The Effect of Tax Incentives on the Development of Manufacturing Industry in Rwanda

Iradukunda Bonne Esperance and Dr. Mpakaniye Jean Paul

AJP

The Effect of Tax Incentives on the Development of Manufacturing Industry in Rwanda

Iradukunda Bonne Esperance[1*] and Dr. Mpakaniye Jean Paul[2]

[1]Post Graduate Student, Ines Ruhengeri

[2]Dean, Faculty of Economics Social Science and Management, Ines Ruhengeri

Corresponding Author's Email:
iradukundabonne11@gmail.com

Abstract

Purpose: The main objective of this research was to determine the effect of tax incentives on development of manufacturing industry in Rwanda under the period of research 2012 up to 2022.

Methodology: By using Slovene's formula a sample of 344 registered manufacturing companies was extracted from 2500 registered manufacturing companies. Secondary data collected from Ministry of Finance and Economic planning annual reports. The research used quantitative data analysis for analyzing the relationship between the independent and dependent variables.

Findings: The analysis showed that $5.73 + 0.03AD + 10LCF$ is statistically significant as it gave a prob>F of 0.00 and regression analysis showed that one unit increase of accelerated depreciation and loss carried forward will increase 0.03 and 10 units in the development of manufacturing industry in Rwanda. It have found that there is a positive relationship between tax incentives and development of manufacturing industry in Rwanda under the period of research where the model is capturing the variability of manufacturing industry of 93%. Research concluded that tax incentives are the key to the sustainable growth of manufacturing industry.

Recommendation: The government should design policies that specifically address issues related to the sustainable growth of manufacturing industries in Rwanda.

Keywords: *Tax incentives, manufacturing industry*

INTRODUCTION

Tax incentives have been used by different governments to promote prioritized sectors. These incentives are special treatments designed for selected group of taxpayers that fulfill certain requirements provided by the law. They may take form of tax credits, accelerated depreciation, value added tax refund, capital gain, tax holidays, import tariffs, preferential tax rates, investment allowance and deferral of tax liability. The country's tax code determines the incentive schemes in accordance to the behavior of encouraging a given economic activity by making a reduction in tax liability of a company (United Nations, 2018).

According to a research done by Quimb and Rosellon (2019) about impact of government incentives on micro, small and medium establishment's innovation in Philippine, the findings have highlighted that upon the external and the internal factors affecting micro, small and medium establishments the government support play a great role. It has been shown that tax incentives generate benefits not claimed on innovation process but recorded in terms of management and marketing skills.

Rwanda have targeted to benefits from the incentives, the program largely targets players in the manufacturing industries because the sector has multiplier effects. They are looking at it from the perspective of catalyzing other sectors of the economy as well as stabilizing trade balance because there are so many products imported that could be produced locally (Mwai, 2021). The government of Rwanda each financial year spends a considerable amount in terms of tax incentives with aim of attracting foreign and local investment. According to the tax expenditure report of 2017/20218, 2018/2019, 2019/2020 the foregone amounts in terms of billions on accelerated Depreciation are 4.46, 12.37, 11.14 and Loss carried forward 22.9, 33.4, 41.3 respectively (MINECOFIN, 2021).

The significant amount foregone by Rwandan government in terms of incentives had specific objective fixed in internal policy. Mainly the overall context is to provide an investment climate to facilitate the raise of internal and external capital through the investment. The main problem to be address by this research is the assessment of relationship between incentives granted and the achievement of the set policy. This is to be done through the evaluation of the relationship, which is between the incentives foregone accelerated depreciation, loss carried forward and the turnover recorded by manufacturing industry across the 10 previous years.

LITERATURE REVIEW

Fred Siebert, Theodore Peterson and Wilbur Schramm had proposed normative theory for first time during the cold word war. The theory describes how the development of the institutional structure of government creates a set of incentives as well as constraints within which governments and other actors operate (Wegner, 1985). Normative theory present the way development of government bring to existence of incentives with other government activities restriction (John & Son, 2020) .Incentives formulate development and government can change efficiently in one way or another therefore Policy making of tax and tax administrative Also change. The developed institutions after reforms it provides general conception framework to be put in action when understanding the development of fiscal policies and schemes taking into consideration of time as well as cultural scope. A comprehensive model of explaining, describing and prediction is required.

Chua (1995) indicatethat incentives can highly cause abuse and corruption. There must be an argument the availability of incentives to those who meets the requirements and criteria to benefit them. Alternatively, there is an argument providing that firms need to benefit incentives to push them to enhance investments. The granted incentives to each investment need to be justified with specific reason in a given sector. Normally, each of the both alternatives to be put in action has a correlation with the governance strength in a given institution. The transparency as much as possible of outcomes from the allowed incentives by politicians and rules makers is one of inherent view to observe. Therefore this theory is helpful on the recommendations that could be given to this research as pillar of reference. With normative theory the researcher gets a point of view in terms of assessment on the achievement of implemented policies.

