

HUMAN CAPITAL ACCUMULATION AND TRANSITION TO SKILLED EMPLOYMENT IN NIGERIA

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Abstract

Investment in human capital stock is a strategy many developing countries have embraced. This is in line with the eight Sustainable Development Goal which focus on decent work and employment. Capacity to learn and develop workplace skills is an important area of study. This research examines the transition route to skilled employment and human capital base in Nigeria from the year 1980-2016, applying the Vector Auto regression (VAR) method of examination. The outcome which was empirically generated indicates that human capital accumulation substituted by enrolment in primary, secondary and tertiary levels positively influenced human capital evolving into skilled employment in the years selected for the purpose of this study. Furthermore, it was shown that the smallest influence to transitioning, is the enrolment in primary schools, while the largest influence to transitioning, emanates from Tertiary School enrolment. This study suggested that 15% to 20% of the nation's budget, should be dedicated to education, while provision should be made by the government to enhance ensuing budget allocation for subsequent years to be significantly changed to two digits which will enable comprehensive and quality education. Also, an evaluation of the curriculum of tertiary institutions should be conducted to relate with current realities which will allow for standard output, encourage persistent growth of the economy, and increase the output rate and technological creativity.

Keywords: Education, Employment, Enrolment, Human, Skill

1. Introduction

In every nation, whether developed or developing, humans constitute the most invaluable assets (Hadir and Lahrech 2015). It is therefore pertinent for the purpose of attaining development, for these invaluable assets (humans) to be effectively and adequately handled. This may be achievable through substantial investment in human capital. By human capital, we refer to the accumulated skills, knowledge and the intangible assets owned by people which can be applied to achieve economic gains. Human capital is expressed as the mechanism for improving competitive advantage because it entails the procedure of instructing, obtaining knowledge (education), ingenuities and factors that foster acquiring skills (Schultz, 1993)

Majority of the developing nations in Sub-Saharan Africa have not attained their full capacity in terms of expending on human capital accumulation, necessary to foster growth in the economy and to ease transitioning to skilled employment (UN 2017). The absence of government expenditure on human capital within the Sub-Saharan nations, have led to diverse challenges in form of substandard education delivery which leads to badly armed graduates and even by extension, substandard healthcare structures (Ragan & Lipsey, 2005). Nigeria has been confronted by the challenge of human capital accumulation. Despite the surplus endowment of the nation, she still struggles to attain her maximum growth prospect especially in terms of qualitative human capabilities, competencies and skills to ensure employability in the marketplace.

According to World Bank, (2016), Nigeria's population projected to be 182.2 million. Among this population prevail high literacy level with enormous cases of inadequate access to education and healthcare (Ogunleye *et al* 2017). With high prevalence of illiteracy, many unskilled workers utilize outdated means of production, tools and even capital. Consequently, this gives rise to severely low marginal productivity which paves way for low real income, low savings, low investment and also low rate of capital formation.

Studies like (Angelopoulos *et al* 2017; Jaiyeoba 2015; Olalekan 2014) discussed about the influence of human capital accumulation on skilled employment have been undertaken in various nations, revealing mixed outcomes which is traceable to irregularities in the process of evaluation. Most Prior studies (Aigbedion *et al* 2016: Odeleye 2012) in Nigeria look at impact of Education on economic growth while this research look at employment.

In this regard, this study therefore focuses on analyzing the effect of human capital acquisition on skilled employment and in addition, establish the causal correlation between human capital accumulation and skilled employment in Nigeria applying VAR approach to validate the effect.

The paper is structured as follows: presentation of empirical literature in section two, description of methodology in section three, the presentation of data and result in section four and the conclusion of the paper in section five.

2. Review of Theories

i) Human Capital Theory

The human capital theory, reveals the means through which education result to a rise in the effectiveness and productivity of workers through the rise in the degree of their cognitive proficiencies. Theodore, Schultz, Gory Bucker and Jacob Mincer (1993) pioneered the concept that the investment in education by people, is aimed at increasing the stock of human capacity which can be created by merging natural abilities with human capital investment (Babalola, 2000). Cases of such investments, are visible in education expenditure, on-the-job training, health, and nutrition. The accumulation of human capital rises in certain periods when gross investment surpasses depreciation as time passes or with an active use of human capital or it none usage.

