

**IMPACT OF SECTORIAL VALUE ADDITION ON THE GROWTH
ON THE INDUSTRIALIZED COUNTRIES (PANEL DATA ANALYSIS
OF THREE INDUSTRIALIZED COUNTRIES)**

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ABSTRACT

Purpose of our study is to analyze the relationship between the value addition and growth rate of the three industrialized countries Norway, Australia, Singapore. Data of agricultural and industrial value addition, interest rate and growth rate over the period of 1980_2012 taken from the World Development Indicator (WDI) and used the panel data analysis technique and the Fixed And Random effect model to regress data. After analysis of the data this paper concluded that there is the positive correlation between the growth of the country and the agricultural value addition and the same the case with the industrial value addition over the growth also is positive and results are significant. over all model is significant both the variable agriculture value addition and industrial value addition having the positive impact on the growth but the interest rate is having the negative impact over the growth. Interest rate is not significant in over study, so we concluded that developed countries are developed due to increased level of agricultural and industrial value addition and they are exporting the furnished product instead of primary product which ultimately improve the level of growth of the country and make them economies rich. Interest rate is playing a negative and inverse effect on the income of the industrial countries so it show that reduced interest rate become the reason to raise the level of income in the industrialized countries.

KEYWORDS

Agriculture value addition, industrial value addition, interest rate, GDP (Gross Domestic Product).

INTRODUCTION

If we have compare the advance and industrialized countries with the poor countries we have seen that poor countries exports are primary product and rich countries are exporting the furnished products there is lack of value addition in the different sector of the economies so due to that reason developed countries are rich and developing countries. The poor countries and developing economies are not having the lack of resources but the problem is to manage and lack of opportunities to add value in the primary product to make them value able and get the more benefit from the adding the value in products. It will improve the income of the countries in the poor and developing

economies. We can see the national income of the countries from of the European courtiers too much dependent on the export on goods and services from the export of the furnished and value added products. These countries are getting quite handsome income from the manufacturing sector with in the country. Now the world is changing day by day due to technological progress in the world. Use of the technological advancement in agriculture sector as well as in the industrial sector is increasing day by day. As per much advancement in technology the industrialized countries are using these technologies in the different sector of the society like agriculture and industry to get more benefits from the existing structure and different sectors to gaining the self-sufficiency and more benefits to the economy of the country to make then developed and prosper. There is some of the aspect related to the economic growth and the value added relation is recognized most important. To a great extent focus of the industrialized countries to improve the value addition for the improvement of export and growth of countries. Main purpose of our paper is to analyze the both agriculture and industrial value addition and their role in the economic development. Among them the three most developed countries are our focus. We analysis over three variables i.e. interest rate, Agriculture value addition and industrial value addition and their impact on the growth. Agriculture sector includes the following aspects forestry, hunting, fishing, as well as cultivation of crops and livestock production. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. Data are in current U.S. dollars (World Bank).

Agriculture sector processing and the industrial processing over the different industrial sectors.

GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data is in current U.S. dollars. Dollar figures for GDP are converted from domestic currencies using single year official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used (World Bank).

Real interest rate is the lending interest rate adjusted for inflation as measured by the GDP deflator. The terms and conditions attached to lending rates differ by country, however, limiting their comparability (World Bank).

In our study we have to regress the role of the agriculture and the industrial value addition on the growth we have taken the four variable agriculture value addition and the industrial value addition and the interest rate and their impact on the growth of the of the three courtiers Norway, Australia and Singapore we collected the data 1982-2012 from the world bank data source and we analysis the relationship.

Our objective of our study is to answer the three question of the research

1. What is the role of the agriculture value addition on the GDP growth of the industrialized countries?

2. What is the role of industrial value addition on the GDP growth of the industrialized countries?
3. What is the role of the interest rate on the GDP growth of the industrialized countries?

LITERATURE REVIEW

Parpala (2014) study on value addition in the semiconductor industry in the US economy study analysis that value addition in the semi-conductor grows the industry from 1987 to 2011 tremendously and become the major contributor to raise the income of US economy and raise the level of GDP of the US economy.

Midi, Zaroki and Shahryar (2012) study on the Iranian economy and study explore the impact of export growth and it's ultimately impact the growth of the of country he use the data from 1961-2006 and uses the OLS model and he concludes that industrial value addition and process value addition is having the positive impact to raise the level of export and ultimately it improve the income of the country.

