# Effect of Manufacturing Sector Earnings on Trade Balance in Kenya.

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## ABSTRACT

Trade balance position is a vital component of economic growth and development for any economy. It is expressed in monetary terms over a prescribed time period and measures the variance between the value of what an economy exports and imports. Kenya is a market- based economy and has continued to benefit a lot from key sectors of agriculture, manufacturing and tourism. Persistent and continuous trade deficits is unfavorable to any economic outlook since it negatively impacts level of employment, growth and foreign exchange. Kenya‟s trade balance position is heavily supported by key sectors of agriculture, manufacturing and tourism through their immense contribution in foreign exchange earnings. The manufacturing sector on the other hand enjoyed a significantly high rate of growth between 1964 to 1974 of respectively 4.2% and 31% but continued to experience mixed growth rates in the 90s of 3.6% and 2.7% attributed to trade liberalization, election uncertainties, changing policies on import duty. Literature on how trade balance affects economic growth exists but there is limited evidence relating manufacturing and the sector affects trade balance. This study aimed to investigate the effect of manufacturing earnings on the trade balance in Kenya. This study was anchored on the Absorption theory of trade and used correlation research design and secondary time series data from 1964–2018. The data was collated from Kenya National Bureau of Statistics as contained in Statistical Abstracts. Vector Error Correction findings registered significance at 5% level with coefficients of 0.904 signifying that a 1% increase in net earnings from manufacturing increases trade balance by 0.904%. Trade balance is self-correcting at an annual rate of 43.7%. This study further concluded that in the long-run, earnings from manufacturing sector has a strong relationship with trade balance position in Kenya in the current period. This study recommends a strengthening of the manufacturing sector to help improve the positive gap between earnings from exports and imports in Kenya.

**Key words;** manufacturing, trade balance

## BACKGROUND OF THE STUDY

Trade balance at times referred to as commercial balance is defined as the gap (both negative and positive) between the value of goods/services imported and/or exported into and from an economy expressed in monetary terms. It consists of mainly primary products such as fuels, food and manufactured or processed goods (Sullivan et al, 2003). Trade balance (net exports or commonly symbolized as NX), is the net of a country's exports and imports expressed in monetary terms over a given period of time, one component of the overall balance of payments (Jackson, 2019). It is worth noting to take into consideration the dissimilarity between trade balance on goods and that of services. Osoro (2013) in his description of trade balance indicated that it is merely the monetary difference between the value of goods exported and imported measured over a specified time period or in simple terms, the net of goods produced within a country and those that a country gets from outside her borders.

Papaioannou and Kei-Mu (2001) defined trade balance as the difference between domestic demand and output within a country (summarized as the difference between the value of merchandize produced by one country denoted as X and the value of goods the same country buys from abroad denoted as M; this outcome should exclude money ploughed back on to foreign stock and the idea of bringing in merchandize or goods for purposes of reproducing for the domestic market). Pettinger (2008) asserts that economies that are able to sell out inform of exports more value than it is bringing into the country inform of imports is said to have a "trade surplus" alternatively referred to as positive balance or "favorable balance". In a scenario where an economy brings in more imports in value than what it sells out inform of exports, it is said to have a deficit in trade commonly referred to as negative balance, "unfavorable balance", or, informally, a "trade gap". Trade deficit arises when there are more imports as compared to the exports of goods and services (Mankiw 2003).

Trade deficit has always been seen as a bad thing since it suggests that a country living beyond its means. It suggests economy is relatively not competitive and unbalanced and this encourages consumption at the expense of saving, investment and exports (Gabeyehu, 2014). A positive trade balance(surplus) occurs when exports are greater than imports while a negative trade balance(deficit) occurs when imports are greater than exports. He continues to argue that trade deficit is not necessarily a bad thing as it may be a consequence of rapid growth. A deficit may be as a result of quick and faster economic growth. When the economy is growing, the purchasing power of people increase and they tend to import more of foreign goods. This therefore means that a country‟s deficit position may reflect high growth and falling unemployment, which is a positive indicator. He illustrates this by using the example of Japan which he observes that has enjoyed a current account surplus but very sluggish growth from the 1990s. Further, a deficit may also be an indicator of faster economic growth which pushes domestic inflation up thereby making people to import foreign goods to avoid high priced domestic products. Mann (2002) also alludes that economies tend to finance their trade deficit positions through long term flows in capital which is equally helpful with investment financing. Researchers however have gone further to decompose the serious consequences of prolonged trade deficits which includes reduction of incomes and purchasing powers of local workers therefore pushing most of them into much lower income brackets thereby eroding their saving propensity. This results into reduced national savings.