The availability of education, is recognized as a productive human capital investment which advocates of the human capital theory views as more valuable than the physical capital. It has been discovered by human capital theorist that fundamental literacy improves the output of workers operating in the area of minimal skill occupations. Furthermore, guidelines that require logical and rational mode of reasoning that offers technical and specific knowledge raises marginal productivity of workers.

ii) The Arrow Model

The notion of learning, was first introduced by Arrow (1962). He was of the presumption that at any time in which new capital goods incorporates every information, then availability becomes a function of accumulated practice. However, once built their productive inadequacies will not be changed by subsequent learning. Fundamentally, Arrow's model is written thus:

$$Y_i = A(K) F(K_i, L_i)$$

Where Y_i represents the productivity of firm i , K_i represents the firm's accumulation of capital, L_i represents its accumulation of labour, K in the absence of a subscript represents the total stock of capital, while A represent the expertise segment. He assumes that if the stock of labour is invariable, growth consequently reaches a social halt with very minimal investment and production. This two theories are applicable to this study as they link human capital accumulation with productivity which is driven by skilled manpower. For the purpose of this study, the Arrow Model will be utilized as it helps to relate capital accumulation to development of labour.

Empirical Evidence

Obi and Obi (2014) considered the influence of expending on education, on economic development, as a mechanism of attaining the anticipated socio-economic evolution which Nigeria needs, employing the time series data from the year 1981 to 2012. The Johansen's co-integration analysis and ordinary least square (OLS) econometric methods were employed to evaluate the correlation between gross domestic product (GDP) and recurring expenditure on education. The findings, reveal that a positive correlation exist between expenditure on education and growth of the economy, however, a long run correlation is absent for the duration of the study period. They recommend enhancing the education sector by efficiently applying public reserves, proper governance, accountability, transparency and come up with policies that would assess, sustain and guide the flight of educational capital to other nations.

Olalekan (2014) analyzed the effect of human capital, on the growth of the Nigerian economy through the use of yearly health and education data from the year 1980 to the year 2011. The Generalized Method of Moment (GMM) method was employed to evaluate, while the estimated outcome gave proof of the positive correlation between economic growth and human capital in Nigeria. Also, he suggested special concentration should be provided in the areas of education and health within Nigeria concurrently. Jaiyeoba (2015) conducted an empirical analysis of the correlation between investing in education, health and the economic growth within Nigeria, by applying the time

series data from the year 1982 to the year 2011. Trend analysis were adopted, the Johansen cointegration and ordinary least square method. Findings empirically generated showed that a long-run correlation exist between the expenditure of government on education, health and economic growth. The variables: expenditure on education and health, the level of enrollment into secondary and tertiary institutions and the gross fixed capital structure, is expressed with the anticipated positive signs and are statistically significant (excluding the expenditure of government on the rate of primary enrolment). This research therefore suggests that for the acceleration of growth and to release the citizens of Nigeria from the severe poverty, the government should establish regulations focused on enormous health and education investment.

Adeyemi and Ogunsola (2016) evaluated the effect of human capital development on growth within the Nigerian economy, with the use of time series data from the year 1980 to the year 2013 of enrollment into secondary school, rate of life expectancy, education expenditure carried out by the government, gross capital formation and growth within the economy. In this study, the ARDL was employed, as well as the co-integration method, with findings indicating that a long-term positive correlation exists between enrollment into schools, the rate of life expectancy, education expenditure by the government, gross capital structure and the economic growth rate. They argue that better financial commitment should be made in the area of education in lieu of the health area by the government.

Ekesiobi, Dimnwobi, Ifebi and Ibekilo (2016) for the purpose of their research, considered investment in public sector education and the manufacturing yield in Nigeria. This study utilized the Augmented Dickey Fuller (ADF) unit root test and Ordinary Least Square (OLS) technique for the purpose of evaluating the correlation between expenditure on education in the public sector, rate of enrollments into primary schools, per capita income, exchange rate, foreign direct investment and the development of manufacturing yield. Outcome from analysis, indicates that expenditure on education in the public sector has a positive but insignificant impact on Nigeria's development manufacturing yield.

While other researchers have focused predominantly on economic growth, and some on unemployment, few have actually focused on skilled employment nor the transition mechanism. This research aims to bridge this gap and focuses on supplementing available researches by examining the effect and causal correlation between human capital and the transition to skilled employment.

