African Tax and Customs Review
Issue 2, January – March 2019
atcr.kra.go.ke
ATCR is a Publication of the Kenya School of Revenue Administration, KRA

Analysis of Taxable Capacity and Tax Effort in Kenya

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Abstract

High taxation leads to increase in the tax revenue. Taxation, on the other hand reduces the purchasing power of the people and adversely affects their ability and willingness to work, save and invest. With the continued increase in demand for more resources and consequently desire to increase the rates of some taxes or imposing new taxes, the government has to keep in view the capacity of the people as a whole to pay taxes in framing its tax policy accordingly. The paper provides a longer period analysis of Kenya's trend of taxable capacity and tax effort indices between 1975 and 2015 to enable inform on long-term tax policy direction in Kenya. The paper also provides a trend and comparative analysis of taxable capacity and tax to GDP ratio which informs on the tax effort indices and has established if Kenya's taxable capacity is close or far from its tax effort indices. The findings obtained show that the coefficients of GDP per capita, the share of export in GDP are positive and significant. On the other hand, the share of import in GDP is negative and insignificant. The coefficient of share of agriculture in GDP is positive but insignificant. Measures to enable commercialize agricultural activities will reduce informality in the sector and hence more tax revenue realized. The share of export in GDP has been growing and this trend requires to be maintained. This is by putting in place measures to encourage more exports and to protect domestic production against imports. Taxable capacity in Kenya shows an upward trend which is not stable and has registered higher peaks and lower peaks in different years. The gap between actual and predicted taxes was large in favour of predicted values, between 1975 and 2015. The gap between the taxable capacity and tax to GDP ratio was narrow from 1975 to 1988 but there after the gap has widened. As this gap widens, Kenyan's economy continue being dominated by the service sector though the sector does not play a significant role to actual tax collection in Kenya. This could be a worrying trend to the Kenyan economy. The Kenyan Government needs to develop tax measures targeting the service sector practitioners besides boosting other sectors of the economy. The tax effort indices are on a downward and unstable trend from 1975 to 2015. Kenya Government requires to invest in long term tax measures to enable stabilize the taxable capacity and tax effort trends. Kenya's tax effort indices for the 1975 to 2015 is below 1. This shows that Kenya has no optimal taxation system and that the country has a

substantial scope or potential to raise more tax revenue. Given that actual taxes are below the taxable capacity, Kenya is expected to spend more effort to increase tax revenues.

1.0 Introduction

Taxable capacity is the ability of people to pay taxes without adversely affecting or worsening their standard of living and the efficiency. It fixes the limit beyond which the government cannot tax people because if it taxes the people beyond this limit it will fail in its tax efforts. It is that limit of the people of different classes, taken as a whole, to bear the burden of taxation beyond which productive efforts and efficiency of production begin to suffer (Pessino and Fenochietto, 2010). On the other hand, Tax effort is defined as an index of the ratio between the share of the actual tax collection in Gross Domestic Product (GDP) and the predicted taxable capacity. Tax effort is an index of how effectively a country uses its available tax instruments in collecting taxes, relative to what the country could be reasonably expected to collect from the tax instruments (Islam, 1979). As defined in Le, Moreno- Dodson, and Rojchaichaninthorn (2008), *Taxable capacity* is the predicted tax-to-GDP ratio calculated using the estimated coefficients of a regression specification, taking into account the country specific characteristics. Tax effort is an index that can take a value of 1, meaning the particular country has optimal taxation system. A "high tax effort" is defined as the case when a tax effort index is above 1, implying that the country well utilizes its tax base to increase tax revenues (Stotsky, et al., 1997). A "low tax effort" is the case when a tax effort index is below 1, indicating that the country may have a relatively substantial scope or potential to raise tax revenues.

High taxation leads to increase in the tax revenue. Taxation, on the other hand reduces the purchasing power of the people and adversely affects their ability and willingness to work, save and invest. Consequently, while increasing the rates of some taxes or imposing new taxes, the government has to keep in view the capacity of the people as a whole to pay taxes. Thus if the public has the capacity to bear the burden of additional taxes and of high taxation, the government will frame its tax policy accordingly. If the Government over steps the taxable capacity, it will produce widespread discontent among the people who will oppose government's tax measures to the best of their ability. On the contrary, if the Government imposes taxation much below the taxable capacity of the community, then it will lead to denying the government of its due share of

revenue from taxes. Thus tax efforts of the government should be as near as possible to the taxable capacity.

1.1 Tax Revenue Reforms implemented

Kenya's Tax system has been undergoing various tax reforms as early as 1970s.

Era of shocks (1973 – 1980): Between 1973 and 1980, Kenya's economy was conspicuously marked by two severe economic shocks caused by the oil crisis of 1973 and 1979. The upward spiral in oil process weakened Kenya's capacity to fully finance her budget and induced heavy concessionary foreign borrowing. Another shock factor during this period was the boom and burst cycle in coffee and tea prices in 1976 – 1979. This was followed by another setback in August 1977 with the break-up of the East African Community (EAC), which ended preferential access for Kenyan exports to Uganda and Tanzania. This included the breakup of the EAC revenue bodies, and each country's tax administration was only wholly managed domestically. In an attempt to address fiscal crisis, Kenya replaced the existing consumption taxes with a sales tax in the fiscal year 1972/73. Sales tax was introduced with the aim of taxing specific types of goods to raise additional revenue. The sales tax was also used to set the stage for the change in policy in early 1980s to de-emphasize direct taxes and give prominence to the less intrusive indirect taxes (Kenya Revenue Authority, 2010).

Structural Adjustment Programmes (1980-1990): By the early 1980s, the shortcomings in the macroeconomic policies that the country was pursuing were evident. The rationale was that liberalisation would resuscitate the economy and enhance efficiency in service delivery. As the government sought financial support, the importance of domestic revenue became increasingly pronounced. By 1982, there was a systematic lowering of corporate income tax from 45% to 30% to enhance the country's competiveness for investment finance. Consumption tax regimes were also streamlined with initiatives such as introduction of Value Added Tax (VAT) to replace Sales Tax with effect from January 1990. This was to reduce the prominence of direct taxes, which were considered intrusive, make the tax a lot easier to administer, and to broaden the tax base by applying the tax at various trade levels (Kenya Revenue Authority, 2010).

Tax Modernisation programme (TIM) - The major turning point in reforming the Kenyan tax system came in 1986 with the launch of the Tax Modernisation programme (TIM). Overall, TMP aimed to raise the tax-GDP ratio from 22 per cent in 1985/86 to 24 percent by 1999/2000. This was to be achieved by enhancing reliance on self-assessment system of taxation supported by selective audit, improving administrative efficiency through automation and reducing compliance and administrative costs (Kenya Revenue Authority, 2010).

