

# Determinants of vegetable and fruit export in Ethiopia using vector error correction model

Derese.B<sup>1</sup> Tesfatsion .M<sup>2</sup>.,Alemayehu D3 &.Hizkel. F<sup>4</sup>

DOI: 10.29322/IJSRP.13.06.2023.p13828  
<http://dx.doi.org/10.29322/IJSRP.13.06.2023.p13828>

Paper Received Date: 12th May 2023  
Paper Acceptance Date: 14th June 2023  
Paper Publication Date: 21st June 2023

**Abstract-** Ethiopia has comparative benefits within the manufacturing of exportable vegetable and fruit due to current rich genetic resources, various agro-ecological situation and plentiful arable land and labour. However, despite their high ability and opportunities for export, vegetable and fruit are not absolutely utilized. Hence, this study is attempt to reinvestigate the dynamics of the relationship among exports of vegetable and fruit, exchange rate and consumer price index over the length 1993 to 2015. applying famous time series econometric strategies of co-integration and vector error correction estimation, the study provides the proof of stationary of time series variables, existence of lengthy-run equilibrium relation among them, and in the end, the rejection of export of vegetable and fruit led increase hypothesis for Ethiopia by using the Granger causality check based on vector error correction model estimation.

**Index Terms-** Export- exchange rate, consumer price index, Granger Causality, Error Correction Model

## I. INTRODUCTION

The examined the really worth of the expectation idea in export management and the movements someone chooses are especially decided by means of the expectancies while the choices a person has within a given state of affairs. In addition to motivation is proven to be motivated by the expectation that an effort or action will result in mean time. It is an explanatory variable that explained the exchange rate is an important determinant of sensitivity of the change trade balance due to the changes in the country [23]. The more popular intervention tool in the Asian countries found that the growth of money stock exchange rate is changing interest rate. [24]. These nations mostly face challenges in high occurrences in tariffs via the evolved nations which restriction foreign market get entry to and the opposite one is the subsidy given through developed international locations to their manufacturers which creates a large gap for the growing nation's exporters to compete [5]. maximum growing countries which can be incredibly depending on exporting horticultural products have a exceedingly higher growth opportunities which is favorable in that developing countries are comparatively super with their abundance in labor with regards to capital; which maximum of the work of horticultural products require exertions extensive manufacturing than cereal products.[8]

In most African countries, agriculture and agribusiness have been trailing within the competitiveness race. Competitiveness as loosely measured by way of Africa's share of world agricultural exports has dropped for most international locations.[13]. Many developing countries, which include Indonesia, Thailand and Brazil, now export greater agricultural merchandise than all of Sub-Saharan Africa blended. While, Africa's imports of many food merchandise have been rising while its export shares within the international market are declining. Sustained increase in home call for could increase food imports swiftly, in spite of the abundance of land and water available for African agriculture [6]. Global change is the returned bone of global economy brings together severe blessings to the change partnering countries which might be becoming rich and rich. Economic achievement in many nations is based at the involvement of a country's in international alternate [11]. Useful resource endowment and degree of era led to version within the production of goods between unique nations. The engagement of a state in international trade relies upon a state's specializations in the productions of goods. The benefit of specialization and improvement inside the efficiency of manufacturing is realized via effective worldwide exchange participation [11].

It is not unusual to see fluctuations inside the export earnings of nations mainly relying on the export of primary agricultural commodities. The problem is intense for nations like Ethiopia that attain a large proportion in their export earnings from a few agricultural commodities along with espresso, oilseeds, pulses, and stay animals wherein espresso alone accounted for approximately 34 percent of the price of all exports.[3]. Extraordinary empirical research have shown that diversifying export bases closer to excessive-value crops in well-known may want to increase export income and decrease economic risks relying on limited export budgets [1].