Sullivan et al, (2003) asserts that it is beneficial for countries to be involved in trade at international level for a varied number of reasons; because of different productions conditions among regions, different factor endowments, decreasing costs of production (efficiencies) and because of differences in tastes among other things. Countries participate in international trade since it makes both the countries better off and improves on quality of the goods in question. The principle of comparative advantage comes into play when two or more countries get involved in international trade. This principle states that a country should specialize in making a merchandize whenever it has the relative opportunity cost of producing the specific good. Relative cost here means what good the country must be willing to give up in order to get the other good produced by the other country.

Kenya attained independence in 1963 and since then, it has mostly experienced negative trade balance. KNBS (1965) asserts that the excess of imports over exports, the visible balance of trade, Ksh. 8m; this being an improvement of Ksh. 3.5m on the 1963 figure and under half what it was three years ago. Kenya‟s trade balance position has deteriorated further and deeper into deficit, thoroughly and strongly undermining the country‟s path towards achieving industrialization. Nyongesa (2017) opines that the deficit in Kenya‟s current account position continue to remain a major concern since any major exogenous shock is more likely to destabilize the macro-economic indicators. For the last decade alone, Kenya has never attained trade balance and in most cases, the imbalance has continued to sink deeper and deeper into deficit. KNBS (2015) highlights an improvement in trade balance since it moved from a deficit position of Ksh. 1,081 billion in 2014 to a deficit position of Ksh. 997 billion in the year 2015. This improvement in the years noted was partially as a result of a rise in exports to Ksh. 581 billion or 8.2% in

2015 and a marginal reduction in imports by Ksh. 1,578 billion or 2.5% over a similar period. Osoro (2013) however alludes that apart from the years 1964 and 1977 when the Kenyan economy registered surplus positions of respectively US$ 5.7 million and US$ 18.1 million, Kenya has continuously remained deficit since independence. He further indicates that Kenya‟s trade balance position was at a deficit of US$ 8.1 million which further continued to increase every 5 years peaking at US$ 5,649m, US$ 6,303m, in the years 2008 and 2010 respectively.

Manufacturing sector plays a vital role in transforming inputs into globally competitive outputs through value additions. Scott (2008) and Naude and Szirmai (2012) asserts that the sector of manufacturing is a key and a very vital sector to any economy as it promotes justifiable growth and development which is normally attached to the ability of the economy to create more jobs. Manufacturing is therefore defined as the production and or processing of goods for direct use or sale through the use of tools, labor and machines, biological and chemical processing, or formulation. The term is used to refer to a variety of human activities ranging from agrarian to improved technology, but is most commonly applied to industrial production or processing, in which basic raw materials are converted into finished usable goods on a large scale. The final products or finished goods may be transferred to other manufacturers for further production of other more high level commodities, such as furniture, sports equipment, aircraft, household appliances, automobiles or sold to other dealers like wholesalers, who in turn pass them over to retailers, retailers then finally move them over to end users or consumers to complete the value chain (Bailey and Soyoung, 2009).

In Kenya, the manufacturing sector is considered the largest sector with the multiplier effect on all sectors of the economy and a key pillar to the big four-point agenda for development. Manufacturers, investors, the government, and other key players in the manufacturing sector are therefore able to understand how to optimize local production to help promote a positive trade balance and enhance the achievement of one of the pillars of the Big Four agenda. To complement the manufacturing sector and ensure value addition, the study can be very important to private investors and the government in taking advantage of locally available raw materials, value add locally and ensuring Kenya earns foreign exchange and reduces the trade deficit.

Kenya has since independence experienced negative and volatile trade balance. The country has traditionally relied heavily on imported goods and services for direct consumptions and capital investment while majorly exporting tourism, agricultural outputs. Since independence, Kenya has witnessed increasing trade deficits with the first major spike being reported in During this period, imports grew by 34.8% with a corresponding 13.8% growth in value of exports. This substantial growth in imports and the relatively poor performance of total exports exacerbated the trade deficits which moved to Ksh. 2.891 billion from Ksh.