3. Research Method

The Model Specification

This model is derived from the endogenous growth model, which endogenously considers how the levels of education augment the transition to skilled employment within the economy. The aim is to determine if human capital accumulation holds an impact on skilled employment. In this research, enrolment into primary, secondary and tertiary institutions were used as an alternative for the accumulation of human capital and data sourced from the World Development Indicators (WDI, 2016). This is traceable to the involvement of human capital, skills, knowledge and experience obtained by human resources existing within a nation encapsulates knowledge obtained at numerous phases of education, while the rate of employment serves as an alternative for skilled employment. For the research, vector autoregressive (VAR) model was applied and it is a model recognised as one of the most successful, flexible, and easy to use models to evaluate multivariate time series (Bayraci, Ari, Yildirim 2011). It is an innate extension of the univariate autoregressive model to dynamic multivariate time series. This research employed the model identified by Sims (1980). He stated that a p -th order VAR is also called a VAR with p lags. The procedure for selecting the maximum lag p in the VAR model demands special concentration this is because conclusion is based on the accuracy of the chosen lag order:

A p -th order VAR, denoted VAR (p), is:

$$1$$

where the t -periods back observation is called the t th lag of, c is a vector of constraints (intercepts), α is a time-invariant matrix and ϵ_t is a vector of error terms satisfying.

The model for this study is thus:

$$2$$

Where;

EMP = Employment rate

PSE = Primary School Enrolment

SSE = Secondary School Enrolment

TSE = Tertiary School Enrolment

ϵ_t Is a random error term representing all other variables not specified in the model.

Equation above can be presented in a VAR linear form as follows

$$EMP_t = \beta_0 + PSE_t + SSETSE_t + \mu_1 \quad 3$$

$$PSE_t = \pi_0 + EMP_t + SSETSE_t + \mu_2 \quad 4$$

$$SSE_t = \Omega_0 + EMP_t + PSETSE_t + \mu_3 \quad 5$$

$$TSE_t = \gamma_0 + EMP_t + PSESSE_t + \mu_4 \quad 6$$

The VAR (p) system equation can be denoted in a minimised manner within a matrix framework as:

7

A priori expectation

The a priori expectations are as follows:

The sign and degree of estimated parameter will be evaluated to determine if they are in agreement with their *priori expectation* in the evaluated model.

$$> 0 \quad > 0 \quad > 0$$

Theoretically, there is an anticipation that a higher investment in human capital, which is proxy by for enrollment into primary, secondary and tertiary institutions, will have a positive effect on Nigeria's level of employment. This is as a result of a higher investment in human capital, the level of human skill required will rise. The influence of human capital on the level of employment differs. For this reason, VAR is involved in this research to determine their numerous influences.

4. Results and Discussion

i) Unit Root Test

The Augmented Dicky Fuller and the Phillip Perron unit-root test presented in Table 1 reveals that the rate of employment, enrolment into primary, secondary and tertiary institutions of learning are fixed at initial difference. This is traceable to the variables being of identical sequence. It can be concluded therefore, that the variables possess a unit root. This means a short run equilibrium correlation is present between the variables. The Johansen-Juselius (1990) cointegration method is then used to ascertain if a long run correlation is available between the variables.

Table 1

Variables	ADF statistics	5%Critical Values	Philip-Perron Statistics	5%Critical Values	Order of integration	Remarks
EMP	/4.385590/	/2.963972/	/4.347888/	/2.963972/	I(1)	Significant
PSE	/5.809283/	/2.967767/	/5.938318/	/2.967767/	I(1)	Significant
SSE	/6.065123/	/2.967767/	/6.034602/	/2.967767/	I(1)	Significant
TSE	/5.783085/	/2.967767/	/5.15366/	/2.967767/	I(1)	Significant

Source: Author's computation, 2018.

ii) Co-integration Test

Johansen (1990) method is applied to discover the presence or otherwise of long-run correlation between variables adopted for the purpose of this study with a primary aim of eliminating biased outcomes. When co-integration is discovered among series, it is then obvious that a long-term equilibrium correlation is present between them, which then gives rise to the use of restricted VAR model. The trace statistics coupled with the maximum-Eigen value were employed. Table 2 reveals the outcomes for examining the presence of long run correlation between variables applied for the study. The trace statistics and max-eigenvalue test depicts no co-integration equation(s) at the levels of 0.05. This further indicates that a long run correlation is not available between rate of employment, enrolment into primary, secondary and tertiary institutions of learning. We therefore forge ahead using the unlimited VAR model to ascertain short run attributes.

