

The Impact of Economic Diversification on Economic Growth in Landlocked African Countries – A Panel Data Analysis Using GMM Approach

Mrs Dhanya Jagadeesh

BAISAGO University, Botswana, Private Bag 149, Suite 268, Kgale View Postnet, Gaborone

Abstract

We examine the impact of export diversification on Economic growth using system Generalized method of moments (GMM) Model in the case of sixteen Landlocked countries in Africa, using annual data during the period 2005 to 2015. Most of the countries with lower economic growth and lower HDI are landlocked countries in Africa. However they have enough untapped potential to come out of their curse, most of these countries specialized on one or two goods for their export revenue. In this study a growth model has been developed by incorporating export product concentration and real gdp per capita as a proxy for export diversification and economic growth respectively to analyse the impact on export product diversification on economic growth. The result indicated that export product concentration has a significant and negative impact on economic growth. Therefore the policy suggests that the countries should focus more on export diversification-led-growth. The study also recommended that the governments of the respective countries, privet sector and civil societies assist in exploiting new opportunities in international trade by providing enough research and technical expertise, entrepreneurial and financial support and adopt new and innovative strategies.

Keywords: Export diversification, Economic growth, GMM model, Landlocked African countries

1. Introduction

Landlocked developing countries are generally among the poorest of the developing countries, with the weakest growth rates, high poverty rate and lower socio-economic development. These countries particularly heavily depend on a very limited number of commodities for their export earnings. (UN-OHRLLS,2018)

Being landlocked, and having a reduced number of trade commodities might reduce the export competitiveness. These economies may be vulnerable to external economic shocks, thus being in a low-level equilibrium trap.

Out of 43 landlocked countries in the world 31 are developing countries and 16 of the latter are in Africa, African landlocked countries face very specific challenges given their geographical handicap, which include high transport cost, inadequate transportation facilities, low value -added exported goods and deficit BOPs. A study by ECA (2010) indicated that on average, transport costs for these countries are 77% higher than those of other countries which are not landlocked and have up to 60 percent lower volumes of trade than their neighbors with access to the sea. (World Bank, 1999).

Botswana, Lesotho, Central African Republic Ethiopia, Chad, Burundi, Burkina Faso, Malawi, Mali, the Niger, Rwanda, South Sudan, Swaziland, Uganda, Zambia, and Zimbabwe all lack maritime access making them isolated from the world markets, These countries suffer high transit costs which seriously constraints their overall socio-economic development, Landlocked African countries average HDI of 0.47 is far below the average HDI of the world at 0.71, (world bank 2014). All these countries continue to rank at the bottom of the list except Botswana. Growth has been negative in many parts of Africa especially the landlocked countries particularly in Burundi, Chad, Central African Republic, and South Sudan.

Trade can help countries to create jobs which leads to poverty reduction thereby ensure economic growth and enhance socio-economic condition. Therefore export diversification has been proposed as a possible solution that could enhance economic growth in landlocked African countries. The East Asian development experience and the rich landlocked countries like Switzerland, Luxembourg, and Liechtenstein confirms the success of the export diversification strategy. The landlocked countries enhance growth by protecting their current market shares while conquering new markets by increasing and diversifying the products they offer. To do this, governments of these countries must endeavor to both strengthen their current production as well as diversify from current production.

Economic activity in many African countries especially landlocked African countries remain highly concentrated and exports are often dominated by mineral resources or a few primary products. Lack of diversification has been identified as the main reason why most of the landlocked countries have been unsuccessful in mitigating the consequences of their geographical handicap. Among the landlocked countries only Uganda has less export concentration of products compared to other landlocked countries in Africa which is 0.18 and 0.17 in 2015 and 2016 respectively. All the other landlocked countries in particular, Chad, (0.74), Botswana, (0.87), Zambia, (0.66), Mali, (0.74), Burkina Faso, (0.75) and Sudan, (0.65) have higher product

concentration of exports (WDI 2016) in 2016.