1.472 billion– significant at 96.4%. A further major decline was noted in 2006 when the deficit widened to Ksh. 37.9 billion from a deficit position of Ksh. 19.7 billion – a change of Ksh. 18.2 billion or 92% change. Despite the unpredictability of growth in the three sectors of tourism, agriculture and manufacturing, Kenya‟s economy has continued to persistently record huge trade deficits. Kenya has had several policies and studies meant to enhance the insights regarding the determinants of trade balance and its global position performance. Despite all these, Kenya continues to experience adverse trade imbalance prompting the need to confront and mitigate the challenge by reviewing the underlying causes. Most studies on the effects of sectoral earnings on trade balance have not been conclusive in a number of ways. First, there is limited empirical evidence on the combined influence of tourism, agriculture and manufacturing sector net earnings on trade balance in Kenya. Secondly, available studies majorly give findings on individual sector‟s contributions to trade balance and are mostly concentrated in countries outside Africa. This means that there is greater need to establish the combined influence of agriculture, tourism and manufacturing sector net earnings on trade balance in Kenya. Furthermore, previous studies examined the overall determinants of trade balance ignoring the fact that disaggregating the sectors would have different

understanding of trade balance and what variables affect it. Understanding the link between tourism earnings, manufacturing net earnings, agricultural net earnings and trade balance is therefore critical in highlighting the direct effect of manufacturing, tourism and agricultural sector net earnings on trade balance and in determining policy options that can improve outcomes relating to their linkages.

## LITERATURE REVIEW

Satya (2018) reviewed the Indian manufacturing sector performance in international economy through the use of reliable panel data and an empirical trade model resulting from international trade theory. He analyzed annual data for the period 2000 to 2017 and concluded that indeed manufacturing is such an important sector in the Indian economy. The current gain is that manufacturing as a sector has come out to be an essential supplier of foreign exchange earner to the economy, which has equally helped contain the high depreciation of the Indian currency (rupee) registered between the years 1991 to 2000. Satya however undertook his study for a period of 9 years (9 observations) only which should not be relied upon to deduce statistical conclusions and draw long-run relationships. His study also did not factor in contributions of agricultural inputs in promoting growth of the manufacturing industries. This study shall however be conducted in Kenya for a period of 55 years or 55 observations using time series data which is statistically correct when making statistical conclusions.

Rioba (2014) undertook a Kaldorian review of the Kenyan economy with the aim of understanding how manufacturing industry contributes towards its economic growth. Regression research design was used in testing Kaldor‟s triple laws of growth and by using 42 samples over the years 1971 to 2013. The outcome of his research disagreed with the theory of Kaldor and his laws of growth for the case of Kenya. The research concluded that manufacturing as a sector is not an engine of growth as perceived in the model. The study therefore observed that the sector accounted for only 8% of the national GDP rate of growth way below the 2030 vision of contributing to the 25% set as target. Rioba (2014) focused only on manufacturing sector and GDP and did not review it against trade balance. He did not exhaustively analyze the net earnings on GDP and on trade balance. The paper however will study the net effect of earnings from manufacturing sector and how it impacts trade balance in the Kenya economy.

Githaiga (2021) reviewed trade in manufacturing goods between Kenya and China to establish the nature of trade between the two countries for the period 1984 to 2015. The study was anchored on comparative advantage theory derived from data from United Nations Commodity Trade Statistics. The result indicated that Kenya lacks comparative advantage against manufactured goods from China. The paper reviewed trade from a comparative eye ignoring the absorption angle and how all the three key sectors on tourism, manufacturing and agriculture combined affect trade balance and uses absolute theory to analyze data for the period 1964 to 2018.

Elhiraika (2008) investigated the role played by structural dynamics and transformation in enhancing growth and decelerating growth volatility amongst African countries through increased manufacturing portion in combined or total output. Using figures derived from 36 economies in Africa between the year 1980 to 2007, he examined the manufacturing share determinants in total output and how it relates with real GDP growth and growth volatility. Using the modified form of the Chenery-Syrquin model of economic transformations, he found out that an increase in manufacturing stake in aggregate output has the potential to increase growth in GDP and cut down on growth volatility. While his paper underscored the need for African economies to properly design and effective implement industrial policies geared towards promoting manufacturing and other more creative activities as alternatives of boosting economic transformations, he however did not fully review manufacturing sector against trade balance by only turning his attention to its contribution towards GDP growth. The study shall by using time series data, review the contribution of manufacturing sector towards trade balance by also combining with other key sector of the economy namely

– agriculture and tourism.