Nazima et al., (2011) studied the Pakistan economy using the time series data of trade openness and the industrial value addition and growth of the Pakistan for the period of 1980-2009 for removing the stationary by unit root test and then apply the Granger causality test and concluded that imports of the Pakistan having the positive impact on the value addition and it transform from value addition to the economic growth of the Pakistani economy. CEYLAN and ÖZKAN (2013) Study on the panel data analysis of the 25 to 30 countries of the Europe union for the period of the 13 year from the 1995-2007 an in the second the period from 2002 to 2007 the method us for the estimation of the model they concludes that value addition having the positive impact on the growth of the European countries because of the value addition.

Fakoya (2014) analysis the African countries over the period of the 9 years its study the relation between and the value addition and the growth of the 15 African countries concluded that African countries should pay attention on the value addition of the natural resources of the countries not just only focus on the development and use the primary product and make the final product to get the larger benefits. Mabuwa (2014) analysis the Zimbabwe economy he concluded that export of the primary raw martial give the negative impact on the economy of the Zimbabwe they give the recommendation to improve the value addition efforts to get the greater benefit to the products and agricultural sector.

Boadu (2003) also discusses on the value addition business and there importance and the value addition process. Stehrer (2013) uses the Value added trade, structural change and GDP growth variables they concluded that the European countries and the china are getting the world production system and the value added exports. Cappariello (2012) concluded that due to increases in the uses of the imported goods the local and domestic value addition will be reduced in the countries. Jaravaza and Isaac (2015) study the Zimbabwe economy data over the 390 farmer was collected maize and the tobacco, chilling of the milk the research recommended that farmer should give the proper training and the facilities for the production of the agricultural products and reduced the risk

through the cooperative value addition methods. Ferrer and Kaditi (2008) Value added from government intervention is being generated when a policy is implemented effectively To deals with the market imperfections to attain the desired social goods, base over the actual needs and avoiding unnecessary opportunity costs each government expenditures will consist a loss of Opportunities in other areas. Evans Agalega and Samuel Antwi (2013) studies the effect of macro-economic variables on the economic growth of the Ghana this study uses the data of 31 year and applying the multiple linear regressions technique and concluded that inflation is having the positive relation with the GDP growth and interest rate is having the negative relationship with GDP. Sidrat Jilani, Farooq-E-Azam and Muhammad Asim (2010) studied the Pakistan economy for the period of 33 years and use the multivariate regression analysis and concluded that interest rate is having the negative relationship between the GDP of the country and inflation is also having the inverse relationship with the GDP.

Hatane Semuel and Stephanie Nurina (2015) studied the Indonesian economy study uses the interest rate, exchange rate and inflation as the depend variable and GDP as the independent variable and concluded that interest rate is having the negative and inverse relationship with the GDP growth rate of the Indonesian economy.

CHRIS O UDOKA (2012) analysis the fluctuation of the interest rate and there effect on the GDP growth rate of the Nigerian economy and apply the ordinary least square multiple regression technique and concluded that rise of the interest rate will reduced the GDP growth rate of the Nigerian economy and reduction in the interest rate will raise the GDP growth of the country. Zalk (2014) study on the south African concluded that the manufacturing sector to much dominated over the economy of the south Africa to get the more growth the focus over the value addition of the manufacturing sectors its need to pay attention over the manufacturing sectors to get the more employment opportunities in that sector in the south Africa

DATA AND METHODOLOGY

We study over the period of 33 years of three industrialized countries from 1980-2012 we use panel data analysis of three countries Norway, Australia, Singapore. Data is taken from the World Bank data base. Study uses the four variables and GDP is uses as the depend variable, the agriculture value addition, industrial value addition and interest rate as the independent variable we Stata software to analysis the relation by using the Fixed and random effect model from the stata and Hausman test to check that which test is appropriate between fixed and random effect model.

MODEL

$$\text{GDP} = f(\text{IND}, \text{ACR}, \text{INT}) \dots\dots\dots (i)$$

GDP = Gross Domestic product in US dollars.

IND = Industrial value addition in current US Dollar.

ACR = Agriculture value addition in current US Dollar.

INT = Interest rate in percentage.

DEFINITION OF VARIABLES

Agriculture Value Added

Agriculture sector play important role in the development of the economy it involves the crops, forest, fishing and lives stock of the country. Value addition is the net addition in the value of the product by Appling all the input to get maximum benefit from the sector. It is the net output of the sector.

Industrial Value Added

Industrial sector is also main determent in the progress of the country it involve the mining fertilizer, construction, water sector, gas sector and the power sector etc. industrial value addition is the addition in the net output of the individual sector after the Appling all the input by subtracting the input and output we get the net output of the sector.