Establishment of Kenya Revenue Authority (KRA) - KRA was established by an Act of Parliament (Cap 469) on July 1st 1995 for the purpose of enhancing the mobilization of Government revenue, while providing effective tax administration and sustainability in revenue collection (Kenya Revenue Authority Act of Parliament (Cap 469). This restructuring was expected to provide an effective administration for the enhanced mobilization of Government revenue in a sustainable manner.

Medium Term Expenditure Framework (MTEF) - A major breakthrough in fiscal policy was in the year 2000 with the adoption of Medium Term Expenditure Framework (MTEF) in budgeting. MTEF replaced the previous forward rolling budgeting system by introducing a balanced approach that matched government revenue to expenditure thus achieving greater fiscal discipline. To achieve a balanced budget, there required proper tax administrative measures to effectively mobilise sufficient financial resources. This led to the introduction of the ambitious reform programme dubbed as 'Revenue Administration Reforms and Modernisation Programme (RARMP)' with the aim of strengthening revenue administration, establishing a function based structure that integrated tax administration and a taxpayer segmented approach (Kenya Revenue Authority, 2010). This was from 2003 to date.

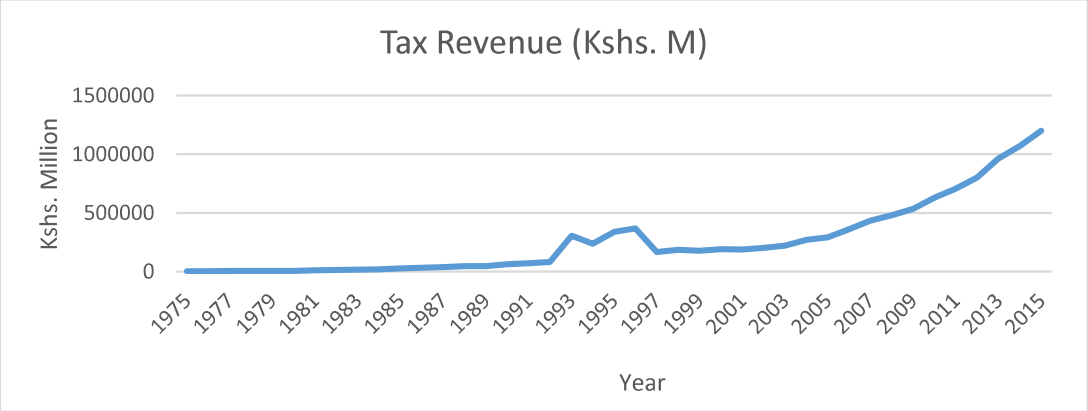
Key reform initiatives from 2003 include: iTax that ensures online service provision of taxpayers in order to reduce the cost of collection; Introduction of Turnover tax in 2007 to enable taxation of small and medium enterprise (SMEs) in Kenya; Amendments to VAT Act, 2013 which led to improvement in VAT Tax administration. VAT revenue collections improved from Kshs. 123,068m in 2013/14 financial year to Kshs. 143,922m in 2014/16 and to Kshs. 174,051m in 2015/16. The improved performance is mainly associated with the improved administrative measures; Sector specific programmes to enhance tax compliance in certain sectors e.g Kenya Revenue Authority (KRA) initiated a Real Estate Revenue Enhancement Initiative in July 2012.

Going forward, KRA plans to revamp real estate sector revenue enhancement strategy. The target is to realise an estimated 20,000 landlords in the tax bracket annually translating to additional estimated revenue of Kshs. 4 billion during the plan period (Kenya Revenue Authority 6th Corporate Plan 2015/16 – 2017/18). The Government of Kenya reintroduced the Capital Gains Tax (CGT) in Kenya following an amendment in the 2014 Finance Act which was assented to by the President on 14th September 2014. The CGT had been suspended in Kenya since 1985 to encourage investment in the real estate sector as well as spur growth in the stock market. One of the main reasons to the current reintroduction of CGT is the need for the Government to balance an ever increasing financial budget. In light of the enormous growth being experienced in the real estate as well as a robust stock market, the CGT is meant to help the Government meet its revenue targets.

1.2 Tax Revenue trend

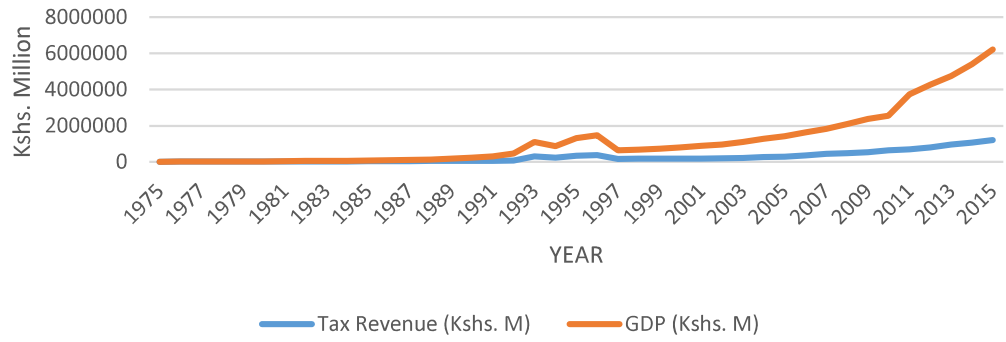
The tax revenue in Kenya has a positive trend from 1975 to 2015. The tax revenue rose from Kshs. 2,992.5Million in 1975 to Kshs 1,200,158.73Million in 2015 (Figure 1).. The positive performance is mainly associated with implementation of various tax reforms in the Kenya. On the other hand, GDP has registered a positive growth from 1975 to 2015. In 1975, Gross Domestic Product (GDP) in Kenya was Kshs. 9,653.462 Million and in 2015, GDP was Kshs. 6,224,370 Million (Republic of Kenya, 2016).

