estimation to model I, equation 1. Results shows that except for low income countries, the low-middle, upper-middle, high, middle and world (all-come) income are positive and highly statistically significant (Table 1). This is consistent with some previous studies such as Bajo-Rubio & Montero-Muñoz (2019) which supports a complementarity effect of OFDI flow on exports. OFDI has positive and significant effects on home countries' export for countries with high income, but negatively significant for low income countries, indicating complementarity and substitutional effects respectively (Table 1). These countries' economy has positive GDP which may have stimulated economy growth, hence the thrive (complementarity effects) of such macroeconomics indicators. However, there is a significant positive effect of OFDI on exports for different income clusters, an indication of a complementary relationship. The impact of inward FDI on home countries' exports are also positive and significant for all income economies. This finding is also in line with earlier studies which suggests that inward FDI was exports-oriented and provides a complementarity effect. The lagged exports variable for all income groups examined are positive and significant. This indicates a demonstration effects confirming high persistence of the export variable.

Table 1: SYS-GMM estimation results for spillover effects of Outward FDI on EXP

	World Bank Income Classification					
	Low	Low-Middle	Upper-Middle	High	Middle Income	All Income
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Lagged EXP	0.513*** (32.270)	0.741*** (180.080)	0.561*** (33.750)	0.674*** (94.230)	0.257*** (20.000)	0.237*** (8.350)
IFDI	0.213*** (10.070)	-0.031*** (-2.790)	0.315*** (6.780)	0.054*** (8.730)	0.103*** (4.150)	0.110*** (4.860)
OFDI	-0.207*** (-4.160)	0.025*** (7.820)	0.214*** (9.090)	0.018*** (4.000)	0.147*** (15.890)	0.023** (2.510)
GDP	0.287*** (4.490)	-0.180** (-2.090)	0.450*** (3.360)	0.099*** (4.500)	0.766*** (8.590)	0.121** (2.430)
TEXP	-0.691 (-0.930)	-0.754*** (-5.830)	0.540*** (5.990)	-1.001*** (-9.340)	1.087*** (5.680)	-0.621* (-1.700)
HDI	-1.007* (-1.797)	-0.242 (-1.110)	0.462*** (2.720)	-1.076*** (-4.670)	0.875*** (6.260)	1.395*** (3.190)
TRDT	0.161 (1.142)	0.255*** (7.170)	-0.101* (-1.760)	0.007 (0.150)	0.123*** (4.190)	0.179*** (4.190)
QINF	-0.181	-0.760***	0.118***	0.718***	0.821***	0.513***

	(-0.710)	(-10.800)	(5.480)	(15.790)	(5.990)	(3.450)
DEBT	-0.354* (-1.846)	0.354*** (7.270)	0.249*** (5.060)	0.057*** (-24.230)	0.149*** (3.850)	-0.151** (-2.190)
Constant	2.445 (1.400)	5.566** (10.860)	-6.749*** (-6.480)	5.948*** (10.870)	-0.708 (-1.270)	5.134*** (6.210)
Nos. of Obs/Grand	400/4260	704/7480	880/9350	880/9350	1584/16840	2864/30430
Nos. of Instrument	25	44	46	50	79	71
Nos. of Groups	25	44	56	55	99	179
Wald test p-value	0.000	0.000	0.000	0.000	0.000	0.000
AR (1) *p*-value	0.006	0.005	0.012	0.034	0.005	0.000
AR (2) *p*-value	0.291	0.264	0.199	0.714	0.212	0.305
AR (3) *p*-value	0.748	0.197	0.268	0.524	0.226	0.483
Hansen *p*-value	0.783	0.380	0.230	0.202	0.481	0.201

Source: Author's calculations
EXP is lagged one year
t-statistics are in parentheses and all standard errors are two-step.
Significance: * p<0.1; ** p<0.05; ***p<0.01

Quality of infrastructure (QINF) for upper-middle, high income, middle and World (all income) income economies are also positively significant. This suggest that a per cent increase in QINF for such economies will boost exports by 11.8%, 71.8%, 82.1% and 51.3% respectively. This implies the existence of complementarity effects of OFDI on exports. The results for impact of state debts (DEBT), HDI, TEXP and trade tariff on export across different income economies are mixed but significant. Studies have argued that positive or negative effects of state debt depends on the cause. However, as expected, state DEBT and government regulations on export (TEXP) indicates negative effects on exports in world (all-income) income as well as countries with low economies. This means that 1% rise in DEBT lead to 23.4% drop in exports of goods and services for low economy countries (Table 1). The negative effects of state DEBT on exports in low countries can be one of the reasons OFDI provides substitutional effects on exports, as debtors countries may have been forced to cut down drastically its export and imports, volume.