Interest Rate

Interest rate is the rate at which loan given to the firm or the individual for the investment or the consumption purpose basically it is the cost of the loaning to the sectors.

Econometric Models

Model

$$GDP = \beta_0 + \beta_1 (IND) + \beta_2 (ACR) + \beta_3 (INT) + \varepsilon \dots \dots \dots \quad (ii)$$

MODEL ESTIMATION

We get the panel data of Three industrialized countries Norway, Australia, Singapore we firstly get the data from the WDI data base data of the all the variables in current us dollars and interest rate in % we firstly convert all the data in the pooled from and then apply Fixed and random effect model on the data then taken the results firstly we have discuss the model.

1. Fixed effect :(intercept and slop) describes the population study as the complete this effect are have the just like the intercept and slops in the conventional regression analysis
2. Random effect: up and the down over the population intercept and slop which are used to tells the sub population these effect can changed across the sub population

Fixed Effect

Fixed-effects (FE) if we are only concerned in analyzing the influence of variables that changes with time. FE investigate the relationship between predictor and resultant variables inside an entity (country, person and may a company etc.). Each entity having its own individual individuality that might be affected or not affected the predictor variables e.g. female and male views could be effected in the direction of some issue or the political system of any country can also have the impact over the trade strategy or policy, GDP and GDP per capita. The business techniques and methods of a company might change its stock Price. After applying the fixed effect we consider that something

inside the individual might affect or make them bias the outcome variables and we have to control this. That is the justification at the back end assumption of the relationship between the error Term and predictor variables Fixed effect eliminate the effect of all time-invariant Characteristics from the predictor variables so we can evaluate the net effect of the predictor...^{2nd} significant statement of the fixed effect model is that those not change with the time Characteristics are distinguish and distinctive to the individual and are not be correlated with Other individual characteristics every entity is different and therefore error term and the constant are not correlated to each other. If the error term are correlated with the constant so in that cause we do not use the fixed effect and the fixed model not give the proper results so concluded are not good so we use the random effect.

The equation for the fixed effects model becomes:

$$Y_{it} = \beta_1 X_{it} + \alpha_i + u_{it}$$

where

α_i ($i = 1 \dots n$) is the not known intercept for each entity (n entity-specific intercepts).

Y_{it} = Dependent variable (DV)

i = Entity

t = Time

X_{it} = Independent variable (IV)

β_1 = Coefficient for that independent variable,

U_{it} = error term

RANDOM EFFECT MODEL

The justification behind model of random effect instated using of the fixed model, The changes across entities is assumed to be random and having no correlation with the Predictor or independent variables which are included in model: "...the important difference between fixed and random effects is that whether the unseen or overlooked Individual effect embodies elements which are correlated with the repressors in the Model, these effect may be stochastic or not stochastic" [Green, 2008, p.183] If we are having the reason to consider that difference across entities having the some of influence on dependent variable so we should use the random effects. A benefit of random effects is that we can include the variable which is invariant with the time (i.e. Gender) in the fixed effects model these variables are absorbed by the intercept.

The Random Effects

$$Y_{it} = \beta X_{it} + \alpha + u_{it} + \epsilon_{it}$$

Random effects suppose that error term of entity's is not correlated with the Predictors which allows for time-invariant variables to be part as the as explanatory Variables In random-effects we have to specify their individual characteristics that may or may not influence the predictor variables. The problem with this is that some are not available which leads to the biasness due to omission of the variable in Model. RE allows generalizing the inferences beyond the sample used in the model. After applying the fixed

and the random effect model for the testing that which method is good and suitable Hausman test is used.

Hausman Test

H0: Random effect is appropriate

H1: fixed effect is appropriate

Then we if the probe value is less than the 5 % we accept the random affect model

Breusch and Pagan Lagrangian multiplier test for random effects:

After applying the random effect we apply the langrangian multiplier test for the random effect to test the significance of the overall model

RESULTS AND INTERPRETATION

After apply the multilevel mixed effect model we get the results. The results are shown below our whole model is significant because Prob > chi2 = 0.0000

The entire variables are significant because the probability value is less than the 5% Value of the (Agriculture value added) $P > |z|$ is zero its show that the variable is significant because its prob value is less than the 5% so our included variable have the influence on our dependent variable significantly and have the positive coefficient. Value of the coefficient is 8.89688 which indicate that if (Agriculture value added) will increases value of the GDP 8.89688 U\$ dollars. Value of the (Industrial Value Addition) $P > |z|$ is zero its show that the variable is significant because its prob value is less than the 5% so our included variable have the influence on our dependent variable GDP and have the positive coefficient. Value of the coefficient is (2.923355) which indicate that if (Industrial Value Addition) will increase value of the GDP (2.923355) U\$ dollars. Value of the (Interest rate) $P > |z|$ is zero its show that the variable is significant because its prob value is greater than the 5% have the negative coefficient. Value of the coefficient is (-1.63e + 09) which indicate that if interest rate will increases value of the GDP will decrease the (-1.63e + 09) Dollars.