Figure 1: Tax Revenue in Kenya 1975 to 2015



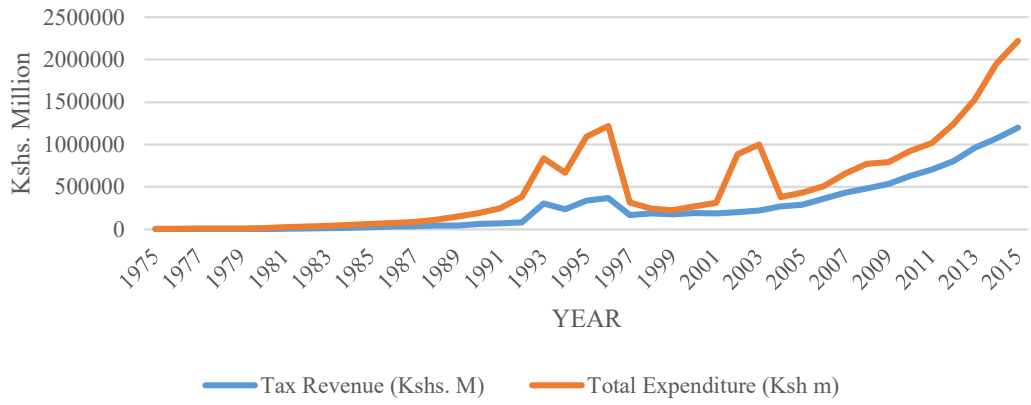
Even as the economy registers positive economic growth, the tax revenue though on an upward trend has remained below the total GDP values (Figure 2).

Figure 2: Tax Revenue and Gross Domestic Product (Kshs, M)



The Total government expenditure has remained higher than the tax revenue (Figure 3). This explains that Government relies on other sources of income mainly through borrowing to bridge the expenditure gap. The main reasons that has led to the increase in government expenditure is implementation of the Kenya Constitution 2010, which was enacted on 27th August 2010 replacing the old one that had been in place since Kenya's Independence in 1963. Some of the key changes that came with the new Constitution includes: two tier government (The National Government and the County Government); Devolved Governments establishing 47 counties each with its own government; and establishment of special courts and new Constitutional Commission offices such as Commission on Revenue Allocation to oversee equitable sharing of resources between national and county governments and the creation of independent National Land Commission to deal with public land allocation. The Kenyan Constitution has also empowered the government to levy tax on given individuals and organizations (Republic of Kenya (2010)). The current government debt stands at Kshs. 3,210,000m in 2015/16 financial year (Republic of Kenya, 2016).

Figure 3: Tax Revenue and Total Government Expenditure (Kshs. Million)



1.3 Problem Statement

The Kenyan economy has been on an upward trend from 1975 to 2015 but the country's tax revenue has been below the government expenditure. To bridge the expenditure gap, the Government has relied on other sources of income, mainly through borrowing. Government also has a positive track record of tax reforms to enable improve on revenue collection. The tax reforms have yield positive results as tax revenue in the country has improved from Kshs. 2992.5 in 1975 to Million to Kshs 1,200,158.73Million in 2015. However even with this improvement, the gap between the tax revenue and government expenditure has continued to widen. The gap between the total tax revenue and the total government started taking a wider gap with implementation of the Kenya Constitution 2010 in 2010 and the gap has continued widening further. This shows that demand for more resources will continue. From figure 3, it is evident that revenue collected from 1970 to 2015 has been less than the government expenditure and this implies that the Government could not meet its obligation of providing goods and services to its citizens. This explains that Government relies on other sources of income mainly through borrowing to bridge the expenditure gap leading to large deficits in the overall government budget. On the other hand, though high taxation leads to increase in the tax revenue, from literature (Colin Clark, 1954), any level of taxation exceeding 25% of the national income reduces the purchasing power of the people and adversely affects their ability and willingness to work, save and invest. Consequently, while increasing the tax rates or imposing new taxes, the government/financial authority has to keep in view the capacity of the people as a whole to pay taxes. This means that if the public has the

capacity to bear the burden of additional taxes and of high taxation, the government require to frame its tax policy accordingly.

Many studies done have focused on the determinants of the tax ratio to GDP and tax effort indices using panel data and time series research methods, and only a few on tax capacity and tax effort in Kenya. The current study adds knowledge to the existing literature by use of time series research methods and analysing the tax capacity and tax effort indices for Kenya from 1975 to 2015. This is with the aim of establishing if Kenyan tax capacity is close or far from its tax effort and come up with possible recommendations on tax policy going forward. In doing so, the paper seeks to respond to the following research questions:

1. What is the trend of taxable capacity and tax effort indices in Kenya from 1975 to 2015?
2. Is Kenya taxable capacity close or far from its tax effort indices?
3. What policy recommendations can be drawn from the study findings?

1.4 Objectives of the Study

The objectives of this study are to:

1. Analyze the trends of taxable capacity and tax effort indices in Kenya from 1975 to 2015.
2. Establish if Kenya's taxable capacity is close or far from its tax effort.
3. Come up with policy recommendations from the study findings.

2.0 Empirical Review

Taxable capacity is influenced by a variety of factors. In the short run, taxable capacity may be less. In the long run, taxable capacity of a country may increase on account of economic growth and rise in national and per capita income. Again, distribution of income and wealth also affects taxable capacity. Paradoxically, a high degree of inequality in the distribution of income and wealth implies a high index of relative taxable capacity. Taxable capacity also depends on government's spending and also functioning. If the government is efficient and undertakes successful welfare programmes, people's patriotism and democratic attitude are encouraged so that the taxable capacity will be high, since people would be ready to sacrifice more and more. Similarly, sound monetary and fiscal policies of the government when they lead to economic stabilisation and economic development, taxable capacity of the economy is improved.

The income level of a country is expected to be one of the significant factors determining actual tax collection. A higher-income country tends to collect more taxes in percentage of GDP. Thus, it is expected that *GDP per capita* to have a positive and significant impact on tax collection, as well as on fiscal revenue (Bahl, 1971; Fox et. al., 2005; Piancastelli, 2001). *Higher age dependency* and *higher population growth* are expected to distort tax collection capacity of countries and lower the share of productive population (Bird et al., 2004). Thus, these two variables are expected to have a negative impact on taxes and total fiscal revenues.

Trade openness is one of the variables commonly considered as an important determinant of taxation (Rodrik, 1998; Piancastelli, 2001; Norregaard and Khan, 2007; Aizenman and JinJarak, 2009). The changing size of international trade is expected to have two opposite effects on taxes. On the one hand, higher trade openness is expected to lower taxes collected on imports and exports; thus, it may have a negative impact on taxes and fiscal revenue. On the other hand, given that because higher trade openness is associated with higher economic growth rates, we expect open economies to grow faster; and as a result, more taxes can be collected with the increasing tax base. It is expected that the second effect dominates and trade openness has a positive impact on taxes and total fiscal revenue. Given that it is relatively harder to tax the agricultural sector, it is expected that as the share of *agriculture value added* in percentage of GDP increases, collected taxes in percentage of GDP drop due to a smaller tax base (Leuthold, 1991; Tanzi, 1992; Piancastelli, 2001). Thus, the expected sign of the agriculture value added ratio is negative.

