Journal of Accounting and Taxation Vol.1 (1), pp. 008-022, April, 2009
Available online at http://www.academicjournals.org/JAT

Full Length Research Paper

The impact of income tax rates (ITR) on the economic development of Botswana

Bonu N. S.* and Pedro Motau P.

Faculty of Business, University of Botswana, Gaborone, Botswana.

Accepted 26 March, 2009

Traditional schools of thought advocated the theory of low income tax rates' influencing economic development, whereas modern schools of thought propagated the theory of higher income tax rates producing greater economic growth, especially for developed nations. In order to justify these thoughts an attempt was made taking Botswana as a case study to pin point the effect of low and high income tax rates on economic growth. In this study various parameters were taken into account including income tax rates, income tax revenue, total revenue and GDP of the country in the nominal and real value of the money. It was located that low income tax rates boosted the economic growth of Botswana.

Key words: Income tax rates, economic development, nominal, real value of money.

INTRODUCTION

Income tax is a tool to achieve economic growth in any country. Income tax is accepted not only as a means of raising the required public revenue, but also as an essential fiscal instrument for managing the economy (Burgess, 1993). Of all the taxing systems, income tax plays a major role in generation of revenue and distribution of income in any country. If income taxation is poorly designed, it may lead to fiscal imbalance, insufficient tax revenue and distortions in resource allocation that can reduce economic welfare and growth (World Bank, 1991). Hence, an ideal tax system would achieve a balance between resource allocation, income distribution and economic stabilization (Lewis, 1984).

Patterns of income taxation (both in level and in composition) differ from country to country because of economic, cultural and historical factors. Ratios of tax revenue to gross domestic product (GDP) in developing countries are typically in the range of 15 to 20%, compared with 30% in industrialized nations (World Bank, 1991). It is also established that countries have different approaches to tax administration. Maisto (1988) stated that "contradictory approaches towards the subject matter have been shown by the tax authorities of different countries because of their diverging interests".

An optimal tax rate has to compromise between the state's revenue and its economic development. A high tax rate would deter saving and development, while a lower tax rate would lead to less revenue to the state. A tax directly influences the savings of individuals and companies; it is a double edged sword used to curtail consumption activity and at the same time, allows the taxpayer to save money in different development activities (Swami, 1995). The income tax financing the current social security benefits such as health, security and provision of utilities draws heavily upon income that otherwise would have been saved. Instead of accumulating capital, this income goes to social security transfers which are probably consumed (Boadway, 1982).

LITERATURE REVIEW

Bartik (1994a and b) suggested that a 10% lowering of taxes would raise employment and investment between 1 and 6%. World Bank periodically relates that economic development is directly correlated to the level of taxation, more so in developing nations where the lower marginal tax rates have higher economic growth. In addition, policy makers in these countries have a "keen interest in the elasticity of economic activity with respect to taxes, suggesting that states and regions are interested in manipulating their tax systems in an attempt to attract business or to foster growth" (Wasylenko, 1997). On the other hand, income tax rates are increased due to factors such as enormous reduction in the purchasing power of money, heavy tax erosion, urgent need for yield and dynamic public expenditure (Fossati, 1992). While dealing with

*Corresponding author. E-mail: bonuns@mopipi.ub.bw.

the effects of income tax rates (ITR) on economic reforms, Henry and William (1996) suggested that one should evaluate the desirability of reform proposals and the impact of such reforms on individuals and businesses as a whole. They further stated that ITR change would revolve around three factors: the tax base, allowable deductions and economic development. While dealing with the ITR, it is suggested that one should study the effects created by these rates, especially the impact of ITR on economic growth (Holger, 2003).

Various governments have different approaches and methods of fixing the ITR. The French Government recently introduced preferential tax treatment by reduced I-TR for young innovative companies completely based on the economic growth. The scheme was originally proposed to the State by French biotechnology as “a way to rapid and strong economic growth” (European Chemical News, 2004).

Martin and George (2003) analyzed several tax rates and expenditure categories and concluded that the tax system has a direct impact on the growth rate of the economy of a country. Long-term economic growth has a direct link with the country’s tax policy (John and Pamela, 2003). Fixation of ITR may be based on different systems of taxation. Akira (2003) demonstrated that a flatrate wage tax stimulated economic growth, while interest income taxation did not foster such growth. Tetsuo (2003) suggested that taxation based on environmental pollution factors results in two contradicting issues such as reduction in production and increase in tax revenue, but in the long run, this system will help the healthy economic growth for future generations. Olhoft (2003) is of the opinion that spending millions of taxpayers’ money on tax breaks and tax incentives is most likely a misguided strategy for any State when the State is in budget deficit.

Earlier studies

There are two schools of thought in understanding the impact of ITR on the economic growth of any country, the traditional school and the modern school. Robert Barro of Harvard had an influential study several years back, which surmised that while holding other determinants of growth constant, low tax rates and low government spending were associated with higher growth (Slemrod, 2003). The higher the marginal tax rate, the greater the chances of higher income taxpayers diverting extra time from productive operations to leisure activities.

The modern school of thought revealed that the higher marginal tax rates lead to greater economic development in the long run. The government would secure a greater revenue, which when invested in the country’s education and infrastructure development, will boost the economy. Slemord (2003) suggested that raising taxes and using the resultant revenue for education and infrastructure would also increase economic growth.

THEORETICAL FRAMEWORK

Problem statement

It is assumed that a higher ITR leads to a higher tax revenue collection which in turn, will enhance the economic development of any country, especially in developed nations as compared to developing or under-developed nations (Slemord, 2003). Extensive literature review revealed that higher ITR in developed countries correlated with high prosperity. This finding cannot apply to all nations, specifically not developing ones. It is the main objective of this research to locate whether there is a greater impact on the economic development by increasing ITR in a developing country such as Botswana.

Objectives

The main objectives of this study are to identify:

i) The impact of change of income tax rates on the economic development of Botswana.
ii) The correlation between the change in income tax rates with that of tax revenue.
iii) The change in the GDP with that of change in the income tax rates.
iv) The effect of inflation over the ITR and revenue.

Hypotheses

Based on the above cited research problem and objectives, the following hypotheses were developed for further study:

H1: Developed nations charged a higher ITR than developing nations.
H2: A more direct effect of income tax revenue on total revenue be located and tax collection per person in developed nations compared to developing nation.
H3: At higher tax rates, based on the nominal value of money (NVM), 1% of income tax rate (both at higher marginal tax rate (HMTR) and average tax rate (ATR) leads to higher (i) tax revenue (ii) total revenue (iii) GDP (iv) percentage tax revenue over total revenue (v) percentage of tax revenue over GDP (vi) tax collection per tax return and (vi) per person based on population.
H4: At higher tax rates, based on the real value of money (RVM), 1% of income tax rate (both at HMTR and ATR) leads to lower (i) tax revenue (ii) total revenue (iii) GDP (iv) percentage tax revenue over total revenue (v) percentage of tax revenue over GDP (vi) tax collection per tax return and (vii) per person based on population

METHODOLOGY

The extensive literature review indicated that the effect of income tax rates (ITR) over income levels and income growth (Wasylenko, 1997) have been less frequently used in the studies of state and lo-

cal economic development. To fill in the gap in existing literature, a maiden venture is undertaken to locate the ITR effect on tax collection, revenue generation, GDP and related economic issues.

The research is divided into three major areas namely (i) comparative study of ITR with that of income tax revenue (ii) comparative study of ITR with that of total revenue generation and (iii) comparative study of ITR effect on GDP.

In addition to the above, the following further variables of ITR are evaluated:

(a) Higher marginal tax rate (HMTR)
(b) Average tax rate (ATR)

The average rate of income tax paid by a person is that, person's total tax divided by his or her income. The marginal rate of tax is the rate he or she would pay on another unit of income (Lipsey, 1989). These terms are used with minor modifications in this research. H-MTR means the top tax rate an individual is supposed to pay at a higher brand of income. The maximum rate at which an individual is charged is taken into account and then the flat rate of company tax is considered. The average of these two is taken as HMTR. In the case of ATR, the average of the individual's minimum and top tax rates are taken, then the same is added to the company's flat tax to get the average of these two.