The estimation results of model II, shown in Table 2 indicate that 'export-supporting' FDI are positive and significant for all income economies except countries with low income. This indicates that export do not boost or provide complementarity effects in low income countries. Past values of OFDI flow have positive and significant effects on the current FDI for all income classification. This shows that past FDI is a good predictor of current FDI. The OFDI lag of one-year period in the explanatory model are used to assess its dynamic effects. Results from the estimation analysis, also showed that other microeconomic indicators such as HDI, TRDT, QINF,

DEBTS are crucial drivers of home countries' economies, and that its spillover effects on home country exports are either positive or negative based on the country's income group. The reports model diagnostics results shown at the lower end of Table 1 and 2 indicates that the Arellano-Bond tests AR (2) & AR (3) statistics for serial correlation are insignificant, suggesting the absence of second-order autocorrelation in the residuals for all income economies. And Hansen tests of over identifying restrictions are also insignificant indicating that the instruments are valid and not correlated with the residual. This validate the adequacy of model I & II in equations 1 & 2.

Table 2: SYS-GMM estimation results for exports supporting Outward FDI

	World Bank Income Classification					
	Low	Low-Middle	Upper-Middle	High	Middle Income	All Income
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Lagged OFDI	0.217*** (4.120)	0.171*** (6.660)	0.091*** (4.890)	0.148*** (5.172)	0.313*** (27.480)	0.227*** (11.480)
IFDI	0.272* (1.740)	-0.271*** (-4.410)	0.765*** (14.630)	1.004*** (14.340)	0.512*** (13.490)	0.330*** (7.910)
EXP	-0.199*** (-4.010)	0.058** (2.590)	0.169*** (11.450)	0.229*** (-3.430)	0.507*** (22.290)	0.071*** (2.780)
GDP	0.827*** (3.170)	0.197*** (3.400)	-0.527*** (-2.690)	1.091*** (10.600)	0.438*** (5.110)	0.772*** (0.001)
TEXP	1.042 (0.610)	0.813*** (3.620)	-1.011** (-2.050)	-0.513*** (-10.440)	0.360 (1.220)	-0.312*** (-4.970)
HDI	0.208* (1.740)	0.695*** (4.600)	0.284*** (5.480)	-0.132*** (-4.590)	1.007*** (3.030)	0.310*** (3.970)
TRDT	1.005** (2.560)	1.053*** (7.830)	-0.280* (-1.740)	1.098*** (2.760)	-0.190*** (-5.860)	-0.014 (-0.250)
QINF	-0.075 (-0.070)	1.019** (2.690)	-0.605* (-1.980)	1.054*** (5.000)	0.940*** (6.520)	0.501*** (3.220)
DEBT	-0.122*** (-3.380)	0.456** (2.200)	-0.278*** (-4.930)	-0.176*** (-3.380)	-0.236*** (-4.800)	-0.153*** (-2.91)
Constant	-6.516 (11.260)	-3.807** (-2.140)	-4.487 (-0.310)	5.258*** (7.690)	-6.908 (-1.320)	1.864* (1.890)
Nos. of Obs/Grand	400/4260	704/7480	880/9350	880/9350	1584/16840	2864/30430
Nos. of Instrument	25	44	46	50	79	71
Nos. of Groups	25	44	56	55	99	179
Wald test p-value	0.000	0.000	0.000	0.000	0.000	0.000
AR (1) *p*-value	0.006	0.005	0.012	0.034	0.005	0.000
AR (2) *p*-value	0.291	0.264	0.199	0.614	0.342	0.215
AR (3) *p*-value	0.748	0.197	0.268	0.564	0.226	0.483
Hansen *p*-value	0.783	0.380	0.230	0.207	0.481	0.201

Source: Author's calculations
OFDI is lagged one year
t-statistics are in parentheses and all standard errors are two-step.
Significance: * p<0.1; ** p<0.05; ***p<0.01

Conclusion

This study examines the relationship between outward FDI and home country's export flows, with support for both theory of vertical and horizontal FDI. The effects of Outward FDI flows on home countries exports is mixed for different income clusters. Low income countries exports of goods and services are affected negatively by the multinational corporation investment abroad. This finding follows Knoerich (2017) views which argues that low-income countries are less likely to benefit from OFDI because they lack investment capital. The estimation results of infrastructure, debts, HDI, etc. may be some the reasons for the weak competitive status of the home countries firms. Therefore, policymakers and other relevant governmental agencies should review and adopt policies that improves and re-establish the domestic firms for efficient production and increase in competitiveness. Implementation of FDI laws that controls and examines the inflow of FDI on a large scale should also be reinforced, so as to prevent the drawback arising from liberation of OFDI. However, report shows that OFDI complements home countries' exports in other income economies classifications (low-middle, upper-middle, High income). Similarly, 'export-supporting' OFDI effects also differs across different income groups. Exports of goods and services from low-middle, upper-middle, High income etc. shows to complement OFDI flow. This suggests that export plays a major role in supporting as well as the promotion of foreign sales.

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