Institutional and governance quality is considered as one of the most essential factors determining the adequacy of tax collection (Tanzi and Davoodi, 1997; Ghura, 1998; Bird, et al., 2004; Gupta, 2007). Countries can collect higher taxes only if the tax collection process is efficient. In this regard, *bureaucracy quality* index and *corruption* index, which are two possible measures of institutional and governance quality, are expected to have a significant impact on tax collection. If people are more patriotic, then taxable capacity is high.

Chelliah, Baas and Kelly (1975) related the tax share in GDP to various combinations of explanatory variables using 47 countries averaged over the 1969 - 1971 period. They obtained the best fit using the agricultural share, and export share in GDP as explanatory variables. The study

found that mining was positively related to the tax share while agriculture was negatively related and the export ratio was insignificant. The study found in general that countries with high share of tax revenue in GDP also tended to have high index, but these results were not uniform. Over time, there appears to be consistency in the tax effort measure, though the tax effort index changes considerably in some countries, compared to earlier study.

Tanzi (1987) examined for a sample of 86 developing countries how the share of tax revenue in GDP was related to logarithm of per capita income. The study found a positive and significant relationship between these two. The study examined in detail the determinants of the share of different components of the tax system. In a subsequent study, Tanzi (1992) extended this analysis to incorporate a specific time dimension by analysing a series of cross sections. For a sample of 83 developing counties over the period 1978 – 1988, the study found that the relationship between tax share and per capita income weak. It was hypothesized that other factors, such as macroeconomic stability, the need to service debt, and the changing structure of the economy, had become more important determinants. The study estimated an alternative specification that relates the tax share in GDP, and per capita income. It was found that the share of agriculture in GDP was strongly inversely related to the tax share and its explanatory power was greater than per capita income. Leuthold (1991) used panel data on eight sub Saharan African countries over the 1973 to 1981 period to estimate a version of this model. It was found that agriculture share was inversely related to tax share and foreign trade was directly related to tax share. Tanzania and Kenya had the highest tax effort while Cameroon and Mali had the lowest tax effort.

Stotsky Janet G. and WoldeMariam Asegedech (1997) used panel data on 43 Sub – Saharan African countries during 1990 to 1995 to measure the determinants of tax share in GDP and to constrict a measure of tax effort. For the 30 countries for which data on sectors shares in value added are available, the analysis suggest that the shares of agriculture in GDP and mining in GDP are both negative and significantly related to the tax share, and that the export shares in GDP and per capita income are both positive and significantly related to the tax share. For the 43 countries for which complete data on agricultural share in value added alone is available, the share of agriculture in GDP is again negative and significant, export share in GDP is again positive and significant, per capita income is not significant, and import share is positive and significant in some variants. No strong link between fund programs and tax shares is found, on average. The tax

effort results suggest that the countries with a relatively high tax share tend to have a relatively high tax index, although these results are not uniform across countries.

In an attempt to highlight the trends in Kenya's tax rations, tax effort indices and their implication for further tax reforms, Wawire (2003 and 2006) performed a regression of tax revenue on income. The estimated tax equation was used to compare tax effort indices by dividing the predicted with the actual figures. After examining the tax effort indices, the study concluded that the slowdown in economic growth had resulted in high levels of taxation that did not match delivery of public goods and services.

Tuan Minh Le, Blanca Moreno-Dodson and Nihal Bayraktar (2012) undertook a cross-country study from a sample of 110 developing and developed countries during 1994–2009 in their study on Tax Capacity and Tax Effort. The study used the regression methodology of ordinary least square for panel datasets and found that Tax revenue is positively correlated with GDP per capita, and trade openness; and negatively correlated with age dependency ratio, population growth, agriculture value added, as well as bureaucracy, quality index and corruption index. The estimated coefficients have the expected signs and they are mostly statistically significant. Most countries' tax effort indexes are relatively stable over the two sub-periods 1994-2001 and 2002-2009. Focusing on the OECD countries, the study found that the tax effort is almost flat at the value of 1 in the years following the initial increase. It means that for this group of countries actual and predicted taxes are very similar. Taxable capacity and tax efforts present significant deviations across countries, income groups and regions, as well as overtime. But overall, developing countries seem to have more limitations to expand the scope for taxation, which is determined by their taxable capacity.

Addison Tony and Levin Jörgen (2012) paper on The Determinants of Tax Revenue in Sub-Saharan Africa identifies the determinants of tax revenue in Sub-Saharan Africa using an unbalanced panel dataset of 39 countries over the period 1980-2005. The paper used a two-step Generalized Methods of Moments (GMM) regression undertaken with four dependent variables, that is, the share of total tax revenue, international trade tax revenue, the domestic indirect tax revenue and the domestic direct tax revenue, respectively. The results significantly suggest that the overall tax to GDP ratio is higher in more open and less agricultural dependent economies, less populous and peaceful countries. The introduction of VAT also has a significant positive

impact on the total tax-GDP ratio. The paper found evidence of relationships between the effect of openness and per-capita GDP on the trade-tax GDP ratio. The size of the agricultural sector and foreign aid affects the direct-tax GDP ratio negatively. VAT and a peaceful environment have a significant positive impact.

Murunga, J., Muriithi M. and Kiiru J. (2016) in their study on Tax Effort and Determinants of Tax Ratios in Kenya used time series data running from 1980 to 2015 and analyzed by use of ordinary least squares regression to establish the determinants of Tax Ratios in Kenya. Their findings revealed that the coefficients of per capita GDP, share of service sector in GDP and share of agriculture in GDP to be positive but significant. On the other hand the coefficients of the share of external debt in GDP and share of export in GDP were negative but insignificant. The coefficient of the share of import in GDP was positive but insignificant. The study further found Kenya's tax effort to be less than unity meaning the country is not utilizing its tax capacity fully.

From literature, main factors considered in analysis include: sectoral compositions of value added to GDP; overall level of industrial development proxied by per capita income; and international trade measure of the economy's openness, proxied by trade/'exports plus imports'.

3.0 Methodology

Taxable capacity is attained by regressing tax to GDP ratio on explanatory variables that serve as proxies for possible tax bases and other factors that might affect a country's ability to raise tax revenues. These factors may include: sectoral compositions of value added to GDP; overall level of industrial development proxied by per capita income; and international trade measure of the economy's openness, proxied by 'exports plus imports'. The predicted tax ratio from such a regression is considered a measure of taxable capacity while the regression coefficients can be interpreted as average effective rates on those bases. Other scholars have also used this approach for instance Murunga, J., et al (2016); Stotsky Janet G. and WoldeMariam Asegedech (1997); Tuan Minh Le, Blanca Moreno-Dodson and Nihal Bayraktar (2012); Lotz & Morss (1967); Tanzi (1992) and Chelliah (1971).