HMTR = (Top marginal tax rate of individual + Company flat tax rate)/2 (i)
ATR = {(Low marginal tax rate of an individual + Top marginal tax rate of individual)/2+Company flat tax rate}/2 (ii)

The effects of the above rates are studied in terms of nominal value of money (NVM) and real value of money (RVM). NVM is the money's face value whereas RVM is the intrinsic value of the money obtained after delinking the effect of inflation in the country. The following principle is applied to find out RVM:

RVM = Base Year (1982) NCOLI/(NCOLI of the current year. Where NCOLI = National Cost of Living (iii)

The year 1982 is considered as the base year for the intensive study of ITR effect in Botswana because the Income Tax Act of Botswana was overhauled in 1982 and this year was then used for a com-parative study of capital gains etc, assuming NCOLI as 100 in 1982. Hence, it is ideal and practical to apply 1982 as a base year for this research. It is also sensible to study the effect of change in income tax rates over a long period in order to find out the trends in changes of tax rates, income generated from income tax source, total revenue, GDP etc. Hence this study covers 1982 to 2002 covering two decades.

In addition, the following parameters are applied in finding out the effect of 1% tax rate at lowest tax rate and highest tax rate:

Nominal value of money (NVM) for the period 1982-2002: Effect of 1% income tax rate (ITR) at higher marginal tax rate (HMTR) and at average tax rate (ATR)

(i) Income tax revenue collected
(ii) Total revenue generated
(iii) GDP of Botswana
(iv) Percent of tax revenue over total revenue
(v) Percent of tax revenue over GDP
(vi) Tax collection per tax return
(vii) Tax collection per person based on the total population

Real value of money (RVM) for the period 1982-2002: Effect of 1 % income tax rate (ITR) at higher marginal tax rate (HMTR) and at average tax rate (ATR)

(i) Income tax revenue collected
(ii) Total revenue generated
(iii) GDP of Botswana at 1% of ITR
(iv) Percent of tax revenue over total revenue
(v) Percent of tax revenue over GDP.

The above test results will be compared at both low and high tax rates prevailing in Botswana over two decades.

Furthermore, the research entailed the collection of secondary data from published sources such as the annual reports of department of taxes, bank of Botswana and Income Tax Acts of Botswana published since 1973. Other publications include "Africa: South of the Sahara" (Europa), and publications of international monetary fund for the period covering 1982 to 2002 and other electronic sources.

Scope of the study

This study also covers the general effect of ITR on developing nations. The tax rates etc., of the selected developing nations in Southern African Developing Community (SADC) for the year 1999/2000 were used. For a comparative study, a few developed nations such as Japan, China, UK, USA and Canada were selected ensuring an East to West spectrum. For the detailed study of the effect of ITR on economic development in the developing nations, Botswana is chosen for the detailed study covering the period from 1982 to 2002.

DISCUSSION

H1: Developed nations charged higher ITR than developing nations

Many countries follow different approaches in taxing income. Earlier studies revealed that developed nations charged high tax rates than developing nations. In order to prove these statement nineteen nations were taken into account selecting fourteen developing nations in Africa and a random selection of five developed countries from east to west. Table 1 displays these nineteen nations' ITR ranging from the lowest and highest marginal tax rates of each country charged in the year 1999/2000. Table 1 further reveals the top marginal tax rates varying from 20 to 45% and low marginal tax rates varying from 5 to 20% for individual taxation and 15 to 50% for Company taxation. Out of the nineteen countries under study, Zimbabwe and South Africa charged the highest marginal tax rate of 45% in SADC, while China charged the same for individuals amongst the developed nations. The lowest tax rate at top marginal tax rates is charged by Mozambique (20%) in SADC and Canada (29%) among the developed nations.

Under the lower marginal tax rates, Botswana and Mauritius charged the lowest at 5% in SADC and China charged 5% in developed nations. The highest rate at the lower marginal tax bracket is charged by Zambia and Zimbabwe (20%) in SADC and Canada (16%) in the developed nations under study.

The above conclusions are presented in the Table 3 (a) and (b), which pinpoint the above stated results.

Table 1. Low and top marginal tax rates for individuals and tax rates for companies in selected developed and developing nations.

Country	ITR (Individuals) (%)	Company tax (%)	Source
Angola	18 to 40	50	Btinternet.com
Botswana	5 to 25	25	Income Tax : Chapter 52:01/2002
Congo	15 to 40	50	Cf.heritage.org/index/country.cfm
Lesotho	18 to 40	25	Lesotho.gov
Malawi	15 to 35	35	KPMG,
Mauritius	5 to 30	35	Lowtax.net
Mozambique	10 to 20	35	cpi.co.mz/facts_mz.htm
Namibia	18 to 36	35	mti.gov.na
Seychelles	10 to 40	15	Lowtax.net/lowtax/html/jsypetx.html
South Africa	19 to 45	35	Sars.gov.za/it/brochure_tax_in_sa.htm
Swaziland	18 to 40	37.5	Gov.swaziland
Tanzania	8 to 35	30	Tra.go.tz/tax_structure.htm
Zambia	20 to 30	35	Zic.org.zm/ipa_information.asp
Zimbabwe	20 to 45	30	Deloitte and Touche
China	5 to 45	30	Shanghaiguide.com/
Japan	10 to 37	30	Gol.com/users/jpc/japan/MALAWI taxes.htm
Uk	10 to 40	30	Inlandrevenue.gov.uk/rates/it.htm
Usa	15 to 40	35	Ctj.org/htm/margfaq.htm
Canada	16 to 29	21	Ccra-adrc.gc.ca/tax/individuals/faq/

H2: More direct effect of income tax revenue over GDP, total revenue and tax collection per person in developed nations compared to developing nations

A comparative analysis of the effect of income tax revenue on GDP and total revenue of the SADC countries and a few developed countries for the year 1999/2000 is presented in Table 2.

Impact of income revenue over GDP

Table 2 (e) reveals that the influence of income tax revenue over GDP is not much in economically advanced countries such as Japan, China, UK, USA and Canada. Among the advanced countries, Japan has 4% followed by Canada (9%), UK (10%), China (11%) and USA (12%). In developing nations, the lowest influence of income tax over the GDP is found in Mozambique (2%) followed by Mauritius (4%), Seychelles (5%), Tanzania and Zambia (6% each), Congo (7%), Lesotho (8%), Botswana (9%) whereas a greater influence is found in Malawi (50%), Angola (36%), Zimbabwe (14%), South Africa (13%) and Namibia (12%).

The above analysis is presented in Table 3 (d) in order to highlight the findings and for a comparative study. Based on the above analysis it can be stated that majority of developing nations are depending on income tax revenue for their economic development. There is no uniformity in the percentage of income tax revenue collection over GDP in the developing nations. It varied from 2 to 50%. Whereas the developed nations' income tax influences variance between the lowest and highest is not much on GDP. It ranged from 4 to 12%, whereas in developing nations the variance ranges from 2 to 50%.

Impact of income tax revenue over total revenue(Hypothesis 4)

In order to find out the influence of income tax revenue over the total revenue the income tax revenue data and total revenue data of 1999/2000 is taken into account for the analysis and determination of the results.

In the advanced countries, China collected 78% of its total revenue from income tax followed by USA (49%), Canada (48%), Japan (36%) and UK (27%) (Table 2 (f)). In the developing nations, the highest percentage of income tax revenue over the total revenue is Angola (75%), followed by South Africa (57%), Zimbabwe (51%), Malawi (42%), Zambia 36%, Namibia (30%), Swaziland (26%), Botswana (22%), Mauritius (19%), Congo (17%) and Lesotho (16%). The lowest influence of income tax revenue over the total revenue of the country is found in Seychelles (12%) and Mozambique (14%) and Tanzania (15%). Both developing and developed nations recorded the highest percentage of income tax revenue over the total revenue within a range of 75 and 78%, and the lowest is between 12 and 27% from developing and developed nations [(e)].