Its negative implementation, the rural commercialization approach of Ethiopia has realized underutilization of crops, fruit and vegetation the need for diversifying export thereby that specialize in growing production and productivity [3]. Populace stress, traditional agricultural production technology, weak institutional assist and natural catastrophe are the major constraints to agricultural boom of Ethiopia [19]. Ethiopia's export overall performance is said to be restrained through the real alternate rate, the space among Ethiopia and its companions, deliver-aspect factors like real GDP, Ethiopian institutional excellent and alternate policy and call for-side elements: which

includes population, partners' actual GDP, worldwide marketplace charge and openness to exchange[4].

However, preliminary review of the country of export of end result and greens indicated the as most important troubles, lack of ability to provide the proper amount and first-class of fruits and vegetable that international marketplace calls for, bad coping with of culmination and vegetables at the production site. loss of proper device and transportation centers to transport the goods from the production sites to the exporters, Constraints in flight centers to move the objects to their locations and obstacles on the overall control capacities with this in thoughts, the export performance and the determinants of fruit and vegetable have not but been empirically explored. The study is to determinants of the export of fruits and vegetables and to analysis its market trend in foreign market.

## II. LITERATURE REVIEW

Any company operates in type of a product line and keeps some of particular inner sources with capabilities to a better magnitude, afterward the competitive advantage and the export overall performance might be better and strengthened [15]). This implied that firms in exceptional cells require a special set of abilities and resources to successfully compete inside the marketplace. This is, the inner set that drives export overall performance is responsible upon the product kind.[22]. Demanding situations in Exporting Horticultural merchandise from growing international locations numerous new environments of any marketplace machine, majority of developing nation's vicinity expected to have distinct dilemmas and challenges in their agricultural quarter exports.[7].These challenges specifically arise due to the fact several nations in the developing world with have especially a low protection to the agriculture area in which their manner of livelihood and export relies upon the products[18].Those international locations broadly speaking face demanding situations in high occurrences in tariffs via the evolved countries which limit market access and the alternative one is the subsidy given by using advanced international locations to their producers which creates a huge task for the developing countries exporters to compete the market.[5].

### Over view of fruit and vegetable industry

Through 2030, in Sub Saharan African nation's agribusiness and agriculture is expected to be a \$1 trillion industry and accordingly they must be pinnacle agenda for the fast financial development and transformation of these countries [9]. Agribusiness can play a prime role in shoot begin of monetary development and transformation via agriculture basing industries which can carry in a miles assorted employment and earnings opportunities.[20]. However, to gain the developmental desires of the agriculture area, agribusiness ought to not be remoted from the point of interest of manufacturing agriculture.[6].

## III. METHODOLOGY

### Data Source and Type

In this study, time series secondary data has been used. The data set has been collected from FAOSTAT, word bank database and national bank of Ethiopia. For the purpose of analyzing the

country's determinants of fruit and vegetable export performance, the export equation has been estimated using time series data for the period 1992/93- 2020/1. Eviewus software was utilized to analyze the secondary data obtained from different sources. The time series data that are used in this study are export of fruit and vegetable valued in US dollar, consumer price index of trading partner (Norway,Saudi Arabia, the former Sudan, UAE, UK, and USA) which accounts about 80 percent of Ethiopia's fruit and vegetable export destinations) valued in USD calculated value by FAOSTAT 2022, of home country valued in USD and openness (calculated using the sum of export as a ratio of GDP) are collected from World Bank[6]. Data for real effective exchange rate is collected from Ethiopian Economic Association.

## IV. ECONOMETRICS MODEL SPECIFICATION

This study specialty of demand aspect determinants of Ethiopia's fruit and vegetable export performance. Therefore, the study signifies Ethiopia's fruit and vegetable export performance as a function of real GDP of home United States of America, trade rate, and foreign country rate index for exchange, improvement and economic development [17]. The version is consequently much like the one used by in estimating determinant of reduce flower export in Ethiopia and [19] in estimating export performance of oil seeds in Ethiopia.