Yeshineh (2012) reviewed the trade balance determinants in Ethiopia. The article examined how trade balance related with selected exogenous variables like money supply, foreign income, income, real exchange rate and budget balance studied over both the short run and the long run periods. The research study which was conducted in Ethiopia was modelled around error correction and bound testing model of cointegration coiled within the ARDL frame work. He applied this framework in analyzing yearly data from 1970/71 to 2010/11 for purposes of investigating the presence of a long run association between trade balance and the related variables. Further, impulse response function (IRF) and VDC (variance decomposition) were applied to interrogate for further interpretations. Through the use of this approach, he established the presence of long run associations between trade balance and its determining variables. The results assessed from his workings confirmed that exchange rate depreciation(appreciation) to be positively (negatively) correlated to trade balance both in the short-run and long-run and this is in line with the outcome of other economic concepts. The outcome observed bear strong support to the theory that exchange rate play a weaker role in influencing the behavior of trade balance in Ethiopia. Money supply, Income and budget balance have a stronger effect on trade balance. The study shall review the contribution of manufacturing sector towards trade balance by employing vector error correction model within the Kenyan context.

Osoro (2013) studied foreign trade balance in Kenya, he undertook an empirical investigation of annual data for the period since independence running between the year 1963 to 2012. He applied Johansen cointegration together with error correction models to interrogate both the short-run and the long-run trade deficit determining factors. His result indicated that trade balance coefficients have a positive correlation with exchange rates, budget deficits and foreign direct investment (FDI). His paper confirmed that depreciations of the real exchange rate improves strongly and in a positive way the trade balance. His review however did not exhaustively analyze the individual components of the country‟s earnings especially from key sectors like tourism, agriculture and manufacturing. This study shall review the contribution of individual sectors of tourism, agriculture and manufacturing towards trade balance in the Kenyan context.

Previous studies confirmed the direct positive relationship between growth in manufacturing sector, tourism to balance of trade and net earnings from agricultural sector and trade balance. Absorption model has formed the basis of most the studies done with both elasticity and monetary approach being sidelined. Absorption model views trade imbalance as merely the difference between domestic output and domestic spending (absorption) i.e., people are„ absorbing‟ more than they produce. This study tends to differ from other previous studies since it relied on the three models – elasticity approach, absorption and monetary approach.

## RESEARCH METHODOLOGY

This study was anchored on correlational research design. Crawford (2014) opines that correlational research design often involves the measurement of variables two or more while assessing their inter-relationships with the aim of understanding their systematic relationships with each other. It involved understanding the statistical relationship between net earnings from agriculture sector, earnings from tourism, manufacturing sector net earnings and balance of trade. This study sought to evaluate the correlation amongst the key variables under study and thus helped give a predictive equation to be adopted in making forecasts in case of distortions affecting the variables.

### Model Specification

Using the absorption model, the following transformed equation was used to establish the magnitudes of the

association

$\ln TBt = \ln A_0 + \beta \ln neMt + \lambda \ln neAt + t$ (3.1)

In the factor case, the equation is re-written as;

$\ln TBt = o + + \beta \ln neMt + + t$ (3.2)

where;

t = time period of 1964, 1965, …. 2018

α, β, λ = Elasticity coefficients

$o = \ln A_0$ = Total factor

$\ln TBt$ = Dependent variable (Trade Balance)

ln neMt, represents net earnings from manufacturing.

## RESULTS AND DISCUSSION

**Descriptive statistics**

Table 4.1 Descriptive Statistics of the Variables

| | *TB* | *eMan* |
|---|---|---|
| Mean | -202593227 | -31337545 |
| Median | -24384560 | -3273940 |
| Maximum | -460920 | 5932480. |
| Minimum | -1147292720 | -266329529 |
| Std. Deviation | 344224241 | 62198920 |
| Skewness | -1.720534 | -2.388587 |
| Kurtosis | 4.475869 | 7.610061 |
| Jarque-Bera | 32.12719 | 101.0031 |
| Probability | 0.000000 | 0.000000 |
| Sum | -1.11E+11 | -1735429927 |
| Sum Sq. Dev. | 6.398477 | 2.081639 |
| Observations | 55 | 55 |