Income tax collected per person

In the SADC region, South Africa ($387.79) collected maximum income tax per head, followed by Botswana

Table 2. Impact of Income tax revenue over GDP and total revenue for the year (1999/2000).

(a)	(b)	(c)	(d)	(e)	(f)	(g)
Angola	930	448	337	36	75	27.57
Botswana	5340	2208	484	9	22	322.67
Congo	1937	847	145	7	17	50.52
Lesotho	640	295	48	8	16	22.77
Malawi	165	197	82	50	42	8.29
Mauritius	3272	765	144	4	19	121.67
Mozambique	2965	362	51	2	14	2.93
Namibia	2146	857	254	12	30	154.33
Seychelles	522	227	26	5	12	32.88
South Africa	125887	29651	16788	13	57	387.79
Swaziland	936	295	77	8	26	78.39
Tanzania	1963	771	119	6	15	3.61
Zambia	1497	263	95	6	36	10.81
Zimbabwe	4181	1143	579	14	51	47.10
China	989621	138264	107351	11	78	84.81
Japan	3655135	455849	162576	4	36	1283.66
Uk	1330009	519688	138060	10	27	2320.29
Usa	9299200	2191734	1078789	12	49	3956.09
Canada	586836	115021	55001	9	48	1906.63

Note: (a) Country under study (b) Gross domestic product (million) converted into a common currency (US$) based on the currency rates in 1999 (c) Total revenue of the country in US$ (million) (d) Income tax revenue in US$ (million) (e) Percent of income tax revenue over the GDP (f) Percent of income tax revenue over total revenue (g) Collection of income tax revenue per person in US$.

Table 3. Range analysis of developed and developing nations on ITR and their influence over GDP, total revenue and tax collected per person.

Range analysis	Developed nations		Developing nations	
	Highest	Lowest	Highest	Lowest
(a) % Higher marginal ITR (individuals)	China (45)	Canada (29)	RSA and Zim. (45)	Moz. (20)
(b) % Lower marginal ITR (individuals)	Canada (16)	China (5)	Zam. and Zim. (20)	Bot. and Mau. (5)
(c) % Company tax rates	USA (35)	Canada (21)	Ang. and Con. (50)	Seyche. (15)
(d) % of IT revenue over GDP	USA (12)	Japan (4)	Malawi (50)	Moz. (2)
(e) % of IT revenue over total revenue	China (78)	UK (27)	Angola (75)	Sey. (12)
(f) Collection of IT per head (US $)	USA (3956.09)	China (84.81)	RSA (387.79)	Moz. (2.93)

(Compiled from Table 2 and the analysis).

$322.67), Namibia ($154.33), Mauritius ($121.67), Swaziland ($78.39), Congo ($50.52), Zimbabwe ($47.10), Sey-chelles ($32.88) and Angola ($27.57). The lowest income tax revenue per head is collected in Mozambique ($2.93), followed by Tanzania ($3.61), Malawi ($8.29) and Zambia ($10.81).

Among the developed nations, the income tax collected per person is highest in USA ($3956.09), followed by UK ($2320.29), Canada ($1906.63), Japan ($1283.66) and China ($84.81). There is a wide disparity of income tax revenue collected per head both in the developing nations and developed nations. This range is high in the developed nations. This may be due to the huge population in China [Table 3 (f)].

ANALYSIS OF BOTSWANA INCOME TAX RATES (ITR), INCOME TAX COLLECTION, REVENUE GENERATION AND THEIR IMPACT ON GDP (ECONOMIC ACTIVITIES)

Earlier studies revealed that there will be higher economic development if income tax rates are high, more so in developed nations. The higher tax rates lead to increase in the total tax revenue, total revenue of the country and there will be direct positive effect in boosting the GDP. One should also seriously think whether the boosting of tax revenue, total revenue and GDP of the country is in terms of nominal value of money and real value after inflation adjustment. It is necessary to do an in-depth study

Table 4. Income tax rates (ITR) details in percentage

Individuals' tax rates				Company	HMTR	ATR	Threshold (Pula)	No. of tax payers
Year (a)	LMIITR (b)	TMIITR (c)	AIITR (b+c)/2 (d)	CTR (e)	(c+e)/2 (f)	(d+e)/2 (g)	(h)	(i)
1982	10	65	37.5	35	50.0	36.25	0	NA
1983	5	65	35.0	35	50.0	35.00	0	NA
1984	5	60	32.5	35	47.5	33.75	0	NA
1985	5	60	32.5	35	47.5	33.75	0	NA
1986	5	60	32.5	35	47.5	33.75	0	17451
1987	5	60	32.5	35	47.5	33.75	0	NA
1988	5	60	32.5	35	47.5	33.75	0	NA
1989	5	60	32.5	35	47.5	33.75	0	NA
1990	5	60	32.5	35	47.5	33.75	0	13199
1991	5	40	22.5	40	40.0	31.25	9000	15053
1992	5	40	22.5	40	40.0	31.25	9000	13288
1993	5	40	22.5	40	40.0	31.25	9000	16884
1994	5	40	22.5	40	40.0	31.25	9000	13000
1995	5	30	17.5	25	27.5	21.25	9000	13828
1996	5	30	17.5	25	27.5	21.25	15000	17430
1997	5	25	15.0	25	25.0	20.00	15000	15569
1998	5	25	15.0	25	25.0	20.00	20000	17895
1999	5	25	15.0	25	25.0	20.00	20000	17187
2000	5	25	15.0	25	25.0	20.00	20000	18462
2001	5	25	15.0	25	25.0	20.00	20000	16414
2002	5	25	15.0	25	25.0	20.00	25000	9955

Note: (a) Year; (b) LMIITR (Low marginal individual income tax rate); (c) TMIITR (Top marginal individual income tax rate); (d) AIITR (Average individual income tax rate); (e) CTR (Company tax rate); (f) HMTR (Higher marginal tax rate); (g) ATR (average tax rate); (h) Threshold (the minimum amount not taxed); (i) Number of taxpayers in the year.

of these issues considering a developing nation like Botswana to establish whether these findings are applicable to the developing nations.

Hypothesis

H3: At higher tax rates, based on the nominal value of money (NVM), 1% of income tax rate (both at higher marginal tax rate (HMTR) and average tax rate (ATR) leads to higher

(i) tax revenue
(ii) total revenue
(iii) GDP
(iv) percentage tax revenue over total revenue
(v) percentage of tax revenue over GDP
(vi) tax collection per tax return and
(vii) tax collection per person based on population

In order to test the above hypothesis, income tax rates details are collected from the old Income Tax Acts and other sources for the period from 1982 to 2002, BoB (1985-2004) and CSO (2001). This data is presented in Table 4.

Tax information

Table 4 (b) highlights the lower marginal individual income tax rate (LMIITR) that is payable beyond the thres-hold if any and top marginal individual income tax rate (TMIITR) is that rate beyond a specific amount, an indivi-dual is liable to pay the highest tax rate. These lower and higher tax rates are on the high side during the early pe-riod of study (10-65% in 1982) and gradually reduced (5 to 25% in 2002). The average individual income tax rate is obtained by applying the principle of (LMIITR + TMIIT-R)/2. The average individual income tax rate is 37.5% in 1982 and gradually reduced to 15% by 2002 (Table 4 (d)). Companies are taxed at flat rate, which varied from 35% in 1982 to 25% in 2002 [Table 4 (e)].

The higher marginal tax rate (HMTR) is derived from the principle of (TMIITR + COMPANY FLAT RATE)/2. The year 1982 reflected as 50% HMTR (65 + 35)/2 and year 2002 as 25% (25+25)/2 as HMTR [Table 4 (f)].