Therefore, the regression equation is given by using: 
$$\text{Export of fruit and vegetable} = \alpha + B_1 \text{exchange charge} + B_2 \text{patron price index} + \epsilon_t$$

where, Export = fruit and vegetable export earnings at time t in log shape is the structured variable consumer price index = the actual rate buying and selling companions (about 80 percentage of Ethiopian fruit and vegetable export destination countries) trade charge is equal actual effective trade charge in log form time period

In studying determinant of vegetable and fruit export overall performance based totally on to be had literature on demand facet, the variables in the model are known as external. Ethiopia is one of the countries whose export overall performance relies upon on overseas economic state of affairs. Because the US is economically a small open charge taker inside the international market. Global marketplace forces, normally determine the costs of its exports. Therefore, overall buying and selling partner affects the fee of fruit and vegetable export overall performance of Ethiopia immediately. This is, all other matters remain steady; an increase in the export of Ethiopia's foremost buying and selling companions, that is denoted through, either due to the output increase of our most important trade companions, liberalization measures, or diversification measures will increase the call for our product in Ethiopia's export income [14].

Consequently, the primary challenge in time collection econometric analysis is venture unit root take a look at on the variable of hobby. The check examines whether or not the statistics collection is stationary or not. To behavior the check, the traditional Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF) test has been used with and without a trend. Generating method isn't regarded a priori, the test of determining the orders of integration of the variables has performed first by way of which include a steady simplest and then each a consistent and a trend. The ADF test is based on the regressions run in the following forms

$$\Delta Y_t = \alpha_1 + \beta Y_{t-1} + \mu_t \text{-----2}$$

$$\Delta Y_t = \alpha_1 + \alpha_2 t + \beta Y_{t-1} + \mu_t \text{-----3}$$

The set of variables to be protected in a VAR is determined by using the monetary trouble handy. There need to the study stationary of the variables which Pre-take a look at all variables to evaluate their order of integration. Plot the variables to see if a linear time period is probable to be gift inside the export of fruit and vegetable in Ethiopia.

The lag period can be decided by some of the statistics standards methods. it is crucial to avoid too many lags, because the wide variety of parameters grows very speedy with the lag duration. Then you must run Deterministic trend Specification of the VECM. There is a system of testing the real number of co integrating vectors by means of the use of most Eigen values and hint facts. Estimation and backbone of rank may be very critical. The variables may also have nonzero manner and deterministic and/or stochastic trends. Further, the co-integrating equations can also have intercepts and deterministic trends. The study by [25] used chi-square statistics and probability to measure causality between the variables. Chi-Square statistics and probability values constructed under the null hypothesis of non-causality show that there is a causal relationship between those variables.

The fine manner to do VAR in non-stationary world is to check for co integration using Johansen. After that we have to use the Granger representation theorem to specific the relationship as a vector blunders correction model (VECM). A vector mistakes Correction (VEC) model is a constrained VAR designed for use with non-stationary collection which are recognized to be co incorporated. The VEC has co integration family members built into the specification in order that it restricts the longer term conduct of the endogenous variables to converge to their co integrating relationships at the same time as making an allowance for brief-run adjustment dynamics. The co integration term is known as the error correction time period. Since the deviation from long-run equilibrium is corrected regularly thru a sequence of partial brief-run adjustments. In this study the error correction model as suggested by Hendry [2] has been used.

As the VECM specification most effective applies to co incorporated series, you have to first run the Johansen co integration check and determine the quantity of co integrating members of the family. There are not unusual strategies for trying out co-integration and estimating the connection among co-integrated variables. Those are two-step procedure and the Johansen's [12] maximum probability methods. [12]The Johansen process looks after the above shortcomings via assuming that there are multiple co-integrating vectors. therefore, testing for co-integration using the multivariate VAR technique advanced by [12] is essential due to the fact failure to seize the life of a couple of integrating vector yields misleading long-run coefficients. Absolutely, a terrific time collection modeling should describe both brief-run dynamics and the lengthy-run equilibrium simultaneously. Subsequently, whether or not the longer term parameters are obtained using the Johansen co integration analysis, the Vector blunders Correction version (VECM) has been envisioned [21].

**Result and decision**

Now, it is required to determine the order of integration for each of the three variables used in the analysis along with their stationary tests.