The following table and graphs show the average of export product diversification and gdp growth rate in Landlocked African countries, Sub-Saharan Africa and East Asian countries. The evidence indicates that the Landlocked African countries becoming more concentrated compared to the sub-Saharan African countries and East Asian countries therefore their growth rate is also lower than that of East Asian Countries. East Asian countries are the fastest developing countries and are highly diversified too, though their average export concentration has been slightly increased from 2014 to 2016, however, it is still remain lower compared to the landlocked countries in Africa. (unctadstat).

Table 1: The average Export product concentration and Average growth rate

Group of Countries	Average Export Concentration index (2014)	Average GDP Growth (2014)	Average Export Concentration index (2015)	Average GDP Growth (2015)	Average Export Concentration index (2016)	Average GDP Growth (2016)
Landlocked African Countries	0.47	4.92	0.46	2.79	0.46	3.17
Sub Saharan Africa	0.40	4.63	0.31	3.04	0.26	1.24
East Asian countries	0.10	6.77	0.12	6.49	0.12	6.32

Source; unctadstat

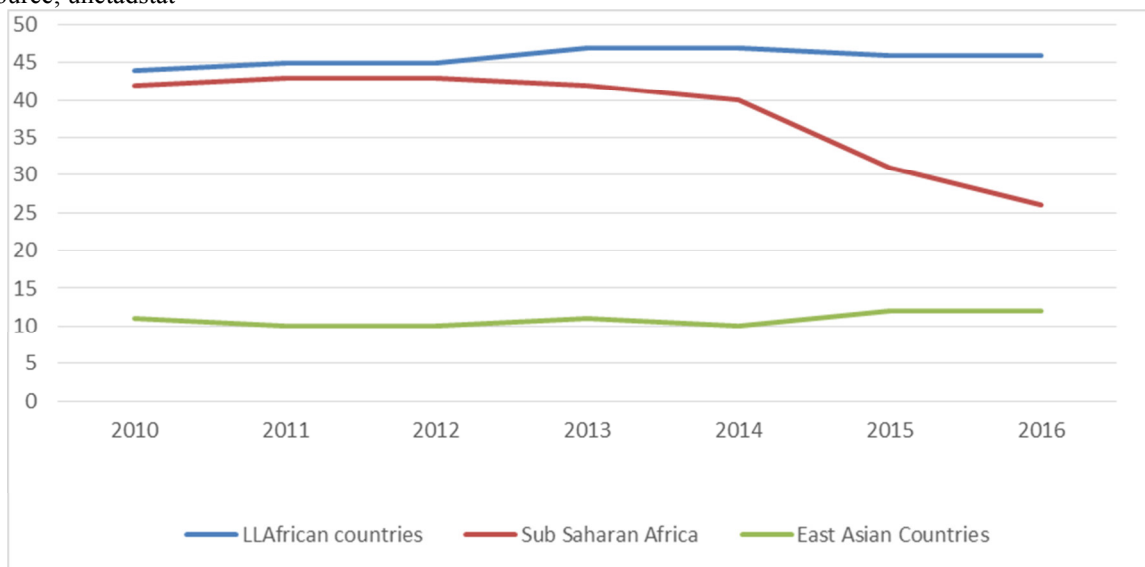


Figure 1: Export Product concentration

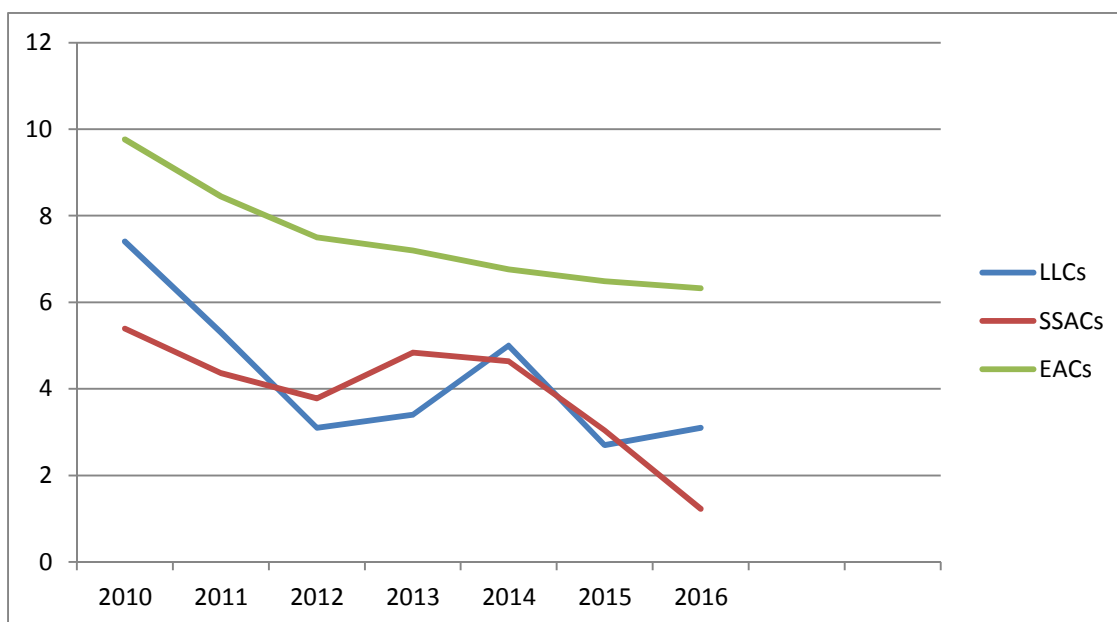


Figure 2: Average growth rate

2. Statement of the Problem

Landlocked countries in general do not have seaports or harbors and their geographical location puts them at a disadvantage with regard to access to cheaper mean of transportation therefore most of the African countries especially landlocked African countries become single- commodity economies. For example Zambia's copper, Botswana's diamonds, Democratic Republic of Congo's (DRC) and Central African Republic's (CAR) diamonds and gold, Mali and Malawi's tobacco(WDI,2017). Due to the high cost for bringing in industrial inputs and shipping out finished products, manufacturing is less developed. Such countries find it extremely difficult to attract Foreign Direct Investment (FDI) particularly in the manufacturing sector which is essential for economic diversification. These economies cannot even afford good social amenities for their people. Poor economic policies and lack of openness to the global world also play an important role of slow growth in Africa. This paper seeks to use econometric model to investigate the impact of economic diversification on economic growth in African landlocked countries.