Table 4 (h) indicates the various thresholds given to individuals. There was no threshold until 1991 and the tax payers were given various concessions such as the married person's allowance, education and medical allowances etc. In order to streamline and standardize the tax law, the government of Botswana replaced all these allowances with a threshold of P9000 where no tax is collected. This threshold was gradually increased to P25000 by 2002.

The number of taxpayers (tax returns assessed) is col-

Table 5. Revenue information

Year	At nominal value of money			NCOLI	At real value of money			Population
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
	Tax Rev	Total Rev.	GDP		Tax Rev.	Total Rev	GDP	
30-Jun	(Pm)	(Pm)	(Pm)		(Pm)	(Pm)	(Pm)	Million
1982	103.1	322.6	743.3	100.0	103	323	743	0.9
1983	98.2	392.6	920.5	109.0	90	360	844	0.9
1984	139.9	563.1	1106.0	119.1	117	473	929	0.9
1985	256.9	802.9	1170.9	130.1	197	617	900	0.9
1986	324.6	1092.2	4516.0	141.2	230	774	3198	1.3
1987	553.2	1462.9	4442.0	154.9	357	944	2868	1.3
1988	741.2	1693.5	6170.1	168.0	441	1008	3673	1.4
1989	989.8	2446.4	10038.0	187.3	528	1306	5359	1.4
1990	1038.3	2604.2	6690.5	207.2	501	1257	3229	1.4
1991	1400.4	3263.1	8343.0	232.0	604	1407	3596	1.5
1992	1201.1	3999.6	8977.6	272.3	441	1469	3297	1.5
1993	1304.8	4552.2	11257.3	311.6	419	1461	3613	1.5
1994	1428.7	5127.1	12100.0	343.1	416	1494	3527	1.5
1995	1423.0	4594.0	12530.3	377.8	377	1216	3317	1.5
1996	1160.9	5143.4	14631.0	417.0	278	1233	3509	1.5
1997	1245.5	5352.7	18015.1	454.1	274	1179	3967	1.5
1998	1947.2	7677.6	20162.6	481.0	405	1596	4192	1.5
1999	1987.0	7536.8	21523.9	514.3	386	1465	4185	1.5
2000	2592.8	11837.1	28636.5	568.8	456	2081	5035	1.5
2001	3422.4	12926.7	31922.1	602.5	568	2146	5298	1.7
2002	3703.4	14226.6	36337.5	655.9	565	2169	5540	1.8

Note: (a) Year; (b) Income tax revenue at nominal value of money; (c) Total revenue at nominal value of money; (d) GDP at nominal value of money; (e) National cost of living index; (f) Income tax revenue at real value of the money; (g) Total revenue at the real value of the money; (h) GDP at the real value of the money; (i) Population of the country.

lected from the annual reports of the department of taxes. For the years 1982-1885 and 1987-1990, the details of tax payers were not available (NA) and others are shown in Table 4 (i). The highest tax returns (18,462) were assessed in the year 2000, when HMTR and ATR were at their minimum. This may be an indication that low tax rates lead to savings, development and income generation.

Revenue information

The revenue information is classified into two categories, namely; revenue at nominal value of money and revenue at real value of money.

Table 5 (b), (c) and (d) record the tax revenue, total revenue and GDP respectively of the year. These figures show the face value of money which we call nominal value of the money. Due to inflation, the national cost of living index (NCOLI) gradually increased from 100 in 1982 to 655.9 by 2002. In other words, P6.55 in 2002 equaled P1.00 in 1982. The NCOLI was applied to the nominal values of income tax, revenue and GDP to determine the real value of money. Columns (f), (g) and (h) respectively highlight the real value of tax revenue, total revenue and GDP. Column (i) indicates the total population of the country at the specific year of study.

Income tax revenue, total revenue and GDP gradually increased in both nominal value and real value of money. Population also gradually increased. In the nominal value of money, there is an absolute increase by 35.92 times in tax revenue, 44.01 times in total revenue and 48.89 times in GDP when compared to the base year 1982 to that of the latest year under study (2002). One should not jump to the conclusion that the country has tremendously improved its tax revenue, total revenue and GDP generation. These results may be the effect of inflation that prevailed in Botswana. Hence we have to delink the effect of inflation by application of NCOLI.

Over these 21 years, the country could increase the real value of the money by 5.51 times in tax revenue, 6.72 times in total revenue and 7.46 times in GDP. Growth is noticed in all areas of study but not at a commendable scale. It was noticed that the population of the country doubled during the 21 years of study.

The main issue of this research is to find out the effect of income tax rates over generation of tax revenue, total revenue and GDP under the situations of nominal and real value of money. The study has to further classify the ef-

Table 6. Impact of high marginal and average tax rates.

Year	At higher marginal tax rates (HTMR)							At average tax rates (ATR)						
(a)	(b) (Pm)	(c) (Pm)	(d) (Pm)	(e) %	(f) %	(g) (000)	(h) (Pm)	(i) (Pm)	(j) (Pm)	(k) (Pm)	(l) %	(m) %	(n) (000)	(o) (Pm)
1982	2.06	6.5	14.9	0.6	0.3	NA	2.3	2.84	8.9	21	0.9	0.4	NA	3.2
1983	1.96	7.9	18.4	0.5	0.2	NA	2.2	2.81	11.2	26	0.7	0.3	NA	3.1
1984	2.95	11.9	23.3	0.5	0.3	NA	3.3	4.15	16.7	33	0.7	0.4	NA	4.6
1985	5.41	16.9	24.7	0.7	0.5	NA	6.0	7.61	23.8	35	0.9	0.7	NA	8.5
1986	6.83	23.0	95.1	0.6	0.2	0.4	5.3	9.62	32.4	134	0.9	0.2	0.6	7.4
1987	11.65	30.8	93.5	0.8	0.3	NA	9.0	16.39	43.3	132	1.1	0.4	NA	13
1988	15.6	35.7	129.9	0.9	0.3	NA	11.1	21.96	50.2	183	1.3	0.4	NA	16
1989	20.84	51.5	211.3	0.9	0.2	NA	14.9	29.33	72.5	297	1.2	0.3	NA	21
1990	21.86	54.8	140.9	0.8	0.3	1.7	15.6	30.76	77.2	198	1.2	0.5	2.3	22
1991	35.01	81.6	208.6	1.1	0.4	2.3	23.3	44.81	104.4	267	1.4	0.5	3.0	30
1992	30.03	100.0	224.4	0.8	0.3	2.3	20.0	38.44	128.0	287	1.0	0.4	2.9	26
1993	32.62	113.8	281.4	0.7	0.3	1.9	21.7	41.75	145.7	360	0.9	0.4	2.5	28
1994	35.72	128.2	302.5	0.7	0.3	2.7	23.8	45.72	164.1	387	0.9	0.4	3.5	31
1995	51.75	167.1	455.6	1.1	0.4	3.7	34.5	66.96	216.2	590	1.5	0.5	4.8	45
1996	42.21	187.0	532.0	0.8	0.3	2.4	28.1	54.63	242.0	689	1.1	0.4	3.1	36
1997	49.82	214.1	720.6	0.9	0.3	3.2	33.2	62.28	267.6	901	1.2	0.3	4.0	42
1998	77.89	307.1	806.5	1	0.4	4.0	51.9	97.36	383.9	1008	1.3	0.5	5.4	65
1999	79.48	301.5	861.0	1.1	0.4	4.6	53.0	99.35	376.8	1076	1.3	0.5	5.8	66
2000	103.71	473.5	1145.5	0.9	0.4	5.6	69.1	129.64	591.9	1432	1.1	0.5	7.0	86
2001	136.90	517.1	1276.9	1.1	0.4	8.3	80.5	171.12	646.3	1596	1.3	0.5	10.4	101
2002	148.14	569.1	1453.5	1	0.4	14.9	82.3	185.17	711.3	1817	1.3	0.5	18.6	103

Note: Impact of 1% of income tax rate (ITR) at nominal value of money (NVM). HMTR: (a) Year; (b) Income tax revenue; (c) Total revenue; (d) GDP; (e) Tax revenue over total revenue; (f) Tax revenue over GDP; (g) Per tax return (h) per person based on population. ATR: (i) Income tax revenue; (j) Total revenue; (k) GDP; (i) Percentage of Income tax revenue over total revenue; (m) Percentage of income tax revenue over GDP; (n) Per tax return ; (o) Per person based on population.

fect of HMTR and ATR on the tax revenue, total revenue and GDP.