Table 2 unit root test of exchange rate

	T statistics	Probability
Augmented Dickey – Fuller test statistic	-3.279057	
Test critical value	-3.808546	0.0300
1%level	-3.020666	
	-2.650413	
5%level		
10% level		

The Augmented Dickey-Fuller unit root test has been used for this purpose and, the results of such test are reported table 3 show that data of consumer price index from 1973 to 2015 pass through the significance  $\alpha = 0.05$ , this means that the p-value are not greater than 0.05.∴the test result of the table p-value is 0.000, it is sufficient evidence to reject Ho, it conclude that the data are stationary

Table 3 unit root test of consumer price index(CPI)

	T statistics	Probability
Augmented Dickey – Fuller test statistic	-4.800903	
Test critical value	-3.752946	0.0009
1%level	-2.998064	
	-2.638752	
5%level		
10% level		

**Estimation Vector Error Correction Model**

The first step to be taken is the VECM model to determine the optimum lag by comparing every lag to the criteria used. The minimum criteria for each information criterion value are given to determine the optimum lag of VECM (p) model. Co-integration and error correction representation estimation and testing can run VECM to examine both short run and long run dynamics of the series.

$$VECT \Delta y_t = B_0 \sum_{i=1}^n B_i \Delta y_t - 1 + \sum_{i=0}^n -1 + \sum_{i=i}^n \Delta \delta X_t - 1 - i + y_{t-1} \emptyset Z_{t-1+N} \text{-----1}$$

$$\text{Co-integrating equation long run model } a Z_{t-1} = ECT_{t-1} = y_{t-1} - B_0 - B_1 X_{t-1} \text{-----2}$$

The VECM has co-integration relations built into the specification so that it restricts the long-run behavior of the endogenous variables to converge on their co-integrating relationship while allowing for short-run adjustment dynamics. The co-integration term is known as the error correction term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments. from the equation error correction relates to the fact that last period derivation from long run equilibrium (the error) influences short run dynamics of dependent variables, thus the coefficient of  $\emptyset$  if the speed of adjustment because it measures the speed at which Y returns to equilibrium at a change in x. In table.1 the regression output

reveals that  $\Delta$  export of vegetable and fruit  $t = 0.0067$  etc  $t-1 + 0.0527\Delta$  export veg.fruit  $t-1 + 0.1670\Delta$  export veg.fruit  $t-2 + 8948 \Delta$  exch  $t-1 - 10853 \Delta$  exch  $t-2 + 71.87\Delta$  CPI  $t-1 - 743.8\Delta$  CPI  $t-2 + 9251$

The estimated vector error correction model (VECM) regression output result of targeted variable export of vegetable and fruit shows as co integration vector represents the long-run equilibrium relationship between exchange rate, consumer price index and export of vegetable and fruit. In the short run, however, there are some deviations or errors and the variables do not stay at their long-run equilibrium.

Table 1 vector error correction estimates

**Vector error correction Estimates**

**Date 03/23/23 Time 21:17 included obs.20 after adgestments**

**Standard errors in()& t\_statistics in [ ]**

Co integrating Eg	coint Eq1		
Export (1)	1.000000	Exch(1) -129178 (32288.4) [-4.00075]	CPI(1) -270880 (0.08291) [1.11660]
<b>Error correction :</b>	<b>D(Export )</b>	<b>D(Exch)</b>	<b>D(CPI)</b>
cointgEq1	-0.008754 (0.014080) [-0.478641]	7.74E-07 ( 8.7E-071) [1.14702]	8.81E-08 (4.7E-08) [-1.88071]
D(Export(1))	0.035260 ( 0.49229) [-0.07161]	-1 .03E-07 (2.4E-05) [-0.00436 ]	- 8.72E-05 (0.00016) [-0.53545]
D(Export(2))	- 0.167046 ( 0.47294 ) [-0.36321]	-2 .37E-076 (2.3E-05) [1.045151.]	- 8.68E-05 (0.00066) [-0.664471]
D(Exch (1))	8948.445 ( 6666.39) [1.344434]	-302397 (0.31867) [-0.08624.]	-1.827680 (2.20276) [0.82972]
D(Exch (2))	-10863 .41 ( 6784.55) [-1.87628]	-0.023883 (0.27693) [0.08624.]	1.3447.22 (1.91425) [0.70248 ]
D(CPI (1))	71.97491 ( 966.020) [0.076371]	0.124439 (0.04672) [2.72169.]	0.65389 (0.31604) [0.706902]
D(CPI (2))	-743.8934 ( 1.10039) [-0.67603]	-0.026009 (0.05266) [-0.493671]	0.219721 (0.36414) [0.60339]
C	9251.097 ( 19632.3) [0.471221]	2.157526 (0.9389.9) [2.29651]	2.768462 (6.49681) [00.42613]