The general form of the equation for estimating taxable capacity is:

$$Yt = \boldsymbol{W}x_t + e_t \quad \ldots\ldots \quad 1$$

Where; Yt is the dependent variable and shows tax revenue ratio to GDP at time t (TAX/GDP) while the xt is a vector of explanatory variables at time t, $\boldsymbol{W}$ is a vector of coefficients of variables that are expected to influence tax revenue to GDP ratio while e_t is an error term at time t.

$TAX/GDP_t = b_0 + b_1\ AGRt + b_2 GDPPCt + b_3 SERV_t + b_4 EXPOt + b_5 IMPt + \epsilon_t$,..... 2

TAX/GDP_t is total tax revenues in percentage of GDP;

AGR is agriculture value added in percentage of GDP;

GDPPC is GDP per capita growth;

SERV is services value added in percentage of GDP;

EXPO is Exports of goods and services (% of GDP)

IMP is Imports of goods and services (% of GDP)

The study used the regression methodology of ordinary least square in the analysis. The main source of data is World Bank's World Development Indicators Database.

4.0 Estimation Results

4.1 Descriptive Statistics

Table 1: Summary Statistics

	TAX/GDP	AGR	GDPPC	SERV	EXPO	IMP
Mean	26.12880	31.42519	0.690399	49.89597	27.31158	32.10912
Median	25.00000	31.33008	1.062195	50.81218	26.74989	31.72147
Maximum	39.00000	41.95100	5.451187	56.44995	38.90363	45.09105
Minimum	18.00000	25.01120	-3.968771	40.06217	20.16926	15.76902
Standard Deviation	5.414943	3.557791	2.313103	4.006368	4.316449	6.276846
Observations	41	41	41	41	41	41

Table 1 above shows summary statistics of both the dependent variable (Tax revenue ratio in GDP) and the explanatory variables (one dependent and five independent variables). From the table, the study considered 41 total number of observations. Services value added in percentage of GDP has the highest value of mean at 49.89 followed by agriculture value added in percentage of GDP at 32.42. The standard deviation shows the spread of the values from the mean. Imports of goods

and services (% of GDP) has a larger spread as compared to other variables. The share of service in GDP has a standard deviation of 4.006%, agriculture has 3.557791% and exports has 4.316449%.

4.2 Unit root test results

The study used the Augmented Dickey Fuller test for Stationarity Check and Table 2 shows the results for Stationarity test in levels. From the results, all variables had a unit root at levels and after the first difference, all variables became stationary (Table 3).

Table 2: Test for Stationarity in Levels

Variable	**Test Statistics**	**1% critical level**	**5% critical level**	**10% critical level**	**p-values**
Tax/gdp	-2.048047	-3.605593	-2.936942	-2.606857	0.2661
Agri	-1.754418	-3.605593	-2.936942	-2.606857	0.3970
gdppc	-3.681169	-3.605593	-2.936942	-2.606857	0.0482
Serv	-1.485847	-3.605593	-2.936942	-2.606857	0.5304
Expo	-2.731189	-3.605593	-2.936942	-2.606857	0.0777
Imp	-2.416730	-3.605593	-2.936942	-2.606857	0.1437

Table 3: Test for Stationarity (First Difference)

Variable	Test Statistics	1% critical level	5% critical level	10% critical level	p-values
Tax/gdp	-8.751096	-3.610453	-2.938987	-2.607932	0.0000
Agri	-5.531473	-3.610453	-2.938987	-2.607932	0.0000
gdppc	-6.952482	-3.610453	-2.938987	-2.607932	0.0000
Serv	-6.323627	-3.615588	-2.941145	-2.609066	0.0000
Expo	-5.787748	-3.610453	-2.938987	-2.607932	0.0000
Imp	-6.662972	-3.610453	-2.938987	-2.607932	0.0000

4.3 Discussion of results

To obtain values of tax capacity for the period of consideration, regressions analysis was first undertaken by use of equation 2 and the results were as below:

Table 4: Estimation results

Dependent Variable: D(TAX) Method: Ordinary Least Squares Sample observations: 41				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(AGRIC)	0.346802	0.606464	0.571842	0.5712
D(GDP)	0.701700	0.221243	3.171633	0.0032*
D(SERV)	0.345735	0.727530	0.475218	0.6377
D(EXPO)	0.362573	0.146219	2.479656	0.0183**
D(IMP)	-0.000887	0.089345	-0.009928	0.9921
C	-0.419005	0.484201	-0.865353	0.3929
R-squared	0.375614			
Prob(F-statistic)	0.005147			
Durbin-Watson stat	2.331943			

Where *, ** indicates significance at 1% and 5% levels respectively.

From the regression results above, the regression performed well in terms of overall significance. This is explained by the fact that the F statistic is significant at 5% level which indicates that the variables considered were jointly significant in explaining the dependent variable (tax ratio to GDP). The results also showed an R-squared of 37.6% which indicates 37.6% variability in determining tax to GDP ratio. The Durbin Watson value of 2.33 indicates that there is no serial correlation (autocorrelation) between the error terms.

Further regression results indicate that agriculture value added in percentage of GDP, GDP per capita, services value added in percentage of GDP, and Exports of goods and services (% of GDP) positively affect the tax ratio to GDP. Imports of goods and services (% of GDP) has been found to have an inverse relationship with the tax ratio to GDP. Other results shows that GDP is an

important determinant of tax to GDP ratio. The coefficient of GDP per capita is positive and statistically significant. This shows that an increase in the level of Kenya's GDP per capita since 1975 to 2015 has led to increased economic activities which have led to more revenue mobilisation in the country. These findings are in line with earlier study by Murunga, J., Muriithi M. and Kiiru J. (2016); Ahsan and Wu (2005); Stotsky Janet G. and WoldeMariam Asegedech (1997) who found per capita GDP to be positive and important in determining tax ratio to GDP.

Exports of goods and services (% of GDP) is an important determinants of tax ratio to GDP. The coefficient of Exports of goods and services (% of GDP) is positive and statistically significant. The results are in line with earlier study (Stotsky Janet G. and WoldeMariam Asegedech (1997) which found that the export shares in GDP is positive and significantly related to the tax share. This is a measure of trade openness and is commonly considered as an important determinant of taxation (Rodrik, 1998; Piancastelli, 2001; Norregaard and Khan, 2007; Aizenman and JinJarak, 2009). The amount of exports of goods and services in Kenya has been on the rise from 1975 to 2015. Higher exports of goods and services is associated with higher economic growth rates, and it is expected that open economies grow faster and as a result, more taxes can be collected with the increasing tax base. Similarly, Tuan Minh Le, Blanca Moreno-Dodson and Nihal Bayraktar (2012) found that countries with more trade openness tend to collect higher tax revenues and fiscal revenues as a whole.