Table 2: Johansen Cointegration Test

Hypothesized No. of CE(s)	Trace Statistic	Critical Value 0.05	Prob	Max- Eigen Statistic	Critical Value 0.05	Prob
None *	44.22545	47.85613	0.1053	23.11181	27.58434	0.1687
At most 1 *	21.11364	29.79707	0.3506	17.17100	21.13162	0.1641
At most 2	3.942643	15.49471	0.9081	2.731435	14.26460	0.9630
At most 3	1.211208	3.841466	0.2711	1.211208	3.841466	0.2711

Source: Researcher's computation using Eviews and data from WDI 2016.

Table 3b: Percentage of EMP, PSE, SSE and TSE Variation due to Shocks

Overall % share of EMP, PSE, SSE, and TSE shocks			
Employment rate shocks	Primary School enrolment shocks	Secondary School enrolment shocks	Tertiary School enrolment shocks
89.59%	1.33%	1.97%	7.11%

Source: Researcher's computation using Eviews and data from WDI 2016.

The above Table, shows that shocks by itself (i.e. rate of employment shocks), enrolment shocks in primary, secondary and tertiary institutions of learning reports for 89.59%, 1.33% and 7.11% of the aggregate discrepancy in the respective rate of Nigeria's employment. It shows also that enrolment into primary schools possesses the smallest contribution to the rate of employment within Nigeria.

iv) Table 3a: Variance Decomposition analysis of Employment rate on Primary enrolment, Secondary School enrolment and Tertiary School enrolment from 1980- 2016

PERIOD	SE	EMP	PSE	SSE	TSE
1	1.153814	100.0000	0.000000	0.000000	0.000000
2	1.548510	97.26738	0.867399	0.376699	1.488524
3	1.829878	93.82361	1.339404	0.947555	3.889425
4	2.047526	90.88534	1.510775	1.497131	6.106759
5	2.218575	88.65790	1.564388	1.967531	7.810176
6	2.353685	87.01515	1.582623	2.364003	9.038223
7	2.460944	85.78891	1.594321	2.704637	9.912133
8	2.546585	84.84760	1.607927	3.005162	10.53932
9	2.615350	84.10188	1.624981	3.276549	10.99659
10	2.670835	83.49372	1.644963	3.525897	11.33542

Source: the computation by researchers when Eviews is employed and data obtain from WDI 2016.

Table 3a connotes the discrepancies in EMP, PSE, SSE and TSE as a result of shocks which due to the shocks that perished to become linked human capital stock variables. The outcome of the degree of employment rate reported by the studied variables of human capital accumulation, are shown in table 3b.

vi) Impulse Responses Analysis

From the impulse response result, we are shown that shocks from the impulse segment which comprises of enrolment in primary, secondary and tertiary institutions of learning as in the case of this research, and the response segment which is specifically the rate of employment. The beautiful nature of the impulse response function, is in its capacity to provide assistance to us ascertain if a variable outcome decreases or increases in other variables. In this research, the impulse response analysis concentrates on the reply gotten from EMP (Employment rate) to other variables such as Primary School enrolment (PSE), Secondary School enrolment (SSE) and Tertiary School enrolment (TSE). This section further employs a sufficient use of graphs to communicate the impulse response and not the table method. To begin with, the response of the rate of employment to the previous rate of employment showcases a positive correlation throughout the time. The rate of employment response to enrolments in primary, secondary and tertiary institutions of learning reveals a positive effect throughout the periods. This is inconsonance with our apriori expectation which mostly means a rise in the degree of enrolments into primary, secondary and tertiary institutions of learning has resulted to a rise in Nigeria’s level of employment.