Estimated error correction term (ECT) in long run model reveals that  $ECT_{t-1} = 10000$  export of veg. & fruit  $-12917exch + 482226$  consumer price index  $27080$  C Exchange rate is its equilibrium value, a negative adjustment coefficient will ensure that the value of exchange rate will fall in the next time period. Similarly, if the short turn deviation/error is negative and exchange rate is below its equilibrium value, a negative adjustment coefficient will ensure that the overall effect is positive. The value of exchange rate and consumer price index will increase in the next time period. Hence, convergence towards equilibrium will occur automatically.

The coefficients of the first difference of Exchange rate and consumer price index lagged one period in Export equation in Table 2 are statistically insignificant which indicate the absence of short-run causality from real exchange rate and consumer price index to exports based on VECM estimates. In order to confirm Table 2: Results of Granger Causality Test

the result of the short-run causality between the  $\Delta$  Exch, the  $\Delta$ CPI and  $\Delta$  Export based on VECM estimates, a standard Granger causality test is also performed based on the F-value.

Pairwise Granger Causality test

Date :03/30/23 time:0025 Lags:2

Hayphothis	F-Statist	T-	Probabip	Decisio	
	statistics		probability	decision	
$\Delta$ Excha exchange rate (Exch) does not				Accept	A
Granger Cause $\Delta$ Export of veg& fruit	1.90473		0.1855	ccept	
$\Delta$ cons consumer price index(CPI)	1.42031	1.42031	0. 2744	Accept	
does not Granger Cause $\Delta$ Export				Accept	

Source: The authors own calculation

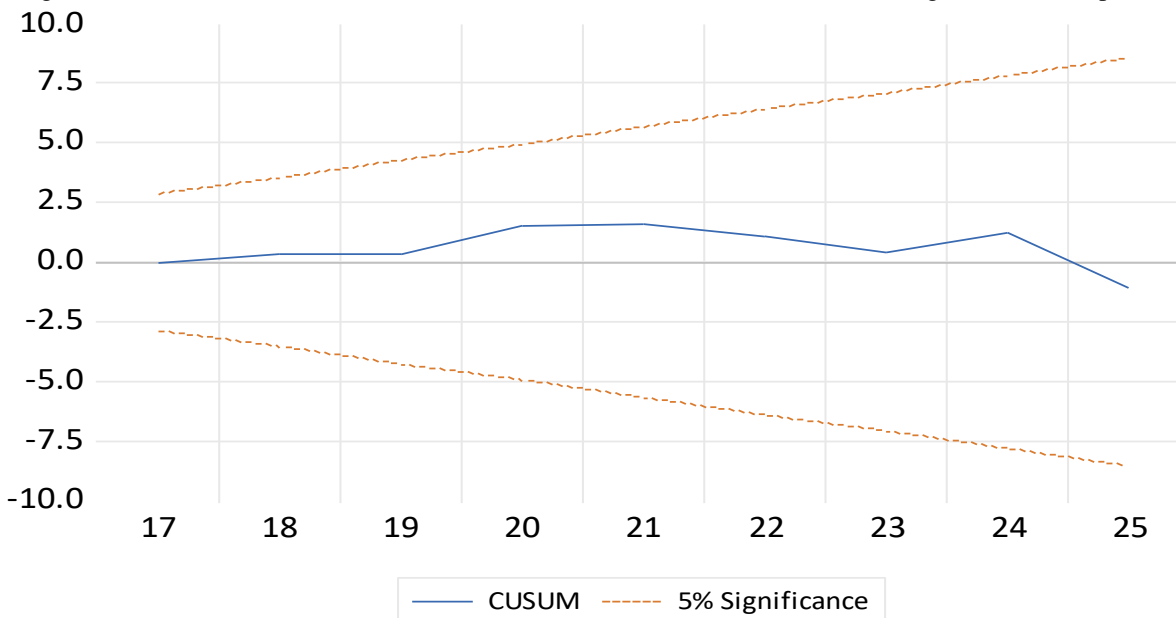
The VECM tests are performed, the next step is to check how the model as a whole is. For this purpose, the diagnostic tests are performed. Table 3 displays the results of the diagnostic test for VECM, which suggest that the model is normally distributed with a probability of Chi-square statistics 5 percent