The coefficient of share of service sector in GDP is positive and statistically insignificant. The findings are in line with many earlier researchers who show that most of the service sector in developing countries is practised in the informal sector making it difficult to tax it (Erica 2014, De Giorgi, Ploenzke and Rahman (May 2015), De Mel, McKenzie, Woodruff, 2012). Growth of informal sector in Kenya has dominated employment sector commanding at least 80% when compared with the formal employment at about 20%. For instance, in 2015, informal sector employment rose by 6.0 per cent to 12,559.6 thousand persons, and accounted for 82.8 per cent of total persons engaged during the period (Republic of Kenya, 2016). The findings are in contrary to earlier studies who found the coefficient of service sector in GDP positive and significant (Chaudhry and Munir, 2010, Murunga, J., et al 2016).

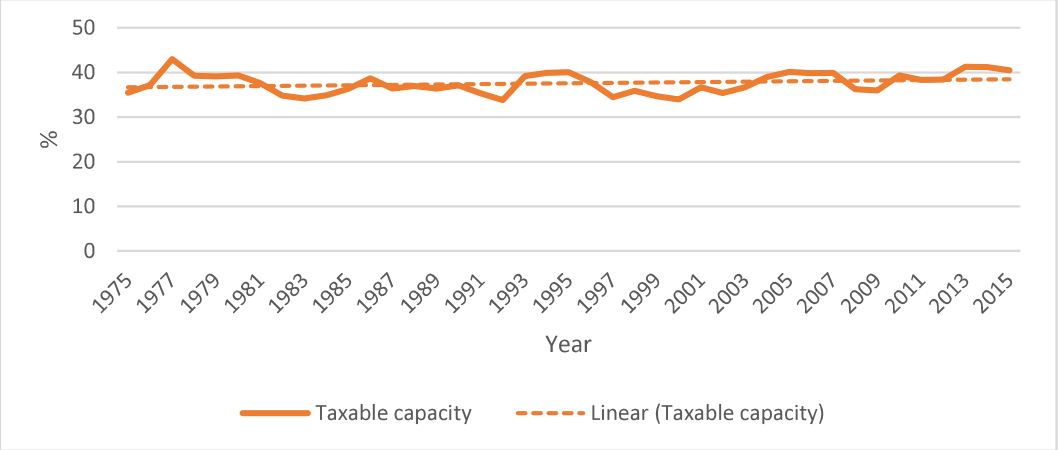
The coefficient of share of agriculture in GDP is positive and statistically insignificant. This can be explained by small scale farming practices where most farmers are in subsistence farming other

than commercial farming. This is as a result of high population growth rate that has led to further subdivision of land reducing large scale farming. The findings are contrary to earlier studies (Murunga, J., Muriithi M. and Kiiru J. 2016, Mahdavi, 2008) who found the coefficient of share of agriculture in GDP to be positive and statistically significant, Leuhold (1991) and Stotsky and WoldeMariam (1997)) found share of agriculture in GDP to negatively influence tax ratio to GDP.

4.4 Taxable Capacity – Trend Analysis

The taxable capacity is defined as the fitted values calculated using the estimated coefficients reported in Table 4. The specification takes tax revenues as a function of agriculture value added (in percentage of GDP), service value added (in percentage of GDP), GDP per capita, Exports of goods and services (% of GDP) and imports of goods and services (% of GDP). The results are presented below. Taxable capacity in Kenya shows an upward trend from 1975 to 2015 with the highest percent recorded being 41.2% in 2013 while the lowest registered being 33.9% in 2000 (Annex 1). The taxable capacity trend is not stable and has registered higher peaks and lower peaks in some years as explained below.

Figure 4.1: Taxable capacity



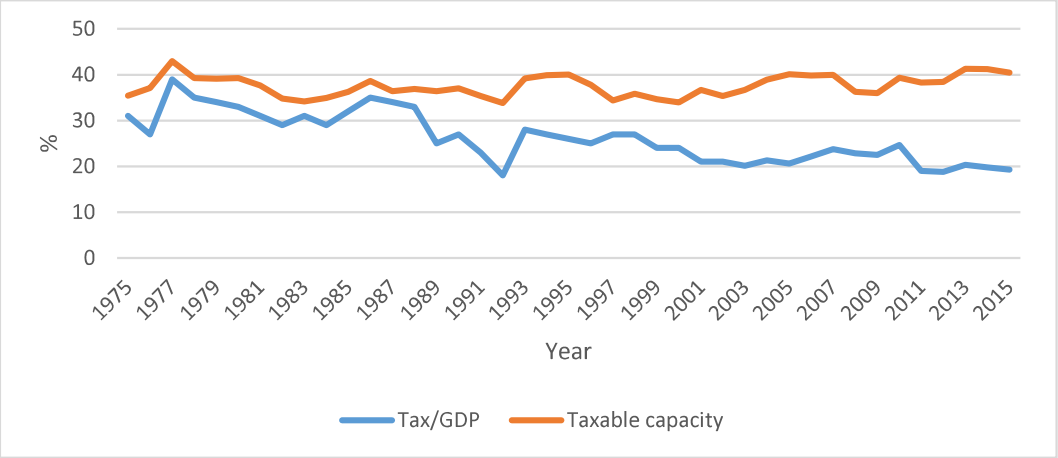
The taxable capacity rose from 35% in 1975 to 42% in 1977. A decline of taxable capacity was registered from 39.2% in 1980 to 37% in 1981 and to 34.8% in 1982. From 1983 to 1995, the taxable capacity remained stable at an average of 36% and rose again to 40% in 1995. Another stable trend was observed between 1996 and 2004 at an average of 36% and taxable capacity rose again to 40% in 2005. Thereafter, an average of taxable capacity of 38% was recorded between

2006 and 2012 when the figure rose to 41% in 2013 and 2014 respectively and slightly dropped to 40% in 2015.

Actual Tax Collection and Taxable Capacity, averages over 1975-2015

Predicted tax/GDP is taxable capacity, calculated based on the estimation results given in Table 4. Figure 4.2 reports the average values of actual and predicted tax collection (tax capacity) in percentage of GDP. The taxable capacity and actual tax collection predicts different trends with the level of taxable capacity remaining above that of actual tax collection, from 1975 to 2015. In Kenya, the gap between actual and predicted taxes was big, in favour of predicted values, between 1975 and 2015. The gap between the taxable capacity and tax/GDP ratio was narrow from 1975 to 1988 (Figure 4.2). There after the gap has been widening until 2015.