vii) Granger Causality Test

The computation of this result, appears in four (4) quadrants, which respectively shows the process through which the explanatory variable granger makes for the occurrence of the dependent variable I the given quadrant. For the purpose of this study, the focus is to examine the magnitude of causality among rate of employment and the accumulation of human capital. The granger causality examination is therefore restricted to the magnitude of the causality between the rates of employment, accumulation of human capital variables (PSE, SSE and TSE) i.e. tin the first quadrant alone. The outcome reveals that the rate of employment was not an outcome of granger by any of the endogenous variables illustrated within the equation. This is traceable to the level of significance, which is 5% and no possibility variable is below or equates 0.05 in absolute term. Therefore, there is no causality available between skilled employment and human capital accumulation

Table 4: VAR Granger Causality/Block Exogeneity Wald Tests

	EXCLUDED	PSE	SSE	TSE	ALL
Dependent Variable EMP	Chi-square	0.360358	1.490982	1.144530	2.470773
	DF	1	1	1	3
	Probability	0.5483	0.2221	0.2847	0.4806
Dependent Variable PSE	EXCLUDED	EMP	SSE	TSE	ALL
	Chi-square	0.003875	0.105626	3.396779	5.389496
	DF	1	1	1	3
Dependent Variable	Probability	0.9504	0.7452	0.0653	0.1454
	EXCLUDED	EMP	PSE	TSE	ALL
	Chi-square	0.530098	0.058861	0.074228	0.628123
DF	1	1	1	3	

SSE	Probability	0.4666	0.8083	0.7853	0.8900
	EXCLUDED	EMP	PSE	SSE	ALL
Dependent Variable	Chi-square	0.997907	0.513940	5.036277	7.473978
TSE	DF	1	1	1	3
	Probability	0.3178	0.4734	0.0248	0.0582

Source: Researcher's computation using Eviews and data from WDI 2016.

5. Conclusion and Recommendations

The aim of this research was to ascertain the human capital accumulation when transitioning to skilled employment within Nigeria. Furthermore, the study sought to determine the impact of accumulation of human capital on skilled employment and then ascertain the causal correlation between them. This study supplements available studies that concentrate on growth in the economy. This research discovered that the accumulation of human capital, (proxy by enrolment into primary, secondary and tertiary institutions of learning); indicated a positive effect with the outcome being in consonance with the Apriori expectation. This implies a high level of employment within Nigeria however their impact on tertiary institutions of learning differs.

This paper argued that in the light of the current and prior low financial allocation for education, 20% to 25% of the aggregate budget, should be focused on education going forward. This is in tune with the United Nations Educational, Scientific and Cultural Organisation's World Education Forum 2015 final report that majority of the government are faced with shortages in allotting the suggested international benchmark of 26 per cent of public spending required to close the educational financial gaps. The government is therefore motivated to enhance the allocation of budget in consequent years which will significantly transfer it to two digits. As an added benefit, this further helps in attaining the SDG (Sustainable Development Goal) number 4 which focuses on attaining a comprehensive and standard education for everyone while ensuring also that every boy and girl finishes primary and secondary education come 2030. The SDG number 8 (Modest jobs and growth of the economy) which will allow for a lasting growth of the economy, increase the rate of technological and productive invention. Also, the government should intensify the supervision and oversight of each tier within the area of education. An analysis of the curriculum of tertiary institutions should be conducted and in accordance with current happenings. The researches that ensue should be centred on vocational training that will allow for an ease of transitioning to skilled employment. This research determined the impact of each stage in the area of education which are enrolment into primary, secondary and tertiary institutions of learning on the skilled rate of employment, revealing enrolment into tertiary institutions as possessing the most impact. With this account, the government can adequately develop plans and schemes to finance the budget on education in tune with how vital every stage of education, influences the rate of employment.