Table.3 daigonstic check of Wald test equation

hypothesis	Value	value	Df	df	Probab	probability
F	F-statistics	1.88665	(2.9)	(	0.2069*	0.0955
		2.998361	(2,10)			
Chi-sq	Chi-square	3.77330	2	2	0.15160	0.0499
		5.996722				

Source: The authors own calculation

CUSUM plots to check the stability of long parameters and short run VECM In figure.1, the plots to check the stability of the long parameters together with the short run movement for vector error correction model. The output result in the chart indicated that CUSUM plots statistics stay within the critical bounds of five percent level of significant, implying that all short run coefficient and long run coefficient of variables in the given output cannot be rejected



## V. SUMMARY AND CONCLUSION

In this examine the relationship among trade rate, consumer rate index and export of vegetable and fruit in Ethiopia has been investigated the use of time series methodologies. The data properties are analyzed to determine the stationary of time series the use of the Augmented Dickey-Fuller unit root check which suggests that the two series are I(1). The results of the Co-integration test primarily based on Johansen's process suggest the lifestyles of the Co-integration amongst exchange rate patron charge index and export of vegetable and fruit. Consequently, the three variables of the study have a long run equilibrium relationship amongst them. Similarly, the terrible and extensive blunders correction time period equation helps the existence of a long-run equilibrium relationship amongst exchange charge, purchaser fee index and exports. Furthermore, the estimates of the VECM imply the lifestyles of a unidirectional causality going for walks from consumer price index, exchange rate to exports. The Granger causality test suggests that there's a causal dating going for walks from exchange rate, client fee and exports within the lengthy-run, but no longer inside the short-run. The consequences

of the empirical evaluation result in the conclusion that exchange rate, consumer price index and exports are related to beyond deviations (error correction terms) from the empirical lengthy-run relationship. It implies that everyone variables within the gadget will be inclined to speedy revert again to their equilibrium courting. This means that any boom in exchange rate, consumer price index would have a high quality impact on the increase of exports within the long-run.

## REFERENCES

- [1] [1]Alekaw, K. 2016. Determinants and potentials of foreign trade in Ethiopia: A gravity model analysis, Munich Personal Research Archive Paper
- [2] [2]Hendry, D.F., 1995, Dynamic Econometrics, Oxford University Press, Oxford
- [3] [3]Eyayu, T. 2017. Determinants of agricultural export in Sub-Saharan Africa: Evidence from panel study. East African Journal of Sciences Volume 14 (2) 121-1
- [4] [4]MoFED (Ministry of Finance and Economic Development). 2016. Growth and transformation plan: Federal Democratic Republic of Ethiopia. Addis Ababa, Ethiopia
- [5] [5]Deepak S., (2001). Horticultural Exports of Developing Countries: Issues under WTO Regime. Economic Analysis Working Papers. Vol. 7, Number 2
- [6] [6]World Bank, (2013b). Global Value Chains Economic Upgrading and Gender; Case studies of Horticulture, Tourism and Call Center Industries.