2.2 Empirical Review

The fiscal incentives have been part many scholars' studies as a government policy in line with investment. The extent to which is assigned its role in attracting local as well as foreign investment has been key point of undertaken researches. Below are some of few recent studies conducted on effect of tax incentives on economic development perspective.

The findings of Uwaume and Ordu (2017) reveal that tax incentives have enhanced industrial growth and economic development of Nigeria. Maxwell (2015) has highlighted using a multiple regression analysis the significant a positive relationship between wear and tear depreciation and financial performance of five star hotels in Nairobi County. Hong Kong Trade Council (2022) by using primary and secondary data to analyze effect of tax incentives on Foreign Direct Investment with Rwanda case study has found a positive relationship between corporate income tax incentives and FDI. Harerimana (2018) used questionnaire and documentation to collect primary and secondary data to analyze the effect of tax incentives on investment in Rwanda and found that tax incentives have a significant positive effect on investment in considered private sector of manufacturing industry.

Research has not been studied in depth in Rwanda and much has been done in other countries such as Kenya, Nigeria and Ghana. Hence, this study will fill this research gap by assessing tax incentives and their influence development of manufacturing industry in Rwanda; determine the effect of accelerated depreciation and loss carried forward on development of manufacturing industry in Rwanda.

METHODOLOGY

This research have analyzed secondary data which are quantitative by nature, the researcher has no control on manipulation of data and need to treat them as they appear. The suitable research design in this case is the correlation research design which investigate relationship between dependent variable and independent variables. The main objective of this research, was to establish the relationship between tax incentives fore gone by the government of Rwanda and the level of development of manufacturing industry measured in terms of annual turnover. According to RDB (2020) the estimated 7,200 manufacturing companies in the country only 2,500 are registered. A sample of 344 registered manufacturing companies was obtained by using Slovene's formula. Within this research, Stata software have used to analyze data and the presentation have done with descriptive statistic, correlation tests are used to determine whether a data set is modeled for normal distribution and stationary test of data.

RESULTS AND DISCUSSION

Annual Turnover (income)

Annual turnover is measure of income generated by manufacturing industry in USA dollar. Table 1 shows income done by manufacturing from 2012 up to 2021 in billions of USA dollars and Gross domestic product contributed by manufacturing industry had increased from 8.28 up to 9.1 % , income is from $ 0.63 billion up to $ 1.02 billion respectively.

Table 1: Rwanda manufacturing output data – historical data

Year	Billions of US dollars	% of GDP
2021	$1.02B	9.18%
2020	$0.89B	8.74%
2019	$0.87B	8.37%
2018	$0.74B	7.63%
2017	$0.71B	7.68%
2016	$0.58B	6.70%
2015	$0.58B	6.83%
2014	$0.56B	6.81%
2013	$0.53B	6.82%
2012	$0.63B	8.28%

Tax Expenditure

Tax expenditure mean losses attributable to provisions of Federal tax laws which allow a special exclusion, exemption, or deduction from gross income. Tax expenditure in this research was an expense spent on tax incentives which are accelerated depreciation and loss carried forward done by government of Rwanda.

Table 2: Rwanda tax expenditure on accelerated depreciation and loss carried forward

Years	Accelerated depreciation	Loss carried forward
2012	$0.19 B	$0.26 B
2013	$0.28 B	$0.16B
2014	$0.33 B	$0.81B
2015	$0.37 B	0.$36B
2016	$0.44 B	$0.319B
2017	$0.2241B	$0.189B
2018	$0.446 B	$0.160B
2019	$0.1237 B	$0.170B
2020	$0.1114 B	$239B
2021	$0.661 B	$0.433B

Descriptive Statistics

Table 3: summary statistics

```
. summarize acerelateddepreciation losscarriedforward annualturnover
```

Variable	Obs	Mean	Std. Dev.	Min	Max
acerelated~n	10	1.73e+12	2.16e+12	1.92e+11	6.61e+12
losscarrie~d	10	9.50e+09	1.44e+10	1.60e+08	4.33e+10
annualturn~r	10	7.29e+11	2.08e+11	5.30e+11	1.20e+12

As demonstrated above the average of accelerated depreciation and loss carried forward received by manufacturing industry for the period 2012 to 2021 were 1.73e+12 , 9.50e+09 with a standard deviation of 2.16e+11 , 1.44e+10. The maximum was 6.61e+12, 4.33e+10 while the minimum was 1.92e+11, 1.60e+08 respectively.