Under each category of NVM and RVM, the research concentrates on the effect of 1% of ITR over income tax revenue, total revenue, GDP, percentage of tax revenue over total revenue. Percentage of tax revenue over GDP, tax collected per tax return and tax collected per person were based on the total population.

The above results will be compared when lower and higher tax rates were prevailing in Botswana during the period of study to determine whether higher tax rates lead to economic development in the developing nations of Africa, like Botswana.

Impact of income tax rates (ITR) on various factors under study at nominal value of money based on HMTR and ATR

Table 6 highlights the impact of 1% of income tax rate on the tax revenue, total revenue, GDP, percentage tax revenue over total revenue, percentage of tax revenue over GDP, tax collection per tax return and per person based on population, as based upon the nominal value of the money.

Nominal value of money at HMTR

Income tax revenue: Generally income tax revenue occupies a major role in the total revenue of the country; hence the effect of 1% of ITR at HMTR is tested and presented in Table 6 (b). The principle applied is:

1% effect of HMTR = Tax revenue/HMTR (iv)

In 1982 the effect of 1% HMTR = P103.1/50 = P2.06m
In 2002 the effect of 1% HMTR = P3703.0/25 = P148.14m

As the HMTR is reduced from 50 to 25%, the tax collection is gradually increased and it confirmed that the effect of 1% ITR is more effective at reduced HMTR.

Total revenue: Table 6 (c) reveals the effect of 1% of ITR on the total revenue generation. At higher tax rates, the revenue generation is lesser per 1% of ITR when compared to lower tax rates**.** The principle applied here is:

1% effect of HMTR = Total revenue/HMTR (v)

In 1982 the effect of 1% HMTR = P322.6/50 = P6.5m
In 2002 the effect of 1% HMTR = P14226.6/25 = P569.1m.

In 1982, the revenue generated per 1% of tax rate is P6.5m, whereas in 2002 it registered P569.1m at the lower tax rates. This test also indicated the higher the tax rates, the lower the total revenue and vice versa. Lower income tax rates generate higher revenue which will add to the economic development of the country.

Effect of 1% of ITR on GDP

Column (d) of Table 6 reflects the effect of 1% of ITR on GDP of Botswana. The principle applied here is:

1% effect of HTMR = GDP/HTMR (vi)

In 1982 = P743.3/50 = P14.9m
In 2002 = P36337.5/25 = P1453.5m

In this test also, the lower HMTR lead to high GDP. In the year 1982, 1% of ITR has a total of P14.9 m GDP whereas in 2002, it has achieved P1453.5 m. There is a gradual increase of GDP when ITR is gradually reduced. This test also proved that the lower the HTMR the higher the GDP through economic growth.

Effect of 1% of ITR on the tax revenue over total revenue

This test reveals the correlative effect of tax revenue over the total revenue. The principle applied here is:

{(Tax revenue/Total revenue)*100}HMTR (vii)

To test the principle years 1982 and 2002 figures of Table 5 (b) and (c) are taken:

1982 = {(103.1/322.6)*100}/50 = 0.6%
2002 = {(3703.4/14226.6)*100}25 =1%

This test also indicated that the lower the tax rate, the higher the tax collection per 1% of ITR. Column (e) of Table 6 revealed that there is a gradual increase in percentage when there is a gradual decrease in HMTR.

Effect of 1% of ITR on tax revenue over GDP

This test pinpoints the relative effect of tax revenue over GDP at 1% of tax rate. The principle applied here is:

{(Tax revenue/GDP)*100}HMTR (viii)

To test the principle years 1982 and 2002 figures of Table 5 (c) and (d) are taken.

1982 = {(103.1/743.3)*100}/50 = 0.3%
2002 = {(3703.4/36337.5)*100}25 =0.4%

This test also indicated that the lower the tax rate, the higher the revenue generation per 1% of ITR**.** Column (f) of Table 6 revealed that there is a gradual increase in percentage, when there is a gradual decrease in HMTR. Over 21 years the change is only 0.1%.

Effect of 1% of ITR per tax return

Number of tax returns assessed or number of persons taxed is taken as a basis for the study of effect of 1% ITR in relation to tax revenue generation. The data for the number of persons' taxed for years from 1982 to 1985 and from 1987 to 1989 was unavailable. The first available year is 1986, where 17,451 tax returns were assessed when the tax threshold is zero. Hence many more tax returns were furnished than in 2002. This is due to the high threshold given in 2002 and because the majority of small income groups were not liable to submit tax returns. Hence the tax returns almost reduced to 50%. However the principle applied here is:

(Tax revenue/No of returns assessed)/HTMR (ix)

For 1986 = {(P324 600 000/17451)/47.5 = P400
For 2002 = (3 703 400 000/9955)/25 =P14 900

In this test also, it is proved that the lower the tax rates, the higher the tax revenue per tax return.

Tax collection per 1% of HMTR /population

The effect of 1% ITR based on population is calculated as the principle:

(Tax revenue/Population)/HMTR (x)

In 1982 = (P103.1/0.9)/50 = P2.3 m
In 2002 = (P3 703m)/1.8)/25 = P82.3 m

This test also proved that lower HMTR has given rise to more tax per 1% of HMTR/per person.

As mentioned earlier, the effect of tax rate is to be tested at HMTR and ATR. So far we have seen the effect of HMTR and the following investigation is to find out the effect of 1% of ATR on all variables such as:

Real value of money (RVM) at ATR

Income tax revenue

The principle applied is:

1% effect of ATR = Tax revenue/ATR (xi)

In 1982 the effect of 1% ATR = P103.1/36.5 = P2.84m
In 2002 the effect of 1% ATR = P3703/20 = P185.17m

Total revenue

Table 7(j) reveals the effect of 1% of ITR on the total revenue generation. At higher average tax rates, the revenue

Table 7. Real value of money (RVM) at HMTR and ATR.