Manufacturing sector was also reviewed and it reported a negative mean of Ksh. – 31.34 billion indicating that in most of the years under review, Kenya imported more of manufactured goods than it exported. The maximum net earnings from this sector were Ksh. 5.932 billion with a minimum of Ksh. – 266.33 billion. Economic Survey (1998) admits a severe upsurge in imports resulting from manufactured and processed goods. During this period, price indices for all imports except for beverages, tobacco and mineral fuels increased resulting into price index rising by 6.8% in 1997. Increases in price indices for inedible crude materials, manufactured goods and chemicals went up by 47.1%, 18.3% and 23.9% respectively. There was also an increased importation of finished food items and two aircrafts by Kenya

Airways that mainly accounted for the increase in imports. Net earnings from manufacturing sector however registered positive deviation of 62,198,920 equally signifying increasing gap between spending on imports against exports. It also noted a negative skewness (-2.388). This signifies that the left tail is longer, the mass of their distribution is concentrated on the right and are fit to be called left-tailed. Kurtosis for the manufacturing sector was 7.610061 again being above 3 i.e. (7.61 > 3) commonly known as leptokurtic and indicating probability concentration around the mean.

**Stationarity Test Results**

Table 4.2 Unit Root Results

| | Ln TB | Lne Man |
|---|---|---|
| *At Level* | | |
| Coefficient | -0.007962 | 0.018956 |
| Std Error | 0.026636 | 0.041022 |
| t-statistic | -0.298901 | 0.462096 |
| Prob. | 0.7663 | 0.6461 |
| Mackinnon Values | -0.298901 | 0.462096 |
| 1% | -3.562669 | -3.562669 |
| 5% | -2.918778 | -2.918778 |
| 10% | -2.597285 | -2.597285 |
| Prob. | 0.9177 | 0.9837 |
| *1st Difference* | | |
| Coefficient | -1.851569 | -1.419311 |
| Std Error | 0.298085 | 0.127148 |
| t-statistic | -6.211557 | -11.16263 |
| Prob. | 0.0000 | 0.0000 |
| Mackinnon Values | -6.211557 | -11.16263 |
| 1% | -3.56543 | -3.560019 |
| 5% | -2.919952 | -2.91765 |
| 10% | -2.597905 | -2.596689 |
| Prob | 0 | 0 |

The residuals were also found to be stationary at all levels of the t statistics (Table 4.2). From the analysis, ADF values are all less than the t-statistic at all levels in absolute terms as compared to all the critical values of 1%, 5% and 10% respectively with Mackinnon p-value of 1.000. From the results in Table 4.2, the MacKinnon values at 1%, 5% and 10% is less than the ADF (Augmented Dickey-Fuller) test statistic in absolute terms. The test result revealed existence of a unit root among the variables at levels since they were all found to be stationary after the first difference as depicted in Table 4.2. The Augmented Dickey-Fuller test statistics in this case is greater than the t-statistic of the Mackinnon Critical Value at 5% in absolute terms (ignoring the negativity of both the ADF test statistics) for all the variables. The value of *p* in this case was found to be 0 i.e., $p = 0.0000$.

A review of *neMan* also returned the results as reported in Table 4.2 respectively indicating that at level and at 1st difference. The unit root residuals for *ln*eMan were also found not to be stationary at levels of the t statistics. From the analysis, ADF values are all less than the t- statistic at levels in absolute terms as compared to all the critical values of 1%, 5% and 10% respectively with Mackinnon p-value of 1.000. From the results above, *ln*eMan is stationary at first difference, the MacKinnon values at 1% (3.56), 5% (2.92) and

10% (2.59) is more than the Augmented Dickey-Fuller (ADF) test statistic (11.16) in absolute terms.

**Correlation Analysis**

Correlation analysis was carried out for purposes of establishing the existence of a correlation between the variables under study;

Table 4.3 Correlation Matrix

| Correlation | | |
|---|---|---|
| t-Statistic | | |
| Probability | *TB* | *eMan* |
| *TB* | 1 | |
| *eMan* | 0.938144 | 1 |
| | -19.72536 | |
| | [0.0000] | |

Correlation results are summarized in Table 4.3. Based on our specific objective, implication is that of the existence of a strong positive association between manufacturing sector and trade balance in Kenya ( = *0.938144*). From the result obtained, this study rejected the null hypothesis that says that manufacturing sector earnings has no effect on trade balance at 5% level of significance. Based on our objective, there is a strong negative correlation between earnings from agricultural sector and trade balance in Kenya ( = *-0.770908*) over the period of study with significant probability values $p = 0.0000 < 0.05$. Outcome of this study is equally summarized in Table 4.3. This study cannot therefore reject the null hypothesis which states that agricultural sector earnings have no effect on trade balance at 5% level of significance.