Random-Effects GLS regression	Number of Obs	99
Group variable:	panelid Number of groups	3
R-sq: within = 0.9778	Obs per group: min	33
Between = 0.9920	avg	33.0
Overall = 0.9804	max	33
Wald chi2(3) = 4759.05		
Corr(u_i, X) = 0 (assumed)	Prob> chi2	0.0000
Results of Random effect Model: <i>GDP</i> [dependent variable]		

Variables	Coefficients	Std. Err.	p- values	Z
Agricultural value added	8.8968	1.107274	0.000	8.03
Industrial value added	2.9233	.111124	0.000	26.31
Interest rate in %	-1.63e+09	1.43e+09	0.255	-1.14

Fixed-effects (within) regression	Number of obs	99
Group variable:	Panelid	Number of groups
R-sq: within	= 0.9835	Obs per group: min
Between	= 0.9962	avg
Overall	= 0.9698	max
F (3, 93)	= 1845.33	
corr(u_i, Xb)	= -0.6922	Prob> F
Wald chi2 (3)	= 4759.05	
Corr(u_i, X)	= 0 (assumed)	Prob> chi2
Results of Fixed effect model: <i>GDP</i> [dependent variable]		

Variables	Coefficients	Std. Err.	p- values	Z
Agricultural value added	17.602	1.729544	0.000	10.18
Industrial value added	2.6160	.1120173	0.000	23.35
Interest rate in %	1.08e+09	1.14e+09	0.346	0.95

DISCUSSION

From the above results and interpretation now we have in the position to address purpose of over research the analysis show that agriculture and industrialization are the key to the key determinant of the income and rich countries are giving to much focus over to raise the values of the products to by increased the value in the product and make then in the final format and furnished form both of the agriculture raw martial and industrial material and convert and process the raw product of agriculture and industrial product and make them furnished. From the above discussion this paper address the three researches question and show that agriculture value addition a key factor contributor to raise the level of income of industries countries and its role is positive. Role of Industrial value addition is significantly positive and main reason to raise the level of income in the industrialized countries. Role of interest rate is not significant in this study but the having the negative impact on the income in the rich and developed economies

CONCLUSION

In a nut shell we concluded after the analysis of the 33 year data onward from the period of 1980-2012 having three developed countries i.e. Norway, Australia and Singapore. This study concluded that agricultural value addition is significant and having the positive impact of the economic growth of the industrialized countries. If there is increases in the agriculture value addition of the country there is too much increases in the income and growth of the country industrial value addition is also significant and also having the positive impact on the economic growth. The industrial value addition increases in the economy it wills increases growth of the economy interest rate is insignificant in our model but having the negative impact of the economic growth if the interest rate decreases. Then it will reduce the growth of the economy. Agriculture value addition having the most better and the too much influence on the growth then the indusial addition main focus should be given to the agriculture sector is more dominant to growth of the country.

Value addition in the both of the sector of the economy like agriculture and industrial sector are the key contributor to improve the level of the income and it shows that value addition in the agriculture raw material and industrial raw material will improve the performance of both sectors And positively enhance the production of both in the agriculture and industrial sectors developed countries are having the common property that focus on the value addition process it's become the reason of development of the rich countries but the poor economies are too much deficient in the value added process and they are selling the primary product and getting less income and growth.

POLICY RECOMMENDATION

1. It is recommended that by incentive should be given to the formers and properly training should be organized and seminars should be conducted to increase the focus over the agriculture product and use the value added on the agriculture product to raise the income of former and whole agriculture sector of the economy.
2. It is recommended that incentive should be given to investor to for the more industrialization and more value addition and increasing the processing in the country to raise the income of the country.
3. From our study we have observe the negative relationship between interest rate and the growth rate of the economy so its recommended that interest rate to be reduced more and given the money interest free to get the more positive impact on the economy and income of the country.

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