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### Landlockedness, foreign direct investment, and export diversification

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**Abstract.** This paper contributes to the literature on the determinants of export diversification in developing countries by addressing the landlockedness issue and foreign direct investment. Although there are some papers analyzing the impact of foreign direct investment on export diversification, the specific focus of the geographical disadvantage, being landlocked, is largely overlooked. The empirical analysis focuses on a sample of 92 developing countries covering the period 1996–2018. The result of the system GMM estimation indicates that the landlocked status influences negatively export product diversification for the sample. Furthermore, the result of the interaction term indicates that the landlocked status worsens the positive effectiveness of FDI in the diversification process for developing countries.

**Keywords:** landlockedness, export diversification, direct investment, developing countries, system GMM

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### Introduction

It is widely accepted that in addition to a country's export performance, the diversification of an export portfolio has a positive effect on economic growth and development. In other words, higher export diversification can lead to higher growth. For instance, while Romer [1] identifies diversification as a production factor, Acemoglu and Zilibotti [2] believe that export diversification eventually increases income by spreading investment risks out over a wider basket of economic activities. Furthermore, many studies have identified the robust evidence of a positive effect of export diversification on economic development both empirically and theoretically (see, e.g., Lederman and Maloney [3], Hesse [4], Aditya and Roy [5]).

Most developing countries, however, rely on a limited number of commodity exports and the global market demand for those commodities is inelastic and unstable. Thus, the export revenues of these countries have become volatile

thereby it harms their domestic economies [6]. In particular, for landlocked developing countries (LLDCs), one can see much higher trade costs, the dependence on transit neighbor countries, and more concentrated export baskets compared to those of non-landlocked developing countries (non-LLDCs) according to the reports of international development organizations.

The obvious characteristics of landlocked developing countries are: 1) the lack of access to a sea-port, 2) being far away from major world markets and, 3) relatively small geographical, population and economy sizes. More than half of the 32 landlocked developing countries refer to the least developed countries and all of them face trade and development challenges [6]. Landlocked developing countries trade 30% less than coastal developing countries [7] and have the 20% lower development level than a comparable non-LLDC [8]. In addition to these facts, about 80 percent of the landlocked developing countries are classified as the commodity dependent countries.

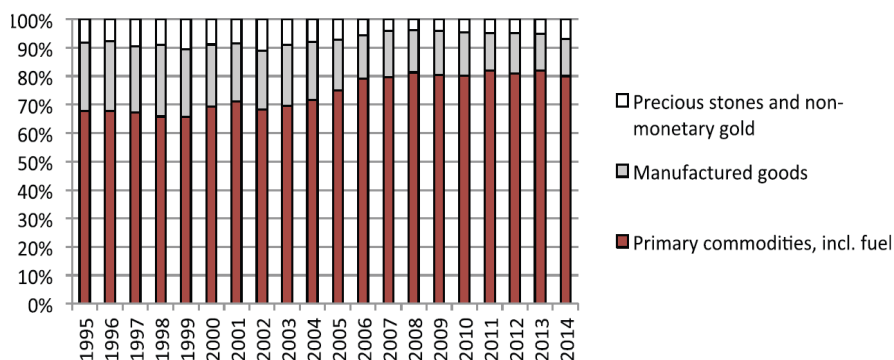


Figure 1. The export structure of LLDCs, percentage of exports value.

*Source: UN-OHRLLS (2016)*

Figure 1 illustrates that the percentage of primary commodities had increased gradually since 1995 and accounted for 80 percent in 2014, which shows the higher dependency on commodity exports for landlocked developing countries.

The constraints of LLDCs mentioned above could decrease the ability of expanding their trade and attracting certain types of foreign direct investment. Since the majority of LLDCs have a small domestic market and a narrow resource base, they have experienced diseconomies of scale on both the production and consumption sides. As a result, for these countries, attracting FDI, in particular export-oriented (i.e. efficiency-seeking and resource-seeking FDI) and import-intensive FDI, is more challenging than for non-LLDCs. In addition, the small size of the countries also limits market-seeking FDI [9].