3. Relevance of the Problem

Most theories recognize International trade as the chief engine of economic growth. Being landlocked pushes up operating costs and hence affects the competitiveness of landlocked economies. These countries over depend on one or two commodities as their main export income source which has implications for the much-coveted economic diversification.

Although many papers have examined the relationship between economic diversification and economic growth in the different countries, much less attention has been paid to the landlocked African countries. Hence this study wishes to focus on the impact of economic diversification on economic growth in African landlocked countries and suggest policy alternatives.

4. The objectives of this study are to

- Determine the impact of Economic diversification on economic growth in the landlocked African countries.
- Come up with appropriate policies that would lead to better performance of landlocked countries in Africa.

5. Literature Review

Theories and existing empirical researched articles tried to high light the relationship between economic growth and economic diversification as well as the obstacles for economic diversification in a bid to find the solution for enhancing economic growth. However a comprehensive analysis of the growth and diversification across the wide spectrum of landlocked African countries has not been carried out so far.

5.1. Theoretical literature review

UNCTAD (2007) outlined that as a result of landlocked countries geographical disadvantage, they face specific challenges in their attempts to integrate into the global trading system; this is because goods coming from or

going to a landlocked country are subject to additional trade barriers.

Hanson, S (2008) indicated that manufacturing in landlocked countries is costly due to the high cost of imports and exports. Another observation by Lesogo (2011) emphasized the importance of political commitment and undertaking enough research in economic diversification. Lesogo pointed out that the policies, strategies and programmes adopted by the government to diversify the economy of Botswana have not been very effective

UN, (2010) highlighted that Landlocked African countries depend heavily on the goodwill of neighboring countries to fully engage in international maritime trade. The additional border crossings and long distances from their markets substantially increase the cost of transport.