Year			At higher marginal income tax rates						At average income tax rates					
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	*(o)*
						(000)							(000)	
1982	2.06	6.5	14.9	0.6	0.3	NA	2.3	2.84	8.9	20.5	0.9	0.4	NA	3.2
1983	108	7.2	16.9	0.5	0.2	NA	2.0	2.57	10.3	24.1	0.7	0.3	NA	2.9
1984	2.47	10	19.6	0.5	0.3	NA	2.7	3.48	14.0	27.5	0.7	0.4	NA	3.9
1985	4.16	13	18.9	0.7	0.5	NA	4.6	5.85	18.3	26.7	0.9	0.6	NA	6.5
1986	4.84	16.3	67.3	0.6	0.2	0.3	3.7	6.81	22.9	94.8	0.9	0.2	0.4	5.2
1987	7.52	19.9	60.4	0.8	0.3	NA	5.8	10.58	28.0	85	1.1	0.4	NA	8.1
1988	9.29	21.2	77.3	0.9	0.3	NA	6.6	13.07	29.9	109	1.3	0.4	NA	9.3
1989	11.13	27.5	112.8	0.9	0.2	NA	7.9	15.66	38.7	159	1.2	0.3	NA	11.2
1990	10.55	26.5	68.0	0.8	0.3	0.8	7.5	14.85	37.2	95.7	1.2	0.5	1.1	10.6
1991	15.09	35.2	89.9	1.1	0.4	1.0	10.1	19.32	45.0	115	1.4	0.5	1.3	12.9
1992	11.03	36.7	82.4	0.8	0.3	0.8	7.4	14.12	47.0	106	1.0	0.4	1.1	9.4
1993	10.47	36.5	90.3	0.7	0.3	0.6	7.0	13.4	46.8	116	0.9	0.4	0.8	8.9
1994	10.41	37.4	88.2	0.7	0.3	0.8	6.9	13.33	47.8	113	0.9	0.4	1.0	8.9
1995	13.70	44.2	120.6	1.1	0.4	1.0	9.1	17.72	57.2	156	1.5	0.5	1.3	11.8
1996	10.12	44.9	127.6	0.8	0.3	0.6	6.7	13.1	58.0	165	1.1	0.4	0.8	8.7
1997	10.97	47.1	158.7	0.9	0.3	0.7	7.3	13.71	59.0	198	1.2	0.3	0.9	9.1
1998	16.19	63.8	167.7	1.0	0.4	0.9	10.8	20.24	79.8	210	1.3	0.5	1.1	13.5
1999	15.45	58.6	167.4	1.1	0.4	0.9	10.3	19.32	73.3	209	1.3	0.5	1.1	12.9
2000	18.23	83.2	201.4	0.9	0.4	1.0	12.2	22.79	104.1	252	1.1	0.5	1.2	15.2
2001	22.72	85.8	211.9	1.1	0.4	1.4	13.4	28.4	107.3	265	1.3	0.5	1.7	16.7
2002	22.59	86.8	221.6	1.0	0.4	2.4	12.6	28.23	108.5	277	1.3	0.5	2.8	15.7

Note: Impact of 1% of ITR at RVM. HMTR: (a) Year; (b) Income tax revenue; (c) Total revenue; (d) GDP; (e) Tax revenue over total revenue; (f) Tax revenue over GDP; (g) Per tax return; (h) Per person based on population. ATR: (i) Income tax revenue; (j) Total revenue; (k) GDP; (l) Percentage of Income tax revenue over total revenue; (m) Percentage of income tax revenue over GDP; (n) Per tax return; (o) Per person based on population.

generation is lesser per 1% of ITR when compared to lower tax rates. The principle applied here is:

1% effect of ATR = Total revenue/ATR (xii)

In 1982 the effect of 1% ATR = P322.6/36.5 = P8.9m
In 2002 the effect of 1% ATR = P14226.6/20 = P711.3m

Effect of 1% of ITR on GDP

Column (k) of Table 7 reflects the effect of 1% of ITR on GDP of Botswana:

1% effect of ATR =GDP/ATR (xiii)

1982: 743.3/36.5 = P21m
2002: 36337.5/20 = P1817m

Effect of 1% of ITR on the tax revenue over total revenue

This test reveals the correlative effect of tax revenue over total revenue. The principle applied here is:

{(Tax revenue/Total revenue)*100} ATR (xiv)

To test the principle years 1982 and 2002 figures of Table 5 (f) and (g) are taken;

1982 = {(103.1/323)*100}/36.5 = 0.9%
2002 = {(3703.4/14226.6)*100}20 =1.3%

This test also indicated that the lower the tax rate, the higher the tax collection per 1% of ITR. Column (k) of Table 6 revealed that there is a gradual increase in percentage when there is a gradual decrease in ATR.

Effect of 1% of ITR on total revenue over GDP

This test pinpoints the relative effect of total revenue over GDP at 1% of tax rate. The principle applied here is:

{(Total revenue/GDP)*100}ATR (xv)

To test the principle years 1982 and 2002 figures of Table 5 (c) and (d) are taken.
1982 = {(103.1/743.3)*100}/36.25 = 0.4%

2002 = {(3703.4/36337.5)*100}20 =0.5%

This test supports the earlier conclusion that the lower the tax rates, the higher the revenue generation per 1% of ITR. Column (f) of Table 6 revealed that there is a gradual increase in percentage when there is a gradual decrease in ATR. Over 21 years the change is only 0.1%

Effect of 1% of ITR per tax return:

The principle applied here is:

(Tax revenue/No of returns assessed)/ATR (xvi)

For 1986 = {(P326 600 000/17451)/33.75 = P600
For 2002 = (3 703 400 000/9955)/20 =P18600

This test also proved that lower tax rates generate, the higher the tax revenue per tax return.

Tax collection per 1% of ATR /Population

The population of the country is doubled during these 21 years period. The effect of 1% ITR based on population is calculated as the principle:

(Tax revenue/Population)/ATR (xvii)

In 1982 = (P103.1/0.9)/36.5 = P3.2
In 2002 = (P3703.4/1.8)/20 = P103m.

This test also concluded that a lower ATR has given rise to more tax per 1% of ATR/per person.

Impact of income tax rates over income tax revenue, total revenue, GDP, tax collection per person, per tax payer at real value of money

The fourth hypothesis investigates the effect of the real value of money by stating: “At the real value of money (RVM), 1% of income tax rate (both at higher marginal tax rate (HMTR) and average tax rate (ATR) leads to lesser (a) tax revenue (b) total revenue (c) GDP and (d) tax collection per person and per taxpayer when compared to lower ITR with higher ITR” The results obtained at the nominal value of the money may be totally different when we study the application of theory of real value of money (RVM). Table 7 portrays the effect of 1% of ITR at RVM by taking the variables of HTMR and ATR.

Let us analyze the various variables by applying the principles mentioned under H3 replacing the NVM by the RVM.

EFFECT OF 1% ATR TAKING THE RVM

Real value of money (RVM) at HMTR: Income tax revenue

The tax revenue at real value in 1982 will be the same as nominal value of money; as 1982 is the base year where the NCOLI is deemed to be 100, whereas the RVM in 2002 is P565m. At the real value the income tax collection is hardly increased by five times (Table 5 (f)). The effect of 1% of ITR at HMTR is derived by the principle:

1% effect of HMTR =Tax Revenue/HMTR (xviii)

In 1982 the effect of 1% HMTR = P103/50 = P2.06m
In 2002 the effect of 1% HMTR = P565/25 = P22.59m

As the HMTR is reduced from 50 to 25%, the tax collection at the RVM is gradually increased at a lower growth rate when compared to NVM. It is confirmed that the effect of 1% ITR is more effective at the reduced HMTR under RVM also [Table 7 (b)].

Total revenue

Table 7 (c) reveals the effect of 1% of ITR on the total revenue generation. At higher tax rates, the revenue generation is less per 1% of ITR when compared to lower tax rates. The principle applied here is:

1% effect of HMTR = Total Revenue/HMTR (xix)

In 1982 the effect of 1% HMTR = P323/50 = P6.5m
In 2002 the effect of 1% HMTR = P2169/25 = P86.8m

In 1982, the revenue generated on the basis of RVM per 1% of tax rate is P6.5m, whereas in 2002 it registered P-86.8 m at the lower tax rates. This test also indicated that the higher the tax rates, the lower the total revenue and vice versa.

Effect of 1% of ITR on GDP

Column (d) of Table 7 reflects the effect of 1% of ITR on GDP of Botswana. In this test also, the lower HMTR lead to higher GDP. In the year 1982, 1% of ITR has a total of P14.9m GDP whereas in 2002, it achieved P221.6m. The growth rate compared to NVM is not as encouraging although there is a gradual increase of GDP when ITR is gradually reduced. This test also proved that the lower the HTMR the higher the economic growth.

Effect of 1% of ITR on the tax revenue over total revenue

This test reveals the correlative effect of tax revenue on the total revenue. The principle applied here is:

{(Tax revenue/Total revenue)*100}HMTR (xx)

To test the principle years 1982 and 2002 figures of Table 5 (f) and (g) are taken.

1982 = {(103/323)*100}/50 = 0.6%
2002 = {(565/2169)*100}25 =1%

This test also indicated that the lower the tax rate, the higher the tax collection per 1% of ITR. Column (e) of Table 7 revealed that there is a gradual increase in percentage when there is a gradual decrease in HMTR.