Figure 4.2: Tax/GDP ratio and Taxable Capacity



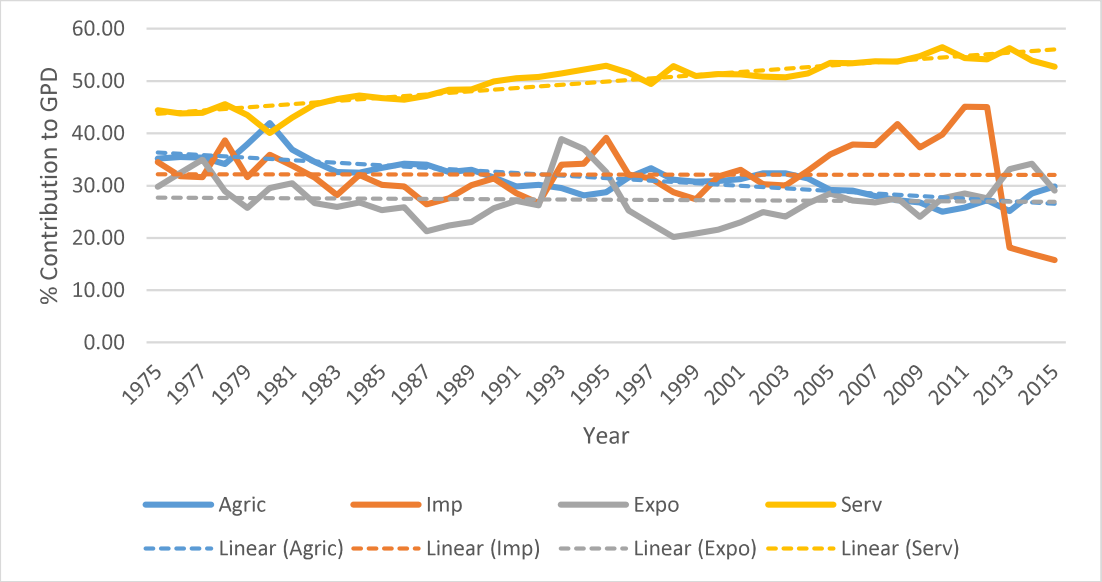
Tax revenue to GDP ratio in Kenya shows a downward trend from 1975 to 2015 with the highest percent recorded being 39% in 1977 while the lowest registered being 18%, registered in some years as shown in Annex 1. Like the trend of taxable capacity, the tax to GDP trend is not stable and has registered higher peaks and lower peaks in some years. The tax to GDP ratio registered a decline to 27 % in 1976 and shot up in 1977 to 39%. From 1980 to 1988, the revenue to GDP ratio rather remained constant at an average of 31%. From 1989 going forward, revenue to GDP ratio started registering a decline with worst performance experienced in 1992 and 1993 at 18%. In 1994, the tax to GDP ratio rose slightly and maintained an average of 26% for the period between

1993 and 2000. This average performance went down to 22% between 2001 and 2010. The tax to GDP ratio declined to 18% and has consistently performed at below 20% since then. It is noted that with the rebasing of GDP in 2014 in Kenya, tax to GDP ratio declined though not significantly. This is also the time when the gap between the taxable capacity and actual tax collection widened further. Rebasing is done to obtain real GDP value at more recent and hence more comparable prices, and also reconstitute and take cognizance of new goods and services being produced in the economy.

Analysis of Sectoral Contributions to GDP

Service sector is the highest contributor to Kenya's economy and has been having an upward trend since 1975 to 2015. It is followed by agriculture sector in the first years (1975 – 1989) before slowing down and overtaken by the imports contribution to GDP. The contributions of agriculture to GDP has a slightly downward trend with the trend for imports and exports contribution to GDP remaining rather constant over the years. However, from figure 4.2, as the gap between the taxable capacity and actual tax collection widens, the level of service sector continues growing though not playing a significant role to tax revenue in Kenya.

Figure 4.3: Sectoral Contributions to GDP



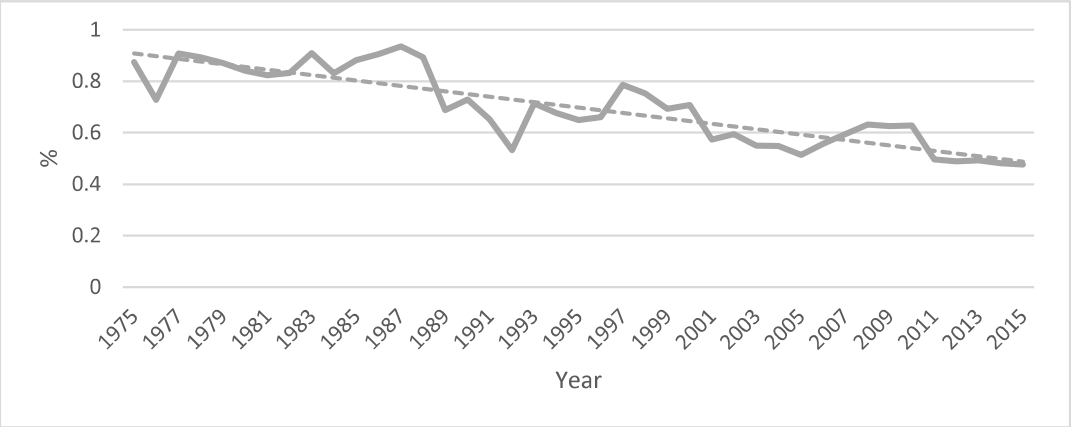
4.5 Tax Effort: Trend Analysis

Tax effort is the ratio of actual taxes to the tax capacity of the country, both in percent of GDP. Annex 1 shows the actual and predicted taxes (i.e. taxable capacity), as well as the tax effort for Kenya from 1975 to 2015. The ratio of actual to predicted tax ratios is then computed and used as an index of 'tax effort'.

From the results, Kenya's tax effort for the 1975 to 2015 is below 1. This shows that actual taxes are less than predicted taxes. It also shows that Kenya has no optimal taxation system and explains a "low tax effort" indicating that Kenya may have a relatively substantial scope or potential to raise tax revenues. Unlike the taxable capacity whose trend is on upward trend, the tax effort indices is on a downward trend. The highest tax effort index was registered in 1987 at 0.934 and the lowest registered was 0.47 in 2015.