According to Hallaert, Cavazos, and Kang (2011), Geographical constraints are not the only reasons for the landlocked countries low trade performance, better domestic policies would make an important contribution to trade expansion.

Songe (2012) suggested that Sub-Saharan African (SSA) countries, especially the resourced based economies, need to concentrate on improving productivity in areas where they have a comparative advantage and on moving up the value chain in those commodities. Such diversification can enhance economic growth.

Martens (2014) states that high concentration leads to a high vulnerability to shocks, which leads to uncertainty and hampers growth, On the other hand high diversification leads to spillover effects that increase productivity, which supports growth.

5.2. Empirical Literature review

A study by Snow, et al. (2003) showed a systematic assessment of all the 30 landlocked countries that the economic disadvantage of being a landlocked country is evidenced by the fact that the economic growth of landlocked countries in the period 1992–2002 was 25 percent lower than that of their transit neighbouring countries. The study pointed out that landlocked countries suffer from a very low level of foreign direct investment. The mean level of FDI inflows to the landlocked nations is 1/49th that of the maritime transit nations.

Naude and Roussouw (2008) investigated the relationship between export diversification in South Africa over the period of 1962-2000, using CGE model and Granger causality. Result showed that increasing export diversification is good for economic development. Result further indicated that export diversification results in higher GDP percapita growth and employment.

Heiko (2008) also confirmed the nonlinear relationship between export diversification and economic growth especially in developing countries. The study reported many of the success full high growing East Asian countries like China, Korea, Malaysia, Taiwan, and Thailand has relatively low levels of export concentration, and also observed many countries with poor growth performance in the past four decades have been sub-Saharan African countries with a very concentrated sector.

Muhammad et al (2010) employed cointegration and Granger causality in Malaysia's economy to examine the long run relationship between diversification and economic growth. The result revealed the result revealed the variables are tied together in the long run so Malaysia should diversify its export commodities.

Suresh Chand et al (2009) examined the relationship between export and economic growth in Malawi. result indicated that, developing countries often depend on a limited number of cash crop exports therefore associated macroeconomic fluctuations may constraints income growth in such countries. These countries often have difficulty achieving sustained economic growth.

Yama (2009) empirically investigate the effects of export diversification on economic growth using random and fixed method based on a panel data of 41 countries from Sub-Saharan Africa and East Asia. The study revealed that East Asian countries have been success full in diversifying their exports. On the other hand SSA' s diversification attempt was too minimal as the countries heavily depended on a narrow base of few agricultural and mineral exports for foreign exchange earnings. The result confirmed that diversification especially vertical diversification played a vital role to induce economic growth in the case of East Asia . The study indicated that East Asia attributed this success by huge investment on human capital through education and the high rate of physical capital accumulation mainly driven by FDI.

Songe and Winkler (2012) investigated the effects of export diversification, economic growth and employment for the panel of 30 selected SSA countries over the period 1995 to 2008 using fixed- effect model. The result confirms that there is a positive relationship between export diversification and economic growth. The study indicated that the East Asian successes relied heavily on the manufacturing sector to achieve rapid growth.

Hodey (2013) used GMM estimation method to study the relationship between export diversification and economic growth in SSA and the result confirmed the positive relationship between the variables. The research suggested that the countries in SSA should promote export diversification and reduce depends on a few primary products and The study recommended that the governments of these countries should implement entrepreneurship support schemes and create a favourable investment climate.

Seetanah, Sannassee, Lamport (2014) outlined that the promotion of export diversification could be achieved through the provision of incentives which improve trade facilitation by setting policy measures to

reduce costs. The study revealed a positive relationship between export diversification and economic growth for Mauritius in both the short run and long run.

The study emphasized the importance of investment in research and development activities to expand a country's export base through enhancing the current status of the firms.

Sunaryati (2015) assessed the relationship between export diversification and economic growth in some of the East Asian countries like Indonesia, Malaysia, Singapore and Thailand using annual data over the period of 1989 to 2010, the cointegration and causality test indicate that there exists a long run relationship between export diversification and GDP in all the countries.