Whereas many studies have addressed the role of FDI in economic growth or export performance, papers examining the FDI impact on export diversification are quite few. Banga [10] found that the effect of FDI on export diversification depends on the industrial sectors to which FDI is allocated. Tadesse and Shukralla [11] observed also that there were varying impacts of FDI on

horizontal export diversification depending on the existing stock of FDI and level of diversification. Gourdon [12] found the mixed results of the FDI effect on export diversification. He concluded that removing the impediments to FDI has been scaled-up export diversification for resource-poor nations in the MENA region. More recently, Fosu [13] found that the own effect of FDI on export diversification is insignificant, but the interactive effect of FDI and infrastructure is positive and highly significant.

None of the above studies, however, address the impact of landlockedness in the influence of FDI on export diversification. Identifying the systematic difference in the effectiveness of FDI on export diversification between LLDCs and non-LLDCs should yield valuable policy recommendations to the international organizations that deal with LLDCs and the governments of the countries. In this study, I focus on the interactive effect of FDI with landlockedness on export diversification.

I test not only the direct effect of landlockedness on export product diversification, but also its indirect effects through foreign direct investment. I postulate that higher trade costs and the dependence on transit partners could reduce the competitiveness of exporting activities substantially in LLDCs (*hypothesis 1*). However, the impact of FDI on export diversification could be less for LLDCs than for other developing countries (*hypothesis 2*).

The rest of the paper is structured as follows. The second section provides the literature linking the concepts involved in the study namely, landlockedness, FDI, and export diversification, in particular, theoretical arguments are considered. The third section discusses the methodology of the paper. It includes model specification, econometric issues, data and variable definitions. Some stylized facts of the variables of interest and the results of the statistical analysis are discussed in the fourth section and it concludes with a fifth section.

### **The literature review: Theoretical insights**

This paper addresses three concepts, namely, foreign direct investment, export diversification and landlockedness. Therefore, I briefly review, in particular, the possible theoretical links between these concepts.

For the relationship between geography, trade and development, the following studies can be considered. Gallup et al. [14] concluded that location and climate have a crucial impact on development, channeled by transport costs, disease burden and agricultural productivity. They also found that the transport costs of intermediate inputs were critical determinants for the success of export activities in developing countries. Paudel and Cooray [15] examined the determinants of export performance in developing countries and compared landlocked developing countries with non-landlocked developing countries. The results of the study suggested that because of the inherent additional trade costs, LLDCs' export performance was lower than that of non-LLDCs. They also argued that the exports from LLDCs are highly influenced by distance-related trade costs than the exports from other developing nations. One of the main

impediments of trade was international borders. The international borders have a significant negative impact on trade (see, e.g., McCallum [16]; Anderson and Wincoop [17]). On the other hand, distance between countries is an important determinant of trade. While Bernard et al. [18] showed a negative relationship between distance and trade flows, Baldwin and Harrigan [19] provided evidence that distance causes to increase “zero exports”.

Prankel and Romer [20] contended that a country’s geography is fixed and it mainly affects national income through trade. They used the variation in trade that is due to geographic factors as a natural experiment in order to determine the effect of trade on growth. Additionally, the factors such as transport costs, environment diseases, and agricultural technology that are determined by physical geography and climate are important determinants for development [21]. However, landlockedness is only one part of the geographic features of a country. Most of the studies that directly focused on the landlocked issue analyzed the impact of landlockedness on economic growth within the cross-country growth regression framework using a landlocked dummy variable (see e.g., Gallup et al. [14]; Mackellar et al. [22]; Collier [23]; Paudel [24]). These studies concluded that being landlocked has a negative effect on economic growth.

Although the benefits of export diversification have been widely acknowledged in the diversification literature, there is no clear theoretical framework that links export diversification to its determinants (Bebczuk and Berretton [25]). However, we can collect some of the results showing the factors that influence export diversification. For example, based on a Ricardian model with continuum of goods, Dornbusch, Fischer, and Samuelson [26] argued that the tariff reduction and lower transport costs cause to increase the export variety. Later, Eaton and Kortum provided an appropriate framework for a formal examination, as a statement in the article shows: “A source with a higher state of technology, lower input costs, or lower barriers exploit its advantage by selling a wider range of goods” [27].