Kenya's tax effort is not stable from 1975 to 2015 (Figure 4.4). In 1977, the tax effort index rose to 0.907 in 1977 from 0.727 in 1976. An average of 0.869 index was maintained from 1977 and 1986 before rising to 0.934 in 1987. A declining trend was recorded for 1988 at 0.89 index to 0.53 index in 1992 before the index rose to 0.71 in 1993. An average index of 0.703 was maintained between 1994 and 2000. The index declined to 0.57 in 2001 and maintained an average index of 0.56 to 2007. This was followed by a rise of the tax effort index to an average of 0.62 in the next three years (2008-2010). In 2011, the tax effort declined to 0.49 from 0.63 in 2010 and thereafter maintained an average of 0.48 until 2015.

Figure 4.4: Tax Effort Indices



Annex 1 also shows the tax effort gap. For instance, in 1975, tax effort gap is 12.5% followed by 27.2% in 1976 and then 9.2% in 1977. The highest tax effort gap recorded is 52% in 2015 and lowest tax effort gap recorded is 6.5% in 1987. Consequently, these are the same years where the tax effort is lowest and highest, respectively. This also explains that taxable capacity is not equal to the country's tax effort and it is either far (where the tax effort gap is higher) for instance in 2015 at 52% gap and nearer (where the tax effort gap is lower) for instance in 1987 at 6.5% tax effort gap.

Conclusions and Recommendations

The paper has used time series research methods to analyse Kenya's trend of taxable capacity and tax effort indices between 1975 and 2015 using ordinary least square method. The paper has established if Kenya's taxable capacity is close or far from its tax effort indices and has come up with policy recommendations drawn from the study findings.

The findings obtained show that the coefficients of GDP per capita, the share of export in GDP are positive and significant. On the other hand, the share of import in GDP is negative and insignificant. The share of export in GDP has been growing and this trend requires to be maintained. To do so, Kenyan Government requires to put in place measures to encourage more exports and to protect domestic production against imports. This may include imposition of import duties on importation of locally produced goods. This is expected to lead to higher economic growth rates, and as a result, more taxes collected with the increasing tax base. GDP per capita for Kenya has been on an upward trend. A higher-income country tends to collect more taxes in

percentage of GDP. On the other hand, distribution of income and wealth also affects taxable capacity whereby a high degree of inequality in the distribution of income and wealth may be counterproductive to tax revenue in the long run. To maintain a higher GDP per capita in Kenya, the country requires a combination of several measures including economic, fiscal, distributive measures. This will as a result raise investment opportunities leading to job creations and more tax revenue realised.

The agriculture sector does not play a significant role to actual tax collection in Kenya. The coefficient of share of agriculture in GDP is positive but insignificant. The agricultural sector is highly dominated by informality in farming, including both subsistence agriculture and informal sales of marketable crops. Measures to enable commercialise agricultural activities will reduce informality in the sector and hence more tax revenue realised.

Taxable capacity in Kenya shows an upward trend which is not stable and has registered higher peaks and lower peaks in different years. In Kenya, the gap between actual and predicted taxes was big, in favour of predicted values, between 1975 and 2015. The gap between the taxable capacity and tax/GDP ratio was narrow from 1975 to 1988 but there after the gap has widened. As the gap between the taxable capacity and actual tax collection widens, Kenyan's economy continue being dominated by the service sector though the sector does not play a significant role to actual tax collection in Kenya. The coefficient of share of service sector in GDP is positive but insignificant. This could be a worrying trend to the Kenyan economy. The Kenyan Government needs to develop tax measures targeting the service sector practitioners and boost other sectors of the economy as well.

Kenya's tax effort indices for the 1975 to 2015 is below 1. This shows that actual taxes are less than predicted taxes (taxable capacity). It also shows that Kenya has no optimal taxation system and that the country has a substantial scope or potential to raise more tax revenue. Given that actual taxes are below the taxable capacity, Kenya is expected to spend more effort to increase tax revenues. The tax effort indices is on a downward and unstable trend from 1975 to 2015. The highest tax effort index gap is 52% recorded in 2015 and the lowest recorded is 6.5% in 1987. On the other hand, Taxable capacity in Kenya shows an upward trend but not stable and has registered higher peaks and lower peaks in different years. Kenya Government requires to invest in long term tax measures to enable stabilize the taxable capacity and tax effort trends.

Annex 1: Tax/GDP, Taxable Capacity and Tax Effort Indices

YEAR	Tax/GDP	Taxable capacity	Tax Effort Indices	Tax Effort gap	YEAR	Tax/GDP	Taxable capacity	Tax Effort Indices	Tax Effort gap
1975	31	35.44488	0.874597	0.125403	1996	25	37.83422	0.660778	0.339222
1976	27	37.1236	0.7273	0.2727	1997	27	34.38524	0.785221	0.214779
1977	39	42.95236	0.907983	0.092017	1998	27	35.86148	0.752897	0.247103
1978	35	39.21036	0.892621	0.107379	1999	24	34.64795	0.692682	0.307318
1979	34	39.07783	0.870059	0.129941	2000	24	33.92317	0.707481	0.292519
1980	33	39.25963	0.840558	0.159442	2001	21	36.64051	0.573136	0.426864
1981	31	37.65018	0.823369	0.176631	2002	21	35.3583	0.59392	0.40608
1982	29	34.82677	0.832693	0.167307	2003	20	36.63903	0.549858	0.450142
1983	31	34.10981	0.90883	0.09117	2004	21	38.92347	0.547698	0.452302
1984	29	34.91893	0.830495	0.169505	2005	21	40.09746	0.513629	0.486371

1985	32	36.26445	0.882407	0.117593	2006	22	39.83823	0.55727	0.44273
1986	35	38.63919	0.905816	0.094184	2007	24	39.954193	0.594773	0.405227
1987	34	36.3683	0.93488	0.06512	2008	23	36.234693	0.631617	0.368383
1988	33	36.92535	0.893695	0.106305	2009	22	35.980966	0.625107	0.374893
1989	25	36.35954	0.687577	0.312423	2010	25	39.318667	0.62823	0.37177
1990	27	37.06002	0.728548	0.271452	2011	19	38.284887	0.495884	0.504116
1991	23	35.34932	0.650649	0.349351	2012	19	38.413688	0.489036	0.510964
1992	18	33.79487	0.532625	0.467375	2013	20	41.243255	0.492457	0.507543
1993	28	39.18898	0.714487	0.285513	2014	20	41.183193	0.481133	0.518867
1994	27	39.93228	0.676145	0.323855	2015	19	40.4501	0.476676	0.523324
1995	26	40.07101	0.648848	0.351152					

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