**Vector Auto-Regression**

An analysis using Vector Auto-Regression (VAR) was done based on objectives of this study. This study therefore was aimed at investigating the correlation amongst the study variables of manufacturing, tourism, and agriculture sector earnings on trade balance in Kenya. Using Akaike information criterion and a lag-length of two (2) were chosen for all the variables

Table 4.5 Vector Autoregression Estimates

| Standard errors in ( ) & t-statistics in [ ] | | |
|---|---|---|
| | lnTB | lneMan |
| lnTB(-1) | 0.840852* | -6.72E-13 |
| | (0.17594) | (2.8E-13) |
| | [ 4.77911] | [-2.37318] |
| lnTB(-2) | -0.245678 | 1.07E-12 |
| | (0.17870) | (2.9E-13) |
| | [-1.37477] | [ 3.73648] |
| lneMan(-1) | 0.092860 | 3.39E-13 |
| | (0.11884) | (1.9E-13) |
| | [ 0.78138] | [ 1.77475] |
| lneMan(-2) | -0.120063 | -5.92E-13 |
| | (0.11589) | (1.9E-13) |

| | | |
|---|---|---|
| | [-1.03599] | [-3.17404] |
| lneMan | 0.223775* | 1.000000 |
| | (0.09854) | (1.6E-13) |
| | [ 2.27097] | [ 6.3e+12] |
| C | -0.585042 | 1.13E-12 |
| | (0.71461) | (1.1E-12) |
| | [-0.81868] | [ 0.98098] |
| $R^2$ | 0.985166 | 1.000000 |
| Adjusted $R^2$ | 0.981186 | 1.000000 |
| Sum squared resids | 4.222027 | 1.09E-23 |
| S.E. equation | 0.320899 | 5.16E-13 |
| F-statistic | 247.5355 | 6.02E+25 |
| Log likelihood | -8.159365 | |
| Akaike AIC | 0.760731 | |
| Schwarz SC | 1.206835 | |
| Mean dependent | 17.20912 | 15.68721 |
| S.D. dependent | 2.339523 | 1.842452 |
| Determinant resid covariance (dof adj.) | | |
| Determinant resid covariance | | |
| Log likelihood | | |
| Akaike information criterion | | |
| Schwarz criterion | | |

At 5% level of significance, all the measurement parameters display a meaningful association on trade balance. $R^2$ is 0.981334 meaning that independent variable trade balance explains 98.1334% of the total variation in the short-run. The Durbin-Watson statistic for this variable is 2.2816 which is closer to two (2) and which discloses that the equation is free from serial correlation.

The objective of this study was to determine the effect of manufacturing sector earnings on trade balance in Kenya. Net earnings from manufacturing sector were reviewed against the trend of trade balance in Kenya. The results obtained and summarized in Table 4.5 demonstrated that in the current period, a 1% change in net earnings from manufacturing sector is associated with 0.223775% increase in trade balance on average *c eteris paribus.*

Ceteris paribus, the findings also indicate that earnings from manufacturing sector have a considerable impact on trade balance. Value addition through adoption of technology on related export products is key to enhancing product net worth, increasing productivity level and improving competitive edge of the manufacturing sector at the international set-up or global market.

Growth in domestic industries and manufacturing sector will not only improve the employment ratio but will as well help improve on domestic absorption and enlarge the productive capacity locally thereby reducing on currency flight. Kenya must therefore invest in manufacturing sector for it to spur higher level of growth and also to achieve middle income status as contained in Vision 2030.

Tran *et al* (2014) confirms the findings. In their finding, they noted that the position of trade balance improves with an increase in domestic absorption and larger productive capacity in the manufacturing sector.