The study has reviewed the researches which have been conducted mainly in Africa and some of the selected Asian countries. All the researches confirmed the positive relationship between the export diversification and economic growth in these countries.

6. Methodology

The study aims to investigate the impact of export diversification on economic growth by using the system General Method of moments (GMM) estimation technique developed by Arellano and Bover, (1995) and Blundell and Bond, (1998). The system GMM procedure is best suited for dynamic panel models because it resolves the dynamic panel bias problem resulting from endogeneity associated with models. System GMM performs better than differenced-GMM in estimating empirical growth models when time dimension of the panel data set is short and outcome variable shows persistence (Roodman, 2006). The system GMM estimator treats the combination of both difference and level equations.

This empirical study is based on a panel data set covering 16 landlocked African countries - Botswana, Lesotho, Central African Republic Ethiopia, Chad, Burundi, Burkina Faso, Malawi, Mali, Niger, Rwanda, South Sudan, Swaziland, Uganda, Zambia, and Zimbabwe, over the period of 2005 to 2015. All the data used in this study are secondary data collected from World Integrated Solution for Trade System (WITS) and UNDP report of 2017. The panel data that will span across a period of 10 years gives adequate degrees of freedom.

The measurement of export product concentration is considered to be a reliable proxy to measure economic diversification. The Hirschman Herfindahl Index is widely used to measure product concentration and also economic diversity; it is regarded as superior to other indices to measure diversification. This index takes value from 0 to 1; the higher value represents greater concentration.

Though the relationship between export diversification and economic growth could be well founded, it does not mean that it is the only one instrument that guarantees higher levels of economic growth, therefore it is important to include some other variables such as lagged real gdp percapita, trade and foreign direct investment (FDI).

7. Model Specification

Empirical estimations on the relationship between export diversification and economic growth, real gross domestic product (RGDP) percapita will be employed as the dependent variable to indicate economic growth. In order to measure the level of diversification, we used to export product concentration (epc). Further we included three other macroeconomic control variables: trade, lagged real gdp percapita, and foreign direct investment (FDI).

We use the system generalized method of moments (GMM) estimators to measure the impact of independent variables on dependent variable.

We consider the following regression equation:

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 X_{ct} + u_{ct} \dots \dots \dots (1)$$

where Y_t is the real GDP percapita in the country at time t , Y_{t-1} is lag of Y_{t-1} , X_{ct} is a set of potential explanatory variables. u_{ct} is the random disturbance term that varies across both countries and years and is assumed to be uncorrelated over time.

$$\text{realgdp capita} = f(\text{rgdpcapita}, \text{epc}, \text{trade}, \text{fdi}) \dots \dots \dots (2)$$

$$\text{realgdp capita} = \alpha_0 + \alpha_1 \text{lrgdp} - \alpha_2 \text{epc} + \alpha_3 \text{trade} + \alpha_4 \text{fdi} \dots \dots \dots (3)$$

$$\text{realgdp capita} = \alpha_0 + \alpha_1 \text{lrgdp} - \alpha_2 \text{epc} + \alpha_3 \text{trade} + \alpha_4 \text{fdi} + \mu_t \dots \dots \dots (4)$$

The above variables are measured at different scales, which makes difficult to compare the regression coefficients. Therefore it is necessary to scale all the variables the same. This can be done by standardizing all the variables which were affected. The resulting regression coefficients are called the standardized regression coefficients. Standardization involves subtracting the variable's mean from each observed value and then dividing by the variable's standard deviation. All the standardized variables are denoted with the alphabet 'z'. Now the α 's are comparable and they all refer to a 1 standard deviation change in their respective independent variables rather than a one-unit change.