Table 4: Correlation analysis

```
. correlate acerelateddepreciation losscarriedforward annualturnover
(obs=10)
```

	acerel~n	lossca~d	annual~r
acerelated~n	1.0000		
losscarrie~d	0.6340	1.0000	
annualturn~r	0.7949	0.9411	1.0000

This table 4 shows correlation coefficient of dependent variable and independent variables. The accelerated depreciation, loss carried forward and annual turnover of manufacturing industry are positively correlated as their p value which is equal to 0.94

Table 5: Normality test

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	joint Prob>chi2
acerelated~n	10	0.017	0.142	6.69	0.0352
losscarrie~d	10	0.012	0.081	7.60	0.0224
annualturn~r	10	0.044	0.170	5.54	0.0627

This table 5 present normality test, tested using skewness and kurtosis. A general guideline for skewness is that if the number is greater than +1 or lower than −1, this is an indication of a substantially skewed distribution. For kurtosis, the general guideline is that if the number is greater than +1, the distribution is too peaked. Likewise, a kurtosis of less than −1 indicates a distribution that is too flat. Distributions exhibiting skewness and/or kurtosis that exceed these guidelines are considered non normal (Hair et al., 2017) to mean these data are normally distributed.

Table 6: Heteroskedasticity

```
. hettest, rhs fstat

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
        Ho: Constant variance
        Variables: losscarriedforward

        F(1 , 8)      =      1.71
        Prob > F      =    0.2274
```

Table 6 represent the assessment is based on the prob>F compared with the significant p-value of 0.05. The results in table above show that a prob>F=0.2274 which is greater than significance level of 5%. This means that there is no heteroskedasticity in the data.

Regression Analysis

In order to find the effect of tax incentives on development of manufacturing industry, a regression model is run and the results are presented in figure 9. The results present the fitness of model used of the regression model in explaining the study phenomena. The independent variables were found to be satisfactory in development of manufacturing industry. This is supported by coefficient of determination also known as the R square which is greater than 85%. This means that the independent variables namely accelerated depreciation and loss carried forward explained over 85%, the variations in the dependent variable which is development of manufacturing industry.

The results further imply that the model applied to link the relationship between the variables was satisfactory. In statistics, the Word R-square acts as an indicator of the good model fits data. Given that the p-value was less than 0.05, taken together, the coefficients in the model means it is statistically significant. Hence, it is concluded that the model is significant in explaining the relationship between tax incentives and development of manufacturing industry.

Table 7: Regression analysis of annual turnover and accelerated depreciation

```
. regress annualturnover acerelateddepreciation
```

Source	SS	df	MS		Number of obs =	10
					F(1, 8) =	13.73
Model	2.4671e+23	1	2.4671e+23		Prob > F =	0.0060
Residual	1.4378e+23	8	1.7972e+22		R-squared =	0.6318
					Adj R-squared =	0.5858
Total	3.9049e+23	9	4.3388e+22		Root MSE =	1.3e+11

annualturn~r	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
acerelated~n	.0765387	.0206581	3.71	0.006	.028901	.1241764
_cons	5.97e+11	5.54e+10	10.77	0.000	4.69e+11	7.25e+11

Table 7 shows regression model of accelerated depreciation and annual turnover where value added tax is statistically significant because its p-value is equal to 0.006 which is less than 0.05 to mean that hypothesis is accepted. A unit increase of accelerated depreciation will increase 0.08 units on development of manufacturing industry other things remains constant.

Table 8: Regression analysis of annual turnover and loss carried forward

. regress annualturnover losscarriedforward

Source	SS	df	MS			
Model	3.4584e+23	1	3.4584e+23			
Residual	4.4655e+22	8	5.5818e+21			
Total	3.9049e+23	9	4.3388e+22			

Number of obs = 10
F(1, 8) = 61.96
Prob > F = 0.0000
R-squared = 0.8856
Adj R-squared = 0.8714
Root MSE = 7.5e+10

annualturn~r	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
losscarrie~d	13.63016	1.731626	7.87	0.000	9.637027	17.6233
_cons	5.99e+11	2.88e+10	20.82	0.000	5.33e+11	6.66e+11

Table 8 shows regression model of loss carried forward and annual turnover where loss carried forward is statistically significant because its p-value is equal to 0.00 which is less than 0.05, this means that hypothesis is accepted. A unit increase of loss carried forward will increase 13 units on development of manufacturing industry other things remains constant.