- International Trade Department Gender Development Unit, Poverty Reduction and Economic Management Network.
- [7] [7]Sisay, M. A. (2018). Assessment of Challenges in Export Marketing: The Case of Ethiopian Vegetable and Fruit Commercial Growers. Sisay, MA (2018). Assessment of Challenges in Export Marketing: The Case of Ethiopian Vegetable and Fruit Commercial Growers. *iBusiness*, 10(01), 1.
- [8] [8]Dube, A. K., Ozkan, B., & Govindasamy, R. (2018). Analyzing the export performance of the horticultural sub-sector in Ethiopia: ARDL bound test cointegration analysis. *Horticulturae*, 4(4), 34.
- [9] [9]Tolossa, D., & Pandya, H. (2023). market strategy, managerial attitude, and firm capability on export performance: structural analysis evidence from fresh fruits and vegetable producers in ethiopia. *International Journal of Management, Public Policy and Research*, 2(1), 62-70.
- [10] [10]Kassie, G. T., Worku, Y., Bachewe, F. N., Asnake, W., & Abate, G. T. (2023). Scoping study on Ethiopian sesame (Vol. 3). *Intl Food Policy Res Inst*.
- [11] [11] Palley, T.I (2011). "The Rise and Fall of Export Led Growth". Working Paper 675. Levy Economics Institute of Bard College.
- [12] [12]Engle, R.F. and C.W.J. Granger, 1987. Co-integration and error-correction: Representation, estimation and testing. *Econometrica*, 55(2): 251-276
- [13] [13]Asres, Z. M. (2019). determinants of ethiopian export: an evidence from five commodities using time series analysis (Doctoral dissertation, Addis Ababa University).
- [14] [14]BELAY, T. (2020). Determinants of Agricultural export in Ethiopia (Doctoral dissertation, St. Mary's University).
- [15] [15]Anagaw, B. K., & Demissie, W. M. (2012). Determinants of export performance in Ethiopia: VAR model analysis. *Journal of Research in Commerce & Management*, 2(5), 94-109.
- [16] [16]Eshetu, F., & Mehare, A. (2020). Determinants of Ethiopian agricultural exports: A dynamic panel data analysis. *Review of Market Integration*, 12(1-2), 70-94.
- [17] [17]Gebremariam, T. K., & Ying, S. (2022). The foreign direct investment-Export performance nexus: An ARDL based empirical evidence from Ethiopia. *Cogent Economics & Finance*, 10(1), 2009089.
- [18] [18]KURABACHEW, M. (2019). Factors affecting export performance: the case of oil seeds export in Ethiopia (Doctoral dissertation, st. mary's University).
- [19] [19]Getahun Mengistu. Technical efficiency in onion production: the case of smallholder farmers in Dugda Woreda, East Shewa Zone, Ethiopia. MSc Thesis, Haramaya University, Ethiopia; 2014.
- [20] [20]Mehare, A., & Edriss, A. K. (2012). Evaluation of Effect of Exchange Rate Variability on Export of Ethiopia's Agricultural Product: Case of Oilseeds (No. 634-2016-41538).
- [21] [21]Belay, T., & Chekol, W. (2019). Determinants of Agricultural Commodities Export in Ethiopia.
- [22] [22]Goshu, A. C. D. (2020). Export Performance of Spice Crops and Its Determinants in Ethiopia: VECM Analysis.
- [23] [23]Saini, K.G., 1982. The monetarist explanation: The experience of six Asian countries". *World Development*, 10(10): 871-884.
- [24] [24]Rose, A., 1996. Explaining exchange rate volatility: an empirical analysis of the holy trinity of monetary independence, fixed exchange rates and capital mobility. *J. International Money and Finance*, 15(6): 925-945.
- [25] [25]Gul, E. and A. Ekinc, 2006. The causal relationship between nominal interest rates and inflation: The case of Turkey. *Scientific Journal of Administrative Development*, 4: 54-69.

#### AUTHORS

**First Author** – Derese.B, deresebalango@gmail.com

**Second Author** – Tesfatsion .M

**Third Author** – Alemayehu D, dubale alemayehu@gmali.com

**Fourth Author** – Hizkel. F, boltfahiz 2017@gmail.com