Effect of 1% of ITR on tax revenue over GDP

This test pinpoints the relative effect of tax revenue over GDP at 1% of tax rate. The principle applied here is:

{(Tax revenue/GDP)*100}HMTR (xxi)

To test the principle years 1982 and 2002 figures of Table 5 (c) and (d) are taken.

1982 = {(103.1/743)*100}/50 = 0.3%
2002 = {(565/2169)*100}25 =0.4%

This test also indicated that the lower the tax rate, the higher the revenue generation per 1% of ITR. Column (f) of Table 7 revealed that there is a gradual increase in percentage when there is a gradual decrease in HMTR.

Effect of 1% of ITR per tax return

The principle applied:

(Tax revenue/No of returns assessed)/HTMR (xxii)

For 1986 = {(P230 000 000/17451)/47.5 = P300
For 2002 = (565 000 000/9955)/25 =P2.3

In this test also, it was proved that the lower the tax rates, the higher the tax revenue per tax return.

Tax collection per 1% of HMTR /population

The population of the country doubled during this 21 year period.

The effect of 1% ITR based on population is calculated as the principle:

(Tax revenue/population)/HMTR (xxiii)

In 1982 = (P103.1/0.9)/50 = P2.3m
In 2002 = (P565m/1.8)/25 = P12.6m.

This test also suggested that lower HMTR has given rise to more tax per 1% of HMTR per person.

As mentioned earlier, the effect of tax rate will be tested at HMTR and ATR. So far, we have seen the effect of HMTR. The following investigation is to find out the effect of 1% of ATR on all variables such as:

Real value of money at ATR

Income tax revenue: It is reiterated that income tax revenue occupies a major role in the total revenue of the country, hence the effect of 1% of ITR at ATR is tested and presented in column (i) of Table 6. The principle applied is:

1% effect of ATR = tax revenue/ATR (xiv)

In 1982 the effect of 1% ATR = P103.1/36.5 = P2.84m
In 2002 the effect of 1% ATR = P565.0/20 = P28, 23m

As the ATR is reduced from 36.5 to 20%, the tax collection is gradually increased and it confirmed that the effect of 1% ITR is more effective at a reduced ATR.

Total revenue: Table 6 (j) reveals the effect of 1% of ITR on the total re-venue generation. At higher average tax rates, the reve-nue generation is less per 1% of ITR when compared to lower tax rates. The principle applied here is:

1% effect of ATR = total revenue/ATR (xxv)

In 1982 the effect of 1% ATR = P322.6/36.5 = P8.9m
In 2002 the effect of 1% ATR = P2169/20 = P108.5m

In 1982, the revenue generated per 1% of tax rate is P8-.9m, whereas in 2002 it is registered as P711.3m at a lower tax rates. This test also indicated that higher the tax rates, the lower the total revenue and vice versa. Lower average income tax rates generate higher revenue which will add to the economic development of the country.

Effect of 1% of ITR on GDP

Column (k) of Table 6 reflects the effect of 1% of ITR on GDP of Botswana. In this test also, the lower ATR lead to a higher GDP. In the year 1982, 1% of ITR has a total of P21m GDP whereas in 2002, it has achieved P277m. There is a gradual increase of GDP when ITR is gradually reduced. This test also proved that the lower the A-TR the higher the economic growth.

Effect of 1% of ITR on the tax revenue over total revenue

This test reveals the correlative effect of tax revenue over the total revenue. The principle applied here is:

{(Tax revenue/Total revenue)*100}ATR (xxvi)

To test the principle years 1982 and 2002, figures of Table 5 (b) and (c) were taken.

Table 8. Analysis of the final results at nominal and real value of money

Final test Of hypothesis for 1% of ITR	Nominal value				Real value			
	HMTR		ATR		HMTR		ATR	
	TTR	LTR	TTR	LTR	TTR	LTR	TTR	LTR
H1. Income tax revenue (Pm)	2.06	148.14	2.84	185.2	2.06	25.59	2.84	28.23
H2. Total revenue (Pm)	6.5	569.1	8.9	711.3	8.5	86.6	8.9	108.5
H3. GDP (Pm)	14.9	1453.5	21	1817	14.9	221.6	20.5	277
H4. % of TxR/TR (P'000)	0.6	1.0	0.9	1.3	0.6	1.0	0.9	1.3
H5. % of tax revenue over GDP	0.3	0.4	0.4	0.5	0.3	0.4	0.4	0.5
H6. Per tax return (P000)	0.4	14.9	0.6	18.6	0.3	2.4	0.4	2.8
H7. Per person based (Pm)	2.3	82.3	3.2	103	2.3	12.6	3.2	15.7

Note: TTR = Top tax rate; LTR = Low tax rate

1982 = {(103.1/322.6)*100}/36.5 = 0.1%
2002 = {(565/2169)*100}20 =1.3%

This test also indicated that the lower the tax rate, the higher the tax collection per 1% of ITR. Column (k) of Table 7 revealed that there is a gradual increase in percentage when there is a gradual decrease in ATR.

Effect of 1% of ITR on total revenue over GDP

This test pinpoints the relative effect of total revenue over GDP at 1% of tax rate. The principle applied here is:

{(Total revenue/GDP)*100}ATR (xxvii)

To test the principle years 1982 and 2002 figures of Table 5 (c) and (d) are taken.

1982 = {(103.1/743.3)*100}/36.25 = 0.4%
2002 = {(565/5540)*100}20 =0.5%

This test also indicated that the lower the tax rate, the higher the revenue generation per 1% of ITR. Column (f) of Table 6 revealed that there is a gradual increase in percentage when there is a gradual decrease in ATR. Over 21 years, the change is only 0.1%

Effect of 1% of ITR per tax return

Number of tax returns assessed or number of persons taxed was taken as a basis for the study of effect of 1% ITR in relation to tax revenue generation. As stated earlier, a few years' data was unavailable. The first available year is 1986 where 17451 tax returns were assessed and the threshold was zero. Hence, there will be more tax returns compared to year 2002. In the year 2002, the highest threshold was given to an individual; hence the majority of the tax payers need no subject to tax returns. Hence the tax returns almost reduced to 36.5%. However the principle applied here is:

(Tax revenue/No of returns assessed)/ATR (xxviii)

For 1986 = {(P230 000 000/17451)/33.75 = P400
For 2002 = (565 000 000/9955)/20 =P2800

In this test also, it is proved that lower the tax rates, the higher the tax revenue per tax return.

Tax collection per 1% of ATR /population

The population of the country doubled during these 21 years period.

The effect of 1% ITR based on population is calculated as the principle:

(Tax revenue/Population)/ATR (xxix)

In 1982 = (P103.1/0.9)/36.5 = P3.2m
In 2002 = (P565/1.8)/20 = P15.7m.

This test also proved that lower ATR has given rise to a higher tax per 1% of ATR per person.

Table 8 pinpoints the effect of 1% of income tax rate under nominal value and real value of money taking into account the higher marginal tax rate and average tax rate. Under each category, the high tax and low tax rate effects are also shown. In all investigations, it revealed that the low tax rates have shown better results than top tax rates.

Conclusions

Developed nations(Hypothesis 1)

The top marginal income tax rate is located in China (45%) and the lowest was 29% in Canada. In lower marginal tax rates, the highest was charged by Canada (16%) and lowest was in China (5%). The maximum company tax was charged by USA at 35% and the lowest was Canada at 21%.

The impact of income tax revenue over the GDP varies from 4 to 12%, lowest being from Japan and the highest was from USA. The share of income tax revenue over its total revenue is impressive in developed nations ranging from 78% (China) to 27% (UK). Income tax collection per head varies from $3956.09 (USA) to $84.81 (China). The highest income tax collection per head is recorded in USA.