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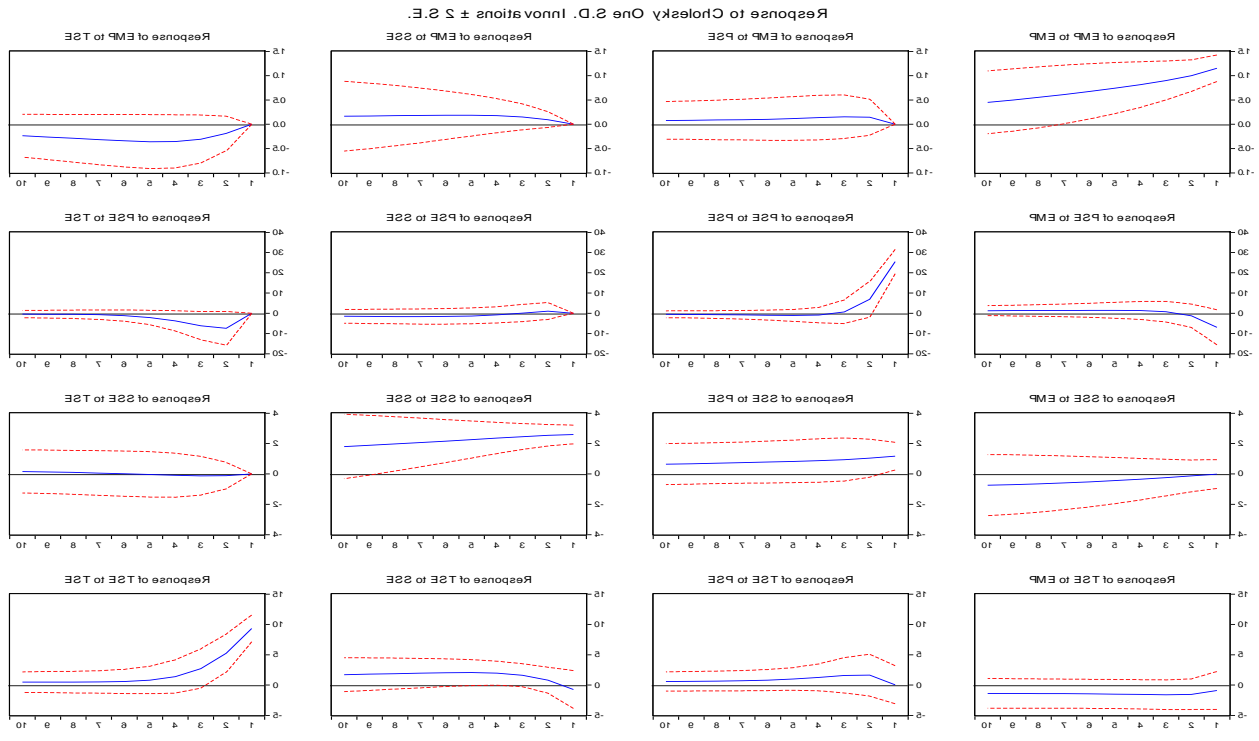
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Appendix

Impulse Responses Analysis



YEAR	EMP	PSE	SSE	TSE
1980	100	94.6188	13.60181	1.82744
1981	100	102.8345	17.00856	2.30834
1982	100	112.4986	20.91	2.66022
1983	100	112.81	25.04047	2.84963
1984	100	111.566	28.68492	2.99404
1985	100	106.0258	29.17356	3.38914
1986	100	93.26726	27.08303	3.54713
1987	100	89.5147	27.07259	3.48128
1988	100	85.1708	27.07781	3.85415
1989	100	82.82685	24.13202	4.12241
1990	100	86.26173	24.59582	25.60492
1991	94.056	85.42164	24.36392	24.36392
1992	93.814	89.4648	24.47987	24.47987
1993	93.8	93.56466	24.4219	24.4219
1994	93.793	93.35262	24.45088	24.45088
1995	93.749	89.06058	24.43639	24.43639
1996	93.126	78.45744	24.44364	24.44364

1997	95.371	75.89741	24.44001	24.44001
1998	94.761	76.3579	24.44182	24.44182
1999	94.073	93.81057	23.41556	6.08309
2000	93.298	98.35726	24.45991	23.92869
2001	93.223	96.04458	26.8612	23.93774
2002	93.147	97.64417	29.42101	25.66056
2003	93.069	98.78219	28.14111	9.64078
2004	92.989	100.2601	34.75204	9.85316
2005	92.943	100.9335	34.69912	10.40532
2006	92.898	101.6728	34.1874	34.72558
2007	92.853	92.90238	31.61383	34.44326
2008	92.808	83.7598	35.09796	32.90062
2009	92.762	84.99313	38.90452	33.3559
2010	92.714	84.71888	43.83671	9.47943
2011	92.666	90.24849	45.15109	10.07095
2012	92.4	91.6585	46.76083	44.4939
2013	92.9	93.67489	55.70422	45.95596
2014	95.2	51.23253	51.23253	51.23253
2015	95.725	53.46837	53.46837	53.46837
2016	94.995	55.70422	52.35045	52.35045