Table 4.6: Vector Error Correction Model

| Error Correction: | *D(lnTB)* | *D(lnneAg)* | *D(lnneMan)* | *D(lneTou)* |
|---|---|---|---|---|
| CointEq1 | -0.393778* | -2.08E-18 | 3.00E-17 | 2.37E-17 |
| | (0.10799) | (4.0E-17) | (1.2E-16) | (3.7E-17) |
| | [-3.64640] | [-0.05199] | [ 0.24794] | [ 0.64784] |
| *D(lnTB(-1))* | 0.239691 | 1.99E-16 | 3.97E-16 | -2.89E-16 |
| | (0.15132) | (7.0E-17) | (1.1E-16) | (1.6E-16) |
| | [ 1.58405] | [ 2.85596] | [ 3.70218] | [-1.81774] |
| C | 0.147503* | -3.77E-17 | -1.13E-16 | -3.77E-17 |
| | (0.05933) | (2.7E-17) | (4.2E-17) | (6.2E-17) |
| | [ 2.48627] | [-1.38351] | [-2.69018] | [-0.60539] |
| *D(lnneMan)* | 0.225263* | 1.04E-16 | 1.000000 | 8.08E-18 |
| | (0.09052) | (4.2E-17) | (6.4E-17) | (9.5E-17) |
| | [ 2.48842] | [ 2.49155] | [ 1.6e+16] | [ 0.08493] |
| $R^2$ | 0.581503 | 1.000000 | 1.000000 | 1.000000 |
| Adj. $R^2$ | 0.505413 | 1.000000 | 1.000000 | 1.000000 |
| Sum sq. resids | 4.224770 | 8.94E-31 | 2.13E-30 | 4.67E-30 |
| S.E. equation | 0.309867 | 1.43E-16 | 2.20E-16 | 3.26E-16 |
| F-statistic | 7.642267 | 8.76E+31 | 3.89E+31 | 1.30E+31 |
| Log likelihood | -8.176575 | | | |
| Akaike AIC | 0.648173 | | | |
| Schwarz SC | 0.982751 | | | |
| Mean dependent | 0.138611 | 0.105938 | 0.119145 | 0.132817 |
| S.D. dependent | 0.440609 | 0.523069 | 0.538122 | 0.461448 |
| Determinant resid covariance (dof adj.) | | 9.34E-96 | | |
| Determinant resid covariance | | 4.44E-96 | | |
| Log likelihood | | 5579.307 | | |
| Akaike information criterion | | -209.0305 | | |
| Schwarz criterion | | -207.5434 | | |

This study adopted this model to help in achieving a desired level of prediction. Results obtained were summarized in Table 4.6. This is adopted to help simplify the model with a great explanatory predictive power. This study analyzed the level of association which is

specified by the t-statistic of the ECT (error correction term) and where;

$$ECT_{t-1}=\{1.000\ln TB_{t-1}-0.490742\ln enMan_{t-1}$$

The coefficient represented by c of the error correction term estimation is -0.3937 implying that during the short run period, the earnings in the short run-on manufacturing (eMan) converges at the rate of 0.39% towards the long-run equilibrium**.** This means that the deviation from the long-run position is corrected

at the rate of 0.394% in each period.

The objective of the research study was to determine the effect of manufacturing sector net earnings on trade balance in Kenya. Net earnings from manufacturing sector were reviewed against the trend of balance of trade in Kenya. The results obtained and summarized in Table 4.6 indicates that in the current period, a 1% change in net earnings from manufacturing sector is associated with 0.225263% increase in trade balance on average *ceteris paribus.* This is similar to the long-run VAR results analyzed in Table 4.5. From the results of the study depicted under review 4.3.3.1 where a 1% change in net earnings from manufacturing sector is associated with 0.224% increase in trade balance position ceteris paribus**.**

## CONCLUSION AND POLICY IMPLICATION

This study concluded that in the current period, the manufacturing sector is statistically significant in influencing the trend of trade balance in Kenya over the period under review. The test results revealed the existence of unit root at levels amongst all the variables. The variables of the research were also found to be stationary after the first difference. Manufacturing sector earnings positively affects the trade balance in Kenya and have a one- way directional effect.

## AREAS FOR FURTHER RESEARCH

This study registered some limitations which need to be considered by other researchers when carrying out further research. First, this study focused mainly on the effects of sectoral earnings on the position of trade balance in Kenya focusing on only one sector, manufacturing. There is a need to review all the sectors of the economy that have in one way or the other contributed to the balance of trade.

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