$z \text{ rgdp capita} = \text{real gdp percapita (constant us\$)}$

$l.\text{rgdp} = \text{lag of Real GDP Percapita}$

epc = Export Product Concentration Index

ztrade= Trade (% of GDP)

zfdi=Foreign Direct Investment

Equation to be estimated is given as:-

$$\text{zrealgdp capita} = \alpha_0 + \alpha_1 \text{z rgdp} - \alpha_2 \text{epc} + \alpha_3 \text{ztrade} + \alpha_4 \text{zfdi} + \mu t \dots \dots \dots (5)$$

8. Empirical Result

Table 2: Dynamic panel-data estimation, one-step system GMM

Group variable: countrynum	Number of obs	=	160
Time variable: year	Number of groups	=	16
Number of instruments = 5	Obs per group: min	=	10
F(4, 156) = 1479.09	avg =	10.00	
Prob > F = 0.000	max =	10	

zrealgdpca~a	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
-----+-----					
zrealgdpca~a					
L1	.875677	.0539136	16.24	0.000	.7691821 .9821719
epc	-.7803972	.3444928	-2.27	0.025	-1.460869 -.099925
ztrade	.0851478	.0285057	2.99	0.003	.0288407 .1414548
zfdi	-.0081509	.0094079	-0.87	0.388	-.0267342 .0104324

Arellano-Bond test for AR(1) in first differences: z = -3.39 Pr > z = 0.001
 Arellano-Bond test for AR(2) in first differences: z = -1.21 Pr > z = 0.226

Sargan test of overid. restrictions: chi2(2) = 2.93 Prob > chi2 = 0.231

9. Result Analysis

In a sample of 16 countries the GMM dynamic panel results confirm the positive association between export diversification and economic growth between 2005 and 2015. Obtained coefficients are of expected signs and all of them highly significant except foreign direct investment (FDI).

As documented in the above table one (1) percent increase in export product concentration (epc) leads to 0.78 decrease in the real GDP percapita. That implies a positive relationship between Export product diversification and economic growth.

Lagged real gdp and trade show a positive effect on economic growth. As indicated in the above table one (1) standard deviation change in the lagged real GDP percapita results an increase in real gdp percapita by 0.87 standard deviation. The result is highly significant and the significance of lagged real GDP percapita indicates the dynamic nature of the real GDP percapita.

The sum of exports and imports of goods and services measured as a share of gross domestic product used as a measure of trade openness, reported in the third raw which has a significant positive effect on GDP percapita. That implies openness is one of the other factors which leads to economic growth which is associated with export product diversification therefore the result suggests that the growth impact of increasing trade share is higher when country's exports are more diversified that accelerate economic growth.

Lastly the foreign direct investment (FDI) found to have a positive and significant growth effect in the many other previous literature , however contrary to that in our analysis it is found to have negative and non-significant growth effect therefor its concluded that there was no statistically significant linear dependence of the mean of FDI on real GDP percapita detected.

Arellano and Bond (1991) recommend the use of the Sargan test for the validity of the instrumental variables. The test accepted null hypothesis implying that all the instruments as a group are exogenous therefore the Sargan tests of over-identifying restrictions for the GMM estimation do not indicate a serious problem with the validity of these instrumental variables.

The instruments validity and reliability are indicated by the serial correlation AR (1) and AR (2) tests. The test examines the null hypothesis that the error term of the differenced equation is not serially correlated. In the result P-value of AR tests indicates the presence of serial correlation at first order but not at second order. AR (2) is most important since it will detect autocorrelation in levels. Therefore it can be concluded that Export diversification and trade openness are very crucial for economic growth in these countries.

10. Conclusion

The purpose of this study was to investigate the impact of export diversification on economic growth in 16 landlocked African countries. The data was analysed using Generalised Method of Moments reveals that export diversification is associated with economic growth. There for landlocked African countries should take in to consideration that export diversification is a very crucial factor which leads to economic growth.

As expected, lagged real gdp capita and trade openness has been found to be an important and statistically significant factor for economic growth, based on the result all the landlocked African countries can be advised to implement trade liberalization policies. The study also recommends that the government of each of these countries to provide support and subsidies to all the medium and small scale industries that engage in innovation and production of new product.