It is not a universal truth that developed nations charged higher ITR. There are instances where a few developing nations such as South Africa and Zimbabwe charged top marginal tax rate at 45%. Hence the first hypothesis is nullified as developing nations have been charging higher tax rates compared to developed nations.

Developing nations(Hypothesis 2)

Except Malawi (36.5%) and Angola (36%), the impact of income tax revenue over the nations GDP is not impressive in developing nations. The lowest impact of income tax over GDP is located in Mozambique (2%), Botswana (3%) and Malawi (4%).

High impact of income tax revenue over the total revenue of the countries is located in countries such as Angola (75%), South Africa (57%), Zimbabwe (51%), Malawi (42%), Zambia (36%), and Namibia (30%). The lowest impact of income tax over its total revenue was traced to Botswana (6%) and Namibia (6%).

Among the SADC countries, the highest income tax per head is collected in South Africa ($387.79) and the lowest is from Mozambique ($2.93). The more direct effect of income tax revenue located over the total revenue and tax collection per person in developed nations compared to developing nations. Based on the above analysis, it can be stated that the majority of developing nations are depending on income tax revenue for their economic development. There is no uniformity in the percentage of income tax revenue collection over GDP in developing nations. It varied from 2 to 50%. Whereas the developed nations' income tax influence variance between the lowest and highest does not depend as much on GDP. It ranged from 4 to 12% whereas in developing nations the variance was from 2 to 50%.

Both developing nations and developed nations recorded the highest percentage of income tax revenue over the total revenue in the range of 75 to 78% and the lowest is between 12 and 27% from developing and developed nations [Table 3 (e)].

There is a wide disparity of income tax revenue collection per head both in the developing nations and developed nations. The range is high in the developed nations. This may be due to a huge population in China [Table 3 (e)]. The majority of developing and developed nations depend on tax revenue. It was observed that developing nations compared to developed nations depend more on income tax revenue. The range of income tax influence is greater in developing nations than in developed nations.

Both types of nations (developing and developed nations recorded highest percentage of income tax reve-nue over total revenue and at the same time it was located that there is a wide variation in income tax collection per head.

Hypothesis 3

The research on hypothesis of ITR influence in developing nations taking case study that the lower the ITR at NVM under the variable of HTMR proved that the higher the tax collection, revenue generation, increase in GDP, percentage of tax revenue over total revenue, percentage of tax revenue over GDP, tax collection per tax return and tax collection per head. This hypothesis is tested at the NVM, taking HMTR and ATR. Income tax revenue, total revenue and GDP are gradually increased at NVM. When HMTR is reduced from 50 to 25%, the tax collection increased and it is confirmed that the effect of 1% of ITR is more effective at the reduced HTMR. Lower income tax rates generated more revenue for the economic development. The effect of 1% reduction of ITR has given raise to increase in tax revenue, GDP, total revenue, tax collection per return and per person at lower HTMR.

Average Tax Rates (ATR) is also taken into account to find out the effect of reduction in ATR in tax collection, revenue generation, increase in GDP, influence of 1% decrease in tax rates over revenue generation, GDP etc., it is located to confirm or to disprove the hypothesis that higher tax rates lead to higher effect is disproved. Lower tax rates have more impact on the tax collection, generation of total revenue, and increase in economic growth.

Hypothesis 4

This study the effect of RVM and assumed that higher tax rates lead to lower tax collection, revenue generation, GDP etc. Even in this study of RVM, the lower tax rates have lead to higher tax collection, revenue generation and economic development. Table 8 has given the final analysis showing that the lower tax rate (LTR) has given more effect on income tax revenue, total revenue, GDP, percentage of tax revenue over total revenue, tax revenue over GDP, tax per tax return and per person. This was proved in both nominal and real value of money in the coverage of higher marginal tax rates and average tax rates.

The above research and analysis disproves the earlier theory that higher tax rates lead to economic development. In order to disprove this theory in developing nations such as Botswana, there is a greater impact of the lower income tax rates on the economic development of the country through a higher tax revenue collection, generation of higher revenue and increase in GDP.

Limitations and suggestions for future research

The major limitation of the study is the incompleteness of data on income tax of the SADC countries under study. Ne-

vertheless, the information available for more than 50% of the countries will represent the whole region as Bobbie (1973) observed, that a sample from a population will accurately describe the total population. A sample of one developing country like Botswana may not be a universal truth; hence it is suggested to take up a cluster of developing nations and developed nations for further research at a large scale.

REFERENCES

Akira Y (2003). Taxation and growth with overlapping generations. J. Public Financ. 87 (3/4): 467-487.

Babbie ER (1973). Survey Research Methods Wadsworth Publishing Company Inc. California.

Bank of Botswana (1985-2004), Annual Reports.

Bartik T (1994a). "Jobs, Productivity and LOCAL Economic Development: What Implications Does Economic Research have for the role of Government: National Tax. J. (47): 847-862.

Bartik T (1994b). "Taxes and Economic Development: What do we know and what can we know?" Proceedings of Eigthy Seventh Annual Conference on Taxation (Nov. 13): 102-106, Charleston, SC, National Tax Association. Tax Institute of America.

Boadway RB (1982). Public Sector Economics, Little, Brown and Company.

Burgess Ronald (1993). Public Revenue without Taxation, Shepheard-Walwyn (Publishers) Ltd, London.

Central Statistics Office (2001). Statistical Bulletin, (26,) No.1.

Department of Taxes, Botswana (1990-2004). Annual Reports

Europa Publications (1990-2004). Regional Survey of the World, Africa, South of Sahara. Taylor & Francis Group.

European Chemical News (2004). Tax Carrot hangs for Enterprise. 80 (2082): 29-34.

Fossati (1992). "From Personal to Indirect Taxation: A general Equilibrium approach", in Galeotti G, Graham J (1994). "The International Handbook of Corporate and Personal Taxes", Chapman & Hall.

Government of Botswana (1973 – 2002). Income Tax Act of 1973 and all amended Acts up to 2002.

Henry J, Aron, William G, Gale (Ed) (1996). Economic Effects of Fundamental Tax Reform. Brookings Institution Press, Washington D.C.

Holger S (2003). Capital tax reform, corporate finance, and economic growth and welfare. J. Econ. Dyn. Control 28 (3): 595-615.

Jerry MR (1983). Dictionary of Business and Management, Wiely-International, New York.

John DW, Pamela H (2003). Issues in Analyzing the Macroeconomic Effects of Tax Policy. National .Tax .J. 56 (3): 447-462.

Lewis SR Jr. (1984). Taxation for Development: Principles and Application. New York: Oxford University Press.

Lipsey RG (1989). An Introduction to Positive Economics, Weidenfeld, Nicolson, London, Seventh Edition.

Maisto G (1988). Tax Treatment of Cost-Contribution Arrangements, Kluwer Law & Taxation Publishers, Boston.

Marrelli M (1992). Design and Reform of Taxation Policy, Kluwer Academic Publishers, the Netherlands.

Martin Z, George D (2003). Fiscal Policy and Economic Growth. J. Econ. Surveys. 17 (3) 397-418.

Olhoft RS (2003). Discussion of the effect of State Income Tax Apportionment and Tax Incentives on New Capital Expenditures. J. Am. Tax. Assoc. 25: 27-32.

Slemord J (2003). The Truth about Taxes and Economic Growth. Challenge. 46 (1): 5-14.

Swami BN (1995). Taxation, Inflation, Savings and Development: Case Study of Republic of Botswana. African Review of Money, Finance and Banking – a Supplementary Issue of "Savings and Development". 1 and 2.

Tetsuo O (2003). Environmental Tax Policy and Long-Run Economic Growth. Japanese Econ. Rev. 54 (2): 203-217.

Wasylenko M (1997). "Taxation and Economic Development: The State of the Economic Literature" New England Econ. Rev. March/April, 3-53.

World Bank (1991). Lessons of Tax Reform, World Bank Washington DC.