Table 9: General regression

. regress annualturnover acerelateddepreciation losscarriedforward

Source	SS	df	MS			
Model	3.7149e+23	2	1.8574e+23			
Residual	1.9001e+22	7	2.7144e+21			
Total	3.9049e+23	9	4.3388e+22			

Number of obs = 10
F(2, 7) = 68.43
Prob > F = 0.0000
R-squared = 0.9513
Adj R-squared = 0.9374
Root MSE = 5.2e+10

annualturn~r	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
acerelated~n	.0319148	.0103813	3.07	0.018	.007367	.0564626
losscarrie~d	10.58681	1.561457	6.78	0.000	6.894552	14.27907
_cons	5.73e+11	2.18e+10	26.29	0.000	5.22e+11	6.25e+11

Regression equation is equal to $D = \mathbf{5.73} + \mathbf{0.03}\text{AD} + \mathbf{10}\text{LCF}$

D represent development of manufacturing industry

AD represent accelerated depreciation and LCF represent loss carried forward

A unit increase in accelerated depreciation will increase 0.03 units in the development of manufacturing industry other things remain constant, and then a unit increase in loss carried forward will increase 10 units in the development of manufacturing industry in Rwanda other things remain constant.

CONCLUSION AND RECOMMANDATION

Conclusion

The main purpose of this study was to assess tax incentives and their effect on development of manufacturing industry in Rwanda for the period of 10 years (2012-2021). The correlation and regression analysis showed that accelerated depreciation and loss carried forward incentives have the great effect on the development of manufacturing industry in Rwanda. Regression model

shows that loss carried forward have much more important than accelerated depreciation because a unit increase of loss carried forward will increase 10 units of development of manufacturing industry while accelerated depreciation will increase 0.03 units only.

The study findings showed that those tax incentives gained by manufacturing industry have positive effects and significant influence on the development of manufacturing industry. This means that any increase in loss carried forward and accelerated depreciation have significant positive influence on the development of the manufacturing industry in terms of income contributed by this industry.

Recommendations

On the basis of the findings in this research work have recommendations to Government that can address the direct need for start-up fund for manufacturing industry by providing accelerated depreciation incentives. That manufacturing companies in Rwanda be made more aware of the importance of loss carried forward incentive and required to take advantage of it in order to increase the country's manufacturing industries.

REFERENCES

RDB. (2022). *Investment incentives*. Official Rwanda Development Board (RDB) Website. https://rdb.rw/why-rwanda/investment-incentives/

Wagner, R. (1985, January). *NORMATIVE AND POSITIVE FOUNDATIONS OF TAX REFORM*. https://www.cato.org/sites/cato.org/files/serials/files/cato-journal/1985/11/cj5n2-2.pdf

Harerimana, J. B. (2018). Effect of Corporate Income Tax Incentives on Investment in Rwanda. Retrieved July 26, 2022.

HKTDC. (2019). Industrial Manufacturing Focus in Rwanda. Retrieved July 26, 2022, from hktdc_MzU3MTQ1Nzg1_en.pdf

MINISTRY OF FINANCE AND ECONOMIC PLANNING. (2021). *Tax Expenditure Report 2019/20*. Retrieved from MINISTRY OF FINANCE AND ECONOMIC PLANNING website: Rwanda_tax_expenditure_report_FY1920%20(1).pdf

Quimba, F. M., & Rosellon, M. A. (2019). Impact of Government Incentive on MSME Innovation. Retrieved July 26, 2022, from pidsdps1927%20in%20phyiripines.pdf

United Nations. (2018). Design and assessment of tax incentives in developing country. Retrieved July 26, 2022, from tax-incentives_eng.pdf

Mwai, C. (2021, March 29). *New incentives for local manufacturers explained*. The New Times | Rwanda. https://www.newtimes.co.rw/news/new-incentives-local-manufacturers-explained

RDB, (2021, March 29). *New incentives for local manufacturers explained*. The New Times | Rwanda. https://www.newtimes.co.rw/news/new-incentives-local-manufacturers-explained

Maxwell, O. (2015). The Effect Of Tax Incentives On Financial Performance Of Five-Star Hotels In Nairobi County (Doctoral dissertation, School Of Business, University Of Nairobi).

Chua, D.   (1995). Tax   Incentives,   in   P. Shome (ed.), Tax Policy   Handbook, International, Monetary Fund, Fiscal Affairs Department, Washington, DC: World Bank.

Daniel,T.,&Faustin,G.(2019).Effectoftaxincentivesonthegrowthofsmallandmedium-sizedenterprises(SMEs)inRwanda:AcasestudyofSMEsinNyarugengedistrict.*JournalofAccountingandTaxation*,*11*(5),89-98.doi:10.5897/jat2019.0339