The landlocked countries are not condemned to low economic growth, economic development and higher poverty rate. They have enough untapped potential to come out of their curse. The government of the respective countries, cooperate sector and international community to assist through research, technical, entrepreneurial and financial support so as to utilize their resources to exploit new opportunities in international trade and also incorporate innovative ideas or strategies applied in other successful countries is further suggested by this study.

In future work, we plan to extend the study to other developing countries. In addition to that, it will specialize in exploring the other determinants of export diversification in African countries to measure the effect of the factors such as institutional transparency and other institutional factors on Export diversification.

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11. References

- Heiko, Hesse., (2008),” Export diversification and economic growth, The International Bank for Reconstruction and Development / The World Bank On behalf of the Commission on Growth and Development”. Working Paper, <http://siteresources.worldbank.org>.
- J.J. Hallaert., R. Cavazos., G. Kang. (2011). Estimating the constraints to developing country’s Trade, A taxonomy of the binding constraints to trade expansion of landlocked countries, small and vulnerable economies, and commodity exporters, OECD, Reference: 290998/TAD/2009).
- Louis S Hodey,. Abena D Oduro, B. Sendza, (2015), Export Diversification and Economic Growth in Sub-Saharan Africa, *Journal of African Development* (2015) 17:67–81.
- M. A. Arip. and L. S yee. and B Abdul karim. (2010), Export diversification and economic growth in Malaysia. <https://mpira.ub.uni-muenchen.de/20588/1/>.
- R. Sannasee., et al. (2014) Export diversification and economic growth in the case of Mauritius, https://www.wto.org/english/res_e/booksp_e/cmark_chap1_e.pdf
- S. Hanson., (2008), Botswana: “An African Success Story Shows Strains” Council on foreign relations. “<http://www.cfr.org/botswana/botswana-african-success-story-shows-strains/p15108>
- S. Chand, et al (2009) Trade and Development When Exports Lack Diversification: A Case Study from Malawi / ERR-77 Economic Research Service/USDA.
- Sunaryati., (2015),” export diversification and economic growth in ASEAN” *journal Ekonomi dan studi pembangunan*, volume 16, pp 119-131.
- Tim Martens., (2014), Export Diversification in Sub-Saharan Africa, A Case Study of Three Country Groups, <http://dare.uva.nl/cgi/arno/show.cgi?fid=546664>.
- Thomas Snow., et al. (2003), “United Nations Development Programme country case studies on the challenges facing landlocked developing countries”(HDROffice, occasional paper,(2003). <http://hdr.undp.org/en/content/country-case-studies-challenges-facing-landlocked-developing-countries>.
- UNDP, (2007),” Regional cooperation in transit transport: solutions for landlocked and transit developing countries”. http://unctad.org/en/docs/c3em30d2_en.pdf
- United Nations Publications, (2010), *Assessing Regional Integration in Africa IV: Enhancing Intra-African Trade*, p. p 241 – 265, <http://www.uneca.org/sites/default/files/PublicationFiles/aria4full.pdf>.
- UN-OHRLLS,(2018), *About the Landlocked Developing Countries (LLDCs)*,<http://unohrlls.org/about-lldc/>.
- V. Songe., and D. Winkler., (2012),” Export and export diversification in Sub - Saharan Africa” *Africa Growth Initiative Working Paper* 3.
- W. Naude and R.Roussouw (2008) “Export diversification and Specialisation in South Africa, Extent and Impact”. <http://www.csae.ox.ac.uk/conferences/2008-edia/papers/060-rossouw.pdf>
- Yoko Yama, et al (2009), “The impact of vertical and horizontal export diversification on economic growth: An empirical study on factors explaining the gap between sub-Saharan african and East Asia’s performances.”

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Author's Biography

Mrs. Dhanya Jagadeesh has been working as a lecturer in the Republic of Botswana since 2007, currently Mrs. Jagadeesh working as an Economics Lecturer at BA ISAGO University for the past Eight (8) years and Previously worked as lecturer in Limkokwing University of Creative Technology (Botswana) as well. She holds B Ed. in Social Science and Master's Degree in Economics from University of Kerala.