This framework is extended by Naito [28]. He showed that the liberalization policy increases trade diversification. Krugman [29] presented the evidence that the number of varieties that a country produces is proportional to the size of the economy which means the exporting country size is associated positively with the export diversification. For the development level, Acemoglu and Zilibotti predict: “the process of development goes hand in hand with better diversification opportunities and more productive use of funds” [2].

Whereas some empirical studies including De Benedictis et al. [30], Parketa and Tamberi [31] suggested the monotonic relationships between economic development and diversification, Cadot et al. [32], Imbs and Wacziarg [33], and Koren and Tenreyro [34] illustrated non-monotonic ones. Additionally, Agosin et al. [35] revealed that having a greater availability of specialized human capital allows firms to produce a wider range of goods through research and development.

I also found some of the studies that can be related to the link between FDI and landlockedness. For example, Cárcamo-Díaz presents that: “the tendency in

recent years towards international dispersal of the production chains of multinational enterprises has made transport costs a very important factor in the choice of location for foreign direct investment (FDI)” [36].

This statement implies that the capability of attracting FDI into the LLDCs may be lower than that of other developing nations because of the higher trade costs faced by LLDCs. An article by Radelet and Sachs [37] analyzes the connection between shipping costs and manufactured exports and draws the conclusion that firms in the countries that have higher shipping costs will have to accept lower returns on investment to compensate for higher trade costs. Bouras and Ragad [38] suggest that lower transport costs can increase vertical FDI through applying cheap labors.

Considering the overview of the literature review, the marginal contribution of this study can be determined. The studies that focused on the constraints due to landlockedness are generally specific to the links between landlockedness, trade costs, and infrastructure or landlockedness and economic growth. On the other hand, the literature on the determinants of export diversification has mostly focused on the economies at all levels of development or on the majority of developing countries. In addition, several studies are conducted sampling the nations located in the same regions such as countries in Africa or in Sab-Saharan Africa. A small number of papers examine the impact of landlockedness on trade but not on export diversification. To the best of my knowledge, there is no systematic research that focused on the relationship between landlockedness and export diversification. Therefore, the present study tries to fill this gap giving a special attention to foreign direct investment.

## Methodology

**1. Econometric model and estimation technique.** I test the hypotheses laid out in the introduction by specifying the baseline model (1), based on the literature on the determinants of export product diversification (e.g. Agosin et al. [35]; Osakwe and Kilolo [39]; Amighini and Sanfilippo [40]; and Gnangnon [41]). These studies have included a set of independent variables such as development level, human capital, institutions, foreign direct investment, country size, and the endowment of natural resources. Therefore, my baseline empiric model is specified as follows:

$$ED_{it} = \beta_0 + \beta_1 ED_{it-1} + \beta_2 L_i + \beta_3 FDI_{it} + \beta_4 L * FDI_{it} + \beta_5 X_{it} + \eta_i + d_t + \varepsilon_{it} \quad (1)$$

where the subscript  $i$  represents a given country,  $t$  denotes the time period,  $\eta_i$  indicates the unobserved country-specific fixed effect, and  $d_t$  is a time dummy.

$\varepsilon_{it}$  an error term which is assumed to be  $IID(0, \sigma_\varepsilon^2)$ . Because of the persistence over time of the proxies of export diversification, a lagged dependent variable ( $ED_{it-1}$ ) is included in the right hand side of the equation.  $ED$  is a measure of export diversification. The log of number of products exported and the normalized Herfindahl-Hirschman index are used as export diversification measures in this

study.  $L_i$  stands for a landlocked dummy and,  $FDI_{it}$ , the variable of interest, presents the flows of foreign direct investment for a developing country  $i$  and in the period  $t$ .  $L * FDI_{it}$  is an interaction term of FDI with landlocked dummy. A matrix of other explanatory variables is presented by  $X_{it}$ .

For estimation purposes, we transform the annual series over the period of 1996–2018 into non-overlapping three-year averages following Kim [42]. The reasons for integrating my data every three years are: 1) the relatively long-run impact of FDI on export diversification, and 2) to reduce the effect of business cycle on the results.

To test the hypotheses mentioned in the introduction, a dynamic panel data model should be used due to the great persistence of the dependent variable. In the specification (1), it is important to note that the OLS method cannot be applied because the estimator is biased in presence of country-fixed effects or lagged dependent variables on the right hand side of the equation. Also my variable of interest, the landlocked status, is a time invariant variable. For this reason, the system Generalized Method of Moments (GMM) estimator is used as a preferred estimation method. The system GMM corrects for the reverse causality, the problem of heteroscedasticity and autocorrelation, and the omitted variable bias [43]. Compared to the difference GMM estimator, the system GMM method has better properties for finite sample bias and root mean squared error [44]. For the GMM framework, the validity of instruments is tested by the Hansen test. In addition to the Hansen test, proposed by Hansen [45], second-order autocorrelation test by Arellano-Bond [46] is also used for the confirmation of valid instruments. In order to correct standard errors, small sample adjustment and robust standard errors are used in the estimation procedure. Concerning a reverse causality problem, the level of development, human capital, natural resource rent, and FDI are considered to be endogenous.

**2. Data sources and sample.** The data used in this study sourced from several databases. To construct the Herfindahl-Hirschman index and the number of exported goods, I used the BACI database, compiled by the CEPII (Centre d'Etudes Prospectives et d'Informations Internationales) based on the data reported by the United Nations COMTRADE. The aim of the BACI database is to provide comprehensive and disaggregated values, and quantities of international trade for the wider range of countries, products, and years [47]. For the product disaggregation level, the data used the Harmonized System (HS) at the 6-digit level. In this disaggregation level there are more than 5000 products, and it is the thinnest one available for an international comparison. The other advantage of the data is their larger geographical coverage (more than 200 countries). Many low income countries including most of the LLDCs have not reported their international trade flows every year to the United Nations Statistical Division. If there is only one figure for a trade flow reported only by the importer, BACI provides a unique reconciled value for each flow reported at least by one of the partners. Therefore the data allows us to analyze the trade patterns of many non-reporting LLDCs.

Most of the independent variables including GDP per capita, economy size, human capital, and the natural resource rents are collected from the World Development Indicators (WDI) database by the World Bank. The inflow of foreign direct investment is obtained from the United Nations Conference on Trade and Development statistics. The institutional quality is proxied by government effectiveness and sourced from the world governance indicators.

The sample used in this study covers 92 developing countries including 28 LLDCs based on the State of Commodity Dependence by UNCTAD. The choice of the developing countries is dictated by the availability of data. However, Small Island Developing States are excluded from the sample since some of their characteristics such as small economy size, remoteness from markets, and high production and trade costs are similar to those of LLDCs. Due to the availability of the BACI database, the estimation used the data over the period between 1996 and 2018. As mentioned, the previous section averaging by three years leaves us eight periods of time.

**3. Variable definitions.** Countries' export can increase in intensive and extensive margins. The intensive margin means a more evenly distribution of the existing export baskets, while diversification at the extensive margin is measured by the greater number of export products [48]. I am interested in the variation at the both margins of export diversification. In the income inequality literature, Herfindahl, Theil, and Gini indices are the frequently applied concentration measures. Export diversification is measured using some of these indexes as well and my study applies the normalized Herfindahl-Hirschman (HH) index as one of the two measures of my dependent variable. The normalized HH index using HS 6-digit category is calculated as follows:

$$H = \frac{\sum_k (s_k)^2 - 1/n}{1 - 1/n} \quad (2)$$

where  $s_k$  is the share of export line  $k$  in total exports, and  $n$  is the maximum number of HS 1996 product categories (5115). This measure indicates the intensive margin of exports. Note that the HH index is a concentration measure and a higher value of the index indicates lower export diversification<sup>1</sup>.

The other proxy of the dependent variable is the log of number of products exported and it represents the extensive margin of exports. The number of export lines is also constructed using the HS 6-digit categories. This is an extensive margin of exports.

The landlocked status is one of the main variables in this paper and represented by a landlocked dummy variable which takes value of 1 if a given country is landlocked and 0 otherwise. The second variable of interest is net FDI inflows as percentage of GDP. Although there are some theoretical mechanisms underlying a positive connection between FDI and export diversification, the potential impact of FDI on export structure is an empirical issue. The reason is that it depends on a country's absorption capacity and policies. Moreover, the directions of FDI into developing countries are different from one another.

<sup>1</sup> Calculation of the HHI is performed in STATA15 software from BACI database.

While some inflows of FDI are aimed for market seeking (horizontal FDI), others are efficiency seeking (vertical FDI) or seeking for natural resources. For instance, if FDI is directed mainly to natural resources, its impact could be negative because of the Dutch disease phenomenon. On the other hand, there are several measures of FDI including FDI inflows in dollars, FDI stocks in dollars, or the ratio indicators to GDP. Depending on the measure, the results of an analysis could be different from one another.

Countries' level of development is measured by GDP per capita and its connection to export diversification is positive. The studies (Imbs and Wacziarg [33] and Cadot et al. [32]) show a non-monotonic relationship between economic development and diversification. However, I would expect to be a monotonic relationship between these variables since my sample includes middle and low income countries. An expected sign of the effect is positive. Gross secondary school enrollment rate is used as a measure of human capital. It is expected to increase export product diversification through the greater availability of skilled workers in research and development. For the measure of institutional quality, we use government effectiveness constructed by the World Bank. This measures the privilege and quality of public and civil services and the governments' quality of policy formulation and its implementation. I assume that this variable is positively associated with export diversification. Based on the gravity theory, the country size is introduced in the model and proxied by population. I expect that the size of a country will be positively associated with export diversification. Finally, the time dummy is included in the model to capture the effect of the change of world trade over time.

### **Empirical results**

Given that my primary focus is on exploring the relationship between landlockedness and export diversification, I show some stylized facts illustrating the links between the variables.

These figures show the trends of export diversification measures, namely the log of number of export lines and the Herfindahl index, in the period 1996–2018. The measures of export diversification are calculated by averaging in different group of countries, namely non-LLDCs and LLDCs. The figures clearly show that on average LLDCs have a highly concentrated export basket compared with that of non-LLDCs. The number of export lines increased until 2006 and after that it has become almost constant. Furthermore, LLDCs' measures of export diversification are slightly more volatile than non-LLDCs' counterparts. See Appendix A for the descriptive statistics of the variables in this paper.

In order to detect a possible multicollinearity problem, I measure the variance inflation factor. The variance inflation factor (VIF) is an index of how much the variance of an estimated coefficient was inflated by multicollinearity. The result for the pooled OLS model according to the VIF test is presented in Appendix B. Some authors suggest that a tolerance value less than 0.1 or a

variance inflation factor greater than 10 indicates severe multicollinearity. In addition, Klein (1962) argues that if  $VIF > \frac{1}{1-R^2}$ , it indicates a statistically significant multicollinearity. According to these criteria, the test illustrates satisfactory results. In the pooled OLS, r-squared was 0.7674 and hence,  $\frac{1}{1-R^2} = 4.30$ . Thus, multicollinearity is not considered as statistically significant.

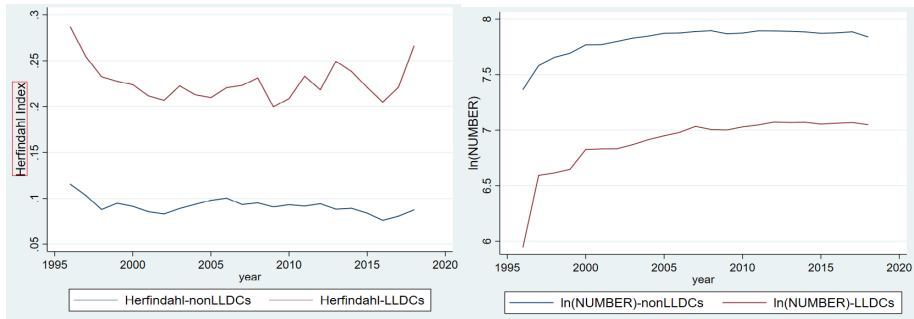


Figure 2. Export diversification by landlocked status (1996–2018).

Source: Author's own compilation from the BACI database

The results from regression analysis are presented in Table 2<sup>1</sup>. First of all, the statistical tests for the validity of instruments have expected results with a non-rejection of the Hansen and second-order autocorrelation tests. In all the specifications, the number of instruments is less than the number of gross-section groups. The coefficients of the lagged dependent are highly significant indicating the persistence of the evolution of export diversification.

For hypothesis (1), I test the prediction that once controlled for main determinants of export diversification whether being landlocked has a negative impact on export variety. In columns (1) and (3), the results show that, after controlled for the levels of development, human capital, the size of economies, and the quality of institutions, the landlocked status has a negative impact on either extensive and intensive margins of exports at the 10 percent significance level. As expected, due to the higher trade costs faced by landlocked developing countries, the coefficient of landlocked dummy is negative for the number of export lines and positive for the export concentration index. The coefficient in model (1) shows that the average number of export lines for LLDCs is 8.5% ( $\exp(-0.0887)$ ) less than that of non-LLDCs.

In a paper by Fosu [13], the dummy variable of being landlocked appears to be a significant factor for export diversification in a GLS-Random effects model and insignificant in the System GMM estimation. He used the Export Diversification Index (XDI) constructed by the IMF; it measures a country's export structure compared with that of world as a whole regarding both products

<sup>1</sup> The regressions are performed in STATA15 software using *xtabond2* command.

and destinations. In a study by Gourdan [12], which used the Hausman-Taylor estimator, although the landlocked status appears to be an insignificant factor, the sign of the coefficients was consistent with the expectation, having an adverse effect on export diversification.

The impact of FDI on diversification is statistically insignificant in spite of the expected sign of the coefficient of the factor. This result is explained in several ways. Firstly, my measure of export diversification is not calculated in the industrial sectors separately, and thus a whole economy's diversification might be less sensitive to FDI. Secondly, the sample used in this paper includes majority of developing countries varying in terms of size, natural and human capital endowments, and the level of development. Therefore, the FDI inflows into these diverse countries depend on the purpose of investors and the nature of host countries. Finally, since the definition of FDI is the inward FDI flows as a percentage of GDP, small countries, which have highly concentrated exports baskets, tend to take higher values compared to larger countries. This fact may affect the significance of the variable with a certain amount.

*Table 1. Results of the system GMM estimation*

Dependent Variable	Lnumber (1)	Lnumber (2)	Herfindahl (3)	Herfindahl (4)
Lagged DV	0.7329***	0.6669***	0.5268***	0.5260***
Landlocked	-0.0887*	-0.0669	0.0437	0.0667*
FDI	0.0006	0.0056	0.0008	0.0017
lnGDPpc	0.0550	0.0527	-0.0550*	-0.0570*
lnPOP	0.0520***	0.0727***	0.0032	-0.0096
HUM	0.0017	0.0005	-0.0001	-0.0002
INSTIT	0.1405***	0.0963*	-0.0650	-0.0626**
RENT	-0.0039*	-0.0052**	0.0040***	0.0042***
Land*FDI		-0.0163**		0.0029*
Constant	0.3831	1.0457	-0.5020	-0.5439*
Number of Observations	625	625	625	625
Number of groups	92	92	92	92
Number of instruments	49	57	49	57
AR1 (p-value)	0.001	0.004	0.002	0.003
AR2 (p-value)	0.249	0.277	0.778	0.696
Hansen (p-value)	0.526	0.144	0.594	0.541
Period effect	Yes	Yes	Yes	Yes

Notes: Robust standard errors are in parenthesis. In the two step system GMM estimations, the variables lnGDPpc, HUM, RENT, FDI, and the Land\*FDI have been considered as endogenous. \*p-value <0.1, \*\*p-value<0.05, \*\*\*p-value<0.01

The insignificants result of FDI in my study is similar to several other studies including Fosu [13], Gourdon [12], and Gui-Diby and Renard [49]. While for Gourdon [12], the specification using the Herfindahl-Hirschman index yields an insignificant coefficient of FDI, the paper by Gui-Diby and Renard [49] used the share of the manufacturing sector in an economy as a measure of the diversification or industrialization of the economy. However, my primary focus

is not the direct effect of FDI on export diversification in developing countries. I am interested in the relative effectiveness of FDI in LLDCs to non-LLDCs.

In Models 2 and 4, the interactive effect of FDI with landlockedness is taken into account. Consistent to hypothesis 2, the impact of FDI on export diversification in LLDCs is weaker than that of non-LLDCs for both extensive and intensive margin of exports. The coefficients of the interaction terms are statistically significant at 5 percent level for the number of exporting goods and 10 percent level for the concentration index. In other words, the effectiveness of FDI in diversification tends to be less for LLDCs than for non-LLDCs. This result is in line with the implication discussed in the theoretical insights.

For the control variables, whereas country size and institutional quality is positively associated with the extensive margin of exports, natural resource rent affects it negatively. Despite the insignificance of the coefficient, the effect of human capital has an expected sign. When the concentration index is used as a dependent variable, the per-capita GDP and institutions have a positive effect on export diversification. As expected, natural resource endowment has a negative and statistically significant impact on the intensive margin of exports for developing countries. The results pertaining to economy size and human capital are as expected, but statistically insignificant.

## **Conclusions**

This paper has examined the constraint of landlockedness in the effectiveness of FDI on export diversification in developing countries during the period of 1996–2018. Theoretically, it is postulated that some types of FDI may not be supplied to LLDCs due to the disadvantages of the countries. Specifically, various types of FDI which are oriented to exports such as export-platform FDI and FDI avoiding trade costs are less likely to inflow to LLDCs.

Based on the system GMM estimation, I have found that the landlocked status is negatively associated with export diversification after controlled for the key control variables including per-capita GDP, economy size, institutions, human capital, and natural resource endowment. The magnitude of the impact indicates that the average number of export lines for LLDCs is 8.5 percent less than that of non-LLDCs. As in previous studies, I have found that resource rent reduces export diversification, while higher per-capita GDP, country size, and institutions increase diversification.

However, special attention was paid to the interactive effect of FDI with landlockedness, measured by the inward FDI as a percentage of GDP. The result of the interaction term indicates that the landlocked status worsens the positive effectiveness of FDI in the diversification process for developing countries. Ideally, if there were disaggregated data of FDI, I would have examined the impact of FDI in a detailed manner. But, such data are unavailable.

The main finding of the paper signals the special need for LLDCs to take into account increasing export-oriented FDI, if the inward FDI into LLDCs is different from that of non-LLDCs. LLDCs could seek more diversified FDI by creating a

more conducive business and production environment. Specifically, it is important to encourage the inflow of FDI in non-traditional high value-added industries. Although LLDCs are specific focus of UN-OHRLLS, promoting the export diversification of these countries is still on priority area for the parties including international organizations, transit or partner countries, and LLDCs.

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*Appendix A. Summary statistics*

Variable	Non-LLDCs					LLDCs				
	<i>Obs</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>Obs</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
ln(NUMBER)	512	7.58	0.75	5.03	8.53	224	6.66	0.77	4.20	7.98
Herfindahl	512	0.09	0.11	0.00	0.73	224	0.23	0.19	0.01	0.87
ln(POP)	512	16.73	1.61	12.27	21.05	224	15.98	0.96	13.20	18.48
INSTITUTION	512	-0.32	0.58	-2.02	1.34	224	-0.74	0.48	-2.18	0.72
RENT	512	7.13	8.72	0.00	46.12	224	11.75	11.03	0.19	69.54
FDI	512	3.70	4.92	-8.40	72.79	224	3.53	5.31	-37.2	45.14
ln(GDPpc)	512	7.85	1.06	5.45	10.17	224	6.95	0.95	5.26	9.29

*Appendix B. The variance inflation factors*

Variables	VIF	Tolerance
ln(GDPpc)	3.41	0.2932
HUM	2.47	0.4041
INSTIT	1.85	0.5405
RENT	1.50	0.6677
landlocked	1.37	0.7309
ln(POP)	1.19	0.8399
FDI	1.15	0.8694
Mean VIF